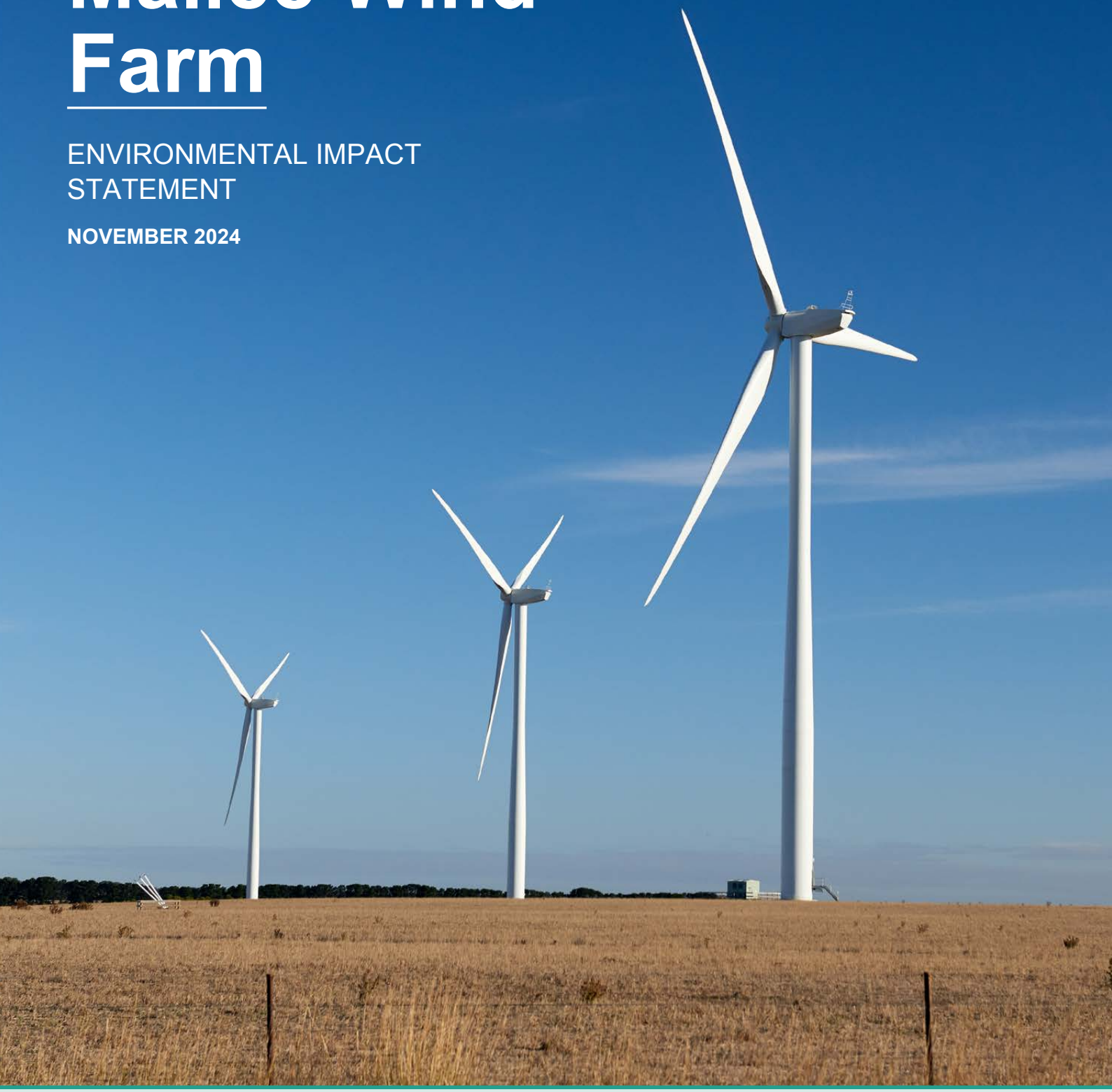
SPARK RENEWABLES

umwelt
Environmental & Social Consultants

Mallee Wind Farm

ENVIRONMENTAL IMPACT STATEMENT

NOVEMBER 2024



Mallee Wind Farm

Environmental Impact Statement

Final

Prepared by Umwelt (Australia) Pty Ltd
on behalf of Spark Renewables Pty Ltd

Project Director: Nathan Baker
Project Manager Jessica Henderson-Wilson
Report No.: 22494/R26
Date: November 2024

Environmental & Social Consultants

APPROVED COMPANY ISO 9001

QMS Certification Services

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Disclaimer

Document Status

Rev No.	Reviewer Name	Reviewer Date	Approver Name	Approver Date
Final	J Henderson-Wilson	5 November 2024	Nathan Baker	5 November 2024

Executive Summary

Project Overview

Spark Renewables Pty Limited (Spark Renewables) proposes to develop the Mallee Wind Farm (the Project) to generate, store and dispatch electricity to the National Electricity Market (NEM). The Project will contribute to reducing greenhouse gas (GHG) emissions associated with energy generation and provide significant regional economic benefits throughout construction and operations. The Project is located approximately 16 kilometres (km) north east of Buronga in the Murray region of southwestern NSW within the Wentworth Local Government Area (LGA) and 17 km north east of Mildura, Victoria (VIC).

The Project will include the installation, operation, maintenance and decommissioning of up to 76 wind turbine generators (WTGs), a single grid scale 100 megawatts (MW) / 200 megawatt hour (MWh) Battery Energy Storage System (BESS), ancillary infrastructure and temporary facilities associated with construction of the Project (refer to **Figure ES.1**). The Project will have an installed generation capacity of up to 402 MW.

The key components of the Project include:

- 76 (three (3) blade) WTGs, with a maximum blade-tip height of 280 metres (m) above ground.
- A single grid-scale 100 MW /200 MWh BESS.
- Permanent ancillary infrastructure including internal access tracks, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
- Temporary facilities including temporary workforce accommodation (TWA) facility, site offices, amenities, construction compounds and laydown areas, concrete or asphalt batching plants, minor 'work front' construction access roads, environmental management and monitoring and signage
- Off-site road works, involving upgrades to the proposed local transport route and establishment of site access points.
- The Project Layout is shown in **Figure ES.1**.

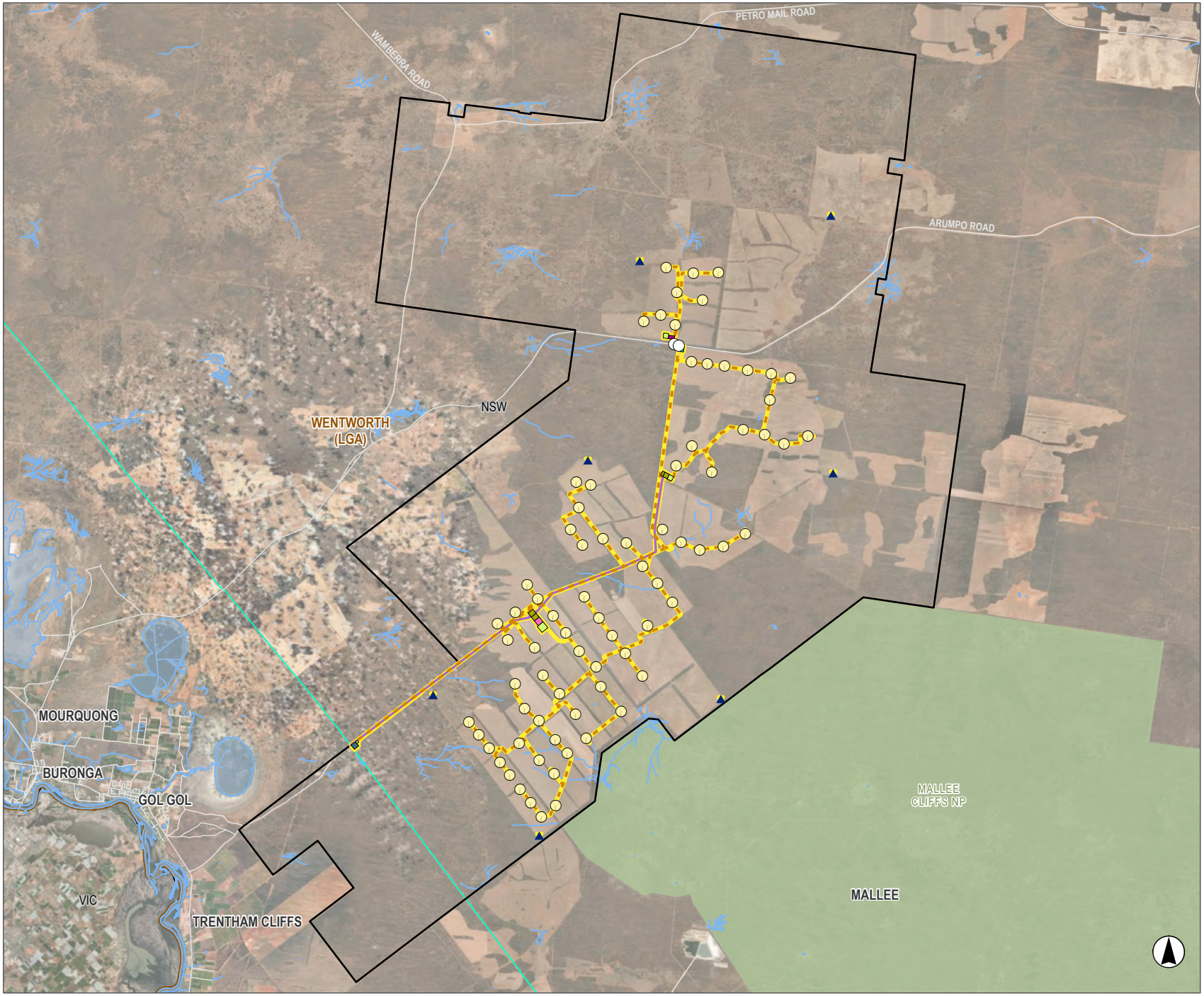


FIGURE ES.1

Project Layout

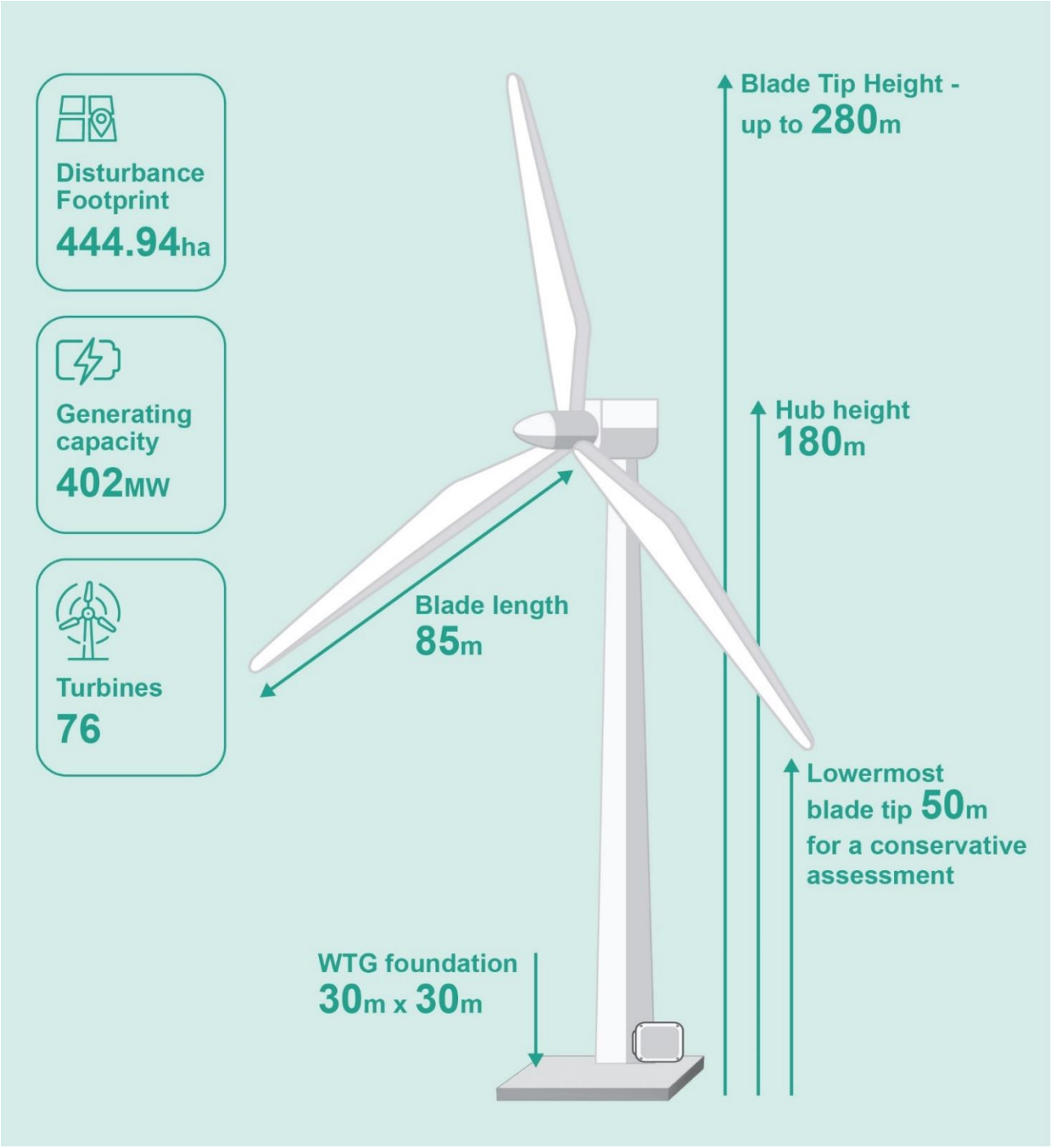
Legend

- Project Boundary
- Disturbance Footprint
- Access Points
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Collector Substation and Switchyard
- Operations and Maintenance Facility
- Construction Compound
- TWA Facility
- Switchyard
- Battery Energy Storage System (BESS)
- Existing HV Transmission Lines
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse
- Waterbody

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)



Picture ES.1 WTG Dimension

Project Need

The development of renewable energy projects aligns with global, Commonwealth and NSW commitments to increase renewable energy generation and reduce GHG emissions across the NSW and Australian economies. NSW is currently in a transition to build a reliable, cost-competitive and sustainable electricity future to support a growing economy (NSW Government, 2019).

Current and future electricity development in NSW is supported though the NSW Government's Electricity Strategy (NSW Government, 2020) and the NSW Electricity Infrastructure Roadmap (NSW Government, 2020) (the Roadmap) which builds on the framework set out in the Electricity Strategy taking an integrated approach to all demand and supply options. The Roadmap aims to support the private sector to deliver at least 12 GW of new renewable electricity generation. This is to be achieved through the delivery of five (5) REZs, comprising the Central West Orana, South West, New England, Hunter-Central Coast and Illawarra REZs. These zones will serve as 'modern day power stations'.

The Project is located within the South West REZ that is projected to generate up to 2.5 GW intended capacity (EnergyCo, 2023). The Project will contribute to meeting the delivery phase of the NSW Network Infrastructure Strategy (EnergyCo, 2022). The Project also aligns with the strategy's principles developed through stakeholder consultation. It will contribute to affordable energy generated and provided to the NEM increasing the networks security and reliability.

A graphic with an overview of the need for the Project is provided in **Figure ES.2**.

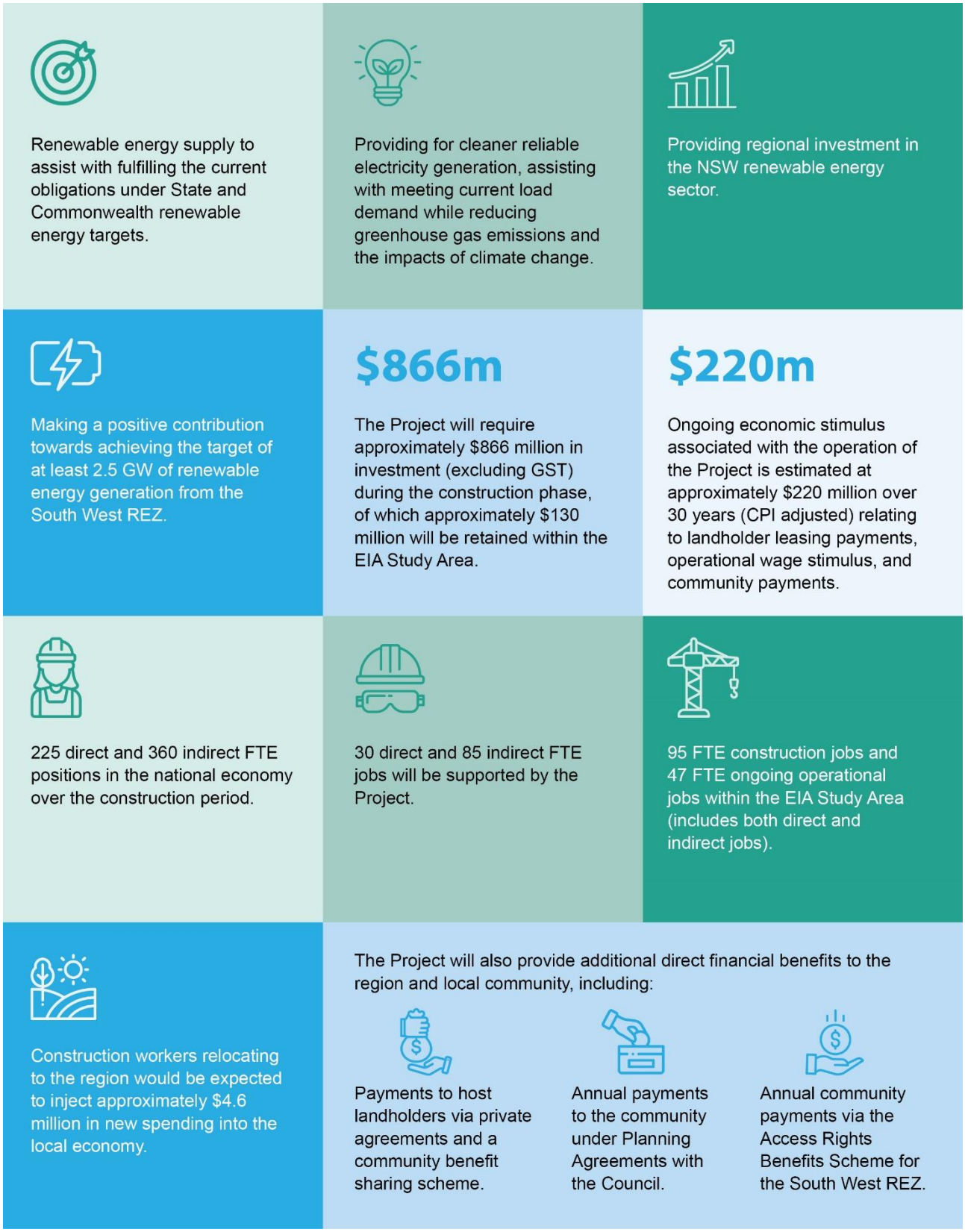


Figure ES.2 Project Need

Source (Umwelt, 2024).

Proponent Overview

The Proponent, Spark Renewables, is one of Australia's leading developers and long-term owners of renewable energy generation assets.

The company's portfolio comprises the Bomen Solar Farm, operational since 2020, and a number of projects in the development phase. Spark Renewables is currently developing more than 7 GW of solar, wind, and renewable storage projects across the NEM, including the Dinawan Energy Hub, Mallee Wind Farm, Mallee Solar Farm and Wattle Creek Solar Farm, within NSW.

Spark Renewables is a wholly owned business within Tenaga Nasional Berhad (TNB), which is the largest electricity utility in Malaysia and also the largest publicly listed power company in southeast Asia. With the core business of providing electricity to businesses, homes and industries, TNB's activities encompass the entire electricity production and supply value chain.

In recent years, TNB has embarked on a sustainability agenda, highlighting its commitment to decarbonisation and renewable energy initiatives. TNB strives to fulfill its commitments as outlined in its Net Zero 2050 Aspiration Plan to attain both net zero emissions and a coal free energy portfolio by 2050, as well as implementing other environmental and social initiatives adding value to all stakeholders and the global community.

Approval Pathways and Assessment Process

The Project is State Significant Development (SSD) as defined under State Environmental Planning Policy (Planning Systems) 2021 and requires development consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). On 17 February 2023, the NSW Planning Secretary issued Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD-53293710).

On 26 May 2023, the Project was declared a Controlled Action under section 75 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on the basis of likely significant impacts to listed threatened species and communities (section 18 and 18A) under the EPBC Act. It was further determined that the Project will be assessed under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). Supplementary SEARs were subsequently issued in June 2023.

This Environmental Impact Statement (EIS) provides an assessment of the environmental, social and economic impacts of the Project, in accordance with the SEARs and Supplementary SEARs. The purpose of this EIS is to assist the community, Council, government agencies and other key stakeholders to understand the Project and its benefits and impacts. This EIS is also intended to provide the necessary information to the consent authority to make an informed decision on the overall merits of the Project.

Figure ES.3 below provides an overview of the key stages in the SSD process.

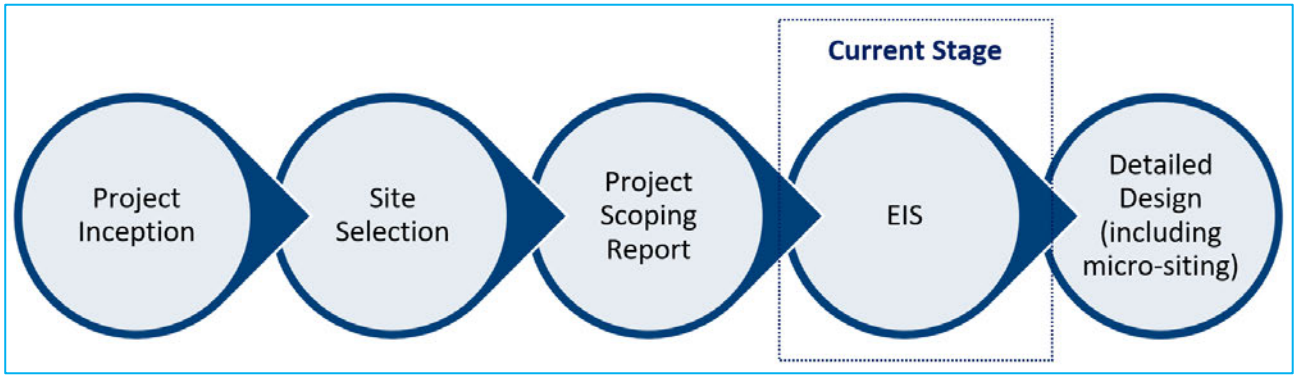


Figure ES.3 Project Design Process Key Stages

Stakeholder Engagement

Spark Renewables has been engaging with local stakeholders since the Project announcement in August 2022, seeking to build relationships and understand perspectives and needs in the region through meetings with local landowners, neighbouring property owners, Councils, First Nations groups, local service providers and relevant Government agencies. This ongoing engagement has informed Project design changes and has assisted in the development of implementation plans for the Project including the management and mitigation measures proposed.

As part of this engagement process, Spark Renewables has reached agreements with host landowners regarding the Project and mitigation of Project related impacts, noting that there are no non-associated dwellings within 10 km of proposed WTGs. These outcomes demonstrate Spark Renewables' focus on proactive engagement, mitigating the impacts and sharing the benefits of the Project.

In addition to consultation with community stakeholders, ongoing consultation has been undertaken with the Wentworth Shire Council, State and Federal Government agencies, functional stakeholders (e.g. service providers), businesses and various non-government organisations and interest groups. This includes an engagement process undertaken with the local First Nations stakeholders. This engagement has informed the design of the Project and has been ongoing throughout the assessment process, and if the Project is approved, the engagement will be ongoing during the life of the Project.

Project Refinement

Since the Project's concept stage, the design has evolved through consideration of constraints or opportunities relating to technical, environmental and social aspects. During the development of the overall design of the Project, Spark Renewables considered outcomes of engagement with host landowners, Project neighbours, broader community, Council, State and Federal government agencies in order to minimise the potential environmental and social impacts of the Project.

Table ES.1 and **Figure ES.4** show the key constraints identified within the Project Area.

The initial design of the Project and subsequent design refinements for were progressed in accordance with the "Avoid-Minimise-Mitigate-Offset" design hierarchy, including:

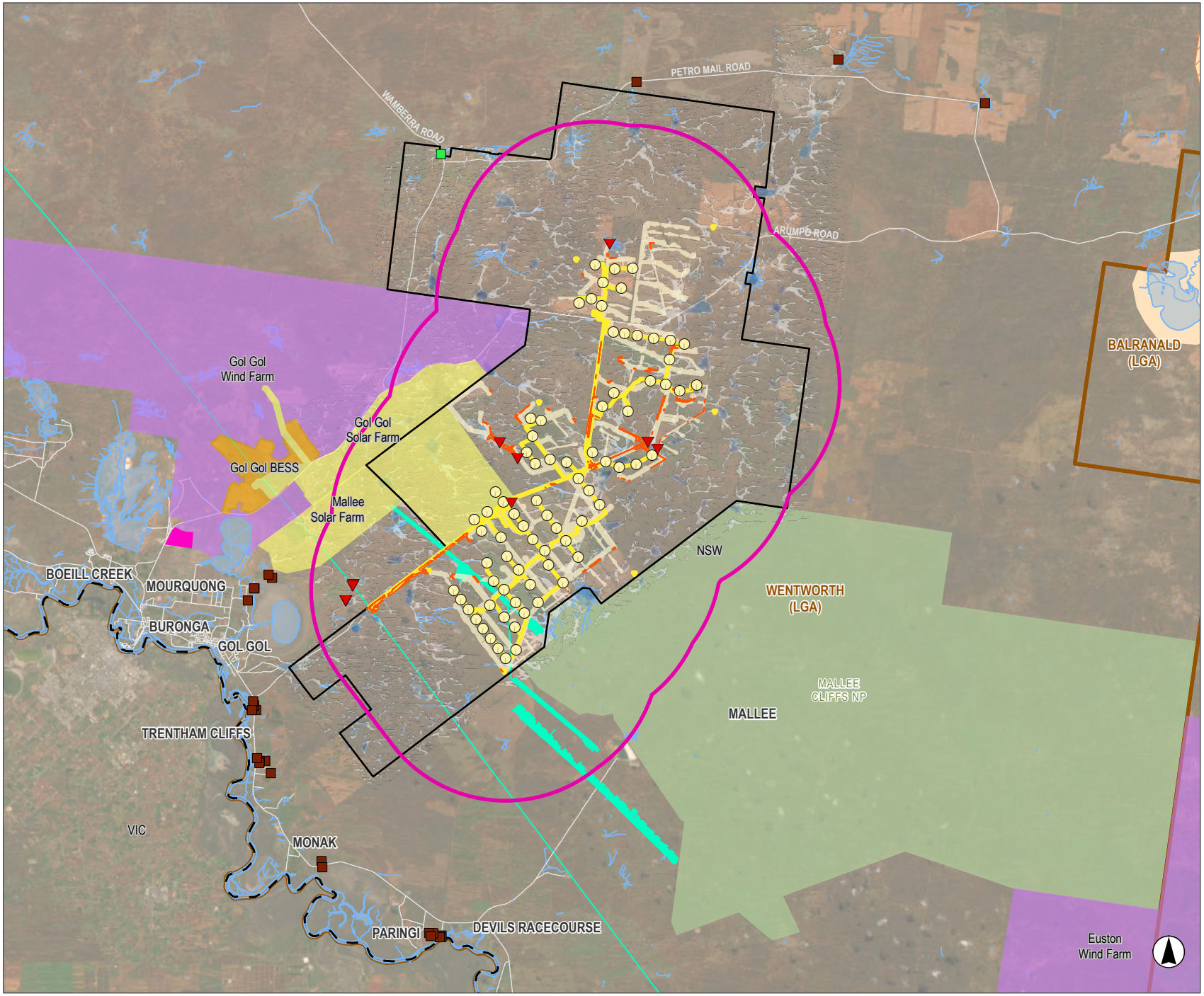
- Avoid – in the first instance, efforts were made to avoid potential environmental and social impacts.
- Minimise – where potential impacts could not be avoided, design principles aimed to minimise environmental and social impacts, as far as practicable.
- Mitigate – mitigation strategies implemented to manage the extent and severity of remaining environmental and social impacts.
- Offset – environmental and social offsets were used only as applicable, following all efforts to first avoid, minimise and mitigate environmental impacts.

Table ES.1 Responses to Key Site Constraints and Community Concerns

Theme	Key Design Changes	Strategies to Avoid, Minimise, Mitigate and Offset
Biodiversity 	• Refining the Project design to avoid areas of higher conservation value, identified threatened species habitat, high and medium value vegetation, remnant vegetation areas and areas of threatened ecological communities. • Maximising the use of land previously modified by agricultural operations, including cleared areas, established access tracks and local roads. • Maximising buffers between WTGs and the adjacent Mallee Cliffs National Park with the closest WTG approximately 800 m to the boundary of the national park.	• Spark Renewables has committed to the design and implementation of a comprehensive biodiversity mitigation strategy to minimise residual impacts of the Project. The following management plans will be prepared post approval and address biodiversity mitigation: o Construction Environmental Management Plan (CEMP) o Operational Environmental Management Plan (OEMP) o Biodiversity Management Plan (BMP) o Bird and Bat Adaptive Management Plan (BBAMP). • Spark Renewables is committed to delivering a Biodiversity Offset Strategy in accordance with the NSW *Biodiversity Conservation Act 2016* and Biodiversity Offset Scheme, including investigation of local Biodiversity Stewardship Sites.
Aboriginal Heritage 	• Refining the Project design to avoid 21 Aboriginal cultural heritage sites including one Potential Archaeological Deposit (PAD).	• Spark Renewables will develop and implement a comprehensive Aboriginal Cultural Heritage Management Plan (ACHMP) in consultation with Registered Aboriginal Parties (RAPs). The ACHMP will include a methodology for the proposed surface collection program, a strategy for long term management and provisions for monitoring impacts to World and National Heritage properties in the area as well as an Aboriginal cultural heritage awareness training package and protocols for discovery of unexpected finds [redacted].

Theme	Key Design Changes	Strategies to Avoid, Minimise, Mitigate and Offset
Agricultural Land Use 	• Aligning the Disturbance Footprint with the boundary of existing agricultural operations to minimise the impact on ongoing operations in consultation with landholders.	• Spark Renewables has designed the Project to minimise impacts on ongoing agricultural operations in consultation with landholders. • Spark Renewables has committed to develop and implement a Decommissioning and Rehabilitation Plan (DRP) to ensure disturbed land will be returned to an equivalent Land and Soil Capability (LSC) class following the end of life for the Project.
Social and Economic Impacts 	• Inclusion of an on-site TWA facility within the Project based on the preliminary findings of the Social Impact Assessment.	• Spark Renewables is committed to managing social impacts and optimising benefits including: ○ Adopting Community Benefit Sharing ○ Implementing a Community and Stakeholder Engagement Plan ○ Commencing Industry and Aboriginal Participation planning ○ Commitment to developing an Accommodation and Employment Strategy.
Traffic and Transport 	• Minor offsite road works to upgrade key intersections on the Local Transport Route.	• Spark Renewables has committed to develop a detailed Traffic Management Plan as part of the post-approval environmental management plans of the construction, operational and decommissioning phases of the Project.
Amenity impacts (Visual, Noise and Dust) 	• Maximising the distance from the nearest non-associated dwelling (~10 km) resulting in reduced noise and visual impacts.	• Measures to mitigate and manage residual visual, noise and dust impacts are outlined within this EIS and will be reflected in environmental management plans for the construction, operational and decommissioning phases of the Project.
Cumulative Impacts 	• Careful placement of infrastructure and WTGs to minimise interactions with Euston Mineral Sands Project. • Avoidance and minimisation of individual impacts to the greatest extent possible to reduce contribution to cumulative impacts.	• Spark Renewables has committed to ongoing consultation in accordance with the Community and Stakeholder Engagement Plan including with adjacent projects. • Mitigation and management measures for identified environmental and social impacts including a framework of environmental and social management plans for each phase of the Project.

FIGURE ES.4
Project Constraints



Legend

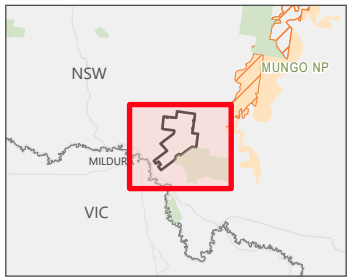
- Project Boundary
- Study area (8km from WTGs)
- Disturbance Footprint
- Wind Turbine Generators
- Aboriginal Sites
- Host Dwelling
- Non-associated Dwelling
- Mallee Bird Community of the Murray Darling Depression Bioregion EEC
- Category 1 - Exempt Land, Cleared, Road and Tracks
- Existing HV Transmission Lines
- Willandra Lakes Region / National Heritage Property
- Willandra Lakes World Heritage Area
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse
- Waterbody

Nearby Projects

- Solar Farm Project
- Hybrid Project
- Wind Farm Project
- Euston Mineral Sands Project
- Buronga Landfill Expansion

1% AEP Flood Hazard

- H1
- H2
- H3
- H4
- H5
- H6



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GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Key Assessment Outcomes

Table ES.2 provides a summary of the key assessment outcomes of this EIS.

Table ES.2 Summary of Key Assessment Findings

Aspect	Key Findings
Biodiversity 	• The Project would directly impact up to 54.34 ha of native vegetation within the Disturbance Footprint. • The Project would directly impact approximately 22.76 ha of Mallee Bird Community of the Murray Darling Depression Bioregion, an endangered ecological community (EEC) listed under the EPBC Act. • There are no direct impacts to threatened species-credit species or their habitats. • No WTGs are located within the recommended buffer to large intact patches of woody vegetation (Rodrigues et al (2015)) within the Mallee Cliffs National Park, which is in the order of 300 m. The closest WTG is located approximately 800 m from the boundary of the National Park, exceeding the recommended buffer by at least 500 m. • Prescribed impacts are considered within the Biodiversity Development Assessment Report (BDAR) including Raptor species, connectivity for threatened fauna species and turbine strike risks for threatened species and other specific fauna. Some impacts relating to bird and bat strike and barotrauma from turbine operation are uncertain and therefore a Bird and Bat Adaptive Management Plan will be implemented to measure and response to any impacts. Species that will be monitored through operation of the Project with potential high risk of impact include black falcon (*Falco subniger*), little eagle (*Hieraaetus morphnoides*) and white-striped freetail-bat (*Austronomus australis*).
Aboriginal Cultural Heritage 	• A detailed Aboriginal Cultural Heritage Assessment (ACHA) was undertaken in consultation with RAPs and having regard to relevant statutory requirements and guidelines. This included desktop investigations and extensive field survey. • Spark Renewables has avoided 21 Aboriginal Sites through Project design refinement including an open site and a potential archaeological deposit (PAD). • The Project will directly impact eight (8) Aboriginal sites located within the Disturbance Footprint comprising four (4) hearths and four (4) isolated artefacts all of which were assessed as having low overall significance. • Spark Renewables has committed to implement a community collection program for the four (4) isolated artefacts to preserve these objects and as an alternative to complete destruction.
Historical Heritage 	• Historical research and site inspections have identified that the Project Area does not contain any registered heritage items. Furthermore, it is unlikely that any historical or potential archaeological material related to ownership in the 19th and 20th centuries will be revealed. • It is concluded that no heritage values exist within the Project Area.
Landscape and Visual 	• There are no non-associated, associated or host dwellings within 8,000 m of any WTG. • The Mallee Cliffs National Park is located immediately south-east of the Project Area approximately 800 m from the nearest WTG. The national park is noted to have restricted public access and as a result, it is unlikely the Project would degrade the scenic value of this landscape feature thus resulting in limited visual impact.

Aspect	Key Findings
	• The Willandra Lakes Region World Heritage Area is located approximately 25 km east of the nearest WTG. Photomontages and wireframes were prepared to assess the potential visual impact. It is unlikely that the Project will alter the existing visual landscape and thus is unlikely to have a visual impact on the Willandra Lakes Region World Heritage Area due to the distance from the Project. • Night lighting is required on meteorological masts and ancillary facilities within the Project Area. If appropriate design principles are incorporated into the night lighting for ancillary infrastructure it is likely there will be no visual impacts resulting from night lighting of ancillary structures. • Shadow flicker was assessed and determined that no dwellings will experience shadow flicker hours however there is potential for motorists along Arumpo Road to experience shadow flicker. Although shadow flicker has the potential to cause annoyance to commuters, there is a negligible risk associated with distraction of vehicle drivers who experience shadow flicker, as this is not dissimilar to the effect of shadows from trees on the side of the road or high passing vehicles. • The risk of blade glint was considered to be very low as a result of low reflectivity surface treatment for WTGs.
Noise and Vibration 	• There are no non-associated, associated or host dwellings within 10 km of any WTG however seven (7) receivers are located within 12 km of a WTG. • Predicted WTG noise levels are below the reference level of 45 dB $L_{Aeq\ 10min}$ at the host receiver and below the Noise Bulletin base noise limit of 35 dBA $L_{Aeq\ 10min}$ at all non-associated receivers. • WTG noise levels are predicted to be in the order of 40 dB L_{Aeq} at the boundary of Mallee Cliffs National Park noting this is approximately 800 m from a WTG at its closest point. This is well below the recommended amenity noise level of 50 dB $L_{Aeq.}$ • Noise emissions from ancillary infrastructure are predicted to be well below the most stringent night-time noise level of 35 dB $L_{Aeq,\ 15\ min.}$ • Ancillary infrastructure noise levels are predicted to be below the recommended amenity noise levels and significantly less than 25 dB $L_{A\ eq}$ at the boundary of Mallee Cliffs National Park noting the 35 dB $L_{A\ eq}$ noise contour is approximately 3.8 km away. • Construction noise is not predicted to exceed either the noise affected or highly noise affected management levels at any dwellings during any of the assessed construction tasks. • Road traffic noise is anticipated to result in a noticeable increase in noise during some periods given the already low existing traffic volumes. Noise mitigation in the form of consultation and communication during these periods is recommended as the most effective means of minimising impacts.
Social 	• Community and stakeholder engagement was undertaken for the Project and to inform the Social Impact Assessment. • While community interest and involvement in the Social Impact Assessment was limited, the perceived positive and negative impacts associated with the Project were identified and assessed. • The majority of residual social impact rankings for identified perceived impacts were low with two (2) moderate negative social impact rankings and three (3) high positive social impact rankings. • Spark Renewables has committed to implementing a Social Impact Management Framework comprising: ○ Accommodation and Employment Strategy

Aspect	Key Findings
	○ Community Benefit Strategy ○ Industry and Aboriginal Participation Plan ○ Community and Stakeholder Engagement Plan.
Transport 	• The operation, construction and decommissioning phases of the Project are expected to generate only a minor impact on the surrounding road network in the peak periods. • Minor road network upgrades are proposed at the following locations as part of the Project to maximise the safety and operational performance of the external road network: ○ Sturt Highway roundabout at intersection of Carey Street, Euston. ○ Sturt Highway roundabout onto Silver City Highway, Buronga. ○ Silver City Highway onto Arumpo Road. • Suitable site access intersection configurations would need to be provided to accommodate OSOM heavy vehicle movements, which would meet the minimum sight distance required to comply with Austroads requirements.
Water Resources 	• Construction water demand is estimated to be 140 megalitres (ML) over the three (3) year construction period reducing to 1 (ML) per year during operations and will be met by commercial water supply sources from Wentworth Shire Council. • During construction up to 15 waterway crossings (minor streams and drainage features) may need to be established to facilitate access throughout the Disturbance Footprint. Where required, these will be designed and constructed in accordance with relevant guidelines and in consultation with DPI Fisheries. As such, these crossings (if required) are not expected to result in any measurable impacts to stream health including water quality and fish passage.
Soils, Land and Agriculture 	• A soil survey found the Project Area to contain two dominant soil mapping units and three (3) land and soil capability (LSC) classes comprising Class 4 (moderate capability), Class 6 (low capability) and Class 7 (very low capability). • There is no mapped Biophysical Strategic Agricultural Land (BSAL) or State Significant Agricultural Land (SSAL) within the Project Area. • The Project would temporarily remove up to 444.69 ha of land within the Project Area from agricultural land use for the duration of the Project.
Air Quality 	• Air quality impacts would be primarily limited to the construction phase, and to a lesser extent, the decommissioning phase of the Project. • During construction and decommissioning, impacts would generally be localised within the Project Area, and are unlikely to extend more than 250 m beyond the Project Boundary. • The host dwelling (R1146) is located within 250 m of the Project Boundary however it is noted that it is in excess of 10 km to the nearest WTG and the Disturbance Footprint. • A range of dust mitigation measures are proposed to manage potential dust impacts during all phases of the Project, consistent with best industry practice.
Economic 	• The Project is expected to generate an accommodation need greater than the current accommodation capacity of the locality. Spark Renewables has included an on-site TWA facility in the Project to accommodate the peak construction workforce. • The Project would result in a temporary loss of 444.69 ha of agricultural land over the 30-year life of the Project with an economic impact to agricultural primary productivity equating to $154,415 per year for the duration of the Project.

Aspect	Key Findings
	• Of the total investment for the Project approximately $130 million is estimated to be retained in the locality and the Project will support 225 direct and 360 indirect jobs over the construction period. • Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $220 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments.
Hazards 	• A Preliminary Hazard Assessment was undertaken to identify a range of hazards that have the potential to result in an incident with offsite impacts. No incidents were identified as resulting in offsite impacts and it is concluded that the risks at the Project Boundary are not considered to exceed the acceptable risk criteria under Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning (DPIE, 2011). • The Project Area has been identified as being Category 3 Bush Fire Prone Land by the NSW RFS Bush Fire Prone Land mapping. Spark Renewables has committed to a range of bush fire mitigation and management strategies including the establishment of Asset Protection Zones (APZs) and a static water supply on site and establishing emergency procedures including shutdown to enable safe aerial firefighting. • Assessments undertaken with respect to blade throw risk, electromagnetic interference (EMI) and Electro Magnetic Fields (EMF) have concluded that the Project meets relevant assessment criteria. • Aviation safety requirements of the Wentworth LEP are satisfied. The Project will not create incompatible intrusions, adversely affect or compromise the safety of existing airports and associated navigation and communication facilities. • The WTGs have been identified to infringe the relevant Grid lowest safe altitude (LSALTs) and three (3) air routes (Q4, J10 and W451). Consultation with relevant authorities and aerial operators remains ongoing. • An aviation safety risk assessment concluded that the WTGS do not require obstacle lighting however temporary wind monitoring towers exceed 152.4 m AGL or any WMT further than 300 m from a WTG will need to be marked with red/white/red bands and have obstacle lighting fitted at the top.
Waste 	• The Project will implement a waste hierarchy (in order of priority) of avoidance, resource recovery and disposal. While many wastes generated by the Project can be avoided, recycled or reused, some wastes will need to be disposed of to landfill, and in this case Spark Renewables will liaise with the relevant local authorities to manage waste accordingly. • A Decommissioning and Rehabilitation Strategy has been developed for the Project. A more detailed DRP would also be developed in consultation with key stakeholders post approval.
Cumulative 	• There are ten (10) renewable energy, infrastructure and other major projects within approximately 75 km of the Project. Of the ten (10), two (2) are approved and eight (8) are proposed. • Key potential cumulative impacts identified include biodiversity, Aboriginal cultural heritage, amenity issues (noise and visual), traffic impacts and social and economic impacts. Spark Renewables is committed to implementing mitigation and management measures to minimise potential cumulative impacts associated with the Project.

Conclusion

As a renewable energy project located within the South West REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The NSW Government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of coal fired power stations over the coming decades. The Project will contribute to meeting these Federal and NSW Government objectives and is appropriately located.

The Project is consistent with the objectives of the NSW Electricity Strategy and the Roadmap, in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of approximately 402 MW, the Project will make a material contribution to the planned energy generation capacity for the South West REZ.

The Project has been designed and progressively refined in consultation with key stakeholders to:

- Maximise the use of previously disturbed cropping land, thereby avoiding and minimising impacts to biodiversity and cultural heritage values whilst also facilitating co-existence of renewable energy and agriculture.
- Maximise potential benefits to impacted communities.

The assessment findings outlined in this EIS indicate that while there will be environmental, social and economic impacts associated with the Project, the extent of impact has been avoided and minimised through the design process and where impacts are predicted, Spark Renewables has committed to management, mitigation and offset measures to address these residual impacts.

The Project will provide long-term, strategic benefits to the State of NSW, including:

- Renewable energy supply to assist with fulfilling the current obligations under NSW and Commonwealth renewable energy targets.
- Providing for cleaner reliable electricity generation, assisting with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change.
- Providing regional investment in the NSW renewable energy sector.
- Making a positive contribution towards achieving the target of at least 2.5 GW of renewable energy generation from the South West REZ.
- The Project will also provide direct financial benefits to the region and local community, including:
- The Project will require approximately $850 million in investment during the construction phase, of which approximately $130 million will be retained in the Wentworth Shire LGA and the Mildura Rural City LGA.
- Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $220 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments.

- Supporting 225 direct and 360 indirect FTE positions in the national economy (on average) over the construction period, with 400 direct FTE during peak construction.
- Supporting an estimated 30 direct and 85 indirect FTE jobs nationally during operations. Indirect benefits to local services through the construction and operation phases.
- Supporting 95 FTE construction jobs and 47 FTE ongoing operational jobs (includes both direct and indirect jobs within the Wentworth Shire LGA and the Mildura Rural City LGA.
- Injection of approximately $4.6 million in new spending into the Wentworth Shire LGA and the Mildura Rural City LGA over the construction phase with flow on benefits for local businesses.
- Payments to host landowners via negotiated agreements, resulting in financial contributions to the local community.

The Project will also provide additional direct financial benefits to the region and local community, including:

- Payments to host landowners via private agreements and a community benefit sharing scheme.
- Annual payments to the community under a community benefits sharing program and the Planning Agreement with Wentworth Shire Council.

On this basis, and subject to the implementation of the mitigation, management and offsetting commitments outlined in this EIS, it is considered that the Project is consistent with the objects and requirements of the EP&A Act and is in the public interest.

Abbreviations and Definitions

Abbreviation	Definition
ABS	Australian Bureau of Statistics
ACHA	Aboriginal Cultural Heritage Assessment
AEMO	Australian Energy Market Operator
AIA	Aviation Impact Assessment
BAM	Biodiversity Assessment Method
BBUS	Bird and Bat Utilisation Survey
BC Act	NSW *Biodiversity Conservation Act 2016*
BCD	Biodiversity and Conservation Division [former]
BCS	Biodiversity, Conservation and Science [current]
BDAR	Biodiversity Development Assessment Report
BOM	Bureau of Meteorology
BSAL	Biophysical Strategic Agricultural Land
CASA	Civil Aviation Safety Authority
CCC	Community Consultative Committee
CEEC	Critically Endangered Ecological Community
Council	Wentworth Shire Council
CLM Act	NSW *Contaminated Land Management Act 1997*
Crown Land Act	NSW *Crown Land Management Act 2016*
CSEP	Communications and Stakeholder Engagement Plan
DA	An application made seeking consent for SSD under Part 4 of the EP&A Act
dB(A)	A-weighted noise or sound power level in decibels
Cth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water [current]
DCCEEW Water	NSW Department of Climate Change, Energy, the Environment and Water – Water Group [current]
DPE	NSW Department of Planning and Environment [former]
DPE Water	NSW Department of Planning and Environment Water Group [former]
DPHI	NSW Department of Planning, Housing and Infrastructure [current]
DPIE	NSW Department of Planning, Industry and Environment [former]
EEAP	NSW Energy Efficiency Action Plan
EDC	Estimated Development Cost (formerly 'Capital Investment Value')
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EL	Exploration Licence
EMF	Electromagnetic Field
EMI	Electromagnetic Interference
EnergyCo NSW	Energy Corporation of NSW
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*

Abbreviation	Definition
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
FWRP	Draft Far West Regional Plan 2041
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Geographical Positioning System
GW	Gigawatts
Ha	Hectares
HHA	Historical Heritage Assessment
IAIA	International Association for Impact Assessment
ICNG	Interim Construction Noise Guideline 2009
KV	Kilovolt
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
LVIA	Landscape and Visual Impact Assessment
MWF	Mallee Wind Farm
MNES	Matter of National Environmental Significance
MP	Member of Parliament
MW	Megawatt
MWh	Megawatt Hour
MWTT	Multiple Wind Turbine Tool
NDC	Nationally Determined Contributions
NEM	National Electricity Market
NPfI	Noise Policy for Industry 2017
NSW	New South Wales
NSW REAP	NSW Renewable Energy Action Plan
OSOM	Over-size, over-mass vehicle
PA	Planning Agreement
PCT	Plant Community Type
POEO Act	NSW *Protection of the Environment Operations Act 1997*
Project	Mallee Wind Farm
Proponent	Spark Renewables Pty Limited
RAAF	Royal Australian Air Force
REZ	Renewable Energy Zone
RFS	NSW Rural Fire Service
Roads Act	NSW *Roads Act 1993*
SAT	Spot Assessment Technique
SEARs	Secretary's Environmental Assessment Requirements

Abbreviation	Definition
SIA	Social Impact Assessment
SISR	Social Impact Scoping Report
South West REZ	South West Renewable Energy Zone
SSD	State Significant Development
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TTIA	Traffic and Transport Impact Assessment
TWA	Temporary Workforce Accommodation
Umwelt	Umwelt (Australia) Pty Ltd
WM Act	NSW *Water Management Act 2000*
WRIA	Water Resources Impact Assessment
WSP	Water Sharing Plan
WTG	Wind Turbine Generator

Key Project Terms

Term	Definition
Ancillary infrastructure	All permanent infrastructure necessary for the construction and operation of the wind farm with the exception of WTGs and battery storage, including but not limited to internal roads, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
Associated dwellings	Dwellings not located on land within the Project Area or hosting infrastructure, however, the Proponent has a negotiated agreement in place with the landholder regarding Project impacts and are therefore associated with the Project. **For Mallee Wind Farm there are no associated dwellings.**
Associated landholder	The owner(s) of an associated dwelling. An associated landholder has reached a private agreement with Spark Renewables in relation to the Project and management of impacts. An associated landholder is distinct from a host landholder in that no Project infrastructure is proposed to be built on the associated landholder's property. **For Mallee Wind Farm there are no associated landholders.**
Battery storage	Compound and technology for storing and discharging energy. Includes the battery energy storage system (BESS), as well as associated buildings, shipping containers and other infrastructure to contain the chosen technology and to connect the battery storage infrastructure with the WTGs, and substations via underground and/or overhead cables.
Benefit sharing	Benefit sharing aims to distribute benefits generated by a project between the Proponent and the community through mutually agreed opportunities such as funding or sponsoring local community initiatives, programs or projects.
Construction	The construction of the Project, including but not limited to the construction of WTGs, battery storage, ancillary infrastructure but excluding pre-construction works.
Decommissioning	The removal of WTGs, battery storage and ancillary infrastructure.
Development Consent	State significant development consent to carry out the Project granted by the consent authority as nominated under *the NSW Environmental Planning and Assessment Act 1979* (EP&A Act).
Disturbance Footprint	This is the actual disturbance area required for the Project. The Disturbance Footprint is shown conceptually in **Figure 3.1, Figure 3.14, Figure 3.15** and **Figure 3.16** The actual location and extent of the Disturbance Footprint will be determined prior to construction, subject to the micro-siting provisions outlined in this EIS. It includes disturbance associated with the seven (7) proposed permanent meteorological masts, but excludes access to these meteorological masts that would be provided via existing farm tracks or cleared agricultural land.
Ground Disturbance	Activities that cut into the existing ground surface. To avoid any doubt this does not include activities that occur on the ground surface including but not limited to driving vehicles on the ground, parking vehicles, placing infrastructure or materials such as stockpiles on the ground.

Term	Definition
Heavy Vehicle	As defined under the Heavy Vehicle National Law (NSW), but excluding light and medium rigid trucks (less than eight (8) tonnes and with no more than two (2) axles) and buses containing more than 12 seats.
Host Landholder	The owner(s) of a host dwelling. A host landholder has reached an agreement with Spark Renewables to host Project infrastructure within their landholdings and in relation to the management of impacts.
Host Dwellings	A dwelling on privately-owned land in respect of which the owner has reached an agreement with Spark Renewables to host Project infrastructure and in relation to the management of impacts.
Internal Access Tracks	Access tracks established and/or upgraded within the Project Area for the purposes of constructing, operating, maintaining and decommissioning the Project, and includes all waterway crossings where located within the Project Area, but does not include off-site road works areas.
Light Vehicle	A car or rigid truck up to eight (8) tonnes gross vehicle mass or a bus containing up to 12 seats.
Local Transport Route	The transport route extending from Sturt Highway/ Carey Street Euston to the Project access points on Arumpo Road, as shown on **Figure 3.12**.
Micro-siting	This is commonly the process of locating WTGs, battery storage, ancillary infrastructure and temporary infrastructure during detailed design without further approval, providing that certain thresholds are met. In this case, and as a broader Development Corridor is not proposed, these include: • ground disturbance is wholly contained within the Disturbance Footprint. • no WTG is moved more than 100 metres from the relevant GPS coordinates listed in **Appendix 3** and any ground disturbance is contained within the Disturbance Footprint. • the revised location of the blade of a WTG is at least 50 metres from the canopy of existing hollow-bearing trees; or where the proposed location of the blade of a WTG is already within 50 metres of the canopy of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees.
Non-associated landholder	The owner of a non-associated dwelling.
Non-associated Dwelling	A dwelling on privately-owned land in respect of which the owner has not entered into a private agreement with Spark Renewables in relation to the Project's impacts. or A dwelling on privately-owned land in respect of which the owner has reached an agreement with Spark Renewables in relation to the Project's impacts, but the agreement does not cover the relevant impact, or the performance measure for such impact (under that agreement) has been exceeded.
Off-site Road Works	Proposed upgrades to the local transport route including adjacent the site access points as shown in **Figure 3.12** and **Figure 3.1**.
Planning Agreement	An offer by a developer to Council to dedicate land, make monetary contributions, or provide any other material public benefit, to be used for or applied toward a public purpose.

Term	Definition
OSOM Transport Route	The route associated with the transportation of some project components (such as wind turbine blades, nacelles and transformers) that would require over-size, over-mass (OSOM) vehicles from the Port of Newcastle.
Pre-construction Works	Includes the following activities: • surveys • building/road dilapidation surveys • investigative drilling, excavation or salvage • minor clearing or translocation of native vegetation • establishing temporary site office and compounds • installation of environmental impact mitigation measures, fencing, enabling works, meteorological masts • flora and fauna investigations and pre-clearing surveys, inspections, specific habitat feature removal and relocation • adjustments to services/utilities, signage etc. including associated vegetation • removal and heritage artefact salvage • off-site road works.
Project	The Mallee Wind Farm
Project Area	The Project Area encompasses all land within and including the Project Boundary.
Project Boundary	The outer boundary of the Project Area. The Project Boundary is the maximum spatial extent of potential land access defined by the boundaries of the host landholder properties (i.e. all agreed lots owned by host landholders).
Proponent	Spark Renewables Pty Limited
Rehabilitation	The restoration of land disturbed by the Project to its former condition, to ensure it is safe, stable, and non-polluting.
Residence	Has the same meaning as a 'dwelling' as defined under the Standard Instrument – Local Environmental Plan, and also includes: • residences that have development consent, but have yet to commence or complete construction. • proposed residences that are subject to a development application that has been lodged prior to the DA for the Project but is yet to be determined. • a residence does not include moveable dwellings (i.e. tents, caravans or other portable devices used for human habitation), or any derelict dwelling or dwelling that has been built illegally, as confirmed by the relevant Council.
Substation	A facility in an electrical power system where voltage is transformed from high to low or vice versa, and where power is routed and distributed to various areas. It typically includes transformers, circuit breakers, and other equipment
Study Area	The specific assessment area adopted for each technical study.
Switchyards	A section within a substation or a standalone facility where electrical power is switched and routed between different transmission lines or equipment. It mainly involves circuit breakers, switches, and busbars for controlling the flow of electricity.

Term	Definition
Telecommunications Facility	A telecommunications facility is any part of the infrastructure of a telecommunications network or any line, cable, optical fibre, equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole or other structure in connection with a telecommunications network. Telecommunications facilities provide for transmission of voice, data, image, graphic and video information between or among points by wire, cable, optical fibre, microwave, radio, satellite or similar facilities.
Temporary Facilities	Temporary facilities used for the construction, repowering and/or decommissioning of the Project, including but not limited to the temporary workforce accommodation (TWA), site offices, amenities, construction compounds and laydown areas (including stockpiling and materials storage areas, concrete or asphalt batching plants, minor 'work front' construction access tracks, environmental management and monitoring and signage.

EIS Declaration

Project Details

Required Information	Details
Project Name	Mallee Wind Farm
Application Number	SSD-53293710
Address of the land in respect of which the development application is made	Arumpo Road, Mallee NSW, 2738

Applicant Details

Required Information	Details
Applicant Name	Spark Renewables Pty Ltd
Applicant Address	Level 4/1A Rialto Lane, Manly NSW 2095

Details of Person by Whom this EIS was Prepared

Required Information	Details
Name	Nathan Baker
Address	Suite 1101, Level 11/213 Miller St, North Sydney NSW 2060
Professional Qualifications	Master of Design Science. (Audio & Acoustics) University of Sydney, Australia, 2007 Certified Environmental Practitioner (CEnvP), EIANZ

Declaration by Registered Environmental Assessment Practitioner

Required Information	Details
Name	Amanda Antcliff
Registration Number	42151
Organisation registered with	Planning Institute of Australia (PIA)
Declaration	The undersigned declares that this EIS: • has been prepared in accordance with the Environmental Planning and Assessment Regulation 2021; • contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates; • does not contain information that is false or misleading; • addresses the Planning Secretary's environmental assessment requirements (SEARs) for the project; • identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments;

Required Information	Details
	• has been prepared having regard to the Department's State Significant Development Guidelines – Preparing an Environmental Impact Statement; • contains a simple and easy to understand summary of the project as a whole, having regard to the economic, environmental and social impacts of the project and the principles of ecologically sustainable development; • contains a consolidated description of the project in a single chapter of the EIS; • contains an accurate summary of the findings of any community engagement; and • contains an accurate summary of the detailed technical assessment of the impacts of the project as a whole.
Signature	
Date	5 November 2024

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Appendix No. Appendix Name

1.0 Introduction

Spark Renewables Pty Limited (Spark Renewables) ABN 90 632 860 023 proposes to develop the Mallee Wind Farm (the Project) to generate renewable wind energy and supply to the National Electricity Market (NEM). The Project will also contribute to reducing greenhouse gas (GHG) emissions associated with energy generation and provide significant economic benefits to the Murray region of New South Wales (NSW).

The Project is located approximately 16 kilometres (km) north east of Buronga in the Murray region of southwestern NSW within the Wentworth Local Government Area (LGA) and 17 km north east of Mildura, Victoria (VIC), as shown in **Figure 1.1**.

The NSW Government's Electricity Strategy (DPE 2019) and Electricity Infrastructure Roadmap (DPE 2021) (the Roadmap) set out a plan to deliver the State's first five Renewable Energy Zones (REZs). These REZs will play a vital role in delivering affordable, reliable energy generation to help replace the State's existing coal-fired power stations as they come to their scheduled end of operational life. The Australian Energy Market Operator's (AEMO) 2024 Integrated System Plan (2024 ISP) notes that ten coal-fired generators have closed in the past decade and predicts that 90% of the NEM's coal-fired fleet will be retired by 2035, with complete retirement by 2040 (AEMO, 2024).

The Project is located within the South West REZ, as shown in **Figure 1.2**. The South West REZ was formally declared by the NSW Government on 4 November 2022 and identified as a target area for renewable energy development in the Transmission Infrastructure Strategy (Department of Planning and Environment, 2018) and the Roadmap. The South West REZ has a renewable energy generation target of 2.5 GW.
The Project is therefore strategically located in an area identified by the NSW Government as suitable for renewable energy projects and will assist in delivering on the objectives of the Electricity Strategy, the Roadmap and the South West REZ.

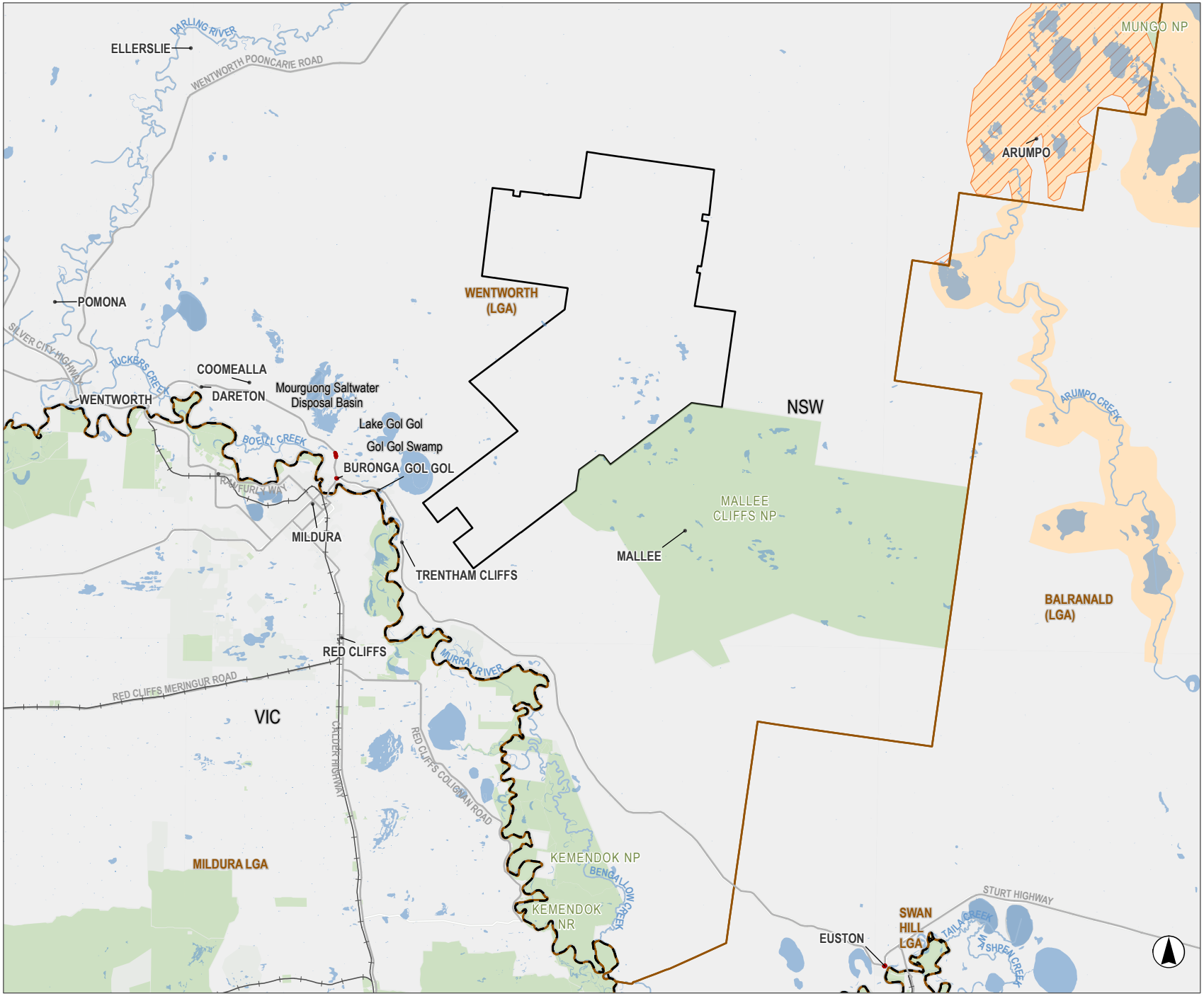
The Project has been designed through a comprehensive process that incorporates community and stakeholder feedback, and the findings of environmental and social studies to maximise positive social, economic and environmental outcomes while minimising adverse impacts. Spark Renewables has undertaken extensive engagement with residents in the area and other stakeholders throughout the Project planning and assessment process. The Project has been designed using an iterative approach incorporating community and other stakeholder feedback from the ongoing engagement undertaken by Spark Renewables since 2022, with the design of the Project changing as a result of this feedback as discussed further in **Section 5.0**.

The Project is State Significant Development (SSD) as defined under State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and requires development consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Environmental Impact Statement (EIS) provides an assessment of the environmental, social and economic impacts of the Project. This document is intended to assist the community, Councils, government agencies and other stakeholders to understand the Project and its benefits and impacts. This EIS is also intended to provide the necessary information to the consent authority to make an informed decision on the overall merits of the Project.

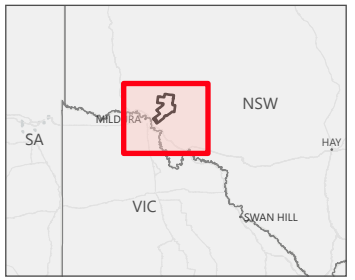
FIGURE 1.1

Regional Context



Legend

- Project Boundary
- Off-site Road Works
- Willandra Lakes Region / National Heritage Property
- Willandra Lakes World Heritage Area
- State Border
- Local Government Area (LGA)
- NPWS Estate
- Water Body
- Watercourse
- Road
- Railway



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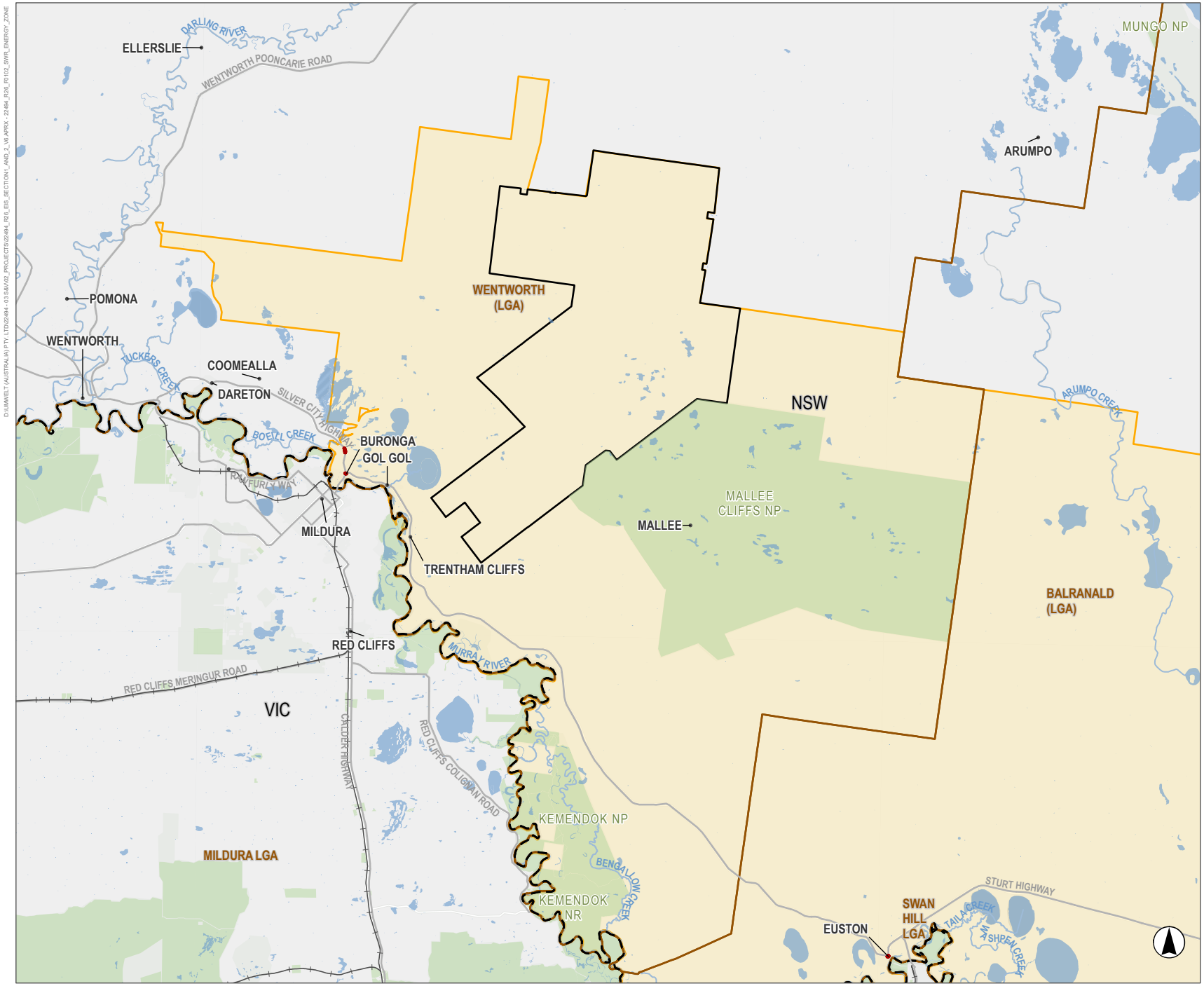
Kilometres

Scale 1:500,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

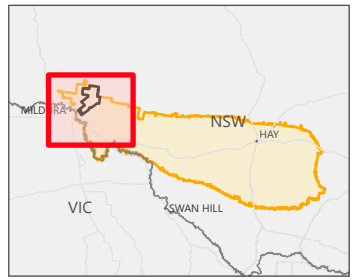
FIGURE 1.2

South West Renewable Energy Zone



Legend

- Project Boundary
- Off-site Road Works
- South West Renewable Energy Zone
- State Border
- Local Government Area (LGA)
- NPWS Estate
- Water Body
- Watercourse
- Road
- Railway



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GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

1.1 Project Overview

The Project will include the installation, operation, maintenance and decommissioning of up to 76 wind turbine generators (WTGs), a single grid scale 100 megawatts (MW) / 200 megawatt hour (MWh) Battery Energy Storage System (BESS), ancillary infrastructure and temporary facilities associated with construction of the Project (refer to **Figure 1.3**). The Project will have an installed generation capacity of up to 402 MW.

The key components of the Project include:

- 76 (three (3) blade) WTGs, with a maximum blade-tip height of 280 metres (m) above ground.
- A single grid-scale 100 MW /200 MWh BESS.
- Permanent ancillary infrastructure including internal access tracks, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
- Temporary facilities including a temporary workforce accommodation (TWA) facility, site offices, amenities, construction compounds and laydown areas, concrete or asphalt batching plants, minor 'work front' construction access tracks, environmental management and monitoring and signage
- Off-site road works, involving upgrades to the proposed local transport route and establishment of site access points.

The Project also seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kilovolt (kV) main switchyard connecting into Project EnergyConnect, the BESS, and the two (2) on-site collector substation and switchyard facilities, and/or other subdivisions that may be required following the detailed design of the Project.

The Project has been designed through a comprehensive process that incorporates community and stakeholder feedback, and the findings of environmental and social studies to maximise positive social, economic and environmental outcomes while minimising adverse impacts. Spark Renewables has undertaken extensive engagement with local landholders and other community stakeholders throughout the Project planning and assessment process. The Project has been designed using an iterative approach incorporating community and other stakeholder feedback from the commencement of engagement undertaken by Spark Renewables in 2022 through the EIS phase, with the design of the Project changing as a result of this feedback as detailed in **Section 2.7**.

1.2 Project Background

1.2.1 Project History

The locality was identified as an area of interest for the Project in 2019 due to its proximity to the Project EnergyConnect transmission line, strong wind resources, significant distances to non-associated dwellings, suitability for grazing and cropping which would avoid the removal of native vegetation where land was previously cleared and flat terrain which would avoid complex earthworks during construction.

Spark Renewables commenced consultation with the Project's landholders in 2019 and together worked on a range of pre-feasibility activities to progress the Project. Pre-feasibility activities included:

- Two (2) years of on-site wind monitoring.
- Due diligence review of easements and encumbrances on title.
- Consultation with landholders on existing and planned land use.
- Wind resource modelling.
- Desktop environmental constraints assessment.
- Grid connection analysis.
- Preliminary financial modelling.

1.2.2 Strategy to Avoid, Minimise and Offset

The initial design of the Project and subsequent design refinements were progressed in accordance with the "Avoid-Minimise-Mitigate-Offset" design hierarchy, including:

- **Avoid** – in the first instance, efforts were made to avoid potential environmental and social impacts.
- **Minimise** – where potential impacts could not be avoided, design principles aimed to minimise environmental and social impacts, as far as practicable.
- **Mitigate** – mitigation strategies implemented to manage the extent and severity of remaining environmental and social impacts.
- **Offset** – environmental and social offsets were used only as applicable, following all efforts to first avoid, minimise and mitigate environmental impacts.

Significant amendments to the Project layout have been made to avoid and/or minimise environmental impacts, including avoidance of areas of high Aboriginal cultural heritage significance and threatened ecological communities (TEC) and maximising buffers between WTGs and natural values such as Mallee Cliffs National Park. **Section 2.7** provides further detail on the key strategies that have been adopted to avoid, minimise, mitigate and offset the impacts of the Project.

1.2.3 Related Development

Related developments, as outlined in the NSW Government State Significant Development Guidelines (DPE, 2022), refers to any existing or approved developments that would be incorporated into, or operated in conjunction with the Project. Related development can also include developments by the Proponent that are subject to a separate development approval process. At the time of writing no related developments are in operation or approved within the vicinity of the Project.

It is noted that two related developments are proposed within the vicinity of the Project being the Euston Critical Minerals Project and Mallee Solar Farm. Both of these proposed projects are in the Prepare EIS phase.

The Euston Mineral Sands Project, also SSD, is located within the southern extent of the Project Area. The Applicant, Iluka Resources Limited (Iluka), is proposing to develop a mineral sands resource. The Euston Mineral Sands Project would involve open pit strip mining of six (6) mineral sands deposits. One of these deposits, the Castaway deposit comprising of Castaway Pits one (1) and two (2), is located within the Project Area. Iluka Resources Limited is currently preparing an EIS for the Euston Mineral Sands Project.

The Mallee Solar Farm is a separate SSD project also proposed by Spark Renewables, and includes a large-scale solar photovoltaic (PV) generation facility and BESS, supported by associated infrastructure. The proposed Mallee Solar Farm is located adjacent to the southern extent of the Project Area. Spark Renewables is currently preparing an EIS for the Mallee Solar Farm, noting it is subject to a separate SSD application to the Project and does not form part of this EIS.

Consideration of the potential cumulative impacts of the Project in combination with these projects and other projects within 75 km of the Project is provided in **Section 6.15** (Cumulative impacts). The potential cumulative impacts of these Projects are also assessed in the relevant technical studies identified in **Section 1.5**.

1.2.4 Restrictions or Covenants

A title search has been undertaken for the Project Area. Restrictions and covenants that apply to the Project Area include Crown land, and easements for transmission line, flooding, drainage, and access. There are also Conservation Agreements under Part 5, Division 3 of the NSW *Biodiversity Conservation Act 2016* which impacts land parcels within the Project Area. A full list of restrictions and covenants relating to the Project Area can be found in **Appendix 4**.

Relevant easement holders have been consulted by the Applicant as described in **Section 5.0** and each has been considered in the Project design in **Section 3.0**.

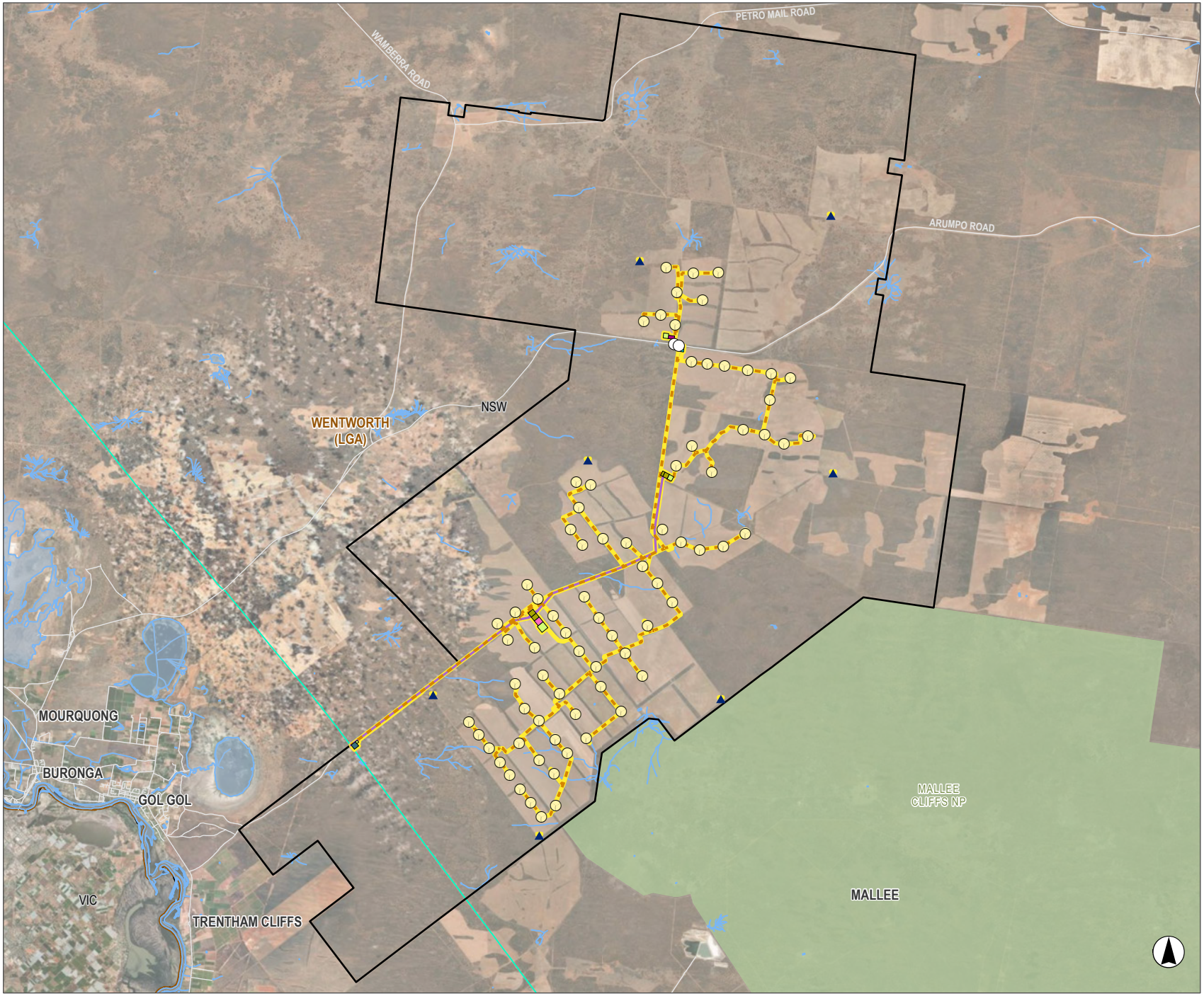


FIGURE 1.3

Project Overview

Legend

- Project Boundary
- Disturbance Footprint
- Access Points
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Collector Substation and Switchyard
- Operations and Maintenance Facility
- Construction Compound
- TWA Facility
- Switchyard
- Battery Energy Storage System (BESS)
- Existing HV Transmission Lines
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse
- Waterbody

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

1.3 Project Objectives

The objectives of the Project are to:

- increase renewable energy generation in NSW and contribute to strategic objectives and targets of the NSW and Commonwealth governments
- provide for cleaner reliable electricity generation and assist with meeting current load demand while reducing GHG emissions and the impacts of climate change
- provide regional investment in the NSW renewable energy sector
- contribute to achieving the target of 2.5 GW of renewable energy generation from the South West REZ
- create employment opportunities during Project construction, operations and decommissioning
- support communities by providing economic and employment benefits for regional NSW and to reinforce Spark Renewables' commitments under the Clean Energy Council's 'Best Practice Charter' with respect to socially responsible development
- develop the Project in a manner which supports long-term productive relationships with the local community, Traditional Owners, regulators, and industry
- avoid and minimise environmental, biodiversity, cultural heritage and social impacts where practicable through careful design and best practice environmental protection and impact mitigation.

1.4 The Proponent

Spark Renewables is one of Australia's leading developers and long-term owners of renewable energy generation assets. Founded in 2018, the company was established as the renewables arm for the Spark Infrastructure Group, a A$5 billion company with investments in leading energy infrastructure across Australia. Since September 2023, Spark Renewables has been owned by Tenaga Nasional Berhad (TNB), the largest listed energy utility company in Southeast Asia, with a market capitalisation of A$26 billion.

Spark Renewables has grown rapidly and employs an experienced team of 30 people, with over 250 years of experience in end-to-end development, construction and operations of wind, solar and BESS projects between them. The company retains industry experts across the key areas of engineering, development, consenting, financing, construction and commissioning, with the team having cumulatively worked on over 36 GW of capacity globally.

The company specialises in southwestern NSW, having constructed the 120 MWdc Bomen Solar Farm in Wagga Wagga, which was commissioned in 2020. The company has a development pipeline of highly advanced projects across Australia, exceeding five (5) GW of total generation capacity.

For the purposes of this EIS, the Proponent will be referred to throughout as Spark Renewables. Key details of the Proponent are provided in **Table 1.1** below.

Table 1.1 Proponent Details

Requirement	Details
Full Name/s	Spark Renewables Pty Limited
Postal Address	Level 4/1A Rialto Ln, Manly NSW 2095
Street Address (Project)	Arumpo Road, Mallee NSW 2738
ABN	90 632 860 023

1.5 Structure of this EIS

This EIS has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs), issued on 17 February 2023, the Supplementary SEARs issued on 28 June 2023 and the relevant provisions of Part 8, Division 5 of the Environmental Planning and Assessment Regulation 2021 (NSW). **Appendix 1** provides the SEARs and where these have been addressed in the EIS.

Additionally, this EIS has been prepared in consideration of the NSW Government – DPE – Wind Energy Guideline (the Wind Energy Guideline), dated December 2016 (DPE, 2016), including:

- NSW Government – DPE – Wind Energy: Visual Assessment Bulletin (the Visual Bulletin), dated December 2016 (DPE, 2016).
- NSW Government – DPE – Wind Energy: Noise Assessment Bulletin (the Noise Bulletin), dated December 2016 (DPE, 2016).

It has also been prepared with due regard to the NSW Government – Department of Planning, Industry and Environment (DPIE, now DPHI) – State Significant Development Guidelines (SSD Guideline), dated November 2022 (DPIE, 2022a), including where relevant:

- NSW Government – DPIE – State Significant Development Guidelines – Preparing an Environmental Impact Statement – Appendix B (SSD EIS Guideline), dated July 2022 (DPIE, 2022).
- NSW Government – DPIE – Social Impact Assessment Guideline for State Significant Projects (the SIA Guideline), dated February 2023 (DPIE, 2023).
- NSW Government – DPIE – Undertaking Engagement Guidelines for State Significant Projects (the Engagement guidelines), dated October 2024 (DPHI, 2024).
- NSW Government – DPIE – Cumulative Impact Assessment Guidelines for State Significant Projects (the CIA Guidelines), dated October 2022 (DPIE, 2022).

Additionally, Spark Renewables have considered and will continue to have regard to any relevant Electricity Infrastructure Roadmap guidelines during the development of the Project, including NSW Government – Office of Energy and Climate Change – First Nations Guidelines (dated August 2022). **Table 1.2** below outlines the overall structure of this EIS, having regard to the SSD EIS Guideline.

Table 1.2 EIS Structure

Component	Description	Relevant Section /Appendix
Introduction	Introduces the Project, the Proponent and provides an outline of the structure of the document.	**Section 1.0**
Strategic Context	Outlines the strategic context for the Project, including the justification for the Project, a summary of the locality in which the Project is undertaken and an overview of the environmental, social and economic context.	**Section 2.0**
Project Description	Contains a description of the Project, including an overview of alternatives considered and strategies to avoid and minimise environmental impacts.	**Section 3.0**
Statutory Context	Summarises the relevant State and Commonwealth statutory context applicable to the approval process for the Project.	**Section 4.0**
Engagement	Describes the stakeholder engagement program for the Project, outlines the environmental, social and economic matters identified by stakeholders and how they have been considered in this EIS.	**Section 5.0**
Assessment of Impacts	Contains analysis of the environmental, social and economic matters relevant to the Project and the specialist assessments which have been undertaken for this EIS.	**Section 6.0**
Project Justification	Provides a justification and evaluation for the Project, having regard to the economic, environmental and social impacts of the Project and the principles of ecologically sustainable development.	**Section 7.0**
References	Provides a list of references within this EIS.	**Section 8.0**
SEARs Table	Provides a summary of the SEARs and how they have been addressed in this EIS. Additionally, this appendix includes the Commonwealth's Controlled Action Decision under the EPBC Act.	**Appendix 1**
Schedule of land	Identifies all land parcels on which the development is proposed to occur.	**Appendix 2**
Detailed Maps and Plans	Provides maps and plans of the proposed Project, as well as GPS coordinates and elevations for the proposed WTG locations.	**Appendix 3**
Statutory Compliance Table	Provides a summary of all statutory requirements relevant to the assessment of the Project.	**Appendix 4**
Mitigation Measures Table	Provides a consolidated summary of all environmental mitigation and management measures which will be implemented for the Project, consistent with the findings of this EIS and specialist assessments.	**Appendix 5**

The EIS contains a number of appendices that provide detailed technical studies for key environmental and social issues related to the Project, and other supporting information, refer to **Table 1.3** below. The key outcomes of these technical studies are summarised in **Section 6.0**.

Table 1.3 Technical Specialist Assessments

Technical Study or Supporting Information	Technical Specialist	Relevant Appendix
Biodiversity Development Assessment Report	Umwelt	**Appendix 6**
Aboriginal Cultural Heritage Assessment Report	Austral Archaeology	**Appendix 7**
Statement of Heritage Impact	Austral Archaeology	**Appendix 8**
Landscape and Visual Impact Assessment	Moir Landscape Architecture	**Appendix 9**
Noise and Vibration Assessment	Marshal Day	**Appendix 10**
Social Impact Assessment	Umwelt	**Appendix 11**
Traffic and Transport Impact Assessment	Access Traffic	**Appendix 12**
Water Resource Impact Assessment	WRM Water & Environment	**Appendix 13**
Soil, Land and Agriculture Impact Assessment	MineSoils	**Appendix 14**
Air Quality Impact Assessment	Zephyr Environmental	**Appendix 15**
Preliminary Hazard Assessment	Riskcon	**Appendix 16**
Bush Fire Hazard Assessment	Peak Land Management	**Appendix 17**
Telecommunications Impact Assessment	Middleton Group	**Appendix 18**
Blade Throw Assessment	Middleton Group	**Appendix 19**
Aviation Impact Assessment	Aviation Projects	**Appendix 20**
Economic Impact Assessment	Ethos Urban	**Appendix 21**
Cumulative Impact Scoping Summary	Umwelt	**Appendix 22**

2.0 Strategic Context

2.1 Renewable Energy Market and Policy Context

2.1.1 Electricity Generation Market

The development of renewable energy projects aligns with global, Commonwealth and NSW commitments to increase renewable energy generation and reduce GHG emissions across the NSW and Australian economies.

NSW is currently in a transition to build a reliable, cost-competitive and sustainable electricity future to support a growing economy (NSW Government, 2019). After more than half a century, Australia's coal-fired generators are reaching the end of their service life. Up to 90% of the NEM's coal-fired power stations are projected to retire before 2035, and the entire fleet before 2040 (AEMO, 2024). These power stations provide around three quarters of NSW's electricity supply and two thirds of the firm capacity required during peak demand periods such as summer heat waves. The NSW Government is taking action to deliver cheap, reliable, and clean electricity for homes and businesses in NSW (EnergyCo, 2022).

The NSW Government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. EnergyCo, the statutory authority responsible for leading the delivery of REZs, has described REZs as modern-day power stations which combine renewable energy generation and energy storage systems, connected to transmission infrastructure via energy hubs (EnergyCo, 2022). REZs will have a role in providing reliable electricity for homes, businesses and industry in NSW to help replace the State's existing coal fired power stations as they come to their scheduled end of operational life (EnergyCo, 2022).

Various government strategies, plans and policies such as AEMO's ISP (AEMO, 2024), the NSW Transmission Infrastructure Strategy (NSW Government, 2023b) and the Roadmap (NSW Government, 2023a), identify the important role for REZs to provide an effective and economical way to integrate new generation, storage and transmission development (EnergyCo, 2022).

Over the year to December 2023, coal, renewables and gas contributed 57%, 38% and 5% to total electricity generation in the NEM (DCCEEW, 2024). The share of coal in the electricity sector has continued to decline in contrast to the beginning of the century when coal's share of electricity generation exceeded 80%. The contribution of renewable energy to the total national electricity generation increased from 21% in 2019 to 38% in the year ending September 2023 (DCCEEW, 2024).

The Clean Energy Regulator estimates that 5.5 gigawatts (GW) of renewable capacity was installed during 2021 with renewable electricity averaging 31.4% of the market share in the NEM (Clean Energy Regulator, 2022). In 2022, the Clean Energy Regulator expected between 2.5 and three (3) GW to be registered from large scale renewable electricity generation (Clean Energy Regulator, 2022).

NSW has a strong pipeline of renewable energy projects which have the potential to contribute to achieving the current transition targets. However, significant investment is required from the private sector to achieve sufficient renewable energy supply that will support NSW's transition to renewable energy and the retirement of the existing fossil fuel generated supply.

The Project is consistent with the current strategic direction of the NSW and Australian energy generation market and will assist in achieving the planned transition to an increased contribution of renewable energy to Australia's energy needs. As a renewable energy project located within the South West REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government.

2.1.2 United Nations Sustainable Development Goals (SDG)

More broadly, the United Nations 2030 Agenda for Sustainable Development includes Sustainable Development Goals (SDG) designed to build for a sustainable resilient future. There are 17 SDG targeting 169 individual measures designed to improve economic, social and environmental sustainability.
All members of the United Nations agreed to work towards achieving the SDGs by 2030. Goal seven (7) and Goal 11 relate to energy access and an increase in renewables, and then reducing the adverse impacts of cities with a focus on air quality and waste. The Project will provide a source of renewable energy, increasing the proportion of renewable energy generation in Australia. It will also assist to reduce reliance on fossil fuels for energy generation, resulting in a reduction of GHG emissions and improved air quality.

2.1.3 United Nations Framework Convention on Climate Change (UNFCC) Conference of Parties 28 (COP28)

The COP 28 UN Climate Change Conference in Dubai, the United Arab Emirates, was the 28th conference of the UNFCCC. The conference represented the first 'global stocktake' of the worlds efforts in addressing climate change under the Paris Agreement. The conference concluded the progress was slower than required with a call on all governments to increase their transition from fossil fuel-based energy production and increased adoption of renewable technology. An agreement was developed between participating nations including Australia to "triple renewable energy capacity and doubling energy efficiency improvements by 2030". An objective of the Project is to support the transition away from fossil fuels and contribute to reducing GHG emissions associated with energy generation.

2.1.4 Commonwealth Renewable Energy Commitments

2.1.4.1 United Nations Paris Climate Change Agreement

Australia is one of the 195 parties from around the world (comprising 194 States and the European Union) signed to the international climate change agreement (The Paris Agreement) which seeks to:

- Hold the increase in the global average temperature to below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.
- Increase the ability (of nations) to adapt to the adverse impacts of climate change and foster climate resilience and low GHG emissions development, in a manner that does not threaten food production.
- Make finance flows consistent with a pathway towards low GHG emissions and climate resilient development.

The Paris Agreement seeks to meet its objectives by developing programs and mechanisms that:

- Require participating Parties to prepare and communicate GHG mitigation contributions. Parties were expected to set mitigation targets for 2020, and then develop new targets every five years.
  Each successive target is expected to represent a larger mitigation effort than the previous target.

- Promote climate change resilience and adaptation.
- Provide mitigation and adaptation funding to developing countries.
- Foster mitigation and adaptation technology transfer between Parties.
- Require participating Parties to report progress towards their mitigation contributions on an annual basis.

Australia, in its commitment to the Paris Agreement, signed the agreement on 22 April 2016 pledging to reduce GHG emissions by 26-28% below 2005 levels by 2030. In response to these obligations, Australia has implemented the Commonwealth *Climate Change Act 2022.*

The Project, as a large-scale renewable energy project, will contribute to achieving Australia's GHG emission reduction targets through reducing emissions from energy production in NSW.

2.1.4.2 National Electricity Market

The National Electricity Market is a wholesale market through which electricity is traded in Australia. The NEM incorporates 40,000 km of transmission lines and cables and spans the eastern and south western coasts, including QLD, NSW, ACT, SA, VIC and TAS (AEMO, 2022). It delivers approximately 80% of all electricity consumption in Australia (DCCEEW, 2023).

The NEM facilitates the exchange of electricity between generators and retailers. Retailers resell the electricity to businesses and households. AEMO controls the NEM and is responsible for monitoring electricity consumption and for the security and reliability of the power system.

AEMO recognises the NEM needs to be modernised to accommodate and respond to changes in electricity generation (i.e. retirement of coal-fired power stations) and replacement with renewable energy generation, combined with transmission integration and storage technologies, such as batteries. Replacement with renewable energy ensures there is sufficient capacity in the system to address peak demand events and to ensure price competition in electricity markets. There is also an increasing demand from consumers and financiers for greener energy production.

The coal-fired power stations planned for retirement by around 2040 produce approximately 70,000 gigawatt hours of energy per year. Power reliability in NSW is forecast to deteriorate over the next 10 years due to increasing forced outages as generators age and near retirement (AEMO 2020). With these retirements comes a significant reduction in the energy generation potential which will need to be replaced with alternative renewable energy electricity production.

The Project represents an investment in large scale renewable energy (wind) production (and storage) which will provide essential input into the renewable energy sources needed in the transition from coal fired generation to renewable generation.

2.1.4.3 Climate Change Act 2022

The Commonwealth *Climate Change Act 2022* sets out legislated commitments for achieving nation-wide GHG reduction targets.

These targets include:

- Reducing Australia's net GHG emissions to 43% below 2005 levels by 2030.
- Reducing Australia's net GHG emissions to zero by 2050.

This follows Australia's lodgement of an updated Nationally Determined Contribution with the United Nations Framework Convention on Climate Change (UNFCCC) secretariat in June 2022, as per the obligations under the Paris Agreement. To achieve net-zero GHG emissions by 2050, the Australian Government developed the Long-Term Emissions Reduction Plan (CoA, 2021), which details the proposed strategies to invest in low emissions technologies across the country, including renewable energy infrastructure.

The Project, as a generator of renewable electricity, aims to support Australia's commitment under the Agreement.

2.1.4.4 Commonwealth Renewable Energy Target Scheme

The Commonwealth Renewable Energy Target (RET) Scheme has legislated objectives that include encouraging additional electricity generation from renewable sources, reducing GHG emissions in the electricity sector, and ensuring the use of ecologically sustainable renewable energy sources. The RET operates by creating a market for renewable energy certificates, which promotes investment in the renewable energy sector.

The RET provides the opportunity to both major power stations and owners of smaller systems to generate certificates for each megawatt hour of power they produce. These certificates come in two types: large-scale generation certificates and small-scale technology certificates. Electricity retailers, responsible for supplying power to households and businesses, purchase these certificates and present them to the Clean Energy Regulator. As a result, a market is established, offering financial incentives to both large-scale renewable energy power stations and owners of small-scale renewable energy systems.

The RET aimed to achieve a large-scale renewable generation of 33,000 GWh in 2020, accounting for approximately 23.5% of Australia's total electricity generation at the time. This target was met in January of 2021 and will remain at 33,000 GWh until 2030.

The Project will enable Spark Renewables to participate in the scheme as an electricity provider, capable of generating certificates and participating in the RET. As a provider, the Proponent may sell these certificates to viable entities.

2.2 NSW Renewable Energy Context

2.2.1 NSW Renewable Energy Policy

The NSW Climate Change Policy Framework (OEH, 2016) aims to enhance the economic, social, and environmental well-being of NSW in the face of a changing climate and evolving national and international policies on climate change. The framework aligns with the global Paris Agreement targets and sets ambitious long-term goals, including achieving net-zero emissions by 2050 and building greater resilience to climate change in NSW.

To implement the framework, various strategies are employed, focusing on both emission reduction and adaptation. The Net Zero Plan Stage 1: 2020-2030 establishes the NSW Government's delivery plan toward its objective of achieving net zero emissions by 2050 (DPIE, 2020). These strategies include the development of the Renewable Energy Action Plan (REAP) and the NSW Energy Efficiency Action Plan (EEAP), and a climate change adaptation action plan.

The Project will contribute to the goals established in the NSW Climate Change Policy Framework by building increased security into the regional electricity network. The framework has a focus on resilience for communities and economies in the face of a changing climate and the Project will offer this resilience through network stability.

2.2.2 NSW Climate Change Policy Framework

The NSW Government has developed its NSW Climate Change Policy Framework, which aims to deliver net zero emissions by 2050, and a State that is more resilient and responsive to climate change (OEH, 2016).

Under the NSW Climate Change Policy Framework, NSW has committed to both follow the Paris Agreement and to work to complement national action.

The policy framework is being delivered through:

- the Climate Change Fund
- developing an economic appraisal methodology to value GHG emissions mitigation
- embedding climate change mitigation and adaptation across government operations
- building on NSW's expansion of renewable energy
- developing action plans and strategies.

In 2013, the NSW Government released the REAP and the EEAP.

The REAP aimed to increase the generation, storage and use of renewable energy in NSW, at least cost to customers and with maximum benefits to NSW. The three core goals of the REAP were to attract renewable energy investment, build community support for renewable energy and attract and grow expertise in renewable energy. Based on the implementation of the REAP, renewable energy is now well-placed to play a leading role in meeting NSW's energy needs into the future.

Consistent with the national target, the NSW Government's objective is to achieve net zero emissions by 2050. To achieve this, the NSW Government has released:

- The *Climate Change (Net Zero Future) Act 2023*, which sets out a clear path to deliver net zero by 2050.
- The EII Act, which enables the State's 20-year plan to transform our electricity system under the NSW Electricity Strategy (DPIE, 2019) and the Roadmap (DPE, 2021) into one that is cheap, clean and reliable.
- The Infrastructure Investment Objectives Report (IIO Report) (AEMO, 2023) which is the NSW Consumer Trustee's plan for meeting the future electricity needs of NSW.
- The Network Infrastructure Strategy (NIS) (EnergyCo, 2022) for the coordination of the network infrastructure required to modernise NSW's energy system over the next 20 years.

Current and future electricity development in NSW is supported though the NSW Government's Electricity Strategy (DPIE, 2019) and the Roadmap which builds on the framework set out in the Electricity Strategy taking an integrated approach to all demand and supply options, including action by households and small businesses, demand management and investment in large-scale, affordable and reliable generation.
The Project is consistent with the objectives of the Electricity Strategy and Infrastructure Road Map, in aiming to provide large-scale renewable electricity generation that is affordable and reliable.

The NSW Electricity Strategy is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy (NSW Government, 2019).

IIO Report (AEMO, 2023) sets out the NSW Consumer Trustee's 20-year Development Pathway for the construction of electricity infrastructure in NSW to achieve the infrastructure investment objectives included in the EII Act in a practically feasible way. The 2023 IIO Report highlights the significant progress in achieving the Infrastructure Investment Objectives but also the need for more investment in new generation, storage and network infrastructure.

The NIS (EnergyCo, 2022) is a strategy for the practical coordination of NSW network infrastructure to connect new generation, firming and storage in NSW's five REZs, and to assist NSW to meet the EII Act objectives.

2.2.3 NSW Electricity Strategy and Electricity Infrastructure Roadmap

Current and future electricity development in NSW is supported though the NSW Government's Electricity Strategy (NSW Government, 2020) and the NSW Electricity Infrastructure Roadmap which builds on the framework set out in the Electricity Strategy taking an integrated approach to all demand and supply options, including action by households and small businesses, demand management and investment in large-scale, affordable and reliable generation.

The Electricity Infrastructure Roadmap (NSW Government, 2020) aims to support the private sector to deliver at least:

- 12 GW of new renewable electricity generation
- 2 GW of long-duration storage, such as pumped hydro.

This is to be achieved through the delivery of five (5) REZs, comprising the Central West Orana, South West, New England, Hunter-Central Coast and Illawarra REZs. These zones will serve as 'modern day power stations', combining:

- new renewable energy infrastructure, including generators (such as wind and solar farms)
- storage (such as batteries and pumped hydro)
- high-voltage transmission infrastructure.

The development of the REZs is expected to deliver a range of benefits both within the REZs and to NSW as a whole (EnergyCo, 2024), including:

- energy bill savings from reduced wholesale electricity costs
- emissions reduction from a cleaner energy sector
- reliable energy from significant amounts of new energy supply
- host community benefits through strategic planning and best practice engagement and formalised benefit sharing arrangements.

The Project is consistent with the objectives of the Electricity Strategy and the Roadmap, in aiming to provide large-scale renewable electricity generation that is affordable and reliable.

2.2.4 Network Infrastructure Strategy

The NSW Network Infrastructure Strategy (NIS) is a plan aimed at enhancing network infrastructure in NSW with a primary focus on supporting renewable energy projects in the state's five REZs (EnergyCo, 2022), with a focus on adding between 14 GW and 24 GW of network capacity over the next two decades.

The planned development in South West REZ includes Project EnergyConnect, a transmission line between Wagga Wagga and the eastern edge of the REZ at Dinawan, continuing through the REZ to Buronga. The Wagga Wagga to Dinawan section of the line will be constructed at 500 kV by 2026, with an initial 330 kV operation delivering 0.8 GW of network capacity. South West REZ is in the deliver now phase progress as quickly as possible for delivery by 2033 (EnergyCo, 2022).

The Project is located within the South West REZ that is projected to generate up to 2.5 GW intended capacity (EnergyCo, 2022). The Project will contribute to meeting the delivery phase of the NIS. The Project also aligns with the strategy's principles developed through stakeholder consultation. It will contribute to affordable energy generated and provided to the NEM that will increase the networks security and reliability.

2.2.5 South West Renewable Energy Zone

The South West REZ was formally declared by the Minister for Energy under section 19(1) of the *Electricity Infrastructure Investment Act 2020* and published in the NSW Gazette on Friday 4 November 2022.

The location of the South West REZ was selected based on its abundance of high-quality wind and solar resources, proximity to existing and planned high voltage transmission including Project EnergyConnect, relative land-use compatibility and a strong pipeline of proposed projects (EnergyCo, 2024b).

The South West REZ has an intended network capacity of 2.5 GW. This will be delivered by the eastern section of Project EnergyConnect, HumeLink, and the NSW-side of Victoria to NSW Interconnector (VNI) West and minor additional REZ network infrastructure.

According to EnergyCo (2024b):

- The South West REZ is expected to receive up to $2.8 billion in private investment by 2030.
- At its peak, the REZ is expected to support over 2,000 construction jobs in the region.
- The Project is wholly located with the South West REZ, as shown in **Figure 1.2**. Additionally, the Project is strategically located along the 330 kV Eastern Section of Project EnergyConnect (SSI-9172452), which is now under construction which will run through the southern section of the Project Area and connect to the 330 kV main switchyard.

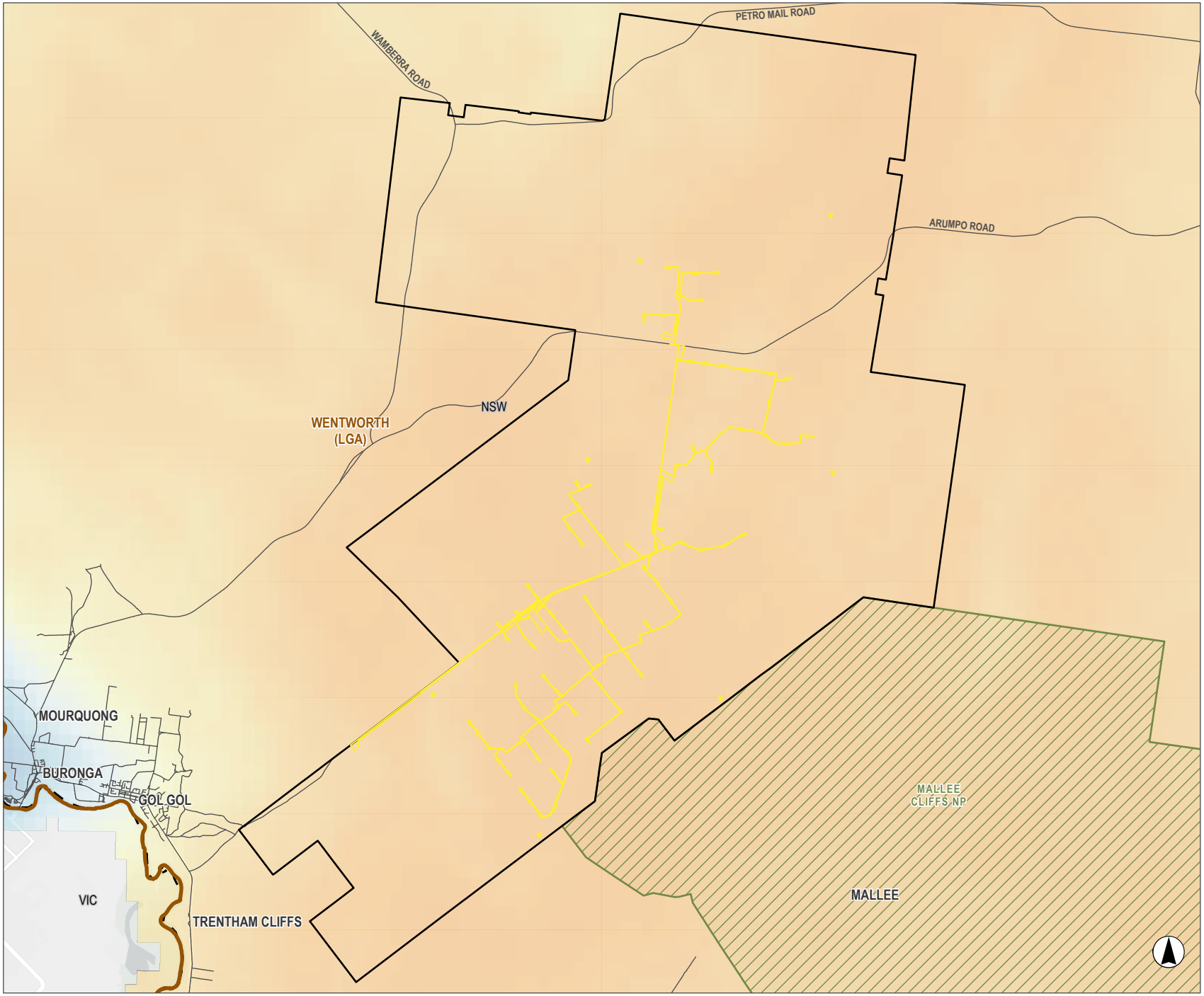
2.3 Regional and Local Renewable Energy Context

Wind energy is known to be one of the cheapest forms of new build large-scale energy generation and NSW has significant wind resources. The South West REZ has been identified as a suitable location to support wind energy development with consistently high average wind speeds and close proximity to existing and planned transmission infrastructure (EnergyCo, 2022b). The wind resource for the Project Area and its immediate surrounds are identified in **Figure 2.1**.

The Project will contribute significant capital investment within the region, generate jobs during the construction and operational phases, provide indirect benefits to local services throughout the life of the Project (e.g. indirect employment creation in local and regional economies would include jobs supported through transportation, trade supplies, services, accommodation, catering, retail services, etc.), deliver additional income to host and other associated landholders, and provide benefits to the local community through the implementation of the Community Benefit Fund.

FIGURE 2.1

Wind Resource Mapping



Legend

- Project Boundary
- Disturbance Footprint
- State Border
- Local Government Area (LGA)
- Road

Wind speed (metres per second)

High : 10.2

Low : 2.4

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

2.3.1 Far West Regional Plan 2036

Adopted in August 2017, the Far West Regional Plan (FWRP) is a 20-year framework to guide NSW Government's land use planning priorities and decisions regarding land use plans, development proposals and infrastructure funding decisions in the Far West region (NSW Government, 2017). The plan introduces the vision for the region, which is to create a diverse economy, supported by the right infrastructure, an exceptional natural environment and resilient communities.

The objectives underpinning the direction of the Far West Regional Plan are:

- A diverse economy with efficient transport and infrastructure networks.
- Exceptional semi-arid rangelands traversed by the Barwon-Darling River.
- Strong and connected communities.

The FWRP acknowledges that that the economy of the Far West is built on the diverse landscapes that define the region. Agricultural land has historically been the foundation of the region's success founded on irrigated cropping enabled by the Darling and Murray rivers and the Menindee Lakes (NSW Government, 2017). The FWRP notes that leveraging new opportunities such as wind and solar energy generation will play an important role in supporting new economic ventures alongside traditional industries.

Renewable energy generation is supported within the plan through Direction 4: 'Diversify energy supply through renewable energy generation'. Wentworth, Broken Hill and Balranald are identified within the FWRP as local government areas with potential and capacity for renewable energy generation. The Project Area is located within the Wentworth Local Government Area (LGA) and aligns with the strategic objectives of the FWRP to utilise natural resources and diversify the economy of the far western NSW.

Agricultural land is a priority within the plan under Direction 2: 'Protect productive agricultural land and plan for greater land use compatibility.' The Project has been designed to operate alongside current agricultural land uses and future proposed land uses.. Agricultural use of the land will continue with the Project during the construction, operation and decommissioning phases. Access to a diversified stream of income will enhance the capacity of landholders to invest in agricultural operations and offer alternative sources of income, particularly during periods of low productivity. This will contribute to the stability and assurance of their operations.

The proposed Project aligns closely with the vision of the FWRP under:

- Direction 3: 'Sustainably manage mineral resources' as it is co-located with the Euston Mineral Sands Project.
- Direction 6: 'Unlock economic potential through improved freight transport infrastructure' by undertaking road upgrades between Euston and the Project.
- Direction 10: 'Enhance the economic self-determination of Aboriginal communities' and 'Direction: 22: Collaborate and partner with Aboriginal communities' by developing partnerships and engagement protocols during the assessment of the Project and providing employment opportunities in line with the Project's Aboriginal Participation Plan.

The FWRP also acknowledges that the expansion of wind energy, solar energy, and bioenergy production will foster job creation within local communities and unlock development prospects for related industries.

2.3.2 Draft Far West Regional Plan 2041

The FWRP 2037 has been reviewed and will be extended to 2041 with renewed priorities and goals. Focus priorities include opportunities of a changing regional economy and catalyst projects such as the South West REZ. Most notably the region's resources of copper, cobalt, scandium and rare earth elements are acknowledged as critical components to deliver renewable energy components including storage batteries, solar panels, high-performance optics and powerful magnets needed for electric motors, wind turbines, electric vehicles and a range of advanced manufacturing capabilities (DPE, 2022).

The draft Far West Regional Plan 2041 was exhibited from 6 October 2022 to 21 November 2022. This plan supports the NSW Government's commitment to net zero by 2050 with renewable energy positioned to replace the coal fired power stations set to reach the end of their technical life within this time. The final version of the Far West Regional Plan 2041 has not been formally published.

2.3.3 Western Murray Regional Economic Development Strategy – 2023 Update

In 2018, the NSW Government developed Regional Economic Development Strategies (REDS) for 38 Functional Economic Regions (FERs) across regional NSW. The Western Murray Regional REDS was developed to identify economic development opportunities that capitalise on the endowments and industry specialisations of the Western Murray Region (Department of Regional NSW, 2018).

The Western Murray region has seen significant investment delivered since 2018, with additional projects in the planning or delivery stages in the region, including over $1 billion invested to deliver a number of major solar farm projects and $2.3 billion to deliver Project EnergyConnect between NSW, SA and Victoria (Department of Regional NSW, 2023).

The REDS identify that potential supply chain opportunities exist around wind farm component production, fabrication of solar equipment and sovereign manufacturing. A key challenge is ensuring the region can derive long term local benefit from new renewable energy generation projects, especially following construction (Department of Regional NSW, 2023).

The REDs also recognise renewable infrastructure projects may boost the influx of skilled workers, but may exacerbate housing market challenges in the region. The Project will provide a TWA facility on site to minimise impacts on the housing market within the Wentworth Shire and adjoining Mildura LGA throughout construction.

2.3.4 Wentworth Shire Local Strategic Planning Statement

The Wentworth Shire Local Strategic Planning Statement (WSLSPS) was adopted on 6 March 2020 and establishes the land use framework for Wentworth Shire's economic, social and environmental land use toward 2040 (Wentworth Shire Council, 2020). Through integration of the objectives of the Far West Regional Plan 2036, the Future Transport Plan 2056 and the NSW State Infrastructure Strategy 2018–2038 the WSLSPS addresses the planning and development issues of strategic significance for the Wentworth Shire.

Planning themes and priorities of the WSLSPS are focussed on ensuring the LGA remains a productive, attractive, sustainable and resilient region. The plan recognises the areas rich deposits of mineral-rich sand as well as capacity to generate energy from the development of solar and wind infrastructure.

The planning priorities aims to foster a productive, attractive, sustainable, and resilient Shire.

The Statement recognises the opportunity to diversify energy supply through renewable energy generation as the region has significant levels of solar exposure and high wind speeds. Due to the strategic location on the transmission network and capacity for renewable electricity generation, the region is well positioned to advance the security of energy supply rural NSW.

The Statement also aims to develop resilience to climate change. In this regard, a medium-term action in the WSLSP is to investigate subdivision provisions in association with renewable energy projects where it does not sterilise land for agricultural purposes.

The statement identifies the requirement of providing an adequate supply of affordable accommodation for workers and the necessity of managing cumulative impacts of demand for temporary workers accommodation in Wentworth Shire and adjoining local government areas.

The Project aligns with the vision and objectives stated in the WSLSPS, particularly regarding contribution to the planning priority of a productive shire through the development of renewable energy generation. Additionally, the Project's design considers the agricultural activities on the Project Area and aims to minimise any conflicts with existing land uses in the region. The Project will also provide a TWA facility on site to minimise impacts on the housing supply within the Wentworth Shire and adjoining Mildura LGA throughout construction.

2.3.5 Wentworth Shire Community Strategic Plan 2022–2032

The Wentworth Shire Community Strategic Plan embodies a shared vision of our community, providing a roadmap for the region’s development over the next decade. This Plan outlines community aspirations, ideas, challenges, and opportunities for the LGA. In response, Wentworth Shire Council established objectives to meet the community’s desires, including Council’s role and potential partners to contribute towards these objectives.

The Project will contribute towards meeting the following objectives:

- 1.1 Promote the shire as an ideal location for investment and the establishment of innovative sustainable and diversified industries.
- 1.5 Encourage and support initiatives that improve local employment opportunities.
- 3.1 Ensure our planning decisions and controls enable the community to benefit from development.
- 3.3 Minimise the impact on the natural environment.

2.4 Environmental and Social Context

2.4.1 Local and Regional Community

As outlined in **Section 1.0** the Project is located approximately 16 km north-east of Buronga in the Murray region of southwestern NSW, within the Wentworth LGA and 17 km north east of Mildura, VIC. The Project is located within the Wentworth LGA which has a population of 7,453 and covers an area of 26,269 km (ABS, 2021a). The LGA currently has a population density of 0.4 residents per square kilometre, much lower than NSW at 10.2 (ABS, 2021b). The southern extent of the LGA has the greatest population density, with population located in the townships of Buronga, Wentworth, Dareton and Gol Gol (Wentworth Shire Council, 2021).

The closest township in NSW to the Project is Buronga, located on the banks of the Murray River with a population of 2,400 people followed by Wentworth with a population of 2,369 people (40 km east of the Project) (ABS, 2021). Across the Murray River in Victoria is Mildura which has a population of approximately 35,652 (ABS, 2021) and is the nearest regional centre to the Project. Smaller localities of Mallee, Red Cliffs and Trentham Cliffs are located to the south and south west of the Project. The Project Area is located mostly east of the Arumpo Road; however this road also intersects the northern extent of the Project Area in an east to west direction.

The Project Area is located approximately 12 km north east of the Sturt Highway and is adjacent to the western extent of the Mallee Cliffs National Park. Calder Highway is located approximately 15 km south west of the Project Area, while the Silver City Highway is located approximately 38 km west of the Project Area (see **Figure 1.1**).

2.4.2 Land Use and Ownership

The Project Area and surrounds are characterised by existing agricultural land uses with associated rural residences. Land within and surrounding the Project Area has been subject to extensive historical vegetation clearing associated with agricultural land uses (refer to **Figure 2.3**).

Agriculture is the predominant land use in the Project Area, primarily being non-irrigated broad-acre cropping activities. Several grain and pulse crops are produced including wheat, beans and chickpeas that are distributed to the national food market. The Project Area north of Arumpo Road rotates between sheep grazing and cropping year to year. The Project Area south of Arumpo Road is exclusively used for broadacre cropping. There are no areas of mapped Biophysical Strategic Agricultural Land (BSAL) within the Project Area.

The Project Area is also used for agricultural research activities throughout the year which contributes to knowledge of productive land management in the region.

There are eight landholdings within the Project Area, containing a mix of Crown land and Freehold Land, as outlined in **Table 2.1** and illustrated in **Figure 2.4** below.

Table 2.1 Land Tenure within the Project Area

Lot/DP	Land Tenure	Ownership
7/DP1256363	Freehold	Landholder 1 (Owner)
1726/DP763664	Crown	Landholder 2 (Lessee)
1727/DP763667	Crown	Landholder 2 (Lessee)
3805/DP763156	Crown	Landholder 3 (Lessee)
3/DP756993	Freehold	Landholder 3 (Owner)
1/DP756995	Freehold	Landholder 3 (Owner)
3/DP1182353	Freehold	Landholder 4 (Owner)
1/DP1233260	Freehold	Landholder 4 (Owner)

The Land Parcels within the Project Area currently designated as Crown land (Lot 1726/DP763664, Lot 1727/DP763667 and Lot 3805/DP763156) are associated with Crown lands leases established by the Host landholders as part of the broader Crown Lands 'Western Division'. **Appendix 2** contains a list of lot/DPs within the Project Area of which this application applies.

The Host landholders intend to purchase the Crown land 'Western Land Leases' to acquire freehold title to lots where works are proposed before construction. This process has commenced in accordance with the provisions of the *Crown Land Management Act 2016*, including any special provisions applicable to land in the Western Division, as well as any other relevant legislation. Three (3) Crown land parcels will be converted to freehold title. Of these two (2) have received an offer to purchase (1726/DP763664 and 1727/DP763667) and the remaining parcel (3805/DP763156) is well progressed through the freehold application process.

In the unlikely event that Host landholders are unable to obtain freehold title within the specified timeframe, adjustments to the landholder leases may be necessary to accommodate any works that may intersect areas of Crown land.

Travelling stock reserves are parcels of Crown land originally reserved for the use of travelling stock. The travelling stock reserve network is now used for a range of purposes, including:

- travelling stock, emergency stock refuge and transport of stock to market
- providing biodiversity corridors
- providing access and connection to country for Aboriginal peoples
- maintaining heritage.

A Travelling Stock Reserve (TSR) R66986 is located along the northern extent of the Project Area at the northern portion of Arumpo Road as shown in **Figure 2.4**. Crown lands have advised that this reserve is no longer in use and would be closed as part of the freeholding of the property. No other crown land easements such as roads or waterways traverse the Project Area (refer to **Figure 2.4**).

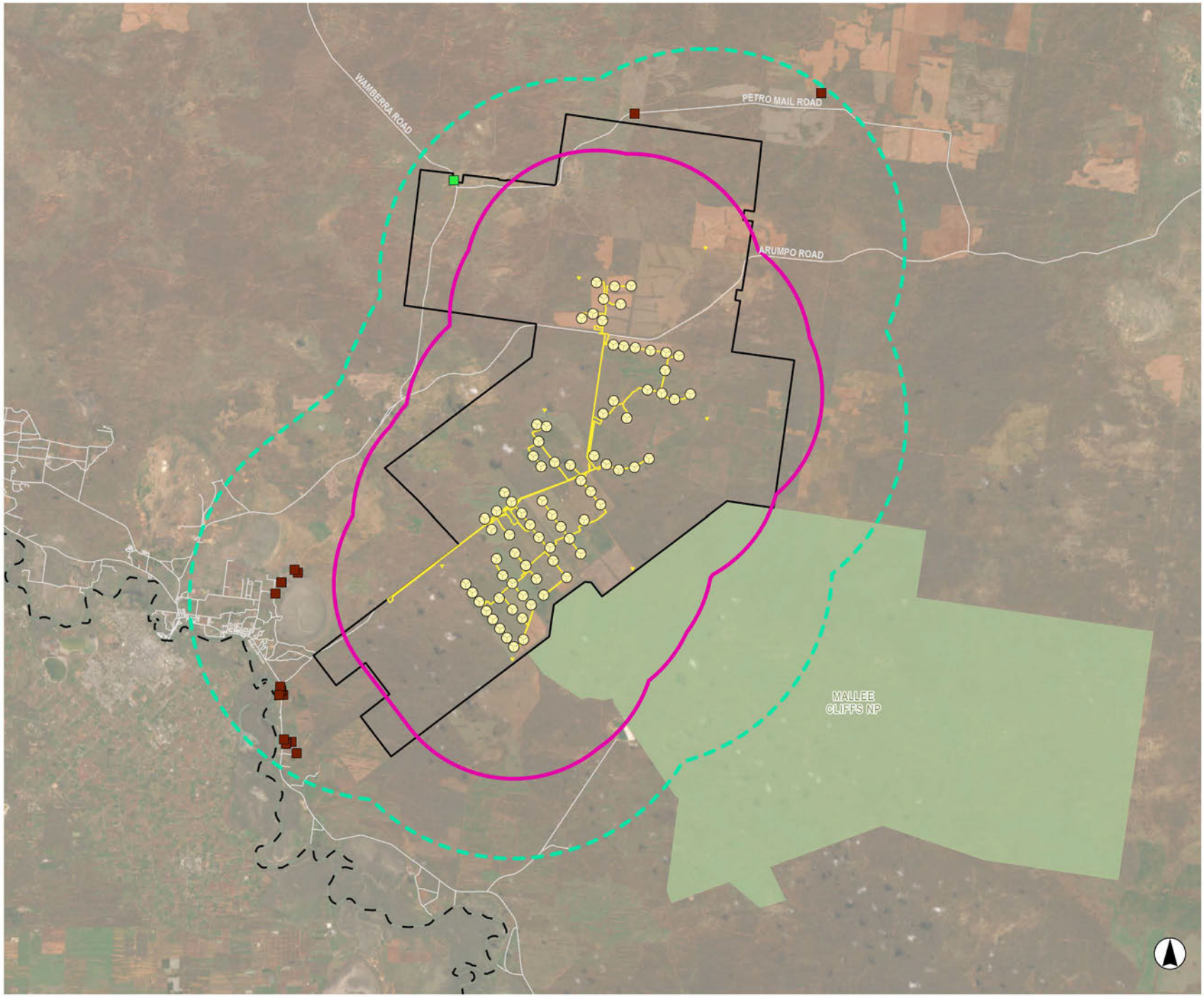
The landholders and Spark Renewables have undertaken consultation with DPHI, Crown lands division (Crown lands). Consultation with Crown lands is further discussed in **Section 5.0**.

Relevant specialist assessments undertaken as part of this EIS have identified three (3) categories of dwellings (refer to **Figure 1.3**):

- **Host Dwellings** – those dwellings located within the Project Area and located on land hosting infrastructure associated with the Project. The host landholders have agreements in place with Spark Renewables. The host dwelling is referred to as R1146.
- **Associated Dwellings** – dwellings not located on land within the Project Area or hosting infrastructure, however, the Proponent has a negotiated agreement in place with the landholder regarding Project impacts and are therefore associated with the Project. It is noted that Mallee Wind Farm does not have any associated dwellings.
- **Non-associated Dwellings** – dwellings located outside of the Project Area, not associated with the Project and with no negotiated agreement in place with the landholder.

FIGURE 2.2

Dwellings within 12 km of the Disturbance Footprint



Legend

- Project Boundary
- Disturbance Footprint
- Disturbance Footprint - 12 km buffer
- 8,000 m from WTG
- Wind Turbine Generators
- Host Dwelling
- Non-associated Dwelling
- State Border
- NPWS Estates
- Road

0 5 10
Kilometres

Scale 1:325,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Mining licences are currently in place across the Project Area and relate to the mineral sands deposit that is present within the Lower Murray region. There are three (3) exploration leases overlapping the Project Area held by two (2) entities including Murray Basin Critical Minerals Pty and Iluka Resources Limited. Murray Basin Critical Minerals Pty hold exploration licence EL9604 which is located in the western portion of the Project Area (See **Figure 2.5**).

Iluka Resources Limited are the holders of exploration licence EL9530 and EL9380 within the Project Area. Iluka Resources Limited also hold the assessment lease AL24 which intersects the southern portion of the Disturbance Footprint (See **Figure 2.5**).

Consultation undertaken with NSW Department of Primary Industries and Regional Development – Mining, Earth and Geosciences (MEG) and licence holders is outlined in Section 5.

2.4.3 Land Zoning

The Project Area is primarily zoned RU1 – Primary Production under the Wentworth Local Environmental Plan 2011 (Wentworth LEP) (refer to **Figure 2.4**). The objectives of RU1 zoning are to:

- encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- encourage diversity in primary industry enterprises and systems appropriate for the area
- minimise the fragmentation and alienation of resource lands
- minimise conflict between land uses within this zone and land uses within adjoining zones
- encourage and promote the growth and diversification of economic and employment opportunities in agriculture, horticulture and tourism
- enable the development of restaurants and cafes and kiosks as part of agritourism development.

The Project is compatible with the objectives of the RU1 zoning, as it seeks to:

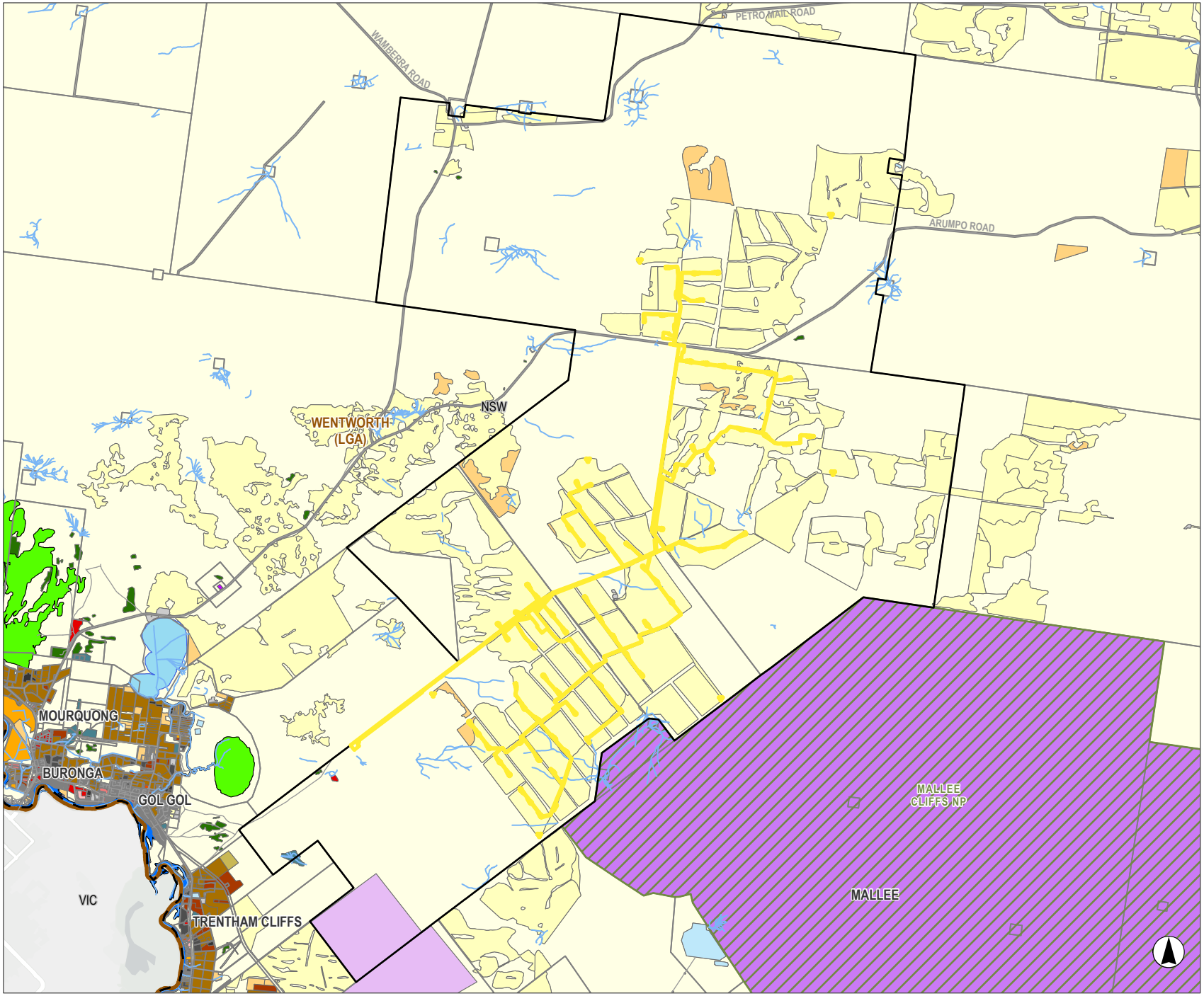
- facilitate co-existence of both renewable energy generation and agriculture, by maintaining existing grazing activities concurrent with Project operations
- diversify income streams for agricultural operators through host and negotiated agreements with impacted landholders, and proximal neighbours who are participating in the Projects neighbourhood benefit sharing scheme
- minimise potential land use conflicts through careful Project design and the implementation of mitigation and management measures to address residual impacts to nearby landholders.

The Project Area also contains pockets of land zoned C2 Environmental Conservation; however the Project design has sought to avoid the placement of infrastructure (and associated ground disturbance) within these areas.

The Mallee Cliffs National Park, located adjacent to (but outside of) the south western boundary of the Project Area, is zoned C1 – National Parks and Nature Reserves. The national park is 57,969 hectares (ha) and was reserved in March 1977 for the purpose of protecting mallee land systems following the purchase of Mallee Cliffs Station (NSW Office of Environment and Heritage, 2018) (OEH).

FIGURE 2.3

Land Use



Legend

- Project Boundary
- Disturbance Footprint
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse

Landuse (2017) - Within the Project Boundary

- 1.1.0 Nature conservation
- 1.2.0 Managed resource protection
- 2.1.0 Grazing native vegetation
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.8.0 Mining
- 5.9.0 Waste treatment and disposal

Landuse (2017) - Outside the Project Boundary

- 1.3.0 Other minimal use
- 2.2.0 Production native forests
- 3.1.0 Plantation forests
- 3.5.0 Seasonal horticulture
- 3.6.0 Land in transition
- 4.1.0 Irrigated plantation forestry
- 4.2.0 Grazing irrigated modified pastures
- 4.3.0 Irrigated cropping
- 4.4.0 Irrigated perennial horticulture
- 4.5.0 Irrigated seasonal horticulture
- 4.6.0 Irrigated land in transition
- 5.1.0 Intensive horticulture
- 5.2.0 Intensive animal production
- 5.3.0 Manufacturing and industrial
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 6.1.0 Lake
- 6.2.0 Reservoir/dam
- 6.3.0 River
- 6.4.0 Channel/aqueduct
- 6.5.0 Marsh/wetland

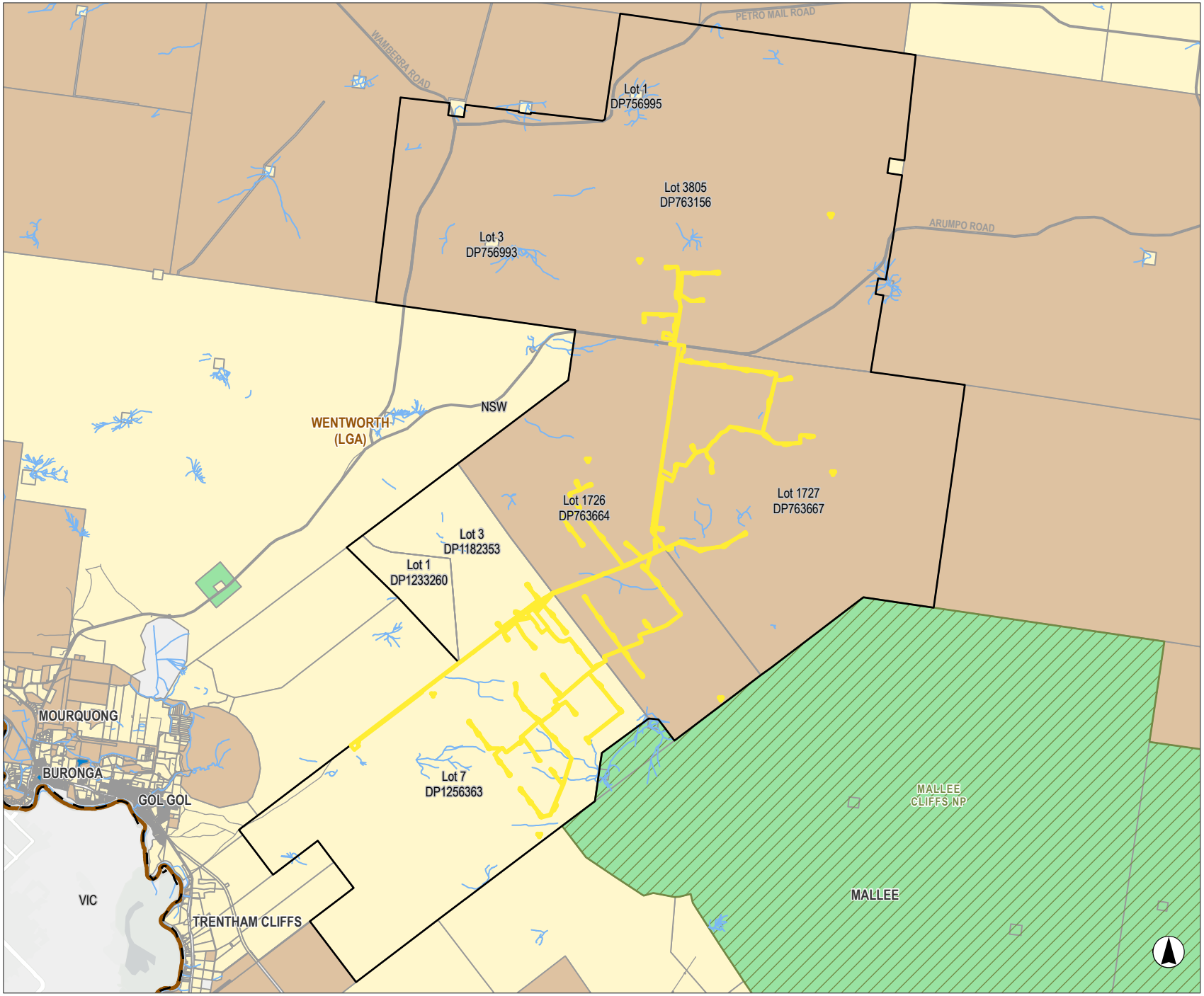
0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 2.4

Land Ownership



Legend

- Project Boundary
- Disturbance Footprint
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse

Land Ownership

- Freehold
- Crown
- Local Government Authority
- NSW Government

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

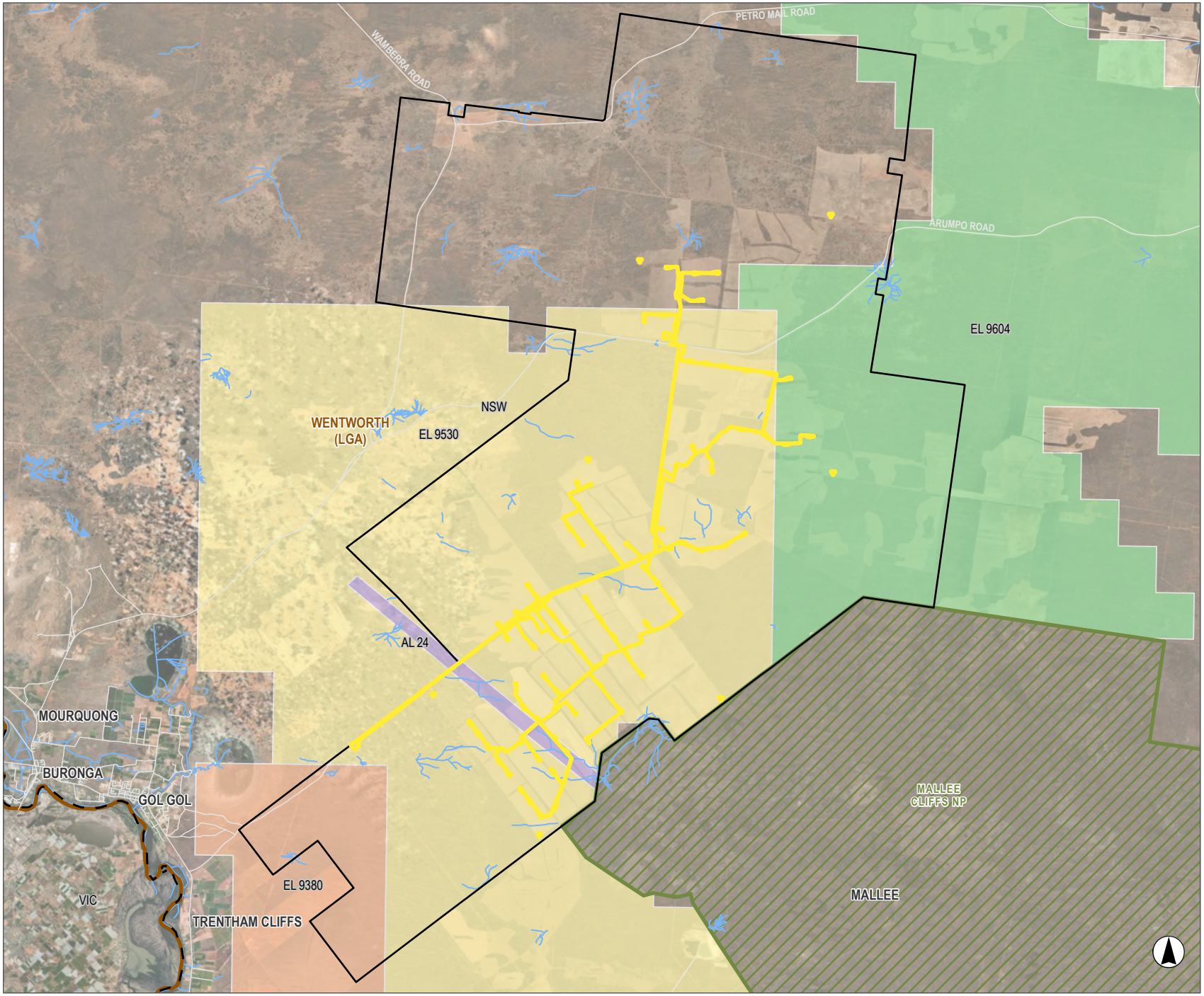


FIGURE 2.5

Mining Licences and Applications

Legend

- Project Boundary
- Disturbance Footprint
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse

Mining Licences and Applications

- AL 24
- EL 9380
- EL 9530
- EL 9604

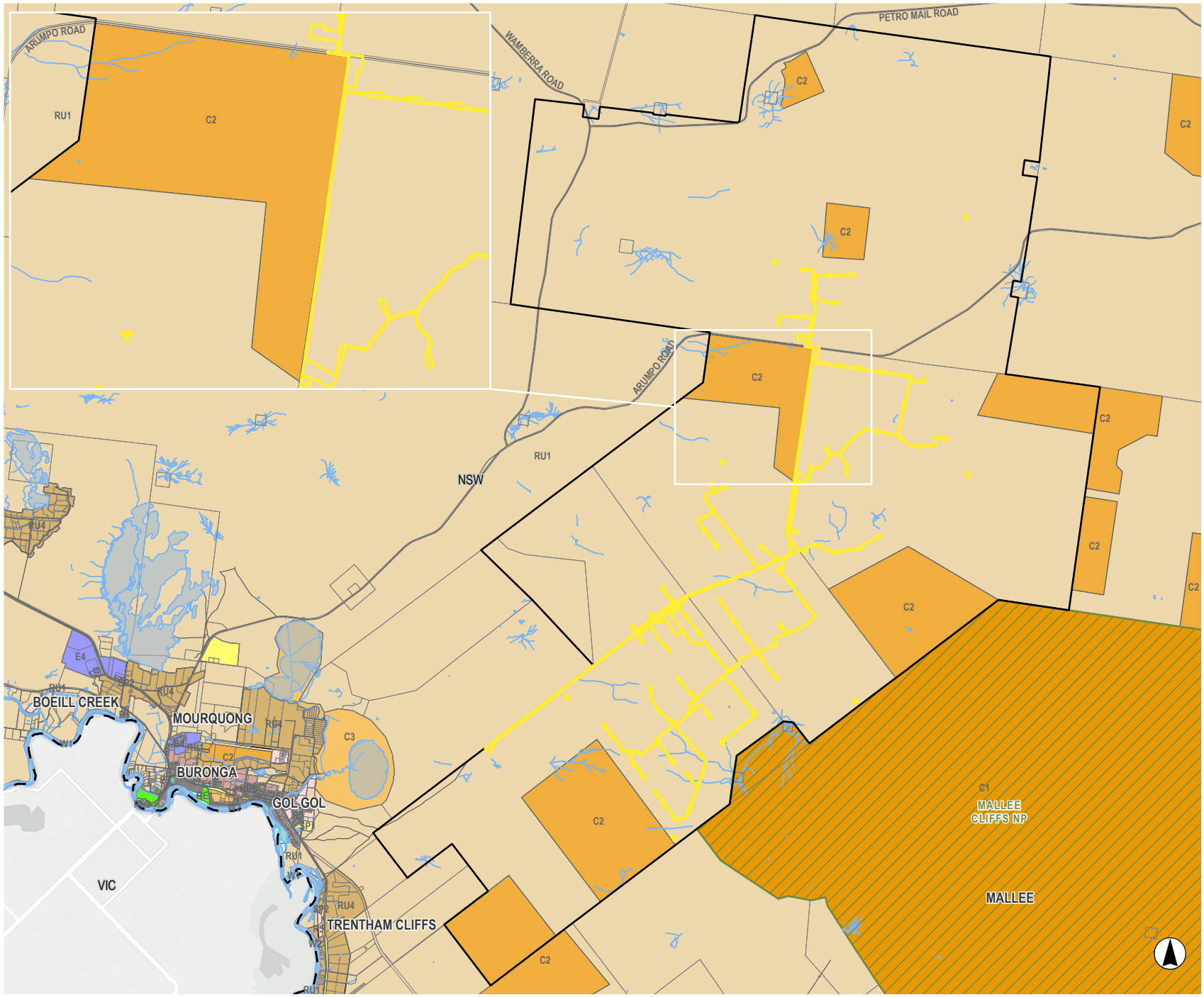
0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 2.6

Land Zoning



Legend

- Project Boundary
- Disturbance Footprint
- State Border
- NPWS Estates
- Road
- Watercourse
- Waterbody

Land Zoning

- C1 - National Parks and Nature Reserves
- C2 - Environmental Conservation; C2, Environmental Management
- C3 - Environmental Management
- E1 - Local Centre
- E3 - Productivity Support
- E4 - General Industrial
- R5 - Large Lot Residential
- RE1 - Public Recreation
- RE2 - Private Recreation
- RU1 - Primary Production
- RU4 - Primary Production Small Lots
- RU5 - Village
- SP1 - Special Activities
- SP2 - Infrastructure
- W1 - Natural Waterways
- W2 - Recreational Waterways

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

2.4.4 Natural, Cultural and Built Features

2.4.4.1 Regional Landform Characteristics

The Project Area is located on the Lower Murray agricultural sub region which covers an area of approximately 48,000 square kilometres. The Lower Murray region covers the land of the lower reaches of the Murrumbidgee River, the Murray River and the Darling River which is typified by a flat floodplain, dry climate and old soils (NSW DPI, 2020).

The Lower Murray region contains diverse landscapes, from arid outback to fertile farmlands and significant wetlands, including the Willandra Lakes World Heritage Area and several national parks. The broader Far West Region, shares borders with Queensland, South Australia, and Victoria and is part of the expansive Murray–Darling Basin, characterised by vast floodplains and tributaries feeding into the Darling River.

The Project Area is located three (3) km north of the Murray River draining into the Murray Riverina and the Benanee Catchment Areas. The Project Area is characterised by a flat, low lying landscape with a maximum elevation change of 90 m across its extent. The lowest point within the Project Area is 40 m Australian height Datum (AHD) along the south western boarder of the Project Area to 130 m AHD in the centre portion of the Project Area. The distance between the lowest point within the Project Area the highest point is roughly 20 km. The wider locality is generally flat although experiences a slight decrease in elevation from east to west (See **Photo 2.1**).

The Project Area is primarily located along a low elevation ridge line, with surface drainage occurring either side of the ridge towards the west and east. Water drains into localised catchments and towards a typically poorly defined and discontinuous waterway network. Off the main ridgeline, the topography generally grades down towards the lower river floodplain to the south (See **Photo 2.2**). There are numerous local depressions within the floodplain topography, which reinforces the discontinuous nature of the local watercourses and drainage network. There are limited mapped watercourses within the Project Area, all of which are of a minor nature. The mapped watercourses within the Project Area are of 1st and 2nd Strahler stream order, which are defined as minor streams.

Photo 2.1 Indicative flat characteristics of Project Area

Photo 2.2 Indicative characteristics of the lower river floodplain

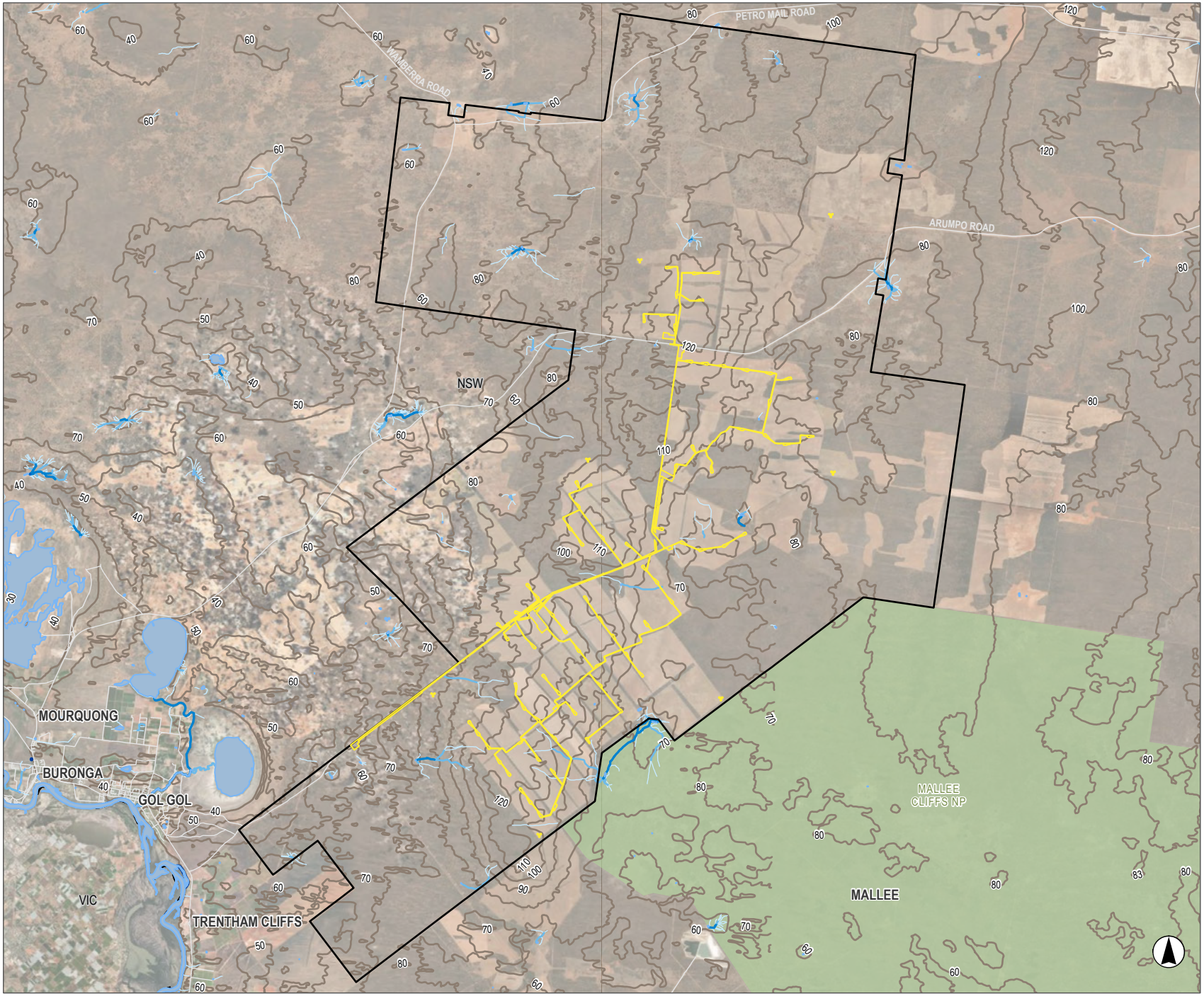


FIGURE 2.7

Topography of the Project Area

Legend

- Project Boundary
- Disturbance Footprint
- State Border
- NPWS Estates
- Road
- Contour (10m Interval)
- Waterbody

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Greater

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

2.4.4.2 Cultural and Historical Heritage Context

The Project Area is situated within the Dareton Local Aboriginal Land Council (LALC) area, with the Balranald LALC located in close proximity to the east of the Project. The Project Area interacts with traditional lands of the Barkindji, Latji Latji, Muthi Muthi and Yitha Yitha people.

The Barkandji (Paakantji/Barkindji) People are recognised as the traditional owners of the neighbouring Mallee Cliffs National Park in the Barkandji No.8 Native Title determination (2015) and the Mallee Cliffs Draft Plan of Management (POM) (2017). The nation of Latji Latji has occupation ranging from Chalka Creek to Mildura on the southern bank of Murray River; at Kulkyne; ranging about 80 km south from the river to near Murrayville and Pine Plains. The traditional lands of the Muthi Muthi people are also recognised as being some of the Traditional Owners of the Mallee Cliffs National Park which is adjacent to the Project Area and the Willandra Lakes Region which is recognised as being one of the most significant archaeological regions in Australia. Yitha Yitha nation boundaries are unclear although it is recognised that their culture and boundaries were closely intertwined with the Muthi Muthi people.

The Project is on land that is within the area of a native title determination for the Barkandji Traditional Owners. The determination found that native title exists in certain parts of the claim area but that native title had been extinguished within the Project Area. It is acknowledged that while native title does not exist within the Project Area the Barkandji Native Title Prescribed Body Corporate are a key stakeholder that have been consulted through project planning and preparation of the EIS.

There are currently no known native title claims over the Project Area. Site-specific social and cultural values were identified during the consultation process and field survey for the Aboriginal cultural heritage assessment of the Project (refer to **Section 6.4**). Mungo National Park (a World Heritage listed National Park) is located 40.5 km north east of the Project Area. The need to protect this area from the impacts of development was a key aspect for the EIS identified through early consultation with the community and stakeholders. It is the home of the 'Mungo Lady' and 'Mungo Man' and represents a place rich in Aboriginal history (NPWS, 2022).

A search of the Heritage NSW Aboriginal Heritage Information Management System (AHIMS) was undertaken on 12 March 2024 (Client Service ID 872664) which identified 93 previously recorded sites within a 25-kilometre radius of the Project Area. The archaeological sites that were identified during the 2023 heritage survey for the Project are included in these search results.

2.4.4.3 Biodiversity Context

Mallee Cliffs National Park

The Mallee Cliffs National Park is situated adjacent to the eastern boundary of the Project Area, 800 m from a WTG and covers an area of 57,969 ha (NPWS, 2022). It is managed to protect the sand plain and sand dune land systems and ecological communities with emphasis placed on the value of Mallee Cliffs National Park as a wildlife conservation area.

The national park hosts 11 native plant communities and more than 293 native plant species. Among these, two plant species are recognised as threatened and are protected under the NSW *Biodiversity Conservation Act 2016* (BC Act). Bitter quandong is listed as endangered under the BC Act, and yellow Swainson-pea is listed as vulnerable under both the BC Act and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Twenty-seven threatened animals listed under the BC Act have been recorded in the national park. The predominant vegetation community within the national park is the Mallee community, which constitutes 76% of the area and offers a critical habitat for the at-risk mallee fowl species. The main conservation initiatives currently taking place in the Mallee Cliffs National Park involves a program to reintroduce several regionally extinct mammal species, including the Bilby, delivered in partnership with the Australian Wildlife Conservancy. Control of introduced pest animals is a key management focus in the national park, particularly the control of introduced predators such as foxes and cats which threaten mallee fowl and which have played a significant role in the loss of mammals in the region.

Due to the national park's strong emphasis on nature conservation, visitor access within the national park is limited. A policy of restricted public access for education purposes is maintained to assist in meeting conservation objectives (NPWS, 2022). Further details regarding potential impacts upon and consideration of Mallee Cliffs National Park is provided in **Section 7.0**.

Biodiversity Values

The vast majority of the Project Area that would be utilised by the Project is previously cleared cropping land. Only 12% of the Disturbance Footprint would involve any impacts to native vegetation. Areas of native vegetation across the Project Area generally consist of a mix of native grassland and open woodland, which is situated in a rural landscape. Detailed biodiversity field surveys determined native vegetation within the Development Footprint comprises three PCTs across 7 vegetation zones (refer to **Section 6.2**). Of these, two (2) PCTs (170 and 171) are identified as being associated with Threatened Ecological Communities (TEC) listed under the BC Act and EPBC Act. Further detail on the biodiversity values of the Project Area is provided in **Section 6.0**.

Category one (1) exempt land is land in which native vegetation values are not considered to be present and are thus exempt from approval from Local Land Services. A total area of 390.36 ha of the Disturbance Footprint has been assessed as Category one (1) Exempt Land. The areas assessed as Category one (1) Land contain highly disturbed non-woody vegetation primarily dominated by cropped and or grazed land.

The Project Area is in proximity to a number of landscape features which have been identified as notable features for birds and bats including:

- Mallee Cliffs National Park – located adjacent to the western boundary of the Project Area.
- Mungo National Park – located approximately 47 km north east of the Project Area.
- Willandra Lakes Region World Heritage Area – located approximately 25 km north east of the Project Area.
- Mourquong Saltwater Disposal Basin – located approximately 13 km west of the Project Area.
- The Murray and Darling Rivers – located approximately nine (9) km south and 37 km west of the Project Area, respectively.

- Lake Gol Gol and Gol Gol Swamp – located approximately eight (8) km west and 4 km south west of the Project Area, respectively.
- Large areas of remnant native vegetation surrounding the Project Area – located immediately along the north, west, south and eastern edges of the Project Area.
- A comprehensive bird and bat monitoring program has informed the Project design and siting to minimise impacts to species utilising these features. Appendix B of **Appendix 6** provides details of the assessment and steps taken by the Project to avoid impacts to birds and bats.

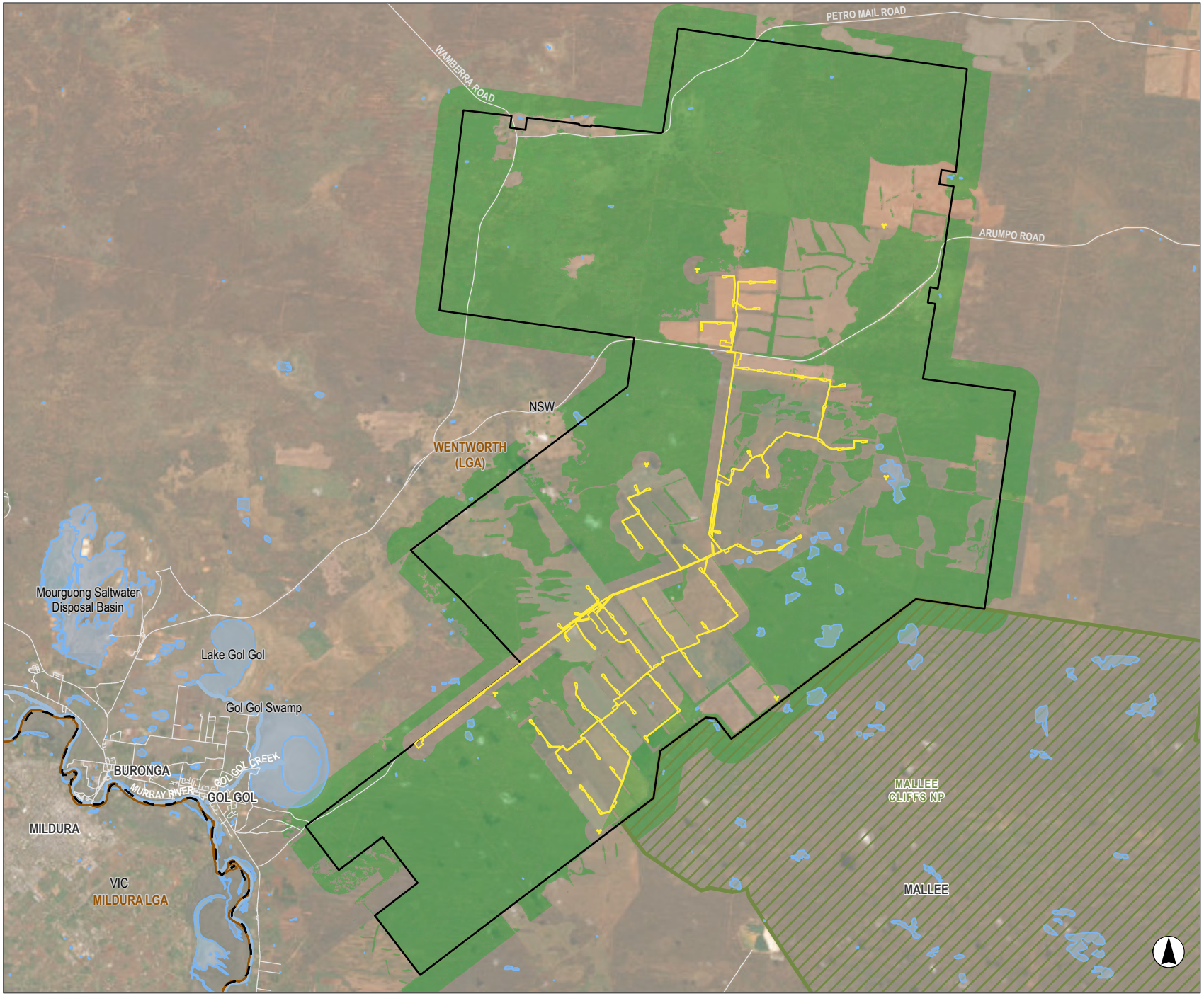


FIGURE 2.8

Ecological features in proximity to the Project

Legend

- Project Boundary
- Disturbance Footprint
- State Border
- NPWS Estates
- Local Government Area (LGA)
- Remnant Native Vegetation
- Road
- Watercourse
- Waterbody

0 5 10
Kilometres

Scale 1:220,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

2.4.5 Key Risks and Hazards

The iterative design process and the assessments undertaken for this EIS have supported the Project design to, wherever possible, avoid, minimise and mitigate potential risks and hazards. Notwithstanding, the nature of the Project (i.e. a wind farm and a battery energy storage system) is such that some risks or hazards cannot be entirely addressed through design, management or mitigation measures.

The Project Area:

- has not been identified as containing contaminated land
- is not located within land considered to be prone to mine subsidence
- is not located within a coastal zone
- has not been identified as containing steep slopes or subject to landslips
- is categorised as medium bush fire risk vegetation (Vegetation Category 3)
- the nearest flood prone land is Gol Gol Swamp which is located 1.1 km from the Project Area and 4.0 km from the southern switchyard
- there have been limited flood studies across the Project Area and surrounding terrain which present a limitation to identifying flood risks
- has no BSAL present within or in the vicinity of the Project Area. Additionally, there are no mapped Class 1–3 land under the Land and Soil Capability Assessment Scheme (LSC) present within the Project Area.

Relevant risks and hazards, as well as the associated management and mitigation measures, have been considered and are described in detail in **Section 6.0**. In accordance with the SEARs, relevant assessments have been undertaken of risks and hazards associated with the Project, including:

- aviation safety, via the aviation impact assessment (refer **Appendix 20**)
- telecommunications (EMI), via the telecommunications impact assessment (refer **Appendix 18**)
- electric and magnetic field (EMF), via the human health assessment (EMF) (refer **Appendix 16**)
- battery storage, via the preliminary hazards assessment (refer **Appendix 16**)
- blade throw, via the blade throw assessment (refer **Appendix 19**).
- storage and handling of dangerous goods (refer **Appendix 16**).

Where a hazard or risk was unable to be avoided entirely, Spark Renewables has endeavoured to implement all reasonable and feasible management and mitigation measures.

2.5 Cumulative Impacts

This EIS and associated technical studies have been prepared to address the requirements of the CIA Guidelines (DPIE, 2022).

2.5.1 Consideration of the South West REZ

The NSW Government's Electricity Strategy (NSW Government, 2020) and the Roadmap (NSW DPIE, 2020) (refer to **Section 2.2.3**) established a framework to deliver five REZs across NSW in strategic locations. The REZs were introduced to provide reliable renewable energy sources to the state while the existing coal fired power stations come to the end of their operating life. The South West REZ was identified for its abundance of high-quality wind and solar resources, and its proximity to existing and planned high voltage transmission infrastructure (see **Section 2.2.5**). Other REZs across NSW are located in the Central-West Orana, New England, Hunter-Central Coast, and the Illawarra which were selected for similar reasons to the South West REZ.

The South West REZ Access Scheme Order 2024 (South West REZ Access Scheme) was formally declared by the Minister for Energy under section 24(1) of the EII Act on Friday 12 April 2024. This declaration is the statutory instrument for the South West REZ Access Scheme which established how projects are granted access rights to the NEM within the South West REZ.

The objectives of the South West REZ are to:

- Deliver affordable energy into the future.
- Diversify the NSW energy mix.
- Expand electrical transmission capabilities.
- Open new parts of the NEM for energy generation in locations that can benefit from diverse weather patterns.

The Project is located within the western portion of the South West REZ shown on **Figure 1.2** and aligns with the strategic objectives outlined above. The Project will contribute to the objectives of the South West REZ by delivering clean, reliable electricity, assisting with meeting current load demand while reducing GHG emissions and the impacts of climate change. The Project will also make a positive contribution towards achieving the target of at least 2.5 GW of renewable energy generation from the South West REZ.

2.5.2 Proximal Developments

The Cumulative Impact Assessment (CIA) Guidelines for State Significant Projects (DPIE, 2022) requires consideration of a project together with the impacts of other relevant future and existing projects in order to determine potential cumulative impacts. The NSW Wind Energy Guideline (DPE, 2016) also identifies the requirement to address cumulative impacts in relation to any other proposed, approved or operating wind energy projects in the vicinity particularly with regard to landscape, noise, biodiversity and traffic impacts.

The CIA Guideline indicates the following future projects should be considered in the cumulative impact assessment:

- changes to existing projects (expansion, modification, closure)
- approved projects (approved but construction has not commenced)
- projects under assessment (application for the project has been exhibited and is currently under assessment)
- related development (development that is required for the project but subject to separate assessment).

Table 2.2 below lists the various other future and existing projects known to exist in the region, general information relating to those developments, estimated construction periods and approximate distances to the Project. Cumulative impact assessments for each relevant technical study have considered this list and addressed potential environmental and social impacts accordingly. These cumulative impact assessments are documented in each of the relevant technical studies noted throughout this report.

Figure 2.9 below then visually illustrates the indicative construction timelines for key projects in the region.

Overall assessment outcomes are provided in **Section 6.0** with a cumulative impact summary table provided in **Appendix 22**, and a summary of cumulative impact assessment findings provided in **Section 6.15**.

Table 2.2 Major Approved and Proposed Development in the Vicinity of the Project

Project	Application ID	Current Status	Description	Distance and Direction to Project	Proposed Construction Start Date
Mallee Solar Farm	SSD-69576706	Prepare EIS	Project Area = 5,400 ha Development Corridor = 1,500 ha Generation Capacity = 600 MW BESS capacity = 300 MW/1,200 MWh Additional Detail: • Up to 1.5 million PV modules. • Electrical collection system, substation, and control room. • An on-site substation connected to the solar farm and BESS. • Scoping Report lodged April 2024. • SEARs issued 17 May 2024.	Overlapping Project Boundaries and 3.7 km between disturbance footprints.	Q1 2026
Euston Mineral Sands Project	SSD-53674728	Prepare EIS	Project Area = 48,000 ha Disturbance Footprint = 6,000 ha Mine type = Open cut Additional Detail: • Mining method: Open pit strip mining and progressive backfill using conventional heavy earthmoving equipment. • Ore types = Zircon, ilmenite, rutile and REO. • Capital investment value = $500 million. • Scoping Report lodged January 2023. • SEARs issued 23 February 2023.	Overlapping within the Disturbance Footprint	2026
Gol Gol Solar Farm	SSD-70916707	SEARs requested	Project Area = 3,000 ha Development Corridor = 2,500 ha Generating capacity = 600 MW BESS capacity = Project to connect to the Gol Gol BESS and/or the Buronga Substation	Shared Project Boundaries with 3.3 km between Disturbance Footprints	Unknown

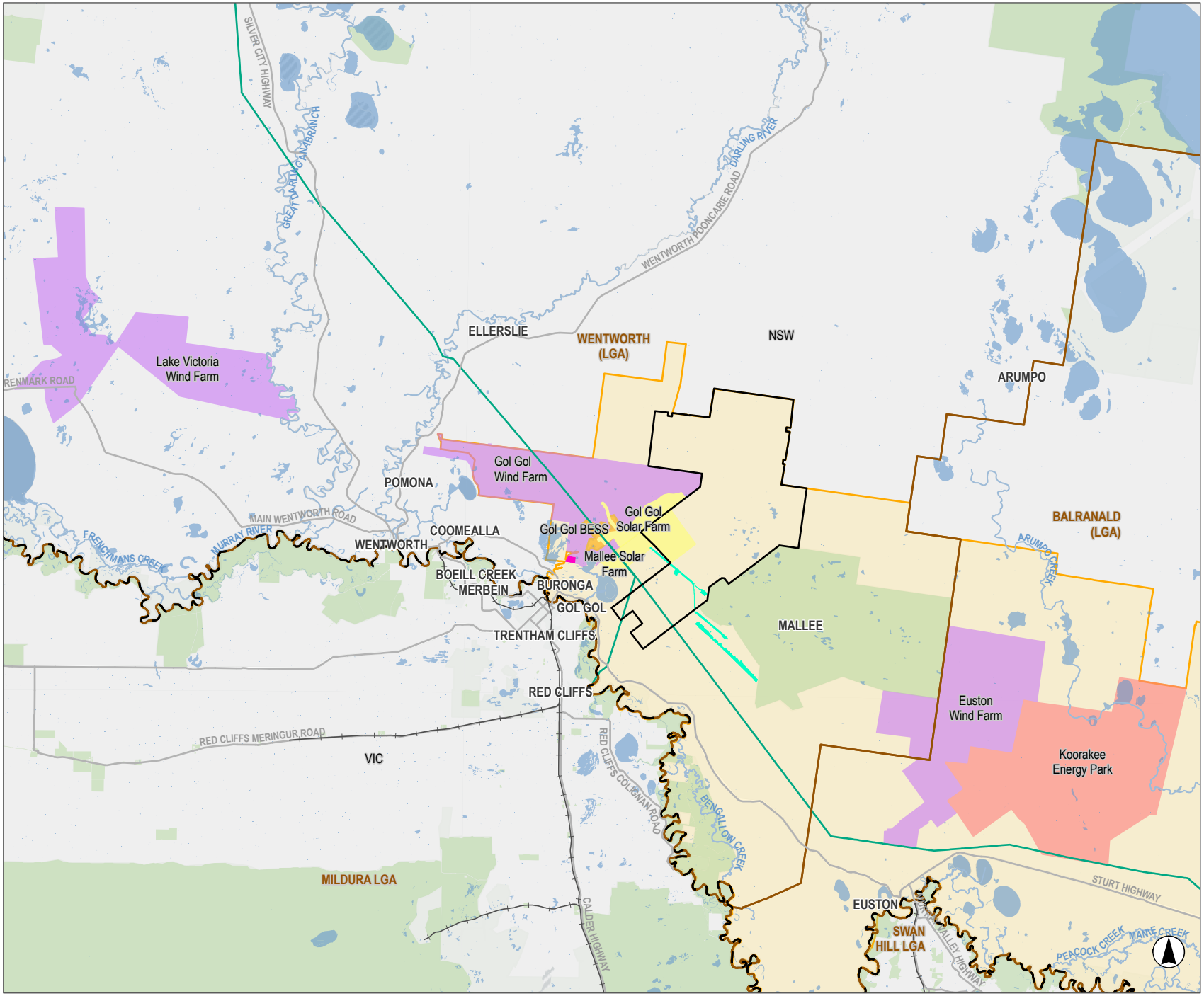
Project	Application ID	Current Status	Description	Distance and Direction to Project	Proposed Construction Start Date
			Additional Detail: • Approximately two (2) million PV Solar Arrays. • Up to two (2) substations approximately eight (8) ha each. • Up to two (2) O&M facilities approximately one (1) ha each. • Squadron Energy is also proposing to develop separate Wind Farm (Gol Gol Wind Farm) and BESS (Gol Gol BESS) projects on lands adjacent to and partially overlapping the solar project investigation area. • Scoping Report lodged May 2024. • SEARs issued 7 June 2024.		
Gol Gol Wind Farm	SSD-70849709	SEARs requested	Project Area = 48,000 ha Development Corridor = 10,500 ha Generating capacity = 840 MW BESS capacity = Project to connect to the Gol Gol BESS and/or the Buronga Substation Additional Detail: • Up to 120 WTG's with a three (3) blade system. • WTG height: 280 m. • Substations: Three on-site collector substations. • Scoping Report lodged May 2024. • SEARs issued 7 June 2024.	Shared Project Boundaries with 8.3 km between Disturbance Footprints	Q3 2028
Gol Gol Battery Energy Storage System	SSD-70893706	SEARs requested	Project Area = 1,500 ha Disturbance Footprint = 1,144 ha BESS capacity = 1,500 MW / 12 GWh Additional Detail: • BESS Area 1 is located to the west of the existing 220 kV transmission line and is approximately 657 ha. • BESS Area 2 is located to the east of the of the transmission line and is approximately 487 ha.	Nine (9) km to the north west	Unknown

Project	Application ID	Current Status	Description	Distance and Direction to Project	Proposed Construction Start Date
			• Overhead and / or underground transmission lines will be constructed to connect the BESS to the Buronga substation. • Scoping Report lodged May 2024. • SEARs issued 7 June 2024.		
Project EnergyConnect (NSW - Eastern Section)	SSI-9172452	Under construction, not yet operational	Eastern Section to extend from the Buronga substation to the existing Wagga Wagga substation (375 km) (including the proposed Dinawan 330 kV substation) 330 kV line running through the Project Area alongside the 220 kV external transmission line. Accommodation Camp located at Dinawan • Scoping Report lodged September 2020. • SEARs issued 2 October 2020. • EIS exhibited 12 January 2022. • Approval granted 02 September 2022.	11 km south	In Progress
Buronga Landfill Expansion	SSD-10096818	Approved, operational	Project Area = 124 ha Disturbance Footprint = 40 ha Maximum throughput for disposal: 100,000 tonnes per annum (tpa) of mixed waste received. EDC: $122,826,299 Additional Detail: • Operational life for Stage one (1) is estimated to be over 70 years and for Stage 2 over 50 years. • Scoping Report lodged 8 October 2020. • SEARs issued 11 November 2020. • EIS exhibited 25 January 2022. • Approval granted 19 July 2023.	14 km west	Q4 2024

Project	Application ID	Current Status	Description	Distance and Direction to Project	Proposed Construction Start Date
Euston Wind Farm	SSD-62466963	Prepare EIS	Project Area = 38,567 ha Development Corridor = 3117.5 ha Generation Capacity = 700 MW (AC) BESS capacity = 500 MW/2000 MWh Additional Detail: • The Project proposes the construction of indicative 96 wind turbines. • Primary access off the Sturt Highway. • Connection to existing 220 kV or 330 kV Transgrid infrastructure. • Scoping Report lodged September 2023. • SEARs issued 24 October 2023.	Approximately 30 km south east	Q2 2025
Koorakee Energy Park: Koorakee Energy Park	SSD-70640221	Prepare EIS	Project Area = 58,000 ha Development Corridor = 13,700 ha Generation Capacity = two (2) GW (up to one (1) GW wind and one (1) GW solar) BESS capacity = Up to one (1) GW for 12 hours (12 GWh) Additional Detail: • Wind: Up to 167 WTGS. three (3) blade system. • Solar: Approximately 2.2 million panels. • Scoping Report lodged May 2024. • SEARs issued 27 May 2024.	43 km south west	Q4 2025
Lake Victoria Wind Farm	SSD-71630724	Prepare EIS	Project Area = 41,700 ha Development Corridor = 1,800 ha Generation Capacity = 1.5 GW BESS capacity = Up to 600 MW for four (4) hours (2,400 GWh) Additional Detail: • Wind: Up to 203 WTGS. • Scoping Report lodged June 2024. • SEARs issued 04 July 2024.	71 km west	2028

FIGURE 2.9

Major Approved and Proposed Development in the Vicinity of the Project



Legend

- Project Boundary
- Hybrid Project
- Wind Farm Project
- Solar Farm Project
- Buronga Landfill Expansion
- Euston Mineral Sands Project
- South West Renewable Energy Zone
- State Border
- Local Government Area (LGA)
- NPWS Estate
- Water Body
- Watercourse
- Road
- Railway
- Project Energy Connect

0 10 20
Kilometres

Scale 1:800,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

2.6 Project Related Agreements and Benefit Sharing

Through the Project design and stakeholder engagement process, Spark Renewables has developed and implemented several Project related agreements which are summarised below.

2.6.1 Host Agreements

Host landholders will receive annual lease payments to host wind farm infrastructure. These payments are confidential between Spark Renewables and host landholders. There are agreements with four Host Landholders in place for the Project. Host landholders will continue to undertake agricultural activities on their land unaffected by the Project (excluding the areas hosting infrastructure). Any impacts of the Project on Host landholder dwellings, whilst noted in some of the technical studies, are addressed by the agreements in place.

2.6.2 Impact Agreements

The nearest non-associated (i.e. non-host) dwelling is located around ten (10) km from any WTGs and assessments undertaken in **Section 6.0** have determined that direct impacts to this dwelling will be minimal. There are no impact agreements for the Project.

2.6.3 Community Benefit Sharing and Planning Agreement

Spark Renewables will establish a planning agreement with Wentworth Shire Council in accordance with Subdivision 2, of Division 7.1 of the EP&A Act.

The planning agreement will document Spark Renewables obligations to make initial and ongoing contributions to benefit sharing in the region. The planning agreement will be subject to indexation to consumer price index (CPI), for the operational life of the Project to decommissioning.

Spark Renewables has undertaken consultation with Wentworth Shire Council during 2022–2024 regarding the community benefit sharing program to fulfil the requirements of a planning agreement and has submitted a proposal to Wentworth Shire Council in Q3, 2024.

A community benefit sharing program would be established in accordance with the DPHI draft benefit sharing guideline rate of $1,050 per MW/per annum. The community benefit sharing program is proposed to provide funding to three initiatives, co designed with Wentworth Shire Council to have a lasting positive impact to the community. One third of the planning agreement will be dedicated to critical projects identified in the Council's Development Contributions Plan including First Nations initiatives, local transport and communications infrastructure and community recreational facilities. An additional third will go towards a community benefit fund that will be administered by a committee of Wentworth Shire Council (such as a section 355 committee established under the NSW *Local Government Act 1993*). This will provide grant funding to initiatives that collectively benefit proposals put forward by the local community and that align with Spark Renewables and the Council's strategic objectives. A final third will go towards a program of local initiatives administered by Spark Renewables to share project benefits with the neighbouring community and First Nations groups.

2.6.3.1 Access Rights Benefits Scheme

Separate to the other community benefits commitments outlined throughout this section, it is noted that generation and storage projects that connect to network infrastructure in the South West REZ will be charged access fees that include components to fund community benefit and employment programs. Based on the Project design as detailed in **Section 3.1**.

2.6.4 First Nations Participation

Spark Renewables are committed to engaging First Nations-owned businesses and employees in its renewable energy projects wherever possible. First Nations engagement has been a priority throughout project development and our approach has been informed by initial consultation with First Nations stakeholders, including through the appointment of a local Aboriginal Engagement Coordinator.
A comprehensive program of stakeholder mapping and engagement has been led by Spark Renewables' Aboriginal Engagement Coordinator who met with and built relationships with local First Nations stakeholders throughout the development of the Project to better understand the local community of Traditional Owners and their connection to Country, and identify opportunities for their engagement with the project.

An Aboriginal Participation Plan (APP) is currently being prepared for the Project to outline Spark Renewables' initiatives targeted towards providing engagement, employment, training, education, business, and cultural heritage opportunities for Aboriginal and Torres Strait Islander peoples. The plan has been shaped by the professional expertise and lived experience of both Aboriginal and non-Aboriginal company personnel, and more importantly, through ongoing consultation and relationship-building with local First Nations stakeholders. The knowledge built through these channels has allowed Spark Renewables to form a strong understanding of the key inequities and barriers that have historically prevented meaningful Aboriginal and Torres Strait Islander participation.

2.7 Project Alternatives

During the planning and design phase of the Project, a range of alternatives were considered by Spark Renewables with changes made to the Project based on community feedback and to minimise environmental, cultural and social impacts while maximising the potential for electricity generation and economic benefits for the region. The alternatives considered included the 'do nothing option' (i.e., not developing the Project), alternative locations and alternative project layouts.

2.7.1 Do Nothing Option

The Project Area is currently used primarily for broad-acre grain cropping activities. The 'do nothing option' would allow for the continued use of the whole Project Area for agricultural purposes. The 'do nothing option' would also mean that the Project is not developed and would therefore forgo the Project's identified benefits, namely:

- assisting in meeting the NSW and Commonwealth government's objectives of transitioning to renewable electricity generation
- increased energy security and supply into the NEM

- significant social and economic benefits created through capital investment and provision of direct and indirect employment opportunities during the construction and operation of the Project
- Project related agreements and community benefit sharing initiatives, as described in **Section 2.6**.
- lost opportunity for the landholders to diversify their revenue streams.

The 'do nothing option' would avoid the environmental and social impacts associated with the construction, operation and decommissioning of the Project, such as biodiversity impacts, noise, traffic, social amenity and visual impacts. Whilst impacts will occur with the construction and operation of the Project, these impacts will be managed to acceptable levels through the careful design of the Project and the implementation of the management and mitigation measures outlined throughout **Section 6.0**.

As the NSW government has identified the South West REZ as an area suitable for renewable energy projects and has identified the need for this area to provide a certain energy generation output, should this Project not proceed, an alternative project would need to proceed within the South West REZ to deliver the required energy generation capacity.

Compared with other wind farm projects in the South West REZ, the Project's careful site selection and design would have an extremely low level of impact on the environment or community. The site selection uses cropping land that is distant to local townships. While being well connected to the local road network, the Project would have no neighbouring dwellings within 10 km of wind turbines. This represents a positive outcome for local amenity, with significant buffers enabling the avoidance of visual and noise impacts associated with Project operations in comparison to other large scale renewable energy projects in NSW. In addition, all turbines and key infrastructure are sited within previously cleared cropping land to minimise impacts to biodiversity and cultural heritage.

Considering the benefits of the Project, that the Project satisfies the principles of ecologically sustainable development (ESD) (refer to **Section 7.0**) and that effective management, mitigation and offsets can be implemented to address the predicted impacts of the Project, the 'do nothing option' is not proposed.

Spark Renewables proposes to proceed with the Project subject to obtaining approval.

2.7.2 Alternative Site Locations

The Project location was selected due to a reliable wind resource, low density of rural residential dwellings, strategic position within the South West REZ, proximity to transmission infrastructure and the existing road network, and in consideration of limited environmental values given much of the site has been historically cleared for both cropping and grazing.

The Project Area was identified as having potential for a wind farm development in 2019. The Project Area is geographically notable for being the highest elevation land in the South West REZ (up to 120 m above sea level rising from ~50 m to the east and west) resulting in a strong wind resource. This was further confirmed by Project EnergyConnect providing direct connection of the Project to the NEM. Consultation with potential host and associated landholders started in 2019 via phone calls and face to face meetings conducted by Spark Renewables.

Wind monitoring commenced on site in 2021, to further understand the local wind resource and assess the feasibility of the Project.

2.7.3 Site Selection and Alternative Locations

The Project location was selected based on the factors outline in **Section 2.7.2**. After an extensive site selection process, the Project Boundary was subsequently refined down to the area presented within this EIS, based on:

- the presence of existing agricultural activities within the Project Area and inputs from host landholders relating to the successful coexistence of the wind farm and agricultural farming practices and minimising impacts on the agricultural land use occurring within the Project Area
- the presence of other environmental and social constraints such as potential impacts to biodiversity values and identified Aboriginal sites
- interest from landholders to enter into Host agreements.

2.7.4 Refinement of the Project Layout

Since the Project's concept stage, the design has evolved through consideration of constraints or opportunities relating to technical, environmental and social aspects. During the development of the overall design of the Project, Spark Renewables considered outcomes of engagement with host landholders, Project neighbours, broader community, Council, State and Australian government agencies in order to minimise the potential environmental and social impacts of the Project. The key stages of this process are set out below (**Figure 2.10**).

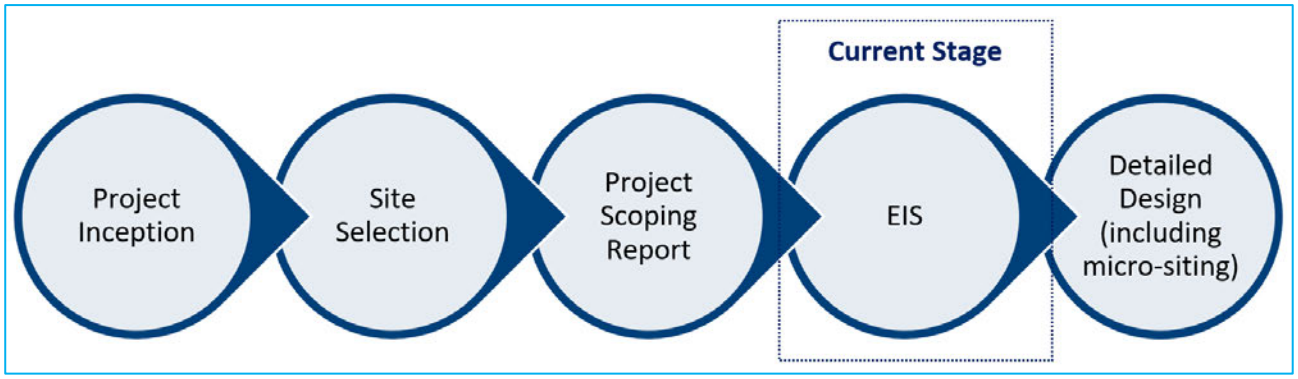


Figure 2.10 Key Stages of the Design Process

The current indicative WTG placement and infrastructure design has been informed by discussions with landholders and neighbours, and subject to a number of iterations to incorporate feedback.

The Project Area was selected due to its suitability for a wind farm and the limited environmental and social constraints identified in the initial studies. In designing and assessing the potential impacts of the Project, the following design hierarchy was adopted (in order of priority):

- **Avoid** – in the first instance, all efforts were made to avoid potential environmental, cultural and social impacts.
- **Minimise** – where potential impacts could not be avoided, design principles sought to minimise impacts, as far as feasibly practicable.
- **Mitigate** – mitigation strategies have been identified and will be implemented to manage the extent and severity of the remaining impacts.
- **Offset** – environmental offsets are only used following all efforts to first avoid, minimise and mitigate impacts.

In addition, the following specific principles were adopted:

- Prioritise avoidance and minimise vegetation clearing of significant biodiversity values – multiple biodiversity surveys over several seasons (2022–2024) have enabled the progressive refinement of the Disturbance Footprint, with avoidance of areas of higher conservation value, identified threatened species habitat, high and medium value vegetation, remnant vegetation areas and areas of threatened ecological communities. As biodiversity fieldwork progressed and a more detailed understanding of the biodiversity values of the Project Area became available, further design adjustments were made to minimise disturbance.
- Minimise land disturbance – design footprints for WTG hardstands, site compounds, substations and ancillary infrastructure were limited to the minimum area required.
- Maximise use of previously disturbed land – the Disturbance Footprint has been selected to maximise the use of land previously modified by agricultural operations, including cleared areas, established access tracks and local roads.
- Align the Disturbance Footprint with the boundary of existing agricultural operations to minimise the impact on ongoing operations in consultation with landholders.
- Avoid impacts to significant Aboriginal cultural heritage values – areas of high archaeological sensitivity and Aboriginal sites identified during fieldwork have been avoided through refinements to the Disturbance Footprint to the extent practicable.
- The design has been refined to avoid 21 Aboriginal cultural heritage sites including one Potential Archaeological Deposit (PAD).
- The Project is located 10 km from the nearest non-associated landholder resulting in reduced noise and visual impacts.
- Careful placement of infrastructure and WTGs to minimise interactions with Euston Mineral Sands Project.
- An ongoing flexible approach to design, enabling continual refinement of the Disturbance Footprint from 2022 to 2024, responding to identified environmental impacts and constraints.

The Project design evolution has included material impact minimisation steps to account for feedback received during discussions with stakeholders, and as knowledge of the Project Area and constraints has increased.

Spark Renewables has worked with the local community since 2022 and has been proactive in responding to community feedback. Before presenting the initial proposed wind farm layout, a Community Drop-In Session was held in August 2022 to hear community perspectives about a wind farm in the area and gather feedback. The investigation area discussed at the Community Drop-In Session is shown in **Appendix 11**.

Key design refinements which took place, over four (4) key phases, between the exhibition of the Scoping Report (November 2022), design revision A (December 2023), design revision B (May 2024) and the final design (June 2024) include:

- During the Scoping phase of the Project, a Development Corridor was used as the assessment area for technical studies to determine potential design constraints. As the confidence in the design footprint increased over time, the Disturbance Footprint was used as the assessment area. Changes to the Project Boundary and internal Project layout has been an iterative process in response to consultation and advice from technical specialists.

- A reduction from up to 150 WTGs proposed at the Scoping stage to up to 76 WTG locations assessed in the EIS. The reduction in WTGs is based on Spark Renewables analysis of the available transmission capacity in this section of the NSW South West REZ and consideration of avoidance and minimisation principles.

- Refinement to a Disturbance Footprint of 444.69 ha as described in **Table 2.5**. Based on avoidance strategies implemented to reduce and minimise clearing of native vegetation, and host landholder feedback regarding the layout within the existing agricultural site setting, Spark Renewables have significantly reduced the level of direct impacts.

- A reduction of the capacity of the wind farm from up to 1,000 MW to a 402 MW capacity reducing the number of WTG and associated extent of disturbance.

- A reduction of the capacity of the BESS from 300 MW to 100 MW.

- Refinement of the WTG specifications (280 m blade-tip height, 180 m hub height and 200 m blade diameter) noting the blade-tip height of 280 m remains unchanged from Scoping Report to Final Design.

- The inclusion of an onsite TWA facility. Based on the outcomes of the Social Impact Assessment and consultation with local stakeholders, the TWA facility is proposed to minimise impacts to local housing and accommodation service providers.

- The addition of a fourth involved landholder and two (2) lots to the Project Area to enable WTG locations to be located in areas that minimise impacts. These WTGs are located on previously cleared land to avoid the requirement to clear extensive areas of native vegetation.

Additional detail is included **Table 2.3**, **Table 2.4**, and **Table 2.5** and depicted in **Figure 2.11**, **Figure 2.12** and **Figure 2.13** below.

Table 2.3 Refinement of Project Design from Scoping to Design Revision A

Project Element	Description (Revision A WTGs used as reference point)	Justification
Project Area	Increase Project Area from 18,566 ha to 59,463 ha.	Increase Project Area to encompass landholder agreements and cadastre boundaries.
Development Corridor Area	Reduced Development Corridor from 3,575 ha to 1,094 ha.	Revised Development Corridor to reflect increased confidence in the area required to site Project, all proposed Project infrastructure and all Project related ground disturbance.
Disturbance Footprint	The Development Corridor was removed and has not been assessed in the final design of the Project. Not specified in the Scoping Phase although mapped as 633 ha for Design Revision A.	Revised Disturbance Footprint to reflect increased confidence in the area required to site Project, all proposed Project infrastructure and all Project related ground disturbance.
WTG 85, WTG 91, WTG 102, WTG 108	Removal of one WTG and moved the remaining WTGs south west by 550 m.	Increase buffer from native vegetation from 50 m to more than 200 m.
WTG 83, WTG 95, WTG 104	Removal of two WTGs and moved the remaining WTG to the boundary of existing agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 89, WTG 97	Removal of two WTGs and moved the remaining WTGs to the west by at least 250 m.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 80	Moved WTG 190 m to the north.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 87	Moved WTG 170 m to the east.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 98	Moved WTG 280 m north east.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 94	Moved WTG 470 m north east.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 79, WTG 86	Removal of one WTG and moved the remaining WTG to the boundary of existing agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 59	Moved WTG 400 m south west.	Increase compatibility with existing agricultural land use in consultation with landholders.

Project Element	Description (Revision A WTGs used as reference point)	Justification
WTG 70, WTG 76	Removal of one WTG and moved the remaining WTG to at least 140 m from native vegetation.	Increase buffer from native vegetation from 50 m to more than 140 m.
WTG 64, WTG 72	Removal of one WTG and moved the remaining WTG to the boundary of existing agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 57, WTG 44, WTG 49, WTG 53	Moved each WTG and Disturbance Footprint to the boundary of existing agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 76, WTG 73, WTG 78, WTG 84, WTG 93	Moved WTG and Disturbance Footprint to a more centralised location within cleared agricultural land.	Increase buffer from native vegetation from 50 m to more than 110 m.
WTG 103	Moved WTG 290 m to the north.	Increase compatibility with existing agricultural land use in consultation with landholders.
Disturbance Footprint between WTG 90 and WTG 93	Moved to align with the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 105	Moved WTG 600 m north.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 81, WTG 75, WTG 69, WTG 63	Moved to align the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 58	Moved WTG 600 m to the east.	Increase buffer from native vegetation and reduce required clearing of native vegetation between WTGs.
WTG 99, WTG 106, WTG 109	Moved to align the Disturbance Footprint to the eastern boundary of existing cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 100, WTG 107, WTG 101	Moved WTG and Disturbance Footprint to a more centralised location within cleared agricultural land.	Increase buffer from WTG to native vegetation to more than 400 m.
WTG 88	Moved to align with the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 96	Moved WTG and Disturbance Footprint to a more centralised location within cleared agricultural land.	Increase buffer from WTG to native vegetation to more than 550 m.

Project Element	Description (Revision A WTGs used as reference point)	Justification
WTG 82	Moved WTG to align with the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Avoidance of Aboriginal Heritage item identified within the scoping report Disturbance Footprint including [redacted]. Additional detail provided in **Section 6.3**.
WTG 71, WTG 77	Moved WTGs and Disturbance Footprint to a more centralised location within cleared agricultural land.	Increase buffer from WTG to native vegetation to more than 550 m.
WTG 65	Moved WTG 220 m east to the northern boundary of existing, cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 47, WTG 48, WTG 50, WTG 42, WTG 37, WTG 32, WTG 41	Moved WTGs to align with the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 29, WTG 31, WTG 34	Moved three (3) WTGs to a more centralised location within cleared agricultural land.	Increase buffer from WTG to native vegetation to more than 350 m.
WTG 55, WTG 52, WTG 60, WTG 54, WTG 56, WTG 61	Moved WTG and Disturbance Footprint to a more centralised location within cleared agricultural land.	Increase buffer from WTG to native vegetation to more than 250 m.
WTG 35, WTG 51, WTG 39, WTG 46, WTG 43, WTG 38, WTG 40, WTG 45, WTG 17	Removal of 10 WTGs and moved remaining WTGs to align with the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders.
WTG 33, WTG 27, WTG 23, WTG 15, WTG 06, WTG 08, WTG 22, WTG 26, WTG 30	Removal of nine WTGs and moved remaining WTGs to a more centralised location within cleared agricultural land.	Increase compatibility with existing agricultural land use in consultation with landholders and Increase buffer from WTG to native vegetation.
WTG 09, WTG 05, WTG 12, WTG 20, WTG 24, WTG 10, WTG 14, WTG 19, WTG 25, WTG 28	Removal of WTGs and moved remaining eight (8) WTGs to align with the Disturbance Footprint to the boundary of existing, cleared agricultural land.	Removed turbines beyond the disturbance footprint of the Euston Mineral Sand Project and to increase compatibility with existing agricultural land use in consultation with landholders.

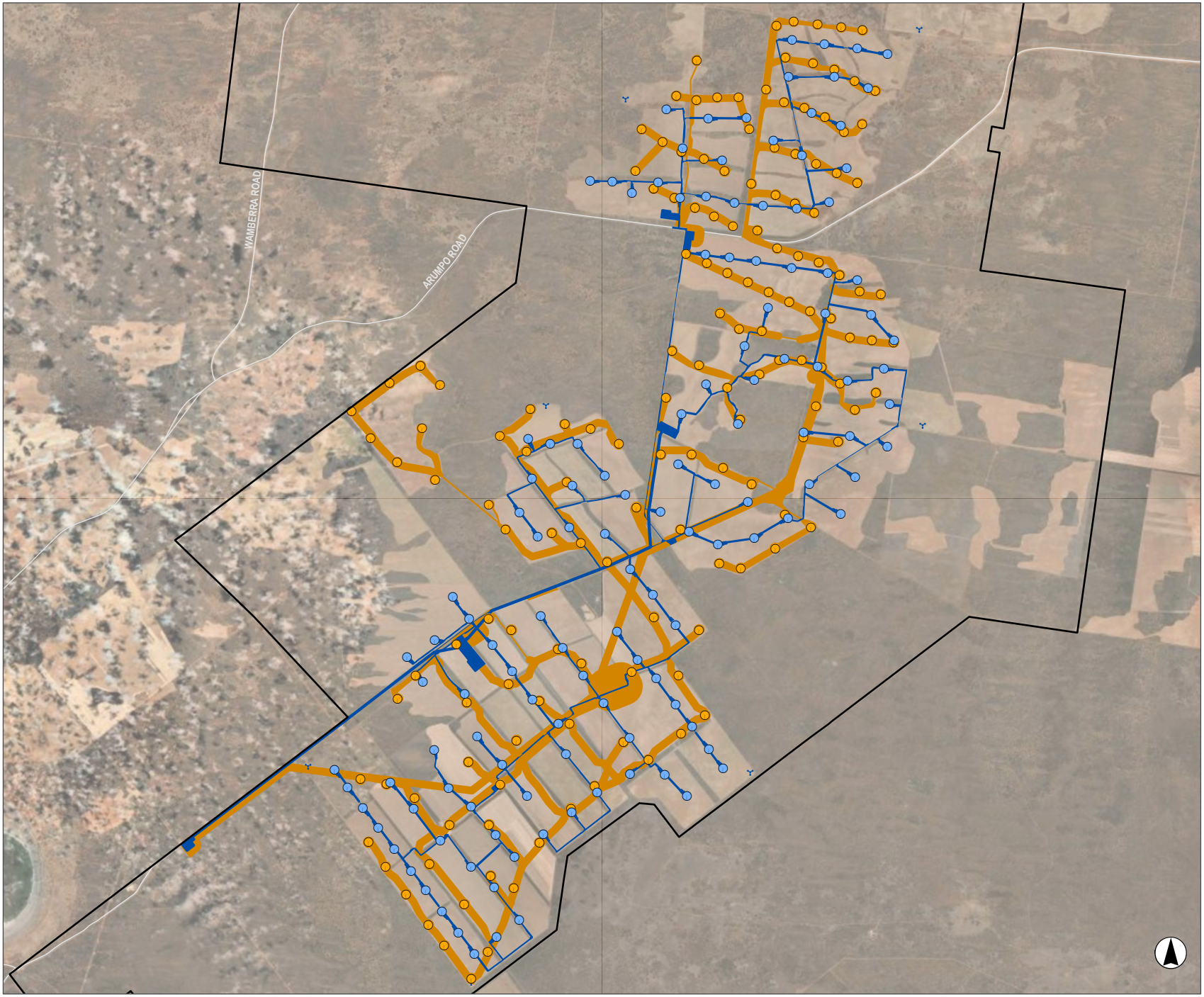


FIGURE 2.11

Summary of Design Changes (Scoping to Revision A)

Legend

- Project Boundary
- Road

Scoping (November 2022)

- Scoping Development Corridor
- Scoping Wind Turbine Location (150)

Revision A (December 2023)

- Revision A Development Corridor
- Revision A Wind Turbine Location (129)

0 2,500 5,000
Metres

Scale 1:140,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Table 2.4 Summary of Design Refinements from Design Revision A to Design Revision B

Project Element	Description (Revision B WTGs used as reference point)	Justification
Project Area	Decreased Project Area from 59,463 ha to 57,330.31 ha	Removal of Mallee Solar Farm from the Project Area.
Development Corridor	Decreased Development Corridor from 1,094 ha to 974 ha	Reduction in the number of WTGs being assessed from 129 to 110.
Disturbance Footprint	Decreased Disturbance Footprint from 633 ha to 586 ha	Reduction in the number of WTGs being assessed from 129 to 110.
WTG 78	To the north west, west and south west of WTG 78, three WTGs were removed	Reduce the number of WTGs that border native vegetation and reduce the total impact of the Project on existing agricultural operations.
WTG 100	To the west of WTG 100, one WTG was removed	Reduce the number of WTGs that border native vegetation and reduce the total impact of the Project on existing agricultural operations.
WTG 65	To the north of WTG 65, three WTGs were removed	Reduce the number of WTGs that border native vegetation and reduce the total impact of the Project on existing agricultural operations.
WTG 50	To the west of WTG 100, one WTG was removed	Reduce the requirement to clear native vegetation and reduce the total impact of the Project on existing agricultural operations.
WTG 54	To the north west of WTG 54, one WTG was removed	Reduce the total impact of the Project on existing agricultural operations and increase the distance between WTGs and native vegetation.
WTG 66	To the south east of WTG 66, one WTG was removed	Reduce the total impact of the Project on existing agricultural operations.
WTG 51	To the north of WTG 51, three WTGs were removed	Reduce the number of WTGs that border native vegetation and reduce the total impact of the Project on existing agricultural operations.
WTG 45	To the south west of WTG 66, one WTG was removed	Reduce the number of WTGs that border native vegetation and reduce the total impact of the Project on existing agricultural operations.
WTG 21	To the north east of WTG 21, one WTG was removed	Reduce the total impact of the Project on existing agricultural operations.
WTG 12	To the north west of WTG 54, two WTG were removed	Reduce the total impact of the Project on existing agricultural operations.

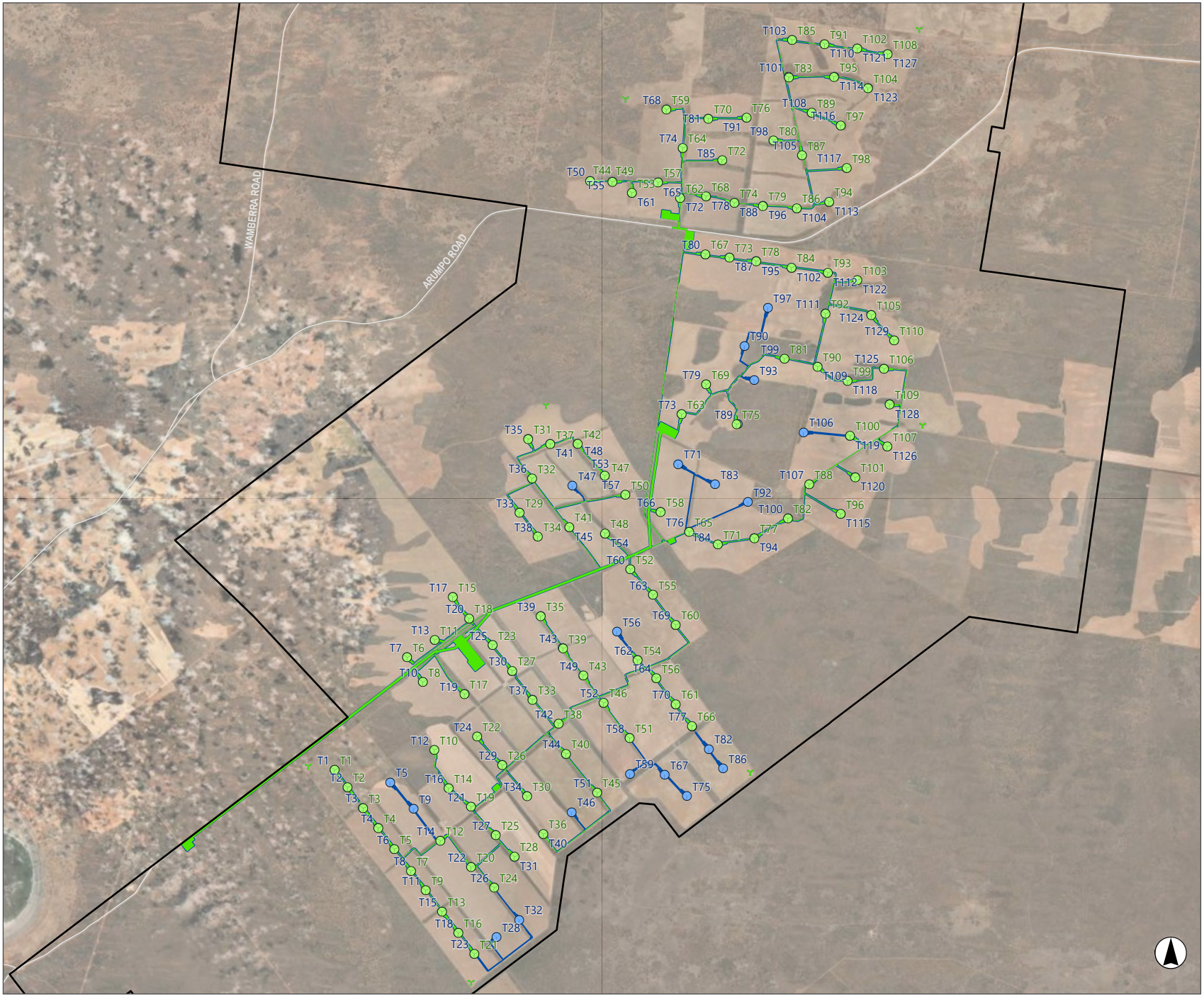


FIGURE 2.12

Summary of Design Changes (Revision A to Revision B)

Legend

- Project Boundary
- Road

Revision A (December 2023)

- Revision A Development Corridor
- Revision A Wind Turbine Location (129)

Revision B (May 2024)

- Revision B Development Footprint
- Revision B Wind Turbine Location (110)

0 2,500 5,000
Metres

Scale 1:140,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Table 2.5 Summary of Design Refinements from Design Revision B to the Final Design

Project Element	Description (Revision B WTGs used as reference point)	Justification
Project Area	No Change	No Change
Disturbance Footprint	Decreased Disturbance Footprint from 586 ha to 444.69 ha	Reduction in the number of WTGs being assessed from 110 to 76.
WTG 127, WTG 121, WTG110, WTG 103, WTG 123, WTG114, WTG 101, WTG 116, WTG 114, WTG 101, WTG116, WTG 98, WTG 105, WTG 117, WTG 113, WTG 104, WTG 96, WTG 88, WTG 78.	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 129, WTG 124	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 97, WTG 90	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 93	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 128, WTG 126, WTG 119, WTG 106, WTG 120, WTG 107, WTG 115	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 83, WTG 92, WTG 71	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 48, WTG 53, WTG 57, WTG 47	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 86, WTG 82, WTG 77, WTG 70, WTG 64, WTG 75, WTG 67, WTG 59, WTG 56	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 46	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 32	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 9, WTG 5	Removed	Remove potential impact to unsurveyed native vegetation.
WTG 1, WTG 2	Removed	Remove potential impact to unsurveyed native vegetation.

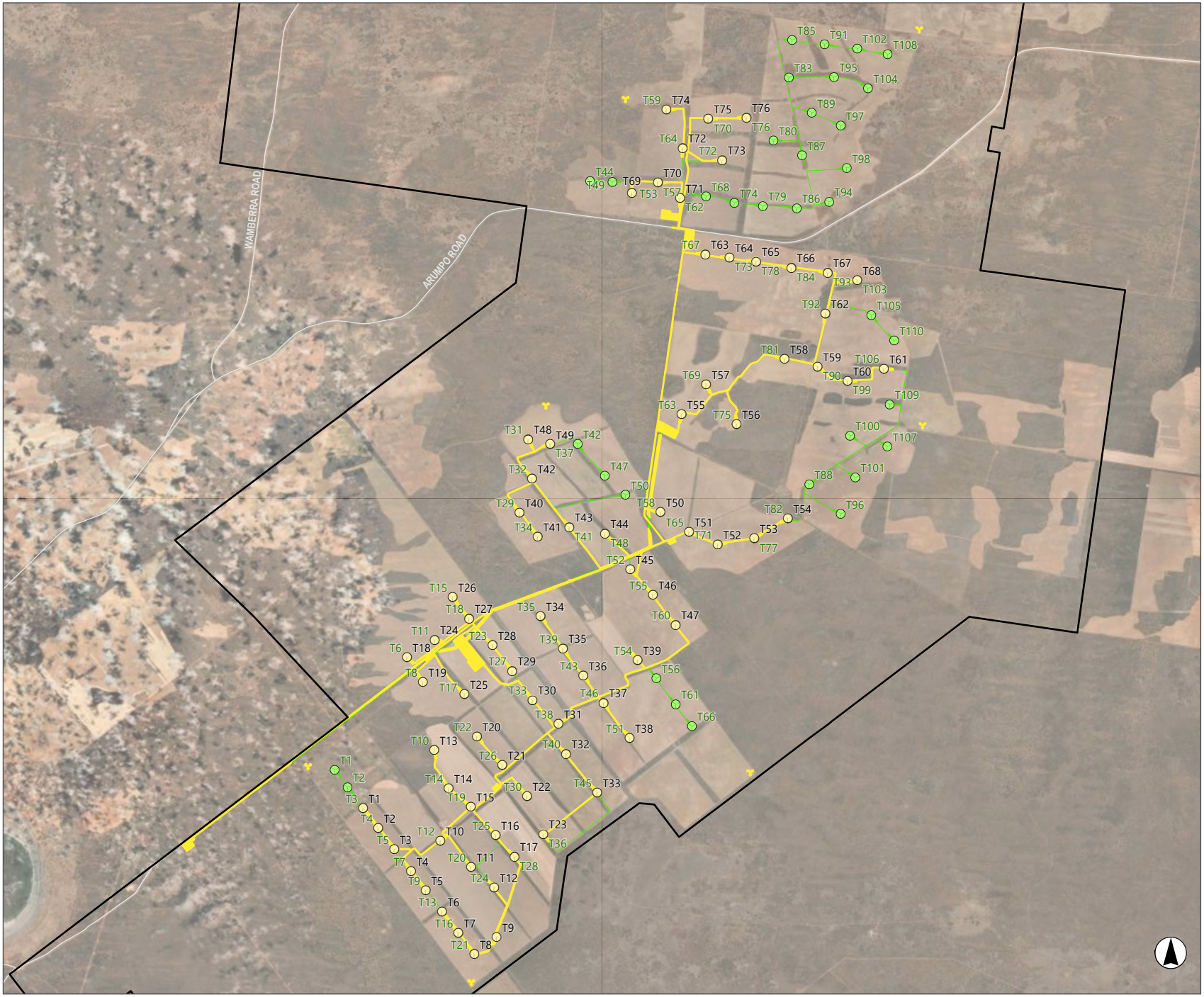


FIGURE 2.13

Summary of Design Changes (Revision B to Final)

Legend

- Project Boundary
- Road

Revision B (May 2024)

- Revision B Development Footprint
- Revision B Wind Turbine Location (110)

Final Design (June 2024)

- Final Design Disturbance Footprint
- Final Design Wind Turbine Location (76)

0 2,500 5,000
Metres

Scale 1:140,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

2.8 Project Justification and Benefits

The expansion of renewable energy generation aligns with both Commonwealth and NSW commitments to increase renewable energy generation and reduce carbon emissions across the NSW and Australian economies. By developing the Project, Spark Renewables aims to provide cleaner reliable energy generation to assist with meeting current load demand while simultaneously reducing GHG emissions and the impacts of climate change.

As discussed in **Section 2.4**, as a renewable energy project located within the South West REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The NSW government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The Project will contribute to meeting these Federal and NSW Government objectives and is appropriately located.

The Project is consistent with the objectives of the NSW Electricity Strategy and Roadmap (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of up to 402 megawatts (MW), the Project will make a material contribution to the planned energy generation capacity for the South West REZ.

The Project will also contribute significant capital investment within the region, generate jobs during the construction, operational and decommissioning phases, provide indirect benefits to local services throughout the life of the Project (e.g. indirect employment creation in local and regional economies would include jobs supported through transportation, trade supplies, services, accommodation, catering, retail services, etc.), deliver additional income to host and other associated landholders, and provide benefits to the local community through the implementation of a planning agreement with Wentworth Shire Council and the community.

The assessment findings outlined in **Section 6.0** indicates that while there will be environmental and social impacts associated with the Project, the extent of impact has been minimised through the design process and where impacts are predicted, Spark Renewables has committed to management, mitigation and offset measures to address these residual impacts.

The Project will provide long-term, strategic benefits to the State of NSW, including:

- Renewable energy supply to assist with fulfilling the current obligations under NSW and Commonwealth renewable energy targets.
- Providing for cleaner reliable electricity generation, assisting with meeting current load demand while reducing GHG emissions and the impacts of climate change.
- Providing regional investment in the NSW renewable energy sector.
- Making a positive contribution towards achieving the target of at least 2.5 GW of renewable energy generation from the South West REZ.

- The Project will also provide direct financial benefits to the region and local community, including:
    - The Project will require approximately $850 million in investment during the construction phase, of which approximately $130 million will be retained in the Wentworth Shire LGA and the Mildura Rural City LGA.
    - Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $250 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments.
    - Supporting 225 direct and 360 indirect FTE positions in the national economy (on average) over the construction period, with 400 direct FTE during peak construction.
    - Supporting an estimated 30 direct and 85 indirect FTE jobs nationally during operations. Indirect benefits to local services through the construction and operation phases.
    - Supporting 95 FTE construction jobs and 47 FTE ongoing operational jobs (includes both direct and indirect jobs within the Wentworth Shire LGA and the Mildura Rural City LGA.
    - Injection of approximately $22.8 million in new spending into the Wentworth Shire LGA and the Mildura Rural City LGA over the construction phase with flow on benefits for local businesses.
    - Payments to host landholders via negotiated agreements, resulting in financial contributions to the local community.
- The Project will also provide additional direct financial benefits to the region and local community, including:
    - Payments to host landholders via private agreements and a community benefit sharing scheme.
    - Annual payments to the community under the Planning Agreement with Wentworth Shire Council.
    - Annual community payments via the Access Rights Benefits Scheme for the South West REZ.

3.0 Project Description

This section describes the layout, location and function of all infrastructure to be constructed and operated as part of the Project. Descriptions of the construction, operation and decommissioning phases of the Project are also provided.

3.1 Project Overview

The Project consists of the installation, operation, maintenance and decommissioning of up to 76 WTGs up to 280 m in height, BESS, electrical infrastructure providing connection to Project EnergyConnect, ancillary infrastructure, and temporary facilities. The key components of the Project are outlined in **Section 1.1**.

The Project has been designed and refined through a comprehensive process that incorporates community and other stakeholder feedback to maximise positive social, economic and environmental outcomes while minimising environmental and social impacts.

The Project will have a generating capacity of up to 402 MW.

The indicative Project layout (based on 76 WTGs) is shown on **Figure 3.1** with additional detail provided in **Figure 3.2**, **Figure 3.3** and **Figure 3.4**. Key components of the Project are summarised in **Table 3.1** and are described in further detail in the sections below.

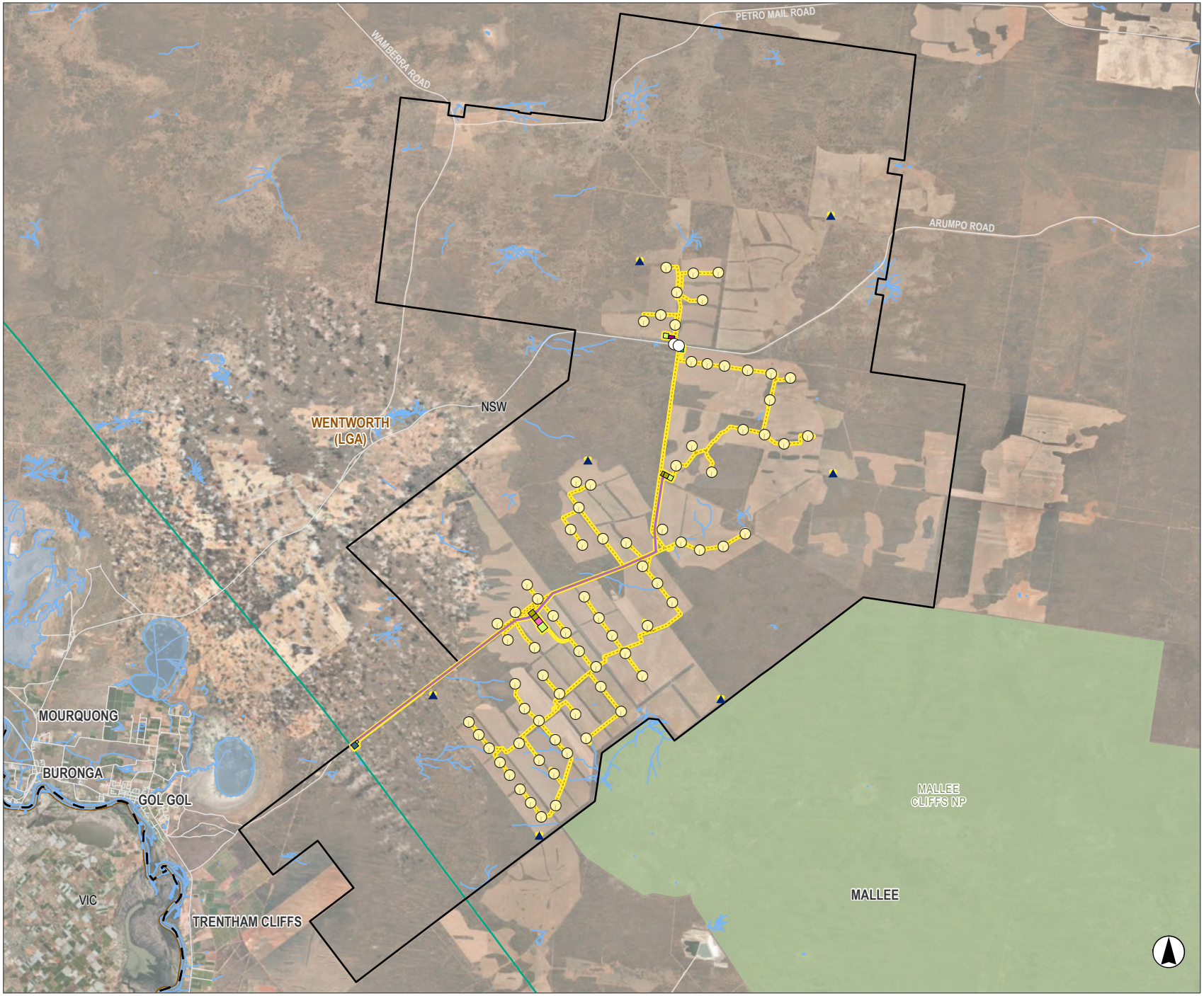
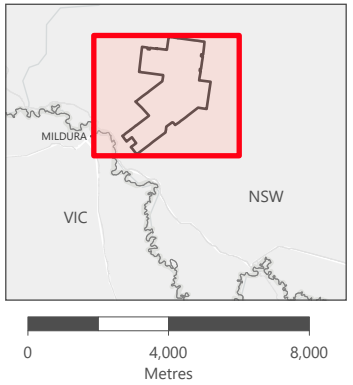


FIGURE 3.1

Project Layout

Legend

- Project Boundary
- Disturbance Footprint
- Access Points
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Collector Substation and Switchyard
- Operations and Maintenance Facility
- Construction Compound
- TWA Facility
- Switchyard
- Battery Energy Storage System (BESS)
- Existing HV Transmission Lines
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse
- Waterbody



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GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

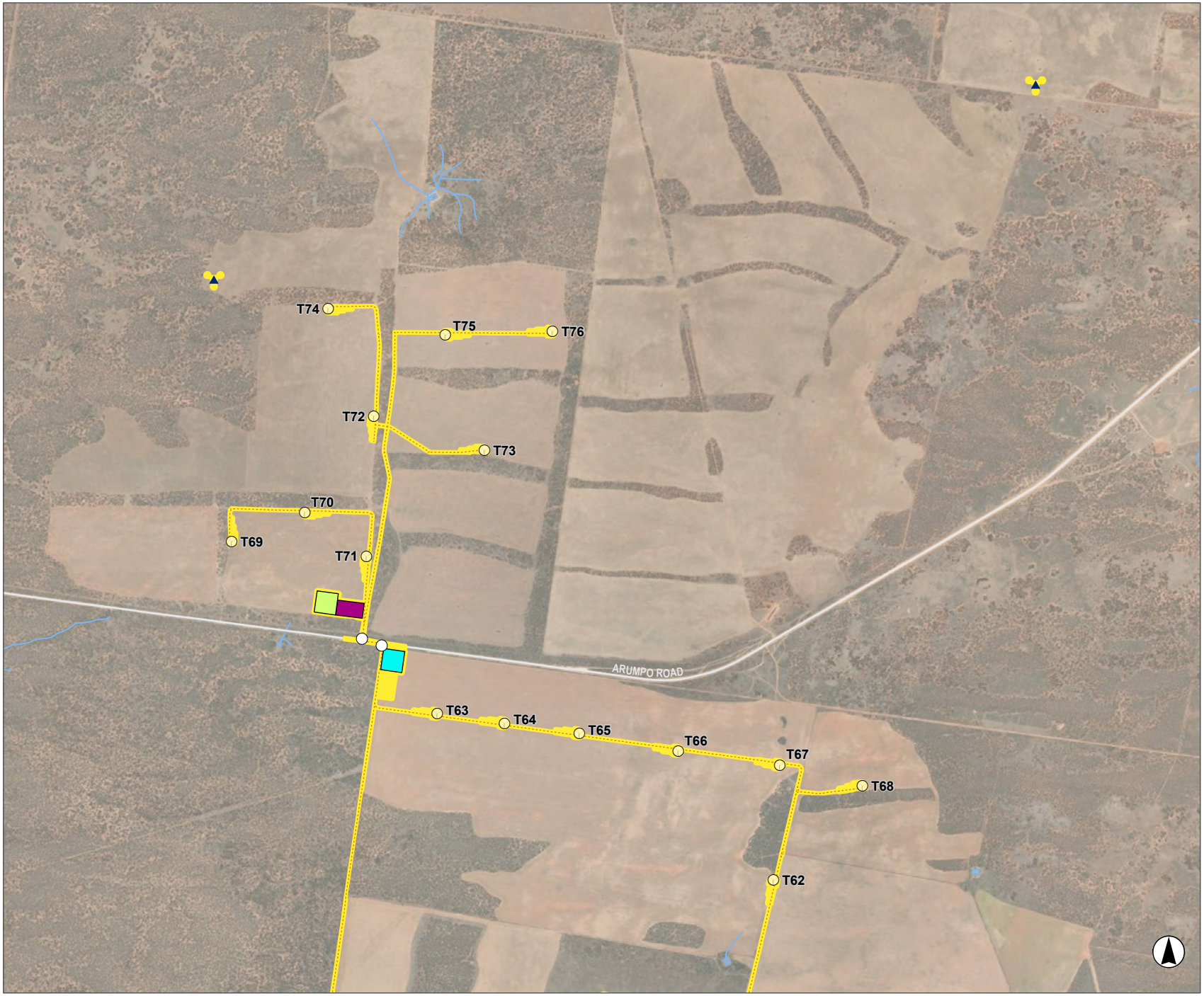
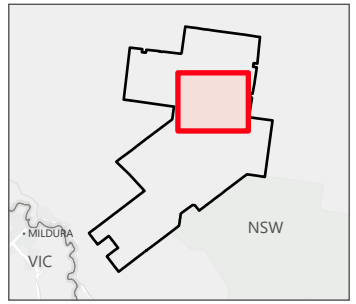


FIGURE 3.2

Project Layout (Northern Area)

Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Points
- Access Tracks
- TWA Facility
- Construction Compound
- Operations and Maintenance Facility
- Road
- Watercourse
- Waterbody



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Metres

Scale 1:50,000 at A4
GDA2020 MGA Zone 54

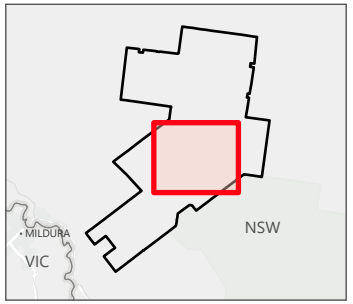
Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 3.3

Project Layout (Central Area)

Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Battery Energy Storage System (BESS)
- Collector Substation and Switchyard
- Construction Compound
- NPWS Estates
- Watercourse
- Waterbody



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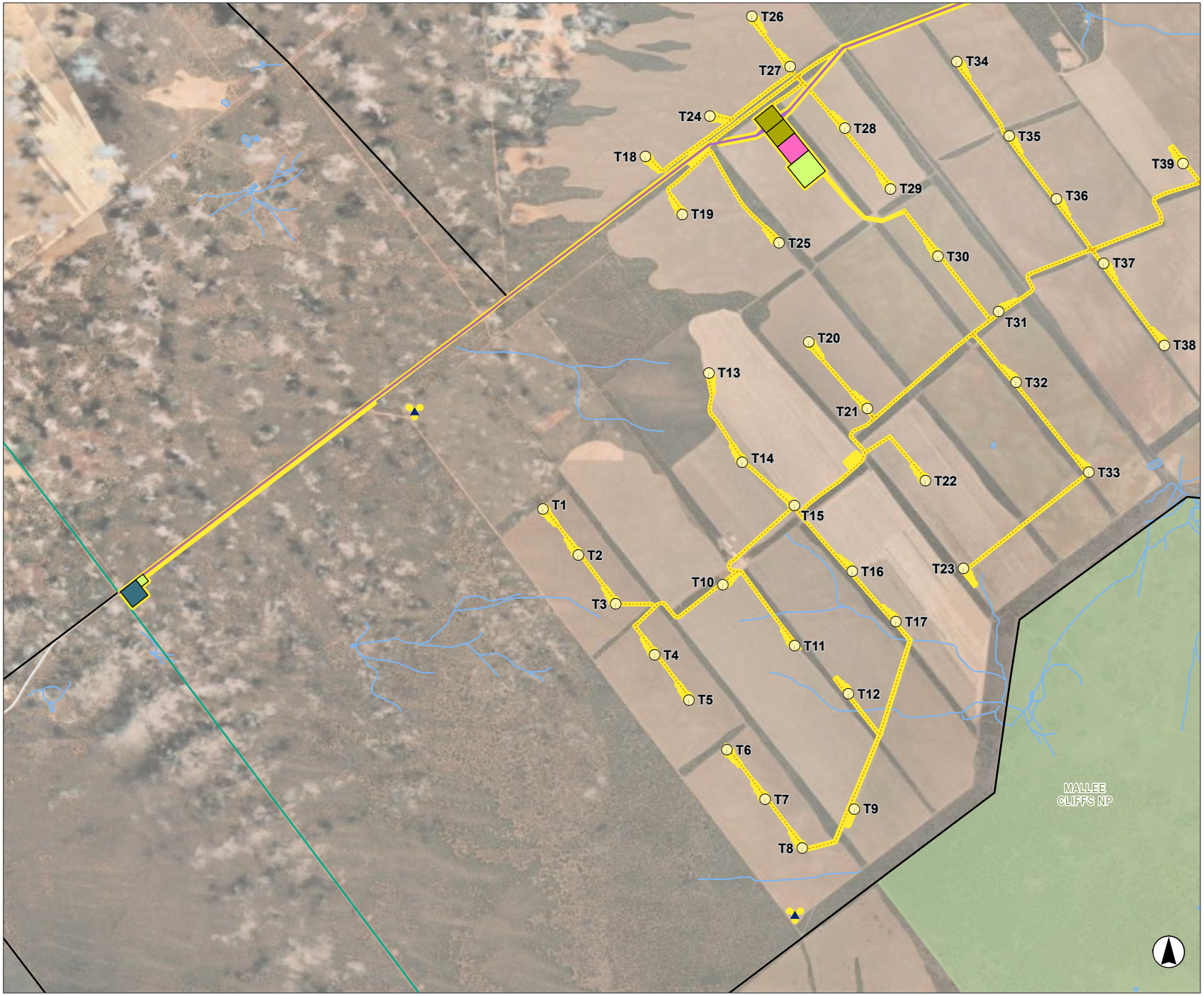
Metres

Scale 1:60,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

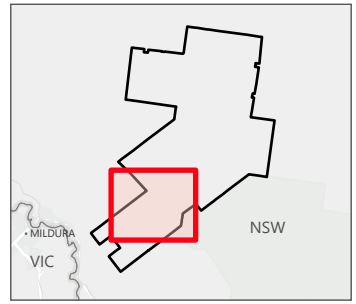
FIGURE 3.4

Project Layout (Southern Area)



Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Battery Energy Storage System (BESS)
- Collector Substation and Switchyard
- Construction Compound
- Switchyard
- Existing HV Transmission Lines
- NPWS Estates
- Road
- Watercourse
- Waterbody



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Metres

Scale 1:60,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Table 3.1 Project Overview

Project Element	Summary of the Project
Life of Project	30 years
Project Area	Approximately 57,330.31 hectares (ha)
Disturbance Footprint	• Approximately 444.69 ha within the Project Area. • Approximately 0.25 ha within the Local Transport Route. • Total Disturbance Footprint is approximately 444.94 ha[1].
Generating Capacity	Up to 402 MW
WTGs	Up to 76 (three (3) blade) WTGs Refer to **Table 3.2** for dimensions and **Section 3.5.1** and **Section 3.8** for further detail;
Battery Storage	100 MW, two-hour battery (200 MWh).
Ancillary Infrastructure	Ancillary infrastructure for the Project includes, but is not limited to: • internal roads • hardstands • collector substations • switchyards • operations and maintenance (O&M) facility • underground and overhead transmissions lines and poles • communications cables (including control cables and earthing) • permanent meteorological masts • water storage tanks. Refer to **Section 3.4** and **Section 3.5** for further detail.

Temporary Facilities	Temporary facilities include, but are not limited to:
	• a temporary on-site workforce accommodation facility
	• construction site compounds, including:
	  ○ site office, amenities and parking areas
	  ○ construction laydown areas for equipment and supplies
	  ○ batching plants (concrete and/or asphalt)
	  ○ temporary stockpiling and material storage areas.
	• laydown areas
	• minor 'construction' access tracks
	• temporary meteorological masts.

Subdivision/other	The Project also seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kV main switchyard connecting into Project EnergyConnect, the BESS, and two collector substations and switchyards connecting to the Project's HV transmission line, and/or other subdivisions that may be required following the detailed design of the Project.

[1] The Disturbance Footprint includes disturbance associated with the seven (7) proposed permanent meteorological masts, but excludes access to these meteorological masts that would be provided via existing farm tracks or cleared agricultural land.

Project Element	Summary of the Project

OSOM Transport Routes	Indicative oversize, overmass (OSOM) transport routes extending from the Port of Newcastle to the Project Area. The route is considered in two (2) sections:
	• **Port to Euston:**
	  ○ The route sections extending from the Port of Newcastle to the Sturt Highway roundabout at Carey Street, Euston, as described in **Section 6.0**. No upgrades to this transport route is proposed as part of this development application and would be subject to separate approval processes.
	• **Local Transport Route:**
	  ○ As described below this section extends from Sturt Highway roundabout at Carey Street, Euston to the site access points off Arumpo Road leading into the Project Area.

Local Transport Route	The Local Transport Route extends from the Sturt Highway roundabout at Carey Street, Euston to the proposed Site Access points off Arumpo Road. The Project will require minor works to accommodate Project related traffic including: • Modifications at roundabouts at Euston and Buronga for the OSOM movements comprising the installation of hardstand, light pole relocations, multiple signs to be relocated and vegetation trimming. • Upgrade to the intersection of Silver City Highway and Arumpo Road to install a channelised right turn (CHR) treatment. • Upgrades to Arumpo road to facilitate entrance to the Project Area via the site access points including basic right and left (BAL/BAR) turn treatments as well as gate and fence modifications are required along Arumpo Road as described in **Section 6.0**. Disturbance and impacts associated with the Local Transport Route have been assessed in this EIS and associated technical studies.
Proposed Site Access	Two (2) site access points into the north and south of the Project Area via Arumpo Road. Disturbance and impacts associated with the proposed site access have been assessed in this EIS and associated technical studies.
Construction Workforce	Peak of approximately 400 full-time equivalent (FTE) positions (estimated average 224 FTE positions over the duration of construction).
Operational Workforce	30 FTE positions.
Hours of Operation (Construction and Decommissioning Phases)	Standard hours during construction and decommissioning between 7:00 am to 6:00 pm Monday to Friday, and 8:00 am to 1:00 pm Saturday. Works may be undertaken outside these hours where the activity is inaudible, for emergency works or time critical delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads, emergency work to avoid the loss of life or damage to property, or to prevent environmental harm.
Hours of Operation (Operational Phase)	24 hours, 7 days per week.
Construction Timeframe	Approximately 36 months, indicatively commencing in 2026 and concluding in 2028.
Staging of construction, operations and decommissioning	Each phase of the construction, operation and decommissioning will be completed in one stage each as detailed in **Section 3.6**.

3.2 Project Area

The Project Area is situated within the Wentworth LGA (refer to **Figure 1.3**). The Project Area covers an area of approximately 57,330.31 ha. A Disturbance Footprint has been determined to be the subject of the assessments detailed in this EIS. The Disturbance Footprint includes all Project components and temporary disturbance areas.

The total Disturbance Footprint is 444.94 ha (within the Project Area 444.69 ha plus 0.25 ha for offsite road works) which represents less than 1% of the Project Area. The Project seeks approval to locate all Project infrastructure within the Disturbance Footprint and the assessments within this EIS have been undertaken accordingly.

Concept road upgrade designs have been prepared for works required along the Local Transport Route and these provide a predicted disturbance footprint of 0.25 ha (refer to **Figure 3.14** to **Figure 3.16**).

Flexibility is required within the approved Project design to allow for micro-siting of the WTGs and site infrastructure as part of the detailed design and construction process to optimise the construction and operation of the Project. This assessment process has included consideration of this flexibility to allow for micro-siting within the Disturbance Footprint.

The Disturbance Footprint has been established in consideration of technical, environmental and social constraints in the immediate vicinity of the Project (refer to **Section 2.7.4**).

3.2.1 Future Land Subdivisions

The Project also seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kV main switchyard connecting into Project EnergyConnect, the BESS, and two collector substations and switchyards connecting to the Project's HV transmission line, and/or other subdivisions that may be required following the detailed design of the Project.

3.2.1.1 Subdivision/s

The network operator, at their request, requires freehold title to the main substation and/or switchyard lot/s to proceed with the construction of the relevant electrical connections and infrastructure. Subdivision is therefore proposed for the parcels of land that include the 330 kV main switchyard connecting into Project EnergyConnect, the BESS, and two collector substations and switchyards connecting to the Project's HV transmission line. These include:

- 330 kV Main substation subdivision: Lot 7/DP1256363.
- BESS and collector substation subdivision: Lot 7/DP1256363
- Collector substation 2 subdivision: Lot 1727/DP763667.

The new freehold lot/s created by these subdivisions will enable the ownership of the main substation and switchyard to be transferred to the network operator. The network operator will obtain freehold title either through transfer, dedication or acquisition.

The subdivision/s are administrative activities that do not involve any physical works and no new dwelling entitlements will be created as a result of the subdivision/s (refer to **Figure 3.5**).

Detailed plans will be prepared to accompany applications for subdivision works certificates, that under Section 6.13 of the EP&A Act are required before subdivision work can be carried out in accordance with a development consent.

Subdivisions may also be required following the detailed design of the Project.

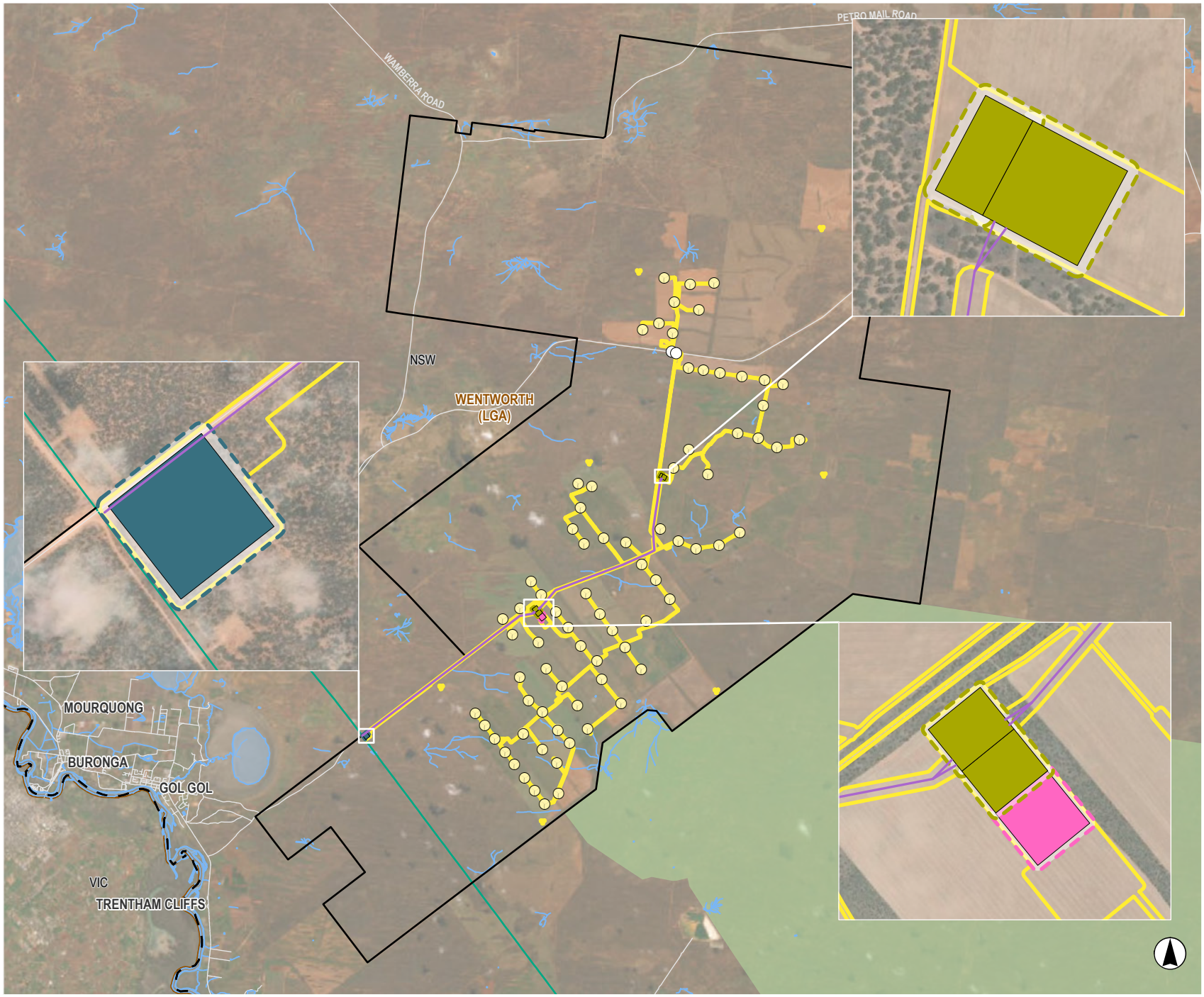


FIGURE 3.5

Electricity Reticulation and Indicative Subdivisions

Legend

- Project Boundary
- Disturbance Footprint
- Access Points
- Wind Turbine Generators
- HV Transmission Line
- Collector Substation and Switchyard
- Collector Substation and Switchyard - 20 m buffer
- Switchyard
- Switchyard - 20 m buffer
- Battery Energy Storage System (BESS)
- Battery Energy Storage System (BESS) - 20 m buffer
- Existing HV Transmission Lines
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse
- Waterbody

0 4,000 8,000
Metres

Scale 1:225,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

3.2.1.2 Long-term Leases

In order to carry out the Project, Spark Renewables will require separate long term leases to be granted by each of the host landholders over parts of existing lots where Project infrastructure will be constructed.

3.3 Project Layout and Design

The key Project components are summarised in **Table 3.2** to **Table 3.6** which provides a summary of the key Project components, including their respective quantities and their approximate dimensions.

The Project seeks flexibility to refine the final layout and details of infrastructure and components to be installed or constructed, to be undertaken post-approval and finalised prior to the commencement of construction (refer to **Section 3.4**), within the assessed Disturbance Footprint. Some aspects of the design may change during detailed design stage. For example, the WTG and battery storage model may change as technology evolves and following a rigorous procurement process and the exact component dimensions and quantities of ancillary infrastructure and temporary construction facilities specified in **Table 3.2** to **Table 3.6** may change.

This flexibility will allow the final Project design to be optimised and the most appropriate and efficient infrastructure selected while still ensuring the Project's impacts remain generally in accordance with those assessed in this EIS. Importantly, however, the total number and dimensions of WTGs will not exceed those specified in **Table 3.2** below, compliance with all relevant performance criteria will be maintained and all Project infrastructure will remain entirely within the Disturbance Footprint.

Relevant assessments in this EIS have considered the 'worst case' for each of the Project components (such as WTG height and blade length, etc). Where components of the physical layout of the Project have the potential to change over time, further detail is provided in the following sections.

Table 3.2 Key WTG Parameters

Project Component(s) / Infrastructure	Approximate Dimensions	Quantity
WTG height	Up to 280 m	76
Blade length	Up to 85 m	228
WTG foundations (excavation size)	30 m x 30 m	76

Table 3.3 Key Battery Storage Parameters

Project Component(s) / Infrastructure	Approximate Dimensions	Quantity
100 MW / 200 MWh battery energy storage facility	300 m x 300 m	One (1) compound located in the southern extent of the Disturbance Footprint.

Table 3.4 Key Ancillary Infrastructure Parameters

Project Component(s) / Infrastructure	Approximate Dimensions	Quantity
Internal access roads	101.6 km	As shown in **Figure 3.1**.
Turbine hardstands	Variable dimensions, but typically approximately 245 m long and up to 75 m wide	76
Collector (on-site) substation and associated switch yard	200 m x 250 m collector substation 200 m x 250 m associated switch yard	Two (2) in total: one each for North and South as shown in **Figure 3.1**
Switch yard	220 m x 220 m	One (1) in the South as shown in **Figure 3.1**
O&M facility	200 m x 200 m	One (1) in the North as shown in **Figure 3.1**
Overhead transmission lines (high voltage)	Approximately 17.81 km of internal overhead transmission lines	Not applicable
Underground reticulation cables (medium voltage)	90,000 m	Not applicable
Permanent meteorological masts	Up to 200 m high	Up to seven (7)
Water storage tanks	One 10,000 litre water storage tanks	One (1)

Table 3.5 Key Temporary Facility Parameters

Project Component(s) / Infrastructure	Approximate Dimensions	Quantity
Temporary Workforce Accommodation Facility	250 m x 140 m	One (1) temporary workforce accommodation facility, located in the northern portion of the Project Area as shown in **Figure 3.1**
Construction site compounds, including: • site office, amenities and parking areas • construction laydown areas for equipment and supplies • batching plants (concrete and/or asphalt) • temporary stockpiling and material storage areas.	200 m x 200 m	Five (5) compounds including two (2) compounds located in the southern portion of the Project Area, two (2) located in northern portion of the Project Area and one (1) additional compound in the north within the area reserved for the permanent O&M facility as shown in **Figure 3.1**.
Laydown areas	100 m x 150 m	3
Temporary Meteorological Masts	125 to 200 m high	Up to 7

Notes:

*Refer to **Section 3.5.1** and **Section 3.8** for further detail.*

*Although a blade diameter (incl. nacelle) of 200 metres has been conservatively assessed in the majority of technical studies, the maximum blade length dimension sought for approval is 85 metres, as constrained by the **Appendix 12** Traffic Impact assessment and associated Route Options Analysis.*

3.4 Temporary Construction Facilities and Activities

Temporary facilities required to support the construction phase of the Project will consist of:

- construction site offices, amenities and compounds
- concrete or asphalt batching plants
- stockpiles and materials storage compounds
- laydown areas
- construction access roads
- temporary workforce accommodation facility
- temporary meteorological masts.

These temporary construction facilities are described in the following subsections. All temporary facility sites that are not required for the ongoing operation of the Project will be rehabilitated once they are no longer required. The Project's Biodiversity Management Plan (BMP) will guide rehabilitation activities for the Project, with a focus on returning disturbed areas to a vegetation type consistent with their pre-disturbance type (e.g. cropping and grazing will be rehabilitated to cropping and grazing, native vegetation will be rehabilitated to native vegetation etc.).

Spark Renewables will also undertake geotechnical investigations as part of the construction of the Project. These works will occur throughout the Disturbance Footprint as required to inform detailed design and construction activities.

3.4.1 Construction Site Offices, Amenities and Compounds

The construction phase will require temporary infrastructure such as portable field offices, toilet facilities and parking bays within the temporary construction compound locations. These facilities will typically occupy an area of approximately 200 m by 200 m. Arrangements will be made for power and communications connections to the site offices during the construction period. During construction, sewage will be managed through temporary pump out systems. For the permanent O&M facility, there will be appropriate onsite systems in accordance with Wentworth Shire Council requirements. Temporary construction compounds will be typical of that used at construction sites; noting they will not include accommodation facilities. Indicative locations for construction compounds have been identified in **Figure 3.1**. Alternative locations may be sought subject to Project detailed design and construction programming. The final locations will be determined in accordance with the development consent conditions and will be within the Disturbance Footprint. Temporary site office facilities will occupy an area of approximately 50 m by 100 m.

One construction compound will be retained for permanent use during the life of the Project as an operations and maintenance facility.

Approval is also sought for temporary construction office facilities associated with the site entry points and substations to support the construction of these components of the Project, and to manage the initial works phases including construction of the site access road and main construction compounds.

Portable temporary offices and amenities will be required at construction work fronts. These areas are not shown on **Figure 3.1** as their location will be determined on an as needs basis during the construction phase, however, they will remain within the Disturbance Footprint.

An indicative layout is shown in **Figure 3.6**.

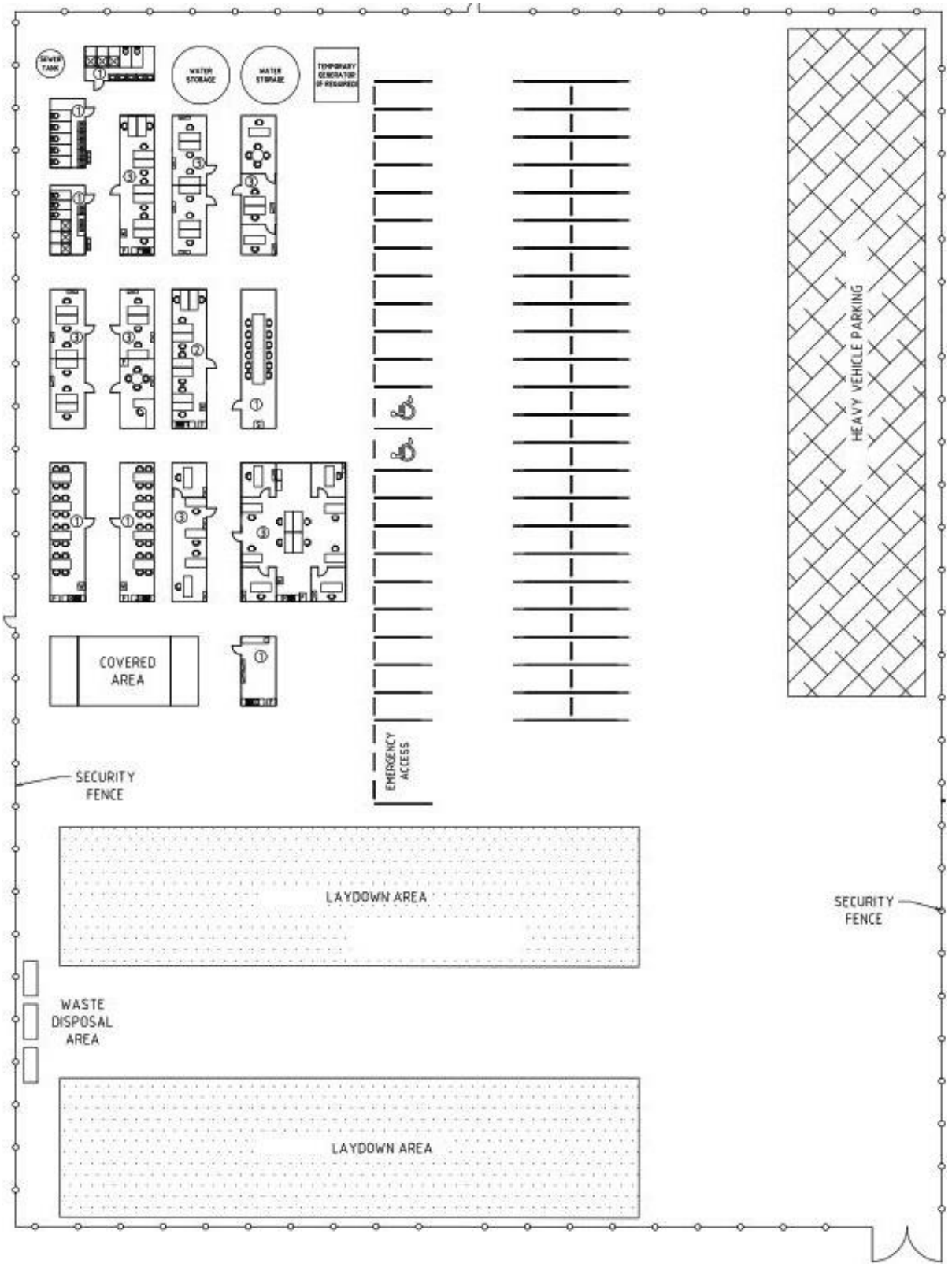


Figure 3.6 Indicative Concept for Wind Farm Temporary Construction Site Offices and Compounds

3.4.2 Stockpiles and Materials Storage Compounds

Stockpiling of materials will be undertaken to maximise construction efficiencies and minimise waste being exported from the Project Area, including excavated materials (e.g. topsoil, subsoil, rock) and gravel/roadbase. Stockpiles will be established and utilised adjacent to excavations for WTG foundations, internal roads, compounds and laydown areas for the duration of construction. Stockpile and storage requirements have been considered in the Disturbance Footprint. Fuel and any other chemicals stored in compound areas will be stored in appropriately designed, bunded storage facilities and trucked to plant in the field.

3.4.3 Batching Plants

Temporary batching plants (concrete and/or asphalt) are proposed to process material for the WTG foundations, electrical infrastructure and internal roads (and other construction needs) and to produce concrete for Project construction activities including WTG foundations.

A typical on-site concrete batching facility would occupy an area of up to 3 ha and likely consist of a concrete mixer, cement bins, sand and aggregate stockpiles and storage facilities for various equipment and tools.

Each facility is sized for the use of front-end loaders, delivery of materials and entry and exit of vehicles and to have a sufficient storage area for materials for five days batching.

Up to five temporary concrete batching plants will be required. These will be located within the construction compounds., Typically, only one concrete batching plant will be operating at any point in time with the infrastructure relocated between the construction compounds.

3.4.4 Laydown Areas

Laydown areas will be required adjacent to WTG locations, site compounds and internal roads for the storage and assembly of WTG components and equipment within the Disturbance Footprint. Hardstands and crane or equipment assembly areas will be used wherever practicable to minimise impacts, however, in some instances separate laydown areas will be required.

The Project will also require temporary field laydown areas which will be those areas where components will be placed on the ground in preparation for moving or relocating around the Project Area. Potential locations for temporary field laydown areas have been identified in **Figure 3.1** as laydown areas. The final locations of temporary field laydown areas will be dependent on detailed design and construction programming. Locations will be selected to minimise environmental and social impacts associated with the key values identified in **Section 6.0** and will occur within the Disturbance Footprint.

3.4.5 Minor Construction Access Tracks

Construction access tracks and use of unformed access paths (e.g. light vehicle movements over farmland areas) will be required to facilitate some parts of the Project including, for example, the erection of overhead transmission lines and maintaining environmental management measures. Construction access tracks that are not required for the ongoing operation and maintenance works of the Project will be removed and rehabilitated on completion of the construction phase, unless landholders request the roads to remain.

3.4.6 Erosion and Sediment Control Structures

Erosion and sediment control measures would be implemented and maintained as needed over the life of the Project. These measures include (but are not limited to):

- Construction and operational activities will be restricted to designated work areas.
- Topsoil will only be stripped and handled when it is moist (not wet or dry) to avoid decline of soil structure.
- Construction of catch/diversion drains to divert clean surface water flows around disturbed areas will be located as close to the source of the sediment as practicable.
- Grassed table drains and sediment fencing to limit the movement of sediment off-site

3.4.7 Temporary Meteorological Masts

Seven (7) temporary meteorological masts up to a height of 200 m will be installed during the construction period to calibrate and verify the data collected from the seven (7) proposed permanent meteorological masts. The temporary meteorological masts will be installed at locations within the Disturbance Footprint, usually (but not always) at a selection of proposed WTG sites ahead of construction. The temporary meteorological masts will require a low voltage power cable connection and a communications cable. The temporary meteorological masts would typically be removed when construction of the WTG at that location occurs.

3.4.8 Temporary Workforce Accommodation Facility

A TWA facility will be required during construction of the Project. The TWA facility would take up an area up to approximately 3.5 ha and will be located in the northern extent of the disturbance footprint, north of Arumpo Road as shown in **Figure 3.1**.

The TWA facility will include accommodation and amenity facilities, car parking, food and catering facilities, recreation facilities, first aid facilities and telecommunications facility for personnel use. The TWA facility will consist of prefabricated demountable units, that will be delivered and installed on site. An example of a TWA facility is shown conceptually in **Figure 3.7**. The TWA will meet the relevant requirements of the Building Code of Australia.

The TWA facility will be established early in the construction phase of the Project and will accommodate up to 300 workers. The TWA will include:

- modular and relocatable single rooms/quarters
- office building(s)
- mess area (including stores, kitchen and dining area)
- laundry facilities
- toilet and shower facilities

- car and shuttle bus parking area
- a medical centre or first aid room staffed by personnel with suitable first aid/medical training
- recreation areas.

During construction, the accommodation facilities will require water, telecommunications, sewage treatment, electricity, diesel, grease and waste management. This includes the following:

- Potable water will be delivered by truck and stored in tanks that are connected to the units and communal infrastructure.
- Rainwater tank/s will be installed to capture water that can be used for non-potable functions such as toilet flushing, laundry, vehicle washing and landscape irrigation.
- An on-site sewage treatment plant will be installed and will produce treated wastewater that can be used during construction of the Project. Subject to appropriate treatment, treated water may be used to supplement rainwater captured for non-potable functions such as toilet flushing. Any wastes associated with the sewage treatment plant that are not suitable for re-use on-site will be disposed of off-site to a suitably licenced facility. On-site sewerage collection/treatment infrastructure will continue to be used during operation.
- The cellular network will be used for telecommunications during construction.
- Electricity may be sourced from the local distribution network (where available), on-site using solar panels/batteries and diesel generation where access to the grid is unavailable.
- Diesel will be delivered and stored within bunded storage tanks that comply with the relevant standards.
- The accommodation facilities kitchens will be equipped with a grease trap that will be pumped out regularly.
- The accommodation facilities will generate putrescible waste, recyclable waste and general waste. Waste will be collected and stored in waste bins that are emptied and removed by truck to licensed landfill and recycling centres, which have the required capacity, at least weekly. No waste will be deposited on site.
- Minimal night lighting is expected to be required at the TWA and would be limited to locations within the camp where it is essential for safety reasons. Where lighting is required low brightness lights will be used that would not be visible to off-site receptors.
- The layout of the TWA facilities will be determined during detailed design. The facilities will use modular and relocatable single rooms/quarters and will be ‘scaled up’ and ‘scaled down’ based on construction workforce requirements.

Additionally, a construction compound including storage areas, material stockpile and temporary power supply for construction will be located immediately west adjoining the TWA facility during construction.

Upon completion of the construction works, all temporary facilities will be removed and rehabilitated as per **Section 6.0**, or as agreed with the landholder.

Figure 3.7 Conceptual Temporary Workforce Accommodation Facility Layout

Source: Transgrid Buronga Camp.

3.4.9 Signage

Traffic signage required as part of traffic safety for the Project will be installed in compliance with relevant regulations and in accordance with any permits obtained for traffic management. Signage will be erected at critical locations from the outset of construction, directing all vehicles associated with the construction site to the Project office. Additional signage would be located at or near entry points, providing information about the Project, the companies involved and essential safety information and telephone numbers.

Consultation with Wentworth Shire Council and Transport for NSW (TfNSW) will inform final signage locations.

3.4.10 Project Materials

Resource requirements for the Project include the provision of cement, aggregate, sand, asphalt, water and road base material. Procurement of resources required for the Project will be determined during the detailed design phase to be undertaken post approval. These resources may be sourced from locations local to the Project and may require the use of public roads not described in this EIS. The routes used to move the resources through the surrounding towns and road network will be along the major road network and standard heavy vehicle road network, or alternatively along routes permitted by the resource supplier's permitting and approvals process. Flexibility is required to provide the opportunity to locally source required resources and to provide the ability to further define road routes for heavy and light vehicles. Materials will be sourced locally and as close to the Project as practicable to do so, including reusing material excavated from WTG foundations, roadworks and other earthworks where practicable. Topsoil cleared during the construction phase will be used for rehabilitation where practicable.

3.4.11 Water Supply

Water requirements will be met in accordance with the provisions of the NSW *Water Management Act 2000* (WM Act) by sourcing water from within the locality where practicable and from a licensed commercial water supplier. Water for construction purposes will be opportunistically sourced from the following methods to minimise the need for imported water:

- use from existing dams where harvestable rights apply
- reuse from construction sediment basins; and
- reuse from rainwater tanks collecting runoff from building roofs.

If it is not practicable to source water locally, then it will be brought to the Project Area by licensed external water suppliers under contract to the Project. It is estimated that in the order of 219 megalitres (ML) of water would be required for the Project construction. This comprises of 104 ML of non-potable water and 125 ML of potable water. Non-potable water would be required for general operations (20 ML) and dust suppression activities (84 ML) during construction. While potable water would be required to produce the quantity of concrete required for gravity foundations (which can be considered the maximum amount of water required for use in concrete batching) (12 ML), as well as water use for the temporary workforce accommodation facility during construction (113 ML). The closest town to the Project with a potable water supply available is Buronga. Alternatively, there are water filling stations in Wentworth that could supply the Project. Non-potable water may be sourced from participating landholder dams, depending on the conditions at the time.

3.4.12 Construction Wastewater Management

Wastewater management for the TWA Facility and construction offices will be provided by an on-site treatment system. The proposed treatment system will be a contained system and is anticipated to include mechanical screening, biological and chemical treatment, filtration and disinfection. The waste solids produced by the treatment system will be emptied by a licensed contractor and disposed of at a nearby council operated wastewater treatment plant or other appropriately licensed facility.

Treated effluent suitable for reuse for construction purposes, which are anticipated to include dust suppression and earthworks conditioning, will be stored in sealed tanks or lined basins to avoid potential interaction with groundwater.

3.5 Project Components

3.5.1 Wind Turbine Generators

The Project will include the installation, operation, maintenance and decommissioning of up to 76 WTGs with a maximum generating capacity of up to 402 MW.

The preferred WTG unit model will be selected following detailed design and procurement. Although 76 WTGs are proposed in this EIS, commercial considerations and selection of a larger WTG model may lead to fewer than 76 WTGs being constructed and operated, at the discretion of Spark Renewables. Similarly, Spark Renewables is seeking flexibility to develop up to 76 WTG, should a lower capacity machine be selected during the detailed design. The maximum installed capacity of the Project would not exceed 402 MW. To provide a precautionary assessment, this EIS and all associated technical studies are based on the maximum 76 WTG layout and associated Disturbance Footprint.

Similarly, a precautionary approach was taken to assess a maximum WTG model with 280 m tip height allowing for advances in WTG technology between the time of assessment for the Project (this EIS) and the commencement of construction.

The key components of a WTG are shown on **Figure 3.8** and include:

- foundations
- towers
- nacelle (hub)
- rotor
- blades.

Additionally, each WTG will have an internal ladder or lift and a generator transformer.

The indicative location and height of each WTG is provided in **Appendix 3**. The WTGs would be installed at final locations to be confirmed within a 100 m micro-siting buffer of the proposed locations identified in the EIS, with the current conceptual locations shown on **Figure 3.1**.

To minimise the visual impacts of the Project, the WTGs will:

- be uniform in the colour, design, height and rotor diameter
- finished in matt-white and non-reflective material to reduce visibility
- not have any unnecessary signage or lighting.

Other key components of an operational wind farm are shown in **Figure 3.9** and are described further below.

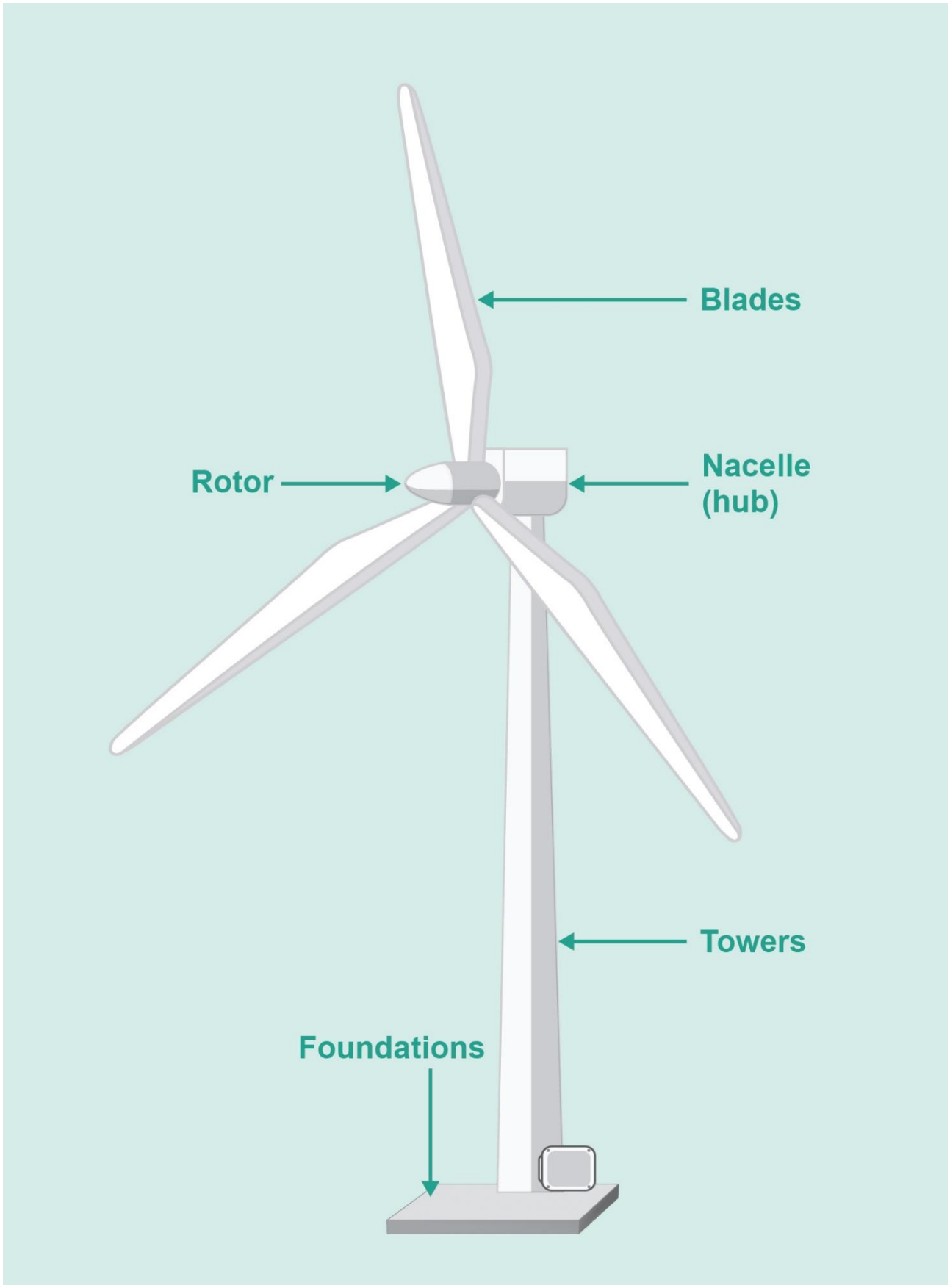


Figure 3.8 Example Components of a WTG

Source (Umwelt, 2024).

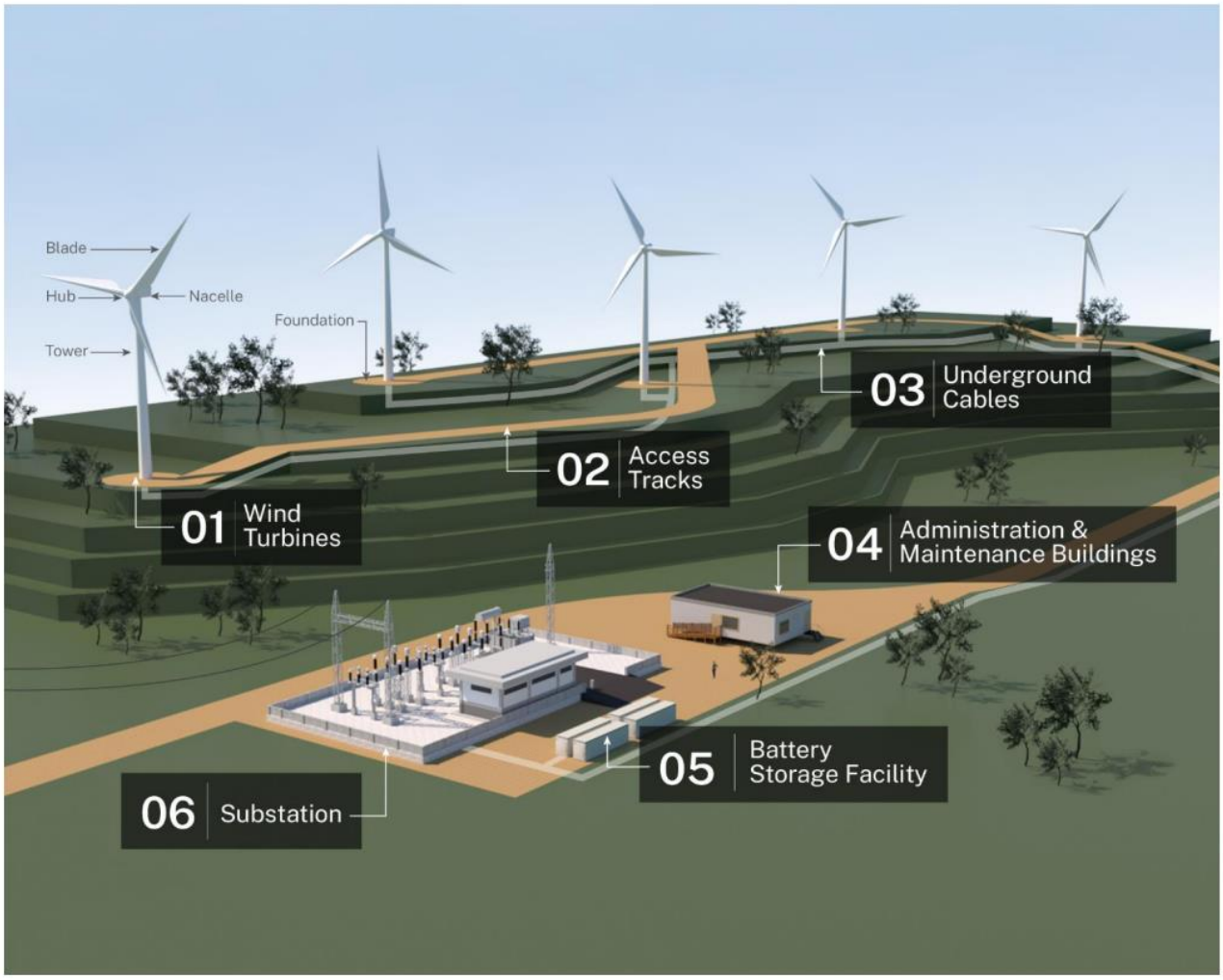


Figure 3.9 Components of a Typical Wind Farm Project

Source: Draft guidance for state significant wind energy development (DPE, 2023).

3.5.2 WTG Foundations

Foundations for the WTGs will be either concrete slab or rock anchor, pending geotechnical investigation of the ground conditions across the Project Area. More than one type of WTG foundation may be required for the Project, which will be determined during the detailed design phase. The excavation required for both types of foundations will be approximately 30 m by 30 m to a depth of approximately 2.5 m.

3.5.3 Towers and Nacelle

The tower structure of a WTG is typically constructed out of welded steel shell, concrete or a concrete steel hybrid. The towers will be fitted with an internal ladder and/or lift to facilitate access to the nacelle.
A range of tower heights are under consideration with the final selection to be undertaken during detailed design, to accommodate the proposed maximum blade tip height of up to 280 m.

The nacelle is a housing constructed of steel and fibreglass which encloses the gearbox, generator, transformers, motors, brakes, electronic components, wiring and hydraulic and lubricating oil systems for the WTG. Weather monitoring equipment located on top of the nacelle will provide data on wind speed and direction for the automatic operation of the WTG.

3.5.4 Rotor

The WTG rotor comprises a central hub, which is the point of connection to the nacelle, attached to the three blades. The WTG rotor drives the generator within the nacelle producing electrical output. WTGs of the size considered in this EIS begin to generate energy at wind speeds in the order of 3.5 to four (4) metres per second (m/s) (13 kilometres per hour (kph)) and shut down in wind speeds greater than 25 m/s (90 kph). The rotor typically rotates at approximately eight (8) revolutions per minute (rpm) at low wind speeds and 20 rpm at higher operational wind speeds.

The Project includes designed rotors of approximately 200 m in diameter with an individual swept area of approximately 31,000 m^2. It is possible that larger rotors will be required depending on the specifications of blades on the market at the time of construction. If so, the selected WTGs would remain within the 280 m tip height envelope.

3.5.5 Blades

At the top of each tower will be a nacelle to which the hub is mounted, and the blades are attached to the hub. WTG blades are typically made from fibreglass reinforced with epoxy or plastic attached to a steel hub and include lightning protection inside the blade. The Project has been designed and assessed based on a maximum hub height of up to 180 m above ground level (AGL).

The Project may install single or multi-piece blades dependent on detailed design and the Project's engineering and procurement processes which would be undertaken following Project approval. To allow for expected advancements in available blade lengths, this EIS has considered a single piece blade up to 85 m and a total blade diameter of up to 200 m. The Project design conservatively assumes a lowermost blade clearance of 50 m AGL based on a hub height of 180 m AGL.

Although a conservative blade diameter (incl. nacelle) of 200 metres has been assessed in the majority of technical studies, the maximum blade length dimension sought for approval is 85 metres, as constrained by the **Appendix 12**, Traffic Impact Assessment and associated Route Options Analysis.

3.5.6 Battery Energy Storage System (BESS)

A key component of the Project is a battery energy storage system (BESS), to allow for the storage and discharge of energy. Storage of energy can add significant benefits to renewable generation because it allows for the dispatch of energy in accordance with market demand and overcomes potential issues associated with intermittency of output from the WTGs. Essentially the BESS will be charged during off-peak hours and discharged during peak hours. The indicative electrical capacity of the battery storage is 100 MW / 200 MWh. An indicative BESS compound has been identified for the Project and is located in the southern portion of the Disturbance Footprint as shown on **Figure 3.1**.

The BESS compound will comprise an area of flat ground surfaced with road base or gravel, with battery components contained within standard sized containers arranged in rows. A candidate battery storage model has been identified for the purposes of assessment in this EIS. A range of technologies were considered, including but not limited to lithium-ion, sodium-ion, sodium sulphur, sodium hydride, electrochemical technology (i.e. flow batteries), cryogenic storage and compressed air. Lithium-ion was selected as the preferred battery type. To understand the perceived risks associated from a lithium-ion battery a Preliminary Hazard Assessment was undertaken and is provided in **Appendix 16**. A typical battery storage arrangement is shown in **Photo 3.1**.

Photo 3.1 Typical Battery Storage Arrangement

Source: Riskcon Preliminary Hazard Assessment.

3.5.7 Permanent Ancillary Infrastructure

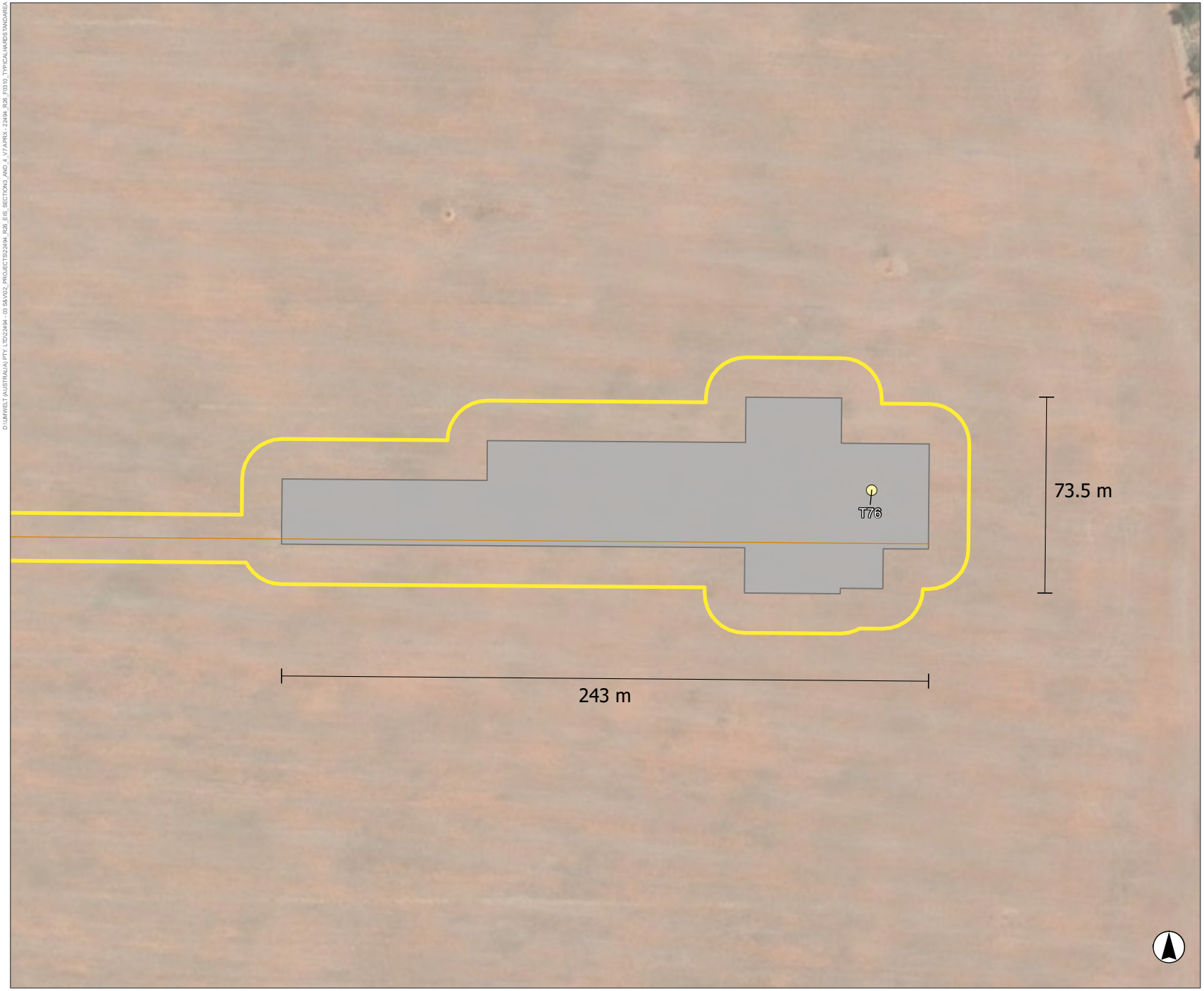
Permanent ancillary infrastructure required to support the Project is presented in **Table 3.1** and **Table 3.2** above and includes internal access tracks, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, communications cables, permanent meteorological masts and water storage tanks. It is noted that here the term 'permanent' means that the proposed infrastructure is expected to remain in place for the life of the development (subject to ongoing maintenance, upgrading or replacement), until such time as the wind farm is decommissioned and rehabilitated.

3.5.7.1 Hardstands

Hardstands are required adjacent to each WTG location for the assembly, erection, maintenance, and decommissioning of the WTGs. Indicative hardstand dimensions are approximately 90 x 90 m, however, this will vary dependent on detailed design, topography, construction methods and the selected WTG model. Hardstands will be surfaced with pavement material consistent with internal roads and be maintained throughout the construction and operational life of the Project. **Figure 3.10** shows a typical hardstand area adjacent to a WTG footing.

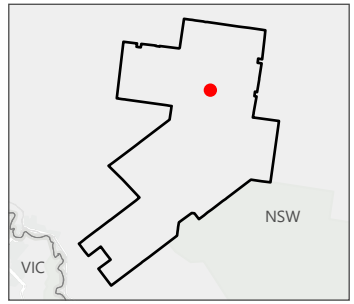
FIGURE 3.10

Typical Hardstand Area



Legend

- Project Boundary
- Disturbance Footprint
- Hard stand
- Wind Turbine Generators
- Access Tracks



0 40 80

Metres

Scale 1:2,000 at A4

GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

3.5.7.2 Electrical Network and Transmission Lines

A series of underground and overground electrical network lines are proposed to deliver the electricity generated by the WTGs to the substations (refer to **Figure 3.1**). The Project EnergyConnect transmission line and associated infrastructure do not form part of the Project.

The indicative electrical layout includes both underground and overhead reticulation connecting the WTGs, the battery storage and substations to the proposed transmission line for the Project (refer to **Figure 3.1**).

The internal electrical network is planned to comprise 33 kV circuits between the WTGs, the battery storage and substations.

Underground electrical network lines and control cables may be installed between the WTGs, the battery storage and the collector substations. Sections of the proposed overhead transmission lines may need to be placed underground subject to local conditions and conversely sections of the proposed underground transmission lines may need to be placed overhead subject to local conditions. For the purposes of this EIS, it is anticipated that the 330 kV high voltage transmission line will be overhead and that medium voltage reticulation would be underground. The final electrical layout will consider opportunities to minimise vegetation clearing and avoid heritage sites, while also considering excavation constraints, ground stability and cost. The overhead transmission lines will be up to approximately 40-80 m in height, with a typical design details are shown in **Table 3.2**. Spark Renewables is working closely with landholders to ensure impacts of overhead transmission lines are mitigated where practicable in the Project design. **Figure 3.11** shows existing HV overhead transmission line configurations in the vicinity of the Project.

The majority of the proposed overhead transmission line locations can be readily accessed during construction via existing access tracks within host properties. In some cases, track creation or enhancement may be required where access cannot be gained or is not considered adequate to support machinery utilised during the construction of the transmission line. During construction, temporary field laydown areas within the Disturbance Footprint will be positioned along the proposed electrical network and transmission routes to store equipment such as transmission poles and conductors. No fuel, oil or chemicals will be stored at these locations.

Figure 3.11 Typical Overhead Transmission Line Configuration

3.5.7.3 Permanent Meteorological Masts

Seven permanent meteorological masts, up to the proposed hub height of the WTGs, will be installed on site. The final number of permanent meteorological masts will be subject to AEMO requirements relative to the final wind farm layout. The purpose of these masts is to aid performance monitoring of the WTGs. The permanent meteorological masts would be of a guyed, narrow lattice or tubular steel design with concrete footings with an expected maximum height of 200 m. Proposed locations for these masts are identified in **Figure 3.1**. For functional reasons they must be located near to the WTGs but separated by a distance allowing accurate wind measurements. The meteorological mast locations are included as part of the Disturbance Footprint and will be accessed via existing access tracks. Permanent meteorological masts will require a low voltage cable connection for power and a communications cable to be laid. The trench required for this will be approximately one (1) m in width and would come from the closest WTG.

3.5.8 Collector (On-site) Substations and Associated Switchyards

Substations are required to collect the electricity generated and increase the voltage for transmission to the grid, and to physically connect to the grid (i.e. switching station). Substations may be constructed as a stand-alone facility or as a combined facility co-located with other compounds at any or each of the locations labelled as collector substations (refer to **Figure 3.1**). Substations will be located within a hardstand area of approximately 200 m by 250 m, will have a bushfire asset protection zone (APZ) and a security fence.

A switchyard is required to connect WTGs to each other and to substations by managing the flow of power within the wind farm to the grid. They include various components comprising of transformers, busbars and lines, circuit breakers, disconnectors, control and protection systems.

The Project will include three (3) switchyards which will be located in the southern extent of the Distance Footprint adjacent to the two collector and Project EnergyConnect. The switchyards will be located within a hardstand area with approximate dimensions of 220 m by 220 m, will have a bushfire APZ and a security fence.

Emergency backup power for the substations and switchyards will be supplied by an on-site diesel generator and/or batteries to maintain network communications and electrical protection capability in the event of an outage. As the transformer(s) may each contain upwards of 50,000 L of oil, the design will include primary and secondary containment measures so that any spills are captured. The electrical infrastructure has been designed to minimise the visual impact of the Project by siting the infrastructure away from dwellings and surrounding public viewpoints as far as practical whilst maintaining the practical and operational needs of the infrastructure. Following construction, and if warranted, raised earthwork perimeters and/or small areas of native tree planting may be undertaken to screen any parts of the substations that are visible from sensitive receptors.

3.5.9 Transport

3.5.9.1 OSOM Transport Route

Transportation of some Project components, such as wind turbine blades, nacelles and transformers, would require over-size, over-mass (OSOM) vehicles that exceed the regulatory limits of standard vehicle dimensions. The origins of heavy and OSOM vehicles will be confirmed during detailed design; however, it is anticipated that major WTG components and power transformers will come from Port of Newcastle. Two potential OSOM vehicle routes from Port of Newcastle to the Project Area have been assessed.

Any modifications to the road network between Port of Newcastle and Sturt Highway/ Carey Street roundabout at Euston would be undertaken by separate planning assessment and approvals and are shown in **Appendix 12**.

3.5.9.2 Local Transport Route

A Local Transport Route has been established for targeted assessment in the EIS between Euston and the Arumpo Road site access points.

The Traffic and Transport Impact Assessment (**Appendix 12**) has identified four (4) locations that require works and modification to facilitate safe vehicle movements along the Local Transport Route as shown in **Figure 3.14** including:

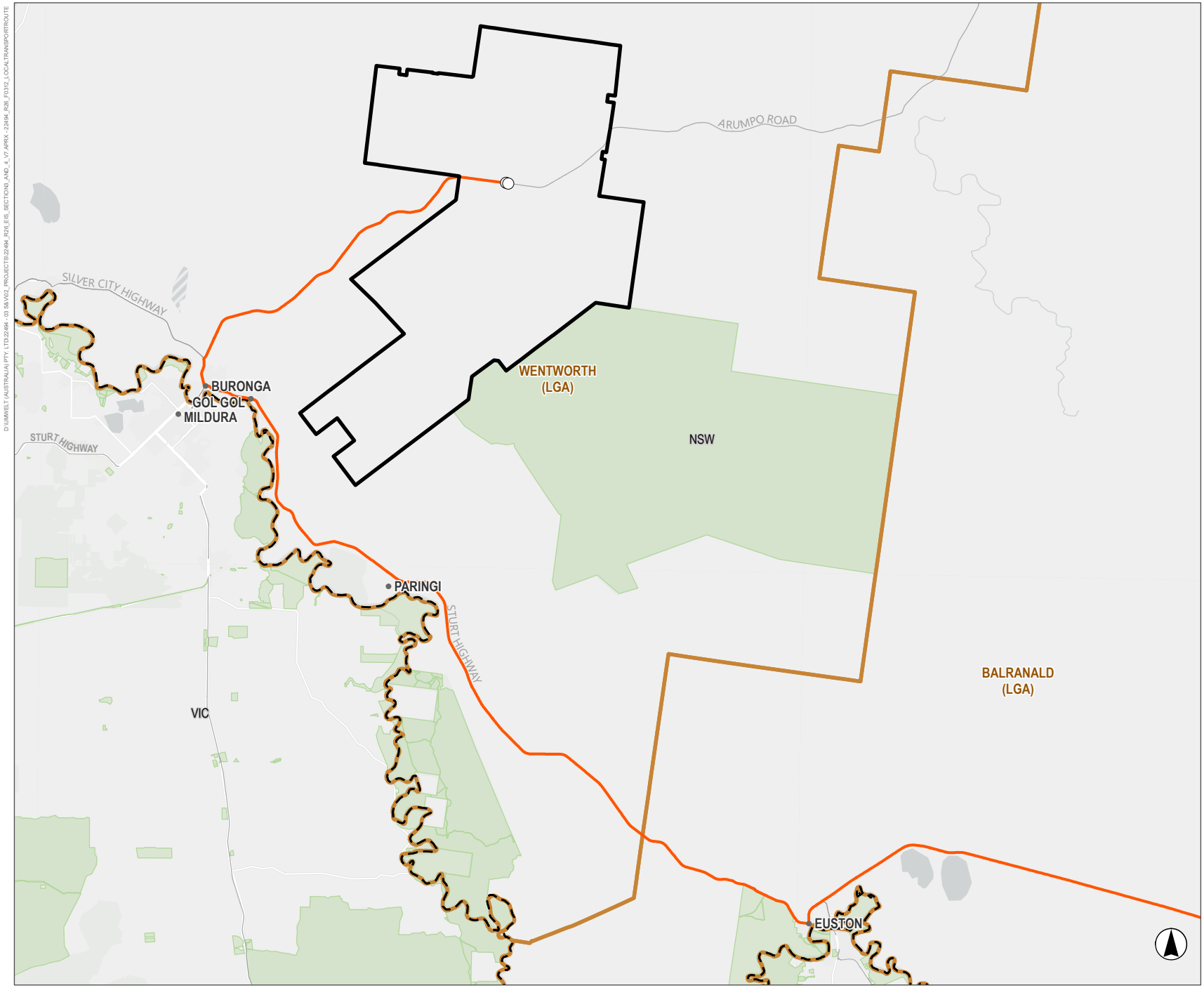
- Sturt Highway roundabout at intersection of Carey Street, Euston.
- Sturt Highway roundabout onto Silver City Highway, Buronga.
- Silver City Highway onto Arumpo Road.
- Site access points off Arumpo Road.

These road works are modifications to the road network and can generally be classified as:

- Traffic Management: Activities related to optimising traffic flow, including roundabout adjustments, sign removal, and island modifications.
- Infrastructure Installation/Modification: Tasks involving the installation or modification of hardstands, gates, and fences.
- Vegetation Management: Activities related to clearing or trimming vegetation along the road corridor.
- Signage and Lighting: Adjustments to signage and lighting fixtures for improved visibility and safety.

FIGURE 3.12

Local Transport Route and Site Access



Legend

- Project Boundary
- Local Transport Route
- Access Points
- State Border
- Local Government Area (LGA)
- Major Road
- NPWS Estates

0 10 20
Kilometres

Scale 1:450,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

3.5.9.3 Site Access

The Project will be accessed by the public road network mostly via the Local Transport Route (i.e. the Sturt Highway and Silver City Highway before entering Arumpo Road).

The Project Area is proposed to be accessed from Arumpo Road at two locations during construction, operation and decommissioning including:

- Access Point 1 will provide access to the Project Area north of Arumpo Road including the temporary workers accommodation facility and car park.
- Access Point 2 will provide access to the Project Area south of Arumpo Road.

The location of both access points is shown on **Figure 3.1**. These access points will connect to the internal access track network to facilitate access during construction, operation and decommissioning.

These access points would meet Wentworth Shire Council's engineering road access standards, be gated and secured, and include appropriate signature.

3.5.9.4 Internal Access Tracks

Internal access tracks will be established within the Project Area for the construction, operation, and decommissioning of the Project. Internal access tracks have been designed to follow existing farm tracks where practicable with some new tracks constructed where necessary.

Internal access tracks will be constructed to a minimum width of six (6) m wide, plus an additional buffer to accommodate roadside drainage and contained to the Disturbance Footprint. The proposed indicative internal access track network is approximately 101.6 km in length.

Generally internal access tracks will be constructed using compacted crushed rock/road base, however some segments of the tracks may need to be surfaced with asphalt to enable haulage of heavy WTG components.

Any waterway or minor stream crossings will be designed and have regard to the following guidelines:

- Managing Urban Stormwater: Soils and Construction (Landcom, 2004).
- Policy and Guidelines for Fish Friendly Waterway Crossings (NSW DPI, 2004).
- Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003).

Fifteen minor stream crossings may also be required to support the required machinery access during the construction phase. Crossings not required for future operational activities will be decommissioned following the completion of construction works. Those that are required for ongoing use during operations will be designed and constructed in accordance with relevant guidelines.

FIGURE 3.13

OSOM Transport Route

Legend

- Project Boundary
- Route Option - OSOM
- Route Option - OSOM High Load
- State Border
- Major Road
- NPWS Estates
- State Forest

0 100 200
Kilometres

Scale 1:4,500,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

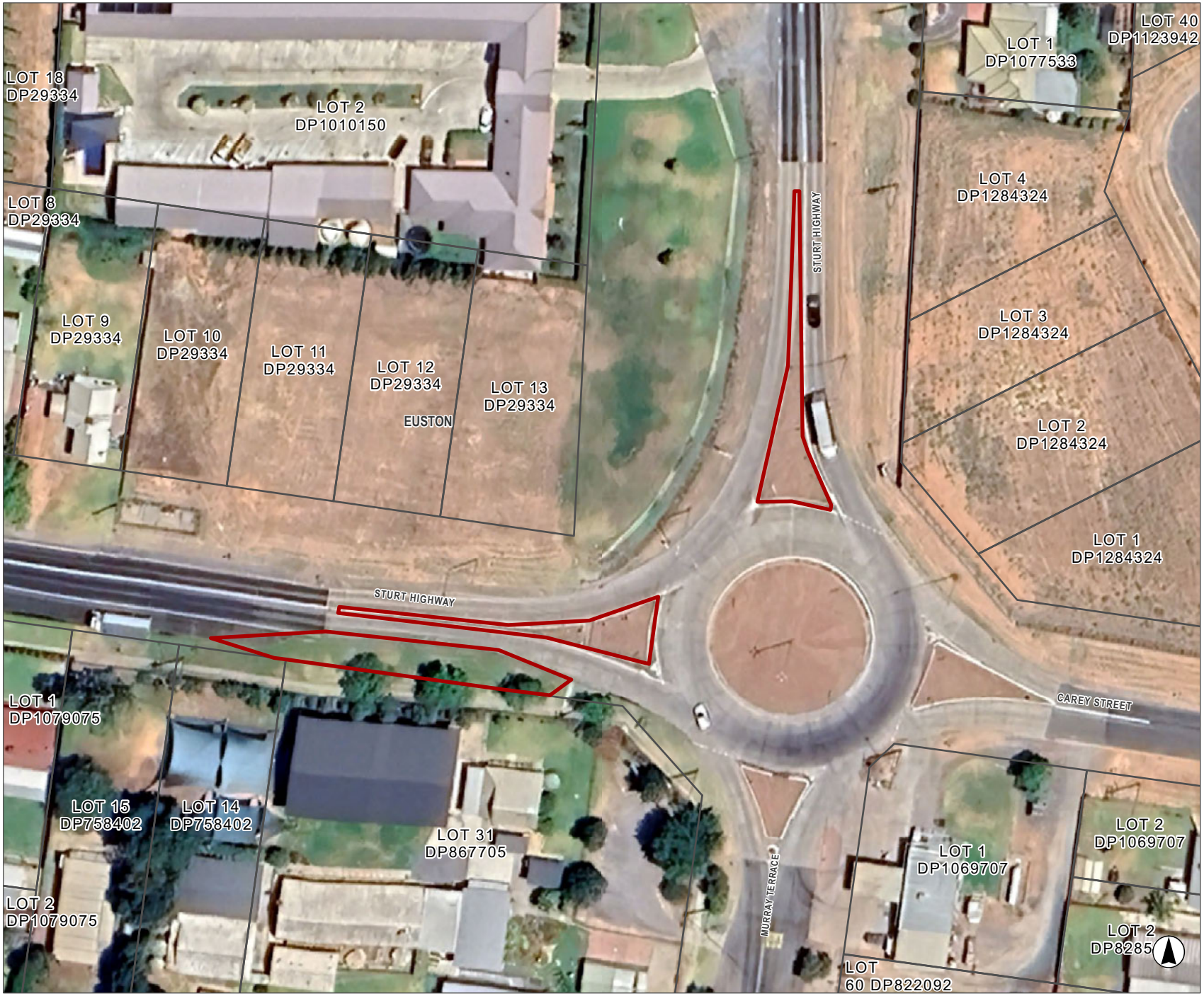
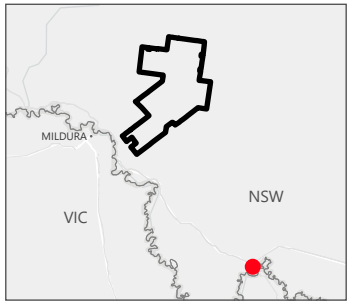


FIGURE 3.14

Sturt Highway roundabout at intersection of Carey Street, Euston - Road Upgrade

Legend

- Off-site Road Works
- Lot Boundary



0 20 40

Metres

Scale 1:1,000 at A4

GDA2020 MGA Zone 54

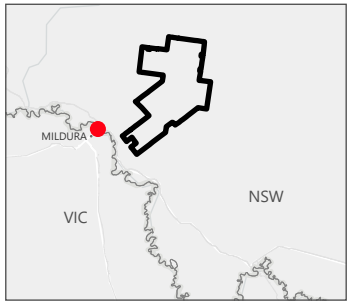
Image Source: Google Earth (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 3.15

Sturt Highway roundabout onto Silver City Highway, Buronga - Road Upgrade

Legend

- Off-site Road Works
- Lot Boundary



0 15 30

Metres

Scale 1:1,000 at A4

GDA2020 MGA Zone 54

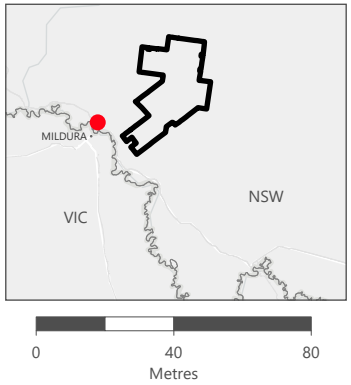
Image Source: Google Earth (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 3.16

Silver City Highway onto Arumpo Road - Road Upgrade

Legend

- Off-site Road Works
- Lot Boundary



0 40 80

Metres

Scale 1:2,200 at A4

GDA2020 MGA Zone 54

Image Source: Google Earth (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

3.5.10 Operations and Maintenance Facility

A permanent operations and maintenance (O&M) facility will be established for the day-to-day operation of the Project and is shown in **Figure 3.1**. The O&M facility would take up an area up to approximately 200 m by 200 m and is located in the northern extent of the disturbance footprint, south of Arumpo Road. The O&M facility will include a lay down area, site operations facility and services buildings, workshop, storage, parking and other facilities for operations staff. **Figure 3.17** shows an example of an O&M facility. The buildings within the O&M facility will include office space, amenities, kitchen, communications equipment, meeting room and routine maintenance stores. The O&M facility will require a standalone power supply from either the local 22 kV distribution network, or an on-site generator.

Figure 3.17 Example of O&M Facility

3.5.11 Telecommunications Facilities

Telecommunications facilities providing for transmission of voice, data, image, graphic and video information are proposed to be installed on site at standalone locations or onto wind farm infrastructure such as permanent masts.

Two (2) separate and independent telephone communications facilities (optic fibre and microwave) will be required to be installed between the substations to enable safe remote monitoring and control of the Project.

Any ground disturbance associated with the installation and maintenance of telecommunications facilities services will be located within the Disturbance Footprint. If required outside the Disturbance Footprint will be sited to avoid key environmental constraints within the Project Area.

3.5.12 Utility Services

The Project will be connected to the transmission network. Backup and emergency power at the substations may be supplied by a local distribution line, on-site batteries and/or a standalone diesel generator.

Operational water requirements will be provided to the proposed facilities and auxiliary services buildings from storage tanks designed to collect water from roof drainage and augmented by potable water delivered by tankers.

Approved septic systems or composting systems will be installed to treat minor quantities of wastewater associated with operation of the Project, subject to securing the relevant authorisations. Other wastes will be classified and removed from the Project Area to a suitably licenced facility (landfill, recycling etc). Waste management is described further in **Section 6.0**.

Where possible, any ground disturbance associated with the installation and maintenance of utilities will be located within the Disturbance Footprint, and all ground disturbance will be sited to avoid key environmental constraints within the Project Area.

3.6 Proposed Activities

3.6.1 Overview of Project Phases and Anticipated Timing

Table 3.6 below provides an overview of the key phases of the proposed Project.

Table 3.6 Overview of Project Phases

Project Phase	Proposed Activities
Pre-construction Minor Works	• Surveys. • Off-site road works (refer to **Section 3.5.9**). • Building/ road dilapidation surveys. • Geotechnical investigative drilling and excavation of test pits and bore holes. • Minor clearing of native vegetation. • Establishment of temporary site office and compounds. • Installation of environmental impact mitigation measures, fencing, enabling works, meteorological masts. • Heritage artefact salvage, biodiversity investigations and pre-clearing surveys, inspections, specific habitat feature removal, and relocation. • Intersection and road upgrades on the public road network. • Establishment of Project access points, minor access roads and minor adjustments to services/ utilities signage, etc. • Minor clearing of native vegetation to facilitate the minor works described above.
Construction Works	Includes all physical works within the Disturbance Footprint to enable the operation, including, but not limited to the construction and installation of: • WTGs. • Compounds. • TWA facility. • Electrical network lines. • Battery storage.

Project Phase	Proposed Activities
	• Construction of ancillary infrastructure. • Establishment or construction of any temporary facilities which are not already established as part of the pre-construction minor works.
Operations	• Ongoing operation, monitoring (on-site and remote monitoring) and maintenance of all Project infrastructure and land within the Disturbance Footprint during the operational lifespan of the Project. • Replacement of major components, such as WTG blades, as required (including the use of cranes and ancillary equipment to enable replacement).
Decommissioning	• Includes all physical works required for the dismantling and transportation of Project infrastructure and rehabilitation of the Project Area. • If not required for ongoing farming/ fire access purposes, internal access tracks would be removed.

Anticipated timeframes for the Project are outlined in **Table 3.7** below. These timeframes are indicative only and may be influenced by a range of factors, including timeframes for Project approval.

Table 3.7 Anticipated Project Timeline

Phase	Approximate Duration and Indicative Timing
Planning and approvals	In progress and aiming to be completed in Q2 2025
Pre-construction Minor Works	Approximately 6–8 months, commencing with geotechnical investigations soon after project approvals are granted, nominally in Q3 2025
Construction Works	Construction and Commissioning: planned to commence in 2026, for approximately three (3) years
Operations	30 years
Decommissioning	After 30 year Project life, unless a new approval is sought to repower the Project

3.6.2 Staging

Spark Renewables aim to construct the Project as a single stage of development.

3.6.3 Construction

Construction will commence following detailed design and include all physical works to enable operation of the Project including, but not limited to, construction and installation of WTGs, BESS, substation and switchyards, ancillary infrastructure, temporary facilities and off-site road works.

3.6.4 Commissioning

Pre-commissioning checks will be carried out on the high voltage electrical equipment prior to connection to the transmission network. When the Project's electrical system has been energised, the WTGs and battery storage will be commissioned and put into service. WTGs are commissioned sequentially enabling some WTGs to commence operation prior to the completion of wind farm construction. For the purposes of this EIS the commissioning phase is considered to commence during construction and will end once the final WTG and electrical compound has been fully commissioned.

3.6.5 Operational Phase

Once operational, the Project would be monitored both by on-site staff and through remote monitoring. Aspects of the Project operation that would be led by on-site staff include safety management, environmental condition monitoring, landholder liaison, routine servicing, malfunction rectification and site visits. Those functions to be overseen by remote monitoring include WTG and battery storage performance assessment, Project reporting, remote resetting and maintenance co-ordination.

Pro-active computer control systems will monitor the performance of the WTGs and battery storage so that any issues can be dealt with by on-site staff, as appropriate. Maintenance staff will be on-site throughout the year, making routine checks of the WTGs, battery storage and ancillary infrastructure on an ongoing basis. Major planned servicing would be carried out approximately twice a year on each WTG. Each major service visit would potentially involve a number of service vehicles on-site.

Replacement of major components, such as WTG blades, may require the use of cranes and ancillary equipment. Management of regrowth and existing vegetation will be necessary within the overhead transmission line corridors to reduce the threat of fire and physical damage to the transmission line, and to allow access for maintenance vehicles. Occasionally, access by medium and heavy vehicles may be required to repair or maintain overhead transmission line components.

3.6.6 Decommissioning Phase

The WTGs have an expected operating life of approximately 30 years. At the end of that 30 year period, three (3) options will be considered:

- Continued use of the Project Area as a wind farm and battery storage utilising the existing WTGs and other facilities (subject to contractual agreement with the host landholders, development consent and condition of equipment).
- Replace the WTGs and battery storage with technology current at that time and continue the wind farm and battery storage operation for a further term (subject to contractual agreement with the host landholders and further development consent).
- Decommission the wind farm and battery storage and remove the WTGs and other infrastructure.

Should decommissioning be required, key stakeholders including relevant landholders would be consulted regarding the decommissioning and rehabilitation plan. All costs associated with decommissioning will be borne by Spark Renewables or the Project owner.

All above ground structures not required for the ongoing agricultural use of the land, including the WTGs and substations will be removed and the land rehabilitated so that it can return to agricultural use. Internal roads, if not required for ongoing farming purposes or fire access, would be removed. Access gates, if not required for farming purposes, would also be removed. Host landholders will be involved in any discussion regarding the removal or hand-over of infrastructure on their properties. Below ground infrastructure, including WTG foundations, hardstands and some cabling may be left in situ and covered in clean fill material, with the land returned to near prior condition and use as far as practicable.

The decommissioning phase would require similar equipment and activities to the construction phase including mobile and heavy equipment (e.g. cranes, earthworks machinery, compressor and rock crusher).

Prior to the commencement of decommissioning activities, Spark Renewables would prepare a detailed decommissioning plan in consultation with DPHI and Wentworth Shire Council to guide the implementation of the decommissioning works.

3.6.7 Re-powering

This EIS has assessed only up to decommissioning and does not include repowering. After approximately 30 years of operation (or sooner if deemed economically viable) the Project may be repowered, utilising contemporary equipment. This would be subject to a subsequent project approval process.

3.7 Hours of Operation

3.7.1 Construction and Decommissioning

Generally, the Project will undertake construction or decommissioning activities between:

- 7:00 am to 6:00 pm, Monday to Friday.
- 8:00 am to 1:00 pm, Saturdays.

However, works may be undertaken outside these standard hours under any of the following circumstances:

- the activities are inaudible at non-associated residences
- the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons
- the activities are necessary to avoid the loss of life, property or prevent material harm to the environment
- the out of hours activities are authorised by the Planning Secretary of DPHI.

An example of activities that are necessary to avoid loss of property and to prevent material harm to the environment is the installation of WTGs. WTG installation is intended to fit into the six-day working week. Due to the designed sequencing of component lifts certain stage/elements need to be completed in a specified order which may require early starts or late finishes, considerate of wind conditions.
When erecting the tower, once the top of the tower is attached, the nacelle must go on without delay due to the risk of tower self-oscillation.

Unfavourable weather can cause delays in mounting the nacelle. Continuing this work outside of standard construction hours will ensure that risk to people, property and the surrounding environment is mitigated. The Project Area is naturally a high wind area and as such Sunday work may be needed to make up for high wind days during the week.

Similarly, once:

- Concrete pouring commences on a given day, pouring cannot be halted and may need to be completed outside of standard hours. Concrete pours are to be carried out as a continuous process (once bases are prepared) for some 8–12 hours per base. This activity includes the operation of the concrete batching plants. Weather conditions play a major role, as the concrete can only be poured at temperatures between five (5) and 35°C (depending on specification) and not during rain periods. This may require concrete pours to start early in the day to avoid peak summer temperatures. Once the bases have been prepared, it is essential that concrete is poured immediately to prevent any damage that may be caused by rain or prolonged exposure. This is expected to be inaudible at non-associated receivers.
- Electrical trenches have been excavated it is important that cables are laid and trenches backfilled as soon as practicable to avoid damage to the electrical equipment or to the trenches (and surrounding areas) due to exposure to the elements. Safety issues, for people, livestock, and native animals, are also reduced by early backfill of trenches.

Out of hours activities may be authorised by the Planning Secretary of DPHI on a case by case or activity specific basis, subject to justification being provided by Spark Renewables or its contractors. This would include, for example, evidence of consultation with potentially affected non-associated residents and details of reasonable and feasible noise mitigation measures which are to be implemented.

3.7.2 Operations

Once the WTGs are commissioned, the Project will operate 24 hours per day, seven (7) days per week except where cessation of operations is required, for example, in the event of an emergency.

3.8 Components of Physical Layout That May Change

The Project described in this EIS is indicative only and subject to a detailed design process. The proposed layout has been prepared based on the best knowledge available at the time and by applying the avoidance hierarchy approach.

A key component that will be refined following detailed design and procurement is the selection of the WTG units. Although 76 WTGs are proposed in this EIS, commercial considerations and selection of a larger WTG model may lead to fewer than 76 WTGs being constructed and operated, at the discretion of Spark Renewables.

Similarly, Spark Renewables is seeking flexibility to develop up to 76 WTG, should a lower capacity machine be selected during the detailed design. The maximum installed capacity of the Project would not exceed 402 MW. To provide a precautionary assessment, this EIS and all associated technical studies are based on the maximum 76 WTG layout and associated Disturbance Footprint.

The proposed Project layout presented in this EIS is a product of Spark Renewables' commitment to avoid environmental and social impacts and mitigate any remaining impacts to the maximum extent practicable. If development consent is granted, preferred suppliers will be selected following a competitive tender and contractor selection process. All 76 WTG locations have been included in this EIS in order to assess worst-case impacts and to allow the flexibility to determine the optimal Project layout within the limits of the development consent, generally in accordance with this EIS.

Any potential supplier will have unique requirements and specifications such as transport vehicle turning radii, access and exit gradients and crane requirements. The final design will only be known following selection of Project components and the completion of the detailed design by the construction contractor post-approval.

Optionality is also provided for the location of compounds, substations, battery storage and electrical network design (as shown in **Figure 3.1**), as the selection of the locations of compounds and substations is subject to the post approval tender, contractor selection, optimisation, geotechnical assessment, detailed design and procurement process. This EIS and associated technical studies assume that each of those areas shown can be interchangeable should the optimisation process direct that a piece of infrastructure would be more efficiently interchanged with another. All areas have therefore been considered in the Disturbance Footprint and subjected to the impact assessment process.

3.9 Micro-siting

WTGs, battery storage, ancillary infrastructure and temporary facilities will be micro-sited post approval during the optimisation, detailed design and construction phase programming. Final micro-siting may not occur until during the construction period, immediately prior to the activity or construction of that Project element. The process of locating WTGs, battery storage, ancillary infrastructure and temporary infrastructure during detailed design without further approval, providing that:

- Ground disturbance is wholly contained within the Disturbance Footprint.
- No WTG is moved more than 100 m from the relevant GPS coordinates listed in **Appendix 3**.
- The revised location of the blade of a WTG is at least 50 m from the canopy of existing hollow-bearing trees; or where the proposed location of the blade of a WTG is already within 50 m of the canopy of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees

3.10 Environmental Management System

An Environmental Management Strategy (EMS) will be developed for the Project. Opportunities for continuous improvement will be implemented where practicable. The EMS will be developed in general accordance with ISO14001 Environmental Management Systems and will include all required management plans, procedures and protocols required as per the Development Consent (if approved) or as required via a risk assessment process.

The EMS will integrate policy, procedures and processes for training of personnel, monitoring, summarising, and reporting of environmental performance information to internal and external stakeholders. It will guide the environmental management activities of the Project throughout construction, operation, maintenance and decommissioning. Environmental risks will be identified via a risk assessment process, and mitigation and/or management measures determined to avoid or minimise environmental impacts.

The EMS will describe measures to monitor and publicly report on environmental performance via the Project website and will generally include a summary of monitoring results in accordance with the Development Consent (if approved), all required approved management plans and programs.

4.0 Statutory Context

This section outlines the key planning and approval pathways for the Project under State and Commonwealth legislation. Relevant statutory requirements under other State and Commonwealth legislation are considered in detail in the Statutory Compliance Table, provided in **Appendix 4**.

4.1 NSW Approval Pathway

The EP&A Act is the primary instrument which regulates the environmental impact assessment and approval process for development in NSW.

The Project will require development consent under Part 4 of the EP&A Act. Being development for the purpose of electricity generation with a capital investment value of more than $30 million, the Project is declared to be SSD under the provisions of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP).

Section 4.15 of the EP&A Act describes the matters for consideration in assessing SSD, which includes the provisions of relevant environmental planning instruments (EPIs), proposed instruments that have been the subject of public consultation, development control plans, planning agreements and statutory regulations. The assessment of SSD must also consider the likely impacts of the development, suitability of the site, any submissions received and the public interest.

In accordance with Part 8, Division 5 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), a development application for SSD (SSDA) must be accompanied by an EIS which complies with the Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project, along with other general requirements as outlined in Part 8, Division 5 of the EP&A Regulation.

On 17 February 2023, the NSW Planning Secretary issued SEARs for the Project. **Appendix 1** outlines the requirements set out in the SEARS and how these requirements have been addressed within this EIS.

4.1.1 Consent Authority

Under Section 4.5(a) of the EP&A Act the consent authority for SSD is the Independent Planning Commission (IPC) (if the development is of a kind for which the Commission is declared the consent authority by an environmental planning instrument) or the Minister for Planning and Public Spaces (if the development is not of that kind).

In accordance with clause 2.7(1) of the Planning System SEPP if any of the criteria identified below are exceeded the IPC is the consent authority:

- Wentworth Shire Council object to the application.
- 50 submissions (other than from the Councils noted above) are made objecting to the Project.
- Spark Renewables discloses a reportable political donation.

If none of the above criteria are triggered, DPHI will determine the development application on behalf of the Minister.

4.1.2 Permissibility

Clause 2.36(1)(b) of State Environmental Planning Policy (Transport and Infrastructure) 2021 (TI SEPP) provides that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed non residential zone, including RU1 Primary Production.

The Project Area is primarily zoned RU1 Primary Production, with some small pockets of C2 Environmental Conservation under the Wentworth LEP 2011. 'Electricity generating works' are permissible with consent within both zones. It is noted, however, that the Project has been designed to avoid areas zoned C2 Environmental Conservation and to locate Project infrastructure within previously disturbed cropping land within the RU1 zone.

Consideration of the relevant zone objectives is provided in **Appendix 4.**

As noted in **Section 3.2.1**, the Project includes the following potential future land subdivision/s, including the creation of new freehold lots. These lots will be smaller than the 10,000-ha minimum lot size under the Wentworth LEP (for land zoned RU1). Notwithstanding this, consent may be granted for the proposed subdivision under Section 4.38(3) of the EP&A Act. It is submitted that consent for the subdivision should be granted on the basis that:

- The proposed subdivision/s would not change any existing dwelling entitlements or result in the fragmentation of agricultural land.
- The subdivision/s would facilitate a permissible land use (being electricity generating works).

4.2 Commonwealth Legislation

4.2.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act provides a framework for protection of the Australian environment, including its biodiversity and its natural and culturally significant places. Any action which will or is likely to have a significant impact on a matter of national environmental significance (MNES) is a Controlled Action which requires assessment and approval under the EPBC Act:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (listed under the Ramsar Convention).
- Listed threatened species and ecological communities.
- Migratory species protected under international agreements.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mines).
- A water resource, in relation to coal seam gas development and large coal mining development.

On 26 May 2023, the Project was declared a Controlled Action under section 75 of the EPBC Act on the basis of likely significant impacts to listed threatened species and communities (section 18 and 18A) under the EPBC Act. It was further determined that the Project will be assessed under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). The Controlled Action Decision (EPBC 2023/09500) is provided in **Appendix 1**. Supplementary SEARs were subsequently issued by the former NSW Department of Planning and Environment. The Supplementary SEARs are included in **Appendix 1**, along with a list of protected matters identified by the Commonwealth DCCEEW as relevant to the Project. The biodiversity requirements are addressed in detail in Appendix E of **Appendix 6**. The heritage requirements are address in **Section 6.3** and **Section 6.4** of this EIS.

4.3 Statutory Requirements Summary

A summary of the statutory requirements for the Project is provided in **Table 4.1**.

Table 4.1 Statutory Requirements Summary

Category	Comment
Power to grant approval	Section 4.38 of the EP&A Act provides the power to grant approval for SSD. The Project is SSD as it involves development for the purpose of electricity generating works (using wind power) and has an estimated cost of more than $30 million (refer to Schedule 1, Clause 20 of the Planning Systems SEPP.
Permissibility	The Project is permissible with development consent under the Wentworth LEP 2011 as it involves development for the purpose of electricity generating works on RU1 and C2 zoned land.
Commonwealth Approvals	The Project has been declared a controlled action under the EPBC Act (EPBC 2022/09500). The Project will be assessed by the NSW Government under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). The Commonwealth Controlled Action Decision and Supplementary SEARs are provided in **Appendix 1** and are addressed in Appendix E of **Appendix 6**.
Other State Approvals	The Project will require an Environment Protection Licence under the NSW *Protection of the Environment Operations Act 1997* (POEO) and consent from relevant roads authorities under Section 138 of the NSW *Roads Act 1993* for works within public road reserves. As per Section 4.42 of the EP&A Act, these approvals cannot be refused if development consent is granted and the approvals must be substantially consistent with the development consent. Other State approval requirements are discussed further in **Appendix 4**.
Pre-conditions to exercising the power to grant consent	Refer to **Appendix 4** for a summary of all relevant pre-conditions to exercising the power to grant consent for the Project and where these have been addressed in the EIS.
Mandatory matters for consideration	Section 4.15 of the EP&A Act describes the matters for consideration in assessing SSD, which includes the provisions of relevant environmental planning instruments, proposed instruments that have been the subject of public consultation, development control plans, planning agreements and statutory regulations. The assessment of SSD must also consider the likely impacts of the development, suitability of the site, and submissions received and the public interest. All relevant matters are addressed in the EIS based on the outcomes of environmental assessments to be undertaken (refer to **Section 6.0**). Mandatory matters for consideration have been addressed in detail in **Appendix 4**.

5.0 Engagement

Since the inception of the Project, Spark Renewables has been committed to obtaining and maintaining community acceptance of the Project through ongoing community engagement including:

- utilising effective community engagement methods to build long-term positive relationships
- delivering an honest, flexible and transparent community engagement process
- avoiding, minimising and mitigating impacts to environmental, social and cultural values in collaboration with community and stakeholders.

Spark Renewables has been engaging with local and other stakeholders since the Project announcement in August 2022, seeking to build relationships and understand perspectives and needs in the region through meetings with local landowners, neighbouring property owners, local councils, First Nations groups, functional stakeholders (e.g. local service providers), businesses, various non-government organisations and interest groups and relevant Government agencies. This ongoing engagement has informed ongoing Project design changes (refer to **Section 2.7.4**) and has assisted in development of plans for the implementation of the Project including the management and mitigation measures proposed. If the Project is approved, the engagement will continue through the life of the Project.

As discussed in **Section 2.8**, as part of this engagement process, Spark Renewables has reached agreements with host landholders regarding the Project and mitigation of Project related impacts, noting that there are no non-associated dwellings within 10 km of proposed WTGs.

In accordance with the SEARs, this EIS must:

- Detail how engagement undertaken was consistent with the Undertaking Engagement Guide: Guidance for State Significant Projects (DPHI, 2024).
- Describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.

In addition to the engagement undertaken by Spark Renewables, further engagement has been undertaken as part of the Social Impact Assessment (SIA) for the Project following the requirements of the NSW Government guidelines and assessment standards including, but not limited to, the SIA Guideline and the Engagement Guidelines.

An overview of the Stakeholder Engagement Program including the identified stakeholders, engagement undertaken, and the outcomes of the consultation process is provided below. All consultation information relevant to this EIS has been summarised below.

5.1 Social Baseline

Section 3.0 of the Social Impact Assessment (**Appendix 11**) defines the social locality of relevance to the Project and provides a baseline context for the Project. An understanding of the Project baseline is important in providing a foundation from which social impacts relating to the Project can be evaluated and predicted and have been utilised to define engagement activities. As presented in Section 2.3 of **Appendix 11**, a community capitals approach was utilised to structure the social baseline and understand the respective economic, political, social, human, physical and natural capital assets of the locality. The social baseline provides an overview of the defining characteristics of the communities, considering a range of demographic, social and economic indicators.

The social baseline profile was compiled based on the definition of the Project's social locality or 'area of social influence' as detailed in **Appendix 11**. The social locality for the Project has been defined at both a localised and regional scale, given the likely social impacts that may be experienced as a result of the Project. The social locality is detailed in Figure 3.1 of **Appendix 11** and illustrated in **Figure 6.19** of this EIS. **Figure 5.1** below provides a snapshot summary of the key towns of importance within the social locality.

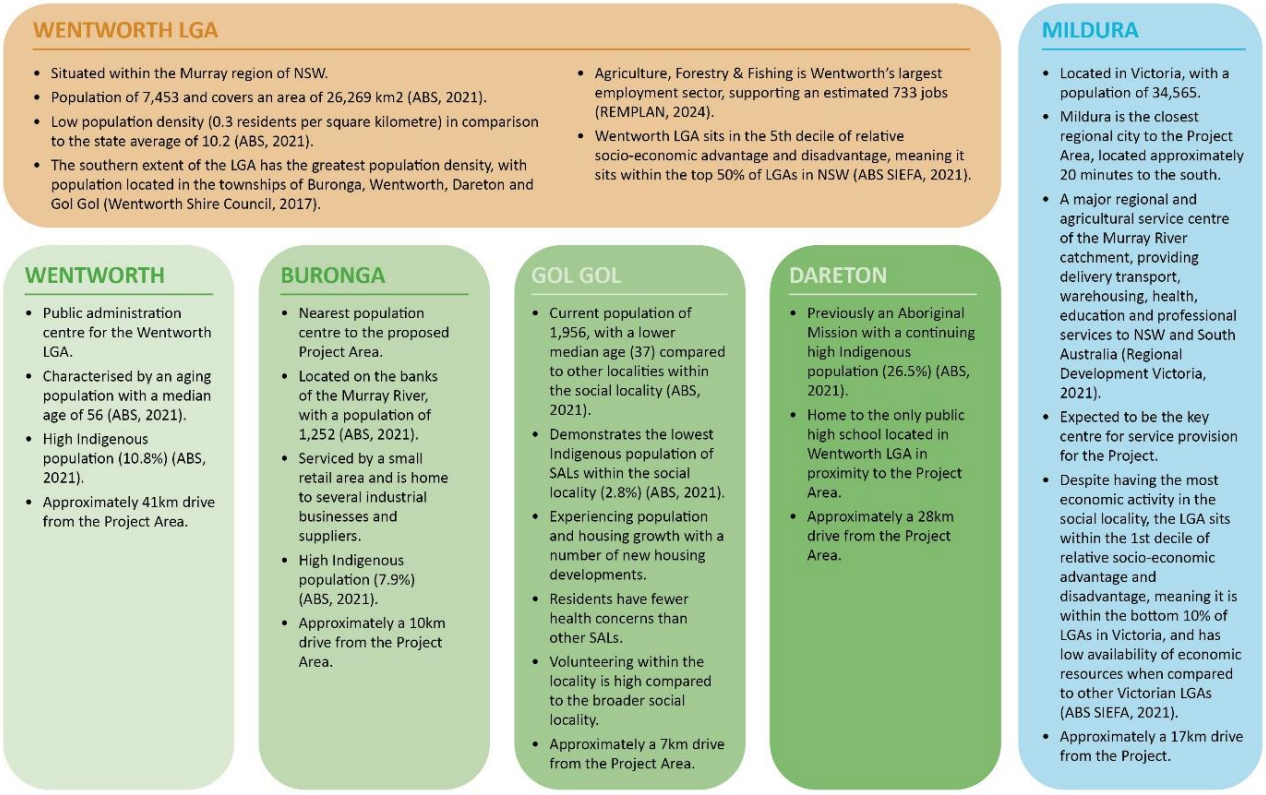


Figure 5.1 Key Towns Snapshot

5.2 Community and Stakeholder Engagement Plan

A Community and Stakeholder Engagement Plan (CSEP) was prepared for the Project (refer to Appendix A of **Appendix 11**) that outlines the objectives and has guided the approach to community engagement.

A stakeholder identification process was undertaken early in the Project to support the planning and delivery of community and stakeholder consultation, and to inform the SIA. This process involved identifying stakeholders with an interest, or those potentially directly and indirectly affected by the Project, including identifying any potentially vulnerable or marginalised groups.

Through the implementation of the CSEP, Spark Renewables aims to:

- Identify effective methods to inform the community of Project information and updates, which foster trust and build positive long-term relationships with community stakeholders.
- Ensure delivery of an honest, innovative, flexible and transparent community engagement process.
- Identify ways to facilitate engagement and collaborate with relevant community organisations, including for input into the social and environmental assessment of the Project and ongoing Project design and planning including the development of community benefit sharing programs.
- Ensure the broader community and stakeholders are kept informed about benefits, potential impacts, and activities of the Project.
- Identify effective avenues for community members to communicate any concerns and provide valuable feedback with Project personnel.
- Ensure means of community involvement are known and distributed consistently.
- Ensure the commitments made to the community during the Project development stage are being met.

The CSEP provides an overview of Spark Renewables' approach to stakeholder engagement throughout all stages of the Project, outlines the Project, provides detail on the consultation undertaken to date and outlines various community benefits. The CSEP and engagement undertaken to date for the Project is consistent with the requirements of the Engagement Guidelines (DPHI, 2024).

5.3 Key Stakeholders

Figure 5.2 below identifies key stakeholders for the Project.

Figure 5.2 Key Stakeholders

5.4 Summary of Engagement Undertaken

Community consultation commenced following the public announcement of the Project, with the first drop-in session held in August 2022. As outlined in **Figure 5.3** additional community information sessions have been conducted, supported by letter box drops of newsletters, for a two (2) year period.

The outcomes of community engagement activities undertaken by Spark Renewables during the scoping and EIS preparation phases were reviewed and consolidated to inform the Project design, EIS and SIA and to understand the range of community views, concerns, interests and feedback provided on the Project. This existing information has been complemented by a targeted consultation program for the SIA, undertaken by Umwelt in collaboration with Spark Renewables.

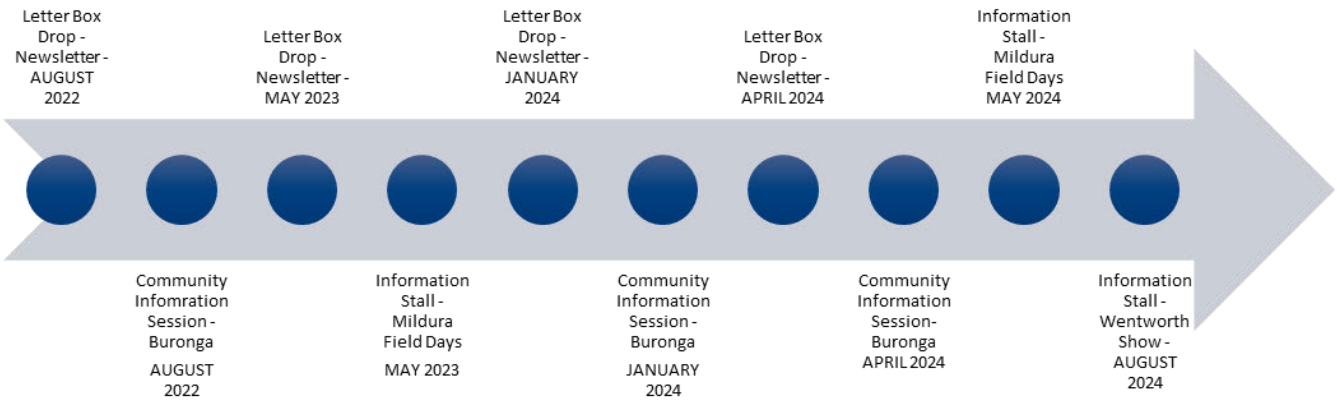


Figure 5.3 Timeline of Community Engagement Activities since August 2022

Spark Renewables has also consulted with relevant Government agencies during the preparation of this EIS. Consultation with Government agencies has been undertaken through various mechanisms throughout the assessment process to keep agencies informed of progress and outcomes of the EIS and associated specialist assessments for the Project. Consultation included Project briefings, discussion of the scope of the specialist assessments and SEARs requirements, and reporting of results of the specialist assessments. Spark Renewables sought relevant Government agency advice throughout the assessment process in order to understand and meet assessment requirements to facilitate robust specialist assessments and ensure key issues were addressed.

5.4.1 Community Engagement

A summary of the consultation activities undertaken during the stakeholder engagement program is presented in **Section 5.4.2** below**.** Spark Renewables has engaged with community stakeholders to ensure that key issues raised are well understood and impacts can be avoided. A summary of the community and other stakeholder interactions and feedback is provided in **Table 5.1** and **Table 5.2**. Spark Renewables engaged in a range of activities, including hosting several community drop-in sessions, pop-up stalls at regional Field Days and meeting with neighbouring landholders and local stakeholders in-person and online to build and maintain genuine and trusting relationships. **Figure 5.3** summarises the key engagement activities undertaken to date including letterbox drops and electronic distribution of community newsletters and in person information sessions and information stalls undertaken to provide opportunities for community to ask questions and provide feedback.

5.4.2 Nearby Stakeholders

5.4.2.1 Host Landholders

Spark Renewables consultation with host landholders has been continuous, and aligned with key milestones, since the commencement of engagement activities in August 2022. Consultation has included the ongoing provision of Project updates focusing on design related matters, property access for surveys, progress with respect to the planning pathway (i.e. this EIS), and more broadly the Project's overall schedule.

Host landholders were provided regular updates regarding matters such as community and stakeholder engagement, field survey and outcomes, visual, noise and traffic. Questions and feedback were received and responded to over the course of the EIS phase. This was facilitated via phone-calls, teleconferences, written correspondence and face-to-face meetings.

5.4.2.2 Proximal Neighbours

As there are no WTGs located within ten (10) km of a non-associated landholder and no landholder agreements have been required, specific consultation relevant to proximal landholders has not been undertaken. Proximal neighbours have been consulted alongside the broader community as outlined in **Section 5.4.1**.

Given the above, consultation with proximal neighbours is not differentiated from the broader community in subsequent parts of Section 5.0 of this EIS or within the SIA (**Appendix 11**).

5.4.2.3 Proximal Projects

As detailed in **Section 2.5**, a number of proposed projects are located in proximity of the Project including:

- Euston Mineral Sands Project located immediately to the south and within the Project Area. Consultation with Iluka Resources Limited, the proponent of Euston Mineral Sands Project has been undertaken and is ongoing to ensure coordinated construction, operation and decommissioning of both projects.
- Mallee Solar Farm located adjacent to the southern extent of the Project Area. This project is also proposed by Spark Renewables but is subject to a separate planning process.
- Gol Gol Solar Farm, Gol Gol Wind Farm and Gol Gol BESS projects are located west of the Project Area and are proposed by Squadron Energy Pty Ltd. These projects have recently received SEARs at the time of writing this EIS (Sept 2024). Consultation with Squadron Energy will be undertaken as the projects progress their development applications.

5.5 Outcomes of Engagement Undertaken

This section provides an overview of stakeholder feedback collected over the course of the Stakeholder Engagement Program.

5.5.1 Community Engagement

As part of the Stakeholder Engagement Program and to support the SIA (**Appendix 11**) a range of engagement mechanisms including a Project website, online and hard copy surveys, personal interviews, and community information sessions were undertaken. Further details regarding the engagement mechanisms are provided in **Section 6.7** and **Appendix 11**.

In accordance with the EIS Guideline, perceived impacts and community views on the Project have been considered in the following categories:

- the strategic context, including identifying the key natural and built features that are valued in the area and could be affected by the Project
- the design of the Project and any alternatives considered

- any relevant statutory issues
- community engagement (e.g. the level or quality of engagement carried out during the preparation of this EIS, the community engagement that should be carried out if the Project is approved)
- the economic, environmental and social impacts of the Project
- the justification and evaluation of the Project as a whole (e.g. consistency of project with Government plans, policies or guidelines; merits of the Project)
- issues that are either beyond the scope of the Project (e.g. broader policy issues) or not relevant to the project.

Feedback from the first community information sessions was that the Project should provide multiple opportunities for community members to engage with Spark Renewables. As such, Spark Renewables hosted information stalls at the local agricultural show, the Mildura Field Days across both 2023 and 2024 and the Wentworth Show in 2024.

Feedback from the community consultation has been broadly supportive of the Project location, with many feeling the Project is “out of the way”. Feedback on the economic opportunities the Project would create for the local area, particularly local employment, has been positive throughout the community engagement. One of the key concerns raised by the community and stakeholders during consultation has been potential for turbine strike impacts to birds and bats. Overall, the feedback received on the Project has been constructive and key stakeholders have responded positively to early engagement.

The main areas of interest raised by the community and stakeholders as detailed in **Table 5.1** and **Table 5.2** include:

- Long-term environmental impacts from wind farm decommissioning and disposal of infrastructure.
- Threats to valued migratory bird species and local flora from bird strikes and land clearing.
- Temporary population increase during construction leading to pressure on housing, health services, and emergency services.
- Traffic-related impacts: increased noise, road deterioration, longer travel times, and safety risks from heavy vehicles.
- Alteration of rural landscape and community sense of place due to the industrial nature of the wind farm.
- Noise disturbance from both construction and operational turbines affecting nearby residents.
- Strain on local resources: water supply, waste management, and electricity, with reduced access for agriculture.
- Potential flooding and environmental risks due to project development and runoff.
- Concerns about the protection of Aboriginal and European cultural heritage values.
- Decreased community cohesion and increased stress or anxiety from uncertainty in the project and its impact.

These keys issues were considered and addressed throughout the Stakeholder Engagement Program and in preparation of technical assessments and this EIS.

5.5.2 Community Consultation on EIS Impacts

Efforts have been made to consult the broader community including proximal neighbours located more than ten (10) km from WTGs. This has included distribution of multiple community information sheets with the final community information sheet focussed on the preliminary findings of the EIS.

During the Scoping and EIS phases, these information sheets were sent to approximately 1,100 households in Buronga, Gol Gol, Mallee, Arumpo, Monak, Trentham Cliffs, and Mourquong via Australia Post's unaddressed mail system, as well as to 131 email addresses on the Project's mailing list.

Residents were also invited to attend community drop-in sessions held in April 2023 and April 2024. During the April 2023 session, 22 community members attended the session which was designed to provide information about the Project design and any preliminary findings of impacts such as biodiversity and visual.

The April 2024 community drop-in session aimed to update stakeholders on the EIS findings, Project status, recent design changes, and outcomes from environmental surveys (e.g., biodiversity and heritage). It also provided a platform for the community to share their opinions on various matters. Despite these efforts, community interest has been low, with only five stakeholders attending the most recent session in April 2024 at the Buronga Midway Centre. This three-hour event included mapping and visual aids to address key issues such as Project design, biodiversity, heritage, noise, visual impact, and bushfire concerns.
These events were facilitated by Spark Renewables and attended by the SIA lead, Umwelt.

Spark Renewables has undertaken additional consultation with the broader community through hosting Project information stalls at local events including Mildura Field Days in 2023 and 2024 and Wentworth Show in 2024. These opportunities captured opportunistic community sentiment and provided Spark Renewables the opportunity to inform the broader community of the preliminary findings of the EIS.
These local events had a much higher attendance rate with 50–80 interactions recorded at each event.

A summary of the community responses to a number of prompted social impacts are provided in **Figure 5.4** indicating the average frequency of response to each of the social impacts presented. It is important to note that stakeholders consulted raised both positive (coloured green) and negative impacts (coloured blue) relating to the Project, which have been captured in the frequency chart.

Furthermore **Table 5.1** and **Table 5.2** provide a consolidated summary of perceived Project impacts and benefits and how these matters have been addressed within this EIS.

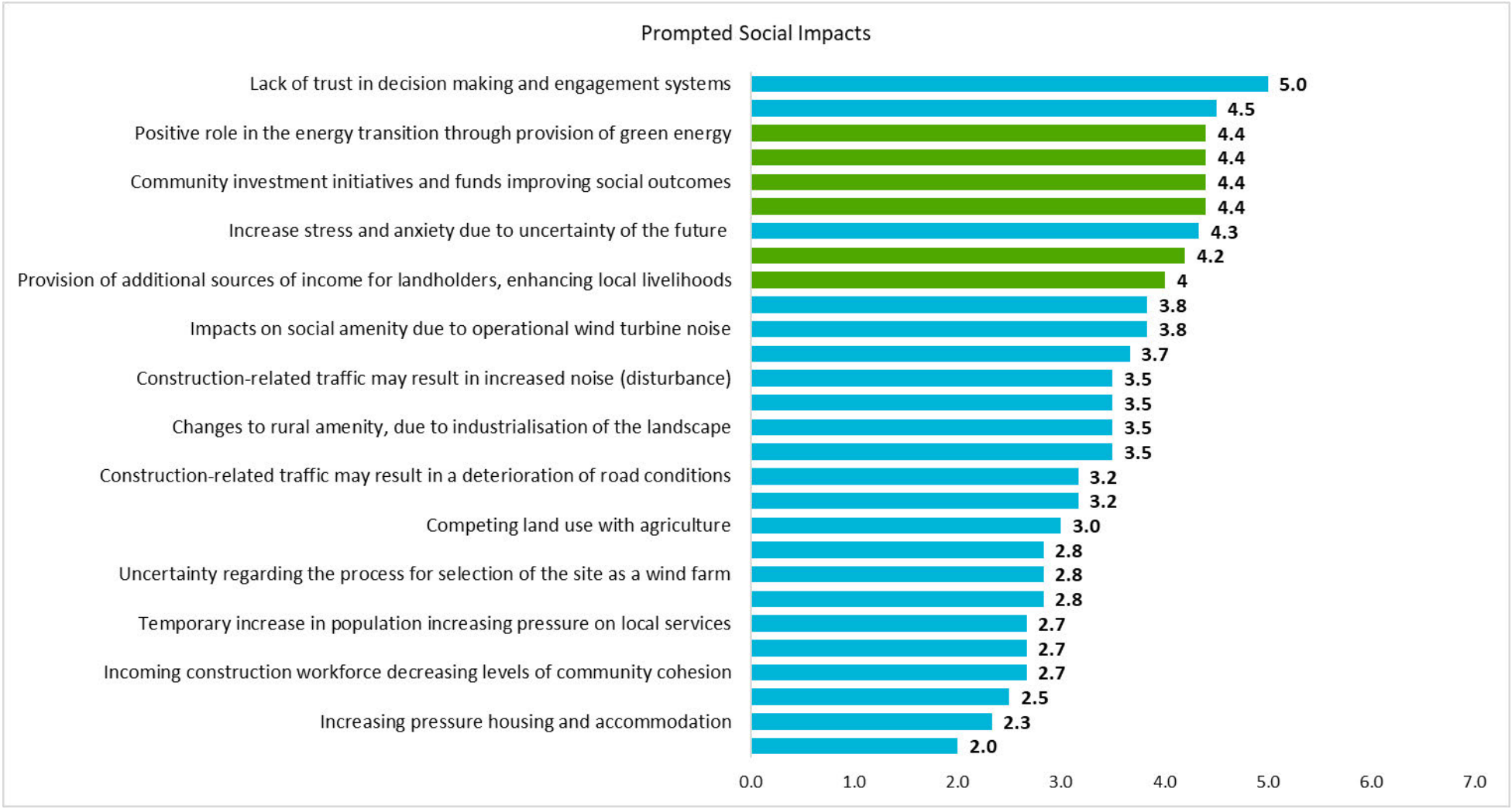


Figure 5.4 Level of Concern of Prompted Social Impacts

N=6, Green represents positive social impacts, Blue represents negative social impacts, Multiple responses allowed.

Table 5.1 Perceived Positive Project Benefits

Category	Feedback	Response	Section Addressed
Economic, environmental and social impacts of the Project	• Increased local procurement and economic spend in local communities and townships due to the influx of construction workers • Increased local employment associated with construction phase • Increase in human capital for local communities (expertise) due to the provision of training and skills development resulting labour pool growth • Host landholders key emphasis was on ensuring infrastructure was sited to maximise ongoing agricultural productivity of the land.	Spark Renewables has worked closely with Wentworth Shire Council to plan an effective program of community engagement and develop a community benefits program that creates lasting value for the local community. Spark Renewables provided regular updates and presented on key aspects of the Project to Councillors and key Council staff from Wentworth Shire Council. Spark Renewables has consulted with local businesses and industry groups including the Industry Capability Network, Department of Regional NSW Western and Mildura Regional Development to connect with local workers, businesses and organisations to maximise regional economic benefits. This includes discussions with Wentworth Shire Council and the Department of Regional NSW (now NSW Department of Primary Industries and Regional Development) about the Project's workforce and construction requirements. Meetings with local universities and education providers including La Trobe University and the Mallee Regional Innovation Centre to discuss local capacity building, and meetings with local businesses including Gol Gol Community Reference Group, Hands Up Mallee, Elecnor, Iluka Resources, The Coomealla Club, Barkandji Native Title Prescribed Body Corporation adn Barkandji Maraura Elders Environment Team to identify opportunities to source local services and supplies during the Project construction. Spark Renewables has proposed a range of measures to optimise the positive economic, environmental and social impacts of the Project.	**Appendix 11, Appendix 21**, EIS **Section 3.1**, EIS **Section 6.7** and EIS **Section 6.12**

It is noted that no perceived positive impacts were identified for the categories of strategic context, justification and evaluation of the Project, Project design or issues beyond the scope of the Project based on the engagement undertaken.

Table 5.2 Perceived Negative Project Impacts

Category	Feedback	Response	Section Addressed
Strategic context	N/A	N/A	N/A
Justification and evaluation of the Project	• Impact on future generations relating to wind farm decommissioning and disposal of infrastructure.	Spark Renewables has committed to a range of measures to avoid and minimise economic, environmental and social impacts of the Project including for the decommissioning phase.	**Appendix 5**
Economic, environmental and social impacts of the Project	• Concern for the loss of valued migratory bird species due to potential for bird strikes and valued flora due to land clearing on the Project site. • Temporary increase in population, increasing pressure on housing and accommodation and increased strain on local health and emergency services due to temporary population change associated with construction workforce. • Construction-related traffic may result in increased noise disturbance and deterioration of road conditions and increase travel times. • Potential decrease in safety of local road users due to increase in heavy vehicle traffic during construction. • Changes to rural amenity, due to industrialisation of the landscape, impacting people's sense of place and change in sense of place due to development of alternate land use. • Increase in construction-generated noise that may cause disturbance and annoyance for proximal landholders and host landholders. • Impacts on social amenity due to operational wind turbine noise.	Spark Renewables has worked closed with host landholders to develop a Project layout that is complementary to existing agricultural activities within the host properties. Ongoing feedback from landholders has been incorporated into the design of the Project layout including making sure that access tracks are aligned with the direction of existing cropping to minimise obstacles to farm machinery during harvest. Spark Renewables has provided Project briefings and presentations to key staff and representatives from NSW National Parks and Wildlife Service ('NPWS') and conservation groups (as outlined below) to ensure the Project siting and design is sympathetic to the specially protected areas in the surrounding region. Spark Renewables has presented on and discussed the Project with NPWS staff from the Mallee Cliffs National Park, the NPWS Area Manager for the Lower Darling Area, the Willandra Lakes World Heritage Area Committee, the Australian Wildlife Conservancy and Gol Gol Community Reference Group. Spark Renewables has worked closely with the NSW Biodiversity Conservation Division in undertaking the BDAR to ensure the presence of birds and bats are well understood across the Project site and that impacts are minimised and avoided where possible.	**Appendix 5, Appendix 6, Appendix 7, Appendix 9, Appendix 10, Appendix 11, Appendix 13, Appendix 17, Appendix 20, Appendix 21** EIS **Section 2.7**, EIS **Section 6.2,** EIS **Section 6.2,** EIS **Section 6.4.** EIS **Section 6.5**, EIS **Section 6.6**, EIS **Section 6.7,** EIS **Section 6.9** EIS **Section 6.1, and** EIS **Section 6.13**

Category	Feedback	Response	Section Addressed
	• Increased strain on community water supply, waste management services and electricity associated with the TWA Facility and reduced access to water for agricultural and household purposes due to construction activities. • Increased flood risk associated with Project development and potential runoff. • Uncertainty regarding the Project site selection. • Impacts to Aboriginal Cultural Heritage values, including artefacts, cultural sites, and connection to Country. • Impacts to European Cultural Heritage values. • Decrease in community cohesion and change to composition of the community due to temporary influx of the construction workforce. • Anxiety/ stress associated with the uncertainty of the assessment process, construction, operation and decommissioning. • Reduced workforce health and wellbeing due to potential isolation at the on-site TWA Facility and associated lifestyle. • Safety risks for aircraft due to height of turbines. • Reduced public safety due to reduced access for fire emergency responders.	Spark Renewables has undertaken an iterative design process which has prioritised the avoidance and mitigation of economic, environmental and social impacts of the Project as far as practicable. This has included avoidance and minimisation of impacts upon biodiversity, Aboriginal cultural heritage and agricultural land use. Spark Renewables has established strong relationships with local First Nations groups including Dareton LALC, Barkandji Native Title Prescribed Body Corporate, Barkandji Maraura Elders Environment Team and Mutthi Mutthi through a program of close early engagement. Spark Renewables has employed an Aboriginal Engagement Coordinator from the SW REZ who has visited stakeholders throughout the Project development to build awareness of the Project, better understand the needs and aspirations of stakeholders and discuss future opportunities for employment and the community benefit sharing program. Spark Renewables has also proposed an on-site TWA facility to reduce impacts upon local services including housing and accommodation. Spark Renewables has committed to a range of measures to avoid and minimise economic, environmental and social impacts of the Project.	
Project design	N/A	N/A	N/A
Issues beyond the scope of the Project	• Lack of trust in decision making and engagement systems. • Reduced property values due to the proximity of the Project.	Impacts to property values are not a relevant planning consideration under the EP&A Act, However, based on the assessment of impacts outlined in Section 6.0 of this EIS, and subject to implementation of the proposed mitigation and management measures, significant impacts to property values are not anticipated.	N/A

5.6 Outcomes of Government Agency Consultation

Consultation with government agencies has been undertaken through various mechanisms throughout the assessment process to keep agencies informed of progress, to confirm assessment requirements and discuss assessment outcomes for the Project.

The consultation provided agencies with the opportunity to provide feedback on assessment methodologies, identify potential concerns and provide guidance on matters to be assessed in this EIS. Consultation included Project briefings, discussion of the scope of the specialist assessments and SEARs requirements and reporting of specialist assessment results.

Table 5.3 provides a summary of key agency consultation outcomes for the Project since the submission of Project specific SEARs.

Table 5.3 Key Outcomes of Government Agency Consultation during the EIS phase

Stakeholder/ Group	Methods of Engagement	Timing	Engagement Summary	Where Addressed in this EIS
NSW DPHI	Statutory process Phone calls Emails Face to face meetings	Scoping Meeting held October 2022 Scoping Report submitted November 2022 SEARs received February 2023 Phone calls and updates via planning portal ongoing Project update in March 2024 Pre-lodgement meeting held in September 2024	Engagement with NSW DPHI is ongoing. The Project has followed the SSD process including a scoping meeting, receipt of SEARs and regular updates with the assessing officers. An update on EIS progress was provided in March 2024. An additional EIS pre-lodgement briefing was held with DPHI on 16 September 2024. Key issues identified in consultation to date includes interactions with Crown land, biodiversity, interactions with nearby national parks and Aboriginal cultural heritage.	**Section 2.4.2, Section 6.2, Section 6.3, Section 5.6, Appendix 6** and **Appendix 7.**
Wentworth Shire Council	Phone calls Emails Face to face meetings Presentations Attendance at information sessions Newsletters	Initial Project briefing in February 2022 Project update meeting in August 2022 Project update meeting in May 2023 Project update in October 2023 Project update in January 2024 Project update meeting in April 2024 Presentation to councillors in April 2024 Community benefit sharing presentation in May 2024 Community benefit sharing proposal letter provided in July 2024	Council has been provided with regular updates regarding the Project and representatives have attended community information sessions. Spark Renewables engagement with Council has been broad and involved engagement with the office of the General Manager and the Director of Health and Planning. There has been direct engagement with councillors that expressed interest in the Project and attended consultation sessions. Spark Renewables also participated in Council's strategic planning consultation regarding regional economic development. Key matters discussed with Council include community benefit sharing, roads and transport and local amenity impacts.	**Section 2.6.3, Section 6.8, Section 6.5, Section 6.6, Appendix 12, Appendix 9 and Appendix 10.**
Commonwealth DCCEEW	Statutory process Phone calls Emails Face to face meetings Site Visit	Project briefing in December 2022 EPBC referral submitted March 2023 EPBC referral decision May 2023 Site visit with Commonwealth DCCEEW assessing officers and Willandra Lakes World Heritage Area representatives held in June 2023 Project update in February 2024 Project update and Section 156 variation in August 2024	There has been ongoing engagement with the Commonwealth DCCEEW assessment team. Following the Project's EPBC referral decision and issue of supplementary assessment requirements, a site visit was undertaken by officers of the Commonwealth DCCEEW. An important aspect of this site visit was meeting with representatives from the Willandra Lakes World Heritage Area including Dr Dan Rosendahl – NPWS Executive Officer for Willandra Lakes World Heritage Area and Mr Warren Clark from the Willandra Lakes World Heritage Area Aboriginal Advisory Group.	**Section 6.5.3, Section 6.2, Appendix 6** and **Appendix 9.**

Stakeholder/ Group	Methods of Engagement	Timing	Engagement Summary	Where Addressed in this EIS
			The importance of understanding the Project's potential visual impacts within the Willandra Lakes World Heritage Area was discussed as a key issue during this site visit. These discussions led to Spark Renewables being invited to present to the Willandra Lakes World Heritage Area Committee in October 2023 which is described further in the NPWS section below. Commonwealth DCCEEW continue to be engaged on the Project with respect to the Project's biodiversity and visual impact assessments. An update meeting was held for the Commonwealth DCCEEW assessing officers in February 2024 where the actions taken to address concerns around the Willandra Lakes visual impacts were discussed. Feedback was received supportive of Spark Renewables early engagement to address these concerns. The outcomes of the biodiversity assessment were identified as a key issue for further consultation. A further Project update was provided in August 2024 followed by a Section 156 Variation to the Project's referral regarding design changes since the referral was originally made.	
NSW NPWS including: Mallee Cliffs National Park Willandra Lakes World Heritage Area Lower Darling Area West Branch	Phone calls Emails Face to face meetings Presentations Newsletters	Briefing letters provided November 2022 Mallee Cliffs National Park and Lower Darling Area West Branch Briefing August 2023 Presentation to the Willandra Lakes World Heritage Committee in October 2023	NSW NPWS have been engaged through the development of the Project and environmental impact statement. Initial briefing information was provided in November 2022. This was followed by a presentation to the Manager of the NSW NPWS Lower Darling Area West Branch and representatives from the Mallee Cliffs National Park at the Buronga NPWS office in August 2023. Key matters discussed included biodiversity, fire and aviation, visual impacts to Willandra Lakes and telecommunications.	**Section 6.6, Section 6. 13.2, Section 6.13.6, Section 6.5.3.4, Section, 6.13.3, Appendix 6, Appendix 17, Appendix 9, Appendix 10** and **Appendix 16.**

Stakeholder/ Group	Methods of Engagement	Timing	Engagement Summary	Where Addressed in this EIS
			In October 2023 Spark Renewables presented the outcomes of a preliminary visual impact assessment to the Willandra Lakes World Heritage Advisory Committee. This meeting was valuable as it facilitated engagement with key stakeholders not previously known to the Project and addressed concerns regarding the potential for visual impacts which are expected to be indiscernible at viewpoints within the Willandra Lakes.	
NSW Biodiversity Conservation Division – South West Region (BCD)	Phone calls Emails Face to face meetings Letters Reports	Briefing meeting December 2022 Detailed consultation regarding bird and bat survey methodology May-July 2023	The Project's biodiversity lead (Umwelt) has consulted closely with NSW BCD through the preparation of the biodiversity development assessment report ('BDAR'). An initial briefing and consultation session was held with the BCD South-West team, Umwelt and Spark Renewables. The approach to bird and bat surveys and impact assessment was identified as a key area of interest for BCD particularly due to the Project's proximity to the Mallee Cliffs National Park. A detailed methodology for bird and bat utilisation surveys ('BBUS') was presented to BCD in May 2023. In July 2023 BCD provided feedback on the BBUS methodology and additional guidance regarding turbine risk assessment and avoidance measures. The Project responded to this feedback by increasing the BBUS survey effort in line with BCD recommendations and applying additional buffers of 600 m between turbines and dense vegetation likely to support high quality habitat for birds and bats. This resulted in a reduction of the number of WTGs.	**Section 6.2.2, Section 6.2.3.4, Section 6.2.3.3, Section 6.2.7** and **Appendix 6.**
Crown Land	Phone calls Emails Face to face	Ongoing since July 2021 Joint meeting with DPHI regarding the Project's SSD application – December 2022	Crown Lands have been consulted closely regarding the conversion of Western Land Leases to freehold titles for the involved properties. This has resulted in two of the three properties receiving an offer to convert and the third expecting to receive an offer to convert shortly. Crown Lands have been generally supportive of the Project's approach and provided written support for the lodgement of the EIS.	**Section 2.4.2**

Stakeholder/ Group	Methods of Engagement	Timing	Engagement Summary	Where Addressed in this EIS
Other agencies consulted: DPI Agriculture, Air Services Australia, CASA, DPE Water, DPI Fisheries, EPA, FRNSW, Heritage Council, Heritage NSW, NSW Mining, Exploration & Geoscience, NSW RFS, Transport for NSW	Phone calls Emails Face to face meetings Letters	Focused consultation August-September 2023	In August 2023 briefing letters issued to all agencies identified in the Project SEARs seeking consultation. Meetings held with agencies seeking further discussion in September 2023 including DPI Agriculture and NSW Mining, Exploration & Geoscience. No additional key matters were identified beyond the scope of the Project SEARs as a result of these meetings.	Not Applicable

5.7 Ongoing Engagement

Spark Renewables is committed to delivering engagement throughout the life of the Project and will remain the key point of contact for local landowners, neighbouring property owners, Councils, First Nations groups, local service providers and relevant Government agencies. The engagement completed to date has built strong relationships with local stakeholders and informed the Project's approach to future engagement. The engagement will continue to be guided by the principles of engagement outlined above and will focus on building and maintaining long term positive relationships with local stakeholders and remaining open and responsive to feedback. A high-level framework for the delivery of future communication and engagement throughout the Project was prepared in consultation with local stakeholders and is presented in **Table 5.4**.

Table 5.4 Plan for Future Engagement

Project Milestones	Indicative Timing	Engagement Approach
Environmental Impact Statement and SW REZ Tender Process	2024	Continue regular community newsletter updates and information sessions including attendance at the Mildura and Wentworth Shows. Detailed stakeholder engagement through the preparation and exhibition of the EIS. Consultation to be held with local industry and First Nations stakeholders to inform the Industry and Aboriginal Participation Plan (IAPP). Detailed consultation with Council, Community Groups and First Nations stakeholders to identify and develop initiatives that will be supported by the community benefit sharing program.
Project Approvals and Procurement	2025	Continue regular community newsletter updates and information sessions including attendance at the Mildura and Wentworth Shows. Ongoing consultation with Council, Community Groups and First Nations stakeholders to identify and develop initiatives that will be supported by Community Benefits Program. Targeted sponsorship of local initiatives.
Construction commences	2026-2028	Continue regular community newsletter updates and information sessions. Community benefits fund commences and provides annual funding for local initiatives selected by committee.
Commissioning	2028	Continue regular community newsletter updates and information sessions including attendance at the Mildura and Wentworth Shows. Community benefits fund commences and provides annual funding for local initiatives selected by committee. Targeted sponsorship of local initiatives.
Project operational	2029-2059+	Continue regular community updates. Community benefits fund continues to provide annual funding for local initiatives selected by committee.

If the Project is approved, Spark Renewables will continue to engage with the community throughout the construction, operation and decommissioning phases of the Project. The approach for ongoing community engagement and public participation will be guided by the standard and protocols outlined in the CSEP.

Spark Renewables will update the existing CSEP for the Project prior to construction commencing. The CSEP will include requirements to regularly monitor, review and adapt ongoing community engagement strategies over time to ensure it remains effective and encourages community participation.

Other ongoing engagement activities will include:

- regular updates to the Project website
- distribution of newsletters/Project updates, information sheets, fact sheets and/or FAQs to the local community
- phone calls and ongoing face to face meetings with local landowners, including hosts, associated landowners and non-associated landowners
- community drop-in sessions and attendance at local Shows and events
- letter box drops
- operation of the free call community enquiry line
- maintenance of a complaints register
- the Project email address and free call number will remain in place, and Spark Renewables representatives will continue to take responsibility for addressing feedback and concerns as and when they arise.

Spark Renewables will also ensure that relevant information is publicly available for the life of the Project on its website. This will include, but is not limited to:

- the final layout plans for the Project
- current statutory approvals for the Project
- approved strategies, plans or programs required under conditions of consent
- a comprehensive summary of the monitoring results
- a complaints register
- any independent environmental audits.

6.0 Assessment of Impacts

This section provides a summary of the impact assessments conducted for the EIS, first providing a preliminary environmental risk analysis (**Section 6.1**) and then targeted assessments for each key issue, refer to **Section 6.2** to **Section 6.15**.

6.1 Preliminary Environmental Risk Analysis

A review of the environmental and social matters relevant to the Project was conducted as part of the Scoping Report (Umwelt, 2022) to determine which issues needed to be assessed as part of this EIS and the level of assessment required. The review was undertaken with reference to the categories of assessment matters identified by the Scoping Report Guideline (DPE, 2022).

As part of the preliminary environmental and social assessment, potential Project issues were separated into 'Key Issues' and 'Other Matters', as presented in the Scoping Report. 'Key Issues' are those where there is a reasonable likelihood that the Project will have a material impact and detailed assessment was required to fully understand such impacts and identify Project-specific avoidance and mitigation. 'Other Matters' are issues which are not of particular concern and are unlikely to have a material impact and/or the measures to manage the impacts are well understood and routinely used on similar projects.

The Scoping Report (Umwelt, 2022) identified that the following key issues required detailed assessment as part of this EIS:

- **Biodiversity** – despite the existing agricultural land use within the Project Area biodiversity is a key issue. The Project will result in some disturbance to native vegetation and loss of habitat and has the potential to impact threatened and endangered species including through bird and bat strike (refer to **Section 6.2**).
- **Aboriginal Cultural** and **Historic Heritage** – the construction and operation of the Project has the potential to impact Aboriginal cultural heritage and other heritage values within and in proximity to the Project Area (refer to **Section 6.3** and **Section 6.4**).
- **Visual Amenity** – despite the site setting, and very low density of dwellings in proximity to the Project Area visual amenity is a key issue. The potential for the Project to impact the landscape character of the locality and result in loss of visual amenity to surrounding landholders and visitors is considered (refer to **Section 6.5**).
- **Noise** – despite the site setting, and very low density of dwellings in proximity to the Project Area noise is a key issue. Noise disturbance to surrounding landholders associated with the operation of the proposed WTGs and associated infrastructure, and road traffic noise and construction activities are considered (refer to **Section 6.6**).
- **Socio-Economic Impacts** – the Project has the potential to result in both positive and negative social and economic impacts. Potential positive impacts resulting from social and economic benefits through significant capital expenditure, the implementation of community and neighbour benefit programs, employment generation and use of services, and the potential for some negative social impact due to potential impacts to nearby landholders and demand on the workforce and services (refer to **Section 6.7** (social impacts) and **Section 6.12** (economic impacts).

- **Traffic and Transport** – the Project will result in increased traffic associated primarily with the construction phase, including OSOM vehicles (refer to **Section 6.8**).
- **Water Resources** – specifically, impacts to water resources through increased demand for water, particularly during the construction period, and potential impact to surface water quality, the quality and quantity of groundwater resources and local flooding regimes (refer to **Section 6.9**).
- **Soils, Land Capability and Agriculture** – impacts to soil and land capability within the Project Area as well as potential land use conflicts associated with the operation of the Project on local agricultural operations (refer to **Section 6.10**).
- **Hazards and Risks** – operation of the proposed WTGs and associated infrastructure requires assessment of potential hazards, including a preliminary hazard assessment regarding the proposed battery storage, bushfire, telecommunications, electromagnetic fields, blade throw and aviation safety (refer to **Section 6.13**).
- **Waste management** – specifically, waste generation associated with the construction, operation and decommissioning of the Project (refer to **Section 6.14**).
- **Cumulative Impacts** – the construction and operation of the Project has the potential to result in cumulative impact within the REZ due to the existence of some other existing and proposed land uses including other renewable energy related projects (refer to **Section 6.15**).

Table 6.1 outlines the matters that are considered to not require further assessment in this EIS based on the scoping phase assessment along with a comment justifying why no further assessment is required.

Table 6.1 Matters Not Requiring Assessment

Stakeholder Group	Identified Stakeholders
Greenhouse gas and energy	As the Project will generate renewable energy, the emissions resulting from the construction, operation or decommissioning will be readily offset by the reduction in energy generation emissions. While GHG emissions are not specifically assessed in this chapter, the Project's contribution to meeting emissions targets is discussed in **Section 2.1** and **Section 7.0**.
Port and airport facilities	The Project does not result in any change to port or airport facilities. Works required along the OSOM Transport Route (between Port of Newcastle and Euston) to facilitate the carrying out of the development do not form part of the current Project (refer to **Section 3.5.9**). Aviation safety associated with Project operations is considered in the Aviation Impact Assessment (refer to **Section 6.13.6**).
Rail facilities	The Project does not propose to utilise any rail facilities.
Odour	The Project is not anticipated to cause any odour.
Coastal hazards	The Project is not located within a coastal zone and will not result in any impacts to coastal zones.
Dams safety	The Project does not require any works in proximity to any prescribed dams.
Land movement	The Project is not located within any declared Mine Subsidence District and is not anticipated to result in any land movement. The Project results in relatively minor excavation works only.

6.2 Biodiversity

A Biodiversity Development Assessment Report (BDAR) (refer **Appendix 6**) has been prepared by Umwelt to inform this EIS. The BDAR addresses the SEARs, Supplementary SEARs issued by Commonwealth DCCEEW, as well as agency advice received from the South West Biodiversity, Conservation and Science (BCS) of NSW DCCEEW, which also incorporated comments from NSW National Parks and Wildlife Service (NPWS).

The matters raised within the SEARs and BCS / NPWS agency advice are presented in **Table 6.2**.

Overall, the BDAR provides an assessment of the biodiversity values within the Project Area (and offsite areas of disturbance), documents the application of the avoid, minimise and offset framework and assesses the likely biodiversity impacts of the Project.

The BDAR has been prepared in accordance with the BC Act and Biodiversity Assessment Method (BAM) (DPIE, 2020) under the NSW Biodiversity Offset Scheme (BOS). The Project is regarded as SSD under Division 4.7 of Part 4 of the EP&A Act and is therefore required to be accompanied by a BDAR in accordance with Section 7.9 of the BC Act.

The South West Office of BCS of the NSW DCCEEW has been consulted during the assessment process via teleconferences and written communication. An onsite visit with BCS did not occur, however an offer will be provided should BCS consider it beneficial following exhibition of the EIS. Where feasible and appropriate, advice from BCS has been adopted and is reflected in the BDAR accordingly.

Preliminary investigations identified that the Project was likely to have a significant impact on biodiversity protected under the EPBC Act. A referral was subsequently prepared and submitted, with the Project being determined to be a controlled action (ref EPBC 2022/09423) under the EPBC Act on 20 March 2023, with the relevant controlling provisions relating to likely impacts on listed threatened species and communities (sections 18 & 18A of the EPBC Act). Supplementary SEARs were issued on 28 June 2023. The Supplementary SEARs are addressed within a stand-alone MNES biodiversity assessment report that is provided as Appendix C of **Appendix 6**.

Commonwealth DCCEEW has been consulted during the assessment process (Dec 2023–Aug 2024) via teleconferences, written communication and a site visit during June 2023. Where feasible and appropriate, advice from Commonwealth DCCEEW has been adopted and is reflected in the BDAR accordingly.

The BAM has been endorsed as the assessment method for MNES under a Bilateral Agreement made under the EPBC Act. The Commonwealth Government is the decision-maker for whether the Project will be approved under the EPBC Act. Nationally-listed threatened species and threatened ecological communities (TECs) have been considered and assessed as part the BDAR (**Appendix 6**) and in a separate MNES Assessment provided in support (refer Appendix C of **Appendix 6**). Whilst not listed as a controlling provision, potential impacts to migratory species have also been assessed within the MNES Assessment in line with advice from Commonwealth DCCEEW. The Supplementary SEARs are presented in **Table 6.3**.

A detailed compliance matrix, identifying where each requirement is addressed, is provided within Section 1.0 of **Appendix 6**.

Table 6.2 Issued SEARS and BCS Agency Advice (Biodiversity)

Agency Advice	Key Issue	Requirement (Specific Assessment Requirements in Addition to the General Requirements)
SEARS	Biodiversity	An assessment of the biodiversity values and the likely biodiversity impacts of the project, including impacts associated with transport route road upgrades and indirect impacts on the Mallee Cliffs National Park and surrounding conservation areas in accordance with the BC Act, the BAM 2020 and documented in a BDAR.
SEARS	Biodiversity	The BDAR must including a detailed description of the proposed regime for avoiding, minimising, managing and reporting on the biodiversity impacts (including on grasslands) of the development over time, and a strategy to offset any residual impacts of the development in accordance with the *Biodiversity Conservation Act 2016* (NSW), the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR), including a detailed description of the proposed regime for avoiding, minimising, managing and reporting on the biodiversity impacts (including on grasslands) of the development over time, and a strategy to offset any residual impacts of the development in accordance with the BC Act
SEARS	Biodiversity	An assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimise and rehabilitate impacts.
SEARS	Biodiversity	An assessment of the impacts of the development on birds and bats, including blade strike, low air pressure zones at the blade tips (barotrauma), alteration to movement patterns, and cumulative impacts of other wind farms in the vicinity.
SEARS	Biodiversity	A cumulative impact assessment of biodiversity values in the region from nearby developments
SEARS	Biodiversity	If an offset is required, include details of the measures proposed to address the offset obligation.
Biodiversity Conservation Division (BCS) Submission	Biodiversity	Biodiversity impacts related to the proposed development are to be assessed in accordance with section 7.9 of the BC Act using the BAM 2020 and documented in a BDAR. The BDAR must include information in the form detailed in the BC Act (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and the BAM, unless DPE determines that the proposed development is not likely to have any significant impact on biodiversity values.
Biodiversity Conservation Division (BCS) Submission	Biodiversity	The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the BAM.
Biodiversity Conservation Division (BCS) Submission	Biodiversity	The BDAR must include details of the measures proposed to address the offset obligation as follows 1. The total number and classes of biodiversity credits required to be retired for the development/project 2. The number and classes of like-for-like biodiversity credits proposed to be retired 3. The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules 4. Any proposal to fund a biodiversity conservation action

Agency Advice	Key Issue	Requirement (Specific Assessment Requirements in Addition to the General Requirements)
		5. Any proposal to make a payment to the Biodiversity Conservation Fund (BCF). If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.
Biodiversity Conservation Division (BCS) Submission	Biodiversity	The BDAR must be submitted with all digital spatial data associated with the survey and assessment as per Appendix K of the BAM.
Biodiversity Conservation Division (BCS) Submission	Biodiversity	The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the BC Act.
Biodiversity Conservation Division (BCS) Submission	Biodiversity	The EIS must assess the impact of wind turbine strikes on protected animals including a) Predict the likelihood of impact on aerial species resident in, or likely to fly over, the Project Area, including but not limited to bat/bird strike and barotrauma. b) Predict the rate of impact per turbine per year for species likely to be affected. c) Justify predictions of likelihood of impact and rates of impact with reference to relevant literature and other published sources of information. d) Predict the consequences of impacts for the persistence of bioregional populations, with reference to relevant literature and other published sources of information. e) Predict and map the likely zone of disturbance around wind turbines for aerial species resident in, or likely to fly over, the Project Area, with reference to relevant literature and other published sources of information. f) Map significant landscape and habitat features within the zone of disturbance for species likely to be affected, including but not limited to hollow bearing trees, nest trees, microbat habitat and important habitat for migratory species. g) Predict the likelihood and describe the nature of indirect impacts on aerial species resident in, or likely to fly over, the Project Area including but not limited to barriers to migratory pathways and breeding, feeding and resting resources. h) For migratory species, predict the impact of avoidance behaviour relative to migration distances and the availability of suitable habitat for breeding, feeding and resting over the migration route, with reference to relevant literature and other sources of published information. i) Justify prediction of likelihood and nature of impact, with reference to relevant literature and other published sources of information.

Agency Advice	Key Issue	Requirement (Specific Assessment Requirements in Addition to the General Requirements)
		j) Predict the cumulative impact of the project together with existing wind farms with respect to movement patterns and the use of adjacent habitat and provide justification for these predictions.
Biodiversity Conservation Division (BCS) Submission	National Parks and Wildlife Estate	The EIS must identify and assess: In the case of a project that adjoins land reserved under Part 4 of the *National Parks and Wildlife Act 1974*, ensure no encroachment of assets or ancillary infrastructure occurs, and the project is restricted to the development site and adequately buffered from the reserve. In the case of a project that adjoins, is in the immediate vicinity of, or upstream of land reserved under the *National Parks and Wildlife Act 1974*, ensure the matters outlined in the Developments adjacent to National Parks and Wildlife Service lands: Guidelines for consent and planning authorities are adequately considered and include: recognition of the natural, cultural, social and educational values attached to that land. The Mallee Cliffs National Park Plan of Management should be considered in the assessment of these values recognition of the impacts, including direct, indirect and cumulative impacts as they relate to the environmental values of that land, its location, and greater landscape connectivity within the South-West REZ extent of the direct, indirect and cumulative impacts on that land duration of the direct, indirect and cumulative impacts on the interface, the greater environmental values and the reserves connectivity in the landscape to other reserved land consideration of any impacts from the development on that part of Mallee Cliffs National Park identified as an Asset of Intergenerational Significance (Asset AIS_E0_221) under Part 12A of the NPW Act. Current values prompting the declaration of the land as an AIS are Numbat, Greater Stick-nest Rat and Bilby. Measures proposed to prevent, control, abate, minimise and manage the direct and indirect impacts including an evaluation of the proposed measures effectiveness and reliability over the life of the project. Residual impacts and their significance subject to the protection and conservation of Mallee Cliffs National Park. Risks and increased restrictions imposed to land management operations undertaken by NPWS as a result of the proposed windfarm project, especially in the use of low flight aircraft for aerial pest baiting, weed spraying, firefighting and hazard reduction purposes. Justify compliance with Australian Government Civil Aviation Safety Authority regulations. Consult with NPWS when assessing this. Impacts and environmental risks to the values and resilience of Mallee Cliffs National Park.

Agency Advice	Key Issue	Requirement (Specific Assessment Requirements in Addition to the General Requirements)
		Bushfire protection requirements attached to the proposed windfarm project ensuring they are restricted to the development site, and all ignition threats relating to the project are identified and planned for within the confines of the development site. No fire management is to affect, burden or threaten land reserved as Mallee Cliffs National Park, including any impact on NPWS fire management operations. The Mallee Cliffs National Park Fire Management Strategy should be considered in this assessment. Risk of interference to the functionality and operation of the emergency telecommunications system used by NPWS on Mallee Cliffs National Park as a result of the proposed windfarm project. Consult with NPWS when assessing this.

Table 6.3 EPBC Act Environmental Assessment Requirements for Biodiversity

Requirement	Key Issue	Commonwealth Assessment Requirement
General Requirements	Relevant Regulations	The EIS must address all matters outlined in Schedule 4 of the EPBC Regulations and all matters outlined below in relation to the controlling provisions.
General Requirements	Project Description	The title of the action, background to the action and current status.
General Requirements	Project Description	The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on MNES.
General Requirements	Project Description	How the action relates to any other actions that have been, or are being taken in the region affected by the action.
General Requirements	Project Description	How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.
General Requirements	Impacts	The EIS must include an assessment of the relevant impacts of the action on the matters protected by the controlling provisions, including: i. a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts ii. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible iii. analysis of the significance of the relevant impacts iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

Requirement	Key Issue	Commonwealth Assessment Requirement
General Requirements	Avoidance, mitigation and offsetting	For each of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including: i. a description, and an assessment of the expected or predicted effectiveness of the mitigation measures ii. any statutory policy basis for the mitigation measures iii. the cost of the mitigation measures iv. an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing v. the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.
General Requirements	Avoidance, mitigation and offsetting	Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.
General Requirements	Avoidance, mitigation and offsetting	For each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any: i. conservation advice or Recovery Plan for the species or community ii. relevant threat abatement plan for the species or community iii. wildlife conservation plan for the species iv. any strategic assessment. Note: the relevant guidelines and policy statements for each species and community are available from the Department of the Environment Species Profiles and Threats Database. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl]
General Requirements	Avoidance, mitigation and offsetting	In addition to the general requirements described above, specific information is required with respect to each of the determined controlling provisions. These requirements are outlined below under Biodiversity (threatened species and communities) - Assessment Requirements.
Biodiversity (threatened species and communities)	Assessment Requirements	The EIS must identify each EPBC Act listed threatened species and community likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the Project Area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted.

Requirement	Key Issue	Commonwealth Assessment Requirement
Biodiversity (threatened species and communities)	Assessment Requirements	For each of the EPBC Act listed threatened species and communities likely to be impacted by the action the EIS must provide a separate: i. description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and Recovery Plans ii. details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements iii. description of the relevant impacts of the action having regard to the full national extent of the species or community's range iv. description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action v. identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account vi. a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established vii. details of how the current published BAM has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts.
Biodiversity (threatened species and communities)	Assessment Requirements	Any significant residual impacts not addressed by the BAM may need to be addressed in accordance with the EPBC Act 1999 Environmental Offset Policy. http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

The BDAR refers to two (2) unique land areas, the landscape "Assessment Area" and "Biodiversity Study Area" as shown in **Figure 6.1** below, and defined as follows:

- **Assessment Area (or Landscape Assessment Area) (10,708.62 ha):** the "Development Footprint" (see note below regarding EIS and BDAR terminology) and the area of land within 500 m of the "Development Footprint" that is determined as per Subsection 3.1.2 of the BAM.
- **Biodiversity Study Area (4,887.25 ha):** the specific assessment area adopted for the BDAR.

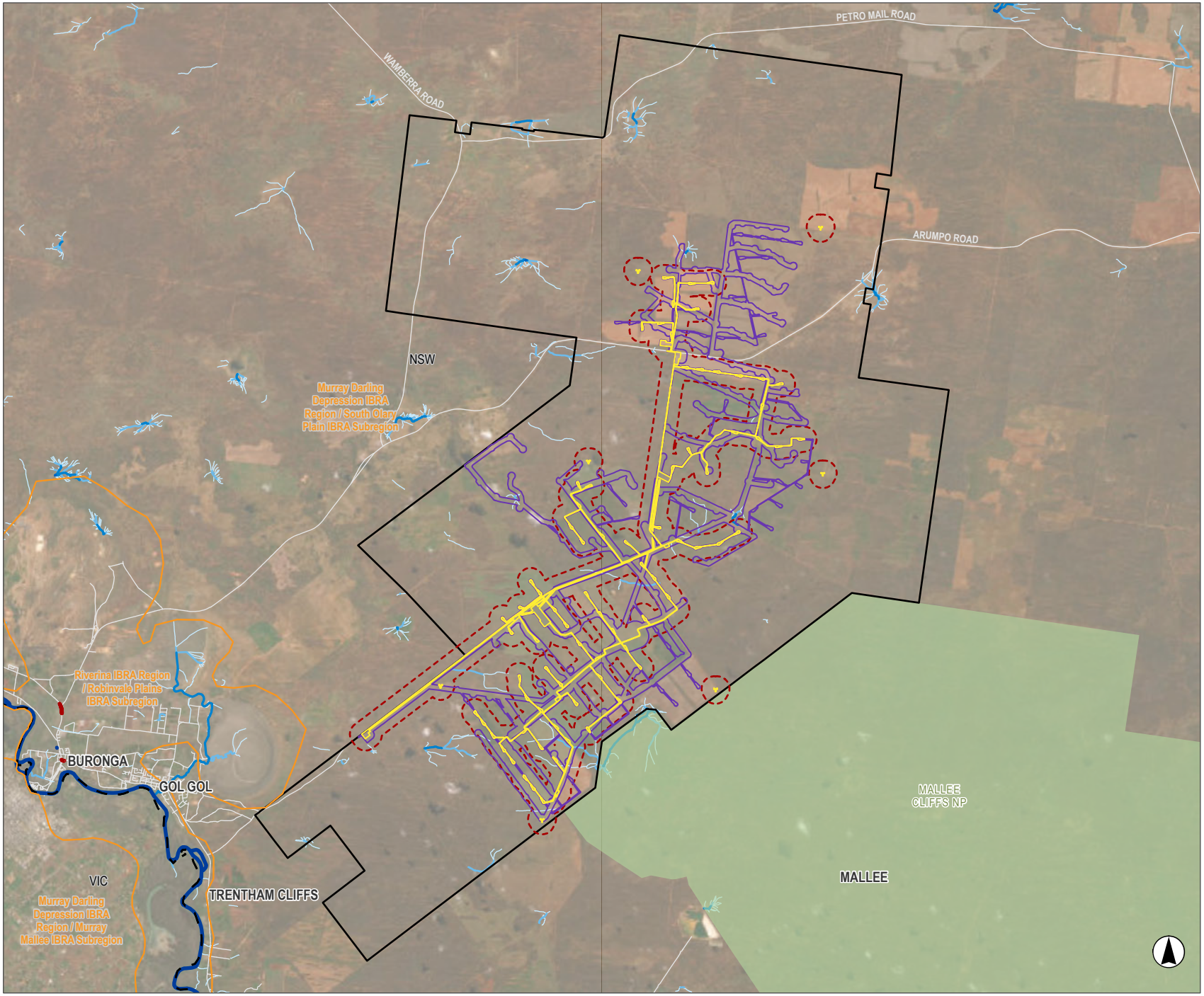
The Biodiversity Study Area is the amalgamation of previous and current designs of the Project. Since 2022, the Project has undergone refinement considering various constraints. The result of surveys within each design iteration has been built upon to form a comprehensive dataset for the Biodiversity Study Area noting the "Development Footprint" is contained within but forms a smaller component of the Biodiversity Study Area. Through the process of avoidance and minimisation Project related disturbance has been refined down to the current "Development Footprint".

Surveys undertaken across the broader Biodiversity Study Area have been used in this assessment. Note that detailed vegetation surveys have been undertaken across the Biodiversity Study Area, while threatened species surveys have been undertaken within approximately 75% of the Biodiversity Study Area. All native vegetation and potential threatened species habitat within the current "Development Footprint" falls entirely within the portion of the Biodiversity Study Area which has been subject to detailed vegetation assessment and threatened species surveys.

The areas defined above are adopted for the purposes of the BDAR presented in **Appendix 6**, and are referred to specifically, and as required, herein. The "Development Footprint" referenced in the BDAR is equivalent to the Disturbance Footprint referenced and assessed in this EIS. Targeted discussion of the off-site road works is provided below, noting that ground disturbance and impacts associated with these additional off-site areas have been assessed in **Appendix 6**, consistent with the EIS.

FIGURE 6.1

Site Map

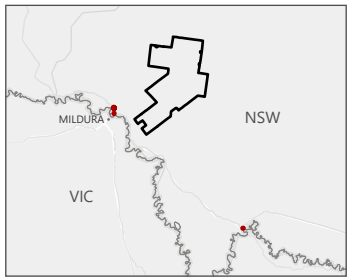


Legend

- Project Boundary
- Development Footprint
- Biodiversity Study Area
- Assessment Area (500m buffer from Development Footprint)
- Off-site Road Works
- State Border
- IBRA Region / Subregion
- NPWS Estates
- Road

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Greater



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Kilometres

Scale 1:225,000 at A4

GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.2.1 Existing Biodiversity Values

The Disturbance Footprint and broader Biodiversity Study Area predominantly consist of cleared land associated with active agricultural practices, primarily being non-irrigated broad-acre grain cropping activities, with associated access tracks and structures.

The Project (specifically the landscape assessment area defined by the BDAR) is located within the Murray Darling Depression Interim Biogeographic Regionalisation for Australia (IBRA) region, and South Olary Plain Subregion of NSW. The Murray Darling Depression Bioregion lies in the southwest corner of NSW and extends into Victoria and South Australia. It is 19,958,349 ha in total with 7,949,169 ha in NSW.
This bioregion is in the Western Division of NSW and is dominated by a hot semi-arid climate in the north and a warm semi-arid climate in the south and eastern section. There are a number of nature reserves, including the World Heritage listed Willandra Lakes Region. Mungo National Park and Mallee Cliffs National Park are also in this bioregion. The bioregion includes the Murray, Murrumbidgee, Lachlan, Darling, Barwon, Yanda River and Peacock Creek catchments (OEH, 2003).

The Disturbance Footprint and broader Biodiversity Study Area do not however contain any rivers, estuaries or wetlands. Waterbodies in the wider area include: Willandra Lakes Region World Heritage Area, (WLRWHA), Mourguong Saltwater Disposal Basin, The Murray and Darling Rivers, Lake Gol Gol and Gol Gol Swamp. There are three (3) dams within the Biodiversity Study Area. These exist as small farm dams that range from 0.2 to 1.8 ha in size. No dams are present in the Disturbance Footprint. There are no wetland communities or ephemeral wetland PCTs present within the Disturbance Footprint or within the Biodiversity Study Area.

The Project Area includes two (2) Mitchell landscapes: Mallee Cliffs Sandplains and Mallee Cliffs Linear Dunes.

The Biodiversity Study Area and Disturbance Footprint primarily contain cropping land, with grazing also occurring in the northern property. Opportunities for wildlife movement across these landscapes would be limited to more mobile species such as large birds, microbats and macropods. Thin strips of native vegetation and small patches of shrubland occur throughout the Biodiversity Study Area and Disturbance Footprint, providing habitat links for less mobile species. These patches are often thin in nature and comprise varying levels of disturbance and understorey/ground cover, reducing the connectivity value to species sensitive to disturbance.

Mallee Cliffs National Park is located south-east of the Project and contains an expanse of native vegetation and connects to several other large natural areas managed for conservation. A portion of Mallee Cliffs National Park was declared an Asset of Intergenerational Significance (AIS) in September 2021 (refer to **Section 7.3.5** and **Figure 7.1**).

Intact vegetation within the Biodiversity Study Area and Disturbance Footprint form part of a large intact expanse of native vegetation in the locality. This intact vegetation likely provides connectivity between the Project Area and habitat to the north, south, east and west for a variety of threatened species such as woodland birds, amphibians, reptiles, and mammals. The Murray River, which is located approximately 10 km west of the Biodiversity Study Area, provides a movement barrier for less mobile species.

The Biodiversity Study Area falls within the Wilkurra Land System (NSW DCCEEW 1991). This landscape comprises a sandplain of Quaternary aeolian material with isolated dunes and rises trending east west, relief to 5 m; small level swales and flats. Soils are highly calcareous solonized brown soils; dunes with deep brownish sands. Vegetation largely comprises dense stands of belah and rosewood, scattered mulga, wilga and inedible shrubs; white cypress pine on sandy rises; variable speargrass, copperburrs and forbs.

The soils are prone to minor windsheeting and drift. Land management considerations include pasture management, erosion hazard if cleared, woody weed control and wind erosion control.

No karsts, caves, crevices, cliffs or rocks are present within the Biodiversity Study Area. No areas of outstanding biodiversity value (AOBV) are present within the Biodiversity Study Area. No areas of Important Habitat Mapping fall within the Biodiversity Study Area or in the surrounding region and there is no Biodiversity Values Mapping in the Biodiversity Study Area.

The extent of native vegetation cover within the Biodiversity Study Area was determined through site surveys and interpretation of aerial photographs using ArcGIS Pro software, the world imagery basemap aerial accessed August 2024 and the NSW State Vegetation Type Map (SVTM): Western 1.0 (VIS_ID 4492) (DCCEEW 2019). The total Landscape Assessment Area comprised 10,708.62 ha, of which the total area of native vegetation cover was approximately 3,076 ha which equates to 28.7 % of native vegetation cover, being Class >10–30%.

6.2.1.1 Plant Community Types

Identification of the PCTs occurring with the Biodiversity Study Area was guided by the results of the review of existing data (Section 4.1.1 of **Appendix 6**) and surveys of the Biodiversity Study Area (Section 4.1.2 of **Appendix 6**).

The data collected during surveys of the Biodiversity Study Area was analysed in conjunction with a review of the PCTs held within the BioNet Vegetation Classification Database and previously published regional vegetation mapping, namely the SVTM C2.0M2.0 (December 2023). Consideration was given to the following:

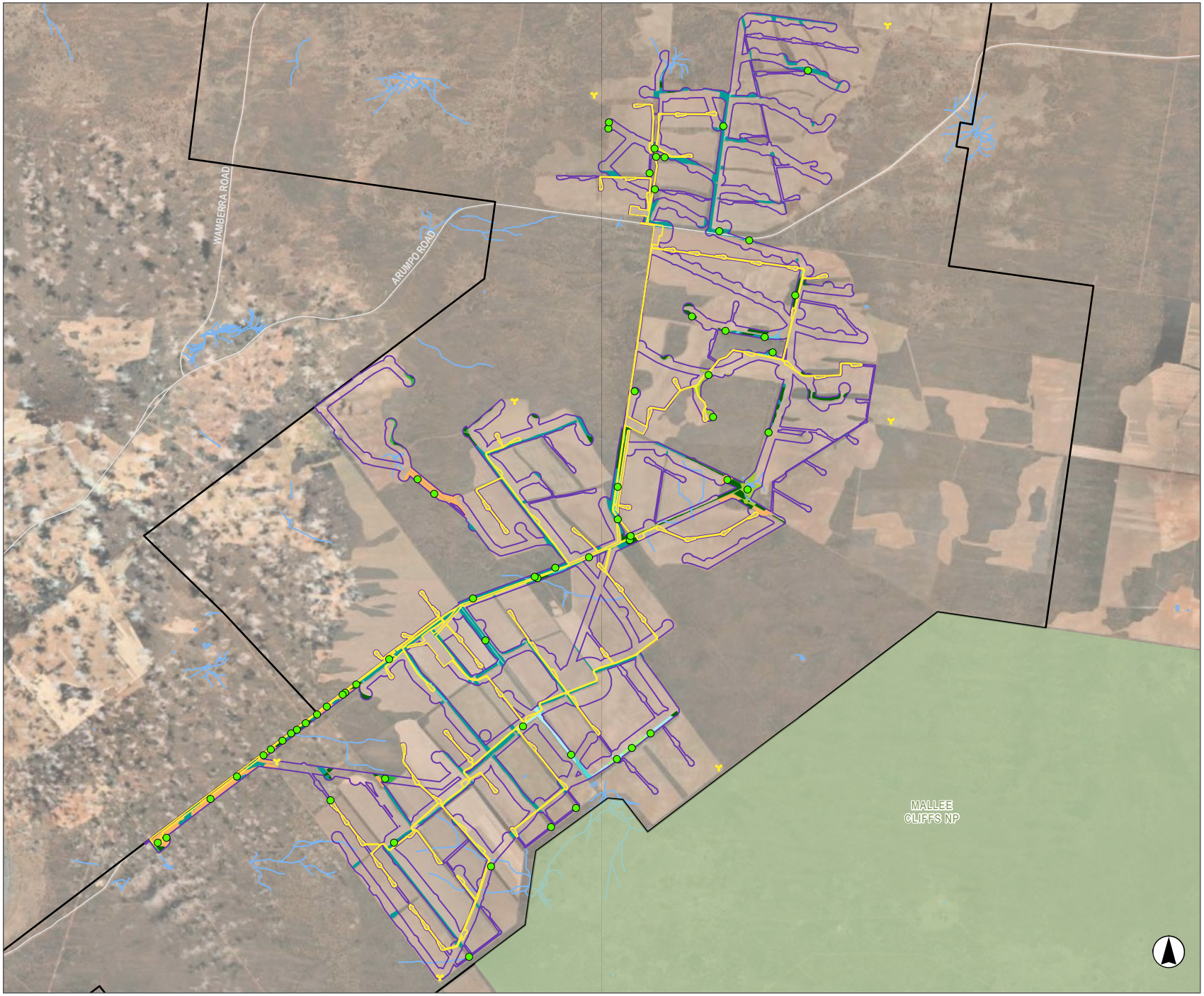
- Occurrence within the Murray Darling Depression IBRA bioregion.
- Vegetation formation.
- Vegetation class.
- Dominant upper, mid and ground strata species.
- Landscape position, soil types and edaphics.

A total of three (3) PCTs comprising eight (8) vegetation zones were recorded across the Biodiversity Study Area, as summarised in **Table 6.7** below. They have been assessed as aligning with the BioNet Vegetation Classification PCTs.

An overview of their extent is shown in **Figure 6.2**, and a detailed figure set is provided within Appendix A of **Appendix 6**.

FIGURE 6.2

Plant Community Types Present within the Biodiversity Study Area

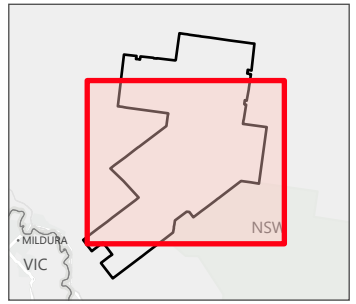


Legend

- Project Boundary
- Disturbance Footprint
- Biodiversity Study Area
- BAM Plot Location
- NPWS Estates
- Road
- Watercourse
- Waterbody

Plant Community Type

- PCT 58 (Moderate-Good)
- PCT 58 (Derived-Weedy)
- PCT 58 (Weedy understory)
- PCT 170 (Moderate-Good)
- PCT 170 (Derived-Native)
- PCT 170 (Derived-Weedy)
- PCT 170 (Weedy Understory)
- PCT 171 (Moderate-Good)



0 3 6
Kilometres

Scale 1:140,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Table 6.4 Plant Community Types Identified within the Biodiversity Study Area

PCT ID	PCT Name	Condition Zone	Biodiversity Study Area (ha)	Development Footprint Area (ha)
58	Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Moderate-Good	558.14	26.81
58	Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Derived-Weedy	41.42	3.39
58	Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Weedy Understory	35.72	0.17
170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Moderate-Good	157.49	3.81
170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derive-Native	22.19	1.15
170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived-Weedy	39.01	0.06
170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Weedy Understory	8.25	0.00
171	Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	Moderate-Good	131.50	18.95
N/A	Category 1 – Exempt Land/ cleared/ structure/ tracks/ road	N/A	3,882.87	390.35
N/A	Waterbodies	N/A	2.58	0.00
		Total	**4879.17**	**444.69**

Note: there are no (0.00 ha) PCTs mapped within the offsite disturbance areas assessed in the BDAR.

Land Categorisation

An assessment of land categorisation was completed for the Project to determine areas of Category 1 – Exempt Land. This assessment included desktop and ground-truthing surveys.

Potential Category 1 – Exempt Land areas were identified using available online data sets, including:

- Draft Native Vegetation Regulatory Map (NSW DCCEEW 2024).
- NSW Government Historical Imagery Viewer (DCS Spatial Services 2024).

Ground-truthing surveys were undertaken during vegetation and land categorisation mapping surveys in September 2022 and April 2024. Combined with the results of the field surveys, Category 1 – Exempt Land was identified through aerial photography interpretation of historical imagery, identifying areas of cropping or tillage. Areas which were identified as having been cleared/disturbed as set out above were then mapped using geo-rectified imagery.

Figure 6.3 displays the draft native vegetation regulatory map, compared with **Figure 6.4** which shows the refined land categorisation based on field surveys and aerial photography review. A key difference between these maps is the southern portion of the Biodiversity Study Area where additional cropping has occurred and additional Category 1 – Exempt Land has been mapped.

The areas assessed as Category 1 – Exempt Land contain highly disturbed non-woody vegetation primarily dominated by cropped wheat and legume paddocks, with grazing also present in the northern third of the Biodiversity Study Area. Non-native vegetation within the Biodiversity Study Area historically would have once contained native vegetation, however due to the inherently high levels of disturbance and ongoing agricultural practices, these areas now contain Category 1 - Exempt Land. Photographic records and other information relevant to these land categorisation outcomes are provided in Section 4.7 of **Appendix 6**.

Off-site Disturbance (Road Works) Vegetation

Other vegetation that is not consistent with a PCT was identified at the three (3) off-site road works areas (that occur outside of the Project Area) and are associated with areas subject to off-site road upgrades and modifications as part of the Project. Specifically, these three (3) off-site road work areas occur at the following locations:

- Sturt Highway roundabout at intersection of Carey Street, Euston.
- Sturt Highway roundabout onto Silver City Highway, Buronga.
- Silver City Highway onto Arumpo Road.

For the purpose of the BDAR, it was assumed that any feature contained in the above off-site disturbance areas will be subject to impact in the form of clearing and/or ground disturbance.

Rapid vegetation assessment surveys were conducted at each area to determine the presence and extent of any native vegetation and/or potential for threatened species and their habitats. In summary these areas comprised a cleared roadside environ, or included exotic roadside, planted exotic, or planted native cultivar vegetation features; with no threatened species and/or their habitats recorded.

There is planted native vegetation at the off-site disturbance area at Buronga (Sturt Highway roundabout onto Silver City Highway), and impacts to this area of native planted vegetation has been assessed in Section 10.2 of **Appendix 6** by applying the streamlined assessment for planted native vegetation (DPE 2022).

An overview of the features within each of the off-site road work areas and their extent is provided in Table 4.12 of **Appendix 6** as shown in **Figure 6.5** to **Figure 6.7** below.

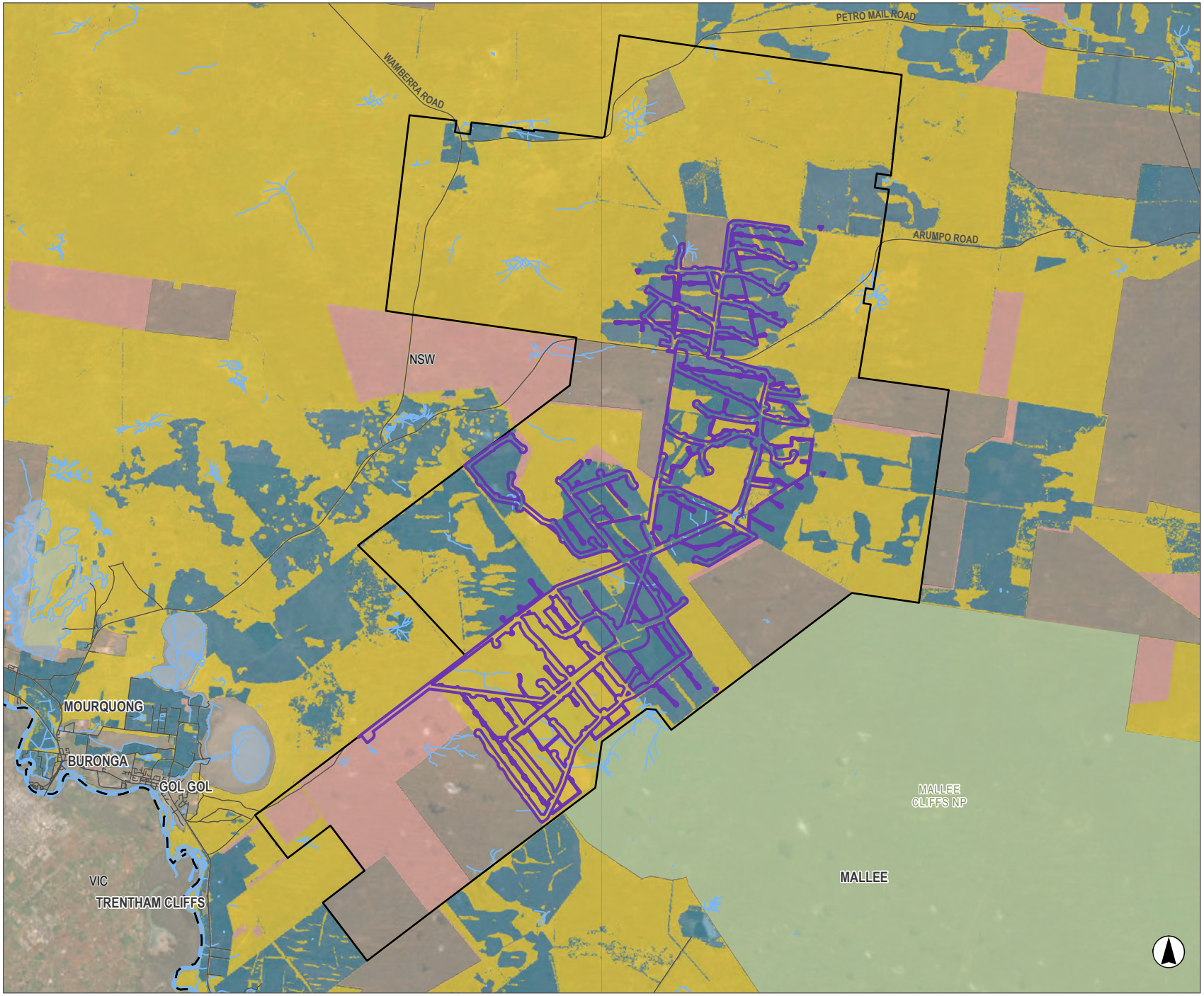


FIGURE 6.3

Draft Native Vegetation Regulatory Map

Legend

- Project Boundary
- Biodiversity Study Area
- State Border
- NPWS Estates
- Road
- Watercourse
- Waterbody

Draft native vegetation regulatory map

- Category 1-exempt land (draft)
- Category 2-regulated land (draft)
- Category 2-sensitive regulated land (in-force)

0 5 10
Kilometres

Scale 1:225,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

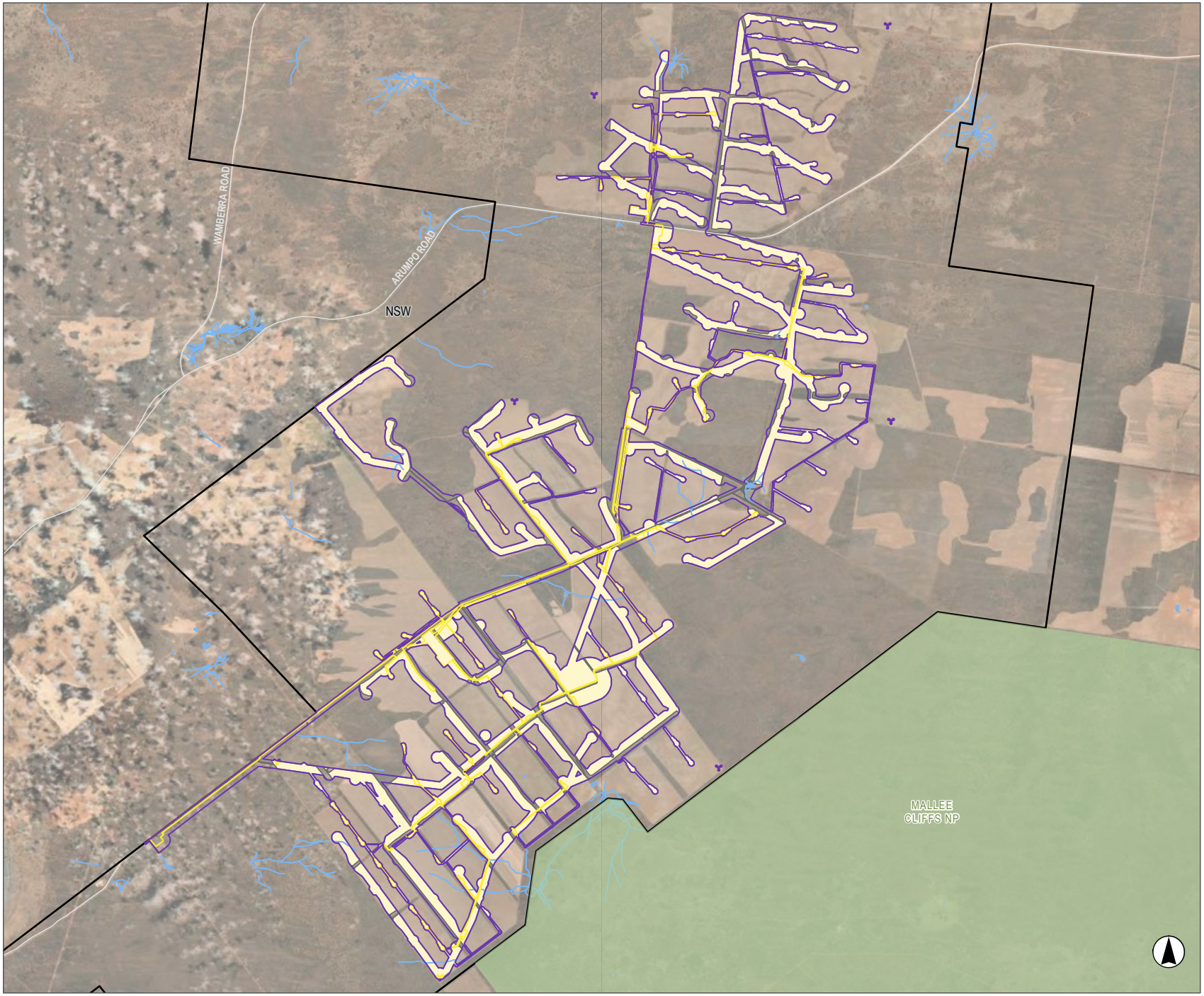
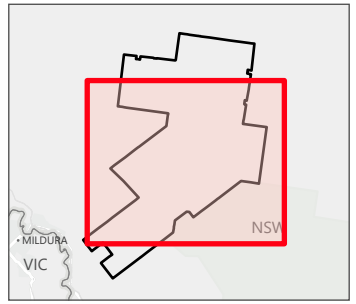


FIGURE 6.4

Land Categorisation of the Biodiversity Study Area

Legend

- Project Boundary
- Disturbance Footprint
- Biodiversity Study Area
- Category 1 - Exempt Land, Cleared, Road and Tracks
- State Border
- NPWS Estates
- Road
- Watercourse
- Waterbody



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Kilometres

Scale 1:140,000 at A4

GDA2020 MGA Zone 54

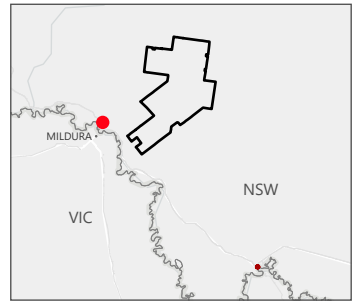
Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 6.5

Features of Off-site Road Works Areas – Arumpo Road

Legend

- Off-site Road Works
- Cleared/road
- Exotic roadside



0 50 100

Metres

Scale 1:2,200 at A4

GDA2020 MGA Zone 54

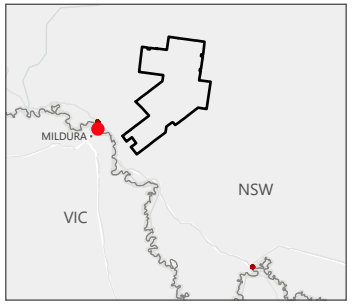
Image Source: Google Earth (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 6.6

Features of Off-site Road Works Areas – Buronga

Legend

- Off-site Road Works
- Cleared/road
- Planted exotic
- Planted native cultivar



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Metres

Scale 1:1,000 at A4

GDA2020 MGA Zone 54

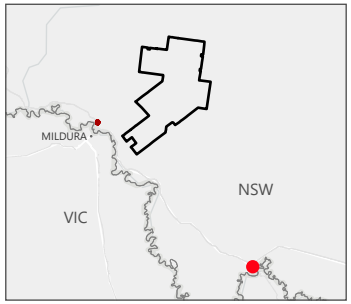
Image Source: Google Earth (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 6.7

Features of Off-site Road Works Areas – Euston

Legend

- Off-site Road Works
- Cleared/road
- Exotic roadside
- Planted exotic



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Metres

Scale 1:1,000 at A4
GDA2020 MGA Zone 54

Image Source: Google Earth (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.2.1.2 Threatened Ecological Communities

Seven (7) threatened ecological communities (TECs) were identified as having the potential to occur within the Biodiversity Study Area and are listed in **Table 6.5**. Potential TECs have been identified based on associations listed for PCTs in the BioNet Vegetation Classification database, BioNet Atlas and PMST database searches and those identified in the SEARs.

Of the seven (7) TECs identified as having the potential to occur within the Biodiversity Study Area, five (5) were not identified within the Biodiversity Study Area based on detailed field surveys. The TECs requiring further assessment are:

- Mallee Bird Community of the Murray Darling Depression Bioregion.
- Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions.

Table 6.5 TEC with Potential to Occur in the Biodiversity Study Area

TEC	Source	BC Act Status	EPBC Act Status	Further Assessment Required
Acacia loderi shrublands	BioNet Vegetation Classification database, BioNet Atlas	Endangered	Not listed	No. *Acacia loderi* was not identified within the Biodiversity Study Area based on detailed field surveys.
Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	BioNet Vegetation Classification database, BioNet Atlas	Endangered	Not listed	No. *Acacia melvillei* was not identified within the Biodiversity Study Area based on detailed field surveys.
Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions/ Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	PMST, SEARs	Endangered	Endangered	No. Buloke was not identified within the Biodiversity Study Area based on detailed field surveys.
Mallee Bird Community of the Murray Darling Depression Bioregion	BioNet Vegetation Classification database, BioNet Atlas PMST, SEARs	Not listed	Endangered	Yes
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	BioNet Vegetation Classification database, BioNet Atlas	Not listed	Critically Endangered	Yes
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	BioNet Atlas	Endangered	Not listed	No. *Callitris glaucophylla* was not identified within the Biodiversity Study Area based on detailed field surveys.
Tecticornia lylei, Wiry Glasswort, low open-shrubland in the Murray Darling Depression Bioregion	BioNet Atlas	Endangered	Not listed	No. *Tecticornia lylei* was not identified within the Biodiversity Study Area based on detailed field surveys.

Section 4.5.1 and Section 4.5.2 of **Appendix 6** provides further assessment of the Plains Mallee Box Woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions and Mallee Bird Community of the Murray Darling Depression Bioregion TEC. The distribution of TEC listed under the EPBC Act across the Biodiversity Study Area is shown in **Figure 6.8** below.

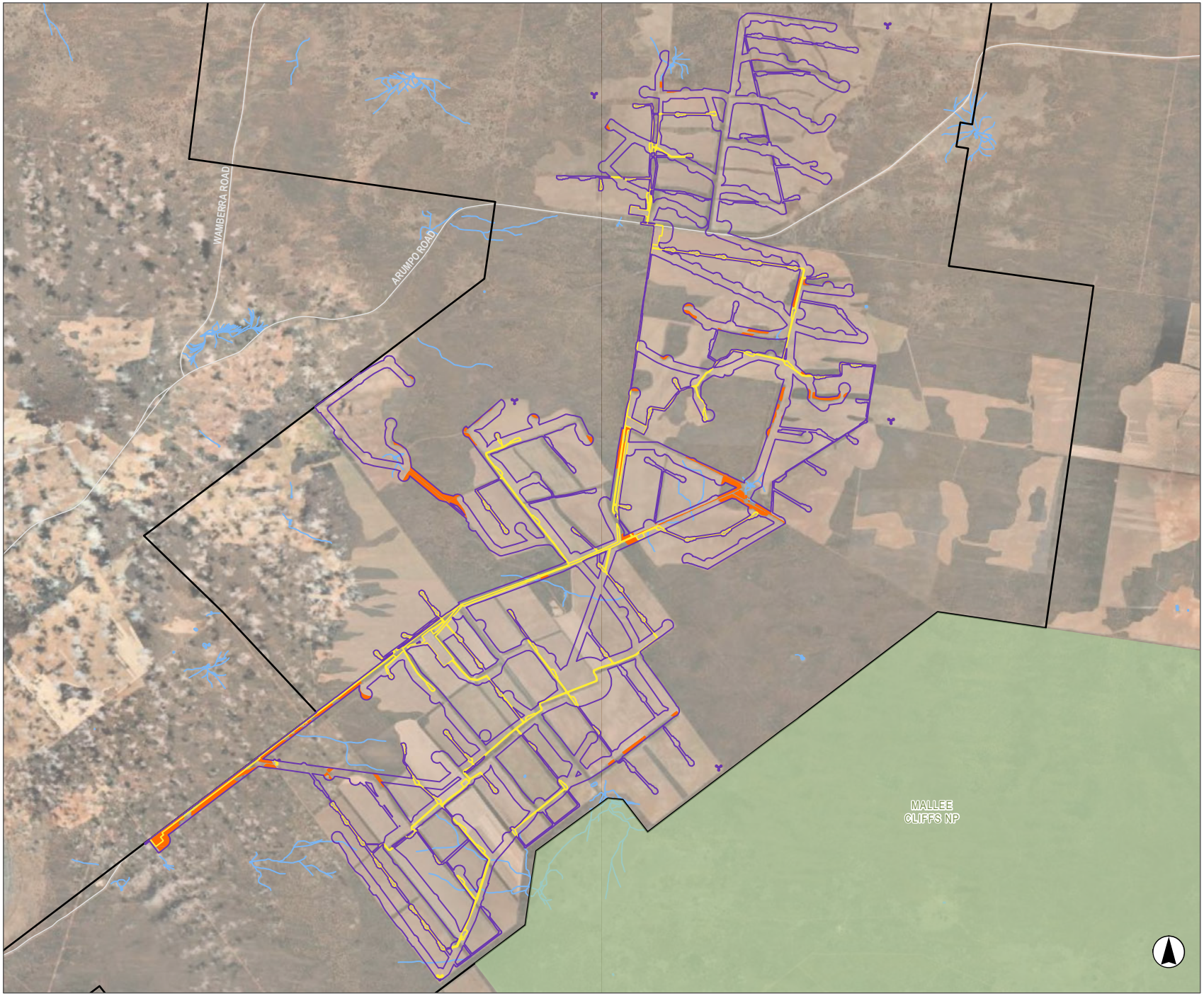


FIGURE 6.8

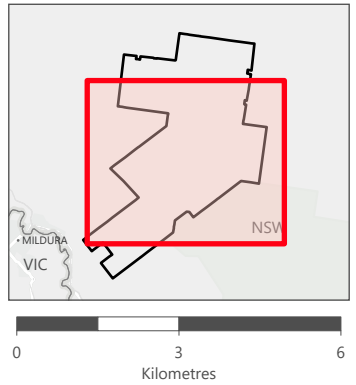
Distribution of Threatened Ecological Communities listed under EPBC Act across the Biodiversity Study Area

Legend

- Project Boundary
- Disturbance Footprint
- Biodiversity Study Area
- State Border
- NPWS Estates
- Road
- Watercourse
- Waterbody

Threatened Ecological Communities - EPBC Act

- Mallee Bird Community of the Murray Darling Depression Bioregion EEC



0 3 6

Kilometres

Scale 1:140,000 at A4

GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.2.1.3 Groundwater Dependent Ecosystems

Groundwater dependent ecosystems (GDEs) rely on the presence of groundwater to function and sustain the resident assemblage of species, populations, and ecological communities. The level of groundwater dependence of vegetation communities in the Biodiversity Study Area has been identified using the GDE Atlas (BoM 2024) and the Risk assessment guidelines for groundwater dependent ecosystems (Serov et al. 2012).

The GDE Atlas delineates and provides information about the following three types of GDEs (BoM 2024):

- Aquatic ecosystems that rely on the surface expression of groundwater – This includes surface water ecosystems which may have a groundwater component, such as rivers, wetlands, and springs. Marine and estuarine ecosystems can also be groundwater dependent, but they are not mapped in the GDEs Atlas.
- Terrestrial ecosystems that rely on the subsurface presence of groundwater – This includes all vegetation ecosystems.
- Subterranean ecosystems – This includes cave and aquifer ecosystems.

Within the terrestrial ecosystem type, an area of vegetation can be classified as either a high potential, moderate potential or low potential GDE. According to the GDEs Atlas, neither the Project Area or surrounding area has any mapped aquatic GDEs and has not been analysed in a regional or national study for the presence of terrestrial GDEs.

Aquatic Habitat

There are limited mapped watercourses within the Project Area, all of which are of a minor nature. The only aquatic habitat associated with the Biodiversity Study Area comprises three (3) farm dams, these however will not be impacted by the Project. No other aquatic habitats are present within the Biodiversity Study Area. No habitat for any threatened species listed under the FM Act is present within the Disturbance Footprint and offsite disturbance areas.

6.2.1.4 Threatened Species

In accordance with the BAM threatened species have been assessed considering both ecosystem credit species and species credit species.

Ecosystem credit species are those threatened species that can be reliably predicted to occur based on the PCTs identified within the Disturbance Footprint. The BAM-C generates a list of predicted ecosystem credit species from numerous inputs such as landscape features and the native vegetation communities present. The ecosystem credit species applicable to the Project have been predicted using the BAM-C based on the South Olary Plain IBRA subregion, associated PCTs (being PCT 58, 170, 171, percentage native vegetation cover class (>10–30%) and patch size class of >100 ha).

Table 5.1 of **Appendix 6** provides the full suite of predicted ecosystem credit species applicable to the Project as generated by the BAM-C.

Species credit species are those threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates and therefore require further consideration through an assessment of habitat suitability. The BAM-C again generates a list of species credit species based on numerous inputs such as the distribution of the species occurring within the same IBRA subregion as the Disturbance Footprint and the presence of habitat features and components associated within these species.

The candidate species credit species predicted to occur within the Disturbance Footprint are identified in Table 5.2 of **Appendix 6**, where justification is provided for any species from the BAM-C automatically populated list excluded from assessment. Geographic limitations, habitat constraints, degradation or lack of suitable microhabitats are the permitted reasons for excluding species credit species.

For threatened flora species only the suitable habitat for the target species within the Disturbance Footprint needs to be surveyed and includes areas supporting any listed habitat constraints and PCTs associated with that species in the Threatened Biodiversity Data Collection (TBDC). In this context suitable habitat for threatened flora may encompass entire PCTs or be restricted to niches determined with consideration of habitat constraints, land use history, disturbance events and climatic factors. The TBDC and the Threatened Species Profile website, along with appropriate published or peer-reviewed references and/or data must be used to determine suitable habitat.

In summary, 15 flora species and 14 fauna candidate species credit species were identified. No species credit species were removed from the BAM calculator automatically populated candidate species list.

An assessment of habitat suitability was carried out for each of the species identified in Table 5.2 of **Appendix 6**. The assessment was based on details provided within the TBDC including associated PCTs and known habitat or geographical constraints as detailed within Table 5.3 of **Appendix 6**. Justification is provided for any species identified automatically populated in the BAM-C that were excluded from further assessment. Geographic limitations, habitat constraints, degradation or lack of suitable microhabitats are the permitted reasons for excluding species credit species in accordance with Section 5.2.1(2)(b) and Section 5.2.2(2)(b) of the BAM.

Based on the above threatened species survey occurred (and expert reports were prepared) to determine the presence of candidate species within the Disturbance Footprint. The threatened species survey methodology is detailed in Section 5.2 of **Appendix 6** but in summary included:

- Background research and desktop review of relevant databases and information sources.
- Review of and comparison to general weather conditions during surveys.
- Habitat Assessment including Woodland/Mallee Habitat and Grassland/Low Shrubland Habitat.
- Targeted Flora Surveys, carried out within the dedicated areas of suitable habitat within the Biodiversity Study Area, totalling approximately 506 ha of survey. Through the detailed design and refinement of the Disturbance Footprint, the total area of suitable habitat was reduced to approximately 54.34 ha across all PCTs. Overall, the survey effort for threatened flora species exceeds the minimum required for the Disturbance Footprint alone.

- Targeted Fauna Surveys, carried out for 12 candidate fauna species and then an expert report prepared for two (2) further candidate threatened fauna species. The following methods were utilised for targeted fauna surveys:
    - Nest searches for candidate raptor species.
    - Searches and assessment for pink cockatoo and regent parrot breeding trees.
    - Diurnal bird surveys – general woodland bird surveys.
    - Bird and bat utilisation surveys (BBUS).
    - Reptile habitat searches, and walked spotlighting transects.
    - Targeted call playback for bush-stone curlew and walked spotlighting transects.
    - Remote camera surveys.
    - Opportunistic observations.

Threatened Species Survey Results

Based on the survey summarised above **ecosystem credit species** were recorded within the Biodiversity Study Area and wider Project Area, as described in **Table 6.6** below. The locations of these ecosystem credit species records are shown in Figure 5.6 of **Appendix 6**.

Table 6.6 Threatened Species Credit (Ecosystem) Species Survey Results

Species Name	Common Name	BC Act	EPBC Act	Observation Details
Aphelocephala leucopsis	Southern whiteface	V	V	This species was frequently observed foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys, vegetation assessments and targeted threatened species surveys.
Artamus cyanopterus cyanopterus	Dusky woodswallow	V	-	This species was frequently observed foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys, vegetation assessments and targeted threatened species surveys.
Certhionyx variegatus	Pied honeyeater	V	-	This species was recorded on four (4) occasions during diurnal bird surveys within the Project Area.
Circus assimilis	Spotted harrier	V	-	This species was frequently observed foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys, vegetation assessments and targeted threatened species surveys.
Chalinolobus picatus	Little pied bat	V	-	The calls of this species were frequently recorded on bat detectors placed within the Project Area.
Cinclosoma castanotum	Chestnut Quail-thrush	V	-	This species was recorded on six (6) occasions within the Project Area and Biodiversity Study Area during diurnal bird surveys and incidentally.
Daphoenositta chrysoptera	Varied Sittella	V	-	This species was frequently observed foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys, vegetation assessments and targeted threatened species surveys.

Species Name	Common Name	BC Act	EPBC Act	Observation Details
Epthianura albifrons	White-fronted Chat	V	-	This species was frequently observed foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys, vegetation assessments and targeted threatened species surveys.
Falco subniger	Black falcon	V	-	This species was observed six (6) times foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys and incidentally.
Hieraaetus morphnoides	Little Eagle	V	-	This species was incidentally observed once foraging within the Project Area.
Hylacola cautus	Shy heathwren	V	-	This species was recorded on one (1) occasion within the Biodiversity Study Area during BBUS surveys.
Lophoictinia isura	Square-tailed Kite	V	-	This species was incidentally observed on one (1) occasion within the Biodiversity Study Area.
Melanodryas cucullata cucullata	Hooded Robin	E	E	This species was frequently observed foraging within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys and targeted threatened species surveys.
Pachycephala inornata	Gilbert's Whistler	V	-	This species was recorded on six (6) occasions within the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys, diurnal bird surveys and incidentally.
Polytelis anthopeplus monarchoides	Regent parrot (eastern subspecies)	E	V	Two flocks of regent parrots were recorded flying over the Project Area and Biodiversity Study Area during field surveys including BBUS Surveys and incidentally. These records were in May 2024, which is outside the breeding period for the species.
Vespadelus baverstocki	Inland forest bat	V	-	The calls of this species were frequently recorded on bat detectors placed within the Project Area.

Regarding the presence of candidate **species credit species** no **threatened flora species** were observed within the Biodiversity Study Area or Disturbance Footprint. Targeted surveys have been completed for all candidate threatened flora species. Umwelt considers that all candidate flora species have been adequately surveyed within suitable survey windows as per the BAM, in addition to numerous supplementary surveys attributable to the overall survey effort across the Disturbance Footprint.

No **threatened fauna species** credit species were observed within the Disturbance Footprint, Biodiversity Study Area or wider Project Area during the targeted surveys. Three (3) dual credit species were recorded during surveys, comprising the regent parrot, little eagle and square-tailed kite, however the species-credit component (breeding habitat) was not recorded.

Analysis of micro-bat calls from the first two (2) BBUS seasons (Spring 2022 and Summer 2023) identified a species complex consisting of southern myotis/Corben's long-eared bat/lesser long-eared bat/Gould's long-eared bat. The calls of these species are difficult to differentiate which is why they were assigned to a species complex. The southern myotis is a species credit species because it is dependent on waterways with pools greater than 3 m wide for foraging and habitat surrounding waterways is used for breeding and roosting. Given that there is no suitable habitat in the Disturbance Footprint, or within 200 m of that area, in addition to the absence of species records for the southern myotis within 20 km of the Disturbance Footprint, it is considered highly unlikely that this species occurs within the Disturbance Footprint. As noted above for threatened flora species, the level of survey effort in the wider Project Area represents suitable coverage for the candidate fauna species credit species.

As a result of the information summarised above, no species polygons have been prepared for candidate flora and fauna species.

Expert Reports

As stated in Section 5.3 of the BAM, an expert report can be used instead of a species survey for all proposals to determine whether a species is present or not present on the 'subject land'. As part of consultation with BCS early in the Project, it was confirmed that due to the difficult survey requirements for these species an expert report would be required for:

- Painted burrowing frog (*Neobatrachus pictus*).
- Desert mouse (*Pseudomys desertor*).

An expert report detailing the likely occurrence of painted burrowing frog (*Neobatrachus pictus*) and desert mouse (*Pseudomys desertor*) was prepared by approved expert, Dr John Read (Ecological Horizons Pty Ltd 2024) with supporting material from GHD (GHD, 2024), in accordance with the Section 5.3 (Box 3) of the BAM. The expert report determined that the painted burrowing frog (Neobatrachus pictus) and desert mouse (Pseudomys desertor) are unlikely to be present in the Biodiversity Study Area and Disturbance Footprint. The full expert report is included in Appendix H of **Appendix 6**.

6.2.2 Avoidance and Minimisation of Impacts

As detailed in **Section 2.7** and identified in **Figure 2.11** to **Figure 2.13** of this EIS, the Project has been refined to avoid and minimise potential impacts on biodiversity values including:

- Reduction in the Project Area and Disturbance Footprint, refer **Section 2.7.4**.
- A hierarchical approach to avoidance being adopted, targeting the entities with the highest biodiversity value.
- Removal of WTGs from within a minimum 800 m (700 m from the assumed worst-case blade tip) buffer of Mallee Cliffs National Park.

This information, and other information relating to Project location, design and planning; avoidance and minimisation of prescribed impacts; bird and bat adaptive management planning; other management plans; and other matters considered (i.e., do nothing approach) are detailed within Section 7.0 of **Appendix 6** as relevant to the biodiversity assessment. For brevity, they are not reproduced further in this EIS.

Spark Renewables is committed to further avoidance and minimisation of impacts to biodiversity during detailed design, construction, operation and decommissioning.

6.2.3 Impact Assessment

6.2.3.1 Direct Impacts on Native Vegetation and Threatened Ecological Communities

The Project would directly impact up to 54.34 ha of native vegetation within the Development Footprint. The 54.34 ha of direct impacts to native vegetation represents approximately 5.5% of native vegetation within the Biodiversity Study Area, or 1.7% of the native vegetation within the Assessment Area (defined in **Appendix 6** as 500 m buffer to the Development Footprint).

The native vegetation to be directly impacted within the Disturbance Footprint comprises three (3) PCTs across seven (7) vegetation zones, including:

1. Zone 1 PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion: Moderate-good.
2. Zone 2 PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion: Derived-weedy.
3. Zone 3 PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion: Weedy-understory.
4. Zone 4 PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones: Moderate-good.
5. Zone 5 PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones: Derived-native.
6. Zone 6 PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones: Derived-weedy.
7. Zone 8 PCT 171: Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion: Moderate-good.

The Project has avoided direct impacts to Zone 7 PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones: Weedy Understory.

Two (2) PCTs to be directly impacted by the Project were found to conform to a single TEC listed under the EPBC Act. PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones and PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion in moderate-good and weedy understory condition conform to the Mallee Bird Community of the Murray Darling Depression Bioregion listed as endangered under the EPBC Act. The Project would result in direct impacts to approximately 22.76 ha of Mallee Bird Community of the Murray Darling Depression Bioregion EEC.

The direct impacts associated with the Project are summarised in **Table 6.7** below and shown on Figure 8.1 and Figure 8.2 of **Appendix 6**. A summary of the expected impacts to vegetation integrity as a result of the Project are detailed in **Table 6.8** below.

Table 6.7 Summary of Impacts to Native Vegetation

Vegetation Zone	PCT	Broad Condition State	TEC	BC Act	EPBC Act	SAII	Area to be Impacted (ha)	Change (Loss) in Vegetation Integrity Score
Zone 1	PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Moderate-good	-	-	-	No	26.81	-79.4
Zone 2	PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Derived-weedy	-	-	-	No	3.39	-35.9
Zone 3	PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Weedy-understory	-	-	-	No	0.17	-75.2
Zone 4	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Moderate-good	Mallee Bird Community	-	E	No	3.81	-61.9
Zone 5	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived-native	-	-	-	No	1.15	-38.3
Zone 6	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived-weedy	-	-	-	No	0.06	-44
Zone 7	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Weedy Understory	Mallee Bird Community	-	E	No	0	0
Zone 8	PCT 171: Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	Moderate-good	Mallee Bird Community	-	E	No	18.95	-74.5
						Total	**54.34**	-

Table 6.8 Impacts to Vegetation Integrity

Vegetation Zone	PCT	Broad Condition State	Before Development – Composition Condition Score	Before Development – Structure Condition Score	Before Development – Function Condition Score	Before Development – Vegetation Integrity Score	After Development – Composition Condition Score	After Development – Structure Condition Score	After Development – Function Condition Score	After Development – Vegetation Integrity Score	Change (Loss) in Vegetation Integrity Score
Zone 1	PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Moderate-good	90	99.6	55.8	79.4	0	0	0	0	-79.4
Zone 2	PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Derived-weedy	48.3	61.6	15.6	35.9	0	0	0	0	-35.9
Zone 3	PCT 58: Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Weedy-understory	85.6	98.8	50.4	75.2	0	0	0	0	-75.2
Zone 4	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Moderate-good	84.9	75.1	37.3	61.9	0	0	0	0	-61.9
Zone 5	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived-native	84.4	37.1	17.9	38.3	0	0	0	0	-38.3
Zone 6	PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived-weedy	66.3	36.7	35	44	0	0	0	0	-44
Zone 8	PCT 171: Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	Moderate-good	99.8	97.8	42.3	74.5	0	0	0	0	-74.5

6.2.3.2 Direct Impacts to Threatened Species

There are no direct impacts to threatened species-credit species or their habitats as none were recorded within the Biodiversity Study Area or Disturbance Footprint during surveys.

6.2.3.3 Indirect Impacts

Indirect impacts are those that occur when the proposal affects native vegetation and threatened species habitat beyond the Disturbance Footprint or within retained areas. This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts.

A risk matrix was applied to indirect impacts, as specified in the BAM, to assess the likelihood of each occurring following the implementation of all mitigation measures; this risk matrix is summarised below in **Table 6.9** and **Table 6.10**. The potential consequences to biodiversity are then described in **Table 6.11**.

Table 6.9 Risk Matrix Criteria

Likelihood Impact/ Consequence	Score	Description
Likelihood of Impact	Almost certain	Very high or certain probability that impact will occur or event is of continuous nature
Likelihood of Impact	Likely	Likely probability that impact will occur or event is frequent (1–5 years)
Likelihood of Impact	Possible	Moderate probability that the impact will occur or the event is infrequent (5–20 years)
Likelihood of Impact	Unlikely	Low probability that impact will occur or event is very infrequent (100+ years)
Likelihood of Impact	Remote	Very low probability that impact will occur or may occur under extenuating circumstances. Event is very rare and stochastic in nature (frequency 1000+ years)
Likelihood of Consequence	Significant	An impact that is widespread, permanent and may result in large-scale loss of 'critical' habitat
Likelihood of Consequence	Major	An impact that is widespread, long lasting and may result in large-scale loss of important habitat
Likelihood of Consequence	Moderate	Large-scale conversion of natural habitat or small-scale conversion of important habitat
Likelihood of Consequence	Minor	Temporary and localised impact to natural habitat
Likelihood of Consequence	Insignificant	No measurable impact

Table 6.10 Risk Matrix

		Likelihood of Consequence					
		Unknown	Insignificant	Minor	Moderate	Major	Significant
Likelihood of Impact	Remote	Unknown	Negligible (N)	Negligible (N)	Very Low (VL)	Low (L)	Medium (M)
	Unlikely	Unknown	Negligible (N)	Very Low (VL)	Low (L)	Medium (M)	High (H)
	Possible	Unknown	Very Low (VL)	Low (L)	Medium (M)	High (H)	Very High (VH)
	Likely	Unknown	Low (L)	Medium (M)	High (H)	Very High (VH)	Extreme (E)
	Almost certain	Unknown	Medium (M)	High (H)	Very High (VH)	Extreme (E)	Extreme (E)
	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Table 6.11 Potential Indirect Impacts to Biodiversity Including their Extent, Frequency, Timing, Duration and Consequence

Indirect Impact	Impacted Biodiversity	Timing and Duration	Extent	Frequency	Likelihood of Impact	Likelihood of Consequence	Indirect Impact Level	Summary and Potential Consequences
Reduced viability of adjacent habitat due to edge effects	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term, permanent)	Zones 1-8	During clearing	Likely	Minor	M	Earthworks, foot traffic, plant or vehicle movements may lead to introduction or spread of weed species that would reduce the quality and integrity of adjacent native vegetation and habitat. Edge effects may result in increased competition between native fauna species for resources and displacement of native fauna species.
Reduced viability of adjacent habitat due to edge effects	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term, permanent)	Unknown	Throughout operational phase	Possible	Minor	L	Earthworks, foot traffic, plant or vehicle movements may lead to introduction or spread of weed species that would reduce the quality and integrity of adjacent native vegetation and habitat. Edge effects may result in increased competition between native fauna species for resources and displacement of native fauna species.
Reduced viability of adjacent habitat due to noise, dust or light spill	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term)	Zones 1-8	Throughout construction phase	Possible	Minor	L	Noise, light and dust will be managed during construction to relevant standards. There is potential for retained areas of habitat in close proximity to construction works to be affected by noise, dust and light spill as follows: Noise and light spill may lead to altered behaviour in fauna species. Increased dust may result in health impacts to fauna and reduced photosynthetic capacity for flora. Any residual noise, light and dust is likely to have negligible impacts on threatened and non-threatened fauna species.
Reduced viability of adjacent habitat due to noise, dust or light spill	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Minor	L	Noise, light and dust will be managed during construction to relevant standards. There is potential for retained areas of habitat in close proximity to construction works to be affected by noise, dust and light spill as follows: Noise and light spill may lead to altered behaviour in fauna species. Increased dust may result in health impacts to fauna and reduced photosynthetic capacity for flora. Any residual noise, light and dust is likely to have negligible impacts on threatened and non-threatened fauna species.
Transport of weeds and pathogens from the site to adjacent vegetation	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term)	Unknown	Throughout construction phase	Possible	Moderate	M	Earthworks may result in the movement of weeds across the site and into adjacent vegetation. Vehicle movement may lead to weeds being spread across the site or lead to the introduction of weed species to the site. Increased weed and pathogens may reduce the quality of native vegetation and habitat for native fauna species.
Transport of weeds and pathogens from the site to adjacent vegetation	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Moderate	M	Earthworks may result in the movement of weeds across the site and into adjacent vegetation. Vehicle movement may lead to weeds being spread across the site or lead to the introduction of weed species to the site. Increased weed and pathogens may reduce the quality of native vegetation and habitat for native fauna species.
Increased risk of starvation or exposure, and loss of shade or shelter	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term, permanent)	Unknown	During clearance	Possible	Minor	L	Loss of vegetation may increase the risk of exposure. The removal of foraging habitat may increase competition between native fauna species for remaining resources. Loss of sheltering or breeding habitat may lead to increased competition for remaining resources.

Indirect Impact	Impacted Biodiversity	Timing and Duration	Extent	Frequency	Likelihood of Impact	Likelihood of Consequence	Indirect Impact Level	Summary and Potential Consequences
Increased risk of starvation or exposure, and loss of shade or shelter	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term, permanent)	Unknown	Throughout operational phase	Remote	Minor	N	Loss of vegetation may increase the risk of exposure. The removal of foraging habitat may increase competition between native fauna species for remaining resources. Loss of sheltering or breeding habitat may lead to increased competition for remaining resources.
Loss of breeding habitat	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term, permanent)	Zones 1-8	During clearance	Possible	Moderate	M	Removal of breeding habitat may disrupt the breeding cycle of species, and potentially lead to displacement of affected species.
Loss of breeding habitat	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term, permanent)	Unknown	Throughout operational phase	Remote	Minor	N	Removal of breeding habitat may disrupt the breeding cycle of species, and potentially lead to displacement of affected species.
Rubbish dumping	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term)	Zones 1-8	Throughout construction phase	Likely	Minor	M	The dumping of rubbish may reduce the quality of native vegetation. May result in injury or mortality to native fauna species.
Rubbish dumping	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term)	Unknown	Throughout operational phase	Likely	Minor	M	The dumping of rubbish may reduce the quality of native vegetation. May result in injury or mortality to native fauna species.
Wood collection	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term)	Unknown	Throughout construction phase	Unlikely	Minor	VL	Unlawful harvesting of timber and fallen logs may reduce quality of native vegetation and the amount of habitat available for native species. Injury or mortality of native fauna species as a result of the removal.
Wood collection	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term)	Unknown	Throughout operational phase	Unlikely	Minor	VL	Unlawful harvesting of timber and fallen logs may reduce quality of native vegetation and the amount of habitat available for native species. Injury or mortality of native fauna species as a result of the removal.
Removal and disturbance of rocks, including bush rock	Native fauna species and their habitat. Rocks not recorded as part of survey of the Biodiversity Study Area.	Construction phase (short-term)	Unknown	During clearance	Remote	Insignificant	N	Reduced availability of habitat or shelter for ground-dwelling native fauna. Injury or mortality of native fauna species as a result of removal or disturbance.
Removal and disturbance of rocks, including bush rock	Native fauna species and their habitat. Rocks not recorded as part of survey of the Biodiversity Study Area.	Operational phase (long-term)	Unknown	Throughout operational phase	Remote	Insignificant	N	Reduced availability of habitat or shelter for ground-dwelling native fauna. Injury or mortality of native fauna species as a result of removal or disturbance.
Increase in predatory and pest species populations	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term)	Unknown	Throughout construction phase	Possible	Minor	L	Increased human presence, and therefore increased presence of rubbish/food, may result in an increase in the presence of pest species, including predators, in the area. Clearing of vegetation causing a reduction in the area available for fauna species to occupy, resulting in an increased concentration of pest species in an area. Increased injury or morality of native fauna species as a result of increased competition and predation with pest species.
Increase in predatory and pest species populations	Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term)	Unknown	Throughout operational phase	Unlikely	Minor	VL	Increased human presence, and therefore increased presence of rubbish/food, may result in an increase in the presence of pest species, including predators, in the area. Clearing of vegetation causing a reduction in the area available for fauna species to occupy, resulting in an increased concentration of pest species in an area. Increased injury or morality of native fauna species as a result of increased competition and predation with pest species.

Indirect Impact	Impacted Biodiversity	Timing and Duration	Extent	Frequency	Likelihood of Impact	Likelihood of Consequence	Indirect Impact Level	Summary and Potential Consequences
Increased fire risk	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Construction phase (short-term)	Unknown	Throughout construction phase	Possible	Moderate	M	The use of machinery, particularly in summer, can increase the risk of fire. Storage and utilisation of flammable materials on site can increase fire risk. Human-caused fires may be detrimental to native vegetation and cause injury or mortality to native fauna species.
Increased fire risk	Native vegetation. Native fauna species habitat, including the TEC Mallee Bird Community of the Murray Darling Depression Bioregion.	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Moderate	M	The use of machinery, particularly in summer, can increase the risk of fire. Storage and utilisation of flammable materials on site can increase fire risk. Human-caused fires may be detrimental to native vegetation and cause injury or mortality to native fauna species.
Pollutant spills	Native vegetation.	Construction phase (short-term)	Unknown	Throughout construction phase	Possible	Minor	L	Pollutant spill may contaminate and change the composition of soils, resulting in detrimental impacts to native vegetation.
Pollutant spills	Native vegetation.	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Minor	L	Pollutant spill may contaminate and change the composition of soils, resulting in detrimental impacts to native vegetation.

Proximity of Wind Turbines to Large Intact Patches of Woody Vegetation

Given the proximity of the Project to Mallee Cliffs National Park, the **Appendix 6** has considered a EUROBAT Publication article by Rodrigues et al (2015) regarding the proximity of WTGs to the National Parks Estate.

This article suggests that wind turbines should be located a minimum of 200 m away from woodlands and forests (or structures that would provide substantial habitat for microbats) to minimise potential turbine strike impacts to microbats.

Importantly, the Rodrigues et al (2015) 200 m distance is to be measured from the tip of the WTG blade, not the WTG tower itself. Considering the precautionary assessment (and 100 m long WTG blade) assessed in **Appendix 6**, the recommended buffer is in the order of 300 m from the WTG locations.

It is noted that whilst a 200 m blade diameter (incl. nacelle) is considered in **Appendix 6**, the blade length for the Project is limited to 85 m based on the Traffic and Transport Impact Assessment (TTIA) (refer to **Section 3.5.1** for WTG specifications, and **Appendix 12** for the TTIA (Access, 2024).

A buffer (min 500 m) was applied to large intact patches of woody vegetation which exceeds the recommended buffer as outlined above.

Consideration of Mallee Cliffs National Park

The Rodrigues et al (2015) article focuses on the minimisation of impacts to microbats; however, the Umwelt assessment documented in **Appendix 6** has considered both bird and bat species that are known, likely or with the potential to inhabit Mallee Cliffs National Park.

Mallee Cliffs National Park provides high quality habitat for woodland birds, and due to its size and lack of ongoing disturbances, provides better habitat than the habitats present within the Project Area. The Project Area contains extensive cropping, and a large portion of the impacts associated with the Disturbance Footprint occur to windrow remnants of native vegetation with large edge effects.

Mallee Cliffs National Park may also provide suitable foraging and breeding habitat for hollow dependant microbats species, predicted to occur within the Disturbance Footprint. The habitat buffer described in the Rodrigues et al (2015) article was considered by the Project during the design phase of the Project.

No WTGs are located within the 300 m recommended buffer (established as above with due regard to Rodrigues et al (2015)) of the Mallee Cliffs National Park.

The closest WTG is located approximately 800 m (700 m from the assumed worst-case blade tip) away from the boundary of the National Park, exceeding the recommended buffer by at least 400 m.

The location of WTGs being situated beyond the 800 m buffer from the Mallee Cliffs National Park is a result of careful and considered avoidance and minimisation of the Project design following direct feedback from the biodiversity assessment (refer to Section 7.0 of **Appendix 6**).

Further consideration of the Mallee Cliffs National Park is provided in **Section 7.0** of this EIS.

6.2.3.4 Prescribed Biodiversity Impacts

Prescribed impacts are described in **Section 6.0** and an assessment of prescribed impacts is provided in Section 8.3 of **Appendix 6**.

No threatened entities are considered likely to be dependent upon or may use habitat features associated with any of the prescribed impacts. The impacts of WTG strike on protected animals are considered in detail in Appendix B in **Appendix 6**.

Human-Made Structures and Non-Native Vegetation

No human-made structures would be affected by the Disturbance Footprint. An assessment of non-native vegetation is provided in **Table 6.12**.

Table 6.12 Potential Impacts on Threatened Entities Associated with Human-Made Structures and Non-Native Vegetation

Threatened entity	Human-made structures and/or non-native vegetation with potential to be habitat	Nature, extent and duration of short and long-term impacts due to removal of structures and/or non-native vegetation	Importance within the bioregion of the habitat to the threatened entity	Consequences of the impacts for the local and bioregional persistence
Raptor species	The non-native vegetation consists of extensive areas of cropped paddocks, with the northern property also grazed.	Approximately 290 ha of non-native will be permanently removed during construction for the life of the Project.	Raptor species forage over vast areas and a wide variety of habitat. Given this, it is unlikely that the non-native vegetation to be removed within the Disturbance Footprint is significantly important to these threatened entities. A substantial amount of cropped paddocks will remain within the Project Area.	As the non-native vegetation within the Disturbance Footprint is not considered important to the threatened entities, it is unlikely that the removal will impact the local and bioregional persistence of these species.

Habitat Connectivity

As assessment of the impacts of the Project on habitat connectivity, which facilitates the movement of threatened species across their range, within the Disturbance Footprint and Biodiversity Study Area is provided in **Table 6.13** below.

Table 6.13 Potential Impacts on Connectivity of Habitat of Threatened Entities

Threatened entity	Nature, extent and duration of short and long-term impacts to connectivity	Importance of the area of connectivity within the bioregion and to the lifecycle of the species	Consequences of the impacts for the local and bioregional persistence
All threatened fauna species, recorded or predicted to occur in the Disturbance Footprint	During construction 54.34 ha of native vegetation will be permanently removed from the Disturbance Footprint.	A large portion of the impacts to native vegetation are associated with windrows between paddocks. Spark Renewables has designed the Project to make use of existing cleared areas (cropped, existing tracks) to minimise impacts on native vegetation. These windrows would provide movement for local populations of fauna species. The southern portion of the Disturbance Footprint includes the construction of a transmission line. This has been designed to be located adjacent to an existing cleared access road with the intent of minimising further fragmentation of habitat in the region. This transmission line runs through a large area of remnant vegetation being used by local populations of fauna species.	The minor impacts to remnant vegetation associated with the windrows would result in negligible loss of connectivity and movement corridors for native fauna species. The majority of the windrow vegetation will remain and facilitate fauna movement across the Project Area. The transmission line easement will result in native vegetation being removed, along a 50 m extent, and further fragmenting large remnant habitat to the north and south. All threatened fauna species recorded within the Biodiversity Study Area are highly mobile (bird and bat species) and the consequences to connectivity of habitat is considered to be minor. Additionally the easement will be maintained as low vegetation which will still facilitate movement of fauna species across this area.

Water Bodies, Water Quality and Hydrological Processes

No waterbodies are present within the Disturbance Footprint. Three (3) farm dams were identified within the Biodiversity Study Area; however these will not be impacted by the Project. As a result there will be no impacts to biodiversity values associated with waterbodies, water quality or hydrological processes.

Water and erosion management controls will be employed to minimise erosion and discharge of sediment and other pollutants during construction, as described in **Section 6.9.4**, **Section 6.10.5** and **Appendix 5** of this EIS.

Wind Turbine Strikes

Umwelt has prepared a detailed prescribed impacts assessment to consider the potential impacts from turbine strikes on significant bird and bat species. These assessments have been prepared in accordance with Section 6.1.5 and 8.3.5 of the BAM (DPE 2020a). The prescribed impacts assessment is provided in full in Appendix B of **Appendix 6**.

The following data sources were examined to assess which species, in addition to those recorded in the Project Area in 2022 to 2024, may occur in the Project Area:

- Ecosystem credit predicted species database (BAM-C).
- PMST for MNES (DCCEEW 2024).
- BioNet Atlas Threatened Biodiversity Profile Data Collection (DPE 2024).
- SEARs issued on 17 February 2023 and Supplementary SEARs dated 7 June 2023 (as varied by Spark Renewables under Section 156B of the EPBC Act and accepted by Commonwealth DCCEEW on 4 September 2024).

Candidate bird and bat species lists comprising species that were either recorded or are predicted to occur in the vicinity of the Project Area are provided in Appendix B of **Appendix 6**. The candidate lists comprise 166 bird and 16 bat species, respectively, and the Mallee Bird Community of the Murray Darling Depression EEC.

Of these, a further 147 bird and 16 bat species were considered for further assessment due to their known presence in the Project Area or their likelihood of occurrence being moderate or high. **Table 6.14** provides a summary of recorded threatened and key bird and bat species for which detailed risk assessments were conducted. This includes 16 bird species, 16 bat species and the ten (10) bird species included the Mallee Bird Community of the Murray Darling Depression EEC that were recorded in the Project Area. Details of the additional 150 bird species that were assessed are provided in Appendix B of **Appendix 6**.

The Umwelt prescribed impacts assessment approach was initially designed in consultation with the Queanbeyan BCS Directorate (now NSW DCCEEW, South East division) but has been applied to the aforementioned wind farms and this Project to maintain consistency in the preparation of assessment material as we believe this is critical to ensuring consistent assessment of projects throughout NSW. The methodology adopted to complete the qualitative collision risk assessment, including an explanation of the likelihood and consequence scores and overall risk rating matrix, is set out in Appendix B of **Appendix 6**.

Table 6.14 Potential Impacts of Wind Turbine Strikes on Threatened and other Specified Fauna

Type	Common Name	Species Name	Likelihood	Consequence	Risk Rating
Threatened/migratory Birds	black falcon	*Falco subniger*	High	Moderate	High
Threatened/migratory Birds	chestnut quail-thrush	*Cinclosoma castanotum*	Low	Low	Negligible
Threatened/migratory Birds	dusky woodswallow	*Artamus cyanopterus cyanopterus*	Moderate	Low	Minor
Threatened/migratory Birds	Gilbert's whistler	*Pachycephala inornata*	Low	Low	Negligible
Threatened/migratory Birds	hooded robin (south-eastern subspecies)	*Melanodryas cucullata cucllata*	Low	Low	Negligible
Threatened/migratory Birds	little eagle	*Hieraaetus morphnoides*	High	Moderate	High
Threatened/migratory Birds	Pacific swift	*Apus pacificus*	High	Low	Moderate
Threatened/migratory Birds	pied honeyeater	*Certhionyx variegatus*	Low	Low	Negligible
Threatened/migratory Birds	regent parrot (eastern subspecies)	*Polytelis anthopeplus monarchoides*	Moderate	Moderate	Moderate
Threatened/migratory Birds	shy heathwren	*Hylacola cautus*	Low	Low	Negligible
Threatened/migratory Birds	southern whiteface	*Aphelocephala leucopsis*	Low	Low	Negligible
Threatened/migratory Birds	spotted harrier	*Circus assimilis*	High	Moderate	High
Threatened/migratory Birds	square-tailed kite	*Lophoictinia isura*	Moderate	Moderate	Moderate
Threatened/migratory Birds	varied sittella	*Daphoensitta chrysoptera*	Low	Low	Negligible
Threatened/migratory Birds	white-fronted chat	*Epthianura albifrons*	Low	Low	Negligible
Threatened/migratory Birds	Mallee Bird Community EEC: regent parrot	*N/A*	Moderate	Moderate	Moderate
Threatened/migratory Birds	Mallee Bird Community EEC: chestnut quail-thrush, crested bellbird, Jacky winter, shy heathwren, splendid fairy-wren, spotted pardalote, white-eared honeyeater, white-fronted honeyeater and yellow-plumed honeyeater	*N/A*	Low	Low	Negligible
Non-listed birds	wedge-tailed eagle	*Aquila audax*	High	Low	Moderate
Bats	Corben's long-eared bat	*Nyctophilus corbeni*	Low	Moderate	Minor

Type	Common Name	Species Name	Likelihood	Consequence	Risk Rating
Bats	inland forest bat	*Vespadelus baverstocki*	Moderate	Moderate	Moderate
Bats	little pied bat	*Chalinolobus picatus*	Moderate	Moderate	Moderate
Bats	yellow-bellied sheathtail bat	*Saccolaimus flaviventris*	Moderate	Moderate	Moderate
Non-listed bats	chocolate wattled bat	*Chalinolobus morio*	Moderate	Low	Minor
Non-listed bats	Gould's long-eared bat	*Nyctophilus gouldi*	Moderate	Low	Minor
Non-listed bats	Gould's wattle bat	*Chalinolobus gouldii*	High	Low	Moderate
Non-listed bats	inland broad-nosed bat	*Scotorepens balstoni*	High	Low	Moderate
Non-listed bats	inland free-tailed bat	*Ozimops petersi*	High	Moderate	High
Non-listed bats	lesser long-eared bat	*Nyctophilus geoffroyi*	Moderate	Low	Minor
Non-listed bats	little broad-nosed bat	*Scotorepens greyii*	Moderate	Low	Minor
Non-listed bats	little forest bat	*Vespadelus vulturnus*	High	Low	Moderate
Non-listed bats	ride's free-tailed bat	*Ozimops ridei*	High	Moderate	High
Non-listed bats	southern forest bat	*Vespadelus regulus*	Moderate	Low	Minor
Non-listed bats	southern free-tailed bat	*Ozimops planiceps*	Moderate	Moderate	Moderate
Non-listed bats	white-striped freetail-bat	*Austronomus australis*	High	Low	Moderate

6.2.3.5 Serious and Irreversible Impacts

Assessment for Serious and Irreversible Impacts on Biodiversity Values

The determination of a Serious and Irreversible Impact (SAII) is to be made by the decision maker in accordance with the principles set out in the Biodiversity Conservation Regulation 2017 (BC Regulation 2017). Under Clause 6.7 (2) of the BC Regulation 2017, an impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because of one (1) of the following four (4) principles:

- Principle 1: The impact will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or
- Principle 2: the impact will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or
- Principle 3: it is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or
- Principle 4: the impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

The Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (DPIE, 2019) and the Threatened Biodiversity Profile Data Collection was reviewed to determine the SAII candidates relevant to the assessment.

Additional Impact Assessment Provisions for TECs at Risk of an SAII

No TECs present in the Biodiversity Study Area (including the Disturbance Footprint) are listed as SAII entities and no further assessment has been undertaken.

Additional Impact Assessment Provisions for Threatened Species at Risk of an SAII

No threatened species recorded within the Biodiversity Study Area (including the Disturbance Footprint) are listed as SAII entities and no further assessment has been undertaken.

6.2.4 Matters of National Environmental Significance

An EPBC Act referral was submitted to Commonwealth DCCEEW in March 2023 regarding Matters of National Environmental Significance (MNES). A 'Controlled Action' decision was made by the Minister for the Environment and Water (formerly Department of Agriculture, Water and the Environment) in June 2023. To meet the requirements of the Supplementary SEARs, a detailed MNES Report for threatened and migratory entities listed under the EPBC Act is provided in Appendix C of **Appendix 6**.

Species included for assessment in the report include those that are listed within the Supplementary SEARs as being potentially impacted by the Project, and any other that have a moderate to high likelihood of occurrence. Assessments of Significance for threatened and migratory entities were undertaken and is included in Appendix A of the MNES Report (being, Appendix C of **Appendix 6**).

In summary:

- One (1) TEC, Mallee Bird Community of the Murray Darling Depression listed under the EPBC Act was recorded in the Disturbance Footprint.
- Three (3) threatened species and one (1) migratory species listed under the EPBC Act were recorded within the Disturbance Footprint.
- An additional five (5) species that were not recorded during surveys have potential to use habitat within the Disturbance Footprint and have potential to be impacted by the Project during construction and operational phases.
- A further 12 threatened species were identified that do not have habitat within the Disturbance Footprint, but have potential to be impacted by the Project during the operational phase.

A summary of the impacts of the Proposed Action, their nature and consequences to MNES are provided in below **Table 6.15**.

Table 6.15 Summary of the Impacts of the Project, their nature and Consequences to MNES

MNES	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact (local, state or national)
Mallee Bird Community EEC	Direct removal of habitat	Construction	• PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Moderate-good, Zone 4) = 3.81 ha • PCT 171: Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (Moderate-good, Zone 8) = 18.95 ha. Total = 22.76 ha	Local
Mallee Bird Community EEC	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for these ten species recorded ranges from Negligible (for the nine passerines) – Minor (regent parrot).	Local
Australasian bittern	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Moderate.	Local
curlew sandpiper	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
pink cockatoo	Direct removal of habitat	Construction	54.34 ha (Foraging habitat)	Local
pink cockatoo	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Moderate.	Local
south-eastern hooded robin	Direct removal of habitat	Construction	54.34 ha	Local
south-eastern hooded robin	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Negligible.	Local
Australian painted snipe	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Moderate.	Local
common greenshank	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
southern whiteface	Direct removal of habitat	Construction	54.34 ha	Local
southern whiteface	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Negligible.	Local

MNES	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact (local, state or national)
sharp-tailed sandpiper	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
grey falcon	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
Latham's snipe	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
painted honeyeater	Direct removal of foraging habitat	Construction	30.37 ha	Local
painted honeyeater	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
malleefowl	Direct removal of foraging habitat	Construction	23.98 ha	Local
malleefowl	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
blue-winged parrot	Direct removal of foraging habitat	Construction	54.34 ha	Local
blue-winged parrot	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
Corben's long-eared bat	Direct removal of foraging habitat	Construction	54.34 ha	Local
Corben's long-eared bat	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
regent parrot (eastern subspecies)	Direct removal of foraging habitat	Construction	54.34 ha (Foraging habitat)	Local
regent parrot (eastern subspecies)	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Moderate.	Local
fork-tailed swift or Pacific swift	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Moderate.	Local

MNES	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact (local, state or national)
pectoral sandpiper	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
red-necked stint	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Minor.	Local
gull-billed tern	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Negligible.	Local
Caspian tern	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Negligible.	Local
marsh sandpiper	Prescribed impacts – turbine strike	Operational	The indirect impacts are difficult to quantify, as such their quantum has not been estimated. The overall risk rating for this species is Negligible.	Local

6.2.5 Aquatic Impacts

There are limited mapped watercourses within the Project Area, all of which are of a minor nature. The only aquatic habitat associated with the Biodiversity Study Area comprises three farm dams, these however will not be impacted by the Project as part of the Disturbance Footprint.

No other aquatic habitats are present within the Biodiversity Study Area. No habitat for any threatened species listed under the FM Act is present within the Disturbance Footprint.

Water and erosion management controls will be employed to minimise erosion and discharge of sediment and other pollutants during construction.

6.2.6 Cumulative Impact Assessment

Cumulative impacts occur when the impacts from multiple projects or developments combine and the compounding effects are larger than any one of the projects itself has quantified and assessed. The Project will contribute to cumulative impacts on biodiversity during construction and operation along with other large-scale renewable energy projects (operational, under construction, approved and proposed) in the vicinity and within the South West REZ. It is considered likely that cumulative impacts will increase the loss of similar native vegetation and threatened species habitat to the Project across the region.

A review of publicly available information available at the time of finalisation of **Appendix 6** was undertaken for other developments near the Project. Potential cumulative biodiversity impacts are provided in **Table 6.16**.

The final composition of renewable energy development in the South West REZ will largely be determined by the NSW Government allocation of access rights to the limited transmission infrastructure. The intended capacity of the South West REZ is 2.5 gigawatts with registered interest well in excess of this. It is therefore expected that there will be more proposed projects than the intended capacity and cumulative impacts required to build the South West REZ to its maximum capacity will potentially be less than that predicted for the full extent of all projects currently proposed.

Impact information compiled from projects in initial planning stages are not accurate and the final impacts may be more or less than the data presented.

Table 6.16 Past, Present and Future Projects

Project	Distance	Biodiversity value impacted – PCTs and TECs	Biodiversity value impacted – Threatened flora	Biodiversity value impacted – Threatened fauna	Construction Impact	Operation Impacts
Gol Gol Energy Hub (SEARs requested)	Less than 3 km	Three TECs have a moderate-high potential to occur on the subject land, these include: *Acacia loderi* shrublands, *Acacia melvillei* shrublands in the Riverina and Murray Darling Depression bioregions and Mallee Bird Community of the Murray Darling Depression Bioregion, EPBC Act.	No targeted flora survey undertaken yet. Two threatened flora species are known to occur on or nearby the project investigation area.	No targeted fauna survey undertaken. 34 threatened fauna species are known to occur on or nearby the project investigation area.	Installation of PV panels with a generation capacity of up to 600 MW, accommodated within an area of approximately 1,500 ha • Associated infrastructure (underground powerlines, access tracks). Up to 120 WTG's, with 840 MW capacity. • Total Generation capacity = 1440 MW.	120 WTGs and associated infrastructure – collision and traffic risks
Mallee Solar Farm (Prepare EIS Stage)	Overlapping boundaries	Similar to Mallee Wind Farm (Proposed Project).	Similar to Mallee Wind Farm (Proposed Project).	Similar to Mallee Wind Farm.	~1.5 million PV modules, Generation Capacity = 600 MW.	traffic risk
Euston Wind Farm (Prepare EIS Stage)	Nearest boundary is approximately 30 km away	Six PCTs confirmed within the Study Area (PCTs 13, 57, 58, 170, 170, 172). One confirmed TEC (Mallee Bird Community of the Murray Darling Depression Bioregion, EPBC Act) and a further four possible TECs require additional floristic surveys to confirm presence. The four possible TECs include: Plains mallee box woodlands of the Murray Darling Depression and Riverina and Naracoorte Coastal Plain Bioregions, EPBC Act, *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions, Porcupine Grass— Red Mallee—Gum Coolabah hummock grassland/low sparse woodland in the Broken Hill Complex Bioregion, Acacia loderi shrublands.	No threatened flora.	Seven threatened species include brown treecreeper, chestnut quail-thrush, hooded robin, little eagle, pink cockatoo, spotted harrier and white-fronted chat.	~96 WTGs, Generation Capacity = 700 MW (AC)	96 WTGs and associated infrastructure
Euston Mineral Sands (Prepare EIS stage)	Overlapping boundaries	Similar to Mallee Wind Farm.	Similar to Mallee Wind Farm.	Similar to Mallee Wind Farm.	6000 ha of open cut mining	Dust, noise, traffic
Koorakee Energy Park (Prepare EIS Stage)	Nearest boundary is approximately 45 km south east	Ten PCTs noted as potentially present. Four TECs are considered with a moderate to high likelihood of occurring: *Acacia loderi* shrublands EEC, *Acacia melvillei* shrublands in the Riverina and Murray-Darling Depression bioregions EEC, Mallee Bird Community of the Murray Darling Depression Bioregion EEC and Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions EEC.	2 flora species are known to occur on or nearby the site according to NSW BioNet Atlas database records and preliminary surveys conducted for the Euston Wind Farm Scoping Report.	17 fauna species are known to occur on or nearby the site according to NSW BioNet Atlas database records and preliminary surveys conducted for the Euston Wind Farm Scoping Report.	up to 167 WTGs, 3 blade system ~2.2 million solar panels.	up to 167 WTGs and associated infrastructure.
Keri Keri Wind Farm (EIS submitted)	Nearest boundary is approximately 150 km away	The subject land comprises 1,130.93 ha of native vegetation (PCTs 26, 44, 160, 163, 164).	Candidate flora species recorded include *Brachyscome papillosa, Maireana cheelii* and *Swainsona murrayana*.	One candidate fauna species was recorded within the subject land - little eagle.	884 MW wind farm comprising up to 155 WTGs, and a solar farm with 400 MW solar PV and 200 MW/ 800 MW/hour BESS.	155 WTGs and associated infrastructure.
Lake Victoria Wind Farm (prepare EIS Stage)	Nearest boundary is approximately 65 km away	19 PCTs were mapped within the proposed works footprint. Pct 154 makes up of ~70% of the works footprint. Two TECs were identified within the Project area, these include Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions and Mallee Bird Community of the Murray Darling Depression Bioregion, EPBC Act.	The initial survey identified one threatened flora species (*Austrostipa nullanulla*). Additional survey still to be completed.	The initial survey identified three threatened fauna species (Pink Cockatoo, Southern Whiteface and White-fronted Chat). Additional survey still to be completed.	203 wind turbine generators (WTGs) with generation capacity of up to 1.5 gigawatts (GW).	203 wind turbine generators (WTGs) with generation capacity of up to 1.5 gigawatts (GW).

Project	Distance	Biodiversity value impacted – PCTs and TECs	Biodiversity value impacted – Threatened flora	Biodiversity value impacted – Threatened fauna	Construction Impact	Operation Impacts
Junction Rivers Wind Farm (formerly Burrawong WF) (EIS submitted)	Nearest boundary is approximately 120 km away	The subject land comprises 2,248 ha of native vegetation (PCTs 16, 21, 23, 57, 58, 163, 170). Two TECs: *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions EEC and Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions EEC.	Assumed presence have been included for • Menindee nightshade (*Solanum karsense*) • mossgiel daisy (*Brachyscome papillosa*) • winged peppercress (*Lepidium monoplocoides*). Bitter quandong (*Santalum murrayanum*) and *Austrostipa metatoris* were both recorded on the subject land but have been avoided by the project.	Two candidate fauna species was recorded within the subject land (pink cockatoo and regent parrot). Regent parrot was not recorded breeding, as such species credits are not required for this species.	96 WTGs and associated infrastructure, Capacity 750 MW	96 WTGs and associated infrastructure
Wilan Energy Park (Prepare EIS stage)	Nearest boundary is approximately 140 km away	Areas of non-native vegetation and Category 1 land occur in places subject to previous irrigated and dryland cropping or heavy grazing.	Threatened species known or predicted to include: *Austrostipa metatoris, Brachyscome papillosa, Maireana cheelii, Lepidium monoplocoides, Solanum karsense, Swainsona murrayana.* Mossgiel Daisy and Chariot Wheels have been recorded in the project area.	There are 31 threatened fauna species that have potential to occur in the project area.	Up to 138 WTGs. Ancillary electrical equipment and operations and maintenance facilities. Capacity ~1000 MW.	Up to 138 WTGs and associated infrastructure
Baldon Wind Farm (Prepare EIS stage)	Nearest boundary is approximately 160 km away	The SVTM mapping shows 17 PCTs on the subject land, these include (PCTs 13, 15, 17, 24, 28, 46, 57, 153, 157, 159, 160, 163, 164, 166, 216, 236, 238). This mapping is yet to be verified.	One flora species were recorded within the Project Boundary - *Maireana cheelii*. An additional 3 species have the potential to occur.	Two fauna species are recorded within the Project Boundary: Spotted Harrier, Plains-wanderer. Another 20 threatened species have the potential to occur	Construction of 162 WTGs and associated infrastructure providing about 1,000 MW.	162 WTGs and associated infrastructure
Bullawah Wind Farm (EIS submitted)	Nearest boundary is approximately 250 km away	10 PCTs identified in the Subject Land with estimated impacts to 637.99 ha of native vegetation. Impacts to three TECs being: • Weeping Myall Woodlands • Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions • Sandhill Pine Woodland.	Four threatened flora species were recorded within the Project Area: • *Maireana cheelii* • *Swainsona sericea* • *Swainsona murrayana* • *Lepidium monoplocoides.* Two threatened flora species have been assumed present within the Subject Land – • *Austrostipa wakoolica* • *Cullen parvum.*	14 threatened fauna species were recorded within the Subject Land: • plains-wanderer • black falcon • Southernwhiteface • little eagle • spotted harrier • blue-winged parrot • barking owl • diamond firetail • flame robin • grey-crowned babbler • white-fronted chat • yellow-bellied sheathtail-bat • southern bell frog.	Construction of up to 143 WTGs and approximately 815.1 MW capacity.	Includes up to 143 WTGs and associated infrastructure
Pottinger Wind Farm (Exhibition Stage)	Nearest boundary is approximately 235 km away	Estimated impacts to 1,004.60 ha of native vegetation comprised of 19 PCTs identified in the Project Area. Three TECs (BC Act) and one TEC (EPBC Act) recorded in the Subject Land, including: Weeping Myall Woodland EEC • Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions EEC	Four threatened flora species were recorded: • Maireana cheelii • Swainsona sericea • Swainsona murrayana • Brachyscome papillosa.	Fifteen threatened fauna species were recorded or assumed present including: • southern bell frog • southern whiteface • black falcon • grey-crowned babbler • spotted harrier • white-fronted chat.	Construction of up to 247 WTGs with approximately 1.3 GW capacity. Up to six substations and 13 transformers. One BESS and an internal electrical reticulation network. Construction impact area of 379 ha.	Operation of 247 WTGs impact area of approx. 379 ha.

Project	Distance	Biodiversity value impacted – PCTs and TECs	Biodiversity value impacted – Threatened flora	Biodiversity value impacted – Threatened fauna	Construction Impact	Operation Impacts
		• Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions • Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions.		One threatened fauna species has been assumed present being plains-wanderer.		
Pottinger Solar Farm (EIS stage)	Nearest boundary is approximately 200 km away	Impacts to approximately 600 ha of native vegetation, including potential impacts to Weeping Myall Woodland and Sandhill Pine Woodland	Impacts expected to a similar suite of species as Pottinger Wind Farm.	Impacts expected to potential Plains-wanderer habitat.	Construction of 300 MW solar farm and 500 MW BESS, across approximately 1,600 ha.	Operation of 300 MW solar farm and 500 MW BESS.
Project EnergyConnect (NSW – Western Section) (Approved project)	<1 km	Direct impacts to 1,615.20 ha of native vegetation comprised of 38 PCTs. Impacts 232.16 ha of TECs, including: • Weeping Myall Woodlands • Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions • Sandhill Pine Woodland.	Five threatened flora species were recorded including: • *Acacia acanthoclada* • *Atriplex infrequens* • *Austrostipa nullanulla* • *Dodonaea stenozyga* • *Santalum murrayanum.* One threatened flora species was assumed present: • *Cullen parvum.*	Direct impacts to 18 threatened fauna species, including: • Regent parrot • Spinifex slender blue-tongue lizard • Black-breasted buzzard • Chestnut quail-thrush • Greater sand plover • Hooded robin • Little eagle • Pink cockatoo • Malleefowl • Redthroat • Square-tailed kite • white-bellied sea-eagle • White-fronted chat • Bolam's mouse • Southern nungaui • Inland forest bat • Little pied bat • Corben's long-eared bat.	Construction of 330 kV and 500 kV transmission line and Dinawan Substation.	Operation of 330 kV and 500 kV transmission line and Dinawan Substation.
The Plains Solar Farm and BESS (RtS stage)	Nearest boundary is approximately 200 km away	Impacts to ~1,000 ha of native vegetation comprised of six PCTs.	Three threatened flora species were recorded: • *Lepidium monoplocoides* • *Maireana cheelii* • *Swainsona murrayana.* Eight threatened flora species were assumed present, including: • *Austrostipa wakoolica* • *Calotis moorei* • *Brachyscome papillosa* • *Cullen parvum* • *Leptorhynchos orientalis* • *Sclerolaena napiformis* • *Swainsona plagiotropis* • *Swainsona sericea.*	Two threatened fauna species were recorded: • black falcon, • white-fronted chat. One threatened fauna species was assumed present – plains-wanderer.	Includes 900,900 PV panels, 400 MW capacity and BESS.	Includes 900,900 PV panels, 400 MW capacity and BESS.

Project	Distance	Biodiversity value impacted – PCTs and TECs	Biodiversity value impacted – Threatened flora	Biodiversity value impacted – Threatened fauna	Construction Impact	Operation Impacts
The Plains Wind Farm (RtS stage)	Nearest boundary is approximately 210 km away	Impacts to 1,997.03 ha of native vegetation comprised of 10 PCTs. Impacts to one TEC - Sandhill Pine Woodland	A species polygon was developed for seven flora species credit species within the Subject Land, including: A Spear-grass (*Austrostipa wakoolica*) • Winged Pepper-cress (*Lepidium monoplocoides*) • Chariot Wheels (*Maireana cheelii*) • Mossgiel Daisy (*Brachyscome papillosa*) • A burr-daisy (*Calotis moorei*) • Slender Darling Pea (*Swainsona murrayana*) • Small Scurf Pea (*Cullen parvum*). • A species polygon was developed for a single species credit species within the Haul Route DF, being: • Creeping Darling Pea (*Swainsona viridis*).	Six ecosystem credit species were recorded: • Black Falcon (*Falco subniger*) • Spotted Harrier (*Circus assimilis*) • Yellow-bellied Sheath-tailed Bat (*Saccolaimus flaviventris*) • White-fronted Chat (*Epthianura albifrons*) • Redthroat (*Pyrrholaemus brunneus*) • Southern Whiteface (Aphelocephala leucopsis). Once species credit species was recorded/assumed present. Plains-wanderer (*Pedionomus torquatus*).	Includes up to 188 wind turbines and approximately 1,350 MW capacity.	Includes up to 188 wind turbines and approximately 1,350 MW capacity.
Dinawan Wind Farm (EIS stage)	Nearest boundary is approximately 280 km away	Estimated impacts to 780 ha of native vegetation, including nine PCTs and three TECs. Weeping Myall and Natural Grasslands impacts are anticipated.	Suitable habitat potentially present for 11 threatened flora species.	Suitable habitat potentially present for 16 threatened fauna species.	Construction of 1.5 GW wind farm, comprising of up to 250 WTGs, on approximately 22,000 ha.	Operation of 1.5 GW wind farm, comprising of up to 200 WTGs, on approximately 22,000 ha.
Dinawan Solar Farm (RtS stage)	Nearest boundary is approximately 230 km away	Impacts to 2,477 ha of native vegetation, including: 1571 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions and 137 ha Weeping Myall Woodland.	Two threatened flora species were recorded: *Swainsona murrayana* (5.5 ha) and *Swainsona sericea* (5.5 ha). Two threatened flora species are assumed present: • *Austrostipa wakoolica* (220.5 ha) and • *Pilularia novae-hollandiae* (229.5 ha).	Twelve threatened fauna species were recorded, including: • Southern Bell Frog • Plains Wanderer • Black Falcon • Spotted Harrier • Southern Whiteface • Redthroat • White-fronted chat • Yellow-bellied sheathtail bat • Painted honeyeater • Pied honeyeater • Grey-crowned Babbler. One threatened fauna species is assumed present: • Plains-wanderer.	Construction of 800 MW solar farm, 300 MW BESS on approximately 2,500 ha.	Operation of 800 MW solar farm, 300 MW BESS on approximately 2,500 ha.
Argoon Wind Farm (EIS Stage)	Nearest boundary is approximately 300 km away	Potential impacts to up to native vegetation comprised of 19 PCTs. Up to nine TECs listed under both the BC Act and EPBC Act may be present within the Project Area.	Suitable habitat potentially present for 18 threatened flora species.	Suitable habitat potentially present for 55 threatened fauna species.	Construction of 901 MW wind farm, 460 MW/2300 MWh BESS with a Project Area of approximately 10,885 ha.	Operation of 901 MW wind farm, 460 MW/2300 MWh BESS with a Project Area of approximately 10,885 ha.
Yanco Delta Wind Farm (Approved)	Nearest boundary is approximately 290 km away	Impacts to 173.39 ha of native vegetation, including four TECs: • Weeping Myall Woodlands; Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Two threatened flora species were recorded: • *Swainsona murrayana* • *Swainsona sericea.*	Eleven threatened fauna species recording, including: • Spotted Harrier • White-fronted Chat • Little Eagle	Construction of 208 WTGs, 800 MW/800 MWh BESS with a disturbance of approximately 238 ha.	Operation of 208 WTGs, 800 MW/ 800 MWh BESS with a disturbance of approximately 238 ha.

Project	Distance	Biodiversity value impacted – PCTs and TECs	Biodiversity value impacted – Threatened flora	Biodiversity value impacted – Threatened fauna	Construction Impact	Operation Impacts
		• Sandhill Pine Woodland and Natural Grasslands of the Murray Valley Plains.	Twelve threatened flora species are assumed present, including: • *Austrostipa wakoolica* • *Lepidium monoplocoides* • *Cullen parvum* • *Maireana cheelii.*	• Grey-crowned Babbler • Diamond Firetail • Flame Robin • Black Falcon. Three threatened fauna species are assumed present, including: Plains Wanderer.		
Tchelery Wind Farm (EIS Stage)	Nearest boundary is approximately 170 km away	Potential impacts to up to native vegetation comprised of 16 PCTs. Four BC Act listed TECs are potentially within the project site.	Potential impacts to seven threatened flora species identified within the Project Area including: • *Swainsona murrayana* • *Brachyscome papillosa* • *Maireana cheelii* • *Lepidium monoplocoides* • *Cullen parvum.*	Potential impacts to seven threatened fauna species identified within the Project Area including: • Southern Bell Frog • Plains-wanderer • Little Eagle.	Construction of 120 WTGs with a total capacity of 800 MW across a 27,400 ha Project Area.	Operation of 120 WTGs with a total capacity of 800 MW across a 27,400 ha Project Area.

6.2.7 Mitigation and Management Measures

Spark Renewables has committed to the design and implementation of a comprehensive biodiversity mitigation strategy to minimise the residual impacts of the Project.

A Construction Environmental Management Plan (CEMP), Operational Environmental Management Plan (OEMP), Biodiversity Management Plan (BMP) and Bird and Bat Adaptive Management Plan (BBAMP) will be prepared for the Project. Suitable biodiversity management planning documentation would be determined, as part of overall decommissioning works plans for the Project, and will include aspects of the CEMP and BMP, where relevant.

All plans will describe the avoidance, mitigation and management measures that will be undertaken to manage potential environmental impacts of the Project. They will be prepared to meet the specific requirements of the Project to avoid and minimise impacts on biodiversity values, in accordance with best practice.

The following specific control measures are recommended for the mitigation of impacts on the biodiversity features of the Disturbance Footprint:

- Salvage of biodiversity features, including habitat resources (e.g., hollow logs, tree hollows, fallen timber and rocks/boulders).
- A pre-clearing procedure will be implemented to minimise the potential for impacts on native fauna species (focusing on threatened species) as a result of the clearing of hollow-bearing trees. The pre-clearing procedure is designed to minimise impacts to hollow-dependent and ground-dwelling fauna.
- Weed management including biosecurity controls to prevent importation of weeds and weed management measures.
- Fencing and access control.
- Bushfire management.
- Erosion and sedimentation control.
- Workforce education and training.

Each of these minimisation measures will be included in the CEMP and where relevant, OEMP.

6.2.7.1 Mitigation Measures

Proposed mitigation measures are summarised in **Table 6.17**.

Table 6.17 Mitigation Measures

Impact	Action ID	Mitigation measure	Timing	Likely efficacy of mitigation	Outcome	Responsibility
Removal of native vegetation	B01	Native vegetation removal will be minimised through detailed design. An initial corridor was established to identify areas of highest quality vegetation. Where possible the Development Footprint has been placed within non-native and lowest quality native vegetation. Areas of high quality vegetation have been avoided. To avoid and minimise further clearing of vegetation the Development Footprint has utilised existing tracks, existing paddocks/crops and cleared areas.	Detailed design and Project surveys	Effective	The avoidance and minimisation of vegetation and habitat clearing during the Project planning	The Proponent
Removal of native vegetation	B02	Buffer mapping for habitats aid in providing the construction and maintenance teams with the information necessary for OEMP and the CEMP.	Detailed design	Effective	Pre-construction	The Proponent
The clearing of habitat, native vegetation and TECs	B03	Threatened fauna habitat removal will be minimised through detailed design.	Detailed design	Effective	Identify the residual threatened species impacts	The Proponent
The clearing of habitat, native vegetation and TECs	B04	The preparation and approval of a BMP prior to construction which will be prepared by a qualified ecologist with BCS consultation. Prior to clearing, the operational management component will be approved with BCS consultation. The BMP will include but not limited to: • Implementing mitigation measures. • Evaluating mitigation measures. • Objectives for monitoring. • Performance of proposed measures. • Informing an adaptive management method for additional offsets which further impacts are identified. • Remedial action.	Pre-clearing, pre-construction, construction and operation	Effective	Planning and management to avoid, minimise and mitigate biodiversity impacts	The Proponent and contractors
The clearing of habitat, native vegetation and TECs	B05	If any unexpected threatened species (flora or fauna) are found during construction, work should be halted immediately in the vicinity of the discovery, and the onsite manager should be notified.	Pre-clearing, pre-construction, construction and operation	Effective	Planning and management to avoid, minimise and mitigate biodiversity impacts	The Proponent and contractors
The clearing of habitat, native vegetation and TECs	B06	Barbed wire will be avoided for fencing where practicable to avoid entrapment of fauna on fences. Fences will be designed to ensure that fauna are not funneled toward dead ends or to create barriers between areas of habitat across the Project Area.	Detailed design	Effective	Planning and management to avoid, minimise and mitigate biodiversity impacts	The Proponent and contractors
The clearing of habitat, native vegetation and TECs	B07	Mitigation measures for harm to threatened hollow dependent fauna and live animals during pre-clearing surveys and translocation activities will be detailed in the BMP. This includes, but is not limited to: • Validation and mapping of all hollow bearing trees within the Development Footprint will be undertaken at least one month prior to vegetation removal. • Qualified and licenced ecologist or wildlife handler to rescue and re-located fauna during the pre-clearing surveys. • Protocols in place when hollow bearing trees and stick nests are being removed. Furthermore, mitigation protocols for mitigating harm to hollow or stick nest dependent threatened fauna or dependent habitat known in the Development Footprint.	Pre-clearance	Effective	Mitigating, avoiding and minimising impacts to biodiversity	The Proponent and contractors
The clearing of habitat, native vegetation and TECs	B08	During vegetation and habitat clearance work a qualified ecologist will conduct on-foot pre-clearance surveys at the start of each day prior to daily construction. This is to confirm there is no wildlife present in the area to be cleared. A qualified ecologist or qualified wildlife handler will also be present during vegetation and habitat clearing works to rescue and relocate fauna if required in the event individuals are present at the time of clearing. Additionally: • Contracted environmental representatives are to regularly conduct sweeping by regular driving through areas of the planned construction in the Development Footprint prior to planned clearance works to disturb the area and deter fauna from utilising these areas.	During clearing and construction	Effective	Avoiding and minimising impacts to fauna during the clearing and construction processes	The Proponent and contractors

Impact	Action ID	Mitigation measure	Timing	Likely efficacy of mitigation	Outcome	Responsibility
		• In the situation that an animal or threatened species is located in the construction area during other construction works, the Project Management Site Representative and Delivery Manager are to be immediately notified. Work must immediately stop within the construction area with an ecologist or a local wildlife rescuer to be brought on-site for handling and to follow the rescue procedures listed in the BMP.				
The clearing of habitat, native vegetation and TECs	B09	Exclusion zones within the Development Footprint will be marked by a qualified surveyor on site with the boundary of clearing limits. There will be specific exclusion zones included of known areas of threatened flora and fauna habitat.	Pre-clearance, during construction and early operation	Effective	Avoiding and minimising impacts to fauna during the clearing and construction processes	The Proponent and contractors
The clearing of habitat, native vegetation and TECs	B10	Measures to mitigate the impacts associated with construction activities on retained native vegetation and habitat will include: • Prior to all vegetation removal, pre-clearance inspections will be undertaken by a qualified ecologist. • Where possible, trim vegetation rather than clear or removal whole plants. • Retain tree roots where possible. • Retain dead trees and tree trunks where practical.	During construction	Effective	Avoiding and minimising impacts to fauna during the clearing and construction processes	The Proponent and contractors
The clearing of habitat, native vegetation and TECs	B11	The preparation and approval of a Rehabilitation Plan (RP) prior to clearing will be prepared in consultation with BCS. The RP will detail the implementation of rehabilitation in areas of the Development Footprint. The detailed design may include areas requiring rehabilitation prior to operation and areas of disturbance during the construction phase that do not require rehabilitation ahead of the operation of the Project. The RP will include but is not limited to: • Soil erosion preventative measures, re-establishing local PCTs, local native flora, habitat and detailed rehabilitation objectives which measure the outcomes for the success over the locations, target landforms and PCTs. • Restoring vegetation in riparian areas implementation measures to protect and improve areas of key habitat. • Remedial actions that have been triggered that includes notifying BCS through a Trigger Action Response Plan (TARP) with an agreement about the response. • Native indigenous species used for landscaping on pervious surfaces. • Stabilisation of exposed surfaces to prevent soil loss. • Ongoing maintenance which includes but is not limited to weed and pathogen management on rehabilitated areas. • During construction, the topsoil and subsoil generated will be used for rehabilitation and stored on-site.	Pre-construction, pre-clearance, during and post-construction	Effective	The avoidance and minimisation of soil erosion, weeds in disturbed areas and the spread to adjoining edges of native vegetation	The Proponent and contractors
Increase in weeds and disease pathogens in adjacent vegetation	B12	Weed monitoring and control programs are to be documented in the BMP and Trigger Action Response Plan as part of a Construction Soil and Water Manager Plan (CSWMP) detailed in the CEMP and implemented in consultation with BCS. Additional monitoring and control measures for introduced plant establishment and spread should be implemented at and around locations utilised for sediment control structures. Weed monitoring and control programs will include adaptive management strategies for priority weed species during construction, and early operational phase.	Pre-clearance, construction and operation	Effective	Spreading of weed controls from the Project	The Proponent and contractors
Increase in weeds and disease pathogens in adjacent vegetation	B13	All priority weeds, as listed on the DPI NSW WeedWise website - https://weeds.dpi.nsw.gov.au/WeedBiosecurities?AreaId=137 for the Wentworth (Western region), are to be managed and controlled.	Pre-clearance, construction and operation	Effective	Spreading of weed controls from the Project	The Proponent and contractors
Increase in weeds and disease pathogens in adjacent vegetation	B14	Preparation of a vehicle and machinery hygiene strategy protocol as part of the BMP, will be implemented during construction and operation. The strategy will include site specific locations, timings, and methods for removing soil and plant matter from vehicles and machinery. Hygiene	Pre-clearance, construction and operation	Effective	Spreading of weed controls from the Project	The Proponent and contractors

Impact	Action ID	Mitigation measure	Timing	Likely efficacy of mitigation	Outcome	Responsibility
		measures stated in the strategy protocol must be applied during construction and operation to ensure vehicle and machinery hygiene.				
Increase in weeds and disease pathogens in adjacent vegetation	B15	Weeds will be disposed and managed appropriately during clearing works, to stop the spread of invasive weed species.	Pre-clearance, construction and operation	Effective	Spreading of weed controls from the Project	The Proponent and contractors
Increase in weeds and disease pathogens in adjacent vegetation	B16	Construction of wash down stations will occur at suitable locations to wash down vehicles and employee shoes to stop the spread of weeds, pathogens (including *Phytophthora cinnamomi*, amphibian chytrid fungus, agricultural weeds, and exotic rust fungi) and the introduction of new species to the site.	Pre-clearance, construction and operation	Effective	Spreading of weed controls from the Project	The Proponent and contractors
Increase in predatory and pest species	B17	Refuse and personal waste generated throughout the construction and operational phases will be stored in bins and discarded in a suitable waste storage facility.	During construction and operation	Effective	Controlled action to mitigate, avoid and minimise introduced predators and pests to the area of construction	The Proponent
Increase in predatory and pest species	B18	Implementation of a monitoring program for feral animals which is based on performance triggers for adaptive management. If an increase in predator activity is identified, it will trigger the need for a control program based on measures related to performance. This will be outlined in the BMP with control done in consultation of host landowners.	During construction and operation	Effective	Controlled action to mitigate, avoid and minimise introduced predators and pests to the area of construction	The Proponent
Impacts on protected animals from wind farm strikes	B19	To measure impacts on bird and bat species, a Bird and Bat Adaptive Management Plan (BBAMP) will be prepared as part of the BMP. Further details are provided below in Section 9.2.2.	During construction and operation	Effectiveness with an adaptive response method and management	Monitoring fauna blade strike collision	The Proponent
Impacts on protected animals from wind farm strikes	B20	Measures taken to protect birds include: • Nests within 200 m of the Development Footprint will be mapped and validated prior to the erection and operation of WTGs. • Nests will be inspected prior to removal for juvenile birds and avoidance or relocation to be undertaken under the guidance of a qualified ecologist. • Regular carcass removal will be undertaken to prevent raptors being attracted to the Project Area. • Reduction of potential perching locations where possible will be a consideration of the Project design. • Power lines will be fitted with species specific measures to avoid unnecessary collisions.	During construction and operation	Effectiveness with an adaptive response method and management	Monitoring fauna blade strike collision	The Proponent
Fragmentation resulting in reduced connectivity	B21	Clearing/works will be contained within approved areas	During construction	Effective	No reduction in connectivity	The Proponent and contractor
Wildlife impacts from vehicle strikes	B22	Consider 40 km/h speed limits on newly formed access tracks to reduce the risk of vehicle strikes to fauna specifically in areas surrounding permanent water bodies and close to farm dams, particularly after periods of rain.	Pre-construction, during construction and decommissioning	Effective	No wildlife vehicle strikes	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B23	A Construction Soil and Water Management Plan (CSWMP) will be prepared as a part of the CEMP. This will include but not limited to: • Procedures to minimise and manage erosion and sediment transport within the project site and offsite. • The preparation of Erosion and Sediment Control Plan (ESCP) for construction. • Procedures to manage accidental spills with the requirement to maintain spill kits. • Procedures to manage the potential of any acid sulfate soils (ASS) in accordance with the NSW Acid Sulfate Soil Guidelines (Ahern et al. 1998). • Procedures to manage potential tannin leachate. • Procedures to manage stockpiles. • Details of surface water quality monitoring procedures.	Pre-construction, during construction and decommissioning	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor

Impact	Action ID	Mitigation measure	Timing	Likely efficacy of mitigation	Outcome	Responsibility
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B24	As part of the CSWMP, a construction ESCP will be prepared. This will detail erosion and sediment control procedures that will be implemented within the Project Area in accordance with the principles and requirements of Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004).	Pre-construction and during construction	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B25	To minimise and avoid any impacts threatened species and water quality, the following procedure will be implemented: • The total bare earth exposed at any time will be minimised. • Rehabilitation strategies to be implemented to minimise dust regeneration, soil erosion and weed incursion. • Rehabilitate all areas of the Project Area that are not proposed for future disturbance post construction and when decommissioning.	During construction and decommissioning	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B26	Prior to, during and following construction and decommissioning, a surface water monitoring program will be prepared and implemented as part of the CSWMP.	Pre-construction, during construction and decommissioning	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B27	As part of the CSWMP, Project specific procedures and controls will be prepared and implemented. This is to minimise the risk of spills, litter and leaks entering downstream waterways and/ or leaking into the soil and groundwater table. The CSWMP will include, but is not limited to: • All liquids, chemicals and fuels to be stored in a sealed bunded area and stored on level ground within the construction compound. • Appropriate storage of equipment and hazardous substances during construction and operation. • Designated areas with spill capture and management controls for refuelling and minor activities. • An emergency spill response procedure will be prepared in the CSWMP. • Regular water quality checks to be carried out at waterways within proximity to work being carried out. • Installation and maintenance of control measures such as gross pollutant traps and silt fencing.	During construction and decommissioning	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B28	The management of stockpiles to minimise the transport of dust, sediment and leachate runoff. This will include, but is not limited to: Minimising time that the stockpiles are left exposed, the number of stockpiles and the areas used for stockpiles. Designating stockpiles away from waterways, drainage lines and areas where they would be susceptible to wind erosion. Establishing appropriate controls for sediment, stabilising stockpiles and suppressing dust as required.	During Construction	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B29	Measures to avoid ingress from concrete waste into downstream waterways will be incorporated into the detailed design of concrete batch plants and outlined in the CEMP.	During Construction	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species.	B30	Stormwater runoff increases during the Project operation will be managed through, but not limited to: • The design of permanent drainage and water management to meet the Project performance outcomes of no pollution of water. • Control procedures and maintenance of access tracks and scour protection to minimise erosion and impacts on water quality.	During Operation	Effective	Avoiding and minimising impacts to aquatic habitats and threatened fish species	The Proponent and contractor

Impact	Action ID	Mitigation measure	Timing	Likely efficacy of mitigation	Outcome	Responsibility
Contaminant pollution.		• Potential impacts on channel erosion and scour to be monitored at receiving drainage channels and waterways downstream.				
Surface runoff changes resulting in sedimentation changes due to the removal of habitat and vegetation. Impacts on water quality and hydrological processes that sustain threatened species. Contaminant pollution.	B31	Within the detailed design, if the Project excavation exceeds the proposed maximum depth below ground level, potential impacts to GDEs will need to be re-assessed by a qualified hydrogeologist.	Detailed design and during construction	Effective	Avoiding impacts to GDE's	The Proponent
Fire risk during operation	B32	The Project will implement the following permanent bush fire protections: • Asset Protection Zones (APZs) around each WTG. • APZs around the BESS and substations. • An APZ around the operation and maintenance facility (to be constructed to a BAL-12.5 standard). • Perimeter firebreak. • Ongoing vegetation management. • Access for emergency response vehicles. • A permanent, dedicated firefighting water source. • Controls on Project actions to prevent bush fire ignition. • Fire suppression systems in substations, BESS and WTGs. • A Project fire fighting vehicle.	During construction and operation	Effective	Mitigate risks to biodiversity	The Proponent
Fire risk during operation	B33	Construction and Operation Bush Fire Emergency Management Plans will be developed in accordance with Planning for Bush Fire Protection (PBP) (NSW Rural Fire Service (RFS), 2019) and in consultation with the NSW RFS (including any requirements in relation to aerial firefighting). These plans will identify all pertinent bush fire risk and mitigation strategies relating to the construction and operation of the Project, including those listed in B29 and: • Actions to prevent bush fire ignition or spread from Project activities. • Work that will not be conducted during total fire bans. • Appropriate safety procedures and storage location for any fuels or other hazardous or flammable materials. • Protocols in place to alert NSW RFS regarding work with the potential to cause a fire to the surrounding vegetation. • Protocols and triggers to shut down WTGs with an approaching fire. • Measures relating to the requirements of NSW RFS or other authorities regarding the management risk to aerial firefighting in the region. • Escalation notifying protocols with contact details for the local NSW RFS Fire Control Centre, local fire brigades, CASA, Air Services Australia, and all other relevant people and / or organisations who will be notified of an emergency at the Project Area. • The locations of any firefighting water along with alternative water supplies that may be available in the case of an emergency (including any other fire suppression equipment held on and off site). • Bush fire emergency planning that includes evacuation routes, evacuation triggers and when and where to take refuge.	During construction and operation	Effective	Mitigate risks to biodiversity	The Proponent
Light and noise vibration impacts during night works	B34	To address noise that is likely to exceed acceptable noise management levels (NMLs) a Construction Noise Management Plan will be implemented as a component of the CEMP.	During construction and operation	Effective	Mitigate risks to biodiversity	The Proponent and Contractor
Light and noise vibration impacts during night works	B35	Standard noise mitigation measures will be implemented were reasonably practicable, including the following: • Work limited to standard hours of construction unless permitted by the development consent.	During construction and operation	Effective	Mitigate risks to biodiversity	The Proponent and Contractor

Impact	Action ID	Mitigation measure	Timing	Likely efficacy of mitigation	Outcome	Responsibility
		• Adopt low-noise and plant equipment, where feasible plant and equipment to be fitted out with silencing devices. • Consider using less intrusive alternatives to reverse beepers such as 'squawker' or broadband' alarms. • All plant and equipment to be well maintained. • Warrant equipment mufflers are functioning correctly and effectively. • When feasible, employ construction techniques that produce less vibration and are quieter. • Equipment that is on-site be turn-off when not in use. • Only have necessary equipment on-site, including only having necessary size and powered equipment for tasks. • Noisy activities will be concentrated at one location and relocate as soon as possible. • Vehicle movements limited and avoided whenever feasible. • Provide training to acquaint employees with noise sensitivity. • For concentrated, noise-intensive activities implemented temporary construction noise barriers or earth mounds. • Install enclosures around noisy mobile and fixed equipment were reasonably practicable. • Where reasonably practicable avoid coincide operation of two or more noisy plants close to receivers. • Optimise the offset distance between sensitive receivers and noisy plants. • Implement parking, loading/unloading areas and traffic flow management to minimise reversing movements. • Implement routinely monitoring of construction noise levels ensure effectiveness of mitigation measures and whether revision of measures in required.				
Light and noise vibration impacts during night works	B36	Standard vibration mitigation measures from the *Assessing Vibration: a technical guideline* (DECC, 2006) will be implemented were reasonably practicable, including the following: • Where reasonably practicable selecting lower-impact equipment or techniques were feasible. • Operating vibration-causing plant and equipment during the least sensitive time of day were reasonably practicable. • Avoid coincide operation of vibration-causing operations. • High-vibration activities to be located as far away from sensitive receiver areas as possible. • All plant and equipment to be well maintained. • Intensive vibration operation to not occur within the recommended safe set back distances. • Receivers to be notified regarding the nature of construction phases and vibrations-generating operations.	During construction and operation	Effective	Mitigate risks to biodiversity	The Proponent and Contractor
Dust pollution	B37	Air quality management measures will be implemented and include but is not limited to: • Haul routes clearly marked. • Maintenance and watering of haul routes. • Vehicle speed restriction. • Immediate clean-up of any material spillage. • During adverse weather conditions e.g. during hot and windy conditions weather will be monitored.	During Construction	Effective	Avoid, minimise and mitigate impacts from dust pollution.	The Proponent and Contractor
Edge effects on adjacent native vegetation and habitat	B38	Exclusion zones will be set up at the limit of clearing.	During construction	Effective	Identify residual edge effects	The Proponent

6.2.7.2 Adaptive Management for Uncertain Impacts

Some impacts, typically indirect and prescribed, are difficult to predict or assess prior to the commencement of a development (BAM Section 8.5). The adaptive management plan identifies uncertain impacts and can be used to quantify and respond to these throughout construction and operation.

Table 6.18 provides a suggested framework for the Adaptive Management Plan which includes the uncertain impacts and the potential monitoring activities, examples of appropriate methods to be used and example performance criteria required for each. This plan should be reviewed periodically and adjusted when necessary.

Table 6.18 Proposed Monitoring and Adaptive Management Measures

Impact being mitigated	Monitoring schedule	Example methods and triggers to be applied	Example performance criteria
Removal of native vegetation and habitat	During construction	Vegetation clearing reports to verify the area of native vegetation and threatened species habitat cleared. Trigger for compliance should clearing occur outside of Development Footprint.	No clearing outside of approved Development Footprint.
Removal of native vegetation and habitat	Operation - over the life of the Project set at 5 yearly intervals	Monitor the impacts of edge effects on TEC outside of the Development Footprint. Carry out floristic plots in adjacent vegetation, at a feasible distance from the Development Footprint, and compare with baseline data collected prior to construction. Trigger for compliance action and revision of mitigation measures should vegetation integrity scores show any reduction.	No negative change in vegetation integrity scores compared with baseline data.
Changes to surface water runoff regimes due to habitat removal	During construction	After heavy rainfall events, sediment controls will be monitored. Should sediment controls be considered ineffective, mitigation measures will be revised.	Implemented sediment controls are deemed to be effective.
Impacts on water quality and hydrological processes	During construction	Testing of water quality indicators (e.g., pH, turbidity) in aquatic habitats occurring downstream of the development. Should a decline in water quality be detected, work will be ceased or scaled back until additional mitigation measures are implemented and considered effective.	No detected decrease in water quality within downstream aquatic habitats.
Increase in weeds and pathogens within adjacent vegetation	During construction and operation – annually, until no corrective actions have been triggered for three consecutive years	Carry out floristic plots in adjacent vegetation, at a feasible distance from the Development Footprint, and compare with baseline data collected prior to construction. Should the acceptable limit of weed cover be exceeded, weed control and monitoring will be implemented as per the CEMP.	Set an acceptable limit of weed cover. Measures will be considered effective after meeting the performance criteria for three consecutive years post-construction.

Impact being mitigated	Monitoring schedule	Example methods and triggers to be applied	Example performance criteria
Increase in predator and pest species populations	During construction and operation - annually, until no corrective actions have been triggered for three consecutive years	Monitoring of predator and pest species using remote cameras, focusing on areas where there is a potential for increased pest activity i.e. compound sites.	Should an increase in predator and pest species be observed during monitoring, controls will be implemented. Appropriate triggers to be decided in consultation with BCS and landholders.
Increase in vehicle strikes	During construction and operation	Monitoring of tracks/roads for evidence of fauna collision. Reporting of vehicle strikes on fauna by site personnel. Set a threshold for an acceptable number of vehicle strikes on fauna, based on relevant literature, which will trigger revision of mitigation measures.	The acceptable threshold of vehicle strikes on fauna is not exceeded.

6.2.7.3 Adaptive Management of Bird and Bat Strike

Being a wind energy project, the operational impacts that the Project will have on avifauna species can only be predicted during the impact assessment due to requirements for adaptive monitoring and management. The accuracy of these predictions relies on extensive and repetitive surveys relating to bird and bat utilisation which have been undertaken for this Project. Across all wind energy projects, it is considered that some impacts relating to bird and bat strike and barotrauma may be uncertain and therefore, further consideration and an adaptive management strategy is warranted.

All other impacts associated with the Project are considered to be well known.

A BBAMP will be prepared to measure any impacts on avifauna (aerial fauna) by the Project.
The development and implementation of the BBAMP is an integral part of managing impacts to bird and bat species and a key mitigation measure to address the prescribed impacts associated with turbine strike outlined in Section 8.3 and Appendix B of **Appendix 6**.

The plan will develop trigger levels and mitigation measures designed to manage such impacts through Project operation, in consultation with BCS. The BBAMP will provide guidance to develop a framework for monitoring such impacts. This will include baseline monitoring and ongoing monitoring. The BBAMP will be prepared following approval of the Project, however, detail on the likely components of the plan is provided in Section 7.4.1 of **Appendix 6**.

An adaptive management strategy will be prepared as part of the BBAMP, which will provide a framework for establishing whether the Project has any impacts that were not predicted as an outcome of this assessment. Additional mitigation measures to address any new, uncertain or residual impact may include consideration of the following, in consultation with BCS:

- Carrion (carcass) removal program.
- Pest animal control.
- Raptor perch management.
- Lighting and deterrents.
- Alteration of cut-in speeds (minimum wind speed at which a WTG starts generating power).
- Temporary shutdown of WTGs.
- Acoustic deterrents.
- Radar consideration.
- Additional offset requirements.

6.2.8 Biodiversity Credit Impact Summary

The Project would directly impact up to 54.34 ha of native vegetation within the Disturbance Footprint.

Additionally, the impacts will be finalised following the completion of the detailed design and micro-siting of WTGs and associated infrastructure within the Disturbance Footprint. In doing so, Spark Renewables will seek to further minimise impacts to biodiversity values. A range of impact mitigation strategies have been implemented and are proposed to minimise the impact on ecological values prior to the consideration of offsetting requirements. Residual impacts that are not able to be managed through mitigation would be offset in accordance with BAM calculations for ecosystem credits, noting that no species credit species credits have been generated.

The proposed offset obligation for the Project, established in Section 11.0 of **Appendix 6**, and based on the Disturbance Footprint assessed in this EIS has been calculated to require 1,131 ecosystem credits.

Biodiversity Credit Reports which identify the like-for-like and variation credit requirements are provided in Appendix I of **Appendix 6**. A summary of the ecosystem credit requirements of the Project is provided as follows:

- **Ecosystem credit:** 58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion – moderate_good = **665 credits**
- **Ecosystem credit:** 58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion – derived_weedy = **38 credits**
- **Ecosystem credit:** 58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion – weedy_understory = **4 credits**
- **Ecosystem credit:** 170- Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones – moderate_good = **59 credits**
- **Ecosystem credit:** 170- Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones – Derived_native = **11 credits**
- **Ecosystem credit:** 170- Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones – Derived_weedy = **1 credit**
- **Ecosystem credit:** 171- Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion – Moderate_good = **353 credits.**

No species credit species were recorded within the Disturbance Footprint or Biodiversity Study Area. Therefore, no species credit species credits have been generated.

6.2.9 Biodiversity Offset Strategy

Spark Renewables is committed to delivering a biodiversity offset strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the Project.

As discussed in Section 7.0 of **Appendix 6**, the Project has, wherever practicable, optimised the layout to avoid and minimise ecological impacts in the planning and design stages.

A range of impact mitigation strategies are proposed to mitigate the impact on ecological values prior to the consideration of offsetting requirements. The offset requirements for the Project, as calculated in accordance with the BAM are identified in Section 11.0 of **Appendix 6**.

The offset strategy will be implemented in consideration of the process outlined in the BC Act and the final composition of the offset strategy may evolve as the Project progresses.

Spark Renewables will retire the credits required to offset the impacts of the Project as specified in Section 11.1 of **Appendix 6**. Spark Renewables is also seeking flexibility to utilise one or more of the offset options available under the BC Act and BC Regulation including:

- Land based offsets through the establishment of new Stewardship Sites (and subsequent retirement of credits) or by retiring credits from existing Stewardship Sites. Spark Renewables would retire the required number and class of credits determined in accordance with the BDAR and the offset rules in the BC Regulation.
- Securing (purchasing) credits through the open credit market.
- Paying into to the Biodiversity Conservation Fund (BCF).

The current base case option for credit retirement will be the establishment of Biodiversity Stewardship Agreements (BSAs) within the local area. Spark Renewables are currently investigating local land holdings in the region to identify suitable sites for the establishment of BSAs. Based on a desktop review using regional mapping there are extensive occurrences of the three (3) impacted PCTs (58, 170 and 171). Other PCTs within relevant offset trading groups which occur to a lesser extent in the local region include PCT 172, 191, 193 and 252.

It is noted that Mallee Bird Community of the Murray Darling Depression Bioregion EEC listed under the EPBC Act cannot be selected in the BAM calculator and therefore does not appear on the offset trading rules for the applicable vegetation zones. Offsets for PCT 170 and PCT 171, in moderate-good condition, will be provided according to the vegetation classes/percent cleared offset trading groups as listed in the credit summary report, as well as meet the requirements of the approved conservation advice for the Mallee Bird Community of the Murray Darling Depression Bioregion EEC.

Initial discussions with some landholders have taken place for the establishment of BSAs, and Spark Renewables are continuing investigations into suitable land holdings for the establishment of BSAs for the Project.

6.2.9.1 Bilateral Agreement

The Assessment Bilateral Agreement between the NSW and Commonwealth governments covers major Projects; and streamlines benefits for all NSW proponents that use the BOS and need approval under the EPBC Act, under the EPBC Act Condition-setting Policy. This means a NSW proponent who needs an EPBC Act approval can use the NSW BOS to assess and meet their biodiversity offset requirements.

Biodiversity assessments for the Project have been designed and executed in accordance with the NSW BAM. The biodiversity assessment has surveyed and mapped all vegetation communities in the Disturbance Footprint and has assigned them to the relevant PCT and, where relevant determined whether the communities conform to any NSW and Commonwealth TEC final determinations. Under the BAM, all PCT and component TECs generate impact credits that need to be retired in accordance with the BOS and all Commonwealth listed entities must be offset in a 'like-for-like' manner.

Threatened species are predicted by the BAM and subject to targeted surveys in accordance with NSW and Commonwealth guidelines. Species-credits are generated for impacts on habitat for threatened species recorded or predicted to occur which are then retired 'like-for-like' in accordance with the BOS.

The impacts to MNES associated with the Project will be offset in accordance with the BOS.

6.3 Aboriginal Cultural Heritage

The SEARs require:

> *an assessment of the impact to Aboriginal cultural heritage items (archaeological and cultural) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of archaeological test excavations (if required);*
>
> *provide evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010).*

The Supplementary SEARs dated 7 June 2023 (as varied by Spark Renewables under Section 156B of the EPBC Act and accepted by Commonwealth DCCEEW on 4 September 2024) require consideration of both WLRWHA and the Willandra Lakes Region National Heritage Property (WLRNHP) with regard to both ecological and Indigenous values.

An Aboriginal Cultural Heritage Assessment (ACHA) was undertaken by Austral Archaeology to assess the potential impact of the Project on Aboriginal cultural heritage values (both archaeological and cultural) in consultation with Aboriginal communities.

Biodiversity values associated with the Supplementary SEARs are addressed in the BDAR (**Appendix 6**) with relevant aspects of the WLRWHA and WLRNHP discussed in **Appendix 6**, and **Section 7.0** of this EIS.

The ACHA was prepared in accordance with the SEARs and the archaeological assessment followed the Code of Practice for the Investigation of Aboriginal Objects in New South Wales (Code of Practice) (DECCW 2010a). The Aboriginal cultural heritage assessment followed the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (the Guide) (OEH 2011) and the Aboriginal cultural heritage consultation requirements for proponents (Consultation Requirements) (DECCW 2010b).

The full ACHA is included in **Appendix 7** and key findings are summarised in the sections below.

For the purposes of the ACHA, the Study Area comprised:

- The Disturbance Footprint as shown in **Figure 3.1** and sensitive landforms directly adjacent to it, such as sandy rises, uncleared bushland and water sources.
- All areas of disturbance associated with off-site road works. Off-site road works are shown in **Figure 3.14** to **Figure 3.16**.

6.3.1 Existing Cultural Heritage Environment

6.3.1.1 Environmental Context

The Study Area is located within the Murray Darling Depression Bioregion (IBRA), comprising Tertiary and Quaternary aged marine and terrestrial sediments containing highly alkaline soils which are rapidly deposited, resulting in highly preserved archaeological material. The Murray Darling Depression Bioregion is where the Darling River and the Murray River converge with expansive Dunefields and is part of the semi-arid, dry environment known for harsh summers and higher temperatures. The Project Area is characterised by landscapes classified by Mitchell (2002), with the landscapes within the Study Area including Mallee Cliffs Dunes, Mallee Cliffs Linear Dunes and the Mallee Cliffs Sandplains (Mitchell 2002, p. 63).

The majority of the Study Area is located within the Mallee Cliffs Sandplains landscape. With a relief between 6 m and 10 m, the landscape has solonised brown soils, calcareous loamy sand and texture-contrast soils on the plain, red and brown soils on the dunes and non-cracking grey or brown clays in depressions (Mitchell 2002, p. 64). The topography of the Study Area contains slightly undulating dunes with large portions of flat terrain at a maximum elevation of 130 m AHD.

Water availability is a major influence on the range of resources available and the suitability of an area for Aboriginal occupation. The Project Area does not contain perennial streams although has several minor ephemeral drainage lines. The ACHA indicates that the flora and faunal landscapes of the Murray Darling Depression Bioregion would have supported the subsistence strategies, long term occupation and movements of Aboriginal people within the Study Area.

The Project Area was part of the Mallee Cliffs and Tapio Stations which were both expansive grazing properties. Extensive vegetation removal has occurred across the Project Area resulting in erosion along slopes across the terrain. Vegetation clearing post colonisation for the purposes of cattle grazing and cropping resulted in the removal of the original native vegetation, with the Project Area now covered in introduced grasses, agricultural crops, and some areas of dense native vegetation in uncropped areas. Historic imagery from 1964 and 1965 indicate that the Project Area was relatively undisturbed, with natural vegetation occurring across the Project Area, and the main disturbances being the access tracks (**Figure 6.9**).

Figure 6.9 1964 Historical aerial of the Project Area

6.3.1.2 Cultural and Archaeological Context

Populations

The Project Area is located in the traditional lands of the broader Kulin-speaking nations, consisting of the Barkindji, Latji Latji and Muthi Muthi/Mutthi Mutthi/Yitha Yitha people. It should be noted that the term 'Yitha Yitha' has generally been used to describe the Muthi Muthi people. This is incorrect, as the Yitha Yitha comprise a clan within the Muthi Muthi nation (Howitt 1904). Additional detail regarding the linguistic origins, lifestyle, dominant food groups and cultural practices of the Aboriginal groups that traditionally occupied the Study Area is within **Appendix 7**. The environmental and landscape features of the Mallee region had a profound influence on the lives of the Aboriginal people who were reliant on their surroundings to provide food.

World Heritage and National Heritage Properties

WLRWHA and WLRNHP are located approximately 25 km north-east from the Project Area. The Willandra Lakes Region was listed on the World Heritage List as a 'mixed site' in 1981 and in 1995, the boundary of the WLRNHP was modified to better define the area containing World Heritage values. In 2007, the WLWHA was added to the National Heritage List in recognition of its national heritage significance.

The WLWHA and WLRNHP contain evidence of human occupation of Australia dating to 42,000 years including human burials and cremations dating to around 40,000 years. Through ongoing traditions and the management of WLWHA and WLRNHP properties, Aboriginal people living in the area today affirm and continue their connection to their ancestors, culture and Country across the region.

Aboriginal Heritage Information System

A comprehensive predictive model based on the archaeological and environmental context was used to identify the types and characteristics of Aboriginal cultural heritage sites that might exist within the Project Area.

The predictive model is based on the analysis of the following key variables:

- Relationship between site types and their spatial distribution within the landscape.
- Raw site types, raw material types, and site densities, and their relationship to significant environmental features.
- Information from ethnohistorical sources that may highlight important natural resources or landscape features that could have been utilized.
- Potential chronological and spatial relationships between sites.

A predictive model has been developed by considering the variables outlined above, indicating the likely site types that will be encountered during the archaeological survey and testing.

The Aboriginal Heritage Information System (AHIMS) database, administered by Heritage NSW, contains records of all Aboriginal objects reported to Heritage NSW in accordance with Section 89A of the NPW Act. It also contains information about Aboriginal places, which have been declared to have Aboriginal cultural significance. Recorded Aboriginal objects and declared Aboriginal places are defined under the NPW Act as 'Aboriginal sites'.

A search of the AHIMS register was undertaken on 12 March 2024 covering an approximate 25 km buffer centred on the Study Area (i.e., the 'AHIMS search area'; AHIMS searches #872664) and identified 93 Aboriginal sites. Records of these searches are provided in **Appendix 7**; however, it should be noted that this includes the archaeological sites identified during the first round of survey for the Project undertaken in June 2023.

Of those Aboriginal sites reported in the AHIMS search results, most sites only contain 1 feature (n=85, 91.4%), with only 4 (0.43%) sites containing 2 features, 3 (3.2%) sites containing 3 features and only 1 (1.1%) site that contains 4 features. A summary of Aboriginal heritage site features within and adjacent to the Project Area is included in **Table 6.19** and shown in **Figure 6.10** below.

Table 6.19 Summary of Site recorded within and adjacent to the Project Area

Name	AHIMS No.	Type	Location Landform
PED-W-135	46-3-0206	Artefact	Sandplain
PEC-W-217	46-3-0221	Hearth	Sandplain
PEC-W-216	46-3-0222	Hearth	Sandplain
C1 River Margin	46-1-0105	Artefact, Shell	Sandplain
Mallee Windfarm ISO2	46-3-0230	Artefact	Sandplain
Mallee Windfarm ISO1	46-3-0229	Artefact	Sandplain
[redacted]	46-3-0227	[redacted]	Sandplain
Mallee Windfarm AS1	46-3-0228	Artefact	Sandplain
Mallee Windfarm HR1	39-6-0101	Hearth	Sandplain

Figure 6.10 AHIMS Sites within and adjacent to the Project Area

(Removed for Public Exhibition)

6.3.2 Consultation

A major aim of the ACHA was to identify any cultural values within the landscape in which the Project is located so that those values can be recognised and incorporated into the Project's management and mitigation measures. The consultation for the Project followed the Consultation Requirements (DECCW 2010b) and a detailed overview of correspondence with Aboriginal community stakeholders is presented in **Appendix 7**.

Consultation was undertaken in four (4) main stages, in accordance with the Consultation Requirements. These stages are summarised in **Table 6.20** below and include the list registered as Aboriginal stakeholders with an interest in this Project.

Table 6.20 ACHA Consultation Stages

Stage	Details
Stage 1 – Notification and registration of interest	In accordance with the Consultation Requirements, Austral notified the bodies and organisations listed in Section 4.1.2 (DECCW 2010b, p. 10). Letters were written to the Aboriginal stakeholders identified as a result of notification outlined in Section 2.2.1 of **Appendix 7.** Aboriginal stakeholders were provided with a 14-day period to register an interest in the Project. As a result, eight (8) registered Aboriginal parties (RAPs) and five (5) organisations including, Dareton LALC, Koori Digs Services, Independent Barkindji Native Title Holder, Barkindji Maraura Elders Environment Team – Dareton and Ngumbaay registered an interest in the Project. An active consultation process was established whereby Aboriginal parties could contribute to culturally appropriate information gathering and the assessment methodology, provide information to enable the cultural significance of Aboriginal objects and/or places to be determined, and to have input into the development of cultural heritage management options.
Stage 2 – Presentation of information	Information regarding the Project, proposed consultation process and assessment methodology was provided to the RAPs for comment in November 2022 and July 2023.
Stage 3 – Gathering information about cultural significance	Consultation with RAPs regarding the cultural heritage values of the Study Area included: • a request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the Study Area • discussion of cultural heritage values during fieldwork activities.
Stage 4 – Review of the draft ACHA	A copy of the draft ACHA was provided to all RAPs on 19 July 2024 with an invitation to review and comment on all aspects of the document, noting that information on cultural significance and any recommendations provided from an Aboriginal cultural perspective would be documented in the final ACHA. Outcomes of this consultation are detailed in the **Appendix 7** specialist study, however no immediate concerns or issues with the ACHA were identified.

6.3.2.1 Survey Method

The primary aim of the archaeological survey was to identify and record any existing surface evidence of past Aboriginal occupation within the Disturbance Footprint. Survey was primarily conducted on foot and completed by between four (4) to six (6) team members, where ground conditions allowed. Vehicles were utilised for some parts of the survey to achieve greater coverage across the relatively large area. Surveys were conducted between 13 to 17 June 2023 and between 18 to 28 March 2024.

For the June 2023 survey, the proposed Disturbance Footprint consisted of 4 Survey Units within the Project Area. For the March 2024 survey, the Disturbance Footprint was separated into 5 Survey Units, each divided into several transects.

The 3 offsite roadworks locations are likely to have no impact on Aboriginal cultural heritage as they are minor works in existing disturbed road corridors.

A desktop assessment was undertaken and determined there is a low likelihood of Aboriginal sites being present.

6.3.2.2 Survey and Test Excavation

Systematic survey across 13 to 17 June 2023 and between 18 to 28 March 2024 within the Study Area and its surrounds identified 29 Aboriginal sites. Sites most commonly identified across the two (2) surveys included artefacts (n=16, 55.17%) followed by hearths (n=11, 38.93%), a PAD (n=1, 3.43%) [redacted].

The June 2023 survey identified five (5) Aboriginal archaeological sites, including one (1) high density site complex, one (1) low density artefact scatter and one (1) area of dispersed heat retainers all in proximity to watercourses and two (2) isolated finds between 1 and 2 km from the nearest watercourse. Four (4) of the sites were identified in undulating sand dune landforms and one (1) of the sites was identified within a crest landform. No cultural materials were found in other landform contexts or at great distances to water, and limited to no raw material indicating Aboriginal occupation was present in these areas.

Following the June 2023 survey the Project layout was refined to avoid and minimise impacts to Aboriginal sites.

A second survey was undertaken in March 2024 to survey new areas associated with the refined Project layout. The survey identified a total of 24 new Aboriginal archaeological sites across the five (5) survey units including:

- Within survey Unit 1, four (4) suspect heaths were identified within either the ploughed paddock or access tracks and a single identified isolated stone artefact was located within transect Track 1 which is the main access track.
- Within Survey Unit 2, 16 Aboriginal cultural heritage materials were identified including 11 isolated stone artefacts, 5 hearths and/or hearth material and a single PAD.
- Within Survey Unit 3, three (3) Aboriginal cultural heritage materials were identified including a single isolated stone artefact, and 2 hearths and/or hearth material.
- No sites were identified within Survey Unit 4 or Survey Unit 5.

Following the archaeological survey of the proposed Disturbance Footprint, it was determined that test excavations were not required.

6.3.3 Assessment of Significance and Impacts

The current assessment has determined that the Aboriginal cultural heritage values of the Study Area and environs lie principally with both the known Aboriginal objects/sites within the Study Area, and those that may potentially be present and the tangible cultural connections to which they would be associated (if present). The Aboriginal consultation process has identified that the local Aboriginal community place high importance on the Aboriginal objects in the Study Area.

The current assessment determined that the Project would cause direct harm to known Aboriginal objects and the potential resource across the Study Area, however there are Aboriginal sites within the broader Project Area that can be completely avoided by the Project.

As part of the ACHA field survey, 29 Aboriginal sites have been identified within the Study Area. Of the 29 Aboriginal sites, 21 are located outside of the Disturbance Footprint and eight (8) Aboriginal sites are located within the Disturbance Footprint. All of the sites located within the Disturbance Footprint will be directly impacted by the proposed works.

An evaluation of harm to the Aboriginal sites identified as part of the ACHA is summarised in **Table 6.21**.

Table 6.21 Assessment of Harm to Identified Aboriginal Sites

Site Name / AHIMS No.	Site type	Scientific significance	Type of harm	Degree of harm	Consequence of harm
Mallee Windfarm ISO4 / 46-3-0232	Hearth	Low	Direct	Total	Total loss of value
Mallee Windfarm ISO7 / 47-1-0067	Artefact	Low	Direct	Total	Total loss of value
Mallee Windfarm ISO10 / 47-1-0069	Artefact	Low	Direct	Total	Total loss of value
Mallee Windfarm ISO15 / 46-3-0235	Artefact	Low	Direct	Total	Total loss of value
Mallee Windfarm HR5 / 46-3-0238	Hearth	Low	Direct	Total	Total loss of value
Mallee Windfarm HR7 / 46-3-0239	Hearth	Low	Direct	Total	Total loss of value
Mallee Windfarm HR9 / 46-3-0242	Hearth	Low	Direct	Total	Total loss of value
Mallee Windfarm HR10 / 46-3-0241	Hearth	Low	Direct	Total	Total loss of value
Mallee Windfarm HR1 / 39-6-0101	Hearth	Low	None	None	No loss of value
Mallee Windfarm HR2 / 39-6-0103	Hearth	Low	None	None	No loss of value
Mallee Windfarm HR3 / 39-6-0104	Hearth	Low	None	None	No loss of value
Mallee Windfarm HR4 / 46-3-0237	Hearth	Low	None	None	No loss of value
Mallee Windfarm HR6 / 47-1-0072	Hearth	Low	None	None	No loss of value
Mallee Windfarm HR8 / 46-3-0240	Hearth	Low	None	None	No loss of value
[redacted] 46-3-0227	[redacted]	High	None	None	No loss of value
Mallee Windfarm AS1 / 46-3-0228	Artefact	Low	None	None	No loss of value
Mallee Windfarm PAD / 46-3-0236	PAD	Unknown	None	None	No loss of value

Site Name / AHIMS No.	Site type	Scientific significance	Type of harm	Degree of harm	Consequence of harm
Mallee Windfarm ISO1 / 46-3-0229	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO2 / 46-3-0230	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO3 / 39-6-0102	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO5 / 47-1-0064	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO6 / 47-1-0065	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO8 / 47-1-0066	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO9 / 47-1-0068	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO11 / 47-1-0070	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO12 / 47-1-0071	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO13 / 46-3-0233	Artefact	Low	None	None	No loss of value
Mallee Windfarm ISO14 / 46-3-0234	Artefact	Low	None	None	No loss of value
Mallee Windfarm HR11 / 46-3-0243	Hearth	Low	None	None	No loss of value

Details of the eight (8) Aboriginal sites that will be directly impacted by the proposed development are provided in **Table 6.22** below.

Table 6.22 Details of the Impacted Aboriginal Sites

Site ID	Details
Mallee Windfarm HR10 (AHIMS # 46-3-0241)	A hearth situated on a dune within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm HR9 (AHIMS # 46-3-0242)	A hearth situated on a dune within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm HR7 (AHIMS # 46-3-0239)	A hearth situated on a plain within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm HR5 (AHIMS # 46-3-0238)	A hearth situated on a plain within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm ISO15 (AHIMS # 46-3-0235)	An isolated artefact situated on a plain within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm ISO10 (AHIMS # 47-1-0069)	An isolated artefact situated on a plain within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm ISO7 (AHIMS # 47-1-0067)	An isolated artefact situated on a plain within the Project Area and the proposed Disturbance Footprint.
Mallee Windfarm ISO4 (AHIMS # 46-3-0232)	An isolated artefact situated on a flat within the Project Area and the proposed Disturbance Footprint.

The significance values provided in the Australia ICOMOS *Charter for the Conservation of Places of Cultural Significance* (the Burra Charter) are considered to be the best practice heritage management guidelines in Australia (Australia ICOMOS 2013a). The Burra Charter significance values are frequently adopted by cultural heritage managers and government agencies as a framework for a more holistic assessment of significance.

In addition to the Burra Charter significance values include:

- social or cultural value to contemporary Aboriginal people
- historical value
- scientific/archaeological value
- aesthetic value.

Based on these criteria, and the Australian Heritage Council and DEWHA (2009) criteria, which are particularly useful when considering scientific potential, of the eight (8) Aboriginal sites potentially directed impacted by the Project, all sites were assessed as having low overall significance.

As a result of the proposed works, and due to the nature of the hearths detailed above, all four (4) of the hearths will be impacted. As an alternative to complete destruction of the remaining four (4) isolated artefacts identified within the Disturbance Footprint, community collection is recommended as a way to preserve these objects.

The three (3) offsite roadwork locations are likely to have no impact on Aboriginal cultural heritage as they are minor works in existing disturbed road corridors.

6.3.4 Cumulative Impact Assessment

6.3.4.1 Ecologically Sustainable Development

Australia's National Strategy for Ecologically Sustainable Development (1992) defines ecologically sustainable development as: 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'. Simply, Ecologically Sustainable Development is development which aims to meet the needs of Australians today, while conserving our ecosystems for the benefit of future generations.

6.3.4.2 Intergenerational Equity – Cumulative Impact Assessment

As the Project is located wholly within the South West REZ there is the potential to see strong interest for renewable energy development and ground disturbing activities across the locality and region, with the potential risk of generating cumulative Aboriginal cultural heritage impacts. Accordingly, a review of relevant information available within the public domain and for the proximal developments summarised in Section 2.6.2 was undertaken.

When assessing likely harm on Aboriginal objects and places it is necessary to consider the principle of intergenerational equity. Intergenerational equity is:

> *"…the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations".*

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts by historic development or under previous AHIPs/ACHMPs etc), fewer opportunities remain for future generations of Aboriginal people to benefit from the preservation of their cultural heritage, places and objects. Information about the integrity, rarity or representativeness of the Aboriginal objects and places that may be impacted by a project, and how those tangible cultural heritage elements demonstrate the lifeways of Aboriginal peoples within the region, is pertinent to the consideration of intergenerational equity and the understanding of a project's contribution to cumulative impacts. Where there is uncertainty, the precautionary principle must be followed (DECC [former] 2009: 26).

Comparison of the identified Aboriginal cultural heritage resource of the Study Area (as defined in **Appendix 7**) with that of the surrounding region, using the results of AHIMS searches, provides a basic framework for identifying the impacts that a project may have on the broader Aboriginal cultural heritage resource of a given geographic region. Alongside those identified within the Study Area, existing open artefact and hearth sites and environs offer opportunities for future research, conservation and education. Accordingly, it is necessary to quantify the impacts of the Project on this collective resource. As indicated in Section 10.5 of **Appendix 7**, a total of eight (8) Aboriginal sites have been identified within the Project's Disturbance Footprint and will be directly impacted. Of those, sites include isolated artefacts or hearths situated on either a dune or plain. Where reasonable and feasible, impacts to these eight (8) sites will be avoided or minimised through micro-siting. Where impacts cannot be avoided, a surface collection program is proposed of the 4 isolated artefact sites (refer to Section 12 of **Appendix 7**).

AHIMS data indicates that hearths represent approximately 5% and artefacts represent approximately 25% of the site types of the AHIMS search area. While acknowledging the limitations of the AHIMS database with respect to the validity of listed site statuses, on the basis of this data, it seems reasonable to conclude that the loss of these sites would constitute a minor adverse impact to the known artefact artefacts or hearth resources of the region. Consideration of the character of these sites however, all of which have been assessed as being of low scientific significance, provides support to this suggestion.

6.3.5 Mitigation and Management Measures

The following recommendations are derived from the findings described in this ACHA (see **Appendix 7**). The recommendations have been developed after considering the archaeological context, environmental information, consultation with the local Aboriginal community, and the findings of the archaeological surveys and the predicted impact of the planning proposal on archaeological resources.

Although, the proposed works have been altered to avoid 21 sites, eight (8) sites will be directly impacted by the proposed works.

6.3.5.1 Surface Collection Program

ACH01: To mitigate harm to impacted sites, it is recommended that a community salvage program for the sites be initiated. Although harm will occur as part of this activity, the salvage and relocation of these sites will minimise the harm that would occur as part of the proposed works, either directly or indirectly.
Four hearths will be destroyed as these cannot be salvaged due to their nature, although four artefact sites will be collected as part of this community salvage program.

6.3.5.2 Aboriginal Cultural Heritage Management Plan

ACH02: Before any works occur, Spark Renewables will develop an Aboriginal Cultural Heritage Management Plan (ACHMP) to mitigate and manage impacts to all Aboriginal heritage sites within and directly adjacent to the Project Area. These sites are protected under the Section 90 of the NSW NPWS Act 1974. The ACHMP will form part of the Project's construction environmental management plan and the conditions contained within it should apply to the construction, operational and decommissioning phases of the Project.

ACH03: It is recommended that the ACHMP contains the following management and mitigation conditions:

- A description of the measures that would be implemented to avoid impacts to sites 46-3-0227 [redacted] and 46-3-0236 (Mallee Windfarm PAD) by the Project. This will include a no-works and no-access area to protect sites 46-3-0227 (Mallee Wind Farm Open Site) and 46-3-0236 (Mallee Windfarm PAD).
- A methodology for the community collection / surface salvage of four (4) artefact sites within the Disturbance Footprint that will be harmed by the Project.
- A strategy for the long-term management of all Aboriginal objects collected during the community collection / surface salvage program. The strategy should include provisions for reburial at a location nominated by RAPs adjacent to the Project Area. The strategy must be developed in consultation with RAPs.
- Provisions for monitoring any impacts to and protecting World Heritage and National Heritage properties in the local area.
- Provisions for protecting Aboriginal heritage items outside the Disturbance Footprint.
- Include protocols for managing the discovery of human remains and previously unidentified heritage items within and adjacent to the approved Disturbance Footprint.
- Contain a contingency plan and reporting procedure if Aboriginal heritage items within or outside the approved Disturbance Footprint are damaged.
- Include protocols for conducting further archaeological and heritage assessment in any disturbance areas where this assessment has not already been carried out.
- Ensuring any workers on-site receive suitable heritage inductions prior to carrying out any work on site.
- Maintain and manage reasonable access for Aboriginal stakeholders to heritage items on site.
- Provide for ongoing consultation with Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage on site.
- Contain a program to monitor and report on the effectiveness of these measures and any heritage impacts of the Project.

6.3.5.3 Previously Unrecorded Aboriginal Sites and/or Objects

ACH04: In the event that unexpected finds occur during any activity within the Project Area, all works in the vicinity must cease immediately. The find must be left in place and protected from any further harm. Depending on the nature of the find, the following processes must be followed:

If, while undertaking the activity, an Aboriginal object is identified, it is a legal requirement under Section 89A of the NPW Act to notify Heritage NSW, as soon as possible.

If human skeletal remains are encountered, all work must cease immediately and NSW Police must be contacted, they will then notify the Coroner's Office. Following this, if the remains are believed to be of Aboriginal origin, then the Aboriginal stakeholders and Heritage NSW must be notified.

6.3.5.4 Communication with RAPs

ACH05: It is recommended that Spark Renewables continues to inform Aboriginal stakeholders about the management of Aboriginal cultural heritage within the Project Area throughout the life of the Project. The consultation outlined as part of this ACHA is valid for a period of 6 months and must be maintained after this by the Proponent for it to remain continuous and comply with Consultation Requirements (DECCW 2010b).

ACH06: A copy of the final ACHA should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the Project.

6.4 Historical Heritage

The SEARs require:

> *an assessment of the impacts to historical heritage having regard to the NSW Heritage Manual.*

A Statement of Heritage Impact (SoHI) has been undertaken by Austral (refer to **Appendix 8**) and key findings are summarised below. The objective of the SoHI is to assess the potential impact from the development on the significance of any historical built heritage or potential archaeological values that may be present within or near to the Project Area. The report provides suitable management recommendations should impacts to heritage values be anticipated.

6.4.1 Existing Historical Heritage Values

To inform the SoHI, searches of all relevant historical heritage databases were undertaken. This included searches of:

- The Commonwealth Heritage List.
- The National Heritage List.
- The State Heritage Register.
- Section 170 Heritage and Conservation Registers (where publicly accessible).
- relevant Local Environmental Plans (LEPs).

As a result of these searches, it was identified that:

- no heritage items or places listed on the Commonwealth or National Heritage Lists are located within the Project Area
- no State listed heritage items are located within the Project Area
- no items listed on any s170 Heritage and Conservation Registers (NSW State agency heritage registers) are located within the Project Area
- no items listed on Schedule 5 of the Wentworth LEP (2011) are located within the Project Area.

Historical heritage items and values are present in the broader region, and it is noted that within 10 km of the Project Area the following registered historical heritage items were identified:

- former Paddlewheel Hotel
- Gol Gol Cemetery.

Site inspections were conducted between 13 and 17 June 2023 and between 18 and 24 March 2024. The inspections consisted of a systematic survey of the Project Area to identify historical heritage within the Project Area, focusing on the Disturbance Footprint. Due to the size of the Project Area, the survey efforts were divided into 4 Survey Units (SUs) corresponding with the differing landscapes. These were named SU 1, SU 2, SU 3 and SU 4.

The results of these survey efforts are provided below:

- SU 1 was characterised by Mallee sand dunes and exhibited evidence of previous agricultural land use and pastoral practices; however, no evidence of European occupation other than agricultural disturbance is present within this survey unit. No evidence of historical heritage was identified within SU 1.
- SU 2 was characterised by a ridge and crest landform, also within the Mallee dune system. Most areas within this survey unit contained undisturbed areas consisting of both native and introduced vegetation. No evidence of historical heritage was identified within SU 2.
- SU 3 was comprised of an undulating plain and flat landform. Most areas of SU 3, comprise native and introduced vegetation throughout. Disturbances present in these areas largely comprised agricultural practices such as cropping as well as land clearing, farm vehicle tracks, dirt roads, fence lines and some stock erosion. No evidence of historical heritage was identified within SU 3.
- SU 4 comprised of a sloped landform, with native and introduced vegetation species throughout. The survey unit was characterised by red silty sand with high ground visibility. Disturbances present in these areas were largely due to agricultural practices such as cropping, land clearing, farm vehicle tracks, dirt roads, fence lines and some stock erosion. No evidence of historical heritage was identified within SU 4.

The results of the site inspections did not identify any evidence of historical relics or built heritage remaining in the Project Area relating to its post-European land occupation. As such, the potential for heritage to exist within the Project Area has been determined as low.

The SoHI includes a detailed account of the historical context of the region surrounding the Project Area. It acknowledges Aboriginal occupation in the region dated 32,000 years before present prior to European exploration of the region in 1829 which was followed by pastoral squatting and establishment of stations through to more recent grazing and agricultural use from the 1960s to present day.

The Heritage Council of NSW has established a set of 7 criteria to be used in assessing cultural heritage significance in NSW (Heritage Council of New South Wales 2009; NSW Heritage Office 2001).

Table 6.23 addresses the significance of the potential archaeological resource in accordance with the criteria adopted in the Heritage Council's significance guidelines.

Table 6.23 Assessment of Significance

Criterion	Assessment
(A) an item is important in the course, or pattern, of NSW's cultural or natural history (or the local area);	The Project Area has historically been used for pastoral activities and has not been associated with any occupational pursuits which could be considered important to the course, or pattern, of NSW's cultural or natural history. **As such, it does not meet the threshold for listing under this criterion.**
(B) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the local area);	The northern portion of the Project Area was owned by Dr Dugald Fletcher, a significant pioneer of the Wentworth Shire; however, as the main residence and occupation of his land was focused on the Darling River, there is no evidence to suggest that any material relating to Fletcher will be present within the Project Area. **As such, it does not meet the threshold for listing under this criterion.**
(C) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);	The Project Area has had minimal evidence of occupation since the original settlement in the 1800s and has historically been used for pastoral reasons. Additionally, there are no built heritage structures or built structures in general within the Project Area. **As such, it does not meet the threshold for listing under this criterion.**
(D) an item has a strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the local area);	As Fletcher had established a residence a good distance away from the Project Area, the property does not have a special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons. **As such, it does not meet the threshold for listing under this criterion.**
(E) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the local area);	Based on the research conducted, the Project Area is unlikely to contain items that would add scientific or research value to the known historical records of the region. **As such, it does not meet the threshold for listing under this criterion.**
(F) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the local area);	The Project Area is indicative of a typical property within the Wentworth Shire. **As such, it does not meet the threshold for listing under this criterion.**
(G) an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments (or the local area).	The Project Area is indicative of a typical pastoral property in the Wentworth Shire and does not exhibit any evidence of having important environmental features relating to European land use. **As such, it does not meet the threshold for listing under this criterion.**

6.4.2 Impact Assessment

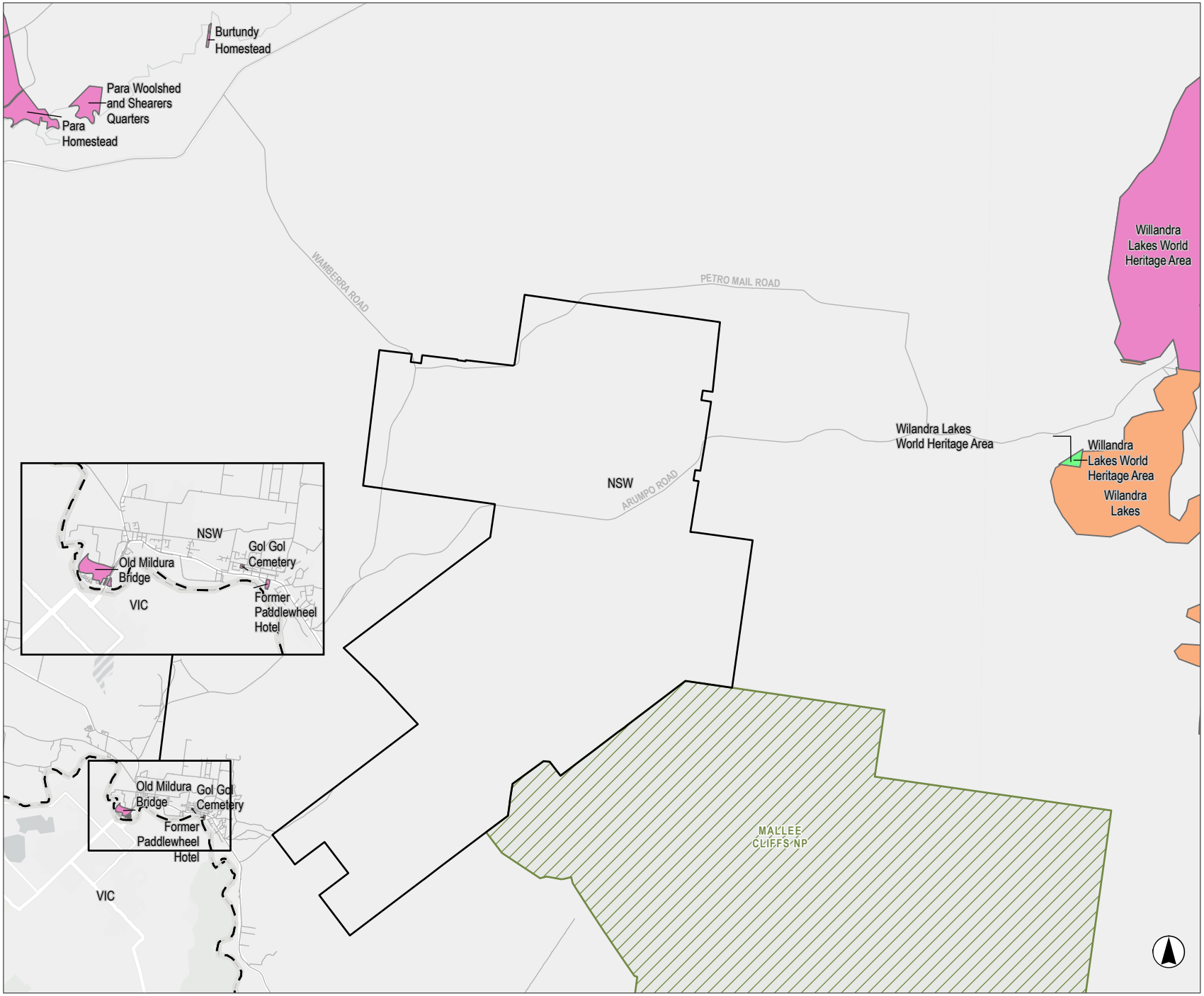
Historical research and site inspections have identified that the Project Area does not contain any registered heritage items. Furthermore, it is unlikely to any historical or potential archaeological material related to ownership in the 19th and 20th centuries will be revealed.

As such, it is concluded that no heritage values exist within the Project Area.

Heritage items with potential view lines to the Project Area are included on **Figure 6.11** and include the WLRWHA. Further assessment of the visual impacts of the Project are outlined in **Section 6.5**.

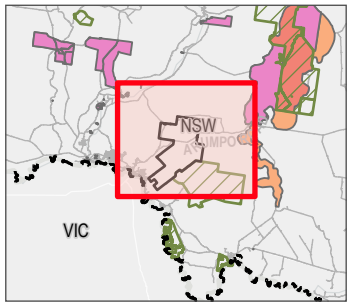
FIGURE 6.11

Heritage items in relation to the Project Area



Legend

- Project Boundary
- State Border
- NPWS Estates
- Road
- Conservation Area - General
- Item - Aboriginal
- Item - General



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GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024), Austral Archaeology (2024)

6.4.3 Mitigation and Management Measures

Spark Renewables has committed to the following mitigation and management measures with respect to historical heritage:

- **HH01:** An unexpected heritage finds protocol will be established and included in the environmental management policies for the Project. All Project team members and construction contractors will undertake a heritage specific induction to support the use of this protocol.
- **HH02:** If historical archaeological relics not assessed or anticipated by this report are found during undertaking of the works, all works in the immediate vicinity are to cease immediately and Heritage NSW be notified. A qualified archaeologist is to be contacted to assess the situation and consult with Heritage NSW regarding the most appropriate course of action.
- **HH03**: Should the development be altered significantly from the proposed design, then a reassessment of the heritage impact may be required. This includes any impacts not explicitly stated in the SoHI and the installation of any subsurface services.
- **HH04**: Provide a copy of the SoHI to relevant stakeholders including the Wentworth Historical Society and Heritage NSW.

6.5 Landscape and Visual

The SEARs require a detailed assessment of the visual impacts of all components of the Project (including WTGs, transmission lines, substations, BESS, and any other ancillary infrastructure in accordance with the NSW Wind Energy: Visual Assessment Bulletin (DPE, 2016), including detailed consideration of potential visual impacts on local residences (including approved developments, lodged development applications and dwelling entitlements), scenic or significant vistas and road corridors in the public domain. The SEARs also require a specific consideration of the Mallee Cliffs National Park across a range of matters beyond those directly relevant to the Landscape and Visual Impact Assessment (LVIA).

A comprehensive LVIA was undertaken by Moir Landscape Architecture (Moir) to address the requirements of the SEARs and in accordance with the Visual Bulletin. The Study Area for the LVIA includes all land within an 8 km radius from the Project Area.

The LVIA is provided in **Appendix 9** and the key findings, including performance against the relevant objectives under the Visual Bulletin, are summarised below.

6.5.1 Existing Visual Environment

A visual baseline study was undertaken to establish the existing landscape and visual conditions of the locality. In accordance with the Visual Bulletin, the baseline study considered the following inputs in the 'visual catchment' for the Project:

- Elements of the landscape important to the community, including public and private viewpoints.
- The sensitivity of the viewers who use those viewpoints, and the distances at which they may view the landscape and potential WTGs and other ancillary facilities.

- The character of the landscape involved, its key features and the relative scenic quality of the area.
- The location of any existing operational or approved wind and solar energy projects within both a regional and local context.

The Project Area was categorised into five (5) Landscape Character Units (LCU). The LCUs are classified by slight variations in geology, topography, land use and vegetation which create distinct character areas. The LCUs were informed by land use patterns, vegetation coverage, topographical maps, site images and a site inspection and are described in **Table 6.24** and shown in **Figure 6.12**.

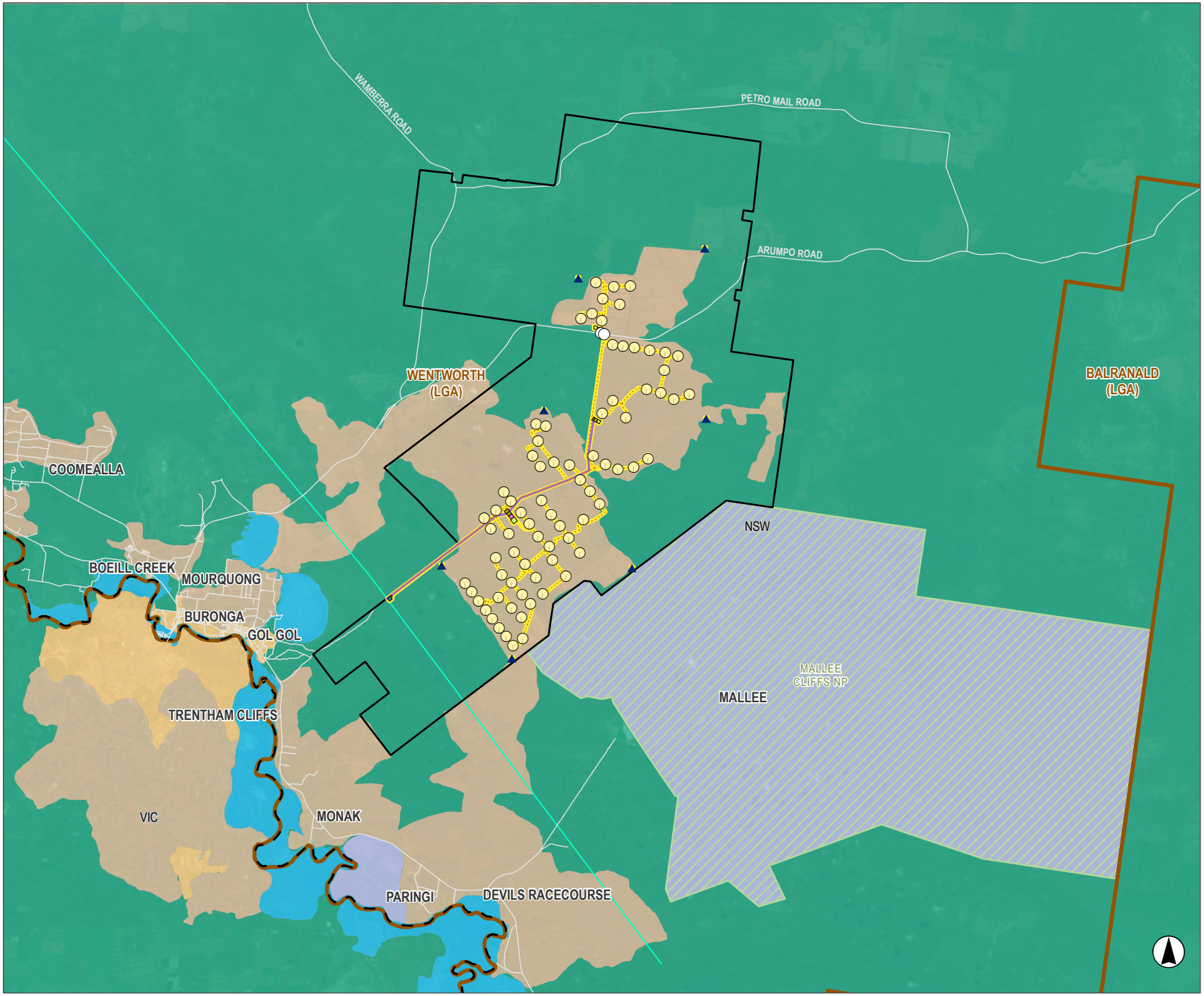
Two (2) Scenic Quality Classes were rated as moderate comprising LCU02: Creek and River Systems and LCU05: National Parks and Conservation Areas. The remaining three (3) LCUs were rated as low scenic quality.

Table 6.24 Landscape Character Units

LCU	Description	Scenic Quality Rating
LCU01: Grazing and Native Pastures	The LCU is defined by vast, open land parcels that are utilised for livestock grazing. The LCU portrays the most dominant character in the region. It comprises of open plains with scattered or no tree cover and vast extents of Chenopod Mallee and Shrubland. Common land uses include grazing, dryland cropping, modified and irrigated pastures. This LCU is the most prominent character in the area and includes little to no elevation changes.	Low
LCU02: Creek and River systems	This LCU is defined by characteristic riverine vegetation along its extents. Gol Gol Swamp, Gol Gol Creek, Murray River and Gol Gol Lake are some significant features within the LCU. Human intervention is through urban development along the river fringes. Tree density varies in different locations and native vegetation has been modified as a result of urban development. Notable hydrological features within this LCU include, the Murray River, Gol Gol Creek, Lake Gol Gol, Gol Gol Swamp and associated floodplains.	Moderate
LCU03: Cropping Pastures	The LCU is characterised by vast extents of land modified for dryland cropping and irrigated agriculture. Vegetation is patchy and serves only as wind breaks or screening. Expansive lots have been modified to support pastoral farming and irrigated agriculture. This LCU is typically visible within and around the Project Area.	Low
LCU04: Local Townships	The LCU is typically defined by dense urban development with significant human intervention. Buronga and Gol Gol are the closest townships to the Project and are important town centres within the Murray region. Both towns are included within the wider Sunraysia region along the Murray River and are key producers of fruits and vegetables. The Project is also in proximity to Mildura, a major regional centre.	Low
LCU05: National Parks and Conservation Areas	This LCU is defined by the densely vegetated woodlands that fall within the extents of the Mallee Cliffs National Park and Gol Gol State Forest, as well as other densely vegetated areas. Land is subjected to minimal use and represents unique characteristics defined by the flat topography and dense Mallee, Rosewood and Belah woodlands. Recreational associations have been identified within the extents of the LCU, the closest being the Bottle Bend picnic area within Gol Gol State Forest.	Moderate

FIGURE 6.12

Landscape Character Units



Legend

- Project Boundary
- Disturbance Footprint
- Access Points
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Collector Substation and Switchyard
- Operations and Maintenance Facility
- Construction Compound
- TWA Facility
- Switchyard
- Battery Energy Storage System (BESS)
- Existing HV Transmission Lines
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Road
- Watercourse
- Waterbody

Landscape Character Units

- LCU01 Grazing Native Vegetation
- LCU02 Creek and River Systems
- LCU03 Cropping Pastures
- LCU04 Local Townships
- LCU05 National Parks and Conservation Areas

0 6,000 12,000
Metres

Scale 1:325,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.5.2 Preliminary Visual Assessment

Consistent with the Visual Bulletin, a visual magnitude assessment and multiple wind turbine visibility assessment were applied in the LVIA as Preliminary Assessment Tools.

6.5.2.1 Visual Magnitude Assessment

In accordance with the Visual Bulletin, the Visual Magnitude thresholds are based on the highest vertical extent of the tip of the blade and distance from dwellings or key public viewpoints. The LVIA has been undertaken based on a worst case scenario with a WTG tip height of 280 m. On this basis, the 'black line' intersects at a distance of 3,750 m and the 'blue line' intersects at 5,500 m. The mapped black and blue lines determined for the Project in accordance with the Visual Bulletin are shown on **Figure 6.13**.

Application of the Visual Magnitude Preliminary Assessment Tool is used to identify dwellings which require further assessment in accordance with the Visual Bulletin. No non-associated dwellings have been identified within 8,000 m of the nearest WTG.

The LVIA concluded that the Project meets the visual performance objectives for Visual Magnitude.

6.5.2.2 Multiple Wind Turbine Visibility Assessment

The Visual Bulletin requires a multiple wind turbine visibility assessment to be completed utilising the Multiple Wind Turbine Tool (MWTT). This provides a preliminary indication of potential cumulative impacts arising from the Project by mapping any proposed, existing or approved WTGs within 8,000 m into six (6) sectors of 60 degrees. Where WTGs were visible within the horizontal views of dwellings or key public viewpoints in three (3) or more 60 degree sectors, the WTGs become the focus for assessment in the LVIA.

The MWTT also considers the Gol Gol Wind Farm that is proposed within 8,000 m of the Project (as per information publicly available as of May 2024). WTGs associated with the Project do not occupy any of the 60 degree sectors from any non-associated dwellings as shown on **Figure 6.14**.

No key public viewpoints were identified within the Study Area. Arumpo Road serves as an access to the World Heritage Listed Willandra Lakes Region (inclusive of both the WLRWHA and WLRNHP) and the Mungo National Park. Site observations made during the LVIA fieldwork in August 2022 and July 2023 did not identify any key public viewpoints along this route. Similarly, no publicly accessible locations with recreational associations were identified in the adjacent Mallee Cliffs National Park.

The LVIA concluded that the Project meets the visual performance objectives defined by the Visual Bulletin for Multiple Wind Turbine Effects.

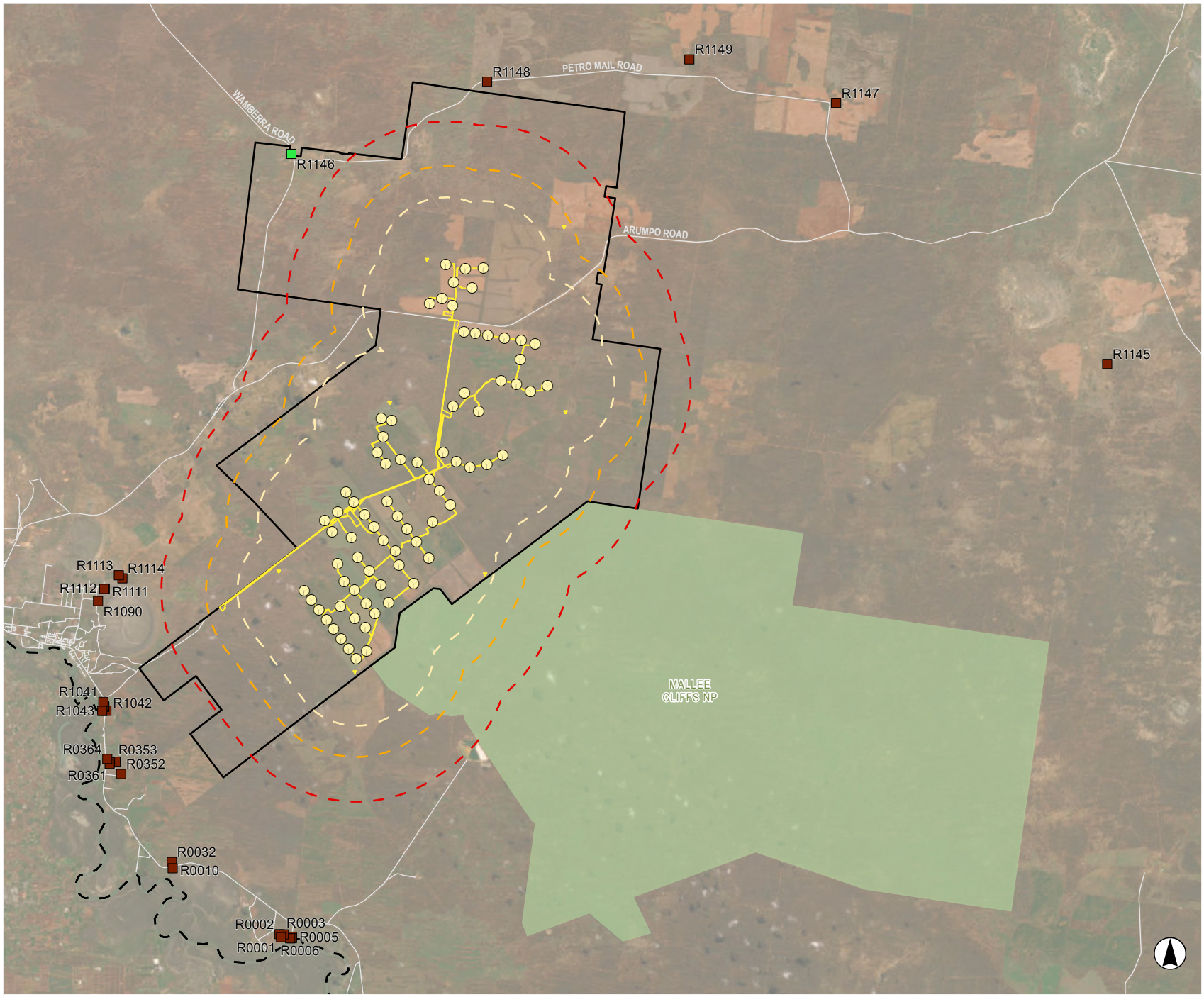


FIGURE 6.13

Visual Magnitude

Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- State Border
- NPWS Estates
- Road

Dwellings

- Host Dwellings
- Non-associated Dwellings

Visual Magnitude

- 3,750 m from WTG
- 5,500 m from WTG
- 8,000 m from WTG

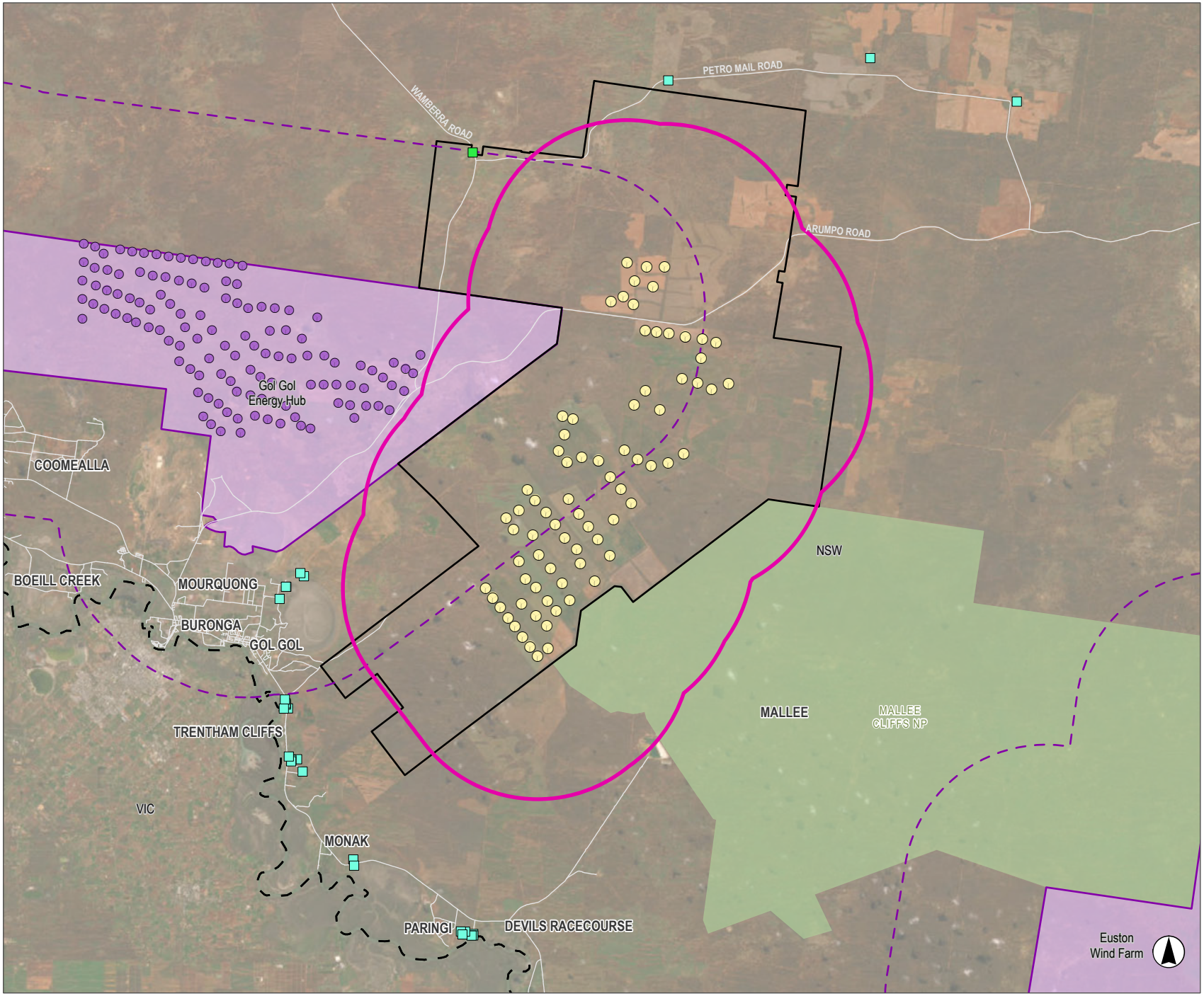
0 5 10
Kilometres

Scale 1:300,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

FIGURE 6.14

Multiple Wind Turbine Tool



Legend

- Project Boundary
- Study area (8km from WTGs)
- Nearby Wind Farm Project 8km buffer
- Nearby Wind Farm Project
- State Border
- NPWS Estates
- Road
- Wind Turbine Generators
- Gol Gol Wind Turbine Generators
- Host Dwelling

Results of MWTT

- Non-associated Dwelling in excess of 8,000m from WTG

0 5 10
Kilometres

Scale 1:300,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.5.2.3 Zone of Visibility

Two Zone of Visual Influence (ZVI) diagrams were prepared to illustrate the theoretical visibility of the Project to identify areas that required additional analysis. The ZVI is included in the LVIA (refer to **Appendix 9**).

Due to the relatively flat topography that characterises this landscape, the ZVI indicates that the majority of the WTGs associated with the Project are likely to be visible from the surrounding areas. The ZVI identifies that without the presence of intervening structures or vegetation screening views to the Project the majority of the WTGs would be visible due to the minor topographical differences between them and the Project. Certain areas to the southwest and west of the Project are characterised by shallow topographical changes by embankments along lakes and swamps. The ZVI also identifies the potential visibility towards the majority of the Project due to the proximity of the Mallee Cliffs National Park. No areas with public access have been identified in the Mallee Cliffs National Park.

Importantly, however, it is noted that the ZVI only considers topography and does not take into account intervening elements such as vegetation and existing structures. Field work undertaken in support of the LVIA concluded that existing vegetation would provide substantial shielding for the closest dwellings located over 8,000 m from a WTG, as detailed in the sections below.

The Visual Bulletin requires detailed consideration of visual impact on dwellings or key public viewpoints within 5,500 m of each WTG (the 'blue line'), with particular focus on those within 3,750 m (the 'black line'). Generally, the Visual Bulletin requires the assessment of residences up to the 'blue line' of visual magnitude, however due to the flat topography, the LVIA assessment considers to 8,000 m from a WTG.

There are no non-associated dwellings within 8,000 m of a proposed WTG, the closest non-associated dwelling is approximately 10 km from a proposed WTG.

The LVIA concluded that the Project meets the visual magnitude performance objectives defined by the Visual Bulletin.

6.5.3 Impact Assessment

6.5.3.1 Impacts to Public Viewpoints

A total of 25 viewpoints were recorded and analysed from public locations (**Figure 6.15**). These viewpoints have been carefully selected to be representative of the range of views within the LVIA Study Area. These viewpoints were identified through community engagement.

Each viewpoint was assigned a Visual Influence Zone (VIZ) in accordance with the Visual Bulletin. In determining the VIZ for each viewpoint, consideration was given to the visibility distance zone, the viewer sensitivity level and the scenic quality class. Each viewpoint was then assessed against the visual performance objectives for the VIZ.

- VIZ1 (High): There were no public viewpoints identified as VIZ1.
- VIZ2 (Moderate): Two (2) publicly accessible viewpoints were identified as VIZ2 (VP22 and VP23). WTGs viewed from these locations have the potential to dominate the visual catchment due to its proximity to the Project. However, it is noted that these locations are on Arumpo Road, which is of a low visual sensitivity. No landscape features were identified at these locations.

- VIZ3 (Low): All remaining public viewpoints (23) were rated as VIZ3. This is generally due to the low landscape sensitivity and / or distance to the Project. There are no performance objectives for VIZ3 receptors.

The LVIA concluded that the Project meets the relevant visual performance objectives for Landscape Scenic Integrity and Key Feature Disruption. Public viewpoint analysis is provided in **Appendix B** of the LVIA (**Appendix 9**). Impacts to landscape character including surrounding National Parks and Conservation Areas is provided in **Section 6.5.3.3**.

Photomontages and Wire Frame Diagrams

Eight (8) viewpoint locations were selected for the preparation of photomontages (refer to **Table 6.25** below). The locations were chosen based on public viewpoints from major routes, rest areas, camp grounds and viewing platforms, which avoided any localised screening factors of vegetation. This was to ensure maximum exposure to the Project. Two (2) wireframes were also generated from potential areas of interest.

A photomontage combines a photograph of an existing view with a computer-rendered image of a proposed development to illustrate the likely view as it would be seen in a photograph (not as it would appear to the human eye in the field). Although photomontages are based on a photograph of the existing landscape, it is important to stress that they are not a substitute to visiting a viewpoint in the field. They provide a two-dimensional image that can be compared with an actual view of the landscape to provide information, such as the scale and potential appearance of a proposed development.

Wire frame diagrams are computer generated images based on a digital terrain model that indicate the 3D shape of the landscape in combination with additional elements. They are useful in the wind farm LVIA process as they allow the assessor to compare the position and scale of the WTGs to the existing view of a landscape. Wire frame images can be seen as a worst case scenario as they do not take into account factors such as vegetation or building structures. Wire frame diagrams have been utilised in the LVIA to assist in the assessment of the Project from locations that were not able to be accessed.

Where potential impacts were identified, photomontages or wireframes diagrams were prepared from public viewpoints to represent those with potential impacts or to best represent the appearance of the Project.

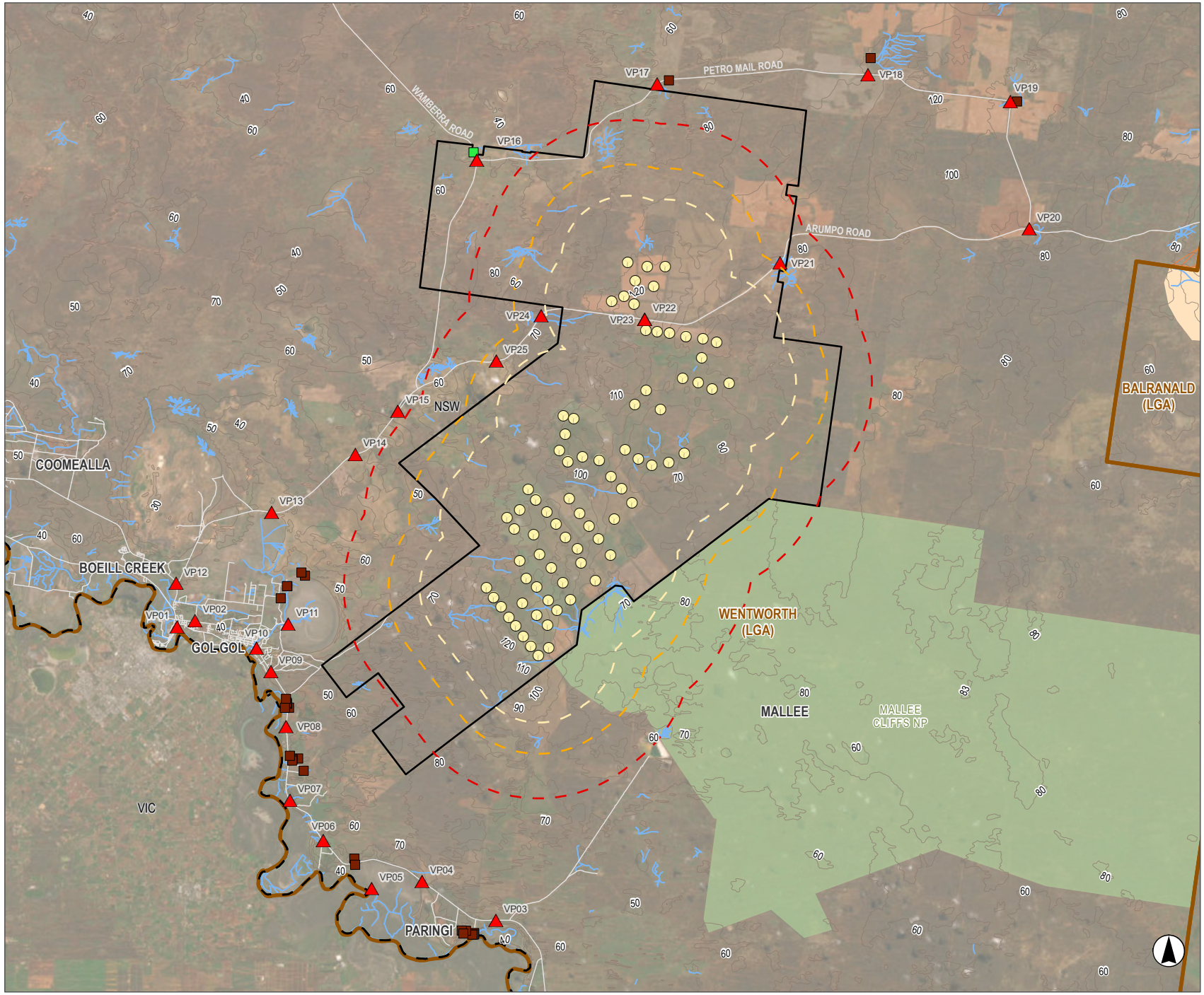
Photomontages are provided in **Photo 6.1** to **Photo 6.10** below.

Table 6.25 Photomontage Locations

Photomontage	Viewpoint Number	Location
Photomontage 01	Viewpoint VP16	Intersection of Wamberra Road/Petro Mail Road, Arumpo NSW
Photomontage 02	Viewpoint VP20	Intersection of Petro Mail Road/Arumpo Road, Arumpo NSW
Photomontage 03	Viewpoint VPB01	Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park
Photomontage 04	Viewpoint VP10	Intersection of Sturt Highway/Wilga Road, Gol Gol NSW
Photomontage 05	Viewpoint VP11	Gol Gol Swamp, Gol Gol NSW
Photomontage 06	Viewpoint VP12	Intersection of Silver City Highway/Arumpo Road, Arumpo NSW
Photomontage 07	Viewpoint VP21	Arumpo Road, Gol Gol NSW
Photomontage 08	Viewpoint VP25	Arumpo Road, Gol Gol NSW
Wireframe 01	-	Mungo Youth Project Site
Wireframe 02	-	Marma Cricket Pitch

FIGURE 6.15

Public Viewpoint Locations



Legend

- Project Boundary
- State Border
- Local Government Area (LGA)
- NPWS Estates
- Willandra Lakes Region / National Heritage Property
- Willandra Lakes World Heritage Area
- Road
- Watercourse
- Contour (10m Interval)
- Public Viewpoint Location
- Wind Turbine Generators

Dwellings

- Host Dwellings
- Non-associated Dwellings

Visual Magnitude

- 3,750 m from WTG
- 5,500 m from WTG
- 8,000 m from WTG

0 5 10
Kilometres

Scale 1:300,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

PM01 Intersection of Wamberra Road/Petro Mail Road, Arumpo, NSW

Proposed View | 60° Cropped B

PM02 Intersection of Petro Mail Road/Arumpo Road, Arumpo, NSW

Proposed View | 60° Cropped

PM03 Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park

Proposed View | 60° Cropped

PM04 Intersection of Sturt Highway and Wilga Road, Gol Gol, NSW

Proposed View | 60° Cropped A

PM05 Gol Gol Swamp, Gol Gol NSW

Proposed View | 60° Cropped A

PM06 Intersection of Silver City Highway and Arumpo Road, Gol Gol, NSW

Proposed View | 60° Cropped A

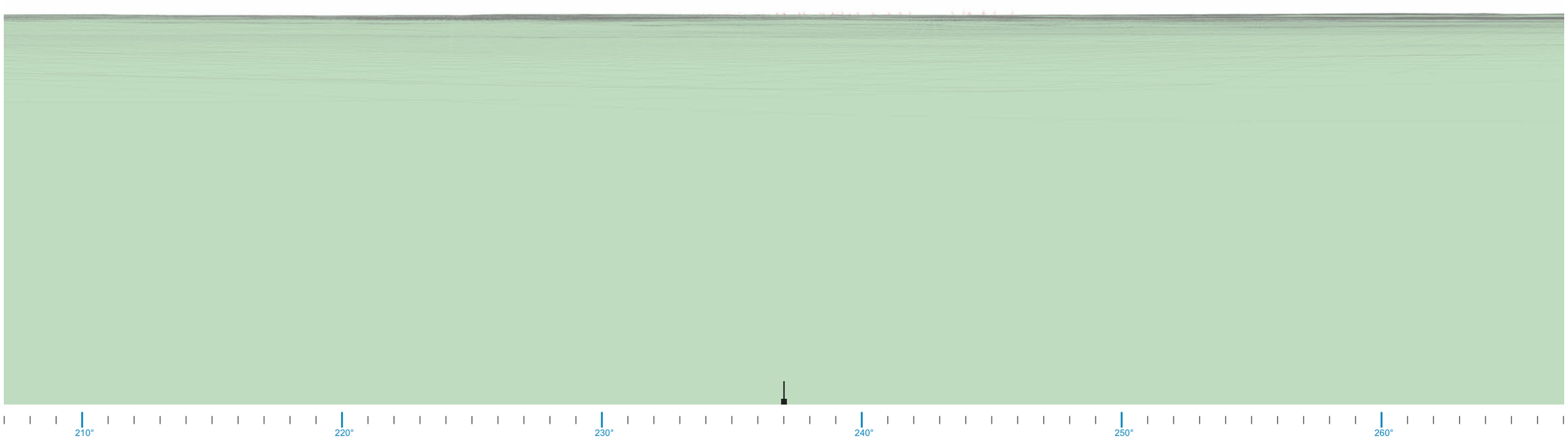
PM07 Arumpo Road, Gol Gol, NSW

Proposed View | 60° Cropped A

PM08 Arumpo Road, Gol Gol, NSW

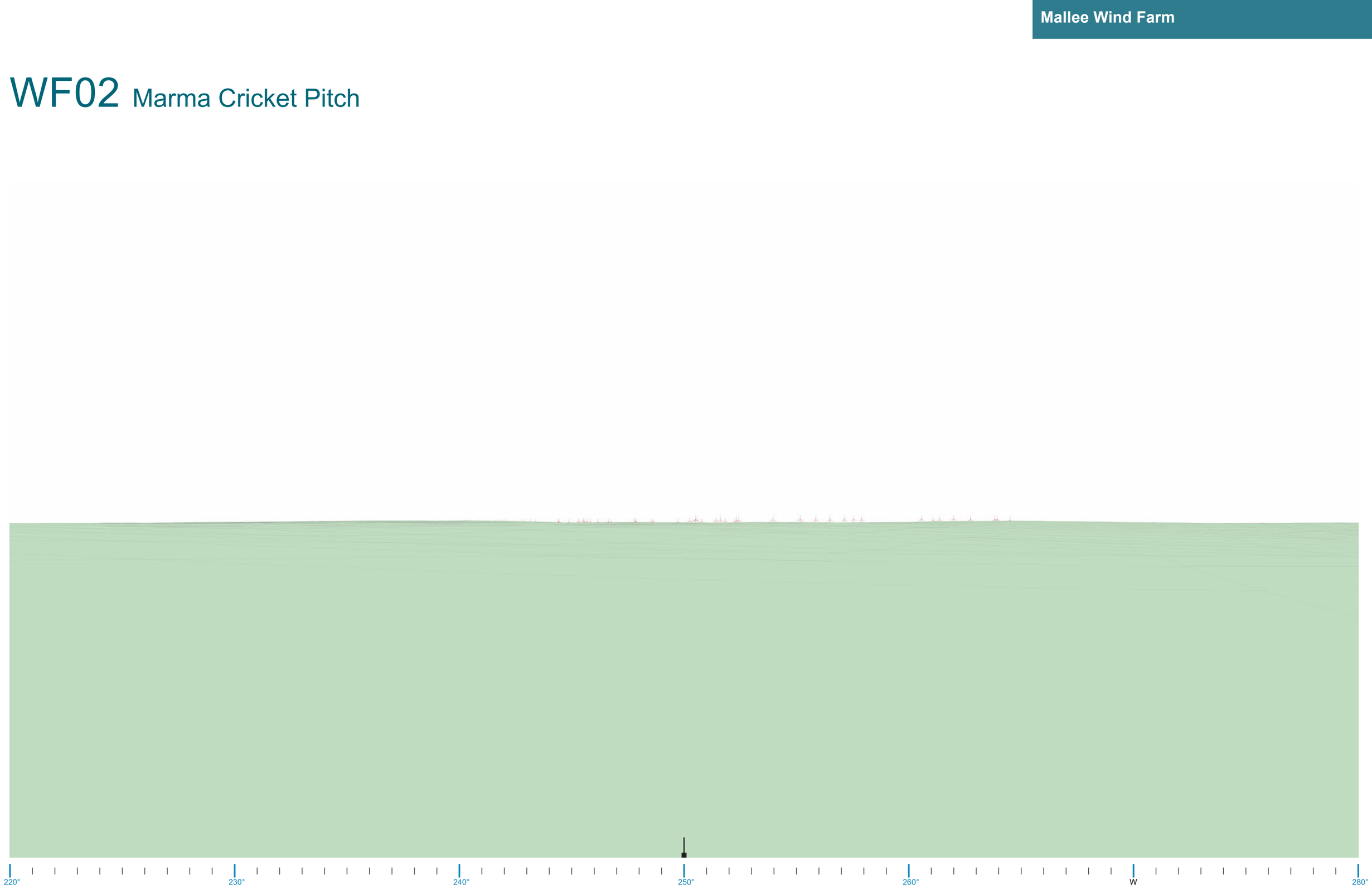
Proposed View | 60° Cropped B

WF01 Mungo Youth Project Site



Proposed View | 60° Cropped

WF02 Marma Cricket Pitch



Proposed View | 60° Cropped

6.5.3.2 Impacts to Dwellings

The Visual Bulletin requires that detailed dwellings assessments be undertaken. However, there are no non-associated dwellings or host dwellings located within 8,000 m of any WTG. Therefore, no further assessment was required.

Approved and Proposed Residences and Dwellings Entitlements

Lots with dwelling entitlements were determined by initially considering all land parcels within 8,000 m of a WTG. Consideration was then given to land zoning, minimum lot size, and whether the landholder was an associated or host landholder.

Two (2) entitlements were identified within 5,500 m of a WTG based on the size of the lot or the on the basis that the lots formed part of an 'existing' holding as defined by the LEP. It is noted that any lots that are prohibited from dwelling entitlement based on zoning such as C zones were also excluded, including Lot 2977/DP765176 which comprises Malle Cliffs National Park.

6.5.3.3 Impacts to Landscape Character

The Project is located within a predominantly rural landscape that has not been identified as significant or rare. The broader landscape character is dominated by established rural land which consists of modified vast plains with little topographical variation. The LVIA determined that the Project would become a feature within the visual landscape due to the addition of vertical turbines in a landscape offering unencumbered views across large expanses.

There is restricted public access within Mallee Cliffs National Park, which is valued for its ecological and environmental functions. As a result, it is unlikely that the Project would degrade the scenic value of this landscape feature thus resulting in limited visual impact.

Generally, the Project will likely be visible in varying degrees from all five (5) LCUs that were identified and assessed. Due to the flat topography surrounding the Project Area, dense woodlands typical of the region and distance to urban settlements, views of the Project are likely to be fragmented. Further, no key features were identified in the LCUs or the existing key features would remain unaltered, resulting in an overall visual impact rating of low for all five (5) LCUs.

Willandra Lakes Region

The WLRWHA and WLRNHP are located approximately 25 km east of the nearest WTG. One (1) photomontage (PM03) and two (2) wireframe analysis (WF01 and WF02) have been prepared to assess the potential visual impact of the Project on the WLRWHA. It is unlikely that the Project will alter the existing visual landscape (even where night lighting is required) and is thus unlikely to have a visual impact on the WLRWHA, due to the distance from the Project.

6.5.3.4 Night Lighting

Night lighting is required on meteorological masts (aviation safety) and ancillary facilities (safety and security) and has the potential to extend the visual impact of the Project into the night time, and thus change the night time landscape character of the region.

Potential light sources associated with the Project include:

- Aviation Hazard Lighting (AHL) on meteorological masts (height of up to 200 m AGL)
- Night lighting for safety and security on ancillary structures.

The Civil Aviation Safety Authority (CASA) recommends night lighting if an obstacle exceeds 160 m above ground level. As discussed in **Section 6.13.6**, obstacle lighting would not be required for the proposed WTGs but may be required for some of the met masts.

Due to the relatively isolated location of the Project, very few existing sources of lighting are present in the night time landscape of the Study Area. Some existing lighting associated with homesteads and motor vehicles is dispersed around the locality and isolated receptors experience a dark night sky with minimal light sources.

Dark sky is a valued quality of the rural landscape due to the lack of light pollution. Aviation lighting has the potential to impact on receptors who view the landscape at night, in particular night-sky enthusiasts, photographers, star gazers, campers and some landowners with potential visibility of WTG hub.

As described above the WLRWHA is more than 25 km from the nearest WTG. The furthest public viewpoint assessed with no vegetation to fragment views (VP20) (refer to **Photo 6.2**) is approximately 20 km from the Project, and was assessed as having low visual impact rating as the overall view affected was negligible. Therefore, the visual impact to the WLRWHA can also be considered to be negligible, given it is located at a further distance from the Project. Despite the negligible risks of night lighting impacts, additional measures are proposed to protect the Dark Sky of the Willandra Lakes Region outlined in full in the LIVA (**Appendix 9**), **Section 6.5.5** and **Appendix 5.**

6.5.3.5 Shadow Flicker and Blade Glint

The LVIA includes an assessment of shadow flicker and blade glint consistent with the requirements of the SEARs and the Visual Bulletin. This assessment concluded that:

- There are no non-associated dwellings that will experience shadow flicker hours.
- Approximately 11 km of Arumpo Road that splits the Project Area is likely to experience potential shadow flicker from the WTGs. The shadow flicker for Arumpo Road is projected to be experienced on average between 30 to 100 hr/per year. Although shadow flicker has the potential to cause annoyance to commuters, there is a negligible risk associated with distraction of vehicle drivers who experience shadow flicker, as this is not dissimilar to the effect of shadows from trees on the side of the road or high passing vehicles.
- The western edge of the Mallee Cliffs National Park will experience potential flicker due to the proximity to the Project. However, as there is no public access in this area, there are no receptors that would experience potential shadow flicker.
- The WTGs selected for the Project will be finished with a low reflectivity surface treatment in accordance with the requirements of the Visual Bulletin. Therefore, the risk of blade glint associated with the Project is considered to be very low.

Therefore, the LVIA concluded that the Project meets the visual performance objectives defined by the Visual Bulletin for Shadow Flicker and Blade Glint.

6.5.4 Cumulative Visual Impacts

There is one (1) wind farm and five (5) other state significant projects are within 8,000 m of the Project. These include the Gol Gol Wind Farm, Gol Gol Solar Farm, Gol Gol BESS (all three, located adjacent to the west of the Project), Mallee Solar Farm (located adjacent to the south west of the Project) Project EnergyConnect (NSW – Eastern Section) (located adjacent to the south of the Project) and the Euston Mineral Sands Project (that intersects the southern portion the Project).

6.5.4.1 Gol Gol Wind Farm

The nearest proposed wind farm to the Project is the Gol Gol Wind Farm (GGWF). The proposed layout available on the Major Projects website indicates that GGWF is located directly west of the Project. The nearest GGWF WTG is located 8.99 km west of WTG 48 of the Project. There is potential to view GGWF and the Project simultaneously from the surrounding area.

6.5.4.2 Gol Gol Solar Farm

The proposed Gol Gol Solar Farm (GGSF) is currently proposed to be located directly adjacent to the west between GGWF and the Project. Views towards GGSF and the Project are limited to Arumpo Road due to its proximity. Arumpo Road is local low use road predominantly utilised as a tourist route providing access to the World Heritage Listed Mungo National Park.

6.5.4.3 Gol Gol BESS

The proposed Gol Gol BESS (GGB) is currently proposed to be located directly adjacent to the west of the Project. GGB forms part of the Gol Gol Energy Hub and includes the GGWF and the GGSF. Views towards GGB and the Project are limited to Arumpo Road due to its proximity. Arumpo Road is local low use road predominantly utilised as a tourist route providing access to the World Heritage Listed Mungo National Park.

6.5.4.4 Mallee Solar Farm

Mallee Solar Farm (MLSF) is located immediately southwest of the Project. The dwellings located along Gol Gol Swamp may experience potential views of the MLSF and the Project.

6.5.4.5 Euston Mineral Sands

Euston Mineral Sands is spread across the southern portion of the Project. Due to its proximity, it is likely that Euston Mineral Sands and the Project would be visible simultaneously, noting the built environment and features of Euston Mineral Sands are not as visible as WTGs.

6.5.5 Mitigation and Management Measures

Spark Renewables has committed to a range of mitigation and management measures consistent with the recommendations of the LVIA:

- **LV01:** WTGs will have a matte, white finish and consist of three blades which is consistent with the current turbine models being considered. The important factors to achieving a visual consistency through the landscape include:
    - Uniformity in the colour, design, rotational speed, height and rotor diameter.
    - The use of simple muted colours and non-reflective materials to reduce distant visibility and avoid drawing the eye.
    - Blades, nacelle and tower to appear as the same colour.
    - Avoidance of unnecessary lighting, signage, logos etc.
- **LV02:** With respect to transmission lines, the following mitigation methods would apply:
    - Where possible underground cabling is to be used to connect WTGs to the electricity grid.
    - Utilise existing transmission lines where possible.
    - The route for any proposed overhead transmission lines should be chosen to reduce visibility from surrounding areas.
    - Plan route to minimise vegetation loss.
    - Use of subtle colours and a low reflectivity surface treatment on power poles to ensure that glint is minimised.
- **LV03:** With respect to internal access roads, the following mitigation methods would apply:
    - Where possible utilise or upgrade existing roads, trails or tracks within the Development Footprint to provide access to the proposed WTGs to reduce the need for new roads.
    - Allow for the provision for downsizing roads or restoring roads to existing condition following construction where possible.
    - Any new roads must minimise cut and fill and avoid the loss of vegetation.
    - Utilise local materials where possible and practical.
- **LV04:** With respect to ancillary infrastructure, the following mitigation methods would apply:
    - Siting to ensure minimal vegetation loss.
    - Consideration should be given to controlling the type and colour of building materials used. Where possible a recessive colour palette is to be used which blends into the existing landscape.
    - Avoidance of unnecessary lighting, signage on fences, logos etc.
    - Any proposed buildings to be sympathetic to existing architectural elements in the landscape.
    - Minimise cut and fill and loss of existing vegetation throughout the construction process.

- Boundary screen planting is an effective mitigation method which could be utilised to ameliorate potential visual impacts resulting from the construction of ancillary structures with a small vertical scale such as collector substations, switching stations and the operations facilities building.

- **LV05:** With respect to lighting of ancillary infrastructure, the following principles will be applied:
  - If used, air navigation lighting should be spaced around the outer edges of the wind farm. Lights are not required on every tower. Where possible, careful consideration should be given to the selection of met masts requiring lighting to avoid unnecessary impact upon residences.
  - Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night.
  - Use of the lowest candela intensity allowed by CASA.
  - According to the CASA requirements, shielding may be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal.
  - No light should be emitted at or below 10° below horizontal.

6.6 Noise and Vibration

The SEARs require an assessment of noise and vibration including:

- an assessment of the wind turbine noise in accordance with the NSW Wind Energy: Noise Assessment Bulletin (EPA/DPE, 2016)
- an assessment of the noise generated by ancillary infrastructure in accordance with the NSW Noise Policy for Industry (EPA, 2017)
- assessment of the construction noise under the Interim Construction Noise Guideline (DECC, 2009) and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria)
- assessment of the traffic noise under the NSW Road Noise Policy (DECCW, 2011)
- an assessment of vibration under the Assessing Vibration: A Technical Guideline (DECC, 2006)
- assess the noise impacts on amenity / recreational use of the Mallee Cliffs National Park (including walking tracks, campgrounds and lookouts) considering comparable noise amenity levels in the NSW Noise Policy for Industry (EPA, 2017)
- assessment of the cumulative noise impacts (considering other developments in the area).

A Noise and Vibration Assessment (NVA) has been undertaken for the Project by Marshall Day Acoustics (MDA) and presented in **Appendix 10** with key findings summarised below.

For the purposes of the NVA dwellings have been described as “receivers”. Furthermore, the NVA (**Appendix 10**) refers to “associated receivers” which are equivalent to host dwellings as discussed in this EIS. It is reiterated that there are no associated landholders or associated dwellings for the Project, as no impact based neighbour agreements are required, or have been established.

6.6.1 Existing Environment

The Project is located in a low population rural area with no host, associated or non-associated dwellings within 10 km of a WTG. Given this unique setting, the NVA identified dwellings within a larger radius of the Project.

Seven (7) dwellings were located within 12 km of a WTG comprising:

- One (1) host dwelling adjacent the Project Area (referred to as R1146).
- Six (6) non-associated dwellings (R1090, R1111, R1112, R1113, R1114 and R1148).

It is noted that the Project does not have any associated dwellings however for the purposes of the noise assessment the host dwelling is considered an associated dwelling. As noted above, the NVA (**Appendix 10**) refers to “associated receivers” which are equivalent to host dwellings discussed in this EIS; hence R1146 is described as a host dwelling herein.

It is also noted that some ancillary infrastructure construction activities and traffic road noise occurs in closer proximity to non-associated dwellings. There is ten (10) dwellings located along the first 3 km of Arumpo Road (East of Silver City Highway) particularly near to the Silver City Highway intersection.

Based on the minimum distance between dwelling and WTG and the predicted noise levels, background noise monitoring was not undertaken for the purposes of this NVA. The NVA uses base noise limit only which is the most stringent approach described by the NSW Noise Assessment Bulletin (Noise Bulletin) and provides a conservative assessment.

6.6.2 Impact Assessment

6.6.2.1 Operational Noise Impacts

Candidate Wind Turbine Model

To provide for a precautionary assessment the candidate WTG model assessed in the NVA (**Appendix 10**) presents a worst-case noise emission level. The WTG noise model specifications for the purposes of the NVIA are summarised in Table 7 of **Appendix 10**.

It is noted that the capacity of this candidate WTG model, when considering the number of WTG proposed, would result in a total capacity above 402 MW. However the approach to model a larger WTG in the NVA is taken to provide a precautionary assessment of WTG noise, and the maximum installed capacity of the Project would not exceed 402 MW. The final WTG model would be selected during the detailed design phase of the Project prior to construction.

Adjustments for low frequency noise have not been applied to the predicted noise levels presented in the NVA. A risk assessment was undertaken with respect to low frequency noise as required by the Noise Bulletin. The risk assessment indicated calculated low frequency noise levels are below the applicable thresholds for the application of penalties at all non-associated dwellings.

Adjustments for tonality have not been applied to the predicted noise levels presented in the NVA. Third octave band data detailed in the manufacturer's specification has been assessed against the additional tonality test prescribed in the Noise Bulletin. This test did not indicate the presence of tonality at any of the available hub height wind speeds.

Predicted Noise Levels

Based on the candidate WTG noise emission level, the A-weighted WTG noise levels at dwellings within 12 km of a WTG were predicted and are provided in **Table 6.26**. Predicted WTG noise levels are below the reference level of 45 dB $_{LAeq\ 10min}$ at the host dwelling and below the Noise Bulletin base noise limit of 35 dBA $_{LAeq\ 10min}$ as shown in **Table 6.26**.

Predicted noise contours for the assessed WTG are shown in **Figure 6.16** below.

The predicted noise levels are for conditions when the WTGs noise emissions have reached their highest level (corresponding to hub height wind speeds of 20 m/s for the candidate WTG model) and the wind is directed from the Project to each dwelling. The predicted noise levels include the +1 dB allowance to account for WTG sound power level measurement uncertainty.

Table 6.26 Predicted WTG noise levels at dwellings within 12 km

Dwelling (Receiver)	Distance to nearest WTG (m)	Predicted noise level (dB LAeq, 10min)	Noise Criterion (LAeq 10min)	Below relevant noise criterion?
R1146 (Host)	10,640	19.6	45 dB	Yes
R1090 (Non-associated)	11,560	20.1	35 dB	Yes
R1111 (Non-associated)	11,170	20.5	35 dB	Yes
R1112 (Non-associated)	11,200	20.4	35 dB	Yes
R1113 (Non-associated)	10,420	21.1	35 dB	Yes
R11114 (Non-associated)	10,210	21.3	35 dB	Yes
R1148 (Non-associated)	10,440	18.6	35 dB	Yes

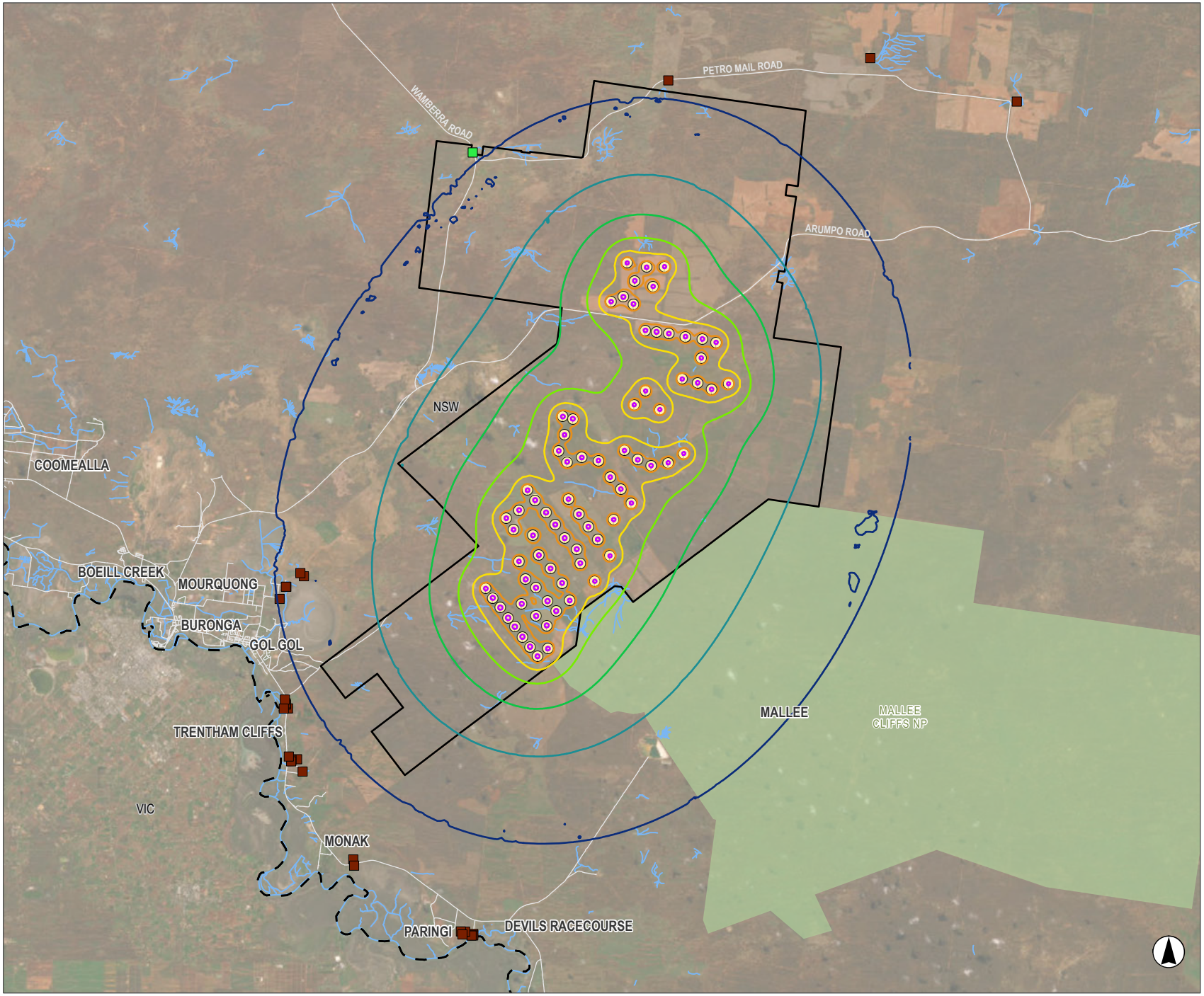


FIGURE 6.16

Predicted Wind Turbine Noise Level Contours

Legend

- Project Boundary
- State Border
- NPWS Estates
- Road
- Watercourse
- Wind Turbine Generators

Dwellings

- Host Dwellings
- Non-associated Dwellings

Predicted noise contour (dB)

- 50
- 45
- 40
- 35
- 30
- 25
- 20

0 5 10
Kilometres

Scale 1:300,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024), Marshall Day (2024)

Ancillary Infrastructure Noise Emissions

An assessment of noise emissions from ancillary infrastructure, comprising the BESS and substation, was undertaken. Other permanent ancillary infrastructure proposed as part of the Project e.g. switchyard and O&M facility, do not typically include significant sources of noise and are not considered further. For the purposes of the NVA all dwellings were considered to be Rural in nature, as defined in Table 2.2 of the NPfI. Project noise trigger levels for day, evening and night were identified in accordance with the NPfI (refer Table 12 of **Appendix 10**) however as the ancillary infrastructure is proposed to operate constantly, the most stringent project noise level will be referenced for the assessment which is night time at 35 dB $_{LAeq, 15\ min}$.

Noise emissions are predicted to be well below the night-time project noise trigger level at all dwellings within 12 km for each ancillary infrastructure assessed and as a cumulative total as shown in **Table 6.27**.

Table 6.27 Predicted Noise Emissions of Ancillary Infrastructure

Dwelling (Receiver)	BESS noise levels dB LAeq, 15 min	Substation noise levels dB LAeq, 15 min	Cumulative ancillary infrastructure noise levels dB LAeq, 15 min
All dwellings	<10	<10	<10

A modifying correction factor for tonality is not applicable and has not been applied. While the ancillary infrastructure noise data exhibits tonality at source, the likelihood of tonality being audible or measurable at dwellings is essentially nil, given the very low predicted noise levels.

Mallee Cliffs National Park

The SEARs specifically require the noise assessment to assess the noise impacts on amenity and recreational use of the Mallee Cliffs National Park considering comparable noise amenity levels in the NSW NPfI. It is noted that Mallee Cliffs National Park is located immediately east of the Project Area.

The NPfI provides amenity noise levels for different receiver types, including areas specifically reserved for passive recreation, e.g. national parks, providing a prescriptive recommended amenity noise level of 50 dB L_{Aeq}. The recommended amenity noise level is independent of background noise level and applies when the park is in use.

It is noted that the NPfI specifically states that it does not apply to wind farms and the Malle Cliffs National Park does not offer any public recreational use with no walking tacks, campgrounds, lookouts, attractions, activities or facilities identified.

Regardless, the predicted WTG and ancillary infrastructure noise levels have been reviewed in the context of Mallee Cliffs National Park.

WTG noise levels are predicted to be below the recommended amenity noise level in the order of 40 dB $L_{A\ eq}$ at the boundary of Mallee Cliffs National Park noting this is 800 m from a WTG at its closest point.

Ancillary infrastructure noise levels are predicted to be below the recommended amenity noise levels and significantly less than 25 dB $L_{A\ eq}$ at the boundary of Mallee Cliffs National Park noting the 35 dB $L_{A\ eq}$ noise contour is approximately 3.8 km away.

Predicted noise contours associated with WTG and ancillary infrastructure noise levels and Mallee Cliffs National Park are provided in Section 12 of **Appendix 10**.

6.6.2.2 Construction Noise Impacts

Construction of a wind farm project typically involves key stages such as:

- concrete batching
- infrastructure construction (substations, masts, transmission, BESS)
- road upgrades
- site establishment (internal roads, hardstands, compounds)
- WTG assembly
- WTG foundation construction.

Based on the groupings of major plant items during key construction tasks, the total aggregated noise emissions for the proposed works stages (i.e. the total Sound Power Level, L_{WA}) typically ranges from 115 to 130 dB L_{WA}. These predictions are based on the assumption that each item of plant associated with a task operates simultaneously for the entire duration of an assessment period thus providing a conservative approach that is unlikely to occur in practice.

The predicted construction noise levels for host and non-associated dwellings within 12 km are provided in Table 20 and Table 21 of Appendix A of **Appendix 10** and demonstrate that no exceedances of either the noise affected or highly noise affected management levels are predicted to occur during any of the assessed construction tasks. This is due to the significant separation distances between the work areas and the dwelling locations.

6.6.2.3 Construction Vibration Impacts

The NVA includes a planning risk assessment in relation to residential dwellings, and having regard to the AVTG and Construction Noise & Vibration Guideline (CNVG). The assessment addresses three (3) vibration categories under the AVTG, being continuous vibration, impulsive vibration and intermittent vibration. The CNVG sets out minimum working distances from dwellings for typical items of vibration intensive plant, which range from 2 m to 100 m depending on the plant type. The CNVG notes that for most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are allowed, likely equating to greater minimum working distances.

At this stage of the Project, only a preliminary, conceptual assessment of construction vibration impact risk is feasible. Once a more detailed schedule of equipment and plant items, construction method and work areas are known, further assessment would be undertaken and mitigation and management strategies will be detailed in CNVMP.

Due to significant separation distances between the work areas and the dwelling locations the potential for vibration impacts is considered negligible with normal mitigation and management strategies implemented. Similar to construction noise impacts, the decommissioning phase is expected to have negligible vibration impacts.

6.6.2.4 Decommissioning Noise and Vibration Impacts

Decommissioning is also assessed within the NVA and is expected to require similar construction activities to those assessed here. It is however anticipated that these activities are likely to be less intensive and occur over a shorter duration. As such, no further assessment has been undertaken.

6.6.2.5 Road Traffic Noise Impacts

The NVA has undertaken an assessment of noise impacts associated with road traffic. It is noted that during operations, traffic generation is minimal and any noise associated with operational traffic on public roads is likely to be very low and have negligible noise impacts. As such, the assessment has focussed on contraction traffic as it is likely to comprise the majority of traffic movements associated with the Project.

The traffic noise assessment addressed impacts related to the movement of construction traffic from the intersection of the Silver City Highway and Arumpo Road to the proposed site access points. Traffic noise along the broader Oversize Overmass (OSOM) Transport Route and Local Transport Route (up to Silver City Highway/Arumpo Road intersection) is outside the scope of the EIS and the NVA.

Base traffic flows and estimated construction traffic flows were provided to MDA by Access Traffic, as part of the Traffic Impact Assessment (**Appendix 10**) as summarised in Table 23 of **Appendix 10**.

Initial Screening Assessment

In considering feasible and reasonable mitigation measures, the RNP states that an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person. On this basis, to assess noise impacts from construction traffic, an initial screening test was undertaken in the NVA to evaluate whether existing road traffic noise levels would increase beyond this threshold.

Where the predicted traffic noise increase is 2 dB or less, no further assessment is conducted, as impacts will be barely perceptible. However, where the road traffic noise levels are predicted to increase by more than 2 dB as a result of additional traffic, consideration is given to the actual noise levels associated with the construction traffic and whether or not these levels comply with the road traffic noise criteria detailed in Table 3 of Section 3.5 of the NVA (**Appendix 10**).

The relative traffic flow increases on the Local Transport Route that are estimated to occur during the construction of the Project are show in Table 24 of the **Appendix 12**.

Based on the initial screening assessment, the relative traffic noise level increase due to the proposed construction activities is predicted to be:

- Below the 2 dB threshold on all freeway/arterial/sub-arterial roads considered within the assessment comprising Silver City Highway. As such no further detailed noise level predictions are provided for dwellings along these roads.
- Above the 2 dB threshold on local roads considered within the assessment comprising Arumpo Road. Further detailed noise level predictions for dwellings along Arumpo Road are summarised below.
- Predicted Construction Traffic Noise Levels.

The existing traffic volumes on Arumpo Road and those associated with the Project are generally low in absolute levels. The Calculation of Road Traffic Noise (CoRTN) prediction method, preferred by Transport for NSW and the EPA, is not typically applied where traffic flows are less than 50 vehicles per hour. A correction factor for low traffic volumes, applicable when considering traffic flows lower than 200 vehicles per hour, has been applied where relevant, in accordance with CoRTN.

Other relevant inputs relating to traffic speed, road categories, corrections for façade reflection (as required by the Road Noise Policy (RNP)) and other modelling assumptions applicable to the prediction of road traffic noise levels to achieve RNP requirements are outlined in Section 16.2 of **Appendix 10**.

The minimum setback distance from Arumpo Road, beyond which compliance with the RNP criteria is predicted to be achieved during the day and night periods is provided in **Table 6.28.**

Seven (7) dwellings are identified within the setback zone East of Silver City Highway as outlined in **Table 6.28**.

Table 6.28 Minimum setback distance for RNP compliance – Arumpo Road

Road	Minimum daytime setback distance for compliance, m	Minimum nighttime setback distance for compliance, m	Identified dwellings within setback zone
Arumpo Road (East of Silver City Highway)	45	120	7
Arumpo Road (East of Project EnergyConnect Camp)	40	80	None

The increase in traffic noise from the already low existing volumes may result in a noticeable increase in noise during some periods of construction. Noise mitigation options are generally limited for local roads, with community consultation and regular communication being the most effective and practical means of minimising adverse impacts. It is recommended that residents residing nearby to the Silver City Highway/Arumpo Road intersection be included in consultation prior to, and during, construction.

Alternative practical methods for minimising noise impact may include limiting construction traffic speed for the affected stretches of Arumpo Road following the Silver City Highway intersection. Reducing construction traffic speeds would reduce the minimum setback distances and potential for adverse noise impacts to these dwellingss.

6.6.3 Cumulative Impact Assessment

A detailed assessment of potential cumulative noise impacts has been undertaken in accordance with the SEARs which require an assessment of cumulative noise impacts considering other developments in the area.

The NSW Noise Assessment Bulletin does not make specific recommendations concerning cumulative noise and while the SA Guidelines 2009 do refer to cumulative noise, it states that any noise criteria which are set relative to background noise levels should not include the influence of other wind farms. While neither document explicitly states a requirement to assess the combined noise levels of multiple wind farm projects, or define criteria which directly applies to cumulative noise, an assessment of cumulative noise considering the Project and other relevant developments has been undertaken.

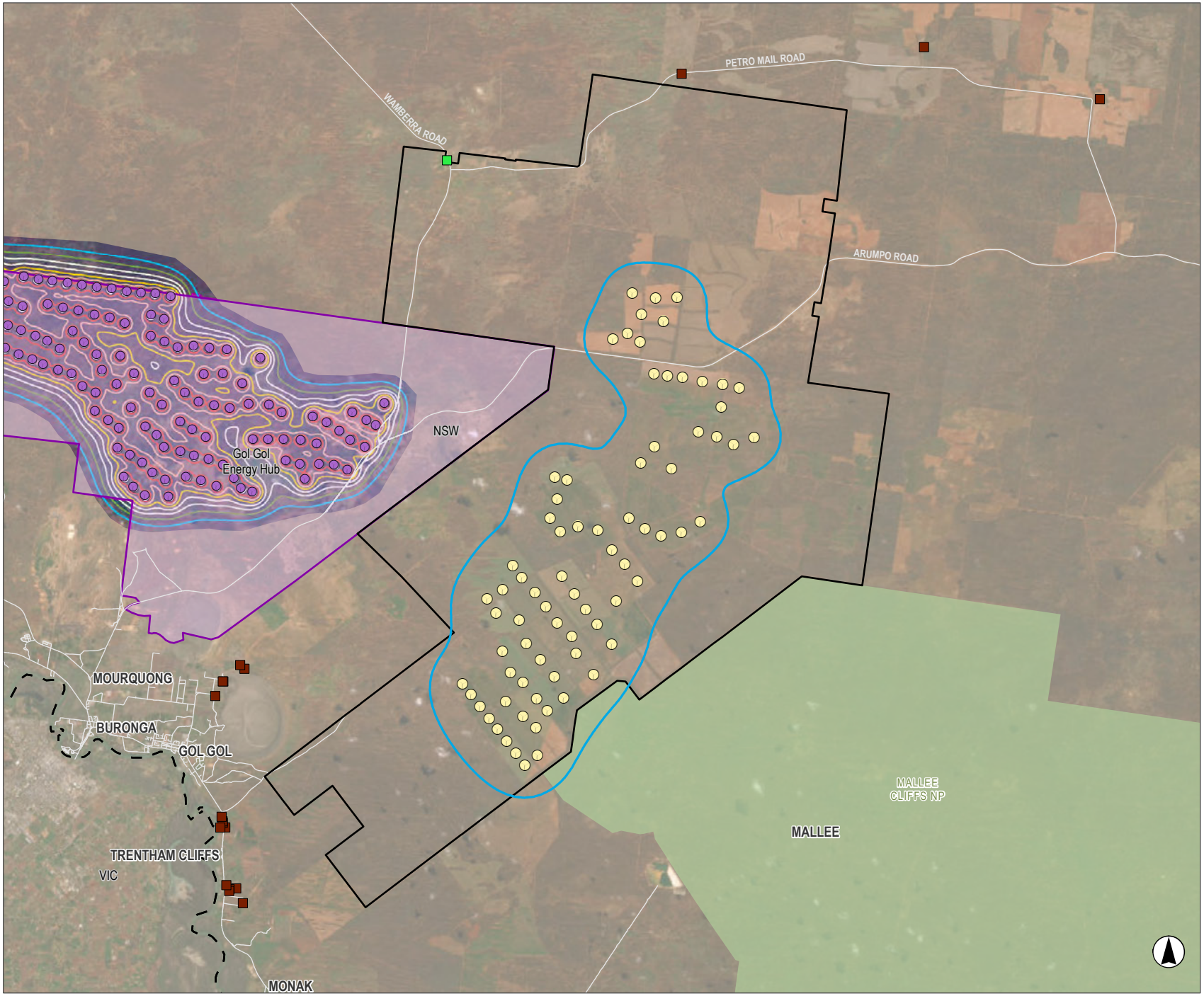
Other developments within 12 km of the Project were identified as relevant for the purposes of the cumulative noise assessment noting that cumulative noise impacts are not anticipated beyond this distance. Six (6) proposed developments were identified within 12 km including Project EnergyConnect (NSW – Eastern Section), Gol Gol BESS, Gol Gol Wind Farm, Mallee Solar Farm, Euston Mineral Sands and Gol Gol Solar Farm.

Of these other developments only Gol Gol Wind Farm contains WTG and as it shares the western boundary of the Project it is considered sufficiently proximate to be considered. To assess the cumulative noise impact a review of publicly available documentation is undertaken to identify common dwellings and noise level contributions for each project to establish an expected cumulative predicted noise level.

The assessment found that R1146 (a host dwelling of the Project) is approximately 11 km from the 35 dB noise contour associated with Gol Gol Wind Farm and 9 km from the 35 dB noise contour associated with the Project. Additionally, R1114 is approximately 9 km from the 35 dB noise contour associated with Gol Gol Wind Farm and approximately 7 km from the 35 dB noise contour associated with the Project. As such, the predicted noise levels at these dwellingss are below the base noise limit with neither project affecting the compliance of the other. An overlay of predicted noise contours associated with Gol Gol Wind Farm and the Project is provided in **Figure 6.17**.

FIGURE 6.17

Cumulative WTG noise levels – Gol Gol Wind Farm and the Project



Legend

- Project Boundary
- Gol Gol Energy Hub
- State Border
- NPWS Estates
- Road
- Wind Turbine Generators
- Gol Gol Wind Turbine Generators

Dwellings

- Host Dwellings
- Non-associated Dwellings

Predicted noise contour (dB L_{Aeq})

- 35

0 5 10
Kilometres

Scale 1:250,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Consideration is also given to the cumulative noise impacts associated with ancillary infrastructure. On the assumption that all other developments comply with obligations under NPfI ancillary infrastructure noise levels from the Project would need to be below 20 dB $L_{A\ eq,\ 15min}$ to ensure compliance for all projects both individually and cumulatively.

As outlined in **Section 6.6.2.1** the predicted ancillary infrastructure noise levels are below 10 dB $L_{A\ eq,\ 15min}$ at all dwellings which is significantly below the above threshold and confirms that cumulative ancillary infrastructure noise will be below NPfI noise limits at all dwellings.

6.6.4 Mitigation and Management Measures

Spark Renewables has committed to the following noise mitigation and management measures consistent with the recommendations of the NVA.

6.6.4.1 Operational Noise

- **NV01:** The predicted operational WTG noise levels will be updated with the final layout and sound power levels of the final WTG model selected for the Project to verify compliance with the criteria in accordance with the Noise Bulletin prior to construction.
- **NV02:** The predicted operational ancillary infrastructure noise levels will be updated with the final design and sound power levels of the final equipment selection to verify compliance with the criteria in accordance with the NPfI prior to the commencement of construction.
- **NV03:** An operational noise management plan will be prepared which identifies how compliance with the Project's operational noise limits will be demonstrated, including details of testing procedures and reporting time frames following commencing of operation of the Project.
- **NV04:** Following construction, compliance monitoring will be conducted to satisfy the Noise Bulletin including evaluation of special noise characteristics.
- **NV05:** Notwithstanding the anticipated compliance, and mitigation measures above, Spark Renewables will provide consideration to available contingency strategies to reduce noise levels, if require.
  The following summarises the two (2) key measures available to reduce the noise:
    - Procurement contract: The procurement contract for the supply of WTGs to the Project will typically include specifications concerning the allowable total noise emissions from the WTG, and the permissible characteristics of the WTG. In the event that WTG emissions are found to exceed the contracted values, the supplier will be required to implement measures to reduce the noise to the contracted value. This can include measures to rectify manufacturing defects or appropriate control settings.
    - Noise reduction management strategy: modern wind farms include control systems which enable the operation of the WTGs to be varied according to environmental constraints. Specifically, variable pitch WTGs as proposed for this Project include control functions which enable the noise emissions of the WTGs to be selectively controlled; by adjusting the pitch of blade, the noise emissions of the WTG can be reduced. In addition, where required, the WTGs can be selectively shut down under relevant wind speeds and directions. These types of control measures can be used separately, or in combination, to achieve noise reductions for predetermined wind speed ranges and directions.

6.6.4.2 Construction Noise and Vibration

- **NV06:** A Construction Noise and Vibration Management Plan (CNVMP) will be prepared and implemented for the Project. Any future CNVMP will include site and process specific noise management work practices designed to mitigate the impact of construction noise activities, including traffic noise. Any targeted noise consultation requirements will be outlined.

6.7 Social impacts

The SEARs for the Project require:

- an assessment of the social impacts in accordance with the Social Impact Assessment Guideline (DPIE, 2021) and consideration of construction workforce accommodation.

A Social Impact Assessment (SIA) has been undertaken by Umwelt and is presented in **Appendix 11** with key findings summarised below.

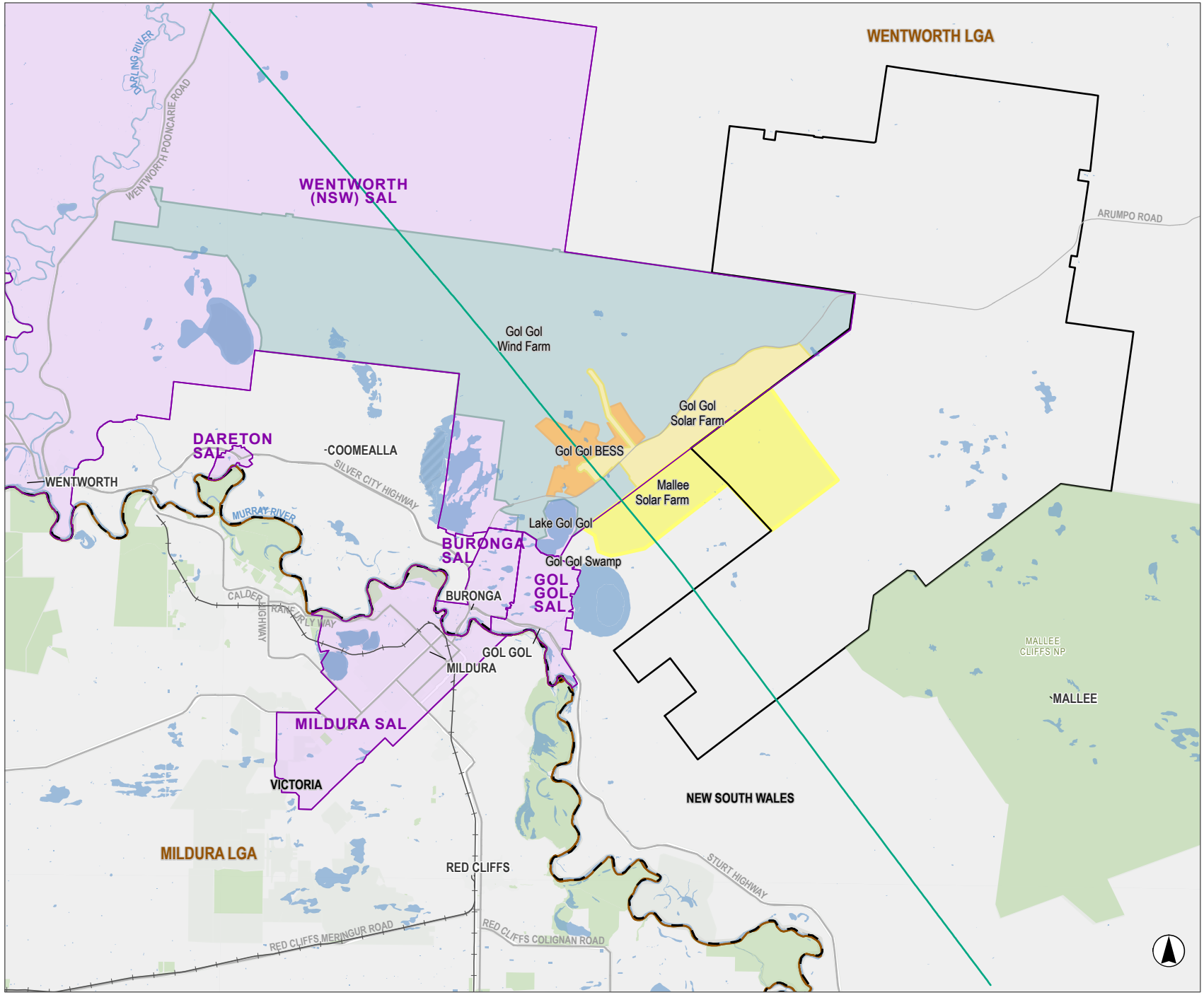
6.7.1 Existing Environment

The social locality, for the purposes of the SIA, is illustrated in **Figure 6.18** and comprises townships in the Wentworth and Mildura LGAs including Buronga, Gol Gol, Dareton, Wentworth and Mildura. **Figure 6.18** provides a snapshot of the locality.

While the Project is located within the Wentworth LGA in NSW, the key regional service centre of Mildura, which will likely service the Project, is located within Victoria, therefore the social locality includes and draws from data from both jurisdictions to define the characteristics of the community relevant to the Project.

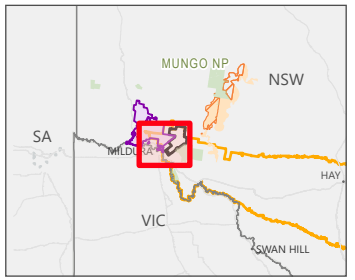
FIGURE 6.18

Social Locality



Legend

- Project Boundary
- Mallee Solar Farm
- Gol Gol Solar Farm
- Gol Gol Wind Farm
- Gol Gol BESS
- South West Renewable Energy Zone
- Willandra Lakes Region / National Heritage Property
- Willandra Lakes World Heritage Area
- State Border
- ABS SAL boundaries
- Local Government Area (LGA)
- NPWS Estate
- Water Body
- Watercourse
- Road
- Railway
- Existing HV Transmission Lines



0 5 10
Kilometres

Scale 1:300,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024), ABS (2021)

6.7.2 Social Impact Evaluation

The identification of potential positive and negative social impacts is based on a combination of

- community and stakeholder perspectives
- practitioner experience and understanding of likely impacts experienced on similar developments in similar contexts
- professional judgement based on the Project context and the social baseline
- the reported lived experiences of this community in response to other, nearby projects
- a review of community submissions on nearby, similar projects regarding positive and negative impacts
- other publicly available literature and research relevant to similar project developments.

Community and stakeholder consultation undertaken for the Project is summarised in **Section 5.0** and comprised a range of engagement mechanisms including a community survey.

It is important to note that stakeholders consulted raised both positive and negative impacts relating to the Project. The SIA includes a detailed analysis of perceived impacts, which are summarised across seven (7) key themes as outlined in **Figure 6.19**.

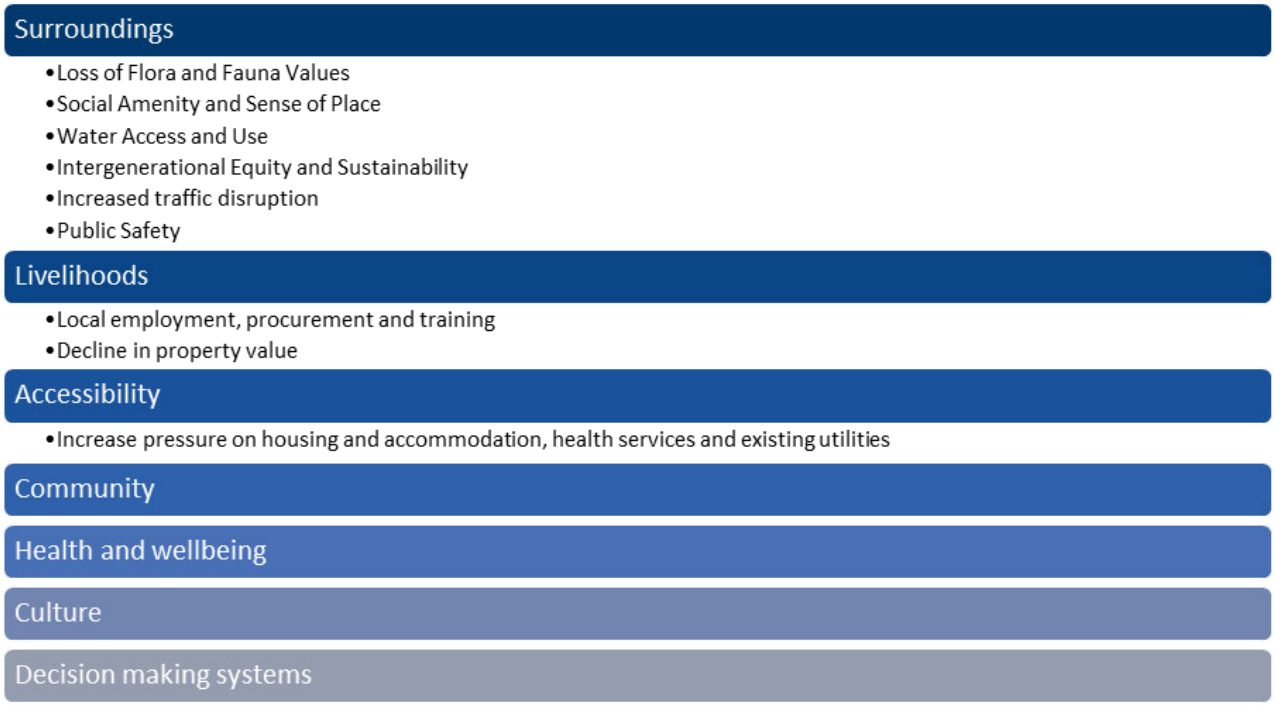


Figure 6.19 Perceived Positive and Negative Impacts Relating to the Project

The SIA provides a detailed assessment of the perceived impacts including an evaluation to assign a social impact ranking pre and post mitigation in line with the Social Impact Significance Matrix and likelihood and magnitude definitions in the SIA Guideline (DPE, 2023).

It is important to note that the social impact evaluation process considers a number of factors in addition to the outcomes of technical assessments to reflect the scale of the impact on people (social impacts) as a result of the Project; and where relevant considers the extent to which such impacts are perceived as of concern to those consulted.

The social impact evaluation includes Project refinements that have been made by Spark Renewables as a result of ongoing discussions with stakeholders and outcomes of technical assessments and presents a residual social risk ranking that reflects these design changes, mitigation and enhancement measures to be put in place to address social impact identified through the assessment.

The majority of residual negative social risk rankings (post mitigation) are low with two (2) moderate rankings including:

- Temporary increase in population, increasing pressure on housing and accommodation
- Impacts to Aboriginal Cultural Heritage values, including artefacts, cultural sites, and connection to Country. (Note: the ACHA rated the significance of the items identified within the Disturbance Footprint as low)

The Project has also been assessed as having three (3) residual positive social risk rankings which are all ranked as high including:

- Increased local employment associated with construction phase.
- Increased local procurement and economic spend in local communities and townships due to the influx of construction workers.
- Increase in human capital for local communities (expertise) due to the provision of training and skills development resulting labour pool growth.

6.7.3 Mitigation and Management Measures

As outlined in Section 5, Spark Renewables have continually sought to avoid and minimise impacts of the Project during the design refinement. This included iterative design changes in response to environmental and social constraints identified through technical assessments and community and stakeholder engagement. In particular, and with respect to the SIA, this has included maximising distances between dwellings and areas of landscape values from WTGs and the provision of an on-site TWA Facility. Inclusion of a TWA Facility as part of the Project is designed to accommodate the peak construction workforce and reduce pressures on housing, accommodation and services in the surrounding locality.

Spark Renewables have committed to implementing a Social Impact Management Framework comprising the following elements.

6.7.3.1 Accommodation and Employment Strategy (AES)

The SIA includes an AES for the Project which outlines the objectives and commitments in relation to local participation and accommodation of the Project's workforce and mechanisms for monitoring and responding to the Project's accommodation and employment needs.

Where local accommodation is required for non-local workers, Spark Renewables has committed to adopting measures as listed in Table 6.1 and Table 6.2 of **Appendix 11**. This will ensure sufficient accommodation is available for the Project workforce and maximise benefits to the local community.

S01: Continue to develop the AES in accordance with the objectives and commitments outlined within the SIA

6.7.3.2 Community Benefit Strategy (CBS)

Spark Renewables is currently in the process of developing a Community Benefit Sharing Fund (CBSF). Whilst the details of the fund are still in development, Spark Renewables is committed to providing benefit sharing funds with total values that are consistent with the Draft Benefit Sharing Guideline, with the total value of the fund being $1,050 per MW per annum for the Project life, indexed to CPI. Spark Renewables has proposed the funding to be distributed across three key areas, as outlined below.

6.7.3.3 Funding Provided to Wentworth Council for Projects Identified in their Development Contributions Plan

Funding to go towards a community benefit fund to be administered either by Spark Renewables or by a committee of council (such as a s355 committee under the NSW Local Government Act 1993), which will provide grant funding to initiatives that collectively benefit proposals put forward by the local community subject to the guidelines in the fund charter.

Funding to be administered by Spark Renewables to be directed to initiatives to share positive project impacts with the neighbouring community and local First Nations groups.

S02: Continue to develop a CBS in accordance with the objectives and commitments outlined within the SIA.

6.7.3.4 Industry and Aboriginal Participation Plan (IAPP)

Spark Renewables is in the process of developing and implementing an IAPP which is being undertaken in consultation and collaboration with local groups, Traditional Owners, Aboriginal representative organisations, industry and Council.

S03: Continue to develop an IAPP in accordance with the objectives and commitments outlined within the SIA.

6.7.3.5 Community and Stakeholder Engagement Strategy (CSEP)

Spark Renewables developed a Community and Stakeholder Plan (CSEP) in the early stages of the EIS process. Should the Project be approved, consistent and consultative engagement with communities throughout the Project's planning, pre-construction, construction, and operations is critical in increasing social acceptance, developing strong local partnerships and achieving successful, and sustainable Project outcomes. Fairness in the Project's development process requires the establishment and management of processes to ensure that people have meaningful opportunities to influence the design, plans, and outcomes of a development as well as in realising the positive impacts of the Project.

Spark Renewables will continue to prioritise the implementation of the community engagement plan / CSEP in the remaining development phase of the Project and throughout the pre-construction and construction phases should the Project be approved.

S04: Continue to implement the CSEP.

6.8 Traffic and Transport

The SEARs for the Project require:

> *An assessment of the construction, operational and decommissioning traffic impacts of the development on the local and State road network.*
>
> *Provide details of the peak and average traffic volumes (including light, heavy and over-mass and over-dimensional vehicles / heavy vehicles requiring escort and construction worker transportation) and transport and haulage routes during construction, operation and decommissioning, including traffic associated with sourcing raw materials (water, sand and gravel).*
>
> *An assessment of the potential traffic impacts of the project on road network function including intersection performance, site access arrangements, site access and haulage routes, and road safety, including school bus routes and school zones.*
>
> *An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the project (including over-mass / over-dimensional traffic haulage routes from port) during construction, operation and decommissioning.*
>
> *An assessment of the likely transport impacts to the site access and haulage routes, site access point, any rail safety issues, any Crown Land particularly in relation to the capacity and conditions of the roads and use of rail level crossings (and rail safety assessment if required) and impacts to rail underbridges and overbridges.*
>
> *A cumulative impact assessment of traffic from nearby developments.*
>
> *Provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and / or rail authority.*

A Traffic and Transport Impact Assessment (TTIA) was undertaken by Access Traffic Consulting to address the requirements of the SEARs. The TTIA is provided in **Appendix 12** and the key findings are summarised below. A Preliminary Transport Route Assessment has also been prepared for the Project by Rex J. Andrews to provide information on the transport route constraints for the movement of Oversize Overmass (OSOM) vehicles and is contained in Appendix A of **Appendix 12**.

6.8.1 Existing Transport Network

As discussed in **Table 3.1**, the Port of Newcastle has been identified as the preferred port for OSOM deliveries. This route comprises two (2) options between Port of Newcastle and the Project as shown in **Figure 3.13** and herein referred to as the OSOM Transport Route.

The Local Transport Route comprises the final 110 km of the OSOM Transport Route between Euston and the Project Area. This will be utilised by heavy vehicles including OSOM as well as light vehicles associated with the Project.

The Project includes two (2) direct vehicular access points to the Project Area from Arumpo Road, located 32.4 km (Access Point 1) and 32.6 km (Access Point 2) from the intersection of the Silver City Highway / Arumpo Road. These access points would be used for standard light and heavy vehicles as well as for all OSOM deliveries to the Project Area.

The critical road links in terms of the potential impacts of the Project were determined to be associated with the Local Transport Route including sections of the state-controlled sections of the Sturt Highway (Mildura to Hay), Silver City Highway (Sturt Highway to Wentworth) and Arumpo Road (Silver City Highway to Access Point 1 and Access Point 2).

All the other road links identified were noted as comprising existing approved heavy vehicles routes or forming part of the Preliminary Transport Route Assessment (Appendix A of **Appendix 12**).
Any modifications to the road network between Port of Newcastle and Sturt Highway/ Carey Street roundabout at Euston would be undertaken by separate planning assessment and approvals and is thus excluded from this EIS.

Volumes for the relevant sections of the external state-controlled road network have been estimated from the available historical link count data from the Transport for NSW Traffic Volume Viewer, while an estimate of the daily volumes on the sections of the Silver City Highway and Arumpo Road were established from 24-hour volumes recorded during a completed count at the Silver City Highway / Arumpo Road intersection on22 July 2024.

A conservative background growth of 2% per annum (compound) was then applied to the identified baseline year volumes to establish forecasts of the current (2024) volumes on the link, as well as the expected background volumes at future design horizons for the Project (i.e. peak construction (2027) and the operations (2039) and decommissioning (2069) design horizons.

Turning movement counts were undertaken at the Silver City Highway / Arumpo Road intersection on 22 July 2024, with the counts undertaken for the full 24 hour period to record the existing traffic conditions at the intersection for both the expected Project peaks (6:00–7:00 am & 6:00–7:00 pm – being the peak periods of traffic generation from the Project during construction) as well as the identified peak periods of traffic volumes at the intersection (7:15–8:15 am & 3:45–4:45 pm) as identified in the count undertaken.

A detailed intersection analysis was undertaken utilising the utilising the Signalised Intersection Design and Research Aid (SIDRA) software package (Ver 9.1.6.228) to understand the current operational performance of the Silver City Highway / Arumpo Road.

The criteria for evaluating road performance used in the TTIA is Level of Service (LoS). LoS is a qualitative measure that describes the operational conditions within a traffic stream and the perception of these by motorists and / or passengers. LoS ranges from A (best) to F (worst). In rural areas, LoS C can be considered a minimum desirable standard; a deterioration of the LoS under this level would imply that remedial measures to maintain the existing LoS should be sought. Existing LoS for the Silver City Highway / Arumpo Road intersection were calculated at LoS A.

6.8.2 Project Traffic Generation

6.8.2.1 Construction Phase

Traffic movements generated during construction will include OSOM WTG component transport, materials and equipment deliveries, and construction staff movements. The Project requires a total of 3,122 vehicles, summarised as follows, to transport WTG components from the Port of Newcastle to the Project Area during the construction stage:

- 1,976 light vehicle escorts.
- 988 WTG component transport vehicles.
- 152 ancillary WTG component transport vehicles (semi-trailers).
- Six (6) meteorological mast transport vehicles.

This would equate to a maximum of 10 vehicles per day on the existing road network. Detailed predictions for materials and equipment delivery, and construction staff vehicle movements are presented in **Appendix 12**. Traffic movements for the delivery of materials and equipment by the Project during construction is summarised in **Table 6.29**.

It is also noted that as various routes have been identified to transport OSOM WTG components, a number of the identified road sections (particularly those forming over dimension bypasses) would be utilised less frequently and see lower daily traffic volumes from the haulage operations.

6.8.2.2 Operational Phase

The heavy vehicle movements during the operations phase of the Project are also likely to be extremely low (approximately one (1) heavy vehicle per week) and are considered to be negligible from a traffic engineering or transport planning perspective.

6.8.2.3 Decommissioning Phase

For the decommissioning phase, the peak traffic movements to/from the Project Area were conservatively estimated to be approximately 70% of the peak construction movements. This would need to be confirmed at that stage, given that the decommissioning works may only commence at least 30 years after construction is completed, and more accurate information would be available. An updated transport and traffic impact assessment would need to be completed to identify proposed decommissioning works, associated traffic movements, the anticipated impact on the surrounding road network and any management and mitigation required.

Table 6.29 Summary of Total Project Material / Equipment Delivery Movement Volumes – Construction Phase

Task	Duration	Total Vehicles	Type of Vehicles	Max Vehicles per Day (Avg)
Phase A – Site Mobilisation & Compound Establishment	6 months	3,871 vehicles (external), including one (1) low loader from Mildura and 3,870 truck & dog combinations via Arumpo Road	Low Loader Truck and Dog Combination	27 vehicles / day (external)
Phase B – Internal Access Road & Hardstand Construction	12 months	13,711 vehicles (external), including 20 low loaders from Mildura, 2,678 water tankers from Buronga and 11,013 truck & dog combinations via Arumpo Road	Low Loader Water Tanker Truck and Dog Combination	48 vehicles / day (external)
Phase C – WTG Foundation Construction	12 months	4,021 vehicles (external), including 152 low loaders & 1,142 truck & trailers from Mildura, 380 water tankers from Buronga and 2,347 truck & dog combinations via Arumpo Road	Low Loader Water Tanker Truck and Dog Combination	14 vehicles / day (external)
Phase D – WTG Component Delivery to Site	14 months	3,122 vehicles total, including 1,976 light vehicle escorts	Special Transport Vehicles (Permit) Semi-Trailer Escorts (light vehicle)	Ten (10) vehicles / day (external)
Phase E – WTG Installation	16 months (1 week for transport task)	12 vehicles required for crane delivery	Special Transport Vehicles (Permit) Crane	Two (2) vehicles / day (external)
Phase F – Electrical Trenching & Cabling	16 months	2,868 vehicles (external), including 67 low loaders, 89 semi-trailers, 20 truck & trailers from Mildura, seven (7) water tankers from Buronga and 2,685 truck & dog combinations via Arumpo Road	Semi-Trailer Low Loader Water Tanker Truck and Dog Combination	Eight (8) vehicles / day (external)
Phase G – WTG Commissioning & Testing	16 months	16 vehicles (external), including six (6) semi-trailers from Newcastle, four (4) truck & trailers from Mildura, two (2) water tankers from Buronga and four (4) truck & dog combinations via Arumpo Road	Semi-Trailer Water Tanker Truck and Dog Combination	One (1) vehicle / day (external)
Phase H – Substation & Electrical Connection Construction	6 months	6,874 vehicles (external), including 14 OSOM transport vehicles from Newcastle and 6,860 truck & dog combinations via Arumpo Road	Special Transport Vehicles (Permit) Truck and Dog Combination	48 vehicles / day (external)

Task	Duration	Total Vehicles	Type of Vehicles	Max Vehicles per Day (Avg)
Phase I – Operational Infrastructure	3 months	564 vehicles (external), including 21 truck & trailers from Mildura, seven (7) water tankers from Buronga and 536 truck & dog combinations via Arumpo Road	Water Tanker Truck and Dog Combination	Eight (8) vehicles / day (external)
Phase J – BESS Construction	6 months	1,261 vehicles (external), including 398 semi-trailers and five (5) OSOM transport vehicles from Newcastle and 858 truck & dog combinations via Arumpo Road	Special Transport Vehicles (Permit) Semi-Trailer Truck and Dog Combination	Nine (9) vehicles / day (external)
Phase K– Decommission Temporary Structures & Demobilisation (construction phase)	1 month	100 vehicles (external), including 100 semi-trailers from Mildura	Semi-Trailer	Five (5) vehicles / day (external)
Other – Site Water (Does not include internal water truck movements)	36 months	4,442 vehicles (external), including 1,112 raw water & 3,330 potable water tankers from Buronga	Water Trucks	Six (6) vehicles / day (external)
Other – Fuel	36 months	1,112 vehicles (external), including 1,112 fuel tankers from Mildura	Fuel Tanker	Two (2) vehicles / day (external)
Other – Waste Removal	36 months	234 vehicles (external), including 234 semi-trailers from Buronga Landfill	Semi-Trailer	One (1) vehicle / day (external)

6.8.3 Impact Assessment

6.8.3.1 Construction

Site Access

Based on the low background volumes on Arumpo Road (approximately 500 vehicles per day) in the vicinity of the proposed site access points, it is proposed that the accesses be provided as access intersections with basic left (BAL) and basic right (BAR) turn treatments, with these works to be provided generally in accordance with Figure 8.2 (rural BAL) and Figure 7.1 (rural BAR) of Part 4A of Austroads *Guide to Road Design*, adopting a design speed of 110 km/h and a 26 m B-Double design vehicle.

Additional hardstand areas are expected to be required at the proposed site access intersections on Arumpo Road to accommodate the swept paths of the OSOM WTG component transport vehicles (particularly the blade transport vehicles), with the preliminary extents of these additional hardstand areas. The specific extents of these additional hardstand areas will need to be confirmed during detailed design. The proposed access arrangements off Arumpo Road is considered suitable to cater for the expected traffic volumes of the Project.

Intersections

Based on the forecast peak hour traffic volumes at the intersection during the critical periods of the construction, operations and decommissioning phases of the Project, the TTIA (**Appendix 12**) shows that the required intersection treatments at the Silver City Highway / Arumpo Road intersection were a basic left (BAL) and a full channelised right (CHR) treatment.

Based on the existing, higher standard auxiliary left (AUL) turn treatment and the proposed provision of an upgraded channelised CHR right turn treatment as part of the Project, it is expected that the configuration of the intersection will be adequate to cater for the additional traffic movements associated with the peak construction (including cumulative assessment), operations and decommissioning phases of the Project.

The results of the SIDRA analysis indicate that the proposed upgraded (CHR / AUL) configuration of the Silver City Highway / Arumpo Road intersection is expected to operate satisfactorily during all Project traffic scenarios identified for the Project (including cumulative assessments), with all values for intersection degree of saturation (DOS), LOS, average delay and vehicle queue lengths being within acceptable limits of operation for a priority-controlled (give-way) intersection.

Based on these results, the upgraded configuration of the intersection will be adequate to cater for the additional traffic volumes generated by the peak construction, operations and decommissioning phases of the Project.

Road Network Capacity

The addition of the expected peak construction traffic is shown to lead to increases in daily traffic volumes of >5% on the section of the Sturt Highway between Corbett Avenue and Arumpo Road, while the operation and decommissioning phase Project traffic led to increases >5% on Arumpo Road. Furthermore, it is noted that the high percentage increases observed on Arumpo Road are generally as a result of the lower background volumes on this rural section of the road network.

As the movement of OSOM vehicles is required to be undertaken under permit (with escort vehicles) and likely out of hours, it is not anticipated that the relatively small increase in daily traffic volumes (up to 10 vehicles per day, including 3 OSOM vehicles) will have a significant ongoing impact on the operation or capacity of the roads forming the proposed WTG transport routes.

A detailed Traffic Management Plan (TMP) is proposed to be prepared as part of subsequent stages of the Project.

The Project would require some road upgrade works on the external public road network, as summarised in **Table 6.30**. These modifications and minor treatments along the Sturt Highway at Buronga and Euston are required to generate space for OSOM vehicle movements. The works include the relocation of signage and road lighting infrastructure and construction of required temporary hardstand pavement areas as identified in the Preliminary Transport Route Assessment for the Project (Appendix A of **Appendix 12**).

Table 6.30 External Road Network Upgrade Summary

Road / Intersection	Treatment	Timing
Silver City Highway / Arumpo Road	Upgrade works to provide CHR turn treatment to intersection in accordance with relevant Austroads standards.	Prior to the commencement of construction works.
Site Access 1 (LHS) Arumpo Road (Approximate Chainage 32.4 km)	Upgrade existing property access to rural BAL / BAR standard as per Figure 8.2 and 7.1 of Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.	Prior to the commencement of construction works.
Site Access 1 (LHS) Arumpo Road (Approximate Chainage 32.4 km)	Additional hardstand area at access to accommodate OSOM transport vehicle swept paths.	Prior to commencement of OSOM WTG component haulage operations.
Site Access 2 (RHS) Arumpo Road (Approximate Chainage 32.6 km)	Upgrade existing property access to rural BAL / BAR standard as per Figure 8.2 and 7.1 of Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.	Prior to the commencement of construction works.
Site Access 2 (RHS) Arumpo Road (Approximate Chainage 32.6 km)	Additional hardstand area at access to accommodate OSOM transport vehicle swept paths.	Prior to commencement of OSOM WTG component haulage operations.
Sturt Highway / Carey Street	Provision of route upgrade works to accommodate OSOM WTG component haulage operations. The upgrade works at this location are to include: • Additional pavement hardstand area on the outside of the departure to the intersection. • Minor works to make the entry and exit traffic islands trafficable. • Removal / relocation of one (1) light pole on the approach to the intersection. • Works to make multiple signs removable. • Minor vegetation trimming.	Prior to commencement of OSOM WTG component haulage operations.
Sturt Highway / Silver City Highway	Provision of route upgrade works to accommodate OSOM WTG component haulage operations. The upgrade works at this location are to include: • Additional pavement hardstand area on the outside of the departure to the intersection.	Prior to commencement of OSOM WTG component haulage operations.

Road / Intersection	Treatment	Timing
	• Minor works to make the entry and exit traffic islands trafficable. • Removal / relocation of two (2) light poles. • Relocation of one (1) power pole. • Works to make multiple signs removable.	
Corbett Avenue Silver City Highway to Modica Crescent (East) Modica Crescent (Full Length) River Drive (Sturt Highway to Raw Water Supply Point)	Completion of pre-construction road dilapidation inspection, including documentation of pre-construction condition.	Prior to the commencement of construction works.
Corbett Avenue Silver City Highway to Modica Crescent (East) Modica Crescent (Full Length) River Drive (Sturt Highway to Raw Water Supply Point)	Completion of post construction road dilapidation inspection, identification of defects and completion of suitable maintenance/rehabilitation works to reinstate road to documented pre-construction condition.	Within 3 months of the completion of construction works.
Various locations on OSOM transport routes	Various infrastructure relocation and hardstand construction works to accommodate vehicle paths of OSOM WTG component transport movements.	Prior to commencement of OSOM WTG component haulage operations.

6.8.3.2 Cumulative Impact Assessment

The TTIA identified seven (7) projects in the region that may have overlapping periods of construction or operation with the Project, which may lead to cumulative increases in traffic volumes on the critical sections of either Sturt Highway, Silver City Highway or Arumpo Road. A summary is provided in **Table 6.31**.

Table 6.31 Cumulative Project Traffic Review Summary

Project	Cumulative Assessment
Euston Mineral Sands Project	Traffic from the Euston Mineral Sands Project is expected to be contained to the Sturt Highway and as such not anticipated to lead to any increases in volumes along Arumpo Road or at the key Silver City Highway / Arumpo Road intersection.
Mallee Solar Farm	Mallee Solar Farm expected to contribute traffic to similar sections of Sturt Highway, Silver City Highway and Arumpo Road as the Mallee Wind Farm Project, noting that traffic from Mallee Solar Farm not anticipated to utilised Arumpo Road north of the current Project EnergyConnect TWA. As such, the road link volumes and intersection volumes during the construction phase of the Mallee Solar Farm are estimated to be approx. 75% of those identified for the Mallee Wind Farm.
Gol Gol Solar Farm	Gol Gol Solar Farm expected to contribute traffic to similar sections of Sturt Highway, Silver City Highway and Arumpo Road as the Mallee Wind Farm Project, noting that traffic from Mallee Solar Farm not anticipated to utilised Arumpo Road north of the current Project EnergyConnect TWA. As such the road link volumes and intersection volumes during the construction phase of the Gol Gol Solar Farm are estimated to be approx. 50% of those identified for the Mallee Wind Farm.

Project	Cumulative Assessment
Gol Gol BESS	Gol Gol BESS Project expected to contribute traffic to similar sections of Sturt Highway, Silver City Highway and Arumpo Road as Mallee Wind Farm, noting that traffic from Gol Gol Solar Farm not anticipated to utilised Arumpo Road north of the current Project EnergyConnect TWA.
Buronga Landfill Expansion	Buronga Landfill Expansion expected to contribute traffic to similar sections of Sturt Highway, Silver City Highway and Arumpo Road as Mallee Wind Farm, noting that traffic from the Buronga Landfill Expansion not anticipated to utilised Arumpo Road north of its access. Buronga Landfill Expansion expected to contribute movements to key Silver City Highway / Arumpo Road intersection. Additional peak hour volumes at Silver City Highway / Arumpo Road intersection assumed to be 10% of daily volumes identified above.
Euston Wind Farm	Traffic from the Euston Wind Farm is expected to be contained to the Sturt Highway and is not anticipated to utilise Arumpo Road or key Silver City Highway / Arumpo Road intersection.
Koorakee Energy Park	Traffic from the Koorakee Energy Park is expected to be contained to the Sturt Highway and is not anticipated to utilise Arumpo Road or key Silver City Highway / Arumpo Road intersection.

It is also expected that the cumulative OSOM traffic movements associated with the other wind farm projects (Gol Gol Wind Farm, Euston Wind Farm and Koorakee Energy Park) will also originate from the Port of Newcastle and follow a similar route to that identified for the Project. However, as all these OSOM movements will be required to be undertaken under permit, it is expected that restrictions and management measures will be implemented to ensure that OSOM movements from one Project only will occur at any time, to minimise the impacts on the operation of the road network forming part of the identified transport routes.

6.8.4 Mitigation and Management Measures

Spark Renewables has committed to the following noise mitigation and management measures consistent with the recommendations of the NVIA.

6.8.4.1 Information and Communication

- **TT01:** To improve the awareness of the local residents and community of the Project and the associated Project traffic, and assist in managing the potential traffic impacts, it is recommended that a community information and awareness program be implemented for the Project.
- **TT02:** Undertaken prior to construction commencing and then at regular intervals during the construction period, a program of consultation should be initiated to ensure local residents are aware of construction traffic accessing the Project, and any specific traffic management issues or measures to be implemented. This program may include elements of the following as appropriate to the relevant phase of Project works:
    - Press releases in local newspapers.
    - Specific emails, newsletters and individual letter drops to neighbouring residents along the key transport routes for the Project (in particular Arumpo Road).

- Provision of a website providing details of the status of works and contact details for complaints or enquiries.
- Provide key contact personnel and contact details, including out of hours contact information to residents, schools, public activities and business operating alongside the local route.
- Neighbours of the wind farm will be consulted and notified regarding the timing of major deliveries which may require additional traffic control and disrupt access.

6.8.4.2 OSOM Road Authority Approvals & Traffic Management Plan

- **TT03:** The proposed use of OSOM vehicles for the Project will require the obtainment of suitable permits from the National Heavy Vehicle Regulator (NHVR). This replaces the approvals that were previously granted from Transport for NSW and councils. Applications are to be submitted to the NHVR, which identify the proposed OSOM loads, vehicle combinations and transport routes.
- **TT04:** In addition to the required permits, it is proposed that a detailed Traffic Management Plan (TMP) be developed for the Project as part of the Construction Traffic Management Plan (CTMP) or the decommissioning management plan that should be developed before construction or decommissioning commences.
- **TT05:** The TMP will provide details of the management measures to be implemented to govern the required OSOM vehicle movements for the Project. The TMP should include, but not be limited to:
  - Procedures for escorts of OSOM vehicles.
  - Traffic control plans for temporary road closures to allow vehicles to cross to the other side of the carriageway where required.
  - Safe work methods and strategies for working on roadways.
  - Indicative OSOM haulage schedule, including dates and times for transporting loads.
  - Location of suitable rest stops and vehicle layover areas along the proposed transport routes.
  - Communication strategy to affected communities.
  - Notification and consultation of key stakeholders including:
    - Police and emergency services.
    - Local Councils along the route.
    - Public and school bus operators that may be affected.
  - Advertising in local newspaper and media releases.
  - Contact details of foreman or project manager throughout operations to be shared with emergency services and road authorities.
  - Timing of operations and measures to avoid commuter peaks and school peaks through populated areas where practicable.

- Consideration of cumulative impacts of other projects along the route, based on updated information that is available at that time.
- Identification of layby areas for driver breaks and co-ordination of OSOM on site arrivals.

6.8.4.3 Driver Code of Conduct

- **TT06:** The Driver Code of Conduct would be finalised prior to issue of the Construction Certificate. The purpose of the Driver Code of Conduct is to minimise the impact of individual driver behaviours on all users of the public roads forming part of the site access routes. The Driver Code of Conduct outlines acceptable behaviour for all vehicle drivers in connection with the Project, including:
  - General requirements (e.g. site induction requirements).
  - Travelling speeds and safe driving practices, particularly through residential areas and school zones.
  - Fatigue management.
  - Adherence to designated transport routes and heavy vehicle noise.
  - Public complaint resolution and penalties and disciplinary action.
- **TT07:** Prior to involvement in the Project, vehicle drivers will be required to read the Driver Code of Conduct and acknowledge their compliance with it throughout their involvement in the Project. The expectations of the Driver Code of Conduct will be established in the Project induction and will be reiterated through pre-starts. Heavy vehicle haulage routes will be communicated to haulage contractors during the procurement stage and requirements of the Drivers Code of Conduct, route use and compliance included in their contracts.
- **TT08:** The Driver Code of Conduct includes an element of fatigue management. This includes the requirements for drivers on the Project to manage their fatigue, be suitably rested and for operators of heavy vehicles to comply with the Chain of Responsibility legal requirements under the National Heavy Vehicle Law (Heavy Vehicle (Adoption of National Law) Act 2013). The fatigue management standards, including those outlined in the Chain of Responsibility, will be consistent with the standards outlined in the Fatigue Management Plan.

6.8.4.4 Emergency Access

- **TT09:** The proposed site access points provide good access and egress around the site for emergency services. No additional emergency access points are expected to be required proposed.

6.8.4.5 On-site Mitigation Measures

- **TT10:** In addition to the external network, it is recommended that mitigation measures targeted at safety and reducing the impact of Project traffic also be implemented for the on-site, internal vehicle circulation facilities. Such measures could include:
  - On-site speed limits / restrictions along internal access tracks.
  - Appropriate dust suppression measures.

- Implementation of condition inspection and maintenance program for on-site access tracks to ensure safe for use by Project traffic.
- Completion of all loading and unloading movements to occur within the designated work areas. No access track area or external streets or roads are to be used for material storage at any time.
- Sufficient car parking is to be provided on-site to ensure vehicles do not park on the surrounding road network.
- All car parking and loading areas to be designed in accordance with the relevant Australian Standard (2890 series) and Council requirements.

6.8.4.6 Road Safety Considerations

- **TT11:** Under the safe systems approach road safety is generally improved by focussing on Safe Roads, Safe People, Safe Vehicles and Speed Management.
- **TT12:** Contractors are to ensure that all vehicles used are road worthy and in good working condition with lights, brakes, tire pressure etc.
- **TT13:** Safe Road Use can be achieved by education of workers and communicating policies of the work site. Worker site induction should include driver education of the local road conditions and an adoption of a "drivers code of conduct". This should include:
  - Driving to the conditions on unsealed roads.
  - Avoid speeding and other dangerous behaviour.
  - Identification and communication of known road crash cluster locations.
  - Identification and warning of when roads may be affected by black ice, road damage (potholes) and incidents.
  - A drug and alcohol policy to reduce incidents of drunk and drug driving.
  - Additional caution of wildlife when driving at dawn and dusk.
  - Measures to reduce the risk of workers driving while tired.
  - Training drivers to respect private property and farm gates.
- **TT14:** The proposed use of shuttle bus services for off-site workers would reduce the number of workers driving from the site when tired, and the provision of these services for off-site workers will be investigated. However, as off-site workers (approximately 25% off total construction workforce) are likely be dispersed around the surrounding localities, it is likely that some workers will need to travel to site independently.
- **TT15:** As part of managing the Project, workers would be required to drive to the conditions, respect speed limits, and abide by the Drivers Code of Conduct
- **TT16:** It is recognised that the Project may have an impact on sensitive land uses such as schools and residential precincts within townships along the identified OSOM haulage and material delivery routes.

To minimise the impacts on schools it is recommended that temporary road closures for OSOM movements should be avoided during school peaks. To this end vehicle layovers should be identified along the proposed haulage routes to allow vehicles to wait until appropriate times for travel.

- **TT17:** Speed reductions, use of fog lights during periods of low visibility, cessation of work and site shutdowns will be implemented as required during periods of adverse weather.

6.9 Water Resources

The SEARs require:

A site water balance for the development, quantify water demand, identify water sources (surface and groundwater), including any licensing requirements, and determine whether an adequate and secure water supply is available for the development.

An assessment of the likely impacts of the development (including flooding and flood modelling) on surface water and groundwater resources traversing the site and surrounding watercourses (including their Strahler Stream Order), drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulphate soils, related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts.

Where the project involves works within 40 metres of the high bank of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the DPI Guidelines for Controlled Activities on Waterfront Land (2018) and (if necessary) Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI 2003) and Policy & Guidelines for Fish Habitat Conservation & Management (DPI, 2013).

A description of the measures to minimise surface and groundwater impacts, including how works on erodible soil types would be managed and any contingency requirements to address residual impacts in accordance with the Managing Urban Stormwater: Soils and Construction series of guidelines.

A Water Resources Impact Assessment (WRIA) was undertaken for the Project by WRM Water & Environment Pty Ltd (WRM) to address the requirements of the SEARs and in accordance with the policies and guidelines listed above. The WRIA is provided in **Appendix 13** and the key findings are summarised below.

6.9.1 Existing Environment

6.9.1.1 Surface Water

The Murray River is located 8.4 km south of the Project Area, within the Murray River Catchment in southern NSW. The Murray River flows in a south westerly direction from its headwaters, which originate in Queensland, NSW and Victoria, draining through South Australia and into the Southern Ocean. As shown in **Figure 6.20**, the Project Area has a low elevation ridge line, with a minimum elevation of approximately 40 m AHD and maximum elevation of around 130 m AHD.

There are numerous local depressions and limited mapped streams of 1st and 2nd Strahler order within the Project Area. There are no major watercourses within the Project Area.

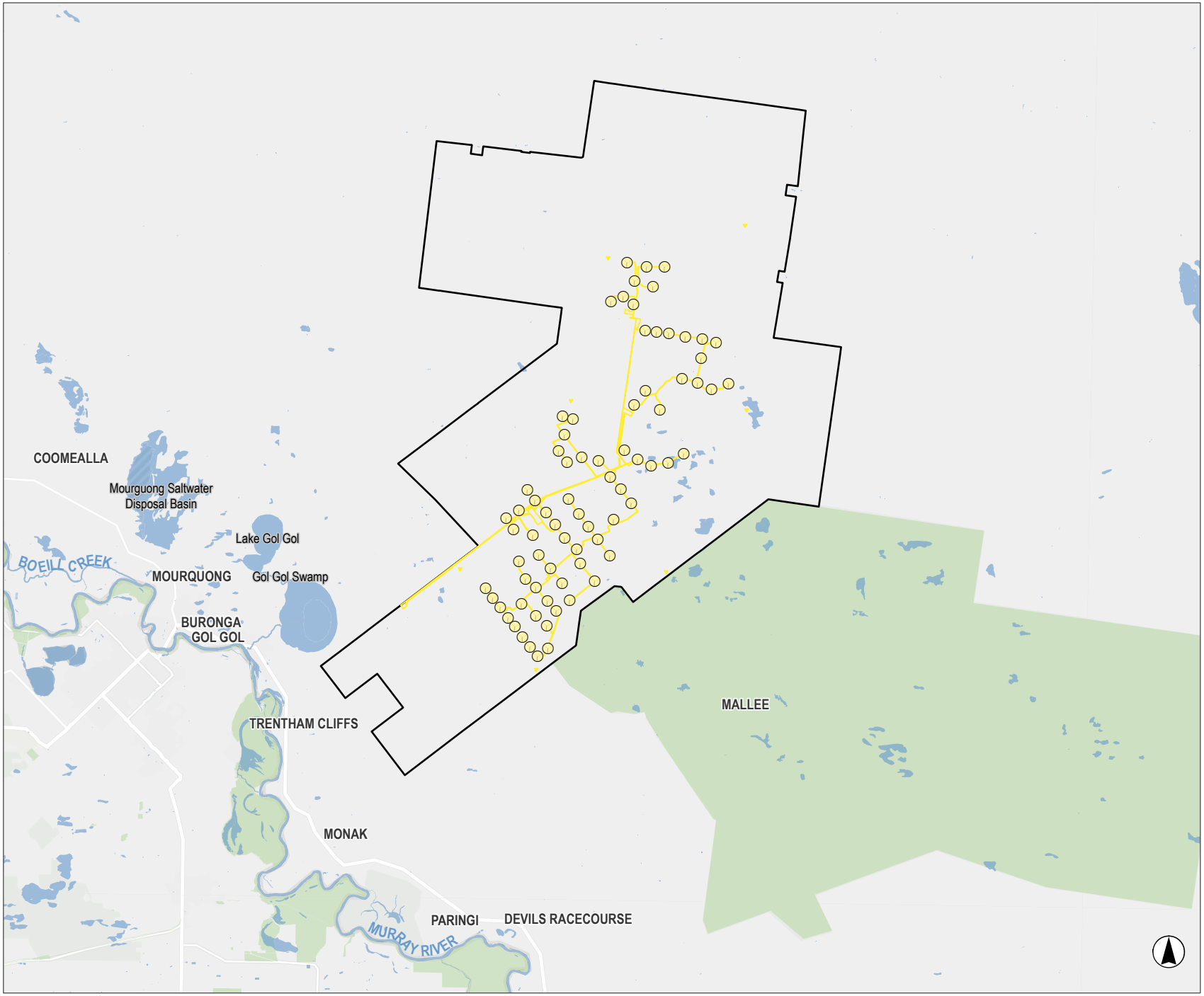
6.9.1.2 Flooding

No known flood prone land or flood management areas are identified within the Project Area. It is understood that no previous flood studies have been undertaken within the Project Area and it is not mapped as flood prone under the Wentworth LEP (2011).

A flood assessment was undertaken for 10%, 1%, 0.5% and 0.2% Annual Exceedance Probability (AEP) and Probably Maximum Flood (PMF). AEP is a measure of the likelihood a flood level or flow will be equalled or exceeded in any given year (note that the 1% AEP event is sometimes referred to as the 1 in 100 year event, however, the AEP terminology is used in this assessment). The PMF is the largest flood that could be conceivably expected to occur at a particular location. The AEP and PMF events were assessed to quantify flood depth, velocity, and hazard levels.

FIGURE 6.20

Regional Watercourses



Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- NPWS Estate
- Water Body
- Major Watercourse

0 5 10
Kilometres

Scale 1:300,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.9.1.3 Groundwater

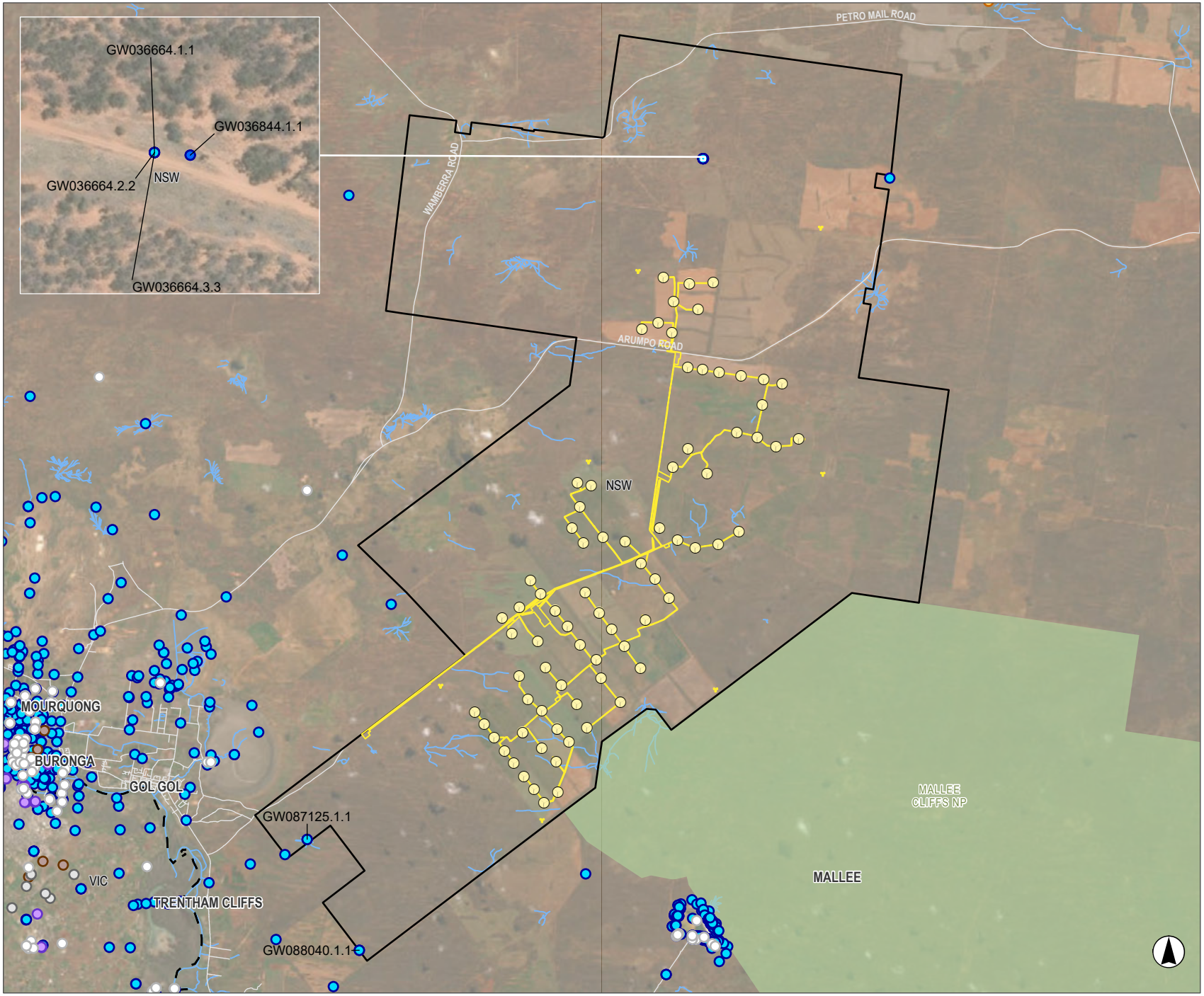
In total there are six (6) registered groundwater bores located within the Project Area (BoM, 2022), as shown in **Figure 6.21**. However, only five (5) groundwater bores (GW087124, GW087125, GW088040, GW600093, GW036664) are listed as currently functioning for monitoring purposes. The remaining bore (GW036844) is close to GW036664 and is for water supply. The drilled depth of water supply and monitoring bores ranges between 31 m and 72 m below ground level.

The regional water table is relatively deep, located at around 25 to 50 m below ground level. Localised perched groundwater systems are still possible. Based on salinity data for registered bores, groundwater quality in the Project Area has a salinity ranging from 3,000 mg/L (slightly brackish) to 29,500 mg/L (very saline) (BOM Groundwater Explorer – Bore log).

As discussed in **Section 6.2.1.3** above, there are no GDEs mapped within the Project Area.

FIGURE 6.21

Groundwater Bores



Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- NPWS Estates
- State Border
- Road
- Watercourse

Monitoring Bore Types

- Water Supply
- Monitoring
- Stock and Domestic
- Dewatering
- Exploration
- Other
- Unknown

0 5 10
Kilometres

Scale 1:225,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

6.9.2 Project Water Demand and Supply

It is estimated that 140 megalitres (ML) of water may be required over the three (3) year construction period. The assumed peak and maximum daily breakdown of water requirements for the construction period are:

- Peak daily demand of 600 kL/day raw with 40 kL/day potable water.
- Average daily demand of 250 kL/day raw with 20 kL/day of potable water.

The final water demand would be calculated during detailed design and will be based on earthwork quantities and environmental conditions at the time. Key Project water demands include:

- Soil and fill conditioning.
- Dust suppression.
- Concrete production.
- Concrete washout.
- Vehicle and equipment wash down.
- TWA and Amenities.

During operations, up to 1 ML per year would be required for ongoing maintenance activities such as amenities and potable purposes by operational staff, and equipment wash down, if required. Washing would not require any detergent or cleaning agents. A static water supply, with the capacity to be determined during the detailed design phase, will also be established and maintained for fire protection.

Water supply during construction, operation and decommissioning will be sourced primarily from Wentworth Shire Council commercial water supply and trucked to the Project Area. Potable water would be primarily sourced from Modica Crescent Buronga and supplied via filling through a metered hydrant from the existing water main. An alternative potable water source is also proposed via Beverley Street Wentworth and would be supplied via an overhead fill point. Both sources are also currently used to facilitate construction of Project EnergyConnect. Non-potable water would be sourced via River Drive Buronga and would also be supplied via an overhead fill point.

In addition to the above, where feasible, water for construction purposes will also be opportunistically sourced from the following methods to minimise the need for imported water:

- Use from existing dams where harvestable rights apply.
- Reuse from rainwater tanks collecting runoff from building roofs.

Where further licences are needed to access water from these sources or licence amendments are required, these would be sourced prior to the water being used.

Any water supplied to the Project from existing groundwater bore or farm dams will be sourced under agreement with relevant landholders while ensuring any WALs, works approvals and water use approvals required under the WM Act (2000) are obtained.

Water sources would be determined prior to the commencement of construction in consultation with suppliers, landholders and the Wentworth Shire Council.

6.9.3 Impact Assessment

6.9.3.1 Surface Water

Construction and Decommissioning

During construction and decommissioning of the Project, soils would be subject to disturbance during the removal of vegetation, excavation works and stockpiling of materials, potentially leading to sediments and/or pollutants being entrained in rainfall runoff and entering local watercourses. Potential impacts to water quality associated with the development (and in the absence of suitable mitigation), include:

- Pollutants such as sediments, pH, oils/grease and other nutrients bound to sediment or dissolved form entering watercourses. The Project would aim as far as practicable to achieving the Barwon-Darling and Far Western – NSW Water Quality Objectives for protection of aquatic ecosystems.
- Works within or near a watercourse are a risk to downstream water quality due to the disturbance of the streambed and the mobilisation of sediments and pollutants. Work occurring outside of watercourses may also indirectly mobilise sediment and pollutants via the action of wind or rainfall. Construction of the Project would not require controlled discharges to watercourses.
- Mobilised high concentration nutrients (fertilisers) may trigger algal blooms that result in anoxic conditions within fish habitat. Mobilised heavy metals and contaminant concentration could result in degradation for aquatic habitats, irrigation and drinking water.
- Soils within the Project Area may contain residual herbicides/pesticides from historical or present-day farming practices.
- Loss of topsoil resources on the land and ongoing erosion reducing the area of usable land and/or damage to private property for host landholders.
- Water quality in farm dams is impacted and not suitable for stock watering, health or aquatic fauna and flora, as well as increased turbidity and decrease in water quality to downstream watercourses.

With the implementation of erosion and sediment control measures as well as appropriate measures to manage hazardous materials such as oils, fuels and other chemicals potential construction-related stormwater pollution impacts can be appropriately managed and are expected to be negligible.

During the construction phase, access throughout the Disturbance Footprint and the Project Area will require the crossing of minor streams, overland flow paths and local depressions. It is noted that minor streams occurring within the Project Area are identified as 1st and 2nd order Strahler streams, which are shown in **Figure 6.22**.

The rainfall-runoff model results have captured areas likely defined as minor drainage features (overland flow paths and inundated local depressions) that are not mapped with a Strahler Stream Order of one (1). All crossings of these minor steams and drainage features are referred to as a 'waterway crossing'. The requirement for specific measures to facilitate access across these areas will be subject to detailed design and verification of the stream at each location.

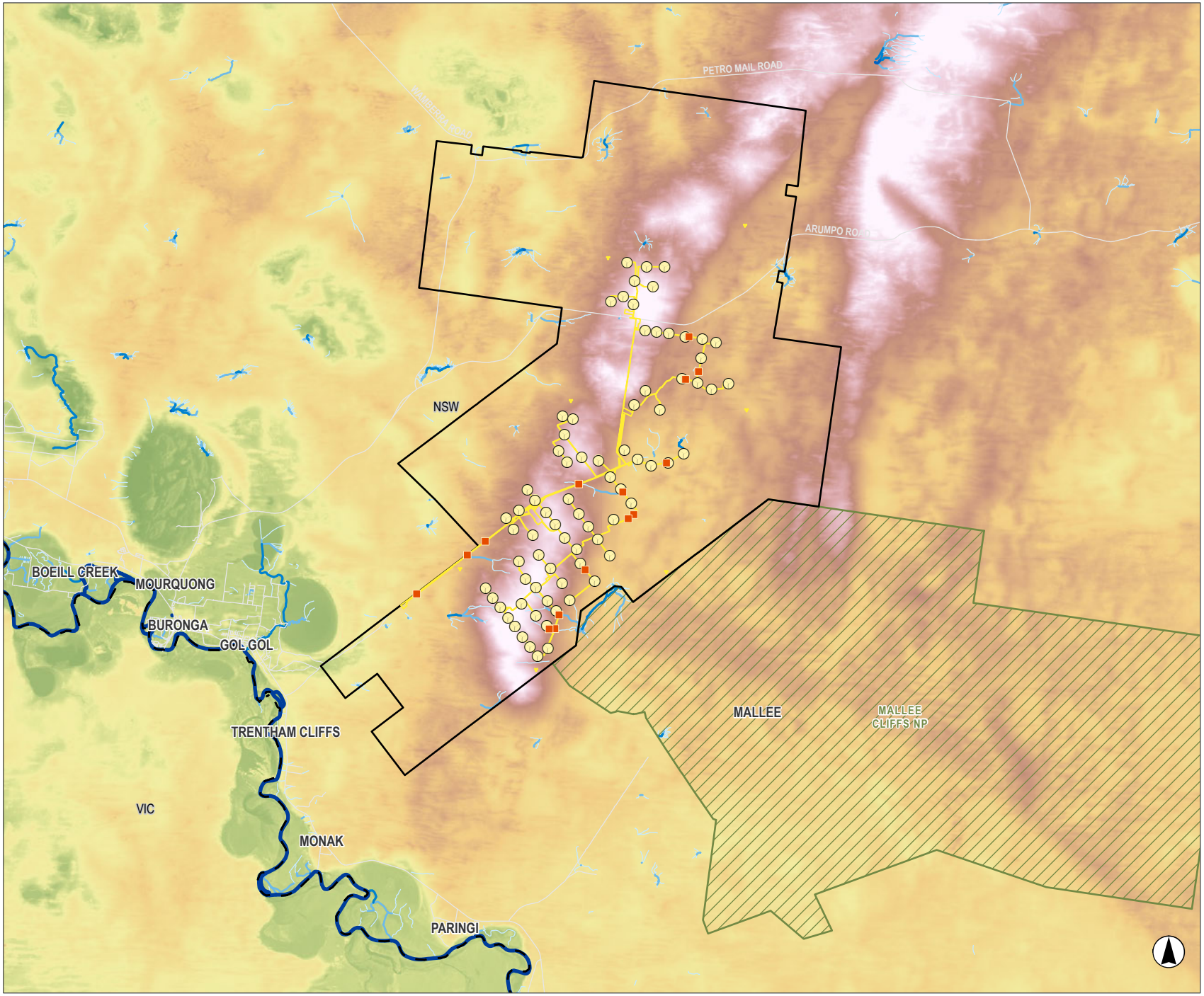
Fifteen potential waterway crossings have been identified within the Disturbance Footprint. The location of each is shown in **Figure 6.22**. Provided any waterway crossings required for the Project are designed and constructed in accordance with relevant guidelines and in consultation with DPI Fisheries, the proposed waterway crossings are not expected to result in any measurable impacts to stream health including water quality and fish passage.

Equipment and activities during decommissioning are expected to be similar to those required during the construction stage, however, decommissioning would occur over a shorter duration of time.

Based on the above, the same recommendations for environmental management measures during construction (refer to **Section 6.9.4**) should be implemented for decommissioning. With the implementation of measures outlined in **Section 6.9.4**, the potential surface water impacts would be adequately managed during the Project's construction and decommissioning phases.

FIGURE 6.22

Watercourses and Strahler Stream Order



Legend

- Project Boundary
- Disturbance Footprint
- Wind Turbine Generators
- Waterway Crossing Locations
- State Border
- NPWS Estates
- Road

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Greater

Ground level (m AHD)

Value

140.899

11.6748

0 5 10

Kilometres

Scale 1:300,000 at A4

GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Operations

During the operational phase the potential impacts on water quality relate to additional impervious area associated with permanent Project infrastructure. Due to the distribution of infrastructure throughout the Disturbance Footprint, the impacts of increased impervious areas are likely to have minimal noticeable impact. An additional measure to be considered during detailed design phase, is the identification of gullies that are already eroding and located within the Disturbance Footprint. Where practicable, the proposed works will rehabilitate these eroding gullies with a view to improving medium to long-term stormwater quality.

Other potential water quality impacts during the operational phase associated with the day-to-day activities during this phase would be limited to:

- Stormwater runoff from impervious surfaces resulting in localised erosion.
- Accidental spills or discharge through use and storage of chemicals such as fuel.

The potential for ongoing erosion post construction is considered to be low, provided appropriate rehabilitation of disturbed areas is undertaken and any areas identified as exhibiting signs of erosion above expected existing levels are addressed.

All hazardous materials and chemicals will be stored in accordance with relevant Australian standards and other state and local guidelines including the NSW EPA's Storing and Handling Liquids: Environmental Protection – Participants Handbook.

Based on the above, and with the implementation of management measures outlined in **Section 6.9.4**, surface water impacts during the operational phase are expected to be negligible.

6.9.3.2 Flooding

Modelling for the 10%, 1%, 0.5% and 0.2% AEP and PMF events has shown the Project Area to generally be of a low flood hazard with minimal risk of changes in internal or external waterway flows.

Internal access tracks cross streams of 1st and 2nd Strahler order, which become inundated during modelled flood events. Similarly, the Project Area boundary at Arumpo Road is also inundated during modelled flood events. Design of any waterway crossings for minor streams (1st and 2nd Strahler Order streams) and minor drainage features (overland flow paths and inundated local depressions) at access points to the Project Area and access tracks within the Disturbance Footprint will be undertaken at detailed design phase. Waterway crossings are shown in **Figure 6.22** and are to be designed in consideration of requirements of 'Guidelines for Controlled Activities on Waterfront Land', as relevant, to reduce construction impacts to any riparian corridors within the Disturbance Footprint.

The results of the 1% AEP flood hazard assessment have identified that the Project Area is classified as generally safe (H1). Isolated local depressions of H4 and H5 hazard exist where water accumulates/ponds. The peak modelled velocities were notably slow due to the flat topography below the ridge that traverses the Project Area and ponding within local depressions.

Peak stormwater discharges from the Disturbance Footprint for impervious areas may increase slightly through the creation of compacted gravel roads, WTG hardstands and some small operational buildings. However, potential impacts to drainage features and downstream watercourses are considered likely to be minimal due to the relative size of the Disturbance Footprint in relation to the size of the receiving catchments, and the distributed nature of minor impacts. The total impervious area represents less than 1% of the total Project Area and is thus negligible. Minimal changes to the land topography, impervious fraction and therefore runoff and groundwater infiltration are expected due to the nature and extent of proposed infrastructure. Subject to the management and mitigation measures outlined in **Section 6.9.4** being implemented the Project is unlikely to have any residual impacts on surface water.

6.9.3.3 Water Supply and Demand

The maximum water demand will be during construction and reduced volumes of water are likely to be required during the operational and decommissioning phase. As water will be obtained from existing mains and trucked to the site, no impacts to surface water availability in the vicinity of the Project are anticipated. Similarly, impacts on surface water availability to downstream water users are expected to be negligible.

6.9.3.4 Groundwater

Generally, impacts to groundwater resources are not expected given the groundwater table is unlikely to be intercepted during Project construction. Excavations associated with the Project are anticipated to be limited to 2.5 m below ground level (for WTG foundations). Further, the anticipated depth to groundwater (i.e. at least 31 m below ground level) within the Project Area means that any hydrocarbon/chemical spills are unlikely to infiltrate to the groundwater table, noting that appropriate spill management measures will be implemented during all phases of the Project.

Interactions with the groundwater table are not expected during the operational phase of the Project.

As such, no impacts to groundwater resources or GDEs are expected during the construction, decommissioning or operational phases of the Project.

6.9.4 Mitigation and Management Measures

The mitigation and management measures to be implemented as part of the Project to minimise impacts on water resources are:

- **WR01:** For the construction phase of the Project, measures are to be captured in the CEMP. This would include the preparation of a Construction Soil Water Management Plan (CSWMP) and Erosion and Sediment Control Plan (ESCP).
- **WR02:** For the operational phase of the Project, the measures outlined are to be documented in the Bush Fire and Emergency Management Operations Plan (BFEMOP) and in the Operational Environmental Management Plan (OEMP). The OEMP will address potentially adverse impacts on the receiving environment surface water quality and flooding during the operational phase. The BFEMOP will outline the flood hazards, evacuation and warning procedures to ensure the safety of all onsite.
- **WR03:** The CSWMP and ESCP should be amended and incorporated into a Decommissioning and Rehabilitation Management Plan.

- **WR04:** Maintaining the natural state of the drainage flow paths whenever possible. Internal access tracks, where crossing minor streams and drainage features, will be designed for 10% AEP design flow and may include compacted rock causeways to provide low maintenance access with limited impact on the minor streams, drainage features or culvert structures.

- **WR05:** The design and construction of cable crossings and all internal access tracks crossing minor streams and drainage features within the proposed Disturbance Footprint should be generally in accordance with the Guidelines for controlled activities on waterfront land – riparian corridors (Guidelines for watercourse crossings on waterfront land and Guidelines for laying pipes and cables in watercourses on waterfront land).

- **WR06:** A CSWMP will be prepared to outline measures to manage soil and water impacts associated with the construction and decommissioning works.

- **WR07:** Creation of catch/diversion drains and sediment fences at the downstream boundary of construction activities where practicable to support containment of sediment-laden runoff.

- **WR08:** Erosion and sediment control measures will be implemented and maintained at all work sites in accordance with the principles and requirements in *Managing Urban Stormwater – Soils and Construction, Volume 1 and Volume 2D* of Blue Book.

- **WR09:** Measures to minimise/manage erosion and sediment transport both within the construction footprint and offsite including requirements for the preparation of (ESCP) for all progressive stages of construction and decommissioning.

- **WR10:** The best practice principles for stormwater and sediment control outlined in the Managing Urban Stormwater Blue Book guidelines will be incorporated into the design, construction and operation phases as part of a SWMP and ESCP.

- **WR11:** BESS components will be located on hardstand areas and will be aligned with local overland flow paths to prevent flows being redirected which could lead to localised increased in flood level and higher risk of scour and erosion.

- **WR13:** Maintenance of stormwater infrastructure including any stormwater treatment devices (e.g. bioretention basins and culverts (e.g. clearing debris).

- **WR14:** Maintenance of suitable ground cover and grassed table drains near access tracks to minimise the potential for erosion and export of sediment.

- **WR15:** Flooding measures:

    - During construction design flood risk will be considered and include, as a minimum, a review of temporary infrastructure layouts and arrangements to a) avoid and/or minimise obstruction of overland flow paths, b) limit the extent of flow diversion, c) include stormwater management controls to avoid/minimise the impact of flooding, and d) consider measures to mitigate alterations to local runoff conditions due to on-site works and activities.

    - During construction, design stockpiles would be located outside areas anticipated to flood and experience velocities above 0.5 m/s and where practicable located outside the mapped 10% AEP flood extents.

- Based on the Project design utilised for this assessment, temporary construction compounds, laydown areas, concrete batching plants and the TWA Facility have been located away from areas where depths of flow are deeper than 250 mm during the modelled 1% AEP event. This mitigation will persist if any future design revisions occur.

- Flood emergency management measures for the construction phase would be prepared and included in applicable environmental and safety management documentation i.e. the CEMP, CSWMP and ESCP noted above, as relevant. As a minimum this would include identification of flood related risks and their management, and processes to monitor and communicate weather warnings. In this regard, construction staff will have access to the following facilities for early severe weather warnings: The Bureau of Meteorology's "MetEye" and The Bureau of Meteorology's "RSS feeds". Radio and Bureau of Meteorology information will be reviewed frequently for potential major storm events and to ensure on-site personnel and visitors are aware of potential flooding events and road closures.

- Flood emergency management measures for the operational phase would be prepared and included in applicable environmental and safety management documentation i.e. the BFEMOP and OEMP noted above, as relevant. In this regard, operations staff will have access to the following facilities for early severe weather warnings: The Bureau of Meteorology's "MetEye" and The Bureau of Meteorology's "RSS feeds". Radio and Bureau of Meteorology information will be reviewed frequently for potential major storm events and to ensure on-site personnel and visitors are aware of potential flooding events and road closures.

- Evacuation routes will be designed during the detailed design phase and will consider zones of flood hazard. These routes would be included in applicable environmental and safety management documentation i.e. the BFEMOP and OEMP noted above, as relevant.

- Flood behaviour as a result of the Project would be confirmed during detailed design, inclusive of climate change. In this regard foundations for the WTGs and transmission lines, their footings are located away from areas of erosive behaviour such as flood depths of 0.3 m and flow velocities greater than 1.5 m/s. Detailed design of the Project will consider the results of the 1% AEP scenario. Based on the Project design utilised for this assessment, this mitigation is achieved and should persist if any future design revisions occur.

- **WR16:** Stream stability, riparian health and fish passage measures:

  - Infrastructure with the potential to cause pollution to watercourses in the event of flooding, such as inverters and battery storage, will be located with a minimum 300 mm freeboard above the maximum 1% AEP flood level. Given the shallow depths across the Project Area, raising these small fill pads is highly unlikely to result in any adverse impacts offsite.

  - No sensitive infrastructure (e.g., substation, BESS) will be placed within 20 m of any Strahler 3 or above order streams. Sensitive infrastructure will be placed outside the 0.2% AEP flood extent with a minimum 500 mm freeboard to the 1% AEP flood level. Based on the Project design utilised for this assessment, this mitigation is achieved and should persist if any future design revisions occur.

  - Controls for receiving watercourses which may include designation of 'no go' zones for construction plant and equipment.

- **WR17:** A water sourcing and monitoring strategy to manage potential availability impacts on downstream water users and ensure compliance with legislation relating to water extraction will be prepared as part of the CEMP.
- **WR18:** Waterway crossings where required are to achieve flood immunity requirements as follows:
    - Adequately sized pipe drainage at the minor stream or drainage feature are to allow for the conveyance of overland flow under and/or across the access tracks.
    - Adequate erosion protection across and downstream of the access track crossings should be provided.
    - An energy dissipator should be included at the pipe outlet or downstream of the minor stream or drainage feature to prevent potential erosion undermining the pipe/culvert and batters.
    - Planned works are to be scheduled for forecasted dry weather periods.

6.10 Soils, Land and Agriculture

The SEARs require:

- A detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints.
- An assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including:
    - the impact of the development on Mallee Cliffs National Park in accordance with the guidelines for Development adjacent to National Parks and Wildlife Services Lands (DPIE, 2020)
    - consideration of agricultural land, biosecurity, irrigated lands, travelling stock routes, flood prone land, Crown lands, mining, quarries, mineral or petroleum rights
    - a soil survey to determine the soil characteristics and consider the potential for erosion to occur
    - a cumulative impact assessment of nearby developments.
- An assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including:
    - consideration of the zoning provisions applying to the land, including subdivision (if required)
    - completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide
    - assessment of impact on agricultural resources and agricultural production on the site and region.

The SLAIA was also prepared in accordance with:

- DPE's Large-Scale Solar Energy Guideline (2022).
- Land and Soil Capability Assessment Scheme (OEH, 2012).

The SEARs require specific consideration of the Mallee Cliffs National Park across a range of matters beyond those directly relevant to Soil, Land and Agriculture Impact Assessment (SLAIA). Consideration of potential key issues (visual, biodiversity and bushfire) is provided within the Landscape and Visual Impact Assessment (Appendix 9), the Biodiversity Development Assessment Report (Appendix 6) and Bush Fire Hazard Assessment (refer Appendix 17).

Additional consideration of potential impacts to Mallee Cliffs National Park were also requested within the agency advice received from BCS and NPWS. A consolidated summary of potential impacts of the Project to the Mallee Cliffs National Park, with regard to the NSW National Parks & Wildlife Service – Developments adjacent to National Parks and Wildlife Service lands – Guidelines for consent and planning authorities (NPWS, 2020), is provided in Section 7.3.5.

A Soil, Land Use and Agriculture Impact Assessment (SLAIA) (see **Appendix 14**) including a detailed Land Use Conflict Risk Analysis (LUCRA) was prepared for the Project by Minesoils Pty Ltd (Minesoils, 2024) to assess potential soils, land use and agricultural impacts associated with the Project. This section outlines the key findings of the SLAIA and the LUCRA, the key land use risks of the Project and proposed mitigation and management measures.

6.10.1 Existing Environment

6.10.1.1 Regional Context

The Project Area lies on Mallee country and sits between the Murray River to the south and Willandra Lakes region to the north. The surrounding locality is characterised by rural land uses and native bushland. The Project Area and broader locality have historically been utilised for agricultural practices primarily consisting of livestock grazing, and cropping, with evidence of broad native vegetation modification resulting from extensive clearing and agricultural land use.

The Project Area is located primarily on land zoned as RU1 Primary Production, with some pockets of C2 Environmental Conservation within the Wentworth LEP (2011).

The Project Area is located within the Lower Murray agricultural sub-region which covers the land around the lower Murrumbidgee River, lower Murray River and lower reaches of the Darling River typified by a generally dry climate, flat floodplain topography and old soils. Agriculture in the Lower Murray landscape is conducted over the semi-arid grass/shrub-land known as ‘rangelands’. The landscape supports grazing systems of low stocking rates over large areas. The vegetation and landscape of Lower Murray have been substantially modified through the expansion of pastoralism and artificial water sources derived from irrigation, and impacts of feral animals, in particular goats.

Approximately 1,998,225 ha of land is subject to agricultural activity within the Wentworth Shire LGA as of the last agricultural census of 2020–2021 (ABS, 2022a). A breakdown of the area of land used for different types of agriculture is presented in **Table 6.32**, which shows grazing of livestock is the dominant agricultural land use within the LGA, accounting for 93% of agricultural land use.

Table 6.32 Agricultural Land Use – Wentworth Shire LGA by Type (2020–2021)

Agricultural Land Use	Wentworth Shire LGA ha (%)
Grazing	1,854,227 (93%)
Cropping	140,372 (7%)
Forestry	2,311 (<1%)
Other	1,344 (<1%)
Total	**1,998,255 (100%)**

Broadacre cropping (consisting of cereals and other broadacre crops) is the dominant agricultural land use within the Project Area although broadacre cropping covers just 4% of the agricultural land within the LGA. Across the LGA, broadacre cropping is only grown when seasonal conditions are favourable. Conversely, livestock (sheep and goats) operations are carried out across Wentworth LGA and is the most widespread agricultural land use in the Lower Murray sub region. Rotational grazing is utilised due to constrained water supplies and stock handling facilities resulting in a low intensity of stocking for the region.

The region has extensive commercial links to major trade centres including ACT, Victoria, Adelaide and Sydney. The Swan Hill Livestock Exchange located approximately 120 km south east of the Project Area, is a major regional livestock exchange servicing north west Victoria and south western NSW. The Ouyen Livestock Exchange is a smaller sheep saleyard located approximately 100 km south of the Project Area. In proximity to the Project Area, the major agricultural service centre of Mildura (approximately 10 km south west), allows access to businesses providing agricultural equipment and supplies, including animal fencing, animal vaccinations, livestock ID, stock supplements, seed, fertiliser and crop protection.

6.10.1.2 Project Area Characteristics

The Project Area is used for a combination of cropping and livestock grazing. Extensively cleared land within the Project Area, occurring over approximately 21,000 ha, or approximately 37% of the overall Project Area, is primarily used for non-irrigated cropping and produces several grains and pulse crops such as wheat, beans and chickpeas. The remaining partially cleared areas within the Project Area are used, or have previously been used, for livestock grazing on low stocking rates. The Project Area is primarily located along a low elevation ridge line, with a minimum elevation of approximately 40 m AHD and maximum elevation of around 130 m AHD.

The Project occurs on Mallee lands, a biophysical landform type characterised by multi-stemmed eucalypts, which occurs widespread across southern Australia, generally on wind-formed (aeolian) landforms, with sandy soils. In general, Mallee soils erode readily once stripped of vegetation and are low in fertility. The soils on the dunes tend to be sands, whereas in the swales and plains calcareous red or brown earths are more common.

The surficial geology of the locality consists of the Woorinen Formation, which is characterised by unconsolidated red-brown medium to fine silty sand, red calcareous silty clay, sandy clay, clay pellet aggregates; which form extensive dune fields with subdued crests and flakes separated by swales and sand plains.

Soil Units

A soil survey identified two (2) dominant soil mapping units within the Project Area:

- **Soil Unit 1: Vertosols – Calcarosols – covering approximately 397 ha:** this soil unit is characterised by sand and sandy loam topsoils with apedal or weak structure (resulting from cropping machinery disturbance) overlying sandy loam and clay loam subsoils with weak structure. pH ranges from mildly to very strongly alkaline, often increasing with depth, and salinity levels range from non-saline at the surface to moderately saline at depth. Topsoils are consistently non-sodic in the upper profile and trend to sodic at depth. Soft, finely divided carbonate is present between 10 and 30%. These soils sporadically contain hard calcrete fragments calcium carbonate nodules and have negligible coarse fragment presence. Soils are well drained, highly permeable and are deep.

- **Soil Unit 2: Dermosols – covering approximately 48 ha:** this soil unit is characterised by apedal or weak structured (resulting from cropping machinery disturbance) sand topsoils with overlying sandy loam subsoils with weak to no structural development. pH ranges from mildly to very strongly alkaline, often increasing with depth, and salinity levels range from non-saline at the surface to slightly saline at depth. Due to low clay content, these soils are not considered sodic. Calcium carbonate occurs within the sub soil. Soils are rapidly drained, highly permeable and are deep.

Laboratory testing results, including sodicity and dispersibility, indicate there is moderate to high potential risk for soil dispersion where soil impacts occur. Higher impact activities such as where earthworks are necessary for construction of sub-station pads or site facilities are very likely to result in increased dispersive behaviour when soil is remoulded, compacted or pulverised. However, due to the nature of the landform, the risk of erosion and sedimentation impacts as a result of the Project remains a low.

Soil Erodibility

The SLAIA indicates that there is a wind erosion and sedimentation risk associated with the topsoils currently present in the Project Area and its surrounds, due to the nature of the landscape and exposure characteristics. The representative laboratory tested soils indicate high levels of sodicity in Soil Unit 1 (Calcarosols). While sodic soils are generally dispersive, it is important to acknowledge that not all sodic soils disperse, and that not all dispersive soils are sodic. However, given the ranges in salinity of the topsoils tested within the Project Area, all sodic soils should be considered dispersive.

Based on these results, there is a moderate potential risk for dispersion where soils are disturbed by Project construction works and activities within the Project Area. Higher impact activities such as where earthworks are necessary for construction of sub-station pads or site facilities are very likely to result in increased dispersive behaviour when soil is remoulded, compacted or pulverised.

In addition, due to very gently undulating nature of the landscape and low rainfall, the risk of soil erosion from surface water flows is generally low. However, the aeolian processes observed to be operational within the region, along with the chemical instability of the laboratory tested soils, indicate an erosion risk that must be considered and appropriately controlled by Project mitigation measures. Wind erosion has the potential to be exacerbated where soils are disturbed as a result of the Project.

Acid Sulphate Soils

The Project Area does not contain any of the five (5) classes on the NSW Acid Sulfate Soil Planning Map. Assessing land elevation and distance from the coast, in conjunction with existing Acid Sulphate Soil mapping for NSW, the potential risk of Acid Sulphate Soil is considered very low. Further, there was no evidence of Acid Sulphate Soil indicators such as soil gleying, odour, marine sediments and organic materials recorded as part of the soils survey.

Land Capability

The Project Area was also subject to a site verification assessment of land and soil capability (LSC), in accordance with the LSC Guideline. Land capability, as detailed in LSC Scheme, is the inherent physical capacity of the land to sustain a range of land uses and management practices in the long term without degradation to soil, land, air and water resources. Failure to manage land in accordance with its capability risks degradation of resources both on- and off-site, leading to a decline in natural ecosystem values, agricultural productivity, and infrastructure functionality.

Following the soil survey, the Project Area was found to contain three (3) LSC classes:

- **LSC class 4: moderate capability land – covering 258 ha:** Class 4 land has very high limitations for high-impact land uses. Land use restricted to low-impact land uses such as grazing, forestry and nature conservation. Careful management of limitations is required to prevent severe land and environmental degradation. The key limitation of this class within the Project Area is wind erosion.
- **LSC class 6: low capability land – covering 150 ha:** Class 6 land has very high limitations for high-impact land uses. Land use restricted to low-impact land uses such as grazing, forestry and nature conservation. Careful management of limitations is required to prevent severe land and environmental degradation. The key limitations of this class within the Project Area are soil structure decline, based on moderately to strongly sodic clay topsoils, and salinity, based on a range of high to extremely high ECe levels in all tested profiles.
- **LSC class 7: very low capability land – covering 37 ha:** Class 7 land has severe limitations that restrict most land uses and generally cannot be overcome. On-site and offsite impacts of land management practices can be extremely severe if limitations not managed. There should be minimal disturbance of native vegetation. The key limitation of this class within the Project Area is soil structure decline, based on strongly sodic clay topsoils.

Based on the soil survey the LSC mapping for the Project has been verified as shown in **Figure 6.23** below.

State Significant Agricultural Land

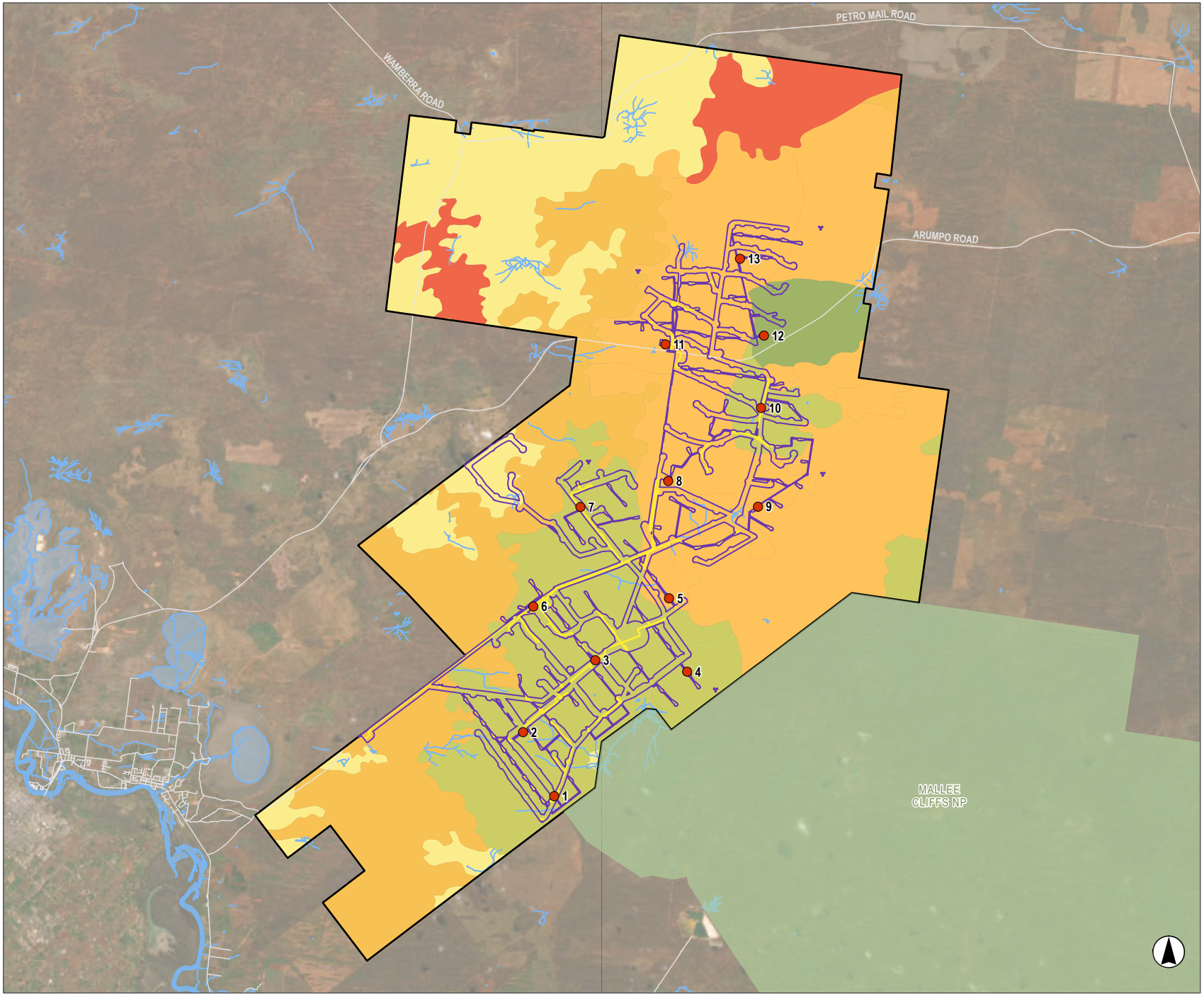
The NSW Department of Primary Industries is undertaking a mapping program to identify State Significant Agricultural Land (SSAL). A map of SSAL is an essential component of agricultural land use planning, enabling clearer local planning with informed prioritisation of future land uses. At this time the mapping is in an early draft stage only.

Based on the draft SSAL map there is no SSAL mapped within the Project Area. The nearest SSAL is approximately 5.7 km south of the nearest Project Infrastructure (Switchyard) and adjacent to the southern Project Area boundary. Furthermore, there is no BSAL mapped within the Project. The nearest BSAL is located approximately 550 km east of the site near Wagga Wagga.

The SSAL mapping with respect to the Project Area is shown in **Figure 6.24** below.

FIGURE 6.23

Verified Land and Soil Capability



Legend

- Project Boundary
- Disturbance Footprint
- Biodiversity Study Area
- NPWS Estates
- Road
- Watercourse
- Waterbody

Verified land and Soil Capability

- 3 - Moderate limitations
- 4 - Moderate to severe limitations
- 5 - Severe limitations
- 6 - Very severe limitations
- 7 - Extremely severe limitations
- 8 - Extreme limitations
- Soil Assessment Location

0 5 10
Kilometres

Scale 1:225,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

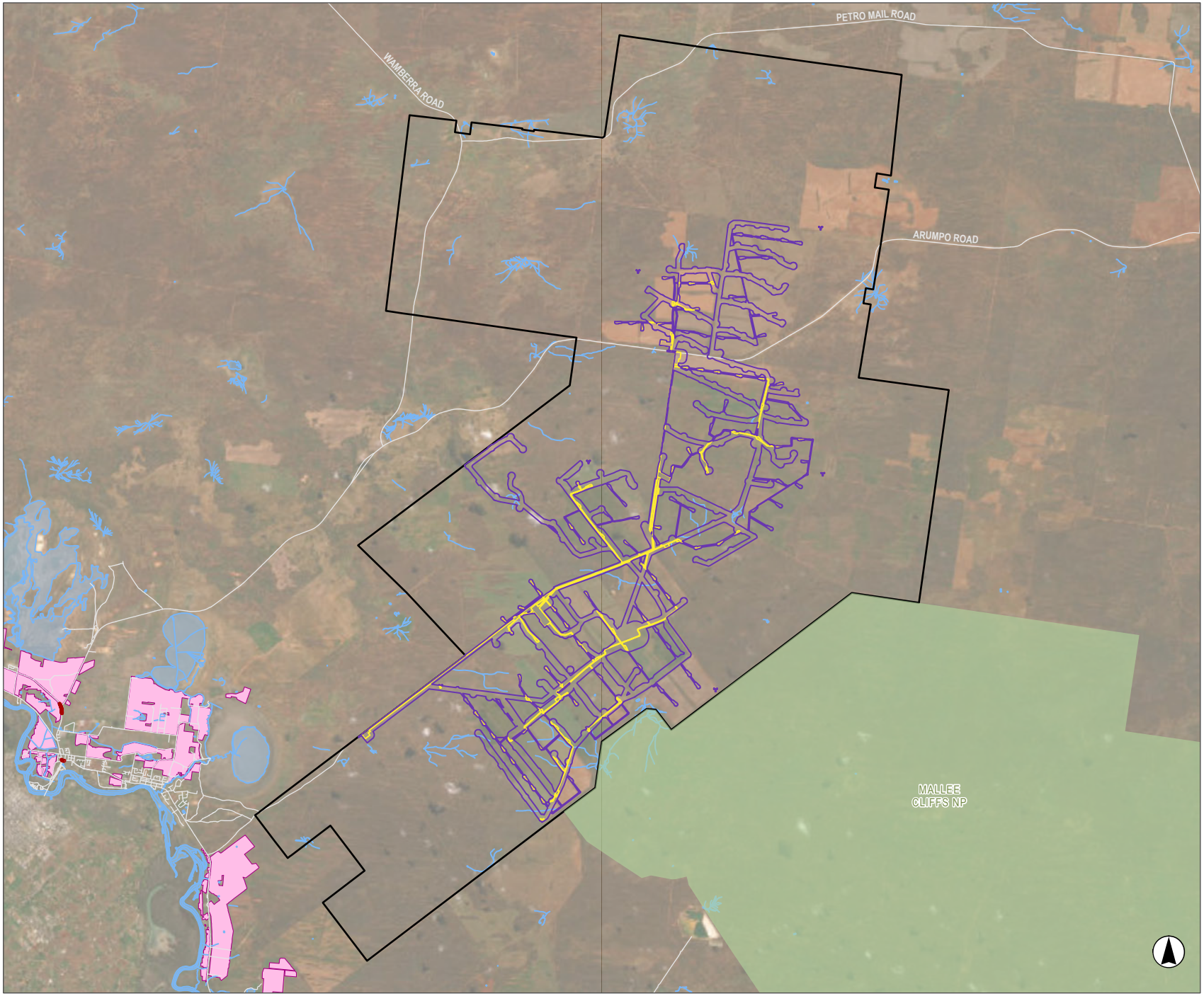


FIGURE 6.24

Regionally Mapped Draft State Significant Agricultural Land

Legend

- Project Boundary
- Disturbance Footprint
- Biodiversity Study Area
- Off-site Road Works
- Draft State Significant Agricultural Land
- NPWS Estates
- Road
- Watercourse
- Waterbody

0 5 10
Kilometres

Scale 1:225,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Off-site Road Works

The Project requires off-site road works as detailed in **Section 3.5.9**, involving upgrades to the proposed local transport route and establishment of site access points to facilitate delivery of WTG components to the Project Area as required. These impacts will not require heavy disturbance and will not impact any agricultural land as they will take place on previously disturbed land.

6.10.2 Methodology

In lieu of guidelines that relate to the assessment of soil, land and agriculture for wind farm projects, the SLAIA generally been undertaken in accordance with the Large-Scale Solar Energy Guidelines (LSSE Guidelines) (NSW DPIE, 2022) which includes requirements to undertake a soil survey and verify land and soil capability (LSC) in accordance with Land and Soil Capability Assessment Scheme (LSC Scheme) (EOH 2012).

Minesoils undertook a soil and land resource survey to inform the following tasks to be undertaken throughout the assessment process:

- Soil assessment, identifying soil units, soil qualities and risks including erosion, acid sulphate soils risk and salinity.
- LSC verification.
- Recommendation of management and mitigation measures for minimising soil erosion during construction, operations and decommissioning.
- Soil survey and mapping was undertaken for the full Project Area, targeting the Disturbance Footprint. A total of 13 sites were assessed, 10 of which were located within the Disturbance Footprint resulting in a survey intensity 0f 1 < 50,000 survey intensity (1 in less than 50 ha within the proposed Disturbance Footprint). This level of survey requires collection of landform pattern and element information, soil profile data, and taxonomic parameters to distinguish soil units according to the Australian Soil Classification criteria, within the Project Area. The soil survey plan and methodology was developed in consultation with DPI Agriculture (refer to Section 5.5).

Soil samples were collected at each of the assessment site's soil horizons to a depth of 1 m, with a total of 39 samples collected. Minesoils chose 15 representative samples that were then subject to laboratory testing. The laboratory testing suite for these sites is detailed in **Appendix 14**. Full soil profile descriptions and laboratory certificates of analysis are included in Appendix 3 of **Appendix 14**.

Given the location of off-site road works and extensive existing disturbance at each location, a preliminary desktop assessment determined that further assessment was not required.

6.10.3 Land Use Conflict Risk Assessment

The Land Use Conflict Risk Assessment (LUCRA) (NSW Department of Primary Industries, 2011) is a system to identify and assess the potential for land use conflict to occur between neighbouring land uses. It helps land managers and consent authorities assess the possibility for and potential level of future land use conflict.

The SLAIA includes a LUCRA undertaken with due regard to and in accordance with the NSW Government - Department of Primary Industry's 'Land Use Conflict Risk Assessment Guide'. In total, 26 potential conflicts were considered as part of the LUCRA. Each potential conflict between the Project and adjacent land use, or wider locality, was assessed and given a risk ranking based on probability and consequence.

The full LUCRA including its methodology, information relating to the risks and potential conflicts (including risk ranking matrix) and then applicable risk reduction controls and performance targets are appended to the SLAIA (refer to **Appendix 14**). Of the 26 potential conflicts assessed, two (2) were ranked as high and with (8) as medium conflicts. These high and medium potential conflicts are summarised in **Table 6.33** below.

Table 6.33 LUCRA High and Moderate Risk Items and Risk Controls Summary

Conflict Category	Potential Conflict	Risk Controls	Conflict Risk
Project infrastructure	Aerial farm service providers in the locality may be concerned that wind turbine structures and associated turbulence in the Project Area may pose safety risk.	The assessment of impacts related to agricultural aviation has been undertaken via an Aviation Impact Assessment (AIA) prepared as part of the EIS. The assessment determined that WTGs are generally not a safety concern to aerial agricultural operators, However WMTs remains primary safety concern to aerial agricultural operators, who have expressed a general desire for these towers to be more visible. Mitigation measures and safety protocols are provided in the AIA.	High
Cumulative impacts	Public Authorities and the local community may have concerns regarding the potential for cumulative impacts arising from the proximity of nearby renewable developments in the South-West Renewable Energy Zone.	An assessment of potential cumulative impacts has been undertaken as part of the EIS. Appropriate mitigation measures (where available) are specified in the EIS to minimise the potential for cumulative impacts to occur at or near the Project Area. Anticipated impacts are presented in the EIS.	High
Biodiversity	Stakeholders may be concerned about potential impacts to biodiversity within the site and locality, including the adjacent Mallee Cliffs National Park, from construction and operational activities.	The assessment of impacts to biodiversity has been undertaken via a Biodiversity Development Assessment Report (BDAR). Appropriate mitigation measures are specified within the BDAR, this assessment and the wider EIS to minimise the risk for impacts on biodiversity within the site and locality. Implement all measures specified in management plans identified in the EIS and/or consent conditions (if approved). Ongoing consultation with stakeholders will identify and address concerns if they arise.	Moderate

Conflict Category	Potential Conflict	Risk Controls	Conflict Risk
Temporary worker accommodation	Temporary workers accommodation occupants may be concerned about exposure to fertilisers, pesticides and other agricultural chemical or products from adjacent and nearby agricultural operations.	Project design, including the placement of the temporary workers accommodation, is expected to reduce potential impacts. Host landowners to restrict fertiliser, pesticide and other chemical application in close proximity to the accommodation camp and to administer elsewhere in a way that reduces potential spray drift. The Construction Management Plan will include details of measures agreed between the Project and host landowners to restrict agricultural activities which may disrupt Project construction and construction workforce. Ongoing consultation between host landowners and construction camp management will identify and address concerns if they arise.	Moderate
Project infrastructure	Neighbouring landholders may be concerned that aerial spraying undertaken on properties within the locality may be limited by wind turbine structures and associated turbulence in the Project Area.	Aerial protocols will provide safe boundaries and clear rules for aerial farm services to operate in the vicinity of the windfarm. This will minimise the inconvenience to farmers and maximise efficiency of spraying activity. The Project will develop an agreed set of protocols with the local aerial applicators for all relevant operational issues, including action by the wind farm operator to stop blades in a safe position during application operations as required.	Moderate
Project infrastructure	Stakeholders may be concerned about potential impacts to biodiversity including migratory wetland birds from placing wind turbines in proximity of seasonal lakes.	The assessment of impacts to biodiversity has been undertaken via a BDAR. Appropriate mitigation measures are specified within the BDAR and this assessment to minimise the risk for impacts on biodiversity within the site and locality. Implement all measures specified in management plans identified in the EIS and/or consent conditions (if approved). Ongoing consultation with stakeholders will identify and address concerns if they arise.	Moderate
Visual amenity	Stakeholders in the locality who wish to maintain views of the existing landscape may be concerned about the change in visual amenity resulting from the wind farm, such as from Arumpo Road, which is frequented by tourists travelling to Mungo National Park.	The assessment of potential visual impacts from - public and private (dwelling) locations has been undertaken as part of a Landscape and Visual Impact Assessment (LVIA) within the EIS. Risk reductions controls consist of the following: Uniformity in the colour, design, rotational speed, height, and rotor diameter. The use of simple muted colours and non-reflective materials to reduce distant visibility and avoid drawing the eye. Blades, nacelle, and tower to appear as the same colour.	Moderate

Conflict Category	Potential Conflict	Risk Controls	Conflict Risk
		Avoidance of unnecessary lighting, signage, logos etc. Maintain vegetation screening.	
Property devaluation	Landholders in the locality may be concerned about potential devaluation of properties due to proximity to wind farm infrastructure.	Property values are influenced by a variety of factors including amenity. The potential for the Project to impact upon neighbours and the locality have been addressed for various aspects within the EIS. To minimise impacts upon neighbouring landowners the design of the Project has been refined throughout development of the EIS. No significant impacts to amenity are expected as a result of the Project.	Moderate
Biosecurity	Land users in the locality may be concerned about biosecurity breaches including weed, plant pest, plant disease or pest animal introduction and/or spread, as a result of the Project.	The assessment of impacts to biodiversity has been undertaken via a BDAR. Consideration of the potential for pest species to impact agriculture has been included in this assessment. Appropriate mitigation measures are specified within the BDAR and this assessment to minimise the risk for weeds and pests to spread throughout the site and onto neighbouring land. Ongoing consultation with stakeholders will identify and address concerns if they arise. Implement all measures specified in management plans identified in the EIS and/or consent conditions (if approved).	Moderate
Mineral Exploration Licence and Mineral Assessment Leases	The holders of the existing Minerals Exploration Licence (EL9459) and of Minerals Assessment Lease (AL24) within the Project Area, and two Minerals Assessment Leases (AL26 and AL27) to the immediate east of the Project Area may be concerned that the Project obstructs mineral exploration and assessment activities.	The holders of Minerals Exploration Licences and Assessment Leases within the Project Area and to the east of the Project area have been engaged regarding the potential impacts of the Project on their mineral exploration and environmental assessment activities. Ongoing consultation with the holders of Minerals Exploration Licences and Assessment Leases will identify and address concerns if they arise.	Moderate

6.10.4 Impact Assessment

The impacts on soils, land use and agriculture as a result of the Project are determined to be generally minimal, temporary and limited to the Disturbance Footprint. The potential impacts can be summarised across five (5) risk areas. The key assessment findings for each risk area are summarised below.

- **Changes in the amount of land used for agriculture:** Temporary removal of up to 444.69 ha of land within the Project Area from agricultural land use for the duration of the Project which represents approximately 3% of land used for cropping within the Project Area, and approximately 1% of the overall agricultural land use areas of the Project Area.
- **Changes to agricultural productivity and agricultural enterprises:** Temporary removal of potential agricultural primary productivity to the estimated value of up to $154,415 per year for the duration of the Project.
- The Project will not negatively impact any existing agricultural enterprise outside of the Project Area
- The Project will have negligible impact on the viability of local and regional agricultural services and employment. There will be negligible impacts experienced by employees or contracting services currently engaged (i.e., stock mustering services).
- There will be no impact to critical mass thresholds of agricultural enterprises needed to attract and maintain investment in agricultural industries and infrastructure.
- Changes to agricultural resources:
    - Soils – Temporary impacts on soil resources and no direct or indirect impacts to soil resources of the Project locality outside the Project Area.
    - Land and Soil Capability – Due to the nature of the Project which will require only localised and sporadic landform modification including soil stripping (for excavation works) impacts on LSC are expected to be negligible.
    - Water – Minimal impact on water resources and temporary impacts to surface water.
    - Erosion and Sedimentation – temporary potential risk for dispersion where soils are disturbed by Project construction works and activities. Direct and indirect erosion and sedimentation risks would be limited and manageable.
    - Agricultural infrastructure – negligible impact on local and regional agricultural.
- Other potential impacts on agriculture are expected to be minimal with the implementation of appropriate mitigation measures including:
    - Agricultural aviation impacts of the Project are not likely to have consequences on agricultural enterprises within the Project locality.
    - Biosecurity risks as a result the Project are low and impacts to agricultural resources and enterprises within the region are unlikely to be experienced.
    - Construction and decommissioning activities would have a negligible impact on local air quality and localised vehicle emissions and generation of dust from vehicles travelling along unsealed internal access tracks are unlikely to affect agriculture.
    - The traffic impacts of the Project are not likely to have consequences on agricultural enterprises within the Project locality.

- Livestock and other agricultural resources are unlikely to be impacted by construction, operational and decommissioning noise due to the Project.
- There are not expected to be any impacts related to the proposed off-site road works.

6.10.4.1 Cumulative Impacts

- In the context of agriculture, increased cumulative impacts including changes to land used for agriculture, localised productivity, secondary productivity and some agricultural support services are likely to be experienced. Given the nature and scale of the established agricultural industries within the region that interface with renewable energy projects (that is, predominantly livestock grazing and some broadacre cropping), as well as the generally low quality agricultural resources and low stocking rates for the region, significant impacts to regional agricultural businesses, industry critical mass thresholds and regional agricultural infrastructure are unlikely to occur in the foreseeable future.
- Given the majority of proposed development in the local and regional context of the Project are renewable developments, the cumulative impact on agriculture for the region is considered to be low given changes to agricultural land use and agricultural productivity are anticipated to be negligible to minor for each respective wind and solar Project.

At the scale of the enterprises operating within the Project Area, the minor anticipated impacts are considered offset as the host landholder/s would be financially compensated. It is anticipated that by implementing mitigation measures during Project construction and operation, and with effective decommissioning and rehabilitation at the end of Project life, the Project will have minor impact on the soils and agricultural productivity of the Project Area, and negligible impact on agriculture industries operating within the wider region.

As noted in **Section 6.10** additional consideration of potential impacts to Mallee Cliffs National Park were requested and is provided in **Section 7.3.5**.

6.10.4.2 Decommissioning and Rehabilitation

The SLAIA includes a Decommissioning and Rehabilitation Strategy (DRS) (refer to Appendix 4 of **Appendix 14**) for the Project.

At the end of the Project's 30 year lifespan, three (3) options will be considered:

- Continued use of the Project Area as a wind farm and battery storage utilising the existing WTGs and other facilities (subject to contractual agreement with the host landholders, required planning approvals and condition of equipment).
- Replace the WTGs and BESS with technology current at that time and continue Project operation for a further term (subject to contractual agreement with the host landholders and required planning approvals).
- Decommission the Project and remove the WTGs and other infrastructure.

Any land disturbed during the construction, operation or decommissioning of the Project will be rehabilitated, except for any parts which have been agreed with the landowners and the relevant network service providers to remain in situ including off-site road works.

For the Project, all above- ground structures not required for the ongoing agricultural use of the land or by network service providers, will be removed and the land rehabilitated so that it can return to agricultural use. Internal roads, if not required for ongoing farming purposes or fire access, would be removed. Access gates, if not required for farming purposes, would also be removed. Host landholders will be involved in any discussion regarding the removal or hand-over of infrastructure on their properties.

Below ground infrastructure, including WTG foundations, hardstands and some cabling may be left in situ and covered in clean fill material to a suitable depth, with the land returned to approximate prior condition and use as far as practicable.

The decommissioning phase would require similar equipment and activities to the construction phase including mobile and heavy equipment (e.g. cranes, earthworks machinery, compressor and rock crusher). Prior to the commencement of decommissioning activities, the Project would prepare a detailed decommissioning plan in consultation with DPHI and Wentworth Shire Council to guide the implementation of the decommissioning works.

Further rehabilitation processes will be identified in a detailed Decommissioning and Rehabilitation Management Plan (DRP) to meet the specific rehabilitation criteria identified in the development consent (if granted).

- Any areas excavated during the decommissioning process will be refilled with clean, compatible sub-grade material, compacted and contoured to blend as seamlessly as practicable with the natural landform. Subsequently, topsoil will be reinstated to mirror the density and consistency of the neighbouring terrain.
- Areas which have been compacted by heavy machinery during decommissioning will be restored through ripping and topsoil replenishment and graded to mimic the slope and contour of the natural landscape.
- Areas designated for pasture restoration will be seeded with an agreed-upon mix selected in consultation with landowners and the appropriate regulatory authority, aimed at meeting the approved final land use objectives of the Project.
- To facilitate plant growth, all revegetated areas will be fertilized during seeding and maintained until sufficient coverage is achieved.
- Erosion control measures will be implemented during the decommissioning and rehabilitation phases. This may include but is not limited to:
    - Fencing around newly rehabilitated areas to prevent livestock and pest access.
    - Mulching around newly established vegetated areas.
    - Adequate levelling and contouring of the rehabilitated areas.
- Rehabilitation performance standards for the Project will be established for the Project through the Development Consent process and will be addressed in the DRP. It is anticipated these criteria, will as a minimum, provide that the area impacted by the Project:
    - Is safe, stable, and non-polluting.

- Is free draining.
- Is free from any physical hazards that could endanger people or wildlife, e.g., by removal of infrastructure, and covering of foundation pads with soil.
- Meets the specified LSC classification, being either consistent with the LSC prior to operations, or as otherwise specified within the Development Consent.
- For agricultural land, is restored to the appropriate LSC for agricultural suitability consistent with the determined final land use, e.g. grazing.
- For non-agricultural land, is restored to an ecosystem function consistent with the surrounding environment, and target vegetation cover and abundance is established.
- Has appropriate bushfire hazard controls, based on advice from the NSW Rural Fire Service.

Further detail regarding decommissioning waste management for the Project is provided in **Section 6.14**.

6.10.5 Mitigation and Mitigation

The mitigation and management measures to be implemented as part of the Project to minimise impacts on Soil, Land and Agriculture are:

- **SLA01:** During the life of the Project, agricultural land use will continue within the Project Area outside of the Disturbance Footprint.
- **SLA02:** At the time of decommissioning, agricultural land use will be re-established over all land removed from agriculture (unless otherwise agreed with the landholder and/or regulatory authorities).
- **SLA03:** At the time of decommissioning, the Project Area will be returned to an agricultural productivity that is approximately equivalent of pre-Project status.
- **SLA04:** All soil that is proposed to be disturbed during the Project will be handled in accordance with the strategy outlined in Section 6.2.1 of the SLAIA (**Appendix 14**) and a site Soil Stripping and Management Plan prepared for the Project that includes soil management measures relating to stripping, stockpiling, reuse, and sourcing, as required. This will inform the CEMP, OEMP and a DRP.
- **SLA05:** All soil resources are to be managed throughout construction, operation and decommissioning phases of the Project in accordance with an ESCP which should include recommendations outlined in Section 6.2.1 of the SLAIA (**Appendix 14**).
- **SLA06:** All remaining infrastructure to be capped with a suitable depth of soil at the time of decommissioning with material of suitable texture and preparation to mitigate long term wind erosion and restore to pre-disturbance LSC classes (generally 0.5 m).
- **SLA07:** At the time of decommissioning, disturbed land will be returned to an equivalent LSC class following the end of life for the Project, through site rehabilitation and good soil management practices as outlined in Section 6.2 of the SLAIA (**Appendix 14**).

- **SLA08:** All soil resources are to be managed throughout construction, operation and decommissioning phases of the Project in accordance with an ESCP which should include recommendations outlined in Section 6.2.1 of the SLAIA (**Appendix 14**).
- **SLA09:** Agriculture infrastructure and property improvements will be retained and maintained to accommodate continued agricultural operations within the Project Area.
- **SLA010:** Pest species will be managed in accordance with measures outlined in Section 5.4.1 of the SLAIA (**Appendix 14**), and a Weed and Pest Management Plan prepared for the Project.
- **SLA011:** Biosecurity will be managed in accordance with measures outlined in Section 5.4.2 of the SLAIA (**Appendix 14**) and an Agricultural Biosecurity Management Plan prepared for the Project.

6.11 Air Quality

The SEARs require:

> *an assessment of the risks of dust generation and propose mitigation measures designed in accordance with the Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales (DECC, 2005).*

An Air Quality Assessment (AQA) has been undertaken for the Project by Zephyr Environmental (refer to **Appendix 15**) and key findings are summarised below.

6.11.1 Existing Environment

The closest meteorological station to the Project is the Bureau of Meteorology Automatic Weather Station (AWS) located at Mildura Airport, approximately 30 km south west of the nearest WTG. Given the relatively flat terrain in the area these conditions are likely to be broadly representative of the Project Area and its surrounds.

A windrose from the AWS at Mildura Airport for the five (5) years from 2019–2023 is presented in **Figure 6.25** below and individual annual windroses for each year from 2019–2023 are presented in **Figure 6.26**. Wind speed and direction do not vary substantially from year to year, except for lower prevalence of southerly winds in 2022, which was a strong la Niña year with atypical meteorological conditions. On an annual basis for the remaining years, winds were predominantly from the south west quadrant.

Stronger winds are predominantly from the north and north-north-east, with maximum hourly average speeds reaching 12.1 m/s. The seasonal windroses show that these stronger winds occur most frequently in spring. There is generally a low frequency of calm conditions, where wind speeds are less than 0.5 m/s.

There is (1) host dwelling (R1146) and six (6) non-associated dwellings (R1090, R1111, R1112, R1113, R1114, R1148) located a substantial distance from a WTG (between 10 km and 12 km) however it is noted that some of these dwellings are in closer proximity to the boundary of the Project Area and discrete areas of the Disturbance Footprint, particularly to the south-west.

The two (2) closest dwellings to the north of the Project are R1146, a host dwelling and R1148, a non-associated dwelling both of which are located approximately 10 km from the Disturbance Footprint and may be impacted by dominant southerly winds.

Another five (5) dwellings are located to the south-west (R1090, R1111,R1112, R1113 and R1114) which are located more than 10 km from a WTG noting that the boundary of the Project Area and some discrete areas of the Disturbance Footprint are in closer proximity (~5.65 km). These dwellings may be affected by strong north-easterlies transporting dust during Spring.

The Mallee Cliffs National Park is adjacent to the south-east Project Area, and while not in the direction of dominant winds, could be impacted by strong northerlies and north-easterlies if dust-generating activities were occurring at the time.

The BCS operates several air quality monitoring sites across NSW. The closest air quality monitoring station to the Project Area is a station in Buronga, approximately 20 km to the south west. Other nearby stations which provide information regarding the wider NSW regional area are located in Euston (approximately 55 km to the south east) and Pooncarie (approximately 60 km to the north).

Total Suspended Particulates (TSP) is measured at each of these three (3) rural monitoring stations. A review of TSP concentrations for each site, from 2019 to 2023 indicates TSP concentrations for each station have remained well below the EPA's annual average assessment criterion of 90 µg/m^3. Concentrations fluctuate year to year, tending to be higher in drier years when drought conditions prevail, such as in 2019–2020. Conditions were much wetter in 2021–2023 and all stations recorded concentrations substantially lower.

No monitoring for PM_{10} data available near the Project Area. However, historically for sites in rural NSW, PM_{10} concentrations have generally been found to be approximately 40% of TSP concentrations (NSW Mineral Council, 2000). Under this assumption, existing PM_{10} concentrations would range from 1.2–14.8 µg/m^3 based on the TSP concentrations between 2019 and 2023. These are below the annual average EPA assessment criterion of 25 µg/m^3. These are well below the annual average EPA assessment criterion of 25 µg/m^3. Furthermore, if it is conservatively assumed that 100% of TSP constituted PM_{10}, these concentrations would also not exceed the 25 µg/m^3 annual criterion.

For the purposes of this assessment, it is assumed that TSP is all PM_{10}, and therefore the annual average PM_{10} concentration used is 11 µg/m^3. These are highly conservative assumptions, both in using the period average and also that all TSP is PM_{10}.

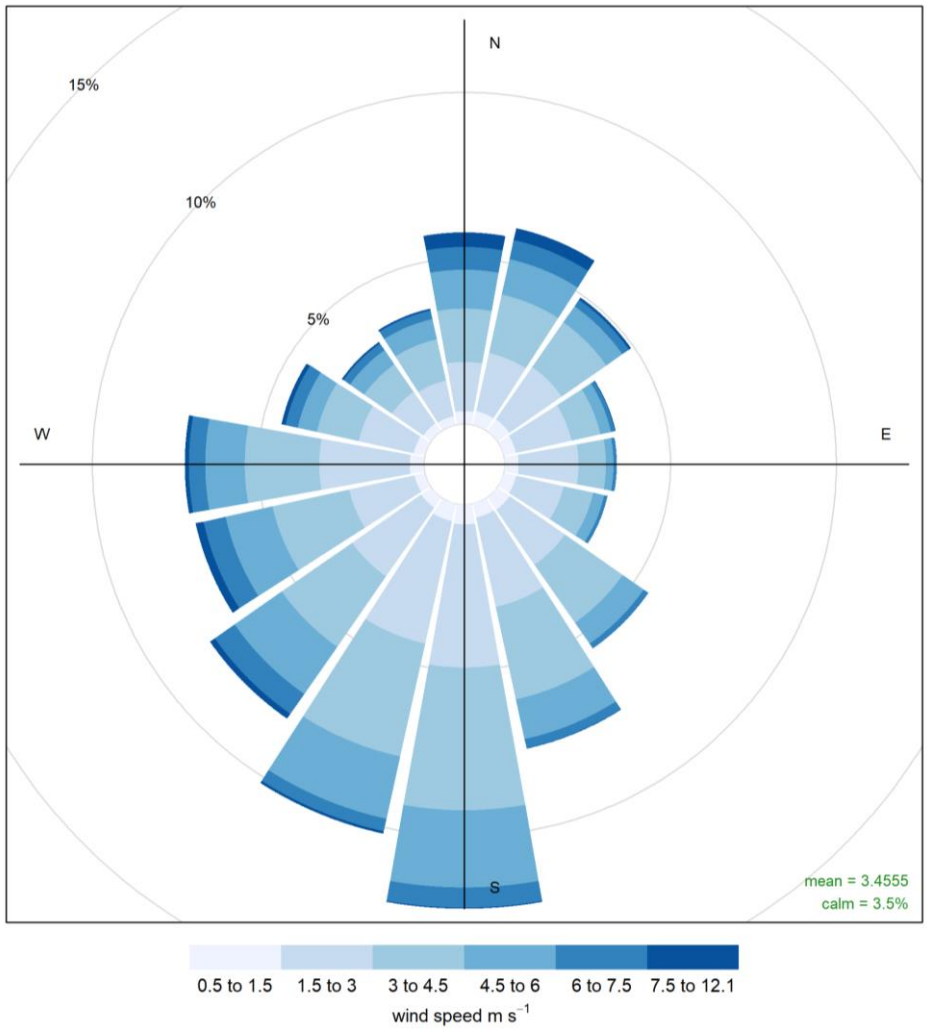


Figure 6.25 Windrose for all data from 2019–2023 at Mildura Airport AWS

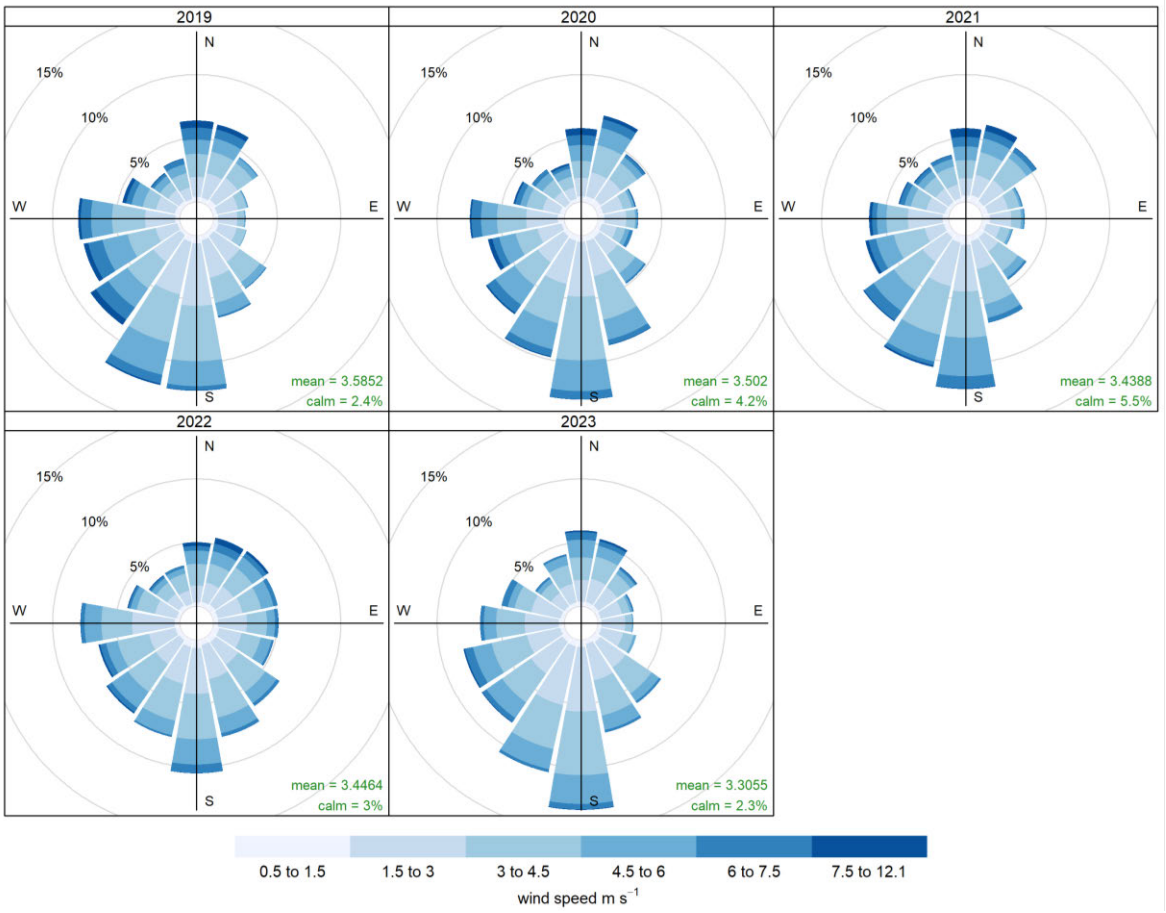


Figure 6.26 Annual windroses for 2019–2023 at Mildura Airport AWS

6.11.2 Methodology

The AQA has been completed considering the construction, operational and decommissioning phases of the Project. It should be noted that the assessment focusses on the construction related activities as impacts during operations are limited and impacts during decommissioning are broadly consistent with construction.

Dust generating activities during the construction phase are anticipated to comprise:

- demolition (removal of existing structures)
- earthworks (crushing, screening, clearing and excavation)
- construction (provision of new structures and roads) and
- track out (transport of dust and dirt by Heavy Duty Vehicles (HDVs).
- The assessment methodology considers dust impacts from annoyance, the risk of health effects and harm to ecological receptors.

It is difficult to quantify dust emissions from construction activities and dispersion modelling is therefore not always the best method for assessing potential impacts. Further details on the limitations of modelling are provided in **Appendix 15**. Given these limitations, the assessment and control of construction-related air quality focused on identifying and managing risk.

The construction assessment methodology involved the application of a semi-quantitative risk-based approach following the guidance developed by the UK Institute of Air Quality Management (IAQM, 2024), and adapted by Zephyr Environmental to be more representative of local conditions in the vicinity of the Project.

The approach was also tailored according to the nature of the Project. The assessment involved the following main steps:

- The identification of the construction activities that would be likely to occur in relation to the Project.
- The division of activities according to their different potential to cause impacts: demolition, earthworks, construction and vehicle track-out. Risks were assessed in relation to the size of the Project, the volume of traffic on unsealed roads, and the locations of sensitive receptors.
- The identification of Project-specific management/mitigation measures to minimise the risk of any potential impacts.

6.11.3 Impact Assessment

The first step of the IAQM methodology (see Appendix A of **Appendix 15**) establishes that a detailed assessment should be undertaken for residential receptors (dwellings) within 250 m of the Project Area and ecologically sensitive receptors within 50 m of the Project Area.

An analysis of dwellings within 250 m of the Project Area identified one dwelling R1146, a host dwelling, is located approximately 70 m to the north of the Project Area, however it is noted that the host dwelling is located more than 10 km from a WTG and the Disturbance Footprint. As the Project Area borders the Mallee Cliffs National Park to the southeast, this is considered a sensitive receptor within this assessment. Only a small portion of the Mallee Cliffs National Park falls within the 50 m distance and it is noted that the Mallee Cliffs National Park is 145 m from the Disturbance Footprint at its closest point being proposed met mast location.

Activities identified as most likely to result in dust emissions include preparation/disturbance of the land (e.g., earth moving) and site plant and road vehicles moving over unsealed roads and open ground or disturbed areas. The vast majority of activities that will result in dust emissions relate to construction. As such, dust emission can vary substantially from day to day depending on the level of activity, the specific activities being undertaken, and the weather conditions. If dirt or mud is tracked onto public roads, dust emissions can occur at some distance from the construction site (IAQM, 2005).

Other sources will include land clearing, wind erosion, as well as excavating and loading spoil material. Exhaust emissions from on-site plant and site traffic are unlikely to have a significant impact on local air quality, and in the majority of cases they do not need to be quantitatively assessed, as is the case for this Project.

6.11.3.1 Construction Impacts

During construction and decommissioning, impacts would generally be localised within the Project Area, and are unlikely to extend more than 250 m beyond the Project Boundary. As detailed above, the closest dwelling is over 10 km from the Disturbance Footprint and the nearest ecologically sensitive receptor, Mallee Cliff National Park, is 145 m from the Disturbance Footprint at its closest point being proposed met mast location.

The unmitigated risk of dust affecting ecological receptors was rated as medium for earthworks, construction, and track-out activities, and high for demolition. However, these risks can be managed with best-practice mitigation measures. The initial risk of dust soiling and the risk to human health are low for earthworks, construction, and track-out, and medium for demolition, noting no demolition is proposed during construction however it may be required during decommissioning. Recommendations have been provided in order to reduce these residual impacts to low.

Given these factors, the initial risk of dust impacts on the host dwelling and non-associated dwellings north of the Project Area is likely to be very low, as these receptors are approximately 10 km from the Disturbance Footprint. The initial risk of dust impacts on non-associated dwellings south and south-west of the Project Area is expected to be slightly higher, although still rated as low, as indicated by the precautionary assessment provided in the AQA. The risk of operational impacts is very low, with the main source being vehicle movements on internal access roads, which can be effectively managed through good road maintenance.

Potential impacts associated with off-site road works were also considered as part of this assessment specifically upgrades between the Project Area and Sturt Highway / Carey Street roundabout at Euston. Given the type of infrastructure proposed to be installed and the construction activities associated with minor works, there is limited potential for dust annoyance or amenity impacts to occur with normal mitigation measures being implemented.

6.11.4 Operational Impacts

Potential air quality impacts during the operational phase of the Project would be limited to:

- Operational vehicle movements.
- Maintenance works on Project infrastructure including access tracks, hardstands and laydown areas.

During operations, the lowermost blade tip for the WTGs is assessed to be approximately 50 m above the ground. While turbine rotation does cause some downstream wake effects (a type of turbulence) for a distance beyond the WTG, the effect is very high above ground, such that it is not likely to be noticeable at ground level.

The primary source of dust emissions during operations will be emissions from vehicle movements along unsealed access roads. However, the risk will be much lower than for construction given the much lower intensity of vehicle movements and can be mitigated via effective road maintenance and vehicle speed management.

Based on the above, there are no recommendations for mitigation and management measures for air quality that apply to the operational phase of the Project.

6.11.5 Decommissioning

Equipment and activities during decommissioning are expected to be similar to those required during the construction stage, however, decommissioning would occur over a shorter duration of time and is likely to involve demolition.

Based on the above, the same recommendations for environmental management measures during construction (refer to **Section 6.11.7**) should be implemented for decommissioning.

6.11.6 Cumulative Impact Assessment

The most notable project for consideration of cumulative impacts is the Euston Mineral Sands Project, proposed by Iluka Resources Ltd. The Study Area for this project is located partly within the southern extent of the Mallee Wind Farm Project Area. The ECM would involve open pit strip mining of six (6) mineral sands deposits. The Castaway deposit comprising of Castaway Pits 1 and 2 is located within the Project Area.

Spark Renewables has been in communication with Iluka regarding the interaction of the two proposed projects. Spark Renewables is committed to working collaboratively with Iluka and other proponents to coordinate the management and minimisation of dust and particulate matter emissions associated with potential cumulative impacts, as relevant.

Additionally, the Mallee Solar Farm and Gol Gol Renewable Energy Hub projects (with approvals being sought via three (3) separate applications as Gol Gol Solar Farm, Gol Gol Wind Farm and Gol Gol Battery Energy Storage System) are adjacent to the Project Area. The measures detailed below in **Section 6.11.7** are considered appropriate to accommodate the nearby Projects noting that dust impacts to occur outside the Project Area, are considered unlikely to occur.

6.11.7 Mitigation and Management Measures

Spark Renewables has committed to implement a comprehensive range of air quality mitigation and management measures for the Project, including:

- **AQM01**: Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- **AQM02**: Display the name and contact details of person(s) accountable for air quality and dust issues on the Project Boundary and the Project access points.
- **AQM03**: As part of the CEMP, detail the air quality control measures and procedures to be undertaken during construction, including:
    - Air quality and dust management objectives that are consistent with relevant regulatory authority guidelines.
    - Identification of potential sources of dust.
    - Mitigation measures to minimise dust impacts on sensitive receptors (including but not necessarily limited to AQM05 to AQM13 below).
    - Contingency plans to be implemented in the event of non-compliances and/or complaints about dust.

- **AQM04**: Maintain regular communications with Iluka Resources Ltd in regard to Euston Critical Minerals Project to ensure plans are co-ordinated, dust and particulate matter emissions are minimised, and interactions of off-site transport/deliveries which might be using the same strategic road network routes are considered. Similarly, regular communications with Squadron Energy in regard to Gol Gol Renewable Energy Hub are also desirable.
- **AQM05**: Areas of exposed surface are to be minimised throughout the construction site planning and programming, to reduce the area of potential construction dust emission sources.
- **AQM06**: Control measures, such as compaction stabilisation or covering will be implemented in order to minimise dust from stockpile sites.
- **AQM07**: Dust suppression measures, such as the use of water carts or soil binders, will be used in any unsealed surfaces and other exposed areas as required.
- **AQM08**: Further stabilisation should be considered for high-use access tracks, particularly those in closer proximity to sensitive receptors such as residential dwellings. Stabilisation may include sealing or the use of lower silt content material such as gravel.
- **AQM09**: All trucks should cover their loads when transporting materials that are potential sources of wind-blown dust, to and from the Project Area.
- **AQM10**: Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- **AQM11**: Activities that generate dust will be avoided or modified during high wind periods.
- **AQM12**: Work activities will be reviewed if the dust suppression measures are not adequately restricting dust generation.
- **AQM13**: Ensure rumble grids and wheel washes are placed at all site exit points and that gravel or sealed surfaces are maintained between the wheel wash and the exit to avoid recontamination of tyres.
- **AQM14**: Construction plant and equipment will be maintained in good working condition to limit impacts on air quality.
- **AQM15**: Where practicable, vehicles will be fitted with pollution reduction devices and switched off when not in use.

6.12 Economic Impacts

The SEARs require an assessment:

> *Including any benefits of the economic impacts or benefits of the project for the region and the State as a whole, including consideration of any increase in demand for community infrastructure services, and details of how the construction workforce will be managed to minimise local impacts, including a consideration of the construction workforce accommodation.*

An Economic Impact Assessment (EIA) has been undertaken for the Project by Ethos Urban Pty Ltd (Ethos Urban) to address the requirements of the SEARs. The EIA for the Project is provided in **Appendix 21** and key findings are summarised below. The EIA Study Area was defined as the entirety of the Wentworth Shire and Mildura Rural City LGAs.

6.12.1 Existing Economic Profile

6.12.1.1 Population Trends

The population of the EIA Study Area is estimated to total 65,240 persons as of June 2023, including 57,550 persons located in the Mildura Rural City Council area and 7,690 persons located in the Wentworth Shire Council area.

Mildura Rural City Council Area is projected to experience an average population growth of +0.7% (or +400 persons p.a. over 13 years) for the period 2023–2036 however, the Wentworth Shire Council LGA is projected to experience a small decline in population of -150 persons between 2023–2036. This is compared to a NSW growth rate of +1.1% p.a. over the same period.

This decline in population highlights the need for local investment that provides new employment opportunities for residents and potentially attracts new residents to the area such as large scale renewable energy projects. Large-scale renewable energy projects also provide an alternative income stream for the existing workforce including local farmers. These factors may contribute to retaining, and potentially expanding the population within the Study Area.

The Project will provide new income to the host landowners (farm operators), while the construction and operational phases of the Project will provide an economic stimulus (additional jobs, project contracts, new spending etc) to the local economy, as well as support the emergence of the region's renewable energy sector.

6.12.1.2 Labour Force and Occupational Structure

The EIA Study Area had a labour force of 35,600 persons and an unemployment rate of 3.9% at December 2023 (source: Australian Government – Small Area Labour Markets data). The unemployment rate is significantly higher compared to NSW (3.3%). The EIA Study Area has approximately 1,385 persons who are unemployed.

The skills base of the EIA Study Area is reflected in its occupational structure. ABS Census data for 2021 highlights that approximately 34.8% of employed residents in the EIA Study Area were occupied in construction-related activities (e.g., technicians and trades workers, machinery operators and drivers, and labourers).

The representation of these occupations in the EIA Study Area is significantly above the State average (26.1%), indicating a generally suitable occupational base for the Project exists in the region. In total, 9,830 workers in the EIA Study Area are occupied in construction-related activities, highlighting the potentially strong worker base available to support larger infrastructure projects.

The Project will require up to 400 workers at peak construction. It is anticipated that approximately 10% of these workers will be sourced from within the EIA Study Area, providing new opportunities for unemployed job seekers (subject to appropriate skills match) or 'back filling' employment opportunities associated with jobs vacated by workers taking up project employment.

The Project also has potential to provide new opportunities for workers who are beginning a career in the renewable energy sector. This transition is driven by global, commonwealth and state reduced emissions targets associated with electricity generation, as well as the economics of renewable energy generation technologies driven by advances in research and development and commercialisation of large scale renewable energy projects.

6.12.1.3 Business Structure

ABS Business Count data for June 2022 shows the EIA Study Area includes 870 construction businesses (rounded), representing 15.7% of all businesses located in the EIA Study Area (refer **Table 3.4**). This data indicates a reasonable presence in the EIA Study Area of the types of firms that have the potential to service aspects of the Project.

Although construction-related businesses will likely be the main beneficiaries of the Project, businesses in other sectors supporting the Project (directly and indirectly) are also likely to benefit, including:

- retail trade
- accommodation and food services
- financial and insurance services
- rental, hiring and real estate services
- health care and social assistance.

These sectors make up approximately 27.0% of all businesses located in the EIA Study Area and their services will likely play a role in supporting the needs of Project workers, especially those relocating to the EIA Study Area to work on the construction phase of the Project.

6.12.1.4 Project Workforce

Direct Construction Employment

Construction-related jobs are expected to be associated with a wide-range of on and off-site activities, including:

- labour recruitment
- training
- installation and assembly of turbine components
- vehicle and equipment hire
- civil works including earthworks, supply of construction materials, foundations, external roads and internal access tracks

- engineering services
- operation of specialised equipment including cranes
- transport and logistics
- electrical works including cabling, connections, and BESS setup
- installation of monitoring equipment
- fencing
- security
- waste disposal
- business and financial services
- administrative services.

The EIA Study Area has moderate capacity in terms of construction-related workers (9,830 workers) and construction-related businesses (870 businesses), including many located in the immediate region and this overall capacity may be able to service some local Project needs and concurrent infrastructure projects, subject to careful management.

An estimated 10% of the required Project workforce could realistically be sourced from the EIA Study Area. The Project will provide new participation opportunities for businesses and workers located in the EIA Study Area, having regard for the good match of skills and resources available and procurement activities by the Proponent.

Indirect Construction Employment

In addition to direct employment, significant employment will be supported indirectly through the employment multiplier effect. By applying an industry-standard multiplier for the construction industry of 1.6 (based on ABS Type B multipliers), on average the Project is estimated to generate an additional 360 FTE jobs indirectly (on average) over the 36 month duration of the construction period.

Indirect or flow-on jobs (which captures industry and consumption effects) include those supported locally and in the wider economy (including within other parts of NSW, and nationally), as the economic effects of the capital investment flow through the economy. Indirect employment creation in local and regional economies includes jobs supported through financial and property services, accommodation, food and beverage, trade supplies, fuel supplies, mechanical support, transportation, etc.

For the purposes of the EIA it was assumed that on average 20% of indirect jobs or approximately 70 FTE jobs will be supported in the EIA Study Area during the construction phase. This assumption is made with reference to findings from completed renewable energy projects in regional areas, where generally 20% share of indirect jobs is applied and noting the impact of non-local workers (and their spending) likely to be associated with the Project.

6.12.1.5 Operational Employment

Up to 30 FTE direct jobs will be supported locally (on-site) on an ongoing basis through the operation and maintenance of the Project. A number of additional jobs will also be supported indirectly through the employment multiplier effect. By applying an industry-standard multiplier for the electricity industry of 2.9 (based on ABS Type B multipliers) to the direct operational and maintenance jobs, an estimated 85 FTE additional permanent jobs would be supported in the wider state and commonwealth economies, with some of these jobs supported locally through operational supply chains and consumption impacts. For the purposes of the EIA it was assumed that 20% of indirect operational jobs are created in the EIA Study Area. This equates to approximately 17 ongoing FTE positions within the EIA Study Area.

Operational-related employment is for the lifetime of the Project (i.e., 30 years). Therefore, while ongoing job creation is relatively small, it represents new long-term employment opportunities at a local, regional, State and national level.

6.12.2 Impact Assessment

6.12.2.1 Workforce Accommodation

The 'external' (or non-local) Project labour requirement would be expected to generate an accommodation need for 360 direct FTE workers at the peak of the Project. The analysis included in the EIA indicates inadequate capacity currently exists in the EIA Study Area to accommodate the number of non-local workers expected at the peak of the Project. Simultaneously, increasing demand from concurrent regional infrastructure projects (refer to Section 2.6) also needs to be factored in.

In light of these factors, and based on consultation with key regional stakeholders, including accommodation and service providers, Spark Renewables proposes to establish a TWA facility within the Project Area. The TWA facility has been designed to accommodate the peak construction workforce for the Project, and provide a range of essential services (as outlined in **Section 3.4.8**), to avoid potential strain on existing housing supply and key services within the EIA Study Area. Notwithstanding this, it is anticipated that significant economic benefits will be flow through to businesses within the EIA Study Area, associated with personal spending by the Project's construction workforce, as discussed in **Section 6.12.2.3** below. Workforce accommodation is discussed further in **Section 3.4.8** and **Appendix 11**.

6.12.2.2 Impacts to Agricultural Production

The Project would result in the temporary loss of approximately 444.69 ha of agricultural land (i.e. the Project's Disturbance Footprint) over the 30 year life of the Project. Land occupied by the permanent Project infrastructure will be leased from the existing landowners for the lifespan of the Project.
This equates to a relatively small reduction in available large scale cropping of grains and legumes, particularly wheat, chickpeas and beans within the total Project Area. The SLAIA estimates that the economic impact associated with the temporary removal of potential agricultural primary productivity would equate to $154,415 per year for the duration of the Project (refer to **Appendix 14**).

The Project will continue to co-exist with agricultural operations (including grazing and cropping operations), and a range of mitigation and management measures have been proposed to minimise potential land use conflicts, as outlined in **Section 6.10**. Additionally, host landholders will benefit from diversification of their income streams, along with improved access across their respective farms associated with the construction of internal roads.

6.12.2.3 Key Economic Benefits

The Project will require approximately $866 million in investment (excluding goods and services tax, GST) during the construction phase, of which approximately $130 million will be retained in the EIA Study Area. On average, the Project will also support 225 direct and 360 indirect FTE positions in the national economy on average over the 36 month construction period.

Construction workers relocating to the region would be expected to inject approximately $4.6 million in new spending into the economy over the construction phase, supporting approximately 8 FTE jobs in the service sector in the EIA Study Area over this time.

Once operational, 30 direct and 85 indirect FTE jobs will be supported by the Project. Of these national totals, the EIA Study Area is expected to benefit from 95 FTE construction jobs and 47 FTE ongoing operational jobs (includes both direct and indirect jobs). Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $220 million over 30 years (CPI adjusted) relating to landholder leasing payments, operational wage stimulus, and community payments.

Additionally, it is noted that the community would also benefit from a range of community benefit sharing commitments by Spark Renewables, as outlined in **Section 2.7**, including community grants (including grants already dispersed), benefit payments made under the Access Rights Benefits Scheme and future Planning Agreements made to the Wentworth Shire Council.

Decommissioning of the Project is likely to support significant employment generation, new business contracts and provide a spending stimulus to the EIA Study Area over the decommissioning period. However, given decommissioning will not occur for at least 30 years after the operation of the Project commences, it is not possible to accurately estimate potential impacts and benefits at this stage noting economic, technological and environmental factors may change considerably over this period.

6.12.3 Cumulative Impact Assessment

The Project will likely compete for labour, accommodation, and other resources with major infrastructure projects being constructed concurrently in the EIA Study Area (principally renewable energy projects being driven by investment in the SW REZ). There are a number of major renewable energy and energy storage projects which are almost certain to overlap with the Project which may result in labour, accommodation and supplier shortages.

- The EIA identified three (3) projects with a high economic impact rating in accordance with the CIA Guidelines (DPIE, 2022). Impacts rated as high require significant mitigation measures and include Koorakee Energy Park, Lake Victoria Wind Farm and Euston Wind Farm. The EIA identified five (5) projects has having a medium economic impact rating including Mallee Solar Farm, Gol Gol Solar Farm, Gol Gol Wind Farm, Gol Gol Battery Energy Storage System and Project EnergyConnect (NSW – Eastern Section).

- The mitigation measures detailed in **Section 6.12.4** are designed to address the potential negative impacts associated with the cumulative impacts of large scale developments competing for labour, accommodation, and other resources within the EIA Study Area.

6.12.4 Mitigation and Management Measures

The mitigation and management measures to be implemented as part of the Project to minimise negative impacts and maximise opportunities on the economy include:

- **ECO01:** Prior to commencing construction, Spark Renewables will prepare an AES for the Project in consultation with relevant stakeholders.
- **ECO02**: Spark Renewables will develop a Community Shared Benefit Strategy which will include details of any Planning Agreement with Wentworth Shire other community benefit initiatives.

6.13 Hazards and Risks

6.13.1 Preliminary Hazards Analysis

The SEARs require:

> *a preliminary risk screening completed in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021 and 'Applying SEPP 33' (DoP, 2011)*

The Preliminary Hazard Analysis (PHA) has been undertaken by Riskcon Engineering (refer to **Appendix 16**) and key findings are summarised below.

6.13.1.1 Assessment Methodology

The PHA considered the hazards and risks posed to off-site receivers and associated dwellings related to the transport, storage and use of hazardous materials for the Project, including the battery storage. The PHA was prepared in general accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) and the following guidelines:

- Applying SEPP 33 (DPIE, 2011).
- Multi-Level Risk Assessment (DPIE, 2011).
- Hazardous Industry Advisory Paper No. 4 –Risk Criteria for Land Use Safety Planning (HIPAP 4) (DPIE, 2011).
- Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (HIPAP 6) (DPIE, 2011).

The detailed methodology and calculations used to identify and assess the potential hazards are outlined in **Appendix 16**.

The classes and quantities of DGs provided in **Table 6.34** are indicative, having regard to the nature and scale of the Project and will be confirmed in construction and operational environmental management plans for the Project, if approved.

Additionally, the State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP-RH) threshold of the individual classes have been provided for the purposes of the SEARs. While the estimates provided below are indicative, the type and quantities of DGs utilised in the carrying out of the Project are not expected to exceed relevant SEPP thresholds at any stage during the life of the Project.

Table 6.34 Dangerous Goods – Preliminary Risk Screening

Storage Location	Class	Description	Indicative Quantity	Resilience and Hazards SEPP Threshold
Battery Storage	9	Lithium ion Batteries (LIBs)	1,476 L	Not applicable
PCU Transformer	C2	Transformer oils	32,000 L	Not applicable
Substation Transformer	C2	Transformer oils	6,400 L	Not applicable
Control room generator	C1	Diesel	24,000 L	Not applicable

Based on the type of dangerous goods proposed to be used, a Level 2 Assessment (partial quantitative analysis) was selected for the Project. This approach provides a qualitative assessment of those dangerous goods of lesser quantities and hazard, and a quantitative approach for the more hazardous materials to be used on-site.

Lithium ion batteries (LIBs) may present hazards as a result of manufacturing faults or range of battery abuse scenarios. As a result, LIBs are equipped with several safety features to prevent the batteries from charging or discharging at voltages which result in battery degradation, leading to shorting of the battery and thermal runaway. Safety features generally include:

- Shut-down separator (for overheating).
- Tear-away tab (for internal pressure relief).
- Vent (pressure relief in case of severe outgassing).
- Thermal interrupt (overcurrent/overcharging/environmental exposure).

These features are designed to prevent overcharging or excessive discharge, pressurisation arising from heat generated at the anode or from battery contamination. Protection techniques for LIBs are standard; hence, the potential for thermal runaway to occur in normal operation is very low with the only exceptions being due to manufacturing faults or battery damage i.e., battery cell is ruptured as this can short circuit the battery resulting in thermal runaway. In terms of physical damage, the batteries are contained within modules which are located within a fenced area; therefore, there is a low potential for damage to occur to the batteries which may initiate an incident.

To maintain a conservative approach with respect to the assessment of hazards and risk, a PHA was completed in relation to potential LIB fire and associated gas dispersion, electrical equipment failure and fire, transformer arcing or electrical surge. A hazard identification table was developed for the Project to identify potential hazards that may be present as a result of operations or storage of materials associated with the Project. Based on the identified hazards, a range of scenarios that may result in an incident with the potential for offsite impacts were considered. These potential scenarios were discussed qualitatively and any scenarios that would not impact offsite were eliminated from further assessment. Scenarios not eliminated were then carried forward for consequence analysis. A review of all incidents carried forward for further analysis indicates that there were no observed offsite impacts associated with the Project.

The PHA considered a candidate lithium-Ion phosphate (LFP) technology BESS for the Project which is considered to be one of the safest battery chemistries within the industry. A UL9540A[2] report (test standard report with a systematic evaluation of thermal runaway and propagation in energy storage system at cell, module, unit, and installation levels) has been completed for this product. The report demonstrates that if one battery cell overheats (thermal runaway), the heat won't spread to all the other cells in the same module or to nearby modules. Although the LFP technology does not cause fire, there can be circumstances where battery modules catch fire due to leaking coolant or electric faults. In those cases, fire will be constrained by the stainless-steel enclosure. Similar systems show that generally the container wall remains intact after sustaining heating in a furnace to over 900^{o}C.

Furthermore, each container should also have multiple built-in fire protection devices that work collaboratively, including smoke and thermal sensors, combustible gas detector, pressure relief system, and aerosol E-Stop buttons. Therefore, a container will automatically detect an internal fire in the first instance.

The PHA concluded that the risks at the Project Boundary are not considered to exceed the acceptable risk as defined under Hazardous Industry Advisory Paper No. 4 'Risk Criteria for Land Use Safety Planning (DPIE, 2011). Therefore, the Project would only be classified as potentially hazardous and would be permitted within the current land zoning for the Project Area.

6.13.1.2 Mitigation and Management Measures

The mitigation and management measures to be implemented as part of the Project to minimise the hazards and risks posed to off-site receivers and dwellings.

- **PHA01:** The BESS will be tested in accordance with UL9540A.
- **PHA02:** The BESS will be installed in accordance with manufacturer and UL9540A report recommended clearances based on testing.
- **PHA03:** The BESS will be installed with fire protection systems specified by the manufacturer and UL9540A report.
- **PHA04:** Prior to the commencement of construction in the relevant stage of the Project, detailed design will be undertaken to validate the BESS can be installed in the Project Area whilst meeting the recommended clearances.
- **PHA05:** UL testing information shall be made available to the certifying authority. It is noted that a confidentiality agreement may be required.
- **PHA06:** The vent covers of the BESS shall be constructed of non-combustible material.
- **PHA087:** The vents shall not be located above battery packs within the BESS container.

[2] UL9540A is a standard report with a systematic evaluation of thermal runaway and propagation in energy storage system at cell, module, unit, and installation levels.

6.13.2 Bushfire

The SEARs require:

> *identify potential hazards and risks associated with bushfires / use of bushfire prone land, including the risks that a wind farm would cause bush fire and any potential impacts on the aerial fighting of bushfires and demonstrate compliance with Planning for Bush Fire Protection 2019.*

Additionally, under the EP&A Act (and its regulations), and the NSW *Rural Fires Act 1997* (and its regulations), determining authorities are required to assess and control new developments in Bushfire prone areas.

A Bushfire Assessment Report has been undertaken by Peak Land Management to demonstrate compliance with Planning for Bush Fire Protection (PBP) 2019 (NSW Rural Fire Service, 2019), with specific consideration of the requirements of section 8.3.5. The Bushfire Assessment Report is provided in **Appendix 17** and the key outcomes are summarised below.

6.13.2.1 Impact Assessment

The Project Area is identified as Category 3 bushfire prone land by the NSW Rural Fire Service Bush Fire Prone Land mapping (refer **Figure 6.27**). Category 3 refers to medium bush fire risk vegetation, with the Project Area predominantly grassland and woodland vegetation types.

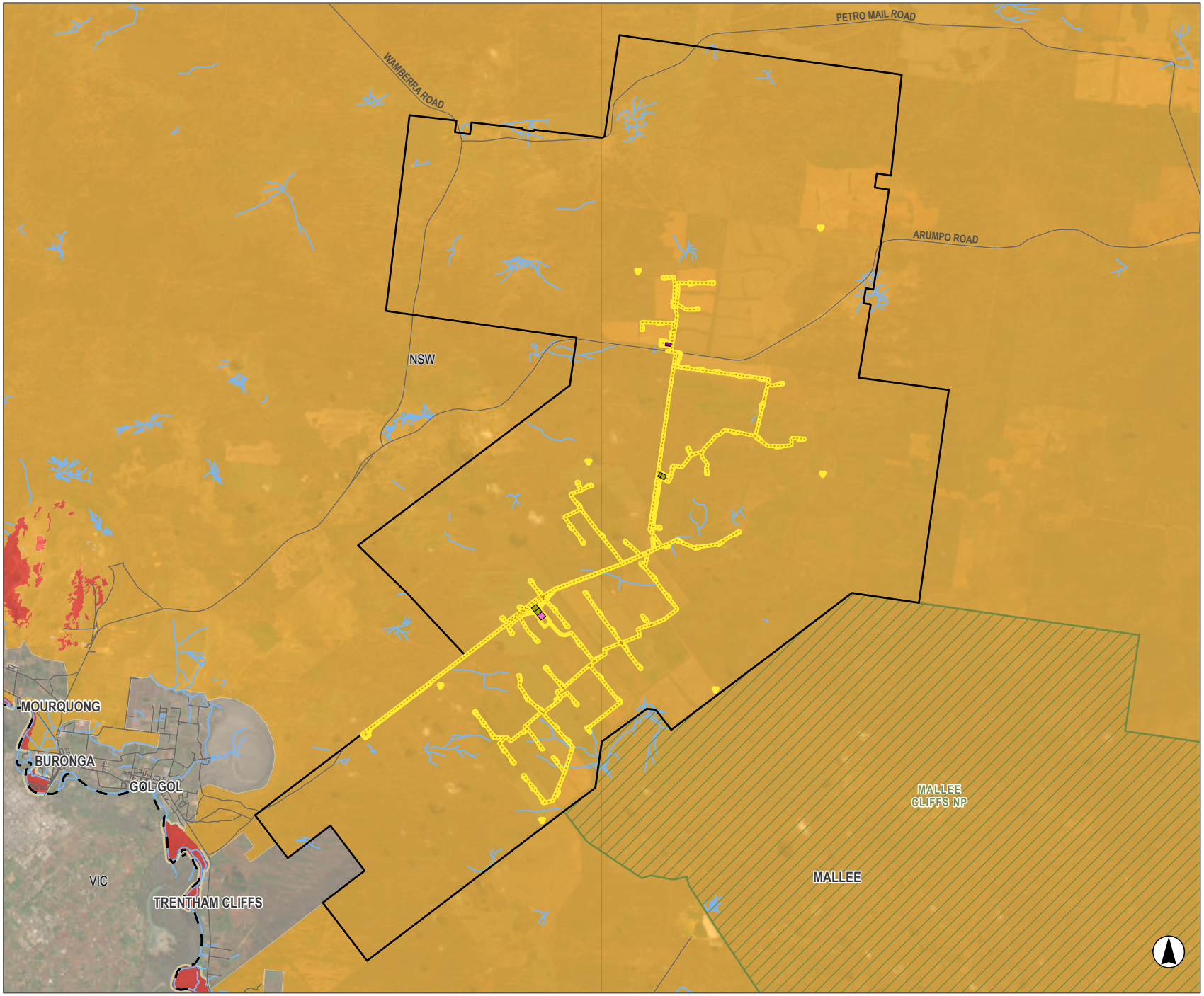
PBP (2019) requires wind farm developments to have adequate clearances to combustible vegetation as well as adequate access and water supply for firefighting purposes. Spark Renewables has committed to a comprehensive range of mitigation measures to manage bush fire risk associated with the Project in compliance with PBP (2019). These measures, which are detailed in **Appendix 17**, include (but are not limited to):

- the establishment and maintenance of Asset Protection Zones (APZs) around key Project infrastructure to maintain clearance to combustible vegetation as follows:
    - TWA facility – 25 m
    - O&M facilities – 20 m
    - WTGs, substations, switchyards and BESS – 10 m.
- the construction and maintenance of the proposed site access points and internal road network in compliance with PBP (2019) standards to facilitate safe site access and egress for emergency services
- the establishment of a dedicated water supply for bush firefighting purposes (initially located at the TWA facility and shifting to the O&M facilities during operations)
- the development of a Bush Fire Emergency Management and Operations Plan, prepared in consultation with relevant authorities (RFS and FRNSW).

Subject to the implementation of these proposed measures, it is considered that potential bush fire risk associated with the Project can be appropriately managed.

FIGURE 6.27

Bushfire Prone Land



Legend

- Project Boundary
- Disturbance Footprint
- Access Tracks
- Collector Substation and Switchyard
- TWA Facility
- Battery Energy Storage System (BESS)
- State Border
- NPWS Estates
- Road
- Watercourse

NSW Bushfire Prone Land

- Vegetation Buffer
- Category 1: Highest Risk
- Category 2: Low Risk
- Category 3: Medium Risk

0 5 10
Kilometres

Scale 1:225,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

Impacts to Mallee Cliffs National Park

The Project has been designed to maximise setbacks from the Mallee Cliffs National Park where practicable. The Project design incorporates a minimum buffer of 800 m between the boundary of the Mallee Cliffs National Park and the nearest proposed WTG tower. A range of mitigation and management measures are also outlined in **Section 6.13.2.2** for the management of bush fire risk associated with the Project on the adjoining Mallee Cliffs National Park. Further consideration of the Project's interactions with Mallee Cliffs National Park is provided in **Section 7.3.5**.

Risk of Bushfire Ignition due to the Project

In 2018, the former Australasian Fire and Emergency Service Authorities Council Limited (now National Council for Fire and Emergency Services) (AFAC) published guidelines for Wind Farms and Bushfire Operations (AFAC, 2018) to clarify the bush fire risks posed by wind farm development and to provide guidance relating to planning for bush fire prevention, preparedness, response and recovery operations in and around existing and planned wind farm facilities.

The AFAC Guideline states that wind farms are not expected to adversely affect fire behaviour or create major ignitions risks, noting that automatic shutdown and isolation procedures are generally installed within modern WTG systems. The AFAC Guideline also states that the risk of WTGs malfunctioning and initiating fires within the unit is generally considered low, given appropriate protection and shut down measures along with remote alarming and maintenance procedures.

The AFAC Guideline also considers that WTGs may reduce the risk of bushfires caused by lightning as they have built in protection mechanisms.

The NSW Government's position in relation to bush fire risk from wind farms is 'that under normal operating circumstances, it is extremely unlikely that a wind farm can cause or adversely affect a bush fire' (NSW Government, 2023).

Additionally, with respect to the proposed BESS, it is noted that the Preliminary Hazard Assessment for the Project (refer to **Section 6.13.1** and **Appendix 16**) concluded that fire risks associated with the BESS within the Project Area are not considered to exceed the relevant acceptable risk criteria under Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning' (DPIE, 2011).

Subject to relevant national, state and territory legislation, wind farms and electricity transmission infrastructure may continue to operate on days of total fire ban. Protocols for responding to elevated fire danger levels will be developed in consultation with RFS and FRNSW and documented in the Bush Fire Emergency Management and Operations Plan.

Impacts of the Project on Aerial Firefighting

Aerial firefighting operations (firebombing in particular) are sometimes conducted below 500 ft AGL and under certain conditions visibility may be reduced or limited by smoke/haze.

The AFAC guideline (2018) advises that wind farm operators should be responsible for ensuring that the relevant emergency protocols and plans are properly executed in an emergency event.

During an emergency, operators need to react quickly to ensure they can assist and intervene in accordance with their planned procedures, including:

- liaison with the relevant fire and land management agencies that is ongoing and effective
- access is available to the Project Area by emergency services response for on-ground firefighting operations
- WTGs are shut down immediately during emergency operations – where possible, blades should be stopped in the 'Y' or 'rabbit ear' position, as this positioning allows for the maximum airspace for aircraft to manoeuvre underneath the blades and removes one of the blades as a potential obstacle.

Aerial bushfire fighting personnel are required to assess risks posed by aerial obstacles, wake turbulence and moving blades in accordance with routine procedures.

Emergency response protocols to facilitate aerial firefighting will be developed in consultation with RFS and FRNSW and documented in the Bush Fire Emergency Management and Operations Plan.

6.13.2.2 Mitigation and Management Measures

Spark Renewables will implement the following mitigation and management measures with respect to bushfire.

Bush Fire Emergency Management and Operations Plan (BFEMOP)

- **BF01:** A BFEMOP will be prepared in consultation with the RFS and FRNSW which will be implemented over the life of the Project. The purpose of the BFEMOP is to identify all relevant risks and mitigation measures associated with the construction, operation and decommissioning of the Project.
  The BFEMOP will consider and integrate the strategies outlined in the Mallee Cliffs National Park Fire Management Strategy. The BFEMOP will include details regarding:
  - measures to prevent or mitigate fires igniting
  - work that should not be carried out during total fire bans
  - availability of fire-suppression equipment, access and water
  - storage and maintenance of fuels and other flammable materials
  - procedures to notify the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bush fire danger period to ensure weather conditions are appropriate
  - appropriate bush fire emergency management planning.
- **BF02:** The BFEMOP will detail emergency response procedures to facilitate aerial firefighting operations, including protocols for:
  - communications with relevant fire and land management agencies
  - ensuring access is available to the Project Area by emergency services responsible for on-ground firefighting operations

- ensuring WTGs are shut down immediately during emergency operations (where possible, blades will be stopped in the 'Y' or 'rabbit ear' position).

- **BF03:** The BFEMOP will reflect Spark Renewables' commitments to bushfire training and the provision of firefighting equipment for personnel, including:
  - training for all on-site personnel regarding bush fire response procedures
  - firefighting training for operational workers
  - fitting of basic firefighting equipment in operational vehicles.

Design and Construction

- **BF04:** Sleeping accommodation within the TWA facility will comply with Sections 3 and 5 (BAL 12.5) of Australian Standard AS3959-2018 'Construction of buildings in Bush Fire-prone areas', except as modified by Section 7.5 of PBP (2019).

- **BF05:** Essential equipment will be designed and housed in such a way as to minimise the impact of bushfires on the capabilities of the infrastructure during bushfire emergencies. It will also be designed and maintained so that it will not serve as a bushfire risk to surrounding bush.

- **BF06:** Fire protection equipment within buildings including fire extinguishers, fire hose reels, evacuation signage, first aid kits, etc will be available at all times and serviced /maintained regularly.

- **BF07:** The O&M site offices will be ember screened, with a 20 m APZ (refer BF11 and BF12 for other APZ commitments). The BFEMOP will include a protocol to shut all windows & doors in a bush fire emergency.

- **BF08:** A sprinkler system (i.e. metal garden sprinklers on the ground) will be considered for the O&M APZs, including wetting the walls of the building. This would provide limited fire suppression in the event of a fire.

- **BF09:** A petrol or diesel or solar powered fire fighting pump (with battery storage backup) and minimum 30 m hose reel with a steel nozzle will be purchased and stored in an ember proofed housing. This mobile pump can be used on the back of a 4WD or similar vehicle to fight grassland fires/spot fires, and for pumping water from water tank(s).

- **BF10:** For the construction and decommissioning phases of the Project, the following measures will be implemented:
  - provide good access i.e. construct access roads prior to WTG and ancillary infrastructure installation as described under BF15 below, and then decommission access roads after WTG and ancillary infrastructure removal (except where required for farming operations)
  - install appropriate signage to assist emergency response crews
  - ensure any and all appropriate permits are issued as required
  - adhere to restrictions on total fire ban, or days of high fire danger
  - vehicles carry fire extinguishers or fire fighting equipment, where possible

- emergency communications equipment is carried
- vehicles will be selected with a preference for diesel and/or will utilise cleared tracks/internal roads to minimise likelihood of ignition
- smoking is restricted to prescribed areas with suitable butt disposal
- plant equipment and machinery is maintained to a suitable standard and cleaned to remove any accumulated flammable material
- the 'Fires Near Me' app is utilised to understand proximal threat of fire.

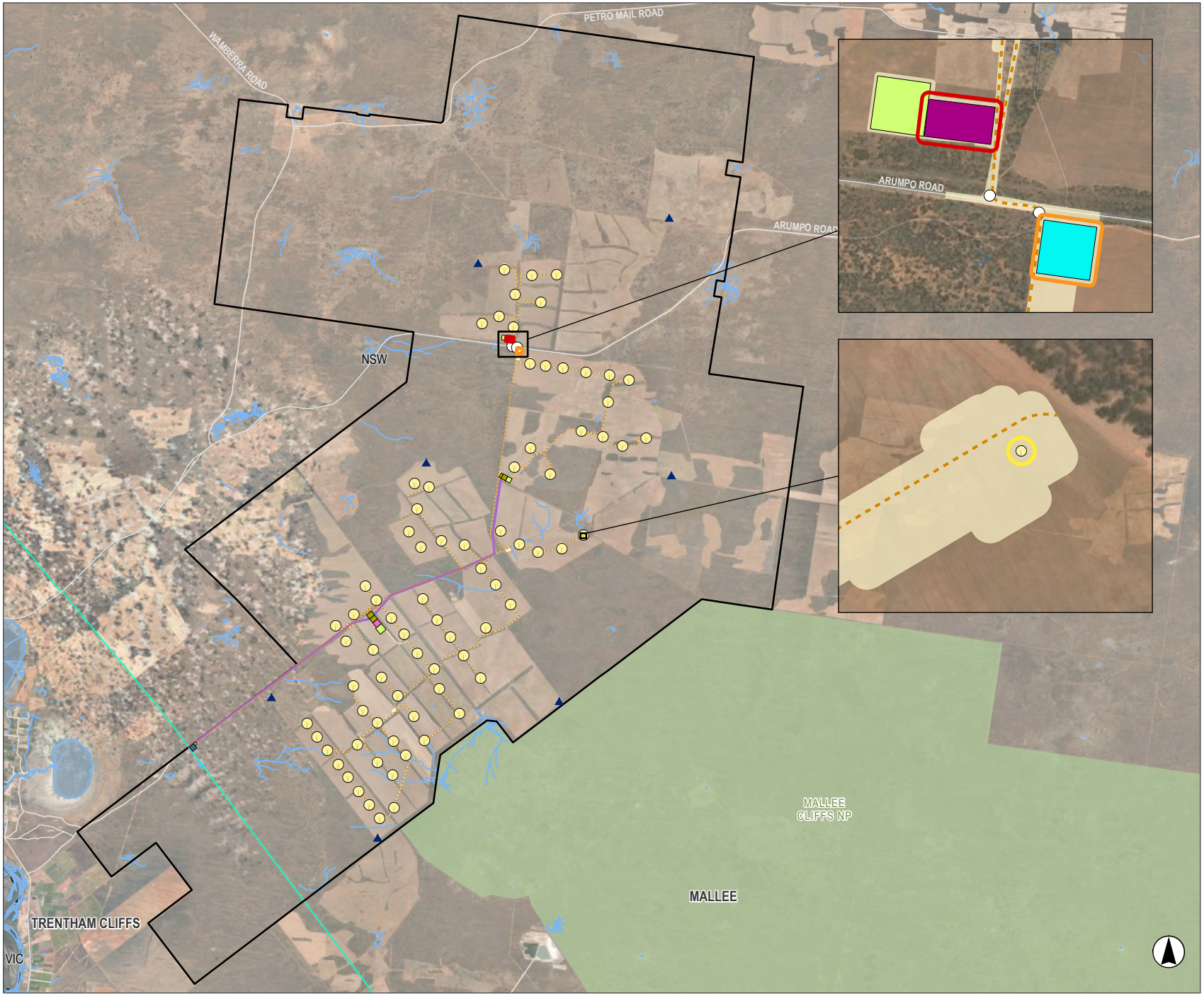
APZs

- **BF11:** During construction and for the life of the Project, APZs will be established and maintained in accordance with Appendix 4 of PBP, 2019. APZs will be established to the following standards, as a minimum:
  - TWA – 25 m
  - O&M facilities – 20 m
  - WTGs, substations, switchyards and BESS – 10 m.

Project APZ's are provided in **Figure 6.28** below.

FIGURE 6.28

Project APZ Boundary



Legend

- Project Boundary
- Disturbance Footprint
- Access Points
- Wind Turbine Generators
- Permanent Meteorological Masts
- Access Tracks
- HV Transmission Line
- Collector Substation and Switchyard
- Operations and Maintenance Facility
- Construction Compound
- TWA Facility
- Switchyard
- Battery Energy Storage System (BESS)
- Existing HV Transmission Lines
- State Border
- NPWS Estates
- Road
- Watercourse
- Waterbody

APZ Boundary

- 10m APZ (Wind Turbine Generator)
- 20m APZ (Operations and Maintenace Facility)
- 25m APZ (Accommodation Camp)

0 4,000 8,000
Metres

Scale 1:215,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024)

- **BF12:** Additionally, Spark Renewables will maintain:
    - Clearance of all woody vegetation within two (2) m of power poles.
    - Clearance of all woody vegetation within three (3) m of transmission tower structures or 12 m from the centre of the tower (whichever is greater).

Water and Utilities

- **BF13:** Water, electricity and gas will comply with Table 7.4a (where relevant) of PBP (2019).
- **BF14:** A non-combustible dedicated water tank/s (minimum capacity 100,000 litre (l)) with Storz fitting will be provided on site. Dedicated fire fighting water supply from this tank is specifically for fire tanker refilling/on-site fire fighting. This Static Water Supply (SWS) will be placed in a location readily accessible by fire tanker (within the TWA facility or O&M compounds). The SWS will be signposted, and a minimum ten (10) m APZ will be established and maintained around it.

Access

- **BF15**: The internal road network will conform to PBP (2019). Specifically, internal roads will have:
    - minimum 4 m vertical clearance to any overhanging obstructions
    - minimum 4 m width with 1 m traversable shoulders, unsealed/sealed all weather traversable road with suitable load bearing capacity, drainage structures and feature crossings
    - a grade generally less than 100, noting short steep sections would be acceptable if sealed and <150 and then suitable cross fall of the road surface provided
    - two-way traffic flow (with capacity for passing and turning areas) which enables safe access & egress for emergency services and allow crews to work with equipment about the vehicle is to be provided by the proposed road system & APZs.

6.13.3 Telecommunications (EMI)

The SEARs require an assessment to:

> *identify possible effects on telecommunications systems, assess impacts and mitigation measures including undertaking a detailed assessment to examine the potential impacts as well as analysis and agreement on the implementation of suitable options to avoid potential disruptions to radio communication services, including emergency telecommunications systems used by NPWS, which may include the installation and maintenance of alternative sites*

A Telecommunications Impact Assessment has been undertaken by Middleton Group Engineering (MGE) (refer to **Appendix 18**) to address the above SEARs.

The Telecommunications Impact Assessment has been completed with due regard to the Wind Energy Guidelines and Clean Energy Council Best Practice Guidelines (June 2018), to assess potential impacts of the Project on existing telecommunications and ensure the suitable level of service is maintained.

This study assesses the potential impacts of the Project on the following telecommunication services:

- point-to-point microwave links
- meteorological radar
- mobile voice-based communications
- wireless and satellite internet services
- broadcast and digital radio
- broadcast, digital and satellite television
- trigonometry stations
- global positioning system (GPS).

MGE conducted an initial review the Australian Communications and Media Authority (ACMA) database for point-to-point links within a 150 km radius of the Project Area in March 2024. Two (2) links were identified within the Project Area although there are no communication links found within the two (2) km buffer of any WTG. In depth analysis and stakeholder consultation was undertaken in respect of these links. Stakeholders included: NSW Telecommunications Authority, NSW Rural Fire Services, NSW National Parks and Wildlife Service, Bureau of Meteorology, Geoscience Australia, Optus, Telstra and Vodafone.

Overall, the Telecommunications Impact Assessment concludes that the Project has been designed, situated, and positioned to prevent, minimise, and address electromagnetic interference that could disrupt the pre-existing television, radar, and radio transmission and reception systems. The potential electromagnetic interference impact of the Project has been assessed. Based on analysis and consultation with key stakeholders, the Project will have no material impact on the telecommunication services listed above, subject to the implementation of the mitigation and management measures outlined in the section below.

6.13.3.1 Mitigation and Management Measures

The Project design has avoided, minimised and mitigated EMI that could disrupt the pre-existing television, radar, and radio transmission and reception systems, and EMI to pre-existing television, radar and radio transmission and reception. Accordingly, there are no Project-specific recommendations required or provided by MGE, as relevant to the Project assessed in this study. Notwithstanding, the following mitigation and management measures will be implemented by Spark Renewables:

EMI01: Should any substantial changes to the WTG layout occur in the future (i.e. moving WTGs beyond approved micro-siting limits) potential interference to telecommunications services will be reviewed, in consultation with relevant stakeholders, as part of any future modification application. If impacts are identified as a result of future design changes the following conceptual avoidance, minimisation and/or mitigation options would be considered:

- Modify the design to either relocate and/or remove wind turbines to avoid, minimise and/or mitigate any EMI issues and telecommunications impacts.
- Monitoring telecommunications during construction, operational and/or decommissioning phases of the Project to confirm impacts.

- Modify telecommunications transmission paths around wind turbines.
- Modify existing telecommunications infrastructure to improve performance.

Where these options require future investigation, any interaction and/or cumulative impact as a result of the developments listed in the EMI report and this EIS (or any additional developments that have entered the public domain since) would be considered.

6.13.4 Blade Throw

The SEARs require an assessment to:

> *assess blade throw risks, including consideration of battery energy storage facilities.*

A Blade throw Assessment has been undertaken by Middleton Group Engineering (MGE) (refer to **Appendix 19** to address the above SEARs. The purpose of the assessment was to estimate risk to people associated with a blade failure event, based on the likelihood of a human occupying space within the potential impact zone and the likelihood of blade failure event occurring.

Blade throw is defined as an incident where the WTG blade detaches or partially detaches and is thrown into the surrounding area. For modern wind farms, blade throw is a very rare occurrence but prudent planning requires the risk of a blade throw event be considered in the design process. In Australia, there has only been five (5) blade throw events, of which data anecdotally suggests that manufacturing defects and lightning were key causes of WTG blade failure.

For the purposes of the Project assessment, blade throw is defined as a catastrophic blade failure, which is divided into two (2) types of events: blade drop and fragmentation. Blade drop is defined as detachment of the whole blade or the majority of the blade from the WTG hub. Fragmentation is defined as an event where a smaller blade fragment such as a blade tip or part of the shell detaches from the blade proper.

Modern WTGs and components supplied by major manufacturers are generally designed and certified in accordance with recognised international standards to ensure structural integrity and safe operation over the lifetime of the WTG, including International Electrotechnical Commission (IEC) Standard 61400-23.

In addition to meeting the required design and manufacturing standards, modern WTGs incorporate sophisticated control systems that are designed to shut the WTG down during high wind speed conditions and in response to a range of faults or abnormalities detected during operation. These control systems include redundant monitoring and protection systems that are intended to prevent situations where the WTG rotor could accelerate to speeds higher than its rated speed. Other conditions that may indicate a structural blade failure and which will cause a WTG to automatically shut down include abnormal vibration, rotor imbalance, or reduced power output. The WTGs also have lightning protection systems, which prevents damage caused by lightning strikes and is usually limited to the blade surface where it can be seen and repaired during preventative maintenance operations.

Operational monitoring and maintenance programs implemented at wind farms help to increase the likelihood that WTG faults or minor damage are prevented or are detected and rectified at an early stage, thus reducing the risk of serious or dangerous problems developing. Spark Renewables will maintain on-site monitoring and maintenance programs, that will allow the Project to be monitored remotely and may assist in detecting potential faults or damage early and quickly.

Compliance with international standards, implementation of high-quality maintenance programs, and continual improvements in WTG design and materials mean that blade failure is relatively rare for modern WTGs and does not typically result in the detachment of blades or blade fragments.

The blade throw assessment provides an estimate of the risk to human life associated with a blade failure event, based on likelihood of a human occupying space within the potential impact zone at the time of blade failure. Two (2) impact radii are considered – a 300 m radius to account for blade drop events and an 800 m radius to account for fragmentation. It is noted that the distance between the nearest dwelling and a proposed WTG location is more than 10 km. The various models and empirical data examined demonstrate that the risk associated with blade throw dwelling is negligible as they are beyond the potential impact area.

The likelihood of a fatal blade throw event, the instance when a WTG loses all or part of its blade, at the Project is estimated to be once in 28.5 million years, which is comfortably within the bounds of what is considered to be broadly acceptable.

Thus, the likelihood of such an event occurring is very low and the level of risk is well within the bounds of being considered acceptable. To provide a risk comparison, Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning (HIPAP 4) (DPIE, 2011) provides suitable thresholds of acceptability for various land uses. The HIPAP 4 acceptable risk threshold for hospitals, schools, child-care facilities and old age housing is a 2 million year return period and for residential, hotels, motels and tourist resorts is a 1 million year return period.

One farm building lies within 400 m of a turbine. The likelihood that it is struck in a blade throw event is estimated to be once in 5.97 trillion years, which is also comfortably within the bounds of what is considered to be broadly acceptable.

This estimate is based on the characterisation of the following:

- The likelihood of a blade failure, based on existing Australian wind turbines and reported blade failure events in Australia.
- The impact area of such a blade failure.
- The likelihood that the impact extent of such a blade failure would be occupied.
- The likelihood that a person or dwelling is within the landing zone.

The low likelihood of adverse outcome is due to low incidence of failure and low rates of occupation in the vicinity of the WTGs.

6.13.4.1 Mitigation and Management Measures

The Project design has avoided, minimised and mitigated risks and impacts associated with blade throw. Accordingly, there are no Project-specific recommendations made in the Blade Throw Assessment.

However, a range of standard recommendations are made in line with best industry practices, which will be implemented by Spark Renewables during the life of the Project. These include ensuring all WTGs:

- **BT01:** are manufactured and certified to achieve relevant Australian and international safety standards (IEC 61400-23).
- **BT02:** are equipped with suitable measurement instrumentation that can detect and then respond to any rotor blade imbalances and shut down WTG if required.
- **BT03:** will be suitably managed and maintained according to industry best-practice standards and are subject to a regular and comprehensive maintenance and servicing regime.
- **BT04:** Additionally, should any substantial changes to the WTG layout occur in the future (i.e. moving WTGs beyond approved micro-siting limits) blade throw risks will be reviewed and the following measures implemented as part of any future modification application:
    - Modify the design to either relocate and/or remove WTGs to avoid, minimise and/or mitigate any blade throw issues, risks and impacts.
    - Confirm during detailed design that any change in probability of fatality, and blade fragmentation and blade drop risk at FB2 (a farm building located within 400 m of T14, as seen in Figure 10 of **Appendix 19**), as a result of any relevant design modification (i.e. relocation of WTG near FB2) results in a risk and associated impact being maintained within suitable thresholds of acceptability.

6.13.5 Health (EMF)

The SEARs require an assessment to:

> *Consider and document any health issues having regard to the latest advice of the National Health and Medical Research Council, and identify potential hazards and risks associated with electric and magnetic fields (EMF) and demonstrate the application of the principles of prudent avoidance, including an assessment against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields.*

Electric and Magnetic Fields (EMFs) were considered within the PHA undertaken by Riskcon Engineering (refer to **Appendix 16**) and demonstrates the Project's compliance with ICNIRP Guidelines.

The following is an excerpt from the PHA (refer to **Appendix 16**).

6.13.5.1 Introduction

EMFs are associated with a wide range of sources and occur both naturally as well as man-made. Naturally occurring EMFs, occurring during lightning storms, are generated from Earth's magnetic field. Man-made EMFs are present wherever there is electricity; hence, EMFs are present in almost all built environments where electricity is used.

Extremely low frequency (ELF) electric and magnetic fields (EMF) occupy the lower part of the electromagnetic spectrum in the frequency range 0-3,000 Hz at which point, the current will change direction 0-3,000 times a second. ELF EMF result from electrically charged particles. Artificial sources are the dominant sources of ELF EMF and are usually associated with the generation, distribution and use of electricity at the frequency of 50 Hz in Australia. The electric field is produced by the voltage whereas the magnetic field is produced by the current.

BESS create EMFs from operational electrical equipment, such as transmission lines, transformers and the electrical components found within BESS units, inverters, etc. This equipment has the potential to produce ELF EMF's in the range of 30 to 300 Hz.

6.13.5.2 Existing Standards

There are currently no existing standards in Australia for governing the exposure limits to ELF EMFs; however, the ICNIRP has provided some guidelines around exposure limits for prolonged exposure which limits the exposure to 2,000 milligauss (mG) for members of the public in a 24 hour period (International Commission on Non-Ionizing Radiation Protection, 2010).

Table 6.34 provides typical magnetic field measurements and ranges associated with EMF sources. It is noted that electric fields around devices are generally close to 0 due to the shielding provided around the equipment. In addition, EMF levels drop away quickly with distance; hence, while a value may be measurable at the source, within a short distance the EMF is undetectable.

Table 6.35 EMF Sources and Magnetic Field Strength

Source	Typical Measurement (mG)	Measurement Range (mG)
Television	1	0.2–2
Refrigerator	2	2–5
Kettle	3	2–10
Personal computer	5	2–20
Electric blanket	20	5–30
Hair dryer	25	10–70
Distribution powerline (under the line)	10	2–20
Transmission power line (under the line)	20	10–200
Edge of easement	10	2–50

6.13.5.3 Exposure Discussion

A review of the site indicates that the closest dwelling is over 5 km away from the Disturbance Footprint, providing substantial distance for attenuation of EMFs. Based upon the typical levels which may be generated by transmission equipment the cumulative effect would not exceed the 2,000 mG limit for prolonged exposure. In addition, the closest dwelling is over 5 km away from the EMF generating sources including electrical infrastructure; hence, the potential for the EMF to exceed the accepted levels is considered negligible.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) advises that the strength of radiation decreases exponentially with distance from the source, and it will become indistinguishable from background radiation within 50 m of a high voltage power line and within 5 to 10 m of a substation (EMM Consulting Pty Ltd, 2021).

A field study was undertaken to characterise the EMF between the frequencies of 0–3 GHz at two large scale facilities operated by the Southern California Edison Company in Porterville and San Bernardino (Tell, et al., 2015).

The field study findings were adopted to estimate the EMF measurements for the Project. The findings are as follows:

- The highest DC magnetic fields were measured adjacent to the inverter (277 µT) and transformer (258 µT). These fields were lower than the ICNIRP's occupational exposure limit.
- The highest AC magnetic fields were measured adjacent to the inverter (110 µT) and transformer (177 µT). These fields were lower than the ICNIRP's occupational exposure limit.
- The strength of the magnetic field attenuated rapidly with distance (i.e. within 2–3 metres away, the fields drop to background levels).
- Electric fields were negligible to non-detectable. This is mostly likely attributed to the enclosures provided for the electricity generating equipment.

As the strengths of EMF attenuate rapidly with distance, the ICNIRP reference level for exposure to the general public will not be exceeded and impact to the general public in surrounding land uses is negligible.

As the potential for exposure to EMF exceeding the international guidelines is negligible, this incident was not carried forward for further analysis within the PHA.

6.13.5.4 Mitigation and Management Measures

The Project design has avoided, minimised and mitigated risks and impacts associated with EMF.

EMF01: Should any substantial changes to the WTG layout and associated electrical infrastructure occur in the future (i.e. moving WTGs beyond approved micro-siting limits) potential EMF impacts, however unlikely, will be reviewed as part of any future modification application. If impacts are identified as a result of future design changes the following conceptual avoidance, minimisation and/or mitigation options would be considered:

- Confirm during detailed design that any change in EMF, as a result of any relevant design modification results in a risk and associated impact being maintained within suitable thresholds of acceptability.
- If required, modify the design to either relocate and/or remove infrastructure to avoid, minimise and/or mitigate any EMF issues, risks and impacts.

Where these options require future investigation, any interaction and/or cumulative impact as a result of the developments listed in this EIS (or any additional developments that have entered the public domain since) would be considered.

6.13.6 Aviation

The SEARs require an assessment to:

- assess the impact of the development under the National Airports Safeguarding Framework Guideline D: Managing Wind Turbine Risk to Aircraft
- provide associated height and co-ordinates for each turbine assessed

- assess potential impacts on aviation safety, including cumulative effects of wind farms in the vicinity, potential wake / turbulence issues, the need for aviation hazard lighting and marking, including of wind monitoring masts, considering, defined air traffic routes, aircraft operating heights, approach / departure procedures, radar interference, communication systems, navigation aids, and use of emergency helicopter access
- identify aerodromes within 30 km of the turbines and consider the impact to nearby aerodromes and aircraft landing areas
- address impacts on obstacle limitation surfaces
- assess the impact of the turbines on the safe and efficient aerial application of agricultural fertilisers and pesticides in the vicinity of the turbines and transmission line.

An Aviation Impact Assessment (AIA) was prepared by Aviation Projects to review potential aviation impacts associated with the Project and provide aviation safety advice with respect to relevant air safety regulations, guidelines and procedures. The AIA is presented in **Appendix 20**, with the key findings summarised below.

6.13.6.1 Assessment Results

Initial consultation was undertaken with Airservices Australia (AsA), Department of Defence, Wentworth Shire Council, Mildura Airport Pty Ltd, Royal Flying Doctor Service, NSW Rural Fire Service, Fire and Rescue NSW during the preparation of the AIA. At time of preparing this EIS, no concerns had been raised by these agencies regarding the findings and recommendations of the AIA. However, Spark Renewables will continue to engage with the agencies during the assessment process and will address any subsequent comments in the Submissions Report.

The Project satisfies relevant aviation safety requirements of the Wentworth LEP (2011). It will not create incompatible intrusions, adversely affect or compromise the safety of existing airports and associated navigation and communication facilities.

Based on the WTG layout and maximum blade tip height of up to 280 m AGL, the blade tip elevation of the highest WTG (WTG15), will not exceed 398.2 m AHD (1306.3 ft AMSL) and:

- There are two certified aerodromes located within 30 nm (55.56 km) of the Project – Mildura and Wentworth aerodromes.
- The Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS) surfaces at Mildura Airport, related to the 25 nm and 10 nm minimum sector altitude (MSA) are infringed by the Project. An amendment to the 25 nm MSA will require consequential amendments to the holding patterns and commencement altitudes to the instrument approaches. Wentworth Airport is not provided with instrument approach procedures.
- The obstacle limitation surface (OLS) at each airport is not infringed by the Project.
- There is one uncertified aerodrome identified within three (3) nm of the Project Boundary – Trentham Cliffs aerodrome. The WTGs with current siting will not impact circuit operations and will not have wake turbulence impacts on aircraft operating to and from this runway.

- The WTGs will infringe the relevant Grid lowest safe altitude (LSALTs).
- The WTGs will infringe three air routes – Q4, J10, W451.
- The Project Area is located within Class G airspace and outside all controlled airspace and Special Use Airspace.
- The WTGs will not impact the aviation navigation facilities.
- The WTGs will not impact on the closest radar installations.

Aviation Projects undertook a safety risk assessment of the Project and concludes that:

- The proposed WTGs would not require obstacle lighting to maintain an acceptable level of safety to aircraft.
- Over the 14-year period between 2010 and 2024, no aircraft collided with a WTG or a WMT in Australia.
- There is no regulatory requirement to mark or light power poles or overhead transmission line.
- Given that aerial operators might use the airspace within the Project Area and that it is expected that WMTs, especially temporary WMTs will be constructed prior to WTGs, the WMTs may be free-standing and not surrounded by any other obstacles. Therefore, the proposed temporary WMTs with a maximum height in excess of 152.4 m AGL, should be marked with red/white/red bands and have obstacle lighting fitted at the top of the mast to ensure visibility in low light and deteriorating atmospheric conditions as per the NASF Guideline D. CASA is likely to recommend obstacle lighting be fitted to temporary free standing WMTs.

6.13.6.2 Mitigation and Management Measures

Spark Renewables will implement the following mitigation and management measures, consistent with the recommendations of the AIA:

Notification and Reporting

- **AV01**: Details of the Project have been reported to CASA in accordance with CASR Part 139.165(1)(2).
- **AVO2**: 'As constructed' details of WTG coordinates and elevation have been provided to AsA, by submitting the form at this webpage: https://www.airservicesaustralia.com/wp-content/uploads/ATS-FORM-0085_Vertical_Obstruction_Data_Form.pdf to the following email address: <vod@airservicesaustralia.com>.
- **AVO3**: Any obstacles above 100 m AGL (including temporary construction equipment) will be reported to AsA NOTAM office until they are incorporated in published operational documents. With respect to crane operations during the construction of the Project, a notification to the NOTAM office may include, for example, the following details:
    - The planned operational timeframe and maximum height of the crane.
    - Either the general area within which the crane will operate and/or the planned route with timelines that crane operations will follow.

- **AV04:** Spark Renewables will continue to consult with local and regional aircraft operators and provide them with details of the Project prior to construction in order for them to consider the potential impact of the wind farm on their operations.

  AVO5: To facilitate the flight planning of aerial application operators, details of the Project, including the 'as constructed' location and height information of WTGs and overhead transmission lines should be provided to landowners so that, when asked for hazard information on their property, the landowner may provide the aerial application pilot with all relevant information.

Marking of WTGs and WMTs

- **AVO7**: The rotor blades, nacelle and the supporting tower of the WTGs should be painted white, typical of most WTGs operational in Australia. No additional marking measures are required for WTGs.
- **AVO8**: While it is not mandatory to mark the WMTs, however the following measures will be implemented in consideration of potential day visual flight rules (VFR) aerial work operations in accordance with NASF Guideline D:
  - obstacle marking for at least the top 1/3 of the mast and be painted in alternating contrasting bands of colour
  - marker balls or high visibility flags or high visibility sleeves placed on the outside guy wires
  - guy wire ground attachment points in contrasting colours to the surrounding ground/vegetation.

Micrositing

- **AV09:** Providing the micrositing is within 100 m of the planned WTGs it is not likely to result in a change in the maximum overall blade tip height of the Project. No further assessment is likely to be required from micrositing and the conclusions of the AIA would remain the same.

Triggers for Review

- **AV10:** Triggers for review of this risk assessment are provided for consideration:
  - following any significant changes to the context in which the assessment was prepared, including the regulatory framework
  - following any near miss, incident or accident associated with operations considered in this risk assessment.

Aerial Firefighting

- **AV11:** Spark Renewables will ensure that:
  - Liaison with the relevant fire and land management agencies is ongoing and effective.
  - Access is available to the Project Area by emergency services response for on-ground firefighting operations.
  - Wind turbines are shut down immediately during emergency operations – where possible, blades should be stopped in the 'Y' or 'rabbit ear' position, as this positioning allows for the maximum airspace for aircraft to manoeuvre underneath the blades and removes one of the blades as a potential obstacle.

6.14 Waste Management

The SEARs require an assessment to:

> *identify, quantify and classify the likely waste streams to be generated by the Project during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.*

An assessment of waste management in accordance with the SEARs is presented below.

6.14.1 Existing Waste Management Facilities

The Project is located within proximity of three LGAs with waste management facilities that may be used during the construction, operation or decommissioning phases of the Project. Spark Renewables will select the waste, recycling and disposal facilities to be utilised by the Project during the detailed design and contract development stage of the Project, in consultation with local councils and the facility operators. These facilities will be identified in the CEMP, OEMP and DRP.

Wentworth Shire Council hosts numerous landfills and waste transfer stations within 75 km of the Project Area. The largest waste facility in the LGA is Buronga Landfill which is located 14 km west of the Project Area. Spark Renewables have consulted with Wentworth Shire Council regarding the Project including with regard to waste management. Waste accepted at the Buronga Landfill includes Asbestos, Chemical Drums, Clean Fill, Commercial Recycling (cardboard & comingle), Commercial Waste Truck loads, Concrete, Contaminated Fill, Scrap Metal and Waste Oil (Wentworth Shire Council, 2024).

Other facilities in the region include Poonacaria Landfill, Ellerslie, Dareton Transfer, Wentworth Transfer Station and Pomona Tip.

Recycling facilities within the Wentworth Shire Council are outlined below (**Table 6.36**).

Table 6.36 Recycling facilities in Wentworth Shire Council

Facility	Recycling capability
Wentworth and Dareton Transfer Stations	Scrap metal, green waste and cardboard.
Pomona Tip	Scrap metal and green waste.
Buronga Landfill	Tyres (refer to charges), mattresses and clean fill, concrete, oil, gas bottles/cylinders, green waste, scrap metal, pushbikes, cardboard, glass, plastic bottles, car batteries.

Within the Balranald Shire Council, the Euston Landfill is located 50 km from the Project Area along the Sturt Highway. Waste accepted at Euston Landfill includes Mixed waste, Green Plastics and Aluminium Metals, Building Waste, Electronic waste and white goods (Balranald Shire Council, 2024).

The Mildura LGA is located across the Victorian border and is located 17 km south-west of the Project. The nearest landfill within the Mildura LGA is Mildura Landfill located 15 km south-west of the Project. Accepted waste includes domestic waste, commercial waste, polystyrene, asbestos and contaminated soil. Other waste facilities in the Mildura LGA include Cullulleraine Transfer Station, Nangiloc Transfer Station.

Mildura Landfill also has recycling capabilities including glass jars and bottles, cans, paper, rigid plastic containers, steel, mattresses, E-waste, automotive oil and green / garden waste.

Prior to the use of Victorian waste facilities, the appropriate council will be contacted, and any relevant Victorian legislation will be complied with and considered within the Waste Management Plan as detailed in **Section 6.14.2**.

Waste water from worker amenities, including the TWA facility and O&M facilities will be pumped out from on-site septic tanks and transported by tanker trunk to a suitably licensed facility.

6.14.2 Waste Classification

The Waste Classification Guidelines: Part 1 Classifying Waste (EPA, 2014) provide direction on the appropriate classification of waste, specifying requirements for management, transportation, and disposal of each waste category. Should waste be found to be unsuitable for reuse or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the Waste Classification Guidelines (EPA, 2014).

6.14.3 Methodology

The identification, quantification and classification of waste streams has been completed using data provided by Spark Renewables.

The subsequent measures for the management of waste have been guided by best-practice principles and in accordance with the following legislation and guidelines:

- NSW *Protection of the Environment Operations Act 1997* (POEO Act).
- NSW Protection of the Environment Operations (Waste) Regulation 2014.
- NSW *Waste Avoidance and Resource Recovery Act 2001* (WARR Act).
- Waste Classification Guidelines – Part 1: Classifying wastes (EPA, 2014).
- Waste Avoidance and Resource Recovery Strategy 2014–2021 (EPA, 2014).

Best practice waste management involves implementation of resource management hierarchy principles as specified in the WARR Act, and the principles of ecologically sustainable development, which include:

- avoidance of unnecessary resource consumption
- resource recovery (including reuse, reprocessing, recycling and energy recovery)
- disposal, including management of all disposal options in the most environmentally responsible manner in accordance with the Waste Avoidance and Resource Recovery Strategy 2014–2021 (EPA, 2014).

The WARR Act is underpinned by a waste hierarchy, which establishes a set of priorities for the efficient use of resources. This hierarchy is, in order of priority (EPA, 2022):

1. **Avoidance** including action to reduce the amount of waste generated by households, industry and all levels of government.

2. **Resource recovery** including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources.

3. **Disposal** including management of all disposal options in the most environmentally responsible manner.

Spark Renewables is committed to ensuring waste generated by the Project is managed in accordance with this waste management hierarchy. While many wastes can be avoided, recycled or reused, some wastes will need to be disposed of to landfill, and in this case Spark Renewables will liaise with the relevant local authorities to work with them to manage this, and cumulative impacts, that may result from the waste disposal needs of multiple developments in the region.

6.14.3.1 Construction and Operation

The potential waste streams expected to be generated by the Project during the construction, operation and decommissioning phases are quantified **Table 6.37**.

The construction period of the Project will result in the largest contribution of waste across the lifetime of the Project, most of which will be required to be disposed of off-site. Onsite use of waste would be limited to reuse of excavated materials, including topsoil, excavated rock and sediment recovered from erosion and sediment control devices which will be reused onsite as general fill material, or it will be incorporated within landscaping materials, where possible.

Waste generated during construction would mainly arise from works associated with site preparation, demolition (if required), construction of access tracks, landscaping and the construction of operational infrastructure. Additionally, packaging materials for components and materials such as pallets, plastic and cardboard are anticipated. During construction a TWA facility will also be in use which will produce putrescible waste from amenities as well as sewage waste.

Under the waste definitions in the POEO Act, most of the waste generated during the construction phase would be classified as general solid waste, either putrescible or non-putrescible as outlined in **Table 6.38**.

During operations waste generation would be limited to minor quantities of waste from staff amenities, redundant equipment and maintenance activities. The potential impacts associated with waste generation and management during the operational phase would be similar to those for construction, albeit at a much smaller scale. Waste streams during the operation of the Project would be limited to minor quantities of putrescible waste from staff amenities, redundant equipment, and general waste from maintenance activities.

Some materials such as fuels and lubricants, redundant equipment and metals may require very infrequent replacement over the operational life of the Project and there will be some disposal of these used materials (e.g. replacement oil) and equipment which has reached its operational life.

On-site waste management will include the appropriate separation and storage of waste streams to enable recycling and reuse wherever possible to reduce associated environmental impacts and impact to the capacity of local waste management facilities.

Table 6.37 Waste Classification and Expected Waste Types

Waste Classification	Construction	Operations	Decommissioning
Liquid Waste	Waste oils, lubricants and liquids, paint, and sewage ablutions.	Waste oils, lubricants and liquids, paint, and sewage ablutions.	Waste oils, lubricants and liquids, paint, and sewage ablutions.
General Solid Waste (Non-Putrescible)	Green waste from site establishment and clearing of Disturbance Footprint, spoil from site earthworks, concrete, footings and laydown area waste, timber and packaging (including pallets), plastic packaging, other plastics (PET), cardboard packaging, paper, glass, empty chemical drums, oil spill clean-up material, metal offcuts and damaged metal (ferrous and non-ferrous), electronics and electrical infrastructure, recyclable domestic waste and personal protective equipment (PPE).	Timber and packaging (including pallets), plastic packaging, other plastics (PET), cardboard packaging, paper, glass, empty chemical drums, paint, oil spill clean-up material, metal offcuts and damaged metal (ferrous and non-ferrous), electronics and electrical infrastructure, recyclable domestic waste and PPE.	Spoil from excavations and removal of infrastructure concrete, footings and laydown area waste, timber and packaging (including pallets), plastic packaging, other plastics (PET), cardboard packaging, paper, glass, empty chemical drums, oil spill clean-up material, metal offcuts and damaged metal (ferrous and non-ferrous), electronics and electrical infrastructure, recyclable domestic waste and PPE.
General Solid Waste (Putrescible)	Domestic waste.	Domestic waste.	Domestic waste.

Potential management actions that may be required to manage waste have been identified for each potential waste type identified in **Table 6.38**, including indicative quantities (construction and operations phase).

Table 6.38 Indicative Waste Generation and Management Activities

Waste Classification	Description	Classification	Indicative Quantity	Management Measures
Paper and cardboard	Packaging materials and general office waste.	General Solid Waste (non-putrescible)	650 m^3	Separated for recycling at a licenced facility.
Wood	Pallets, cable drums and timber offcuts	General Solid Waste (non-putrescible)	1,100 m^3	Separated for reuse or recycling at a licenced facility.
Plastic	Packaging materials, ties, straps and excess building materials such as safety fencing and barriers.	General Solid Waste (non-putrescible)	<500 m3	Hard and soft plastics separated for recycling, where practicable, or disposal at a licenced facility.
Concrete and aggregate	Waste from turbine foundations, concrete overspill, and access roads	General Solid Waste (non-putrescible)	4,000 t	Separated for re-use, or collection by a contractor and recycled or disposed at a licensed facility if unable to be recycled.
General mixed waste	Miscellaneous mixed waste	General Solid Waste (non-putrescible)	500 t	Collection by a contractor and disposed of to a licensed facility.
Metals	Excess building materials such as safety fencing, barriers, retired equipment, cable drum fasteners and framing for transporting turbines.	General Solid Waste (non-putrescible)	500 t	Separated for reuse or recycling at a licenced facility.
Green waste	Vegetation waste from clearing activities.	General Solid Waste (non-putrescible)	Minor quantities	Beneficial on-site or off-site reuse or recovery at a green waste facility.
Spoil from earthworks	Surplus spoil from excavations and earthworks that is not suitable for onsite re-use.	General Solid Waste (non-putrescible) or virgin excavated natural material (VENM)	Minor quantities	Off-site reuse where practicable if classified as VENM or disposal at a licensed facility.
Electrical	Excess building materials or retired equipment.	E-waste	Minor quantities	Separated for reuse or recycling at a licenced facility.
Liquid waste	Oils and fuels, contaminated water from equipment washing.	Liquid waste	Minor quantities	Collection in drums or tanks for disposal at a licensed facility.
Sewage	Biological waste from on-site treatment systems (including from accommodation facilities).	Liquid waste and General Solid Waste (non-putrescible)	84 ML (waste demand and wastewater load for accommodation	On-site treatment infrastructure will be used to treat sewage and will produce:

Waste Classification	Description	Classification	Indicative Quantity	Management Measures
			and construction amenities over 3-year construction period)	• treated effluent (i.e. water) suitable for reuse for construction purposes, which will be stored in sealed tanks or lined basins. • waste solids, which will be emptied by a licensed contractor and disposed of at an appropriately licensed facility.
General domestic	Food scraps aluminium cans, glass bottles, plastics and paper containers	General Solid Waste (putrescible and non-putrescible)	Minor quantities	Separation on site and collection by a contractor and recycled or disposal at a licensed facility.
Commercial waste	Oily rags, filters and drums (non-volatile).	General Solid Waste (non-putrescible)	Minor quantities	Collection by a contractor and disposal at a licensed facility.
Waste batteries	Retired batteries used in construction appliances and equipment.	Hazardous waste	Minor quantities	Collection by a contractor and disposal at a licensed facility.

6.14.3.2 Decommissioning

Spark Renewables acknowledges that waste generation associated with Project decommissioning was identified as a key issue of concern for the community during engagement. A Decommissioning and Rehabilitation Strategy (DRS) (Appendix 4 of **Appendix 14**) has been prepared for the Project based on this feedback, and to achieve the general decommissioning requirements provided in the Wind Energy Guideline (DPE, 2016a).

Decommissioning is discussed in general terms within Section 3 of the Wind Energy Guideline, and states that certain issues which are specifically relevant for wind energy developments are to be considered in the environmental assessment (i.e. EIS), as follows: "decommissioning – consideration will be given as to whether suitable arrangements for decommissioning and rehabilitation of the site are in place". Section 4.3.4 of the Wind Energy Guideline then discusses more specific matters relating to refurbishment and decommissioning aspects of a wind energy development, including a typical timeline that WTG are decommissioned, the need for decommissioning to be included in the environmental assessment (i.e. EIS), the NSW Government's policy relating to decommissioning responsibilities, and these responsibilities being addressed in private agreements.

The DRS was prepared to achieve the above-mentioned objectives and provides a high-level strategy which outlines the current methodology that may be used to decommission all infrastructure associated with the Project and rehabilitate the land at the end of the Project's economic life. It provides the basis of a future Decommissioning and Rehabilitation Management Plan (DRP) which will be developed to address Development Consent conditions for the Project if approved.

The DRP will be developed for the Project prior to closure which will include a detailed review of the associated waste streams and recycling/disposal options available at the time.

As outlined in the DRS, all above-ground components, including WTGs, electrical infrastructure, buildings, and equipment will be removed from site as part of the decommissioning process. Additionally, foundations will be excavated to at least 500 mm below ground level and backfilled with topsoil for rehabilitation. WTGs will be sequentially removed and transport off site for re-use, sale, or recycling, with all costs incurred by Spark Renewables. The same process will be followed for the removal of an individual turbine during operations in the event of malfunction.

After dismantling of the WTGs, components will be either be sold and transported to another site for reuse or sold to the scrap metal market. The methods for re-using or recycling WTG components, particularly turbine blades, is based on current technology. There is an emerging WTG refurbishment industry internationally, however as most Australian wind farms are still within their operational life the industry is still developing in Australia. As wind farms are decommissioned across Australia over the coming years there will be a growth in providers tendering to procure, transport and sell wind farm components and scrap material for future uses, and this growth will be reflected in future development and reviews of the DRP.

After the assets are removed, most of the materials will be reclaimed or recycled, given the significant value of the steel, copper, aluminium and other materials. It is important to note that the recycling of WTGs is an evolving space with research and experimentation occurring across the world to find ways to recycle WTG components at the end of its life. Spark Renewables has committed to the adoption of best practice to reuse, recycle and dispose of turbine components at the time of decommissioning.

Depending on the type of battery storage technology selected for the Project and based on the rapid rate of change in recycling technology for these items, locally available initiatives will be assessed at the time of replacement/decommissioning.

Although to a lesser degree compared to the construction phase, solid wastes will be generated by decommissioning activities including non-putrescibles and putrescibles (refer to **Table 6.32** and **Table 6.33**). Solid wastes include packaging, excess building materials, general refuse, and other non-putrescible wastes will be disposed of using waste management facilities.

Decommissioning and rehabilitation of the Project at the end of its operational life is the obligation and cost of the Project owner. Although there are currently no examples of wind farm decommissioning in Australia, data available from overseas operations suggests that the salvage value of turbine components has the potential to cover the cost of decommissioning of wind farm infrastructure and site rehabilitation.

Based on data from other wind farm operations both internationally and in Australia, and assuming that the Project will be decommissioned by recycling the WTGs for scrap rather than reuse, it is expected that the scrap return of the WTGs and associated infrastructure will cover the Project decommissioning and rehabilitation costs, although a full cost estimate of decommissioning and rehabilitation for the Project will be undertaken and provided in the DRP.

6.14.4 Minimisation and Management Measures

The mitigation and management measures to be implemented as part of the Project to minimise impacts on waste include:

W01: As part of the detailed design and construction phase a Waste Management Plan will be prepared which will include a detailed breakdown of waste types and quantities in accordance with relevant legislation and guidelines.

The Waste Management Plan will outline the measures and strategies to be implemented on site to manage, reuse, recycle and safely dispose of waste including:

- separation and storage of recyclable and non-recyclable materials
- reuse and collection/transportation of waste
- procedures for tracking waste storage and disposal.

W02: Spark Renewables has committed to develop and implement a detailed DRP for the Project in consultation with key stakeholders, to guide the decommissioning of the Project and the rehabilitation of the site and to mitigate any negative legacy impacts to the community.

To cover any potential future shortfall in the decommissioning costs Spark Renewables will commit to the following conditions to be included in any development approval issued:

6.15 Cumulative Impact Assessment Summary

The Cumulative Impact Assessment Guidelines for State Significant Projects (CIA Guidelines) (DPE, 2022) require an assessment of a Project's impacts both alone and in combination with impacts generated by other existing and planned development. In undertaking an assessment of cumulative impacts, the CIA Guidelines require consideration of:

- existing development within the locality and region, as well as planned changes to existing projects (such as expansion, modification, closure)
- approved projects (where development consent has been granted but construction has not commenced)
- projects under assessment (application for the project has been exhibited and is currently under assessment)
- related development (development that is required for the Project but subject to separate assessment.

In accordance with the CIA guidelines, a scoping summary was prepared to identify the potential for cumulative impacts to occur as a result of the Project (**Appendix 23**). Further details on the identified developments are provided in **Section 6.15.2**. It should be noted that not all proposed projects will be approved and not all approved projects may be constructed for example some renewable projects may not get access to the grid.

Due to the nature of wind farm operations, most of the potential cumulative impacts are associated with the construction phase (particularly traffic and social/economic impacts) with some issues such as visual and noise having ongoing operational impacts that may also be cumulative in nature. Many of the other impacts associated with the operations phase of wind farm projects are generally limited due to separation of the projects, the low operational workforce numbers and minimal works required at this time.

For some technical matters, where the Project will only result in minor impacts that can be effectively managed using standard management techniques and design features (e.g. hazards and water/soils) and where impact envelopes (where relevant) are contained within the Project Area, the Project is not considered to materially contribute to potential cumulative impacts and therefore these issues have not been highlighted as requiring further cumulative assessment for the Project. This is not to infer that other projects with a higher risk of impact or impact envelope may not contribute to cumulative impacts, rather it is that this Project will not materially contribute to any such cumulative impact and therefore does not require further assessment within this EIS.

Specialist studies were finalised incrementally during the delivery of this EIS and have listed key projects considered with respect to cumulative impacts as relevant to the specialist assessment. That list of projects is broad and provided consideration of the proximal projects identified in this EIS but is not exhaustive and may exclude select and/or newly exhibited projects e.g. at the Scoping phase, which present either a very limited risk of cumulative impacts occurring or current provide limited information for any detailed assessment to occur.

While there are many other projects currently taking place or undergoing planning assessment within the vicinity of the Project Area due to its location within the South West REZ, many were excluded from further cumulative assessment due to distance exceeding 75 km from Project and based on the available information at the time of writing. The projects identified as requiring further consideration as part of the cumulative assessment are outlined in **Section 6.15.2**.

The key potential cumulative impacts associated with the Project are detailed in **Appendix 23**. A cumulative impact assessment summary is provided in **Section 6.15.2** including:

- Cumulative biodiversity and Aboriginal cultural heritage impacts.
- Cumulative amenity issues, including noise at nearby dwellings and visual impacts of the Project combined with other projects in the viewshed.
- Cumulative traffic generation associated with the Local Transport Route combined with other projects utilising parts of the same route.
- Cumulative social and economic impacts.

All environmental and social matters were considered with respect to potential cumulative impacts within each specialist assessment, but for brevity **Appendix 23** presents a scoping summary of only the key matters summarised above.

6.15.1 Strategic Context

The strategic context of the Project is discussed in **Section 2.1** with respect to the renewable energy market and relevant policy. Regional strategic plans and policies are then discussed in **Section 2.2**. With respect to the Project and other relevant future and existing projects (mostly SSD wind farms, with some SSD solar projects, battery storage projects, Project EnergyConnect and mining and resources) that are prevalent within the South West REZ most align with the relevant Commonwealth and State objectives outlined in this EIS, and those situated close to the Project Area are assumed to achieve the objectives of shared regional strategic plans and policies. In particular most achieve the objectives of the United Nations SDG (United Nations, 2023), UNFCC COP28 (UNFCCC, 2023) and COP21 (UNFCCC, 2021).

Consistent with the Project, these other relevant future and existing renewable energy developments are anticipated to provide affordable, reliable and sustainable energy and would assist achieving Commonwealth and NSW emission reduction targets. They will also assist NSW in the development of affordable, reliable and sustainable renewable energy generation, transmission and storage. The South West REZ (and the development of Project EnergyConnect) will connect multiple generators and storage in the same area, to capitalise on economies of scale to deliver cheap electricity to homes and businesses in NSW.

These other relevant future and existing projects developments:

- Have or are in the process of progressing their respective development applications (predominantly SSDA renewable energy, wind and solar, projects) and the required environmental and social impacts assessments. Consistent with the objectives achieved for the Project these other assessments (which predominately require an EIS to be prepared) will assist to avoid, minimise, mitigate and/or manage potential impacts across key cumulative impact matters such as biodiversity, visual, social and economic, and traffic.

- Will provide social and economic benefit to the region and encourage economic development by supporting both employment and economic growth. While all developments are assumed to seek a percentage of local workforce and employment, labour from outside the region would still be required, however this will likely still provide a significant injection into the local economy as workers spend time and wages in town throughout the years of construction.

6.15.2 Identified Developments

This EIS identifies proximal developments in **Section 2.4.2**, i.e. other relevant future and existing projects proximal to the Project and those within the South West REZ in accordance with Section 3.4 of the CIA Guidelines. In summary these include:

- Mallee Solar Farm (SSD-69576706)
- Euston Mineral Sands Project (SSD-53674728)
- Gol Gol Solar Farm (SSD-70916707)
- Gol Gol Wind Farm (SSD-70849709)
- Gol Gol Battery Energy Storage System (SSD-70893706)
- Project EnergyConnect (NSW - Eastern Section) (SSI-9172452)
- Buronga Landfill Expansion (SSD-10096818)
- Euston Wind Farm (SSD-62466963)
- Koorakee Energy Park: Koorakee Energy Park (SSD-70640221)
- Lake Victoria Wind Farm (SSD-71630724).

As discussed in **Section 2.6**, there are 10 renewable energy, infrastructure and other major projects, including Project EnergyConnect, within approximately 75 km of the Project, based on the distance offset from the approximate centre of the Project Area and boundaries of adjacent developments as of 31 August 2024. Of the 10 projects, 2 (two) are approved (being Project EnergyConnect (NSW - Eastern Section) (SSI-9172452), Buronga Landfill Expansion (SSD-10096818)) and 8 (eight) are proposed. Of the 8 (eight) proposed projects, 5 (five) are preparing an EIS with the remaining 3 (three) at the Scoping stage and therefore having limited project information available.

6.15.3 Cumulative Impact Summary

Based on the information presented in **Appendix 23**, and that summarised above, a cumulative impact assessment summary is provided in **Table 6.39** below. All environmental and social matters were considered with respect to potential cumulative impacts within the respective specialist assessment, with **Appendix 23** presenting a scoping summary of the key matters.

In regard to biodiversity, a detailed assessment is included in **Section 6.2.6**, with the below summarising the outcomes and anticipated potential for cumulative impacts.

6.15.3.1 Visual

No cumulative visual impacts are anticipated with developments within 10 km of the Project including Euston Mineral Sands, Project EnergyConnect (NSW - Eastern Section), Gol Gol Solar Farm, Mallee Solar Farm, Gol Gol Wind Farm and Gol Gol Battery Energy Storage System as there are no dwellings within 8 km of any WTG (**Appendix 9**). The remaining projects considered in this cumulative impact assessment are beyond the assessment requirements under the Visual Bulletin.

6.15.3.2 Noise

No cumulative construction, operational and/or decommissioning noise impacts are anticipated as there are no dwellings within 8 km of the nearest WTG (**Appendix 10**).

Table 6.39 Cumulative Impact Assessment Summary – Key Matters

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Social / Economic
Euston Mineral Sands Project 0 km	Cumulative impacts would occur as a result of the construction of the Project and have been assessed in the BDAR presented in **Appendix 6**. The Euston Mineral Sands Project is anticipated to impact TEC also impacted by the Project. To manage cumulative biodiversity impacts with respect to Euston Mineral Sands Project, which is currently undergoing environmental assessment, the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and native vegetation is unavoidable in accordance with the BOS. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Whilst suitable avoidance and management of Aboriginal sites is required for both projects, the potential for cumulative impacts to occur is limited, as demonstrated in the ACHAR (**Appendix 7**). This finding was provided with respect to recorded AHIMs sites, consideration of intergenerational equity, and the broader Aboriginal cultural heritage resource of the geographic region. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic from the Euston Mineral Sands Project is expected to be contained the east of Mildura and as such is not anticipated to lead to any increases in volumes along Arumpo Road or at the key Silver City Highway / Arumpo Road intersection. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Euston Mineral Sands Project, as construction has the potential to overlap. Social and economic impacts and impacts of the Project have been identified as accessibility to services and infrastructure in Mildura and consultation fatigue. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.
Project EnergyConnect (NSW - Eastern Section) 0 km	Cumulative impacts would occur as a result of the projects construction and have been assessed within the BDAR presented in **Appendix 6**. Project EnergyConnect (NSW - Eastern Section) is anticipated to impact 1,615.20 ha of native vegetation comprised of 38 PCTs. Project EnergyConnect (NSW - Eastern Section) is also expected to impact five (5) threatened flora including one (1) species that was assumed present. To manage cumulative biodiversity impacts with respect to this approved project (under construction), the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Both Projects have minimised impacts to Aboriginal sites within the southern portion of the Project Area, although there is still potential for cumulative impacts to occur. The ACHAR (**Appendix 7**) demonstrated that this is limited, as with respect to recorded AHIMs sites, published reports for each development, consideration of intergenerational equity, and the broader Aboriginal cultural heritage resource of the geographic region. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	No cumulative traffic impacts are anticipated with Project EnergyConnect as construction periods are highly unlikely to overlap. No cumulative operational traffic impacts are anticipated.	Cumulative social and economic impacts are not anticipated with Project EnergyConnect, as construction periods are highly unlikely to overlap. With respect to this infrastructure project, and to address and respond to the social and economic impacts and opportunities of the Project as they relate to the workforce. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.
Gol Gol Solar Farm 3.3 km	Cumulative impacts would occur as a result of the projects construction and have been assessed within the BDAR presented in **Appendix 6**. Gol Gol Solar Farm, Battery Energy Storage System and Gol Gol Wind Farm have been assessed together for the purposes of cumulative impacts within the BDAR (**Appendix 6**). These developments are anticipated to impact three TECs have a moderate-high potential to occur on the subject land, these include: *Acacia loderi* shrublands, *Acacia melvillei* shrublands in the Riverina and Murray Darling Depression bioregions and Mallee Bird Community of the Murray Darling Depression Bioregion, EPBC Act. Limited surveys have been undertaken to date although two (2) threatened flora species are known to occur on or nearby the project investigation area and 34 threatened fauna species are known to occur on or nearby the project investigation area. To manage cumulative biodiversity impacts with respect to this approved project (under construction), the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	The projects have considered avoidance and management of Aboriginal sites within their design and assessment of environmental impacts. The ACHAR (**Appendix 7**) demonstrates that cumulative impacts are limited. This finding is based on recorded AHIMs sites, reports for each development, intergenerational equity, and the broader Aboriginal cultural heritage of the region. With mitigation and management measures, the residual cumulative impacts are considered acceptable.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for the construction of Gol Gol Solar Farm and the Project will be coordinated where practicable. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Gol Gol Solar Farm, due to the proximity of the projects, however it will depend on proposed construction time. Social and economic impacts of the Project have been identified as construction fatigue. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Social / Economic
Mallee Solar Farm 3.7 km	Cumulative impacts would occur as a result of the projects construction and have been assessed within the BDAR presented in **Appendix 6**. Mallee Solar Farm is anticipated to impact similar TEC, native vegetation and threatened species also impacted by the Project. To manage cumulative biodiversity impacts with respect to this approved project (under construction), the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Both Projects share a Project Boundary although their Disturbance Footprints are 3.7 km apart. Considering this distance, the ACHAR (**Appendix 7**) shows that the potential for cumulative impacts is limited. This assessment considers recorded AHIMs sites, development reports, intergenerational equity, and the broader Aboriginal cultural heritage of the region. With mitigation and management measures or each project, residual cumulative impacts are deemed acceptable.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for the construction Mallee Farm and the Project will be coordinated where practicable, as the two projects have the same proponent. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Mallee Solar Farm, as construction periods have the potential to overlap. Social and economic impacts and impacts of the Project have been identified as impacts in relation to accessibility to services and infrastructure in Wentworth LGA and Mildura, increased traffic and the changing nature of the landscape and visual amenity impacts. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.
Gol Gol Wind Farm 8.3 km	Cumulative impacts would occur as a result of the projects construction and have been assessed within the BDAR presented in **Appendix 6**. Gol Gol Solar Farm, Battery Energy Storage System and Gol Gol Wind Farm have been assessed together for the purposes of cumulative impacts within the BDAR (**Appendix 6**). These developments are anticipated to impact three TECs have a moderate-high potential to occur on the subject land, these include: *Acacia loderi* shrublands, *Acacia melvillei* shrublands in the Riverina and Murray Darling Depression bioregions and Mallee Bird Community of the Murray Darling Depression Bioregion, EPBC Act. Limited surveys have been undertaken to date although two (2) threatened flora species are known to occur on or nearby the project investigation area and 34 threatened fauna species are known to occur on or nearby the project investigation area. To manage cumulative biodiversity impacts with respect to this approved project (under construction), the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	While suitable avoidance and management of Aboriginal sites are required for both Projects, th the ACHAR (**Appendix 7**) demonstrates that cumulative impacts are limited. This finding is based on recorded AHIMs sites, development reports, intergenerational equity, and the broader Aboriginal cultural heritage of the region. Residual cumulative impacts, with mitigation and management measures, are considered acceptable.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for the construction of Gol Gol Wind Farm and the Project will be coordinated where practicable. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Construction of the Project likely to be complete prior to commencement of Gol Gol Wind Farm construction. Social and economic impacts and impacts of the Project have been identified as construction fatigue. Refer to **Section 6.15.4.1** below.
Gol Gol Battery Energy Storage System 9 km	Cumulative impacts would occur as a result of the projects construction and have been assessed within the BDAR presented in **Appendix 6**. Gol Gol Solar Farm, Battery Energy Storage System and Gol Gol Wind Farm have been assessed together for the purposes of cumulative impacts within the BDAR (**Appendix 6**). These developments are anticipated to impact three TECs have a moderate-high potential to occur on the subject land, these include: *Acacia loderi* shrublands, *Acacia melvillei* shrublands in the Riverina and Murray Darling Depression bioregions and Mallee Bird Community of the Murray Darling Depression Bioregion, EPBC Act. Limited surveys have been undertaken to date although two (2) threatened flora species are known to occur on or nearby the project investigation area and 34 threatened fauna species are known to occur on or nearby the project investigation area.	Whilst suitable avoidance and management of Aboriginal sites is required for both Projects, the potential for cumulative impacts to occur is limited, as demonstrated in the ACHAR (**Appendix 7**). This finding was provided with respect to recorded AHIMs sites, published reports for each development, consideration of intergenerational equity, and the broader Aboriginal cultural heritage resource of the geographic region. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for the construction of Gol Gol Solar Battery Energy Storage Facility and the Project will be coordinated where practicable. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Gol Gol Battery Energy Storage System, as construction periods have the potential to overlap. Social and economic impacts and impacts of the Project have been identified the potential for impacts on local workforce demands. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Social / Economic
	To manage cumulative biodiversity impacts with respect to this approved project (under construction), the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.			
Buronga Landfill Expansion 14 km	Given the location, type and scale of the Buronga Landfill Expansion, cumulative construction, operational and/or decommissioning biodiversity impacts are unlikely to occur, with suitable avoidance, minimisation, mitigation and offset strategies being implemented.	No cumulative Aboriginal cultural heritage impacts are anticipated.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for the expansion of Buronga Landfill would lead to an increase of up 107 vehicles per day along Arumpo Road between Silver City Highway and the Landfill Access. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with the Buronga Landfill Expansion, as construction periods have the potential to overlap. Social and economic impacts and impacts are expected to be low as the Project will have a small construction workforce. Refer to **Section 6.15.4.1** below.
Euston Wind Farm 30 km	Given the location, type and scale of the Euston Wind Farm, cumulative construction, operational and/or decommissioning biodiversity impacts are unlikely to occur, with suitable avoidance, minimisation, mitigation and offset strategies being implemented.	No cumulative Aboriginal cultural heritage impacts are anticipated.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for Euston Wind Farm are not anticipated to lead to any increases in volumes along Arumpo Road or at the key Silver City Highway / Arumpo Road intersection. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Euston Wind Farm, as construction periods have the potential to overlap. Social and economic impacts and impacts may include accessibility to services and infrastructure in Mildura and consultation fatigue. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.
Koorakee Energy Park 43 km	Given the location, type and scale of the Euston Wind Farm, cumulative construction, operational and/or decommissioning biodiversity impacts are unlikely to occur, with suitable avoidance, minimisation, mitigation and offset strategies being implemented.	No cumulative Aboriginal cultural heritage impacts are anticipated.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for Koorakee Energy Park are not anticipated to lead to any increases in volumes along Arumpo Road or at the key Silver City Highway / Arumpo Road intersection. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Koorakee Energy Park, as construction periods have the potential to overlap. Social and economic impacts and impacts may result from an influx of workers that may increase road traffic and the need for services and accommodation. Workforce accommodation will be considered in the EIS with consideration to an accommodation facility. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Social / Economic
Lake Victoria Wind Farm 71 km	Given the location, type and scale of the Euston Wind Farm, cumulative construction, operational and/or decommissioning biodiversity impacts are unlikely to occur, with suitable avoidance, minimisation, mitigation and offset strategies being implemented.	No cumulative Aboriginal cultural heritage impacts are anticipated.	The Project's construction traffic is expected to have a negligible impact on the road network. The Project has allowed for suitable intersection and road upgrades where required. Potential cumulative construction traffic impacts were considered in the TTIA. Traffic volumes adopted for Lake Victoria Wind Farm are not anticipated to lead to any increases in volumes along Arumpo Road or at the key Silver City Highway / Arumpo Road intersection. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative social and economic impacts may occur with Lake Victoria Wind Farm, as construction periods have the potential to overlap. Social and economic impacts and impacts may include accessibility to services and infrastructure in Wentworth LGA and Mildura and consultation fatigue. It should be noted that an accommodation camp is proposed which may elevate pressure on surroundings' accommodation. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable. Refer to **Section 6.15.4.1** below.

6.15.4 Other Key Matters

6.15.4.1 Social and Economic

This EIS is supported by a comprehensive SIA and EIA, refer to **Appendix 11** and **Appendix 21** respectively.

These technical studies recognised several impacts that are of a cumulative nature and therefore cannot be addressed by Spark Renewables in isolation. There is a responsibility for proponents developing projects in the South West REZ, alongside the NSW Government, to consider these impacts collectively and develop strategies for appropriate management, mitigation, and enhancement through effective and proactive multi-stakeholder collaboration.

The SIA presents a regional profile that includes the accommodation and employment context of the social locality of the Project, which comprises the host LGA of Wentworth Shire and the neighbouring LGA of Mildura Rural City. The regional profile detailed within the SIA highlights the key challenges and opportunities for the Project, such as the lack of existing housing and accommodation, labour and skills shortages, a relatively low median age, predicted population decline, high rates of self-reported health conditions within the Wentworth LGA and low rates of university and vocational education across the LGAs.

The SIA also considers the potential cumulative impacts of other developments in the region, especially the renewable energy projects within the South West REZ, which may increase the demand for accommodation, labour, and services, and affect the social cohesion and community composition of the local area.

Section 6.2.1 of the SIA (**Appendix 11**) includes an AES which was developed with the primary objective of outlining measures to ensure that there is sufficient accommodation available for the construction and operational workforces associated with the Project, while managing the potential effects of workforce influx on the local community and also maximising local participation.

6.15.5 Other Cumulative Impacts Considered

Cumulative impacts were addressed for other key matters across the range of proximal projects identified in this EIS. To avoid an overly exhaustive list of environmental matters and repeated statements relating to cumulative impacts, further discussion is provided below for each other matter considered. These other key matters and general outcomes of their respective cumulative impact assessments are summarised below.

6.15.5.1 Water Resources

Cumulative water resource impacts were considered within the WRIA (**Appendix 13**), which concluded that with successful implementation of mitigation and management measures cumulative impacts to surface water or groundwater availability are not anticipated. This is because Project water demands will be limited to relatively short periods of time with respect to the overall Project lifespan during both the construction and decommissioning phases; and that most, if not all, non-potable water would be sourced via River Drive Buronga and would also be supplied via an overhead fill point.

6.15.5.2 Agriculture

Cumulative impacts to agriculture were considered within the Soil, Land and Agriculture Impact Assessment (**Appendix 14**). The assessment noted that in the context of agriculture, increased cumulative impacts including changes to land used for agriculture, localised productivity, secondary productivity and some agricultural support services are likely to be experienced, as a result of agriculture land use being inhibited by landform modification and infrastructure, such as the development footprints for wind and solar farms. However, given the nature and scale of the established agricultural industries within the region that interfaces with renewable energy projects (that is, predominantly livestock grazing, with some broadacre cropping), as well as the generally low quality agricultural resources and low stocking rates for the region, significant impacts to regional agricultural businesses, industry critical mass thresholds and regional agricultural infrastructure are unlikely to occur in the foreseeable future.

The assessment concluded that given the majority of proposed development in the local and regional context of the Project are renewable developments, the cumulative impact on agriculture for the region is considered to be low given changes to agricultural land use and agricultural productivity are anticipated to be negligible to minor for each respective wind and solar project.

6.15.5.3 Economic

The Project will likely compete for labour, accommodation, and other resources with major infrastructure projects being constructed concurrently in the region, principally renewable energy projects being driven by investment in the South West REZ (refer to **Appendix 21**). The development status of proximal developments varies, with some projects approved but construction has yet to commence, and other projects are currently going through the planning process, with uncertain construction timing and also noting not all projects may end up proceeding, particularly given the limited grid capacity in South West REZ. Furthermore, new developments, currently not in the planning system, may emerge in the period prior to construction of the Project especially as the South West REZ matures.

When assessing the potential economic cumulative impacts, the anticipated timing of the Project is an important factor. The Project is not anticipated to be staged with an expected construction start date of 2026 and lasting approximately 36 months. In this regard, there are a number of major renewable energy and energy storage projects which are almost certain to overlap with the Project which may result in labour, accommodation and supplier shortages.

The EIA considered proximal developments to the Project and identified five (5) that represent a medium cumulative impact assessment risk (impacts likely, targeted mitigation required) and then two (2) that represent a high cumulative impact assessment risk (impacts certain, significant mitigation measures required), including risks associated with labour force and business participation and impacts to housing and commercial accommodation sectors amongst other things. Recognising the importance of these risks, and with consideration of the SIA conducted for the Project (refer **Appendix 11**), Spark Renewables has commenced consultation with potential suppliers in the locality and regional and provided for a TWA facility within the Project Area. The SIA also includes an AES for the Project which outlines the objectives and commitments in relation to local participation and accommodation of the Project's workforce and mechanisms for monitoring and responding to the Project's accommodation and employment needs.

6.15.5.4 Bushfire

Based on the proximity of the above-mentioned developments to the Project, cumulative bush fire impacts will vary but negative impacts are not anticipated to be significant. Fire fighting workload (and call outs) should not significantly increase during either construction (incl. decommissioning) and operations as the risk of ignition is considered to be low (based on the nature and location of proposed activities).
This potential is further reduced during operations due to minimal traffic and road use associated with the Project, when compared to construction (incl. decommissioning).

Potential positive cumulative impacts may also occur in the region e.g. increased activity in managing fire risk, and increased land access associated with wind farm access roads across multiple projects.
These factors would be addressed within the Bushfire Emergency Management and Operations Plan (see Section 6.0 of **Appendix 17** that will be prepared and implemented in consultation with FRNSW/RFS to ensure the most current information relating to fire risk from, and to, surrounding land uses is considered as relevant.

6.15.5.5 Telecommunications

Wind farm impacts are typically related to the direct impact and/or infringement on telecommunication links. The Project is able to avoid and or manage these impact to telecommunication links (refer to **Appendix 18**). Based on the proximity of the above-mentioned developments to the Project, and the limited potential for interactions to occur with respect to electromagnetic interference to telecommunication services, cumulative impacts are considered highly unlikely to occur.

6.15.5.6 Aviation

Cumulative aviation impacts were considered within the AIA; however it concluded that cumulative impacts were unlikely to occur (**Appendix 20**). This is based on AC91 – 10 v1.1 Operations in the vicinity of non-controlled aerodromes, and a three (3) nm radius that was adopted to identify the potential for cumulative impacts of other developments (namely, windfarm developments). Trentham Cliffs aerodrome is located approximately 1.7 nm/3.1 km west of the south-western boundary of the Project Area and 6.8 nm/12.6 km from the nearest WTG. Flight operations would not be impacted by the Project.

6.15.5.7 Air Quality, Hazards and Risk and Waste Management

As identified in each of the specialist studies (**Appendix 15** and **Appendix 16** respectively) and discussed in **Section 6.14** (for waste), cumulative impacts are highly unlikely to occur with the successful implementation of mitigation and management measures.

6.15.6 Mitigation and Management Measures

Potential cumulative impacts associated with the Project will be manageable via Spark Renewables commitment to implement the mitigation and management measures presented in this EIS.
The consolidated set of all Project related mitigation and management measures is provided in **Appendix 5** of this EIS.

These Project related mitigation and management measures, combined with those provided for other nearby future and existing projects are anticipated to avoid and/or minimise cumulative impacts, or provide for suitable management measures, that will reduce residual impacts to acceptable levels.

7.0 Justification

This section provides a conclusion to this EIS. It includes discussion of the justification for the Project, taking into consideration the Project's environmental, social and economic impacts and the suitability of the site, to assist the consent authority to determine whether or not the Project is in the public interest.

7.1 Environmental, Social and Economic Impacts

As discussed in **Section 2.7.4** and **Section 5.0**, the Project has been designed and progressively refined in response to key environmental constraints and in response to landholder and community feedback with the goal of minimising environmental impacts and maximising social and economic benefits to local communities.

As summarised in **Section 6.0**, a comprehensive assessment of the environmental, social and economic impacts of the Project has been undertaken based on:

- assessment of the site characteristics (existing environment)
- expert technical assessment
- focused consultation with relevant government agencies
- engagement with the local community and other key stakeholders
- application of the principles of ecologically sustainable development, including the precautionary principle, inter-generational equity and conservation of biological diversity and ecological integrity.

The key issues identified were subject to detailed specialist assessment to identify the potential impacts of the Project on the existing environment. These assessments are detailed in **Section 6.0** and the appendices to this EIS.

Spark Renewables has considered a range of alternatives in planning the Project and in determining the layout included in this EIS. The preliminary WTG layout and infrastructure design was subject to a number of iterations in order to avoid and minimise adverse environmental, social and economic impacts (refer to **Section 2.7.4**).

The assessment findings outlined in **Section 6.0** indicate that while there will be environmental, social and economic impacts associated with the Project, the extent of impact has been avoided or minimised through the design process and where impacts are predicted, Spark Renewables has committed to management, mitigation and offset measures to address these residual impacts (refer to **Appendix 5**).

The detailed impact assessment undertaken concludes that with the implementation of feasible and reasonable mitigation measures, the Project can proceed within acceptable environmental, social and economic standards.

7.1.1 Summary of Key Environmental, Social and Economic Matters

As noted above and detailed in **Section 2.7.4,** the Project was refined to avoid and minimise adverse environmental, social and economic impacts. This process included consideration of all relevant matters assessed in this EIS but provided a focus on key issues such as biodiversity, social and Aboriginal Cultural heritage where the greatest need, and potential, for adjustments to the Project existed. These matters and any additional considerations, regarding the scale and nature of impacts, costs and benefits are outlined below.

- **Biodiversity** – the Project has been refined as detailed in **Section 2.7.4**.
    - The Project would directly impact up to 54.34 ha of native vegetation within the Disturbance Footprint.
    - The Project would directly impact approximately 22.76 ha of Mallee Bird Community of the Murray Darling Depression Bioregion, an endangered ecological community (EEC) listed under the EPBC Act.
    - There are no direct impacts to threatened species-credit species or their habitats.
    - No WTGs are located within the recommended buffer to large intact patches of woody vegetation (Rodrigues et al (2015)) within the Mallee Cliffs National Park, which is in the order of 300 m. The closest WTG is located approximately 800 m from the boundary of the National Park, exceeding the recommended buffer by at least 500 m.
    - Prescribed impacts are considered within the Biodiversity Development Assessment Report (BDAR) including Raptor species, connectivity for threatened fauna species and turbine strike risks for threatened species and other specific fauna. Some impacts relating to bird and bat strike and barotrauma from turbine operation are uncertain and therefore a Bird and Bat Adaptive Management Plan will be implemented to measure and response to any impacts. Species that will be monitored through operation of the Project with potential high risk of impact include black falcon (*Falco subniger*), little eagle (*Hieraaetus morphnoides*) and white-striped freetail-bat (*Austronomus australis*).
    - Spark Renewables is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.2.7**) and will ensure that biodiversity values are continued to be considered (and impacts offset where required) during the detailed design process.
- **Aboriginal Cultural Heritage** – the Project has been refined as detailed in **Section 2.7.4**.
    - A detailed Aboriginal Cultural Heritage Assessment (ACHA) was undertaken in consultation with RAPs and having regard to relevant statutory requirements and guidelines. This included desktop investigations and extensive field survey.
    - Spark Renewables has avoided 21 Aboriginal Sites through Project design refinement including an open site and a potential archaeological deposit (PAD).
    - The Project will directly impact eight (8) Aboriginal sites located within the Disturbance Footprint comprising four (4) hearths and four (4) isolated artefacts all of which were assessed as having low overall significance.

- Spark Renewables has committed to implement a community collection program for the four (4) isolated artefacts to preserve these objects and as an alternative to complete destruction.
- Spark Renewables is committed to implementing the mitigation and management measures identified in this EIS (refer Section 6.3.5) and will ensure that Aboriginal Cultural heritage values are continued to be considered during the detailed design process.

- **Historical Heritage** – the Project will result in changes to the landscape within the vicinity of the Project. However, the risk of visual or physical impacts to listed heritage items located in the vicinity of the Project has been assessed as negligible. Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.4.3**) and ensure these matters are considered during the detailed design process.

- **Visual (Amenity)** – the Project will result in changes to the landscape, however impacts to non-associated residences are limited, and are generally 'low' or 'negligible'. There are no non-associated, associated or host dwellings within 8,000 m of any WTG.
  - The Mallee Cliffs National Park is located immediately south-east of the Project Area approximately 800 m from the nearest WTG. The national park is noted to have restricted public access and as a result, it is unlikely the Project would degrade the scenic value of this landscape feature thus resulting in limited visual impact.
  - The Willandra Lakes Region World Heritage Area is located approximately 25 km east of the nearest WTG. It is unlikely that the Project will have a visual impact on the Willandra Lakes Region World Heritage Area due to the distance from the Project. If appropriate design principles are incorporated into the night lighting for ancillary infrastructure it is likely there will be no visual impacts resulting from night lighting of ancillary structures.
  - Shadow flicker was assessed and determined that no dwellings will experience shadow flicker hours however there is potential for motorists along Arumpo Road to experience shadow flicker. There is a negligible risk associated with distraction of vehicle drivers who experience shadow flicker. Although shadow flicker has the potential to cause annoyance to commuters, there is a negligible risk associated with distraction of vehicle drivers who experience shadow flicker, as this is not dissimilar to the effect of shadows from trees on the side of the road or high passing vehicles. The risk of blade glint was considered to be very low as a result of low reflectivity surface treatment for WTGs.
  - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.5.5**) and ensure these matters are considered during the detailed design process.

- **Noise (amenity)** – There are no non-associated, associated or host dwellings within 10 km of any WTG however seven (7) receivers are located within 12 km of a WTG. The predicted noise levels at various receivers are detailed below:
  - Predicted WTG noise levels are below the reference level of 45 dB $L_{Aeq\ 10min}$ at the host receiver and below the Noise Bulletin base noise limit of 35 dBA $L_{Aeq\ 10min}$ at all non-associated receivers.

- WTG noise levels are predicted to be in the order of 40 dB L_{Aeq} at the boundary of Mallee Cliffs National Park noting this is approximately 800 m from a WTG at its closest point. This is well below the recommended amenity noise level of 50 dB L_{Aeq}.
- Noise emissions from ancillary infrastructure are predicted to be well below the most stringent night-time noise level of 35 dB $L_{Aeq, 15\ min}$.
- Construction noise is not predicted to exceed either the noise affected or highly noise affected management levels at any dwellings during any of the assessed construction tasks.
- Road traffic noise is anticipated to result in a noticeable increase in noise during some periods given the already low existing traffic volumes.
- Noise mitigation in the form of consultation and communication during these periods is recommended in **Section 6.6.4** as the most effective means of minimising impacts.

- **Transport** – The operation, construction and decommissioning phases of the Project are expected to generate only a minor impact on the surrounding road network in the peak periods.
  - Minor road network upgrades are proposed at the following locations as part of the Project to maximise the safety and operational performance of the external road network:
    - Sturt Highway roundabout at intersection of Carey Street, Euston.
    - Sturt Highway roundabout onto Silver City Highway, Buronga.
    - Silver City Highway onto Arumpo Road.
  - Suitable site access intersection configurations would need to be provided to accommodate OSOM heavy vehicle movements, which would meet the minimum sight distance required to comply with Austroads requirements.
  - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.8.4**) and ensure these matters are considered during the detailed design process.
- Water Resources – Construction water demand is estimated to be 140 megalitres (ML) over the three (3) year construction period reducing to 1 (ML) per year during operations and will be met by commercial water supply sources from Wentworth Shire Council.
  - During construction up to 15 waterway crossings (minor streams and drainage features) may need to be established to facilitate access throughout the Disturbance Footprint. Where required, these will be designed and constructed in accordance with relevant guidelines and in consultation with DPI Fisheries. As such, these crossings (if required) are not expected to result in any measurable impacts to stream health including water quality and fish passage.
  - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.9.4**) and ensure these matters are considered during the detailed design process.

- Soil, Land and Agriculture – A soil survey found the Project Area to contain two dominant soil mapping units and three (3) land and soil capability (LSC) classes comprising Class 4 (moderate capability), Class 6 (low capability) and Class 7 (very low capability).
    - There is no mapped Biophysical Strategic Agricultural Land (BSAL) or State Significant Agricultural Land (SSAL) within the Project Area.
    - The Project would temporarily remove up to 444.69 ha of land within the Project Area from agricultural land use for the duration of the Project.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.10.5**) and ensure these matters are considered during the detailed design process.
- Air Quality – Air quality impacts would be primarily limited to the construction phase, and to a lesser extent, the decommissioning phase of the Project.
    - During construction and decommissioning, impacts would generally be localised within the Project Area, and are unlikely to extend more than 250 m beyond the Project Boundary.
    - The host dwelling (R1146) is located within 250 m of the Project Boundary however it is noted that it is in excess of 10 km to the nearest WTG and the Disturbance Footprint.
    - A range of dust mitigation measures are proposed to manage potential dust impacts during all phases of the Project, consistent with best industry practice.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.11.7**) and ensure these matters are considered during the detailed design process.
- **Hazards and Risks** – A Preliminary Hazard Assessment was undertaken to identify a range of hazards that have the potential to result in an incident with offsite impacts. No incidents were identified as resulting in offsite impacts and it is concluded that the risks at the Project Boundary are not considered to exceed the acceptable risk criteria under Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning (DPIE, 2011). Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.13.1.2**) and ensure these matters are considered during the detailed design process.
- **Bushfire** – The Project Area has been identified as being Category 3 Bush Fire Prone Land by the NSW RFS Bush Fire Prone Land mapping. Spark Renewables has committed to a range of bush fire mitigation and management strategies including the establishment of Asset Protection Zones (APZs) and a static water supply on site and establishing emergency procedures including shutdown to enable safe aerial firefighting. Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.13.3.1**) and ensure these matters are considered during the detailed design process.
- Assessments undertaken with respect to **blade throw risk**, **EMI** and **EMF** have concluded that the Project meets relevant assessment criteria. Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.13.3.1, Section 6.13.4.1** and **6.13.5.4**) and ensure these matters are considered during the detailed design process.

- **Aviation safety** requirements of the Wentworth LEP are satisfied. The Project will not create incompatible intrusions, adversely affect or compromise the safety of existing airports and associated navigation and communication facilities.
    - The WTGs have been identified to infringe the relevant Grid lowest safe altitude (LSALTs) and three (3) air routes (Q4, J10 and W451). Consultation with relevant authorities and aerial operators remains ongoing.
    - An aviation safety risk assessment concluded that the WTGS do not require obstacle lighting however temporary wind monitoring towers exceed 152.4 m AGL or any WMT further than 300 m from a WTG will need to be marked with red/white/red bands and have obstacle lighting fitted at the top.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.13.6.2**) and ensure these matters are considered during the detailed design process.
- **Waste** – The Project will implement a waste hierarchy (in order of priority) of avoidance, resource recovery and disposal. While many wastes generated by the Project can be avoided, recycled or reused, some wastes will need to be disposed of to landfill, and in this case Spark Renewables will liaise with the relevant local authorities to manage waste accordingly.
    - A Decommissioning and Rehabilitation Strategy has been developed for the Project. A more detailed DRP would also be developed in consultation with key stakeholders post approval.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.14.4**) and ensure these matters are considered during the detailed design process.
- **Social** – Community and stakeholder engagement was undertaken for the Project and to inform the Social Impact Assessment.
    - While community interest and involvement in the Social Impact Assessment was limited, the perceived positive and negative impacts associated with the Project were identified and assessed.
    - The majority of residual social impact rankings for identified perceived impacts were low with two (2) moderate negative social impact rankings and three (3) high positive social impact rankings.
    - Spark Renewables has committed to implementing a Social Impact Management Framework comprising:
        - Accommodation and Employment Strategy
        - Community Benefit Strategy
        - Industry and Aboriginal Participation Plan
        - Community and Stakeholder Engagement Plan.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.7.3**) and ensure these matters are considered during the detailed design process.

- **Economic** – The Project is expected to generate an accommodation need greater than the current accommodation capacity of the locality. Spark Renewables has included an on-site TWA facility in the Project to accommodate the peak construction workforce.
    - The Project would result in a temporary loss of 444.69 ha of agricultural land over the 30 year life of the Project with an economic impact to agricultural primary productivity equating to $154,415 per year for the duration of the Project.
    - Of the total investment for the Project approximately $130 million is estimated to be retained in the locality and the Project will support 225 direct and 360 indirect jobs over the construction period.
    - Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $220 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.12.4**) and ensure these matters are considered during the detailed design process.
- Cumulative Impacts – There are ten (10) renewable energy, infrastructure and other major projects within approximately 75 km of the Project. Of the ten (10), two (2) are approved and eight (8) are proposed.
    - Key potential cumulative impacts identified include biodiversity, Aboriginal cultural heritage, amenity issues (noise and visual), traffic impacts and social and economic impacts. Spark Renewables is committed to implementing mitigation and management measures to minimise potential cumulative impacts associated with the Project.
    - Spark Renewables will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.15.6**) and ensure these matters are considered during the detailed design process.

7.2 Suitability of the Project Area

As outlined in **Section 2.7.3**, the Project Area was selected based on a range of factors, including:

- its strategic position within the South West REZ and access to approved transmission infrastructure
- the reliability of the wind resource
- the heavily disturbed nature of much of the Project Area, which enables all WTGs and key infrastructure to be located within previously cleared cropping land, thereby minimising impacts to biodiversity and cultural heritage values
- the absence of any non-associated dwellings within 10 km of proposed WTGs, meaning that the Project's visual and noise impacts are likely to be some of the lowest of any wind farm proposed in NSW
- landholder support for co-existence of agriculture and renewable energy and interest in entering into Host agreements.

The Project design has been developed and refined in response to key site constraints. This has included maintaining a 500 m buffer from vegetation and an 800 m buffer Mallee Cliffs National Park to minimise biodiversity and visual impacts (refer to **Section 7.3.5**).

In addition, a range of specific principles were adopted, as detailed in **Section 2.7.4**. These principles include:

- Prioritising avoidance and minimisation of impacts to significant biodiversity values.
- Minimising the Project's Disturbance Footprint and maximising use of previously cleared land.
- Aligning the Disturbance Footprint with the boundary of existing agricultural operations to minimise the impact on ongoing operations in consultation with landholders.
- Avoiding impacts to areas of high archaeological sensitivity and identified Aboriginal sites.
- Minimising interactions with the Euston Mineral Sands Project through the careful placement of proposed Project infrastructure.
- Commitment to an on-site TWA facility to reduce housing and accommodation pressures on the surrounding localities.
- Based on the assessment findings outlined in **Section 6.0**, and subject to the implementation of the management, mitigation and offset measures proposed to address residual impacts (refer to **Appendix 5**), the site is considered suitable for the carrying out of the proposed Project.

7.3 Ecologically Sustainable Development

An objective of the EP&A Act is to encourage ecologically sustainable development (ESD) within NSW. This section provides an assessment of the Project in relation to the principles of ESD.

To justify the Project with regard to the principles of ESD, the benefits of the Project in an environmental, social and economic context should outweigh any negative impacts. The principles of ESD encompass the following:

- the precautionary principle
- inter-generational equity
- conservation of biological diversity
- valuation and pricing of resources.

Essentially, ESD requires that current and future generations should live in an environment that is of the same or improved quality than the one that is inherited.

7.3.1 The Precautionary Principle

Clause 193(2) of the EP&A Regulation provides:

> *The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*

In applying the precautionary principle, Clause 193(2) provides that public and private decisions should be guided by:

- careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
- an assessment of the risk-weighted consequences of various options.

In order to achieve a level of scientific certainty in relation to the potential impacts associated with the Project, this EIS has undertaken an extensive evaluation of all the key components of the Project. Detailed assessment of all key issues and necessary management procedures have been conducted and are comprehensively documented in this EIS.

The preparation of this EIS has involved a detailed analysis of the existing environment (refer to **Section 2.6** and **Section 6.0**), and the use of desktop analysis, site-specific survey and monitoring and scientific modelling (where relevant) to assess and determine potential impacts as a result of the Project.

The decision-making process for the design/refinement, impact assessment and development of management and mitigation measures has been transparent in the following respects:

- Key community, Aboriginal representatives and Government stakeholders have been consulted during EIS preparation. Stakeholder feedback has informed impact avoidance, the Project refinement process and the development of proposed impact mitigation and management strategies. Further details regarding key stakeholder feedback and how this feedback has been addressed are provided in **Section 5.0**.
- The EIS has been undertaken on the basis of the best available scientific information about the Project Area and has been informed by site-specific survey, monitoring, modelling and impact assessment.

Due to the nature of the Project, specific details will be subject to the detailed design phase and will be influenced by the technology applicable at the time. Any uncertainty in the data used for the assessment has been appropriately identified, and appropriate assumptions have been applied to represent a conservative worst-case analysis to assess a range of potential impact scenarios. Extensive management and mitigation measures will be implemented, including monitoring programs to measure predicted against actual impacts of the Project (refer to **Appendix 5**).

Spark Renewables will prepare and implement a CEMP, OEMP and DRP, which will implement best practice management and will incorporate all identified mitigation and management measures identified in this EIS. Additionally, the Project will be subject to an independent auditing and verification process consistent with relevant requirements for SSD projects.

Spark Renewables will report on monitoring outcomes and compliance with the development consent, should the Project be approved. It is expected any development consent would include non-compliance notification procedures. Spark Renewables will make the following information publicly available on its website as relevant to the stage of the Project:

- a comprehensive summary of the monitoring results, which will be reported in accordance with the various plans and programs approved under a development consent
- the annual Statement of Compliance with an EPL
- any independent environmental audit.

7.3.2 Intergenerational Equity

Clause 193(4) of the EP&A Regulation provides:

> *The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*

The principle of intergenerational equity seeks to ensure that the needs and requirements of today's generations do not compromise the needs and requirements of future generations in terms of health, biodiversity and productivity.

As discussed in **Section 2.3**, as a renewable energy project located within the South West REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The Project is consistent with the objectives of the NSW Electricity Strategy and NSW Electricity Infrastructure Roadmap (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of up to 402 MW, the Project will make a material contribution to the planned energy generation capacity for the South West REZ and support the State's transition away from fossil fuel reliance.

Additionally, Spark Renewables has committed to develop a detailed DRP for the Project, building on the strategies and general principles outlined in the DRS (refer to Appendix 4 of **Appendix 14**). Through the development and implementation of the DRP, disturbed land will be returned to an equivalent LSC class following the end of life for the Project.

The assessment findings outlined in **Section 6.0** indicate that while there will be environmental, social and economic impacts associated with the Project, the extent and severity of adverse impacts have been minimised through the design process and where impacts are predicted, Spark Renewables has committed to management, mitigation and offset measures to address these residual impacts (refer to Appendix 5).

7.3.3 Conservation and Biological Diversity

Clause 193(5) of the EP&A Regulation identifies that the principle of conservation of biological diversity and ecological integrity should be a fundamental consideration in the decision-making process. The conservation of biological diversity refers to the maintenance of species richness, ecosystem diversity and health and the links and processes between them. All environmental components, ecosystems and habitat values potentially affected by the Project are described in this EIS (refer **Section 6.2** and **Appendix 6**) and measures to ameliorate any negative impacts are outlined in **Appendix 5**.

The Project has been designed to maximise use of previously cleared cropping land, and to provide a substantial buffer between WTGs and the adjacent Mallee Cliffs National Park, thereby minimising impacts to identified biodiversity to the greatest extent practicable.

Following the application of avoidance and mitigation measures, the BAM assessment has identified the biodiversity credit requirement to offset the residual impacts of the Project and the required management and mitigation measures to be implemented, including a Bird and Bat Adaptive Management Plan (BBAMP) which will provide for the ongoing adaptive management of impacts on key species. It is noted that the biodiversity credit requirements are very low for a renewable energy project of this scale, which is reflective of the significant effort which has been invested in careful site selection, avoidance and design refinement.

On this basis, the principle of Conservation of Biological Diversity is considered to be satisfied.

7.3.4 Valuation, Pricing and Incentive Mechanisms

The goal of improved valuation of natural capital has been included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment.

The principle has been defined in Clause 193(6) of the EP&A Regulation as:

> *The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as—*
>
> - *polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and*
> - *the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and*
> - *established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

The Project has been designed to avoid and minimise adverse environmental, social and economic impacts as much as practicable. For example, the proposed Disturbance Footprint has been designed to avoid areas of native vegetation and known Aboriginal cultural heritage sites, where practicable.

Project considerations have included the costs of management measures to minimise adverse environmental, social and economic impacts. There will also be additional costs associated with implementation of the Project's Biodiversity Offset Strategy (refer to **Section 6.2.9**).

The Project will provide cleaner reliable electricity generation, assisting with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change.

7.3.5 Consideration of Mallee Cliffs National Park

Table 7.1 below outlines the specific requirements of the SEARs as they relate to Mallee Cliffs National Park, and how these requirements have been addressed during the preparation of this EIS.

Agency advice received from the Biodiversity and Conservation Division (BCD) and the NSW National Parks and Wildlife Service (NPWS), dated 07 February 2023 provided further detailed assessment requirements with respect to Mallee Cliffs National Park. **Table 7.2** below outlines these agency requirements and how they have been addressed during the preparation of this EIS.

Spark Renewables has consulted with NPWS regarding the Project during the development of the EIS (refer to **Section 5.0**). This consultation would continue through the post approval process to ensure NPWS fire management operations are appropriately considered in the CEMP and OEMPs for the Project.

7.3.5.1 Wind Turbines, Large Intact Patches of Woody Vegetation and Mallee Cliffs National Park

In this section Umwelt references a setback distance of 800 m from the WTG tower to the Mallee Cliffs National Park. It is noted that the EUROBAT Publication article by Rodrigues et al (2015) (refer **Section 6.2**) recommends a 200 m distance to be measured from the tip of the WTG blade, not the WTG tower itself.

Considering the precautionary assessment (and a conservative 100 m long WTG blade length) assessed in **Appendix 6**, the recommended buffer is in the order of 300 m from the WTG locations. It is noted that whilst a 200 m blade diameter (incl. nacelle) is considered in **Appendix 6**, the blade length for the Project is limited to 85 m based on the Traffic and Transport Impact Assessment (refer to **Table 3.2** for WTG specifications, and **Appendix 12** of this EIS for the Traffic and Transport Impact Assessment (Access, 2024).

For simplicity, and to enable a comparison of these statements to the figures presented in this EIS, a setback distance of 800 m is referred to herein. Regardless, the Project design achieves the Rodrigues et al (2015) recommended buffer, exceeding that suggested set back by at least 500 m.

Table 7.1 Specific SEARs Requirements – Mallee Cliffs National Park

Requirement	Consideration	Reference
A detailed evaluation of the merits of the project as a whole having regard to feasible alternatives to the development and its key components including project design alternatives to avoid impacts to areas of biodiversity value, indirect impacts to the Mallee Cliffs National Park and areas of archaeological sensitivity, opportunities for shared infrastructure with proposed developments in the region and the consequences of not carrying out the development;	**Section 2.7.4** provides an overview of the Project alternatives considered and key refinements to the Project design. These refinements included removal or relocation of WTGs located nearest to the Mallee Cliffs National Park boundary, to maintain a variable buffer with a minimum setback of approximately 800 m to the nearest WTGs and the minimisation of impacts to native vegetation and areas of archaeological sensitivity. Spark Renewables has committed to a range of strategies to mitigate potential indirect impacts to biodiversity values within the National Park, which are detailed in **Appendix 5** and **Appendix 6**. Further details regarding opportunities for shared infrastructure and the consequences of not carrying out the developed are detailed in **Section 2.7**.	**Section 2.7.4**, **Appendix 5** and **Appendix 6**.
A detailed evaluation of the merits of the project as a whole having regard to the suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses, including rural villages, rural dwellings, subdivisions, land of high scenic value, conservation areas (including National Parks, Conservation Areas, State Parks and Nature Reserves), state forests, mineral and coal resources, triangulation stations, tourism facilities, existing or proposed wind farms, and the capacity of the existing electricity transmission network to accommodate the development;	The suitability of the site is considered in **Section 7.2**. The Project has ben designed to maximise use of previously disturbed cropping land within the Project Area, whilst maintaining a substantial buffer to the adjacent Mallee Cliffs National Park, thereby minimising both direct and indirect impacts to biodiversity and recreational values associated with the National Park. As such, the site is considered suitable for the carrying out of the Project.	**Section 7.2**
Landscape and Visual – including a detailed assessment of the visual impacts of all components of the project (including turbines, transmission lines, substations, and any other ancillary infrastructure in accordance with the NSW Wind Energy: Visual Assessment Bulletin (DPE, 2016), including detailed consideration of potential visual impacts on local residences (including approved developments, lodged development applications and dwelling entitlements), the amenity values of the Mallee Cliffs National Park, scenic or significant vistas and road corridors in the public domain.	A detailed LVIA has been undertaken for the Project (**Appendix 9**). The LVIA concludes that the potential visual impacts of the Project will be limited due to the restricted public access within the Mallee Cliffs National Park. The Project's potential visual impacts to National Parks and Conservation Areas (LCU 05) have been assessed as low. Overall, the LVIA indicates that the Project is unlikely to degrade the scenic values of the Mallee Cliffs National Park.	**Appendix 9**

Requirement	Consideration	Reference
Noise and Vibration – assess the noise impacts on amenity / recreational use of the Mallee Cliffs National Park (including walking tracks, campgrounds and lookouts) considering comparable noise amenity levels in the NSW Noise Policy for Industry (EPA, 2017).	A detailed NVA has been undertaken for the Project (**Appendix 10**). The NVA concludes that predicted noise levels from the proposed WTGs and ancillary infrastructure are significantly below the recommended amenity noise level of 50 dB L_{Aeq} under the NPfI. While the Project has been conservatively assessed against this recommended amenity noise level, it is noted that due to the absence of walking tracks, campgrounds, lookouts, attractions and activities, facilities or other recreational uses within the Mallee Cliffs National Park, this assessment criterion could be interpreted as not being applicable.	**Appendix 10**
Biodiversity – including: an assessment of the biodiversity values and the likely biodiversity impacts of the project, including impacts associated with transport route road upgrades and indirect impacts on the Mallee Cliffs National Park and surrounding conservation areas in accordance the *Biodiversity Conservation Act 2016* (NSW), the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR), including a detailed description of the proposed regime for avoiding, minimising, managing and reporting on the biodiversity impacts (including on grasslands) of the development over time, and a strategy to offset any residual impacts of the development in accordance with the BC Act.	A comprehensive BDAR has been undertaken for the Project (**Appendix 6**), which includes consideration of potential indirect impacts on the Mallee Cliffs National Park. The proposed setback (minimum 800 m to the nearest WTG) exceeds the habitat buffer distance recommended by a EUROBAT Publication article by Rodrigues et al (2015). Further consideration of impacts to large intact woody vegetation is provided in **Section 7.3.5.3** below. Additionally, the BDAR includes a range of recommended strategies to manage indirect biodiversity impacts associated with the Project. These strategies have been adopted by Spark Renewables and are reflected in **Appendix 5**.	**Appendix 5** and **Appendix 6**
Land – including an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: ….the impact of the development on Mallee Cliffs National Park in accordance with the guidelines for Development adjacent to National Parks and Wildlife Services Lands (DPIE, 2020).	Consideration of the guidelines is provided in **Section 7.3.5.2** below.	**Section 7.3.5.2**

Table 7.2 BCD and NPWS SEARs Advice – Mallee Cliffs National Park

Requirement	Consideration	Reference
BCD recommends that the EIS appropriately address the following: 1. Biodiversity / 2. Flooding / 3. Mallee Cliffs National Park.	A detailed assessment is provided within this Chapter.	This Chapter
The EIS must identify and assess:	Refer below	N/A
• In the case of a project that adjoins land reserved under Part 4 of the *National Parks and Wildlife Act 1974*, ensure no encroachment of assets or ancillary infrastructure occurs, and the project is restricted to the development site and adequately buffered from the reserve.	There is no encroachment of Project infrastructure on the Mallee Cliffs National Park reserve. The Project has been designed to provide a substantial buffer between the proposed WTGs and the National Park boundary. This buffer is of variable width, and provides a minimum setback of approximately 800 m to the nearest WTG.	N/A
• In the case of a project that adjoins, is in the immediate vicinity of, or upstream of land reserved under the *National Parks and Wildlife Act 1974*, ensure the matters outlined in the Developments adjacent to National Parks and Wildlife Service lands: Guidelines for consent and planning authorities are adequately considered and include:	Refer below	N/A
○ recognition of the natural, cultural, social and educational values attached to that land. The Mallee Cliffs National Park Plan of Management should be considered in the assessment of these values.	Refer to **Section 7.3.5.4** below.	**Section 7.3.5.4** and throughout this EIS.
○ recognition of the impacts, including direct, indirect and cumulative impacts as they relate to the environmental values of that land, its location, and greater landscape connectivity within the South-West REZ	No direct impacts to environmental values of Mallee Cliffs National Park are expected as a result of the Project. Indirect and cumulative impacts on environmental values and landscape connectivity are considered in **Section 6.2** and **Section 6.15** of this EIS, as well as Section 8.7 of the BDAR (**Appendix 6**).	**Section 6.2, Section 6.15** and **Appendix 6**
○ extent of the direct, indirect and cumulative impacts on that land	No direct impacts to Mallee Cliffs National Park are proposed. The extent of indirect and cumulative impacts are considered in **Section 6.15** of this EIS, as well as Section 8.7 of the BDAR (**Appendix 6**).	**Section 6.15** and **Appendix 6**

Requirement	Consideration	Reference
○ duration of the direct, indirect and cumulative impacts on the interface, the greater environmental values and the reserves connectivity in the landscape to other reserved land	No direct impacts to Mallee Cliffs National Park are proposed. The duration of indirect and cumulative impacts are considered in **Section 3.0,** and **Section 6.15** of this EIS.	**Section 3.0** and **Section 6.15**
○ consideration of any impacts from the development on that part of Mallee Cliffs National Park identified as an Asset of Intergenerational Significance (Asset AIS_E0_221) under Part 12A of the NPW Act. Current values prompting the declaration of the land as an AIS are Numbat, Greater Stick-nest Rat and Bilby.	Refer to **Section 7.3.5.5** below.	**Section 7.3.5.5** **Appendix 5 a**nd **Appendix 6**
• Measures proposed to prevent, control, abate, minimise and manage the direct and indirect impacts including an evaluation of the proposed measures effectiveness and reliability over the life of the project.	No direct impacts to Mallee Cliffs National Park are proposed. Mitigation and management strategies for indirect impacts are outlined in **Appendix 5** and **Appendix 6**. These strategies will be further detailed within a comprehensive BMP for the Project. The BMP would include an evaluation of proposed mitigation and management measures, along with a monitoring program to evaluate their effectiveness and reliability over the life of the Project.	**Appendix 5** and **Appendix 6**
• Residual impacts and their significance subject to the protection and conservation of Mallee Cliffs National Park.	Subject to the implementation of the proposed mitigation and management measures detailed in this EIS, the Project is unlikely to have any significant residual impacts on the protection and conservation of Mallee Cliffs National Park.	**Appendix 5**
• Risks and increased restrictions imposed to land management operations undertaken by NPWS as a result of the proposed windfarm project, especially in the use of low flight aircraft for aerial pest baiting, weed spraying, firefighting and hazard reduction purposes. Justify compliance with Australian Government Civil Aviation Safety Authority regulations. Consult with NPWS when assessing this.	Detailed assessments have been undertaken with respect to aviation and bushfire safety. Additionally, a LUCRA has been undertaken with respect to edge effects including the spread of pests and weeds. The key findings of these assessments are presented within **Section 6.0**. Spark Renewables has consulted with NPWS during the preparation of these studies and the outcomes of this consultation process are summarised in **Section 5.0**.	**Section 5.0** and **Section 6.0**

Requirement	Consideration	Reference
• Impacts and environmental risks to the values and resilience of Mallee Cliffs National Park.	Subject to the implementation of the proposed mitigation and management measures detailed in this EIS (**Appendix 5**), the Project is unlikely to result in any significant impacts or materially alter environmental risks to the values and resilience of Mallee Cliffs National Park.	**Appendix 5**
• Bushfire protection requirements attached to the proposed windfarm project ensuring they are restricted to the development site, and all ignition threats relating to the project are identified and planned for within the confines of the development site. No fire management is to affect, burden or threaten land reserved as Mallee Cliffs National Park, including any impact on NPWS fire management operations. The Mallee Cliffs National Park Fire Management Strategy should be considered in this assessment.	A Bush Fire Hazard Assessment has been undertaken for the Project (**Appendix 17**), with the key findings summarised in **Section 6.0**. Potential ignition threats have been considered during Project design and all APZs would be fully contained within the Project Area without encroaching on Mallee Cliffs National Park. There are three (3) informal access points located along southeastern Project Boundary, providing restricted access for NPWS, the Australian Wildlife Conservancy (AWC) and RFS into Mallee Cliffs National Park **Invalid source specified.Invalid source specified.**. No formal easement exists to permit access through the Project Area, however these access points are identified in the Mallee Cliffs National Park Fire Management Strategy **Invalid source specified.**. Spark Renewables has committed to facilitate continued access to Mallee Cliffs National Park for conservation and emergency management purposes for the life of the Project, noting that the existing access points may be relocated or rationalised (in consultation with the affected stakeholders) to improve access for bushfire fighting and to meet the operational needs of the Project. Spark Renewables has committed to develop an access protocol in consultation with NPWS, AWC and RFS. The access protocol will include procedures to inform stakeholders of any temporary disruption or change to access arrangements. Spark Renewables has consulted with NPWS regarding bush fire management (amongst other matters) during the development of the EIS (refer to **Section 5.0**). This consultation would continue through the post approval process to ensure NPWS fire management operations are appropriately considered in the CEMP, OEMP and DRP for the Project.	**Section 5.0**, **Section 6.0** and **Appendix 17**.
• Risk of interference to the functionality and operation of the emergency telecommunications system used by NPWS on Mallee Cliffs National Park as a result of the proposed windfarm project. Consult with NPWS when assessing this.	A Telecommunications Impact Assessment has been undertaken for the Project in consultation with NPWS (**Appendix 18**). This assessment has concluded that the Project is unlikely to directly impact any NPWS telecommunications systems, however, mitigation strategies will be implemented should any unforeseen impacts to these systems arise during the life of the Project.	**Appendix 18**

7.3.5.2 Guidelines for Developments adjacent to NPWS lands

As required by the SEARs (SSD-53293710), and the additional consideration of potential impacts requested within the agency advice received from BCD and NPWS (refer to **Table 7.2** above), this EIS has considered the impact of the Project on the Mallee Cliffs National Park with regard to the NSW National Parks & Wildlife Service – Developments adjacent to National Parks and Wildlife Service lands – Guidelines for consent and planning authorities (NPWS, 2020) (the DPIE, 2020 guideline).

The DPIE, 2020 guidelines have been prepared for use by councils and other planning authorities when they assess development applications that may impact on land and water bodies managed by NPWS. The goal of these guidelines is to guide consent and planning authorities in their assessment of development applications that are adjacent to land managed by NPWS. The advice aims to avoid any direct or indirect adverse impacts on NPWS parks (NPWS, 2020).

To ensure the objectives of the DPIE, 2020 guidelines are met, a substantial variable width buffer has been provided along the Mallee Cliffs National Park boundary. The minimum setbacks from the Mallee Cliffs National Park Boundary to proposed Project infrastructure are as follows:

- approximately 800 m to the nearest WTG
- approximately 600 m to the nearest hardstands, access tracks and all other Project infrastructure (excluding WTGs and meteorological masts)
- approximately 180 m to the nearest meteorological mast.

The specific issues that must be considered with respect to the DPIE, 2020 guideline are listed below, as well as a summary of the potential impacts associated with the Project.

- **Erosion and sediment control:** based on the findings of both water and soil impact assessments mitigation measures have been recommended with respect to erosion and sediment control. Accordingly, with the implementation of these measures, and the substantial buffer proposed, erosion and the movement of sediment onto NPWS land is not anticipated.
- **Stormwater runoff:** based on the findings of the water impact assessment mitigation measures have been recommended. The Project design also incorporates a suitable allowance for drainage (near access roads etc) that would be confirmed during detailed design and prior to the commencement of construction. Accordingly, with the implementation of these measures, and the substantial buffer proposed, stormwater issues are not anticipated and would be reduced to negligible levels prior to reaching NPWS land. No detrimental change to hydrological regimes is anticipated as a result of the Project.
- **Wastewater:** the Project does not have substantial need for sewage disposal beyond the TWA compound which will incorporate temporary sewage management facilities. Subject to appropriate treatment, treated water may be used to supplement rainwater captured for non-potable functions such as toilet flushing. Any wastes associated with the sewage treatment plant that are not suitable for re-use on-site will be disposed of off-site to a suitably licenced facility. On site sewerage collection/treatment infrastructure will continue to be used during operation. The TWA is located approximately 7.5 km from the Mallee Cliffs National Park boundary and hence no adverse impacts on NPWS land due to wastewater from the Project are anticipated.

- **Management implications relating to pests, weeds and edge effects:** based on the findings of both the BDAR (refer **Appendix 6**) and soil, land and agricultural impact assessment (refer **Appendix 14**), and as summarised within **Section 6.0**, appropriate mitigation measures have been recommended to manage the spread of pests and weeds, along with other edge effects. Accordingly, with the implementation of these measures, and the substantial buffer proposed, increased impacts associated with pests, weeds and edge effects are not anticipated.

- **Fire and the location of asset protection zones:** based on the findings of the Bush Fire Hazard Assessment, assessment mitigation measures have been recommended. Suitable APZ and static water supply have been incorporated into the Project's design. The Project's bushfire threat is considered low and the Project meets the criteria outlined in Section 8.3.5 PBP, 2019 (Wind and Solar Farms). Accordingly, with the implementation of the proposed mitigation measures and with consideration to the positive impact to bushfire fighting that the increased access the Project will provide (through the construction of internal access roads), an acceptable bushfire threat has been determined and potential impacts to the Mallee Cliffs National Park are considered negligible. All asset protection measures are within the Project Area, and there is no expectation for NPWS/AWS to change existing fire management regimes within the Mallee Cliffs National Park.

- **Boundary encroachments and access through NPWS lands:** the Project will not encroach on or limit access through the Mallee Cliffs National Park. No pre-construction, construction and/or post-construction activity associated with the Project will occur on land managed by NPWS.

- The Mallee Cliffs National Park is not directly accessible via public roads, but rather is accessed via private properties to the west (the Project Area), the southwest and the southeast. Internal access within Mallee Cliffs National Park is then provided by a system of fire trails. However, an objective of the Mallee Cliffs National Park Plan of Management (NPWS, 2018) is to establish secure, legal and practical public access for visitors.

- As discussed in **Table 7.2** above, Spark Renewables will continue to facilitate access to Mallee Cliffs National Park for conservation and emergency management purposes via the Project Area, noting that the existing access points may be relocated or rationalised (in consultation with NPWS, AWC and RFS) to improve access for bushfire fighting and to meet the operational needs of the Project. Any temporary construction fencing or permanent security fencing will be located to ensure that access is maintained.

- Spark Renewables has committed to develop an access protocol in consultation with NPWS, AWC and RFS. The access protocol will include procedures to inform stakeholders of any temporary disruption or change to access arrangements. Any such disruptions are unlikely to materially affect conservation or emergency management functions, since alternative access would be still available from other entry points within the Project Area, or from private properties to the southwest or southeast of the Mallee Cliffs National Park.

- Spark Renewables has consulted with NPWS during the development of the EIS (refer to **Section 5.0**). No specific concerns have been raised in relation to access arrangements. Accordingly, boundary encroachment and access impacts are not anticipated.

- **Visual, odour, noise, vibration, air quality and amenity impacts:** based on the findings of the specialist assessments conducted for these environmental matters, a range of reasonable and feasible mitigation measures have been established to further mitigate and manage impacts to off-site receivers, including the Mallee Cliffs National Park. With these measures being implemented, impacts to the Mallee Cliffs National Park are predicted to be low or negligible. No reduction of amenity on NPWS land due to the Project is anticipated.

- **Threats to ecological connectivity and groundwater-dependent ecosystems:** no Project interactions with groundwater are anticipated. During iterative refinement to the Project layout Spark Renewables has applied the following hierarchy (in order of priority): avoid, minimise, mitigate and offset (refer to **Section 2.7**) to address biodiversity impacts. Based on this a comprehensive BDAR has been prepared to address the SEARs and provide additional consideration of potential impacts as requested within the agency advice received from BCD and NPWS. A range of reasonable and feasible mitigation measures have been established to further mitigate and manage impacts. With these factors in mind and acceptable impact to native vegetation (and other flora and fauna habitats) that provide a linkage, buffer, home range or refuge role within the Project Area is anticipated. No impacts to groundwater-dependent ecosystems within NPWS land are anticipated.

- **Cultural heritage:** during iterative refinement to the Project layout Spark Renewables has applied the following hierarchy (in order of priority): avoid, minimise, mitigate and offset (refer to **Section 2.7**) to address Aboriginal cultural heritage impacts. Based on this a comprehensive ACHA report has been prepared to address the SEARs, relevant agency advice and feedback from RAPs. Suitable mitigation and management measures have been established. With these factors in mind the impact to Aboriginal sites within the Project Area has been minimised, and no impact to areas and sites of heritage value on NPWS land, including Aboriginal cultural heritage, are anticipated.

- **Road network design and its implications for continued access to the park:** site access for the Project is via Arumpo Road, located to the west of the Project Area and away from the Mallee Cliffs National Park. Spark Renewables has committed to maintain access to Mallee Cliffs National Park via the Project Area throughout the life of the Project, as outlined above. The establishment of new internal roads for the Project would not impede continued access via established tracks, however, the newly constructed roads may provide a superior alternative access route for NPWS, AWS and RFS to access Mallee Cliffs National Park. Opportunities for these key stakeholders to utilise the Project's internal road network would be explored in collaboration with NPWS, AWS and RFS during the development of a detailed access protocol.

- A detailed assessment of traffic impacts has been prepared to address the SEARs and agency advice received from TfNSW. A range of reasonable and feasible mitigation measures have been established to further mitigate and manage impacts. No access impacts are anticipated.

7.3.5.3 Proximity of WTGs to Large Intact Patches of Woody Vegetation

Mallee Cliffs National Park provides high quality habitat for woodland birds, and due to its size and lack of ongoing disturbances provides better habitat than the habitats present within the Project Area. The Project Area contains extensive cropping and a large portion of the impacts associated with the Disturbance Footprint occur to windrow remnants of native vegetation with large edge effects. Mallee Cliffs National Park may also provide suitable foraging and breeding habitat for hollow dependant microbats species, predicted to occur within the Disturbance Footprint.

Given the proximity of the Project to Mallee Cliffs National Park, the BDAR (**Appendix 6**) has considered a EUROBAT Publication article by Rodrigues et al (2015) regarding the proximity of WTGs to the National Parks Estate comprising Mallee Cliffs National Park.

This article suggests that WTGs should be located a minimum of 200 m away from woodlands and forests (or structures that would provide substantial habitat for microbats) to minimise potential WTG strike impacts to microbats. Importantly, the 200 m distance is to be measured from the tip of the WTG blade, not the WTG tower itself. For the current Project, which proposes a maximum blade length of 85 m, the recommended buffer is therefore 285 m from the WTG.

The closest WTG is located approximately 800 m from the boundary of the Mallee Cliffs National Park, well in excess (at least 500 m) of the Rodrigues et al (2015) recommended buffer. The Project design and incorporated buffer to the Mallee Cliffs National Park is a result of careful and considered avoidance and minimisation of the design following direct feedback from the biodiversity assessment.

7.3.5.4 Mallee Cliffs National Park Plan of Management (PoM)

This EIS (including the supporting technical specialist assessments) have been prepared having regard to the Mallee Cliffs National Park PoM (OEH, 2018). In particular, the PoM emphasises that the primary purpose of the park has been nature conservation and access by the public has been limited mostly to researchers and bird watching groups who visit a few times a year. Since reservation, recreation has been excluded from Mallee Cliffs National Park as access to the park is via private roads over adjoining private land. Consequently, the key consideration for potential land use conflicts associated with the Project relates to indirect biodiversity impacts, rather than impacts to the Park's recreational or scenic values or existing infrastructure. Relevant objectives of the PoM include:

- The environment of the park is protected and where necessary restored to be a healthy, stable, representative sample of mallee and belah ecosystems of south-west NSW.
- Native plant communities are protected and where necessary restored.
- Threatened and rare plant communities and species are protected.
- Understanding of the ecology, distribution, threats and management needs of native plant communities is added to and applied in the park.
- Fire in the park is managed to conserve and maintain semi-arid ecosystems while also protecting park management infrastructure.
- Native animal populations are protected and maintained.
- Populations of malleefowl and other rare, threatened or isolated animal species are protected and maintained.
- Pest animals are controlled and where possible eliminated from the park.
- Aboriginal and shared histories are protected.
- Public access will continue to be limited to natural and cultural resource conservation activities, environmental education and research.

Consistent with the objectives of the PoM, a range of strategies are proposed to mitigate and manage the Project's impacts on biodiversity (including pest and biosecurity management), Aboriginal cultural heritage values and bushfire management regimes (refer to **Appendix 5**). This will include the development and implementation of detailed management plans (including a BMP, ACHMP and BFEMOP) and continued consultation with NPWS. On this basis, it is considered that the Project can be carried out in a manner that is consistent with the PoM.

7.3.5.5 Asset of Intergenerational Significance – Mallee Cliffs National Park

Section 153G of the NPW Act allows the NSW Minister for the Environment to declare an area to be an AIS. An AIS can be any area of exceptional environmental or cultural value that warrants special protection including dedicated management measures. To date, a total of 279 AISs have been declared throughout NSW (NPWS, August 2024). In identifying potential environmental AISs, NPWS may give consideration to the following (amongst other factors):

- sites for critically endangered, endangered, or vulnerable species
- important areas for breeding, feeding or shelter
- locations where locally extinct mammal species are being reintroduced
- where the national park otherwise provides important habitat.

A portion of Mallee Cliffs National Park was declared an AIS in September 2021. The declared AIS (AIS_E0_221) comprises an area of approximately 9,657 ha as shown in **Figure 7.1**.

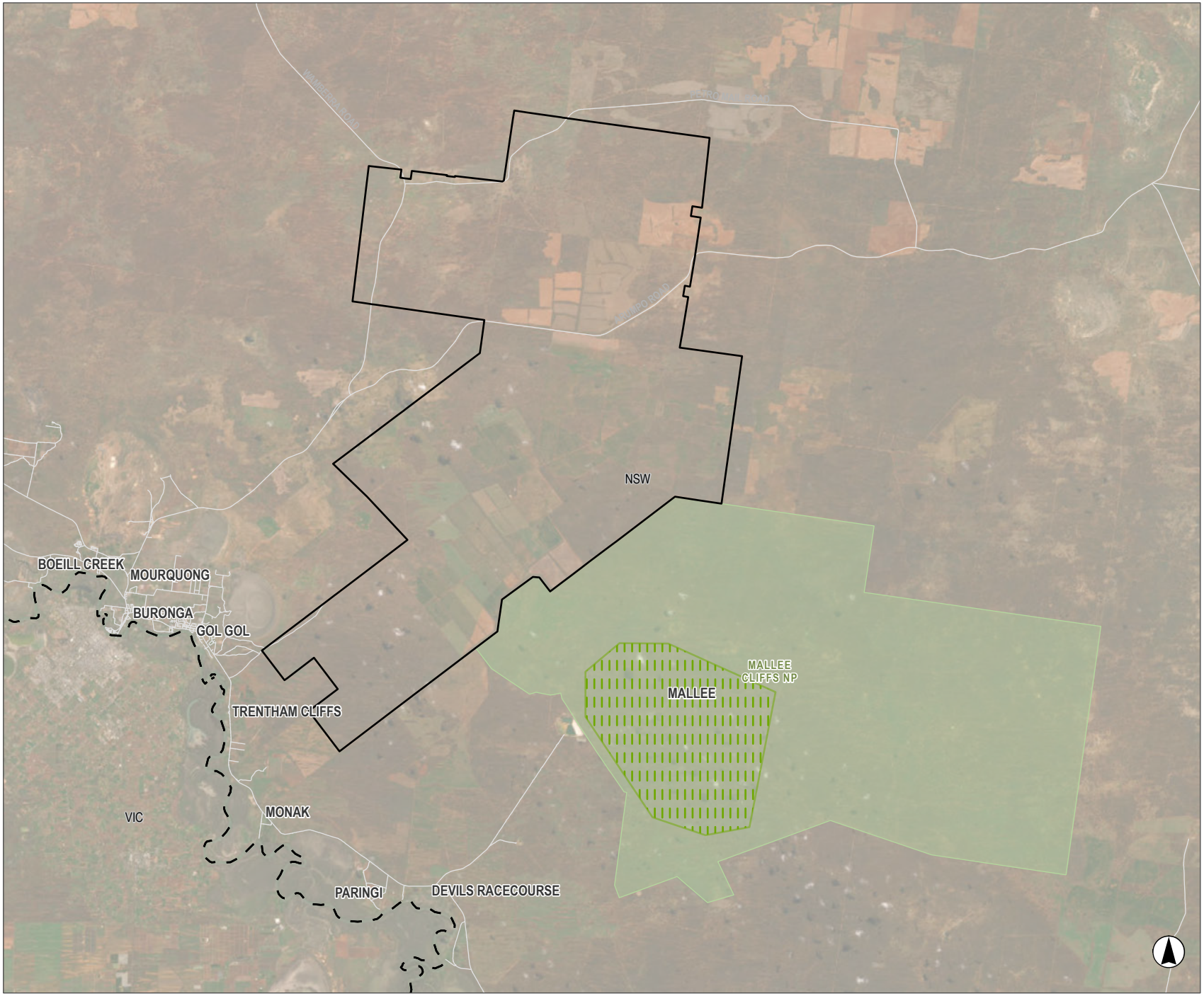


FIGURE 7.1

Mallee Cliffs National Park Asset of Intergenerational Significance

Legend

- Project Boundary
- State Border
- NPWS Estates
- Asset of Intergenerational Significance
- Road

0 5 10
Kilometres

Scale 1:325,000 at A4
GDA2020 MGA Zone 54

Image Source: ESRI Basemap (2024) **Data source:** NSW DFSI (2024), VIC DELWP (2023), Spark (2024), Austral Archaeology (2024)

The purpose of the Mallee Cliffs National Park AIS is to facilitate the reintroduction of three (3) species which are listed as extinct under the BC Act, being Numbat (*Myrmecobius fasciatus*), Bilby (*Macrotis lagotis*) and Greater stick-nest rat (*Leporillus conditor*). Reintroduction of the three (3) species within Mallee Cliffs National Park is being undertaken by AWS, and commenced in October 2019 (AWS, 2024).

In addition to the three (3) key species, additional species have been reintroduced into the AIS area, including Brush-tailed Bettong (*Bettongia penicillata ogilbyi*), Red-tailed Phascogale (*Phascogale calura*) and Mitchell's Hopping Mouse (*Notomys mitchellii*). AWS has also announced plans to reintroduce other endangered mammals including the Western Quoll (*Dasyurus geoffroii*), Western Barred Bandicoot (*Perameles bougainville*), Bridled Nailtail Wallaby (*Onychogalea fraenata Macropodidae*) and Burrowing Bettong (*Bettongia lesueur graii*).

To manage the reintroduction of the three (3) key species, the following Draft Conservation Action Plans (CAPs) have been prepared:

- Draft Conservation Action Plan, Numbat (*Myrmecobius fasciatus*) (NSW DECCW, March 2024)
- Draft Conservation Action Plan, Bilby (*Macrotis lagotis*) (NSW DCCEEW, March 2024)
- Draft Conservation Action Plan, Greater stick-nest rat (*Leporillus conditor*) (NSW DCCEEW, March 2024).

The Draft CAPs outline the identified environmental values for the AIS, which for all three (3) species, are to create a feral predator-free area and important habitat to enable reintroduction, establishment and maintenance of viable wild Numbat, Bilby and Greater stick-nest rat populations.

Importantly, the fenced area identified for species reintroduction is located a substantial distance (more than 5 km southeast of the Project Boundary, as shown in **Figure 7.1**. As such the Project will have no direct impact on the AIS, and the potential for indirect impacts is considered to be limited.

The Draft CAPs identify key risks to the environmental values of the AIS, which include inappropriate fire regimes, feral predators, feral herbivores and pigs, interactions with native species, disturbance (i.e. damage to fencing), inbreeding depression and loss of genetic diversity, unsustainable population levels. The Draft CAPs therefore set out a range of conservation actions to control, mitigate or abate these risks.

Table 7.3 below sets out the key risks relevant to the Project and how any related indirect impacts generated by the Project will be mitigated. These commitments are reflected in **Appendix 5**. Subject to the implementation of these measures, it is considered that the Project is compatible with the identified environmental values of the AIS and the conservation actions established under the Draft CAPs.

Table 7.3 Consideration of Key Risks to the Mallee Cliffs National Park AIS

Key Risk	Mitigation
Inappropriate fire regimes	As outlined in **Section 7.3.5.2** above, subject to the implementation of the proposed mitigation measures and with consideration to the positive impact to bushfire fighting that the increased access the Project will provide, the Project is expected to have a negligible impact on fire regimes within the Mallee Cliffs National Park. Spark Renewables has consulted with NPWS regarding the Project during the development of the EIS (refer to **Section 5.0**). This consultation would continue through the post approval process to ensure NPWS fire management operations are appropriately considered in the CEMP and OEMPs for the Project.

Key Risk	Mitigation
Feral predators, feral herbivores and pigs	As outlined in **Section 7.3.5.2** above, based on the findings of both the BDAR (refer **Appendix 6**) and soil, land and agricultural impact assessment (refer **Appendix 14**), and as summarised within **Section 6.0**, appropriate mitigation measures have been recommended to manage the spread of feral species. Spark Renewables has consulted with NPWS regarding the Project during the development of the EIS (refer to **Section 5.0**). This consultation would continue through the post approval process to ensure CEMP and OEMPs for the Project have due regard to the AIS and the draft Conservation Action Plans (or later versions).

7.4 Conclusion

As discussed in **Section 2.1**, as a renewable energy project located within the South West REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The NSW government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The Project will contribute to meeting these Federal and NSW Government objectives and is appropriately located.

The Project is consistent with the objectives of the NSW Electricity Strategy and NSW Electricity Infrastructure Roadmap (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of up to 402 MW, the Project will make a material contribution to the planned energy generation capacity for the South West REZ.

The Project has been designed and progressively refined in consultation with key stakeholders to:

- Maximise the use of previously disturbed cropping land, thereby avoiding and minimising impacts to biodiversity and cultural heritage values whilst also facilitating co-existence of renewable energy and agriculture.
- Maximise potential benefits to impacted communities.

The assessment findings outlined in **Section 6.0** indicates that while there will be environmental, social and economic impacts associated with the Project, the extent of impact has been avoided and minimised through the design process and where impacts are predicted, Spark Renewables has committed to management, mitigation and offset measures to address these residual impacts.

The Project will provide long-term, strategic benefits to the State of NSW, including:

- Renewable energy supply to assist with fulfilling the current obligations under NSW and Commonwealth renewable energy targets.
- Providing for cleaner reliable electricity generation, assisting with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change.
- Providing regional investment in the NSW renewable energy sector.
- Making a positive contribution towards achieving the target of at least 2.5 GW of renewable energy generation from the South West REZ.

- The Project will also provide direct financial benefits to the region and local community, including:
    - The Project will require approximately $866 million in investment during the construction phase, of which approximately $130 million will be retained in the Wentworth Shire LGA and the Mildura Rural City LGA.
    - Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $220 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments.
    - Supporting 225 direct and 360 indirect FTE positions in the national economy (on average) over the construction period, with 400 direct FTE during peak construction.
    - Supporting an estimated 30 direct and 85 indirect FTE jobs nationally during operations. Indirect benefits to local services through the construction and operation phases.
    - Supporting 95 FTE construction jobs and 47 FTE ongoing operational jobs (includes both direct and indirect jobs within the Wentworth Shire LGA and the Mildura Rural City LGA.
    - Injection of approximately $4.6 million in new spending into the Wentworth Shire LGA and the Mildura Rural City LGA over the construction phase with flow on benefits for local businesses.
    - Payments to host landowners via negotiated agreements, resulting in financial contributions to the local community.
- The Project will also provide additional direct financial benefits to the region and local community, including:
    - Payments to host landowners via private agreements.
    - Annual payments to the community under a Planning Agreement with Wentworth Shire Council and a community benefit sharing scheme.
    - Annual community payments via the Access Rights Benefits Scheme for the South West REZ.

On this basis, and subject to the implementation of the mitigation, management and offsetting commitments outlined in this EIS, it is considered that the Project is consistent with the objects and requirements of the EP&A Act and is in the public interest.

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