



Bullawah Wind Farm Project

Amendment Report (FINAL)

Proponent: Bullawah Wind Farm Pty Ltd

Author: Umwelt (Australia) Pty Ltd

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Bullawah Wind Farm

Amendment Report

Final

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
BayWa r.e. Projects Australia

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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.

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Document Status

Rev No	Reviewer Name	Reviewer Date	Approver Name	Approver Date
Final	Lauren Evans	6 April 2025	Nathan Baker	7 April 2025

Executive Summary

Bullawah Wind Farm Pty Ltd (BWF) proposes to develop the Bullawah Wind Farm (the Project) to provide a reliable and affordable source of energy for the people of New South Wales (NSW). The Project is located approximately 36 km south east of the township of Hay, in the Riverina region of south western NSW. The Project is located within the Hay Shire, Murrumbidgee and Edward River Local Government Areas (LGAs) and is within the South West Renewable Energy Zone (REZ).

The Project is State Significant Development (SSD) under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), and an Environmental Impact Statement (EIS) was prepared to adequately address the NSW Department of Planning, Housing and Infrastructure (DPHI) Secretary's Environmental Assessment Requirements (SEARs) provided for the Project.

DPHI placed the EIS on public exhibition from 27 August 2024 to 23 September 2024. During the public exhibition period, 84 public submissions were received, including 68 submissions objecting to the Project and 16 submissions in support of the Project. Additionally, 22 submissions were received from Government Agencies, including each of the three (3) Councils. No Government Agencies objected to the Project, and Murrumbidgee Council provided its support for the Project. A Submissions Report was subsequently prepared to address key issues raised in community submissions (Umwelt, 2025a).

Several amendments are now proposed for the Project in response to public submissions and agency advice received on the Project EIS during the exhibition period, along with technical advancements to the design of the Project. The proposed amendments are summarised in **ES Table 1** below.

ES Table 1 Proposed Amendments

No.	Description
1	Construction staging amendments – BWF has identified that Stage 2 (North) is now likely to commence sooner than was previously indicated in the Project EIS, and may commence prior to Stage 1 (South). As a result, a greater overlap between the construction periods for Stage 1 (South) and Stage 2 (North) is now anticipated. Consequently, the peak workforce has increased from 350 workers at the height of construction as identified in the Project EIS, to 380 workers in this Amendment Report. As a result this amendment also reduces the overall duration of the construction period from 44 to 35 months.
2	Transport route amendments – The Amended Project encompasses two (2) port options, being Port of Newcastle (considered in the EIS but with impacts only being assessed for the “Local Transport Route” component) and Port Adelaide (a new port option considered in the Amendment Report). Accordingly, BWF is now seeking consent for any and all impacts associated with Off-Site Road Works and modifications between the nominated Ports and the Project Area, noting that consent associated with the SSDA is wholly limited to works within NSW. The Amended Project assesses five (5) Port to Hay Over-size Over-mass (OSOM) transport route options. This includes three (3) route options from the Port of Newcastle, and two (2) route options from the Port Adelaide to accommodate different weights and height dimensions of equipment. Due to certain weight and height restrictions on the road network these routes have been chosen as viable options to transport components from Port to Hay.

No.	Description
3	WTG amendments – The Amended Project includes two (2) potential scenarios with respect to WTG dimensions. The Project EIS identified a maximum turbine size, being a tip height of up to 300 m and a blade length of up to 100 m. BWF has subsequently identified a maximum alternate turbine size (being a tip height of up to 233 m and a blade length of up to 80 m) for the purposes of identifying and assessing required road upgrades to the Port to Hay Transport Routes. However, BWF is seeking to retain flexibility to install a larger turbine (up to 300 m tip height and 100 m blade length), should the necessary Port to Hay upgrades be undertaken by the NSW Government or a third party.
4	Obstacle lighting amendments – The provision of obstacle lighting on select WTGs and meteorological masts (where masts are installed prior to WTG installation or are not proximally to a boundary WTG (>900 m)) in accordance with CASA requirements.
5	Project design refinements – Two (2) WTGs (WTG 37 and 37), including related infrastructure and associated disturbance are proposed to be removed from the Project design.

ES Table 2 provides a comparison of the Project previously presented in the EIS (EIS Project) and the Amended Project as presented in this Amendment Report.

ES Table 2 Comparison of EIS Project and Amended Project

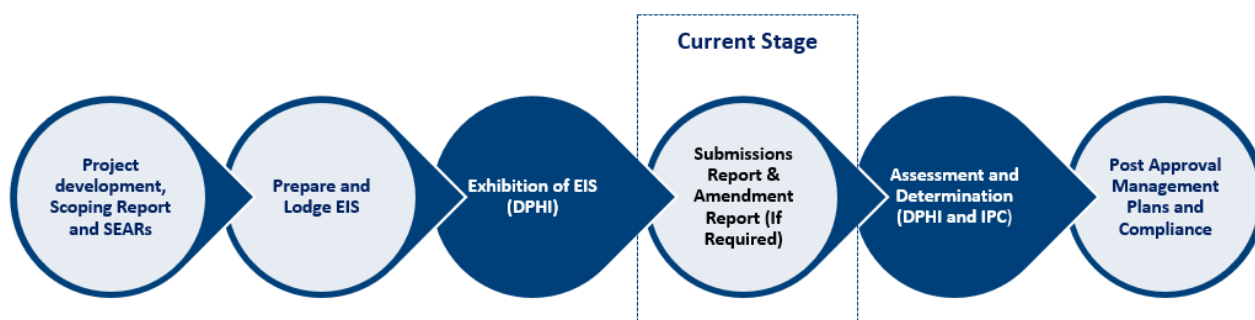
Project Component	EIS Project	Amended Project
Construction duration	3.5 years (44 months)	3 years (35 months)
Peak construction workforce	350 workers	380 workers
Average construction workforce	207 full-time equivalent (FTE) workers	182 FTE workers
Port of Newcastle to Hay Transport Routes	Two (2) transport route options	Three (3) transport route options, including consideration of impacts across entire Port to Hay route
Port Adelaide to Hay Transport Routes	Not assessed	Two (2) transport route options, including consideration of impacts along the entirety of the Port Adelaide to Hay Transport Routes (within NSW)
Maximum dimensions assessed for WTG installation and Local Transport Route off-site road works	- Upper-most blade tip: Up to 300 m - Lower-most blade tip: Up to 100 m above group level - Rotor diameter: Up to 200 m - Tower (hub) height: Up to 200 m.	No change
Maximum dimensions assessed for Port to Hay off-site road works	Not assessed	- Upper-most blade tip: Up to 233 m - Lower-most blade tip: Up to 66.5 m above group level - Rotor diameter: Up to 163 m - Tower (hub) height: Up to 148 m.
Obstacle lighting	N/A	Inclusion of obstacle lighting for select WTGs and WMTs
WTGs	143	141

Approval Pathways and Assessment Process

The Project is SSD as defined under State Environmental Planning Policy (Planning Systems) 2021 and requires development consent under Part 4 of the EP&A Act. **ES Figure 1** below provides an overview of the key stages in the SSD process.

The Project has also been declared a controlled action (EPBC 2022/09423) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) based on potential impacts to EPBC Act listed threatened species and communities. The Project will be assessed by the NSW Government under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1).

As more than 50 submissions have duly been made by way of objection to the Project, it is anticipated that the consent authority for the development application will be the Independent Planning Commission of NSW (IPC). It is expected that DPHI will now assess the Project and document its findings in an Assessment Report which will be provided to the IPC, with a recommendation for approval or refusal. The IPC will then consider the Project and decide whether to approve the Project (subject to conditions) or refuse the Project.



ES Figure 1 **Assessment Process**

Assessment of Impacts

A qualitative assessment has been undertaken against relevant environmental, social and economic features as assessed in the Project EIS (Umwelt, 2024a) to identify potential changes to previously assessed impacts resulting from the Project amendments. This identified the need for detailed assessments of biodiversity, Aboriginal cultural heritage, noise, social impacts, transport, economic impacts and blade throw risk to support the Amended Project.

ES Table 3 Amended Project Impact Assessment Summary

Aspect	Key Findings
Biodiversity	An Amended Biodiversity Development Assessment Report (BDAR) has been prepared to address relevant Project Amendments, (specifically the Port to Hay offsite road works and WTG amendments), and to address Government agency submissions on the EIS. Key findings of the Amended BDAR include: • The Project has been designed and progressively refined to avoid and minimise impacts to biodiversity and in response to stakeholder feedback. Importantly, the Project avoids all important habitat for the Plains-wanderer within the Project Area. • The Amended Project would directly impact 638.15 ha of native vegetation. This includes 638.01 ha within the Project Area and disturbance areas associated with Local Transport Route upgrades. The remaining 0.14 ha comprises native vegetation and planted native vegetation within Port to Hay offsite road works areas which does not conform to any threatened ecological community (TEC). • Of the 638.01 ha of native vegetation to be impacted within the Project Area and Local Transport Route offsite works areas, there would be direct impacts to 87.42 ha of TECs including: ○ 22.80 ha of direct impacts to Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (an endangered ecological community (EEC) listed under the BC Act) ○ 4.92 ha of direct impacts to Weeping Myall Woodland (an EEC listed under the EPBC Act) ○ 59.70 ha of direct impacts to Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion (EEC listed under the BC Act). • Within the Project Area and Local Transport Route offsite works areas, there would be a loss of habitat for: ○ up to 44 ecosystem species predicted to occur within the <i>Project Area</i> ○ <i>five (5) threatened flora species recorded during field surveys: Maireana cheelii</i> (4.67 ha), <i>Swainsona sericea</i> (9.78 ha), <i>Swainsona murrayana</i> (123.09 ha), <i>Lepidium monolocoides</i> (3.52 ha) and <i>Eleocharis obicis</i> (7.31 ha) ○ four (4) threatened fauna species recorded during field surveys including: Barking Owl (2.80 ha), Little Eagle (35.81 ha), Southern Bell Frog (52.16 ha) and Plains-wanderer (20.89 ha of supplementary habitat, not important habitat). • A Prescribed Impact Assessment has been undertaken to consider the potential impacts from turbine strikes on significant bird and bat species. To assess the likelihood and consequence of impacts on aerial species, a qualitative risk-based assessment based on an assessment methodology developed by the Arthur Rylah Institute (Lumsden et al. 2019) has been conducted. Key findings of this risk-based assessment include: ○ A total of 12 bird species were recorded in the Project Area, of which 11 were threatened bird species. Of the total 12 species recorded, two (2) bird species (black falcon and little eagle) were assigned a mitigated risk rating of moderate. Of these, black falcon is a listed threatened species. A further five (5) bird species were assigned a mitigated risk rating of minor and the remaining five (5) were assigned a negligible risk rating (with or without mitigation).

Aspect	Key Findings
	○ A total of 17 bat species were recorded within the Project Area, of which four (4) were threatened species. Of the total bat species recorded, two (2) bat species (white-striped freetail-bat and yellow-bellied sheath-tail bat) were assigned a mitigated risk rating of moderate. Of these, yellow-bellied sheath-tail bat is a listed threatened species. A further 14 bat species were assigned a minor mitigated risk rating and one (1) species was assigned a negligible risk rating (with or without mitigation). ● BWF has committed to implement a comprehensive range of measures to mitigate and manage the biodiversity impacts of the Amended Project. BWF is also developing a Biodiversity Offset Strategy to offset the residual impacts of the Project in accordance with the requirements of the BC Act. Furthermore, BWF has also committed to additional appropriate measures to mitigate biodiversity impacts, with a particular focus on Plains-wanderer and Black Falcon conservation programs and local land management in collaboration with local stakeholders, including First Nations groups.
Aboriginal Cultural Heritage	Several areas along the proposed Port to Hay Transport Routes have been identified where road modifications would be required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in ground disturbance outside of the existing road pavement, which has warranted the preparation of an Addendum Aboriginal Cultural Heritage Assessment Report (ACHAR). The Addendum ACHA addresses three (3) discrete Port to Hay off site road work areas, located in Euston, Balranald and Hay, based on desktop assessment and visual inspection. The Addendum ACHA indicates that: ● Preliminary desktop review of the off-site road works areas (comprising review of historical and contemporary aerial photography and mapping) undertaken within the Addendum ACHAR indicated that all were located in highly disturbed road corridors. Accordingly, the approach and method adopted to meet the archaeological objectives comprised a targeted visual inspection based on information obtained from the desktop assessment to ground-truth the supposition that there was a low likelihood of extant Aboriginal sites being present. ● The visual inspection of the off-site road works areas did not identify any new Aboriginal sites and/or areas of potential archaeological deposit (PAD). The results of the inspection indicated extensive ground disturbance associated with prior road construction activities, with negligible archaeological potential (surface or subsurface). ● On this basis, the assessment determined that it is unlikely that surface and/or subsurface Aboriginal objects would be directly impacted by the construction of the off-site road work areas. In addition, the assessment also determined that the Project would not cause direct harm to Aboriginal objects and/or the potential resource across the off-site road works areas. ● The Addendum ACHAR includes a management strategy to address the potential impacts of the Project on the potential Aboriginal heritage resource of the off-site road works areas. The Addendum ACHA expands on select mitigation strategies as identified in the Project EIS and Submissions Report to specifically include appropriate management at off-site road works areas.
Noise	A Noise Sensitivity Analysis (NSA) was undertaken to support the proposed WTG amendments (refer to ES Table 1). The NSA assessed an alternative WTG model proposed by BWF (Nordex N163 5.7 MW) which has a hub height of 148 m, and compared the predicted noise levels at receivers to the noise management levels presented in the EIS (based on a hub height of 200 m). The results of the NSA indicate that predicted operational WTG noise levels are below the reference level of 45 dB LAeq at all host receivers (with a minimum compliance margin of 1.1 dB), and below the reference level of 35 dB LAeq at all non-associated receivers, with a minimum compliance margin of 0.5 dB.

Aspect	Key Findings
	A noise sensitivity screening process has also been undertaken with respect to construction works within the Port to Hay off-site works areas, to support the assessment of amenity-based impacts at these locations. The screening process involved generating a buffered area around select offsite work areas where more substantive road modifications are proposed (i.e. making the road 'trafficable'), based on a list of assumed plant, equipment and machinery and associated 'time of use' within a 15 minute period needed to deliver the road modifications. This screening process indicates that: • Generally, receivers closest to the works (e.g. 30 m to 50 m) may experience noise levels of up to approximately 68 to 73 dBA, with receivers further away (but within 400 m of the work area) experiencing noise levels greater than 45 dBA, again depending on any shielding already provided. This resulted in an estimated 'impact radius' buffer of 400 m being generated around select off-site road works areas. This off-site road work areas buffer has formed the basis of further consideration of potential noise-related impacts to receivers near these works. • The screening process enables a targeted assessment approach by identifying 'sensitive' receivers within the area of influence of off-site road works, with assumed low existing ambient and background noise levels, who may be subject to potential amenity-based impacts. The off-site road work areas with assumed low ambient noise levels include Balranald, Hay and Narromine. • Consultation undertaken by BWF has identified that nurses accommodation / quarters have been constructed approximately 35 m to 110 m from the proposed off site road works near the right hand bend on Sturt Highway at Balranald, NSW. Careful planning and engagement will be required to ensure that suitable actions (e.g. respite, agreed time for noisy activities, alternate accommodation etc) are discussed and agreed prior to the works occurring. • The updated mitigation measures for the Amended Project include specific consideration of management practices for sensitive receivers identified to experience construction noise levels above the noise affected management level in the ICNG. This includes planning and engagement, particularly with respect to the nurses accommodation / quarters.
Social Impacts	An Addendum Social Impact Assessment (SIA) has been undertaken with respect to the Amended Project's social impacts. The Addendum SIA indicates that: • The proposed amendments to the construction phase of the Project will likely impact the cumulative development landscape of the South West REZ, as a greater workforce will be required though for a shorter and more condensed period. • The projected cumulative population change accounting for the Amended Project's peak workforce and construction schedule, and proposed developments within the South West REZ is <0.02% less than the previous cumulative population change projections across all scenarios. This indicates only a minor change from the original Project assessment and does not significantly alter the social impact rating and mitigating factors previously presented in the SIA. • Despite some dimensions of impact magnitude having changed from the Project EIS SIA, it has been determined that the impact significance remains consistent with the rankings presented in the Project EIS SIA. The proposed amendments are unlikely to change the significance of social impacts of the Project and consequently no further social impact mitigation strategies are considered necessary. However, based on the outcomes summarised above, and updates to social baseline data (where available), in particular, housing and accommodation data an amended Accommodation and Employment Strategy (Appendix A of the Amended SIA) has been prepared.

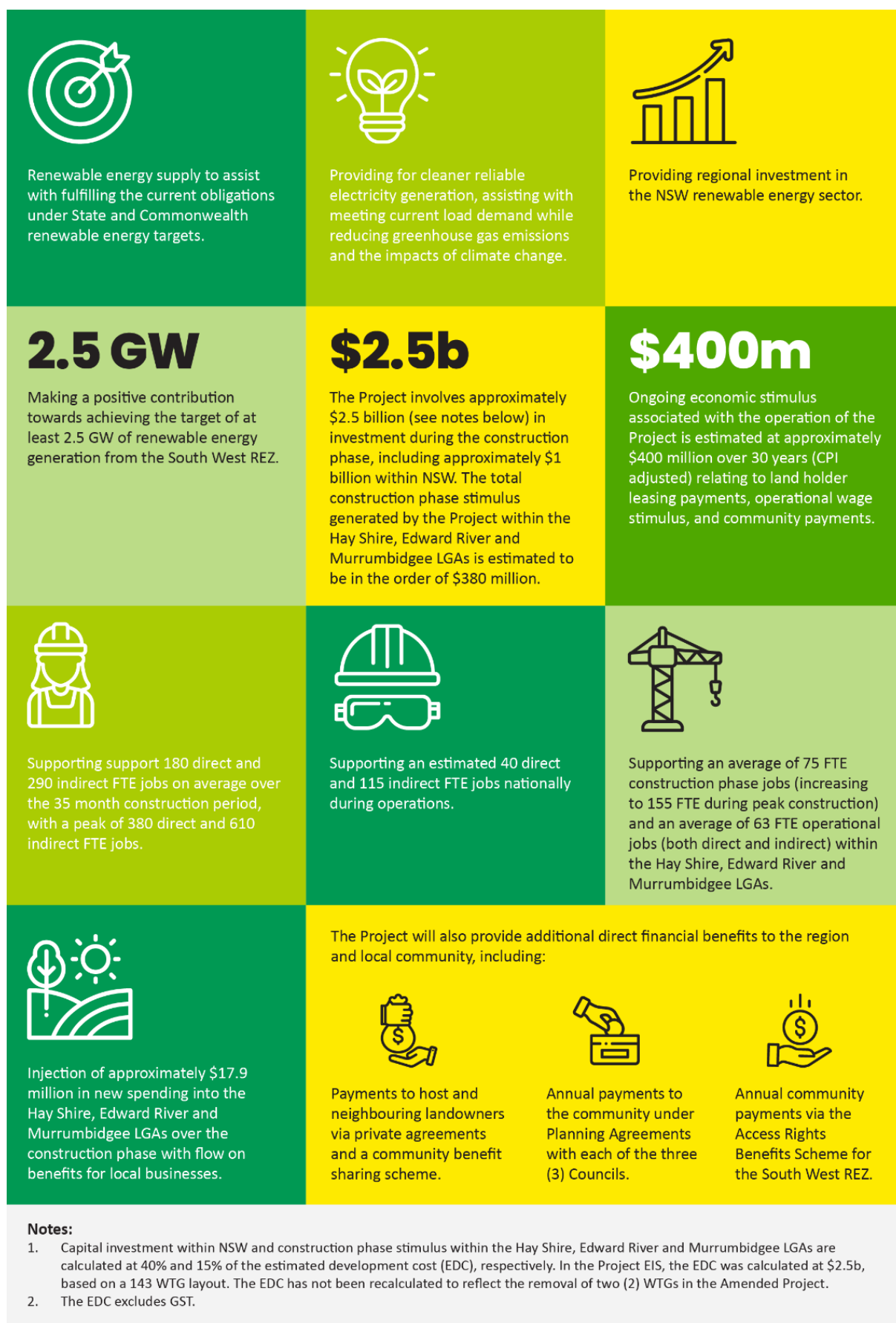
Aspect	Key Findings
Transport	An Amended Traffic Impact Assessment was undertaken with respect to the Amended Project's traffic and transport impacts and to address Government Agency submissions. The Amended TIA was informed by updated Route Study Reports for the respective Port to Hay Transport Route options from the Ports of Newcastle and Adelaide, based on a maximum blade length of up to 80 m. These Route Study Reports identify road modifications required to enable the safe transport of Project components using OSOM vehicles, which now form part of the Amended Project. The most significant traffic generation associated with the Project will occur during construction, where the Project will generate up to: • 56 heavy vehicle trips and 265 light vehicles trips per hour during peak construction • 528 heavy vehicle trips, 14 OSOM trips and 530 light vehicle trips per day during peak construction. The Amended TIA indicates: • With construction traffic generated by the Project and background traffic growth (to 2028) all assessed roads in the vicinity of the Project will continue to operate at the highest Level of Service (LoS), being LoS A. After adding projected traffic from nearby renewable energy developments, all roads will operate at LoS A in 2028 with the exception Cobb Highway which will operate LoS B and which is still acceptable. • It is expected that the proposed site access points will meet the minimum sight distance required to comply with Austroads requirements. • Updated turn warrant assessments were undertaken for the peak period of construction traffic generation to determine whether project traffic would require a higher-order turn treatment. This assessment indicates that no higher order turn treatments are required.
Economic Impacts	An Addendum Economic Impact Assessment (EIA) was undertaken with respect to the Amended Project's economic impacts. The Addendum EIA indicates that: • The Project will generate approximately \$1 billion in capital investment within NSW during construction. Capital investment within NSW is calculated at 40% of EDC. In the Project EIS, the EDC was calculated at \$2.5b, based on a 143 WTG layout. The EDC has not been recalculated to reflect the removal of two (2) WTGs in the Amended Project. • A total of 180 full time equivalent (FTE) direct jobs will be supported on average over the Project's 35 month construction phase, increasing to 380 FTE jobs during peak construction. This includes an average of 15 FTE direct jobs sourced within the Hay Shire, Edward River and Murrumbidgee LGAs, rising to 35 during peak construction. • An average of 290 FTE indirect jobs will be supported by Project construction, increasing to 610 FTE jobs during peak construction. This includes an average of 60 indirect jobs within the Hay Shire, Edward River and Murrumbidgee LGAs, rising to 120 FTE jobs during peak construction. • Consistent with predictions in the Project EIS, the overall construction phase stimulus generated by the Project within the Hay Shire, Edward River and Murrumbidgee LGAs is estimated at 15% of the Project's EDC, or approximately \$380 million. This figure is based on the calculation of EDC presented with the Project's EIS. The EDC has not been recalculated to reflect the removal of two (2) WTGs in the Amended Project. The total local construction phase stimulus includes approximately \$17.9 million in non-local worker wage stimulus, which represents a reduction from approximately \$26 million for the EIS Project, however this reduction is expected to be offset by higher expenditure on local materials and contracts with local service providers, meaning the total construction stimulus across the three (3) LGAs is unlikely to change.

Aspect	Key Findings
	- During construction, workforce accommodation is expected to be required for an average of 165 FTE non-local workers, rising to 345 FTE non-local workers during peak construction. The proposed temporary workers accommodation (TWA) has been designed with sufficient capacity to accommodate the minor increase in the peak construction workforce generated by the Amended Project. - Consistent with predictions in the Project EIS, ongoing economic stimulus associated with the operation of the Project is estimated at approximately \$400 million (over 30 years, CPI adjusted), relating to landholder leasing payments, operational wage stimulus, and community payments. - Due to the minor changes to the construction workforce and accommodation requirements of the Amended Project, there is no amendment to the cumulative economic impacts as assessed during the EIS phase and no changes to previously proposed mitigation measures are required.
Blade Throw	An Amended Blade Throw Assessment (BTA) was undertaken to assess the annual probability of a whole blade or a blade fragment striking a residence, when considering the proposed WTG amendments and project design refinements in this Amendment Report. The Amended BTA adopts a revised assessment methodology which has been confirmed through consultation with DPHI on its advice provided on the EIS BTA following exhibition of the Project EIS. Maximum impact ranges have been derived for both the EIS candidate WTG and Amended candidate WTG for both blade fragment and whole blade drop scenarios, as follows, and having regard to Hazardous Industry Planning Advisory Paper No. 4 (HIPAP 4) - Risk Criteria for Land Use Safety Planning (HIPAP 4) (DoP, 2011): - EIS candidate WTG (representative of a 300 tip height): 1,018 m blade fragment and 388 m whole blade drop. - Amended Project candidate WTG (representative of a 233 m tip height): 700 m fragment; 274 m whole blade drop. Superimposing the maximum blade fragment impact radius of the EIS candidate WTG onto the Project layout shows that one residence (R2) is located 801 m within the impact radii of WTG 96. No residences are located within the maximum blade fragment impact radius for the Amended candidate WTG. Additionally, no residences are located within the maximum whole blade drop scenario for both the EIS and Amended Project candidate WTGs. The Addendum BTA indicates that: - The probability of blade fragment impact is 0.8×10^{-6}, being risk in a million, per year. This is lower than the 1×10^{-6} risk per year location specific individual fatality risk (LSIFR) criteria stated for “Residential, hotels, motels, tourist resorts” in Table 2 of HIPAP 4. - With the removal of WTG 37 and WTG 38 from the Project design, all residences are either outside of potential blade drop and blade fragment impact radii, or are below the acceptable threshold for impacts as stated within HIPAP 4.
Cumulative Impacts	A Cumulative Impact Assessment (CIA) was prepared to assess the Project’s impacts both alone and in combination with impacts generated by other existing and planned development within the Project EIS (Umwelt, 2024a), in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (CIA Guidelines) (DPE, 2022). All environmental and social matters were considered with respect to potential cumulative impacts. Due consideration of potential cumulative impacts on select environmental features has been undertaken in the respective sections of this Amendment Report. This included consideration of potential traffic and transport-related cumulative impacts along the proposed Port to Hay Transport Routes. Given the minor changes proposed under the Amended Project, no material change to cumulative impacts (outside of those assessed in the Project EIS) is considered likely.

Project Need

The NSW Government's Electricity Strategy and Electricity Infrastructure Roadmap sets out the plan to deliver the State's first REZs. These REZs will play a vital role in delivering affordable, reliable energy generation to help replace the State's existing power stations as they come to their scheduled end of operational life.

The Project is strategically located within the South West REZ, which has an intended network capacity of 2.5 gigawatts (GW). The Project will deliver a range of social and economic benefits to NSW and to regional and local communities as illustrated in **ES Figure 2** below.



ES Figure 2 Key Project Benefits

Table of Contents

Executive Summary	i
Key Terms	xv
1.0 Introduction	1
1.1 Background	1
1.2 The EIS Project	2
1.3 The Amended Project	5
1.3.1 Amended Project Overview	6
1.4 Structure of this Report	6
1.5 Assessment Undertaken	7
2.0 Strategic Context	10
2.1 Strategic Context for Project Amendments	10
2.1.1 Renewable Energy Market	10
2.1.2 NSW Electricity Strategy	11
2.1.3 Renewable Energy Planning Framework	11
3.0 Description of Amendments	13
3.1 Summary of Amendments	13
3.2 Construction Staging Amendments	14
3.3 Transport Route Amendments	14
3.3.1 Offsite Road Works	15
3.4 WTG Amendments	30
3.5 Obstacle Lighting Amendments	32
3.6 Project Design Refinements	34
4.0 Statutory Context	36
4.1 NSW Assessment and Approval Process	36
4.2 Commonwealth Assessment and Approval Process	36
5.0 Engagement	37
5.1 Engagement Carried Out	37
5.2 Future Engagement	40
6.0 Assessment of Impacts	41
6.1 Assessment Approach	41
6.2 Biodiversity	57
6.2.1 Engagement with NSW DCCEEW - CPHR	57
6.2.2 Engagement with Commonwealth DCCEEW	58

6.2.3	Existing Context	58
6.2.4	Avoidance and Minimisation of Impacts	77
6.2.5	Assessment Results	82
6.2.6	Matters of National Environmental Significance	110
6.2.7	Consideration of Obstacle Lighting Impacts to Wildlife	112
6.2.8	Aquatic Impacts	112
6.2.9	Cumulative Impacts	113
6.2.10	Management and Mitigation Measures	113
6.2.11	Biodiversity Credit Impact Summary	135
6.2.12	Biodiversity Offset Strategy	139
6.2.13	Bilateral Agreement	141
6.3	Aboriginal Cultural Heritage	142
6.3.1	Assessment of Off-site Road Works	142
6.4	Noise	143
6.4.1	Assessment	144
6.4.2	Cumulative Impacts	150
6.4.3	Management and Mitigation Measures	150
6.5	Social Impacts	151
6.5.1	Assessment Results	151
6.5.2	Cumulative Impacts	152
6.5.3	Management and Mitigation Measures	152
6.6	Transport	153
6.6.1	Existing Environment	153
6.6.2	Assessment Results	154
6.6.3	Traffic Capacity Analysis Results	158
6.6.4	Turn Warrant Assessments	159
6.6.5	Operations	160
6.6.6	Decommissioning	160
6.6.7	Cumulative Impacts	160
6.7	Economic Impacts	171
6.7.1	Assessment Results	171
6.7.2	Cumulative Impacts	172
6.7.3	Management and Mitigation Measures	172
6.8	Blade Throw	172
6.8.1	Assessment Results	173
6.8.2	Cumulative Impacts	173
6.8.3	Management and Mitigation Measures	173
6.9	Cumulative Impacts	174
7.0	Justification of Amendment Project	175

7.1	Environmental, Social and Economic Impacts	175
7.2	Strategic Context	178
7.3	Suitability of the Site	178
7.4	Ecologically Sustainable Development (ESD)	179
7.5	Conclusion	179

8.0	References	182
------------	-------------------	------------

Figures

Figure 1.1	Regional Context	3
Figure 1.2	The EIS Project	4
Figure 3.1	Amended Indicative Project Construction Workforce Histogram	14
Figure 3.2	Port to Hay Transport Routes	18
Figure 3.3	Port to Hay – Off-site Road Work Areas	19
Figure 3.4	WTGs Proposed for Obstacle Lighting (Indicative)	33
Figure 3.5	Amended Project Layout	35
Figure 6.1	Plant Community Types and Vegetation Zones	62
Figure 6.2.1	Threatened Ecological Communities (BC Act)	67
Figure 6.3.1	Threatened Ecological Communities (EPBC Act)	71
Figure 6.4.1	Avoid and Minimise Impacts – Early Scoping Report	78
Figure 6.5	Balranald Offsite Road Works Area – Sensitive Receivers	147
Figure 6.6	Hay Offsite Road Works Area – Sensitive Receivers	148
Figure 6.7	Narromine Off-site Road Works Area – Sensitive Receivers	149
Figure 6.8	Indicative Light Vehicle and Quarry Transport Routes	157

Tables

Table 1.1	Proposed Amendments	5
Table 1.2	Report Structure	6
Table 1.3	Summary of Assessment by Proposed Project Amendments	8
Table 3.1	Comparison between the EIS and Amended Projects	13
Table 3.2	Port to Hay Transport Routes	15
Table 3.3	Port to Hay – Offsite Road Works	16
Table 3.4	Maximum Proposed WTG Dimensions – Amended Project	30
Table 3.5	WTG Dimensions Adopted for Assessment Purposes – Amended Project	31
Table 5.1	Summary of Government and Agency Consultation	38
Table 6.1	Qualitative Assessment of Impacts	42
Table 6.2	Summary of Impacts to Native Vegetation	84
Table 6.3	Summary of Direct Impacts on Threatened Species Credit Species	86
Table 6.4	Risk Criteria – Likelihood of Impact	87
Table 6.5	Risk Criteria – Likelihood of Consequence	87
Table 6.6	Risk Matrix	87

Table 6.7	Potential Indirect Impacts to Biodiversity Including their Extent, Frequency, Timing, Duration and Consequence	88
Table 6.8	Potential Impacts on Threatened Entities Associated with Human-Made Structures and Non-Native Vegetation	95
Table 6.9	Potential Impacts on Connectivity of Habitat of Threatened Entities	96
Table 6.10	Potential Impacts to Water Quality, Water Bodies and Hydrological Processes that Sustain Threatened Entities	99
Table 6.11	Turbine Risk Assessment Summary	103
Table 6.12	SAII Impact Assessment – Plains Wanderer	106
Table 6.13	Threatened Ecological Communities Recorded in the Subject Land	110
Table 6.14	Summary of Direct and Indirect Impacts on Threatened Flora Species and the Likelihood of a Significant Impact	110
Table 6.15	Summary of Direct and Indirect Impacts on Threatened Fauna Species and the Likelihood of a Significant Impact	111
Table 6.16	Mitigation Measures	115
Table 6.17	Proposed Monitoring and Adaptive Management Measures	133
Table 6.18	Summary of Credit Requirements and Additional and Appropriate Measures	140
Table 6.19	Road Modification Construction Noise Assumptions	145
Table 6.20	Cumulative Population Change Prediction for the Construction Period	152
Table 6.21	Amended Project – Transport Route Traffic CIA	163
Table 7.1	Amended Project Environmental, Social and Economic Impact Summary	175

Appendices

Appendix No.	Appendix Title
Appendix 1	Amended Project Description
Appendix 2	Project Design Information
Appendix 3	Updated Mitigation Measures
Appendix 4	Summary of Biodiversity Offsets, Road Upgrades and Heritage Item Management
Appendix 5	Amended Biodiversity Development Assessment Report
Appendix 6	Addendum Aboriginal Cultural Heritage Assessment Report
Appendix 7	Noise Sensitivity Analysis
Appendix 8	Addendum Social Impact Assessment
Appendix 9	Amended Traffic Impact Assessment
Appendix 10	Addendum Economic Impact Assessment
Appendix 11	Amended Blade Throw Assessment
Appendix 12	Amended Obstacle Lighting Plan

Key Terms

Project-Specific Term	Description
Amended Project	The amendments proposed to the Project as described and assessed within this Amendment Report.
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 Landholder	The owner(s) of an associated residence. An associated landholder has reached a private agreement with BWF 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 the purposes of this EIS, there are three (3) associated landholders with residences (R4, R5 and R8) described as associated residences/receivers throughout this report, with the exception of the EIS Noise and Vibration Assessment (NVA). As the agreements with these three (3) landholders do not explicitly reference a potential noise impact, a worst-case approach has been adopted for assessment purposes, whereby the NVA has assumed the residences to be non-associated.
Associated Residence	A residence on privately-owned land in respect of which the owner has reached a private agreement with BWF in relation to the Project and management of impacts. As noted above, there are three (3) residences (R4, R5 and R8) are described as associated residences/receivers throughout this report, with the exception of the EIS NVA. As the agreements with these three (3) landholders do not explicitly reference a potential noise impact, a worst-case approach has been adopted for assessment purposes, whereby the NVA has assumed the residences to be non-associated.
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, as described under the Renewable Energy Planning Framework Benefit Sharing Guideline (2024), 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 <i>Environmental Planning and Assessment Act 1979</i> (EP&A Act).
Development Corridor	This is the area within which all Project infrastructure will be placed, and all Project related ground disturbance will occur. The Development Corridor is of variable width (to avoid key site constraints) and has been designed to provide some flexibility for micro-siting of infrastructure. The Development Corridor is shown in Figure 3.5 .

Project-Specific Term	Description
Disturbance Footprint	This is the actual disturbance area required for the Project. The Disturbance Footprint is shown conceptually in Figure 3.5 . 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.
EIS Project	The Project as described in EIS (Umwelt, 2024a) and summarised in Section 1.2 of this Amendment Report.
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.
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 residence. A host landholder has reached an agreement with BWF to host Project infrastructure within their landholdings and in relation to the management of impacts.
Host residence	A residence on privately-owned land in respect of which the owner has reached an agreement with BWF to host Project infrastructure and in relation to the management of impacts.
Internal Roads	Roads 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 Boundary, 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 Local Transport Route extends from the intersection of the Cobb Highway and Jerilderie Road to the Project Area. The majority of traffic movements to and from the Project will utilise this route, however, some of the construction workforce and quarry material deliveries may utilise alternative routes. The Project includes road widening and establishment of temporary parking areas at selected locations along the Local Transport Route.
Micro-siting	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 Development Corridor, with the exception of meteorological masts. • No WTG is moved more than 100 metres (m) from the relevant GPS coordinates listed in Appendix 3 of the Project EIS. • 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. • Permanent meteorological masts are installed within the Project Area at all times and within the Development Corridor where reasonable and feasible.
Non-associated Landholder	The owner of a non-associated residence.

Project-Specific Term	Description
Non-associated Residence	A residence on privately-owned land in respect of which the owner has not entered into a private agreement with BWF in relation to the Project's impacts. Or A residence on privately-owned land in respect of which the owner has reached an agreement with BWF 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.
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.
Port to Hay Transport Routes	Five (5) indicative oversize, overmass (OSOM) transport route options extending from the Ports of Adelaide and Newcastle to the intersection of the Cobb Highway and Jerilderie Road, as illustrated in Figure 3.2. This comprises: • three (3) transport routes from the Port of Newcastle • two (2) transport routes extending from Port Adelaide.
Port to Hay - Offsite Road Works	Discrete areas along the Port to Hay Transport Routes where road modifications are required to enable the safe transport of Project components using OSOM vehicles, as described in Section 3.3.1. In some instances, these road modifications result in disturbance outside of the existing road pavement.
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	Bullawah Wind Farm Pty Ltd (BWF)
Rehabilitation	The restoration of land disturbed by the Project to its former condition (as much as practicable), 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.

Project-Specific Term	Description
Substation	Infrastructure required to collect the internal electrical reticulation to increase the voltage for transmission to connect to the grid. Typically includes step-up transformers, an array of cable marshalling, busbars, various voltage and current transformers, operation and facilities building (with parking), communication facilities and tower, diesel generator, lighting, a buried earth grid, lightning masts, power conditioning equipment, a reactive power control system, and network support equipment as required and agreed with Transgrid (or other transmission network system operator).
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), on-site borrow pits, rock crushing facilities, concrete or asphalt batching plants, minor 'work front' construction access roads, environmental management and monitoring and signage.

1.0 Introduction

1.1 Background

Bullawah Wind Farm Pty Ltd (BWF) proposes to develop the Bullawah Wind Farm (the Project) to provide a reliable and affordable source of energy for the people of New South Wales (NSW). The Project is located approximately 36 km south east of the township of Hay, in the Riverina region of south western NSW. The Project is located within the Hay Shire, Murrumbidgee and Edward River Local Government Areas (LGAs) and is within the South West Renewable Energy Zone (REZ), as shown in **Figure 1.1**.

The Project is State Significant Development (SSD) as defined under the *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). The Project has also been declared a controlled action (EPBC 2022/09423) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) based on potential impacts to EPBC Act listed threatened species and communities. The Project will be assessed by the NSW Government under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). Accordingly, an Environmental Impact Statement (EIS) was prepared to address the NSW Department of Planning, Housing and Infrastructure (DPHI) Secretary's Environmental Assessment Requirements (SEARs) provided for the Project. A summary of the Project as described in the EIS (i.e. the EIS Project) is included in **Section 1.2**.

Public exhibition of the EIS took place between 27 August 2024 and 23 September 2024 with 87 unique submissions made by the public as well as submissions from three (3) local councils and 19 government agencies. A formal response to these submissions and government agency advice received on the Project EIS was provided in the form of a Submissions Report (Umwelt, 2025a), prepared in consideration of the *State significant development guidelines – preparing a submissions report* (i.e. the SSD Submissions Report Guidelines) (DPHI, 2024a) to address the key issues raised in the submissions.

Since submission of the EIS, and in response to select community submissions and government agency advice, BWF has conducted a thorough review of the layout and optimised the Project design to enhance its efficiency while minimising associated environmental and social impacts.

This amended Project design is hereafter referred to as the Amended Project. A summary of the Amended Project as assessed in this Amendment Report is provided in **Section 1.3** and **Section 3.0**, and described in detail in **Appendix 1**.

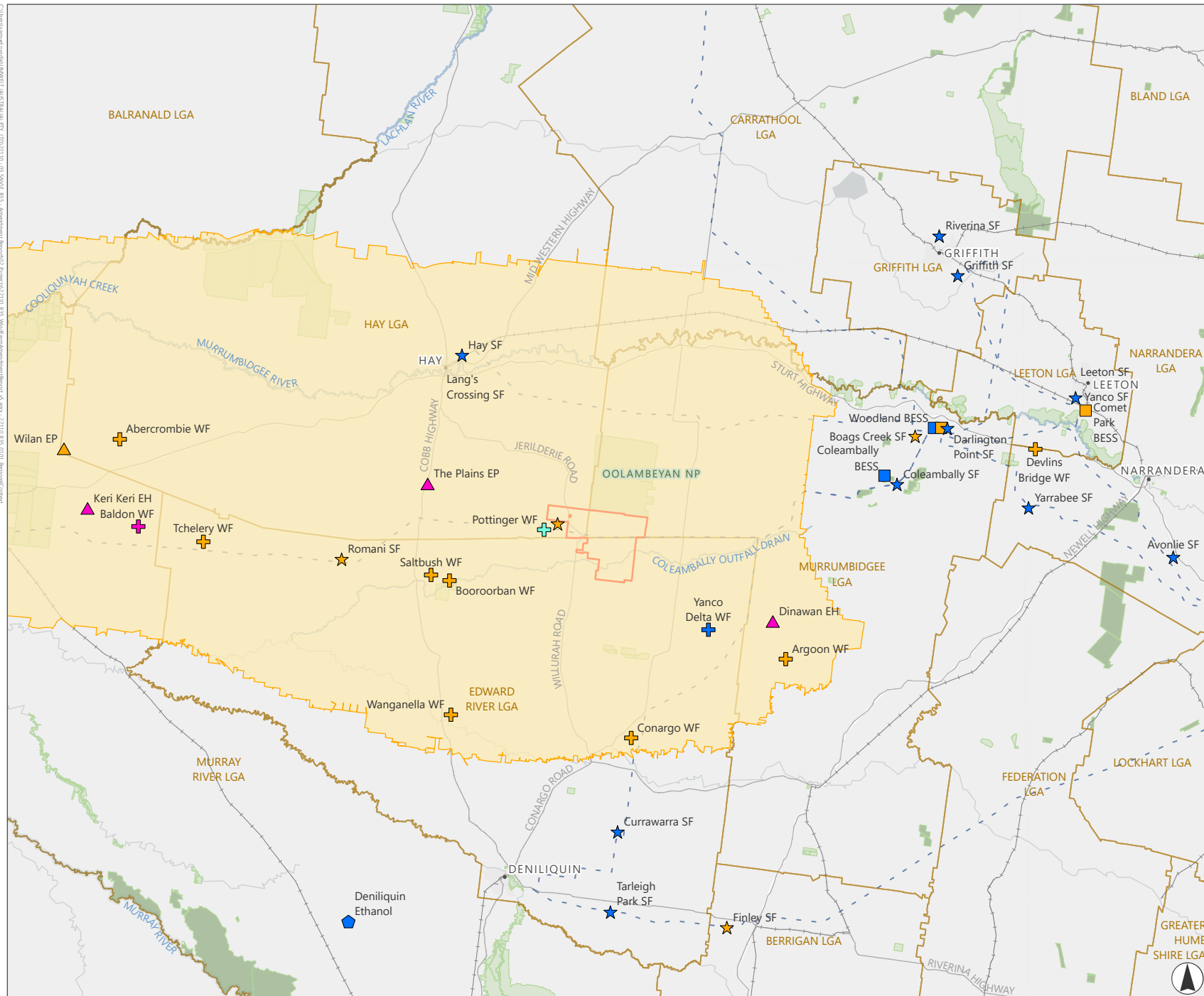
The proposed amendments continue to align the Project with the renewable energy strategies of both the State and Federal governments. It is widely acknowledged that the National Electricity Market (NEM) needs to rapidly transition to renewable energy to support Government commitments to net zero including the NSW Climate Change Policy Framework, and the Commonwealth Government's commitments under the Paris Agreement. At present, additional renewable energy capacity is being added to the NEM at a lower rate than what the Australian Energy Market Operator (AEMO) has identified as required to achieve the transition to renewable energy (Parkinson, Renew Economy, 2023). The Project will materially assist in addressing this shortfall by delivering approximately 803.7 MW of renewable energy capacity to the NEM.

1.2 The EIS Project

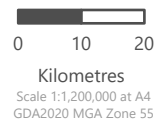
The EIS Project layout is shown in **Figure 1.2**. The key components of the EIS Project included:

- Up to 143 (three (3) blade) wind turbine generators (WTGs), with a maximum blade-tip height of 300 metres (m) above ground level.
- A 359 MW / 718 megawatt hour (MWh) battery energy storage facility.
- Permanent ancillary infrastructure including 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.
- Temporary facilities including a temporary workforce accommodation (TWA) camp, site offices, amenities, construction compounds and laydown areas, on-site borrow pits, rock crushing facilities, 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 to facilitate delivery of wind turbine components to the Project Area as required.

FIGURE 1.1
Regional Context



- Legend**
- Project Boundary
 - South-West REZ Boundary
 - Local Government Area
 - NPWS Reserves
 - State Forest
 - Electricity Transmission Line
 - Road
 - Railway Line
 - River/Stream
- Nearby SSD Projects**
- Project Type - Status**
- Battery - Determination
 - Battery - Prepare EIS
 - Bioenergy - Determination
 - Renewable Energy Hub - Response to Submissions
 - Renewable Energy Hub/Energy Park - Prepare EIS
 - Solar - Determination
 - Solar - Prepare EIS
 - Wind - Assessment
 - Wind - Determination
 - Wind - Prepare EIS
 - Wind - Response to Submissions



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FIGURE 1.2
The EIS Project

Legend

- Project Boundary
- Development Corridor
- Wind Turbine Generators
- Host Residence
- Associated Residence (Visual Impact)
- 220kV Transmission Poles
- 330kV Transmission Poles
- ▲ Site Access Points
- ▲ Permanent Meteorological Masts
- Temporary Met Mast (As Built)
- Tracks Connecting Hardstands
- Hardstand Area
- Cable Corridor
- 330kV Project Energy Connect Line
- 220kV External Transmission Line
- 330kV Internal Transmission Line (North to Central)
- 220kV Internal Transmission Line (Central to South)
- Main Temporary Laydown
- Temporary Satellite Laydown
- Main Temporary Construction Compound
- Temporary Construction Compound
- Temporary Workers Accommodation Compound
- Operations and Maintenance Facility
- Collector Substation
- 220 kV Switchyard
- Switchyard Laydown Area
- Main Substation
- Main Substation Temporary Laydown
- Battery Storage
- Quarry South (Current)
- Quarry South (Proposed)
- Quarry North
- NPWS Reserves
- Road

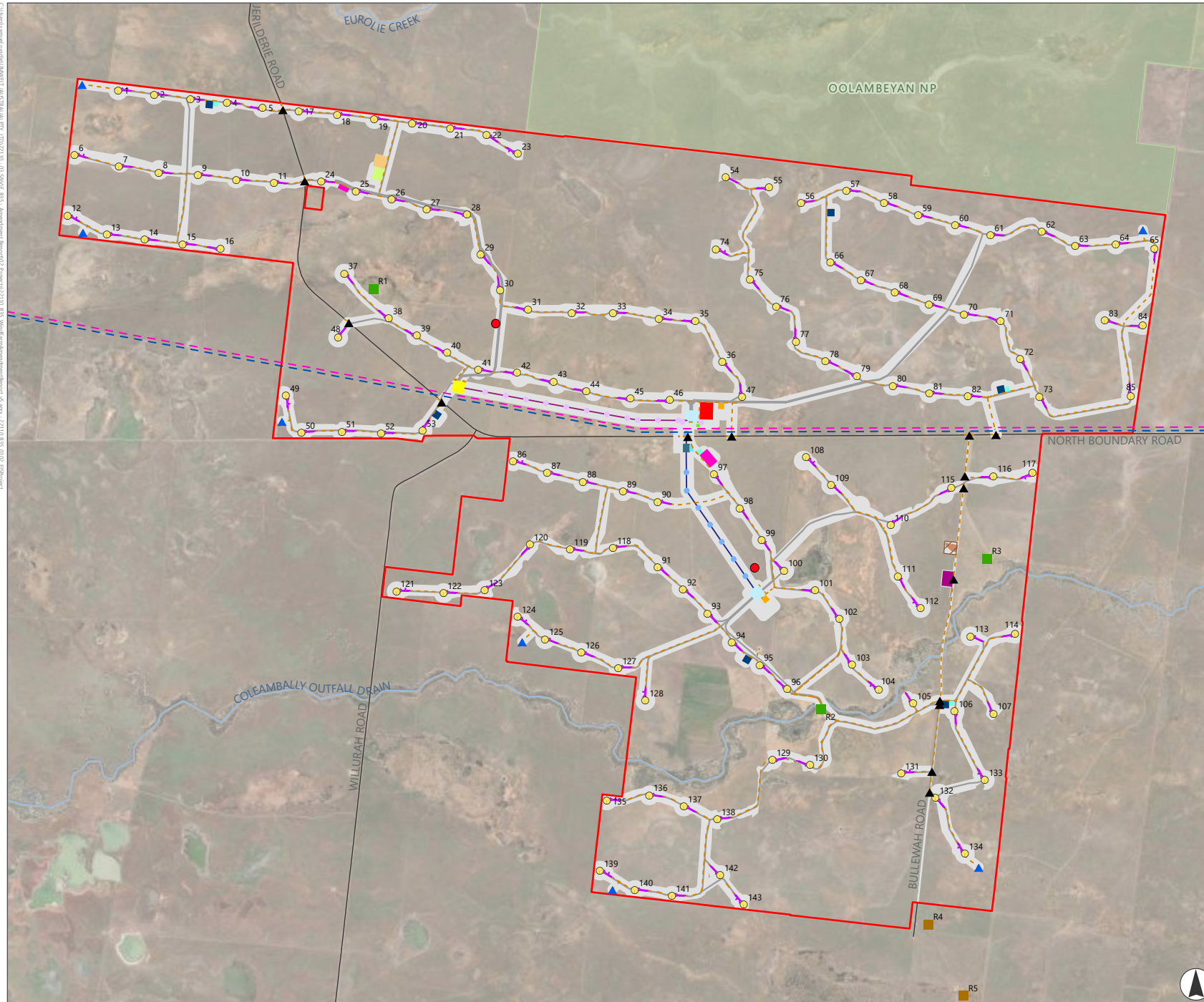


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1.3 The Amended Project

Several amendments are proposed for the Project in response to public submissions and agency advice received on the Project EIS during the exhibition period, along with technical advancements to the design of the Project. These amendments are all design refinements and do not materially change the nature of the Project.

A summary of the key proposed amendments to the EIS Project are provided in **Table 1.1** and are described in detail in **Section 3.0**.

Table 1.1 Proposed Amendments

No.	Description
1	Construction staging amendments – BWF has identified that Stage 2 (North) is now likely to commence sooner than was previously indicated in the Project EIS, and may commence prior to Stage 1 (South). As a result, a greater overlap between the construction periods for Stage 1 (South) and Stage 2 (North) is now anticipated. Consequently, the peak workforce has increased from 350 workers at the height of construction as identified in the Project EIS, to 380 workers in this Amendment Report. As a result this amendment also reduces the overall duration of the construction period from 44 to 35 months. Further details are provided in Section 3.2 .
2	Transport route amendments – The Amended Project encompasses two (2) port options, being Port of Newcastle (considered in the EIS but with impacts only being assessed for the “Local Transport Route” component) and Port Adelaide (a new port option considered in the Amendment Report). Accordingly, BWF is now seeking consent for any and all impacts associated with Off-Site Road Works and modifications between the nominated Ports and the Project Area, noting that consent associated with the SSDA is wholly limited to works within NSW. The Amended Project assesses five (5) Port to Hay Over-size Over-mass (OSOM) transport route options. This includes three (3) route options from the Port of Newcastle, and two (2) route options from the Port Adelaide. Further details are provided in Section 3.3 .
3	WTG amendments – The Amended Project includes two (2) potential scenarios with respect to WTG dimensions. The Project EIS identified a maximum turbine size, being a tip height of up to 300 m and a blade length of up to 100 m. BWF has subsequently identified a maximum alternate turbine size (being a tip height of up to 233 m and a blade length of up to 80 m) for the purposes of identifying and assessing required road upgrades to the Port to Hay Transport Routes. However, BWF is seeking to retain flexibility to install a larger turbine (up to 300 m tip height and 100 m blade length), should the necessary Port to Hay upgrades be undertaken by the NSW Government or a third party. Further details are provided in Section 3.4 .
4	Obstacle lighting amendments – The provision of obstacle lighting on select WTGs and meteorological masts (where masts are installed prior to WTG installation or are not in close proximity to a boundary WTG (>900 m) in accordance with CASA requirements. Further details are provided in Section 3.5 .
5	Project design refinements – Includes the removal of two (2) WTGs, related infrastructure and associated disturbance from the Project design. Further details are provided in Section 3.6 .

1.3.1 Amended Project Overview

Considering the amendments proposed in **Table 1.1**, key components of the Amended Project include:

- Up to 141 (three (3) blade) wind turbine generators (WTGs), with a maximum blade-tip height of 300 m above ground level, with obstacle lighting as required.
- A 359 MW / 718 megawatt hour (MWh) battery energy storage facility.
- Permanent ancillary infrastructure including 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.
- Temporary facilities including a temporary workforce accommodation (TWA) camp, site offices, amenities, construction compounds and laydown areas, on-site borrow pits, rock crushing facilities, 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), and Port to Hay Transport Routes to facilitate delivery of wind turbine components to the Project Area as required.

1.4 Structure of this Report

This Amendment Report is structured in accordance with the *State significant development guidelines – preparing an amendment report* (i.e. the SSD Amendment Report Guidelines) (DPHI, 2022a) as presented in **Table 1.2**.

Table 1.2 Report Structure

Section	Description
Section 1.0	Introduces the EIS Project and a summary the proposed amendments.
Section 2.0	Identifies any changes to the strategic context relevant to the Amended Project.
Section 3.0	Describes the proposed amendments to the EIS Project.
Section 4.0	Identifies any changes to the statutory requirements as a result of the proposed amendments to the EIS Project.
Section 5.0	Summarises the stakeholder engagement that has been undertaken during the development of the Project Amendments.
Section 6.0	Provides a detailed summary of any changes in impacts resulting from the proposed amendments to the EIS Project.
Section 7.0	Provides an updated justification of the amended EIS Project.
Section 8.0	Provides a list of references used during the preparation of this report.
Appendix 1	Provides an amended description of the Project.

Section	Description
Appendix 2	Provides updated turbine coordinates, updated schedule of lands for all lots located within the Amended Project Area, and strategic concept designs for site access points and select road modifications along the Port to Hay Transport Route.
Appendix 3	Provides an updated table of mitigation measures presented for the Project.
Appendix 4	Provides a consolidated summary of clearing limits and offset liability for biodiversity values requiring offset, road and intersection upgrades along the proposed transport routes, residence status and distance to Project WTGs, and Aboriginal and historic heritage item management.
Appendix 5	Amended Biodiversity Development Assessment Report, which includes an updated assessment of biodiversity values within the wind farm site, as well as at discrete offsite impact areas associated with the proposed transport routes.
Appendix 6	An addendum to the Aboriginal Cultural Heritage Assessment Report prepared with the Submissions Report, which assesses Aboriginal cultural heritage values at discrete offsite impact areas associated with the proposed transport routes.
Appendix 7	Noise Sensitivity Analysis assessing the alternative turbine model proposed under the Amended Project.
Appendix 8	An addendum to the Social Impact Assessment prepared with the Project EIS, to assess changes in the proposed constructing staging and workforce amendments. Also includes an Amended Accommodation and Employment Strategy.
Appendix 9	An amendment to the Traffic Impact Assessment prepared with the Project EIS, to assess changes in the proposed constructing staging and additional transport routes.
Appendix 10	An addendum to the Economic Impact Assessment prepared with the Project EIS, to assess changes in the proposed constructing staging and workforce amendments.
Appendix 11	Amended Blade Throw Assessment assessing the alternative turbine models proposed under the Amended Project.
Appendix 12	Amended Obstacle Lighting Plan assessing the changes in proposed obstacle lighting resulting from the removal of WTG 37 and 38 from the Amended Project design.

1.5 Assessment Undertaken

A qualitative assessment has been undertaken against relevant environmental, social and economic features as assessed in the Project EIS (Umwelt, 2024a) to identify potential changes to previously assessed impacts resulting from the Project amendments. This identified the need for detailed assessments of biodiversity, Aboriginal cultural heritage, noise, social impacts, transport, economic impacts and blade throw risk to support the Amended Project, as summarised below:

- An Amended Biodiversity Development Assessment Report (BDAR) summarised in **Section 6.2** and appended to this Amendment Report as **Appendix 5**. This includes additional survey and assessment undertaken since the exhibition of the EIS, outcomes of agency consultation, and small area and planted tree assessment components to assess select off-site road work areas along the Port to Hay Transport Route(s).

- An Addendum Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared to address the proposed off-site road works areas along the Port to Hay Transport Route (s), as summarised in **Section 6.3** and appended to this Amendment Report as **Appendix 6**.
- A Noise and Sensitivity Analysis (NSA) prepared to assess the alternative WTG model proposed under the Amended Project, summarised in **Section 6.4** and appended to this Amendment Report as **Appendix 7**.
- An Addendum Social Impact Assessment (SIA) and Amended Accommodation and Employment Strategy (AES) prepared to assess changes in the proposed constructing staging and workforce, transport routes, WTG and obstacle lighting amendments, summarised in **Section 6.5** and appended to this Amendment Report as **Appendix 8**.
- An Amended Traffic Impact Assessment (TIA) prepared to assess changes in the proposed constructing staging and additional transport routes, summarised in **Section 6.6** and appended to this Amendment Report as **Appendix 9**.
- An Addendum Economic Impact Assessment (EIA) prepared to assess changes in the proposed constructing staging and workforce amendments, summarised in **Section 6.7** and appended to this Amendment Report as **Appendix 10**.
- An Amended Blade Throw Assessment prepared to assess the alternative turbine models as well as the removal of two (2) WTGs proposed under the Amended Project, summarised in **Section 6.8** and appended to this Amendment Report as **Appendix 11**.
- An Amended Obstacle Lighting Plan, addressing the removal of two (2) WTGs, as summarised in **Section 3.5** and appended to this Amendment Report as **Appendix 12**.

A summary of assessment revisions undertaken for the Amended Project is provided in **Table 1.3** below.

It is noted that **Table 7.1** provides a summary of the qualitative assessment undertaken against all relevant environmental, social and economic features as assessed in the Project EIS (Umwelt, 2024a) and highlights where additional assessment was justified and deemed applicable in support of the Amended Project.

Table 1.3 Summary of Assessment by Proposed Project Amendments

Amended Assessment	Project Amendment	Project Amendment	Project Amendment	Project Amendment	Project Amendment
Amended Assessment	Construction Staging Amendments	Transport Route Amendments	WTG Amendments	Obstacle Lighting	Project Design Refinements
Amended BDAR	n/a	Applicable	Applicable	Applicable	n/a ¹
Addendum ACHAR	n/a	Applicable	n/a	n/a	n/a ¹
Noise Sensitivity Analysis	n/a	n/a	Applicable	n/a	n/a ¹
Addendum SIA	Applicable	Applicable	Applicable	Applicable	n/a
Amended TTIA	Applicable	Applicable	Applicable	n/a	n/a
Addendum EIA	Applicable	n/a	n/a	n/a	Applicable

Amended Assessment	Project Amendment	Project Amendment	Project Amendment	Project Amendment	Project Amendment
Amended Blade Throw Assessment	n/a	n/a	Applicable	n/a	Applicable
Amended Obstacle Lighting Plan	n/a	n/a	n/a	Applicable	Applicable

Note ¹: These assessments have retained a precautionary assessment of the 143 WTG layout and have not been updated to specifically address the proposed design refinements. These refinements are considered to have a neutral or reduced impact with respect to biodiversity and Aboriginal Cultural Heritage values. Instead, an overview of the reduction in impacts has been included where applicable. Strategic Context.

2.0 Strategic Context

The strategic context as described in Section 2.0 of the Project EIS (Umwelt, 2024a) remains relevant for the Amended Project. The Project continues to be aligned with the NSW and Commonwealth governments' energy and climate policies and will make a meaningful contribution to achieving the goal of net zero emissions by 2050.

2.1 Strategic Context for Project Amendments

The Amended Project, as summarised in **Section 3.0** and described in detail in the Amended Project Description (**Appendix 1**), generally consists of Project infrastructure and logistical refinements, and does not change the overall strategic context of the broader Project. The justifications for the proposed amendments are outlined in **Section 7.0**.

An overview of the strategic context for the Amended Project is provided below.

2.1.1 Renewable Energy Market

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

Since submission of the Project EIS (Umwelt, 2024a), the renewable energy market has continued to expand as new projects progress through the NSW major project approvals process. In 2024, the Clean Energy Council released their Clean Energy Australia Report (Clean Energy Council, 2024) which included updated key statistics regarding the contribution of renewable energy to the NSW electricity market, which have been reflected below.

Renewable energy sources accounted for almost 40% (39.4%) of the total electricity generation in 2023, up from 32.5% in 2020 (Clean Energy Council, 2024). Coal's share of electricity generation continued to decline, falling to 52.7% in 2023, down from 54.6% in 2022 (Clean Energy Council, 2024). Gas currently generates 7.3% of energy, down from 8.9% in 2022. At 3.1 GW, rooftop solar was the largest contributor to Australia's renewables drive, accounting for 28.5% of all renewable energy and 11.2% of energy generation overall, up from 25.8% and 9.3% respectively in 2022. Despite there being some positives for large-scale renewables, 2023 saw a plateau for new investment in utility scale generation (AEMO, 2025).

The Amended Project will assist in addressing this potential energy shortfall by delivering approximately 803.7 MW of renewable energy capacity to the NEM. This contribution will help to replace the generation capacity lost when NSW's largest power station, Eraring, closes in 2027.

The Amended Project aligns with the current strategic direction of the NSW and Australian energy generation market and assists in achieving the planned transition to an increased contribution of renewable energy to Australia's energy needs. As an existing renewable energy operator in Australia, BayWa r.e. Projects Australia has commissioned over 270 MW of solar and wind projects, with a current project pipeline reporting more than 5.7 GW under development.

2.1.2 NSW Electricity Strategy

Current and future electricity development in NSW is supported through the NSW Government's Electricity Strategy (NSW Government, 2023a) and the NSW Electricity Infrastructure Roadmap. Since submission of the Project EIS, there have been no changes to the NSW Electricity Strategy and the Amended Project continues to be consistent with the objectives of the Electricity Strategy by aiming to provide affordable and reliable electricity to NSW consumers.

2.1.3 Renewable Energy Planning Framework

The NSW Government released the Renewable Energy Planning Framework (the Framework) on 12 November 2024. The Framework was developed to support legislated net zero targets, assist with the transition to renewable energy, and ensure an affordable supply of electricity for NSW. It also aims to support the industry by providing greater investment certainty and ensuring that communities benefit from renewable energy projects. The Framework provides a set of policies that will guide the planning and assessment process for renewable energy development and infrastructure.

The Framework comprises a series of guidelines that apply to all large-scale wind and solar development and major transmission projects that are SSD, State significant infrastructure (SSI), or Critical state significant infrastructure (CSSI), including the Wind Energy Guideline (DPHI, 2024a). The Wind Energy Guideline provides advice on the planning considerations relevant to wind energy development and includes technical supplements for evaluating visual and noise impacts. It also includes information on aviation safety and other assessment issues.

The following guidelines contained within the broader Framework that relate to the Project include:

- Wind Energy Guideline (DPHI, 2024b).
- Technical Supplement for Landscape Character and Visual Impact Assessment (DPHI, 2024c).
- Technical Supplement for Noise Assessment (DPHI, 2024d).
- Benefit-Sharing Guideline (DPHI, 2024e).

While the Framework, inclusive of the Wind Energy Guideline and associated technical supplements, does not immediately apply to the Project (as the EIS was lodged before 12 November 2024), it is relevant in understanding the NSW Government's position on assessment and management of select environmental features, including (but not limited to) requirements for obstacle lighting for WTGs, and as such has been referenced in select sections of this Amendment Report.

2.1.3.1 Benefit-Sharing Guideline

The Benefit-Sharing Guideline (DPHI, 2024e) was released in November 2024 as part of the Renewable Energy Planning Framework and is designed to ensure that the benefits of large-scale renewable energy projects are shared equitably with local communities. It includes policy principles, benefit-sharing mechanisms, and guidance on distributing benefits at neighbourhood, local, and regional levels. Section 4.1 of the Benefit-Sharing Guideline prescribes \$1,050 per MW per annum for wind energy developments when determining the total funding value for community benefits.

The Project has established Community Benefits Sharing initiatives and is committed to entering into Voluntary Planning Agreements with Edward River, Hay Shire and Murrumbidgee Councils prior to Project construction, in line with the requirements of the Benefit-Sharing Guideline.

3.0 Description of Amendments

Proposed amendments to the Project are summarised in **Table 3.1** and addressed further in the subsequent sections of this chapter. The detailed description of the Amended Project is included as **Appendix 1**.

3.1 Summary of Amendments

A comparison of the Amended Project to that assessed in the Project EIS (Umwelt, 2024) is provided in **Table 3.1** below.

Table 3.1 Comparison between the EIS and Amended Projects

Project Component	EIS Project	Amended Project
Construction duration	3.5 years (44 months)	3 years (35 months)
Peak construction workforce	350 workers	380 workers
Average construction workforce	207 full-time equivalent (FTE) workers	182 FTE workers
Port of Newcastle to Hay Transport Routes	Two (2) transport route options	Three (3) transport route options, including consideration of impacts across entire Port to Hay route
Port Adelaide to Hay Transport Routes	Not assessed	Two (2) transport route options, including consideration of impacts along the entirety of the Port Adelaide to Hay Transport Routes (within NSW)
Maximum dimensions assessed for WTG installation and Local Transport Route off-site road works	- Upper-most blade tip: Up to 300 m - Lower-most blade tip: Up to 100 m above ground level - Rotor diameter: Up to 200 m - Tower (hub) height: Up to 200 m.	No change
Maximum WTG dimensions assessed for Port to Hay off-site road works	Not assessed	- Upper-most blade tip: Up to 233 m - Lower-most blade tip: Up to 66.5 m above ground level - Rotor diameter: Up to 163 m - Tower (hub) height: Up to 148 m.
Obstacle lighting	N/A	Inclusion of obstacle lighting for select WTGs and WMTs
WTGs	143	141

3.2 Construction Staging Amendments

BWF has identified that Stage 2 (North) is likely to commence sooner than was previously indicated in the Project EIS (Umwelt, 2024a) and prior to Stage 1 (South). As a result, a greater overlap is anticipated between the construction periods for Stage 1 (South) and Stage 2 (North). Consequently, this would result in an increase in the peak workforce from 350 workers as identified in the EIS to 380 workers in this Amendment Report at the height of construction, with the additional 30 workers being housed within the on-site TWA facility. This peak would occur during the height of construction in Stages One and Two and reduce thereafter, as shown indicatively in the amended construction workforce histogram in **Figure 3.1** below. It is noted that this amendment reduces the overall duration of the construction period from 44 months as identified in the Project EIS, to 35 months as proposed under the Amended Project.

The proposed construction staging amendments have been considered in detail within the Addendum SIA (**Appendix 8**), Amended Traffic Impact Assessment (**Appendix 9**), and Addendum EIA (**Appendix 10**) prepared in support of this Amendment Report.

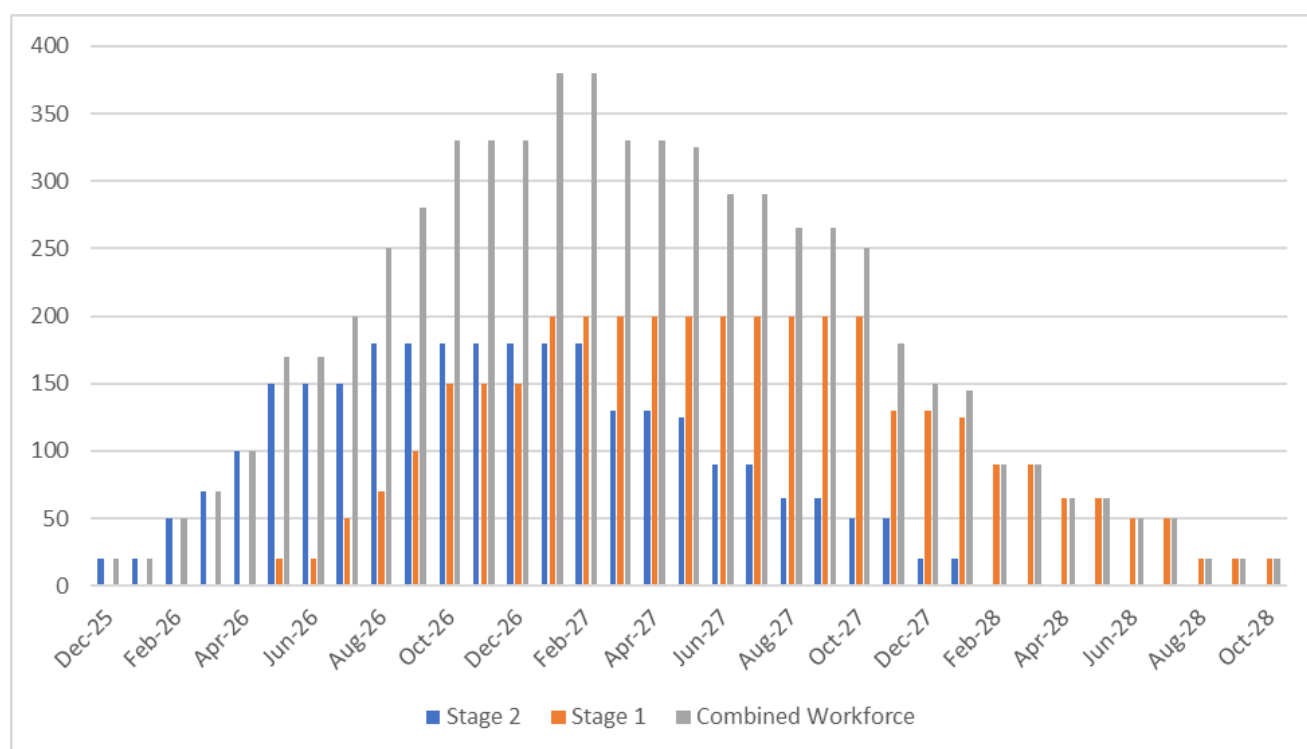


Figure 3.1 Amended Indicative Project Construction Workforce Histogram

Source: BWF (2024).

3.3 Transport Route Amendments

BWF has investigated additional Port to Hay Transport Route options from the Port of Adelaide, in addition to the Port of Newcastle routes previously identified in the Project EIS (Umwelt, 2024a). The Amended Project proposes five (5) Port to Hay transport route options in total. This includes three (3) route options from the Port of Newcastle, and two (2) route options from the Port of Adelaide. These transport routes are detailed in **Table 3.2** below.

Table 3.2 Port to Hay Transport Routes

Transport Route	Intended Use and Maximum Load Height	Route Length and Geographic Description
Route 1. Newcastle, NSW	Maximum loaded height of 4.9 m for WTG blades to use North Connex tunnel.	This route is approximately 950 km and travels through NSW from the Port of Newcastle to the Project Area through Sydney, Goulburn, Wagga Wagga and Narrandera (amongst other townships and localities).
Route 2. Newcastle, NSW	Maximum loaded height of 6.1 m for WTG towers.	This route is approximately 1,071 km and travels through NSW from the Port of Newcastle to the Project Area through Muswellbrook, Dubbo, Parkes and Narrandera (amongst other townships and localities).
Route 3. Newcastle, NSW	Maximum loaded height of 5.3 m for all remaining loads via Pennant Hills Road	This route is approximately 956 km and travels through NSW from the Port of Newcastle to the Project Area through Sydney, Goulburn, Wagga Wagga and Narrandera (amongst other townships and localities).
Route 1. Adelaide, South Australia (SA)	Maximum loaded height of 5.2 m for WTG blades, motors and general loads.	This route is approximately 820 km and travels through South Australia, Victoria and NSW from Port Adelaide to the Project Area through Gawler, Nuriootpa, Blanchetown, Loxton, Red Cliffs, Robinvale and Hay (amongst other townships and localities).
Route 2. Adelaide, SA	Maximum loaded height of 6.4 m for WTG towers.	This route is approximately 847 km and travels through South Australia, Victoria and NSW from Port Adelaide to the Project Area through Two Wells, Kapunda, Blanchetown, Loxton, Red Cliffs, Robinvale and Hay (amongst other townships and localities).

3.3.1 Offsite Road Works

Route Study Reports have been undertaken by Rex J Andrews Engineered Transportation (RJA) for the respective route options from the Ports of Newcastle and Adelaide, based on a maximum blade length of up to 80 m. These reports are included as Appendix A of the Amended TIA (refer to **Appendix 9**).

The Route Study Reports identify areas along the Port to Hay Transport Routes where road modifications would be required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in disturbance outside of the road pavement, which has warranted further assessment of relevant environmental constraints within this Amendment Report.

Table 3.3 provides an overview of the proposed Port to Hay off-site road works and identifies the specific works which require further assessment within this Amendment Report. Those highlighted in grey were subject to further assessment due to the presence of potential biodiversity and/or Aboriginal cultural heritage constraints, as documented within the Amended BDAR (**Appendix 5**) and Addendum ACHAR (**Appendix 6**). All other aspects of the Port to Hay Transport Routes encompass works that are either occurring within highly disturbed existing road reserves (e.g. existing road pavement), and/or are very minor and do not include any disturbance works. As such, further assessment of these areas was not warranted within the Amendment Report and supporting technical assessments.

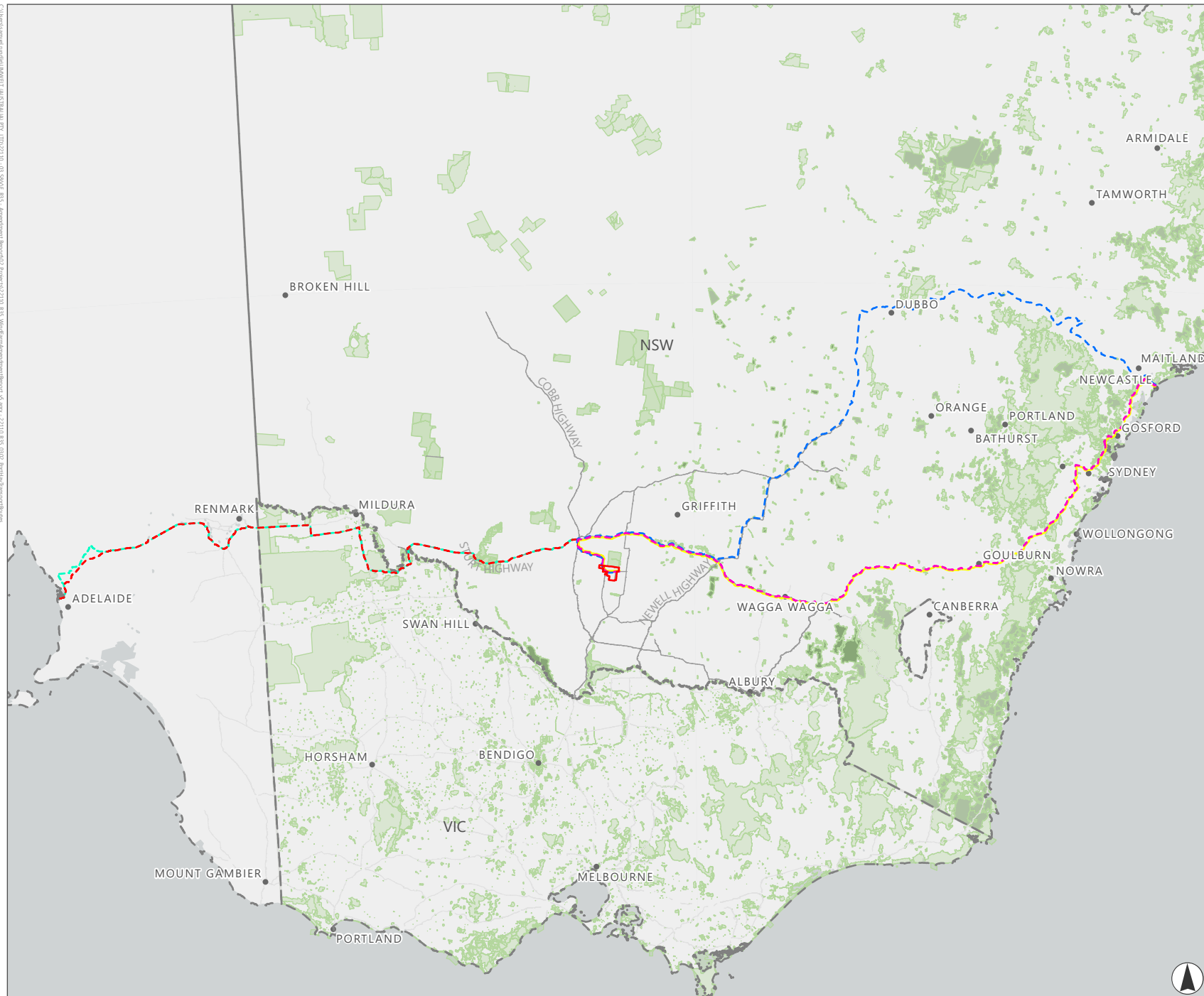
Where the proposed off-site works include physical changes to the road pavement, including the installation of additional hardstand, or changes to existing traffic islands, roundabouts or kerbs, a strategic design for the proposed works has been undertaken and is provided in **Appendix 2** of the Amendment Report.

Table 3.3 Port to Hay – Offsite Road Works

Relevant Port	Location	Description of proposed road modification	Chainage (km from Port)	Further assessment required?
Adelaide	Murray Valley Highway onto Sturt Highway at Euston, NSW.	Additional hardstand and associated fill required to bring new hardstand area level with the highway. Sign to be relocated.	546 km (Route 1)	Works are within an undisturbed road reserve with vegetation present. Further assessment undertaken within the Amended BDAR and Addendum ACHAR, included as Appendix 5 and Appendix 6 of the Amendment Report, respectively.
Adelaide	Right hand bend on Sturt Highway at Balranald, NSW.	Hardstand will be required on the outside of corner along with the removal of vegetation, light poles and numerous signs. Median strips to be made trafficable/replaced with painted lines. Note: this is identified as 'Option 2' in the Port Adelaide to Bullawah Wind Farm Route Study (RJA, 2025).	623.7 km (Route 1)	Works are within an undisturbed road reserve with vegetation present. Nearby AHIMS site also present. Further assessment undertaken within the Amended BDAR and Addendum ACHAR, included as Appendix 5 and Appendix 6 of the Amendment Report, respectively.
Adelaide	Roundabout on Sturt Highway at Hay, NSW onto Cobb Highway.	Several light poles and signs to be removed or relocated. Hardstand to be installed on exit of corner.	750 km (Route 1)	Works are within an undisturbed road reserve with vegetation present. A PCT is also mapped. Further assessment undertaken within the Amended BDAR and Addendum ACHAR, included as Appendix 5 and Appendix 6 of the Amendment Report, respectively.
Newcastle	Selwyn Street onto Industrial Drive via George Street at Mayfield, NSW	Sign to be removed and replaced for each blade movement. No road modifications proposed.	1.3 km (Route 1)	Sign removal and relocation only proposed. Sign relocation will occur within heavily disturbed road reserve. No specialist assessment required.
Newcastle	John Renshaw Drive onto the M1 at Beresfield	Sign to be relocated or lowered. No road modifications proposed.	18.4 km (Route 1)	Sign removal and relocation (or lowering only) proposed. Sign relocation will occur within heavily disturbed road reserve. No specialist assessment required.
Newcastle	Wagga Wagga – Roundabout at the corner of Edward Street and Pearson Street.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	614.6 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Wagga Wagga – Roundabout at the corner of Mason Street and Hammond Ave.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	617.3 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.

Relevant Port	Location	Description of proposed road modification	Chainage (km from Port)	Further assessment required?
Newcastle	Wagga Wagga – Roundabout at the corner of Koorigal Road and Hammond Ave.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	618.4 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Wagga Wagga – Roundabout at the corner of Tasman Road and Hammond Ave.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	621.5 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Left hand bend on the Sturt Highway at Gillenbah, NSW.	Several signs to be relocated or made removable. Light/power pole to be relocated out of swept path. Section of traffic island to be made trafficable. Suitable trailer to be used in order to straddle centre median.	711 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Golden Highway through Merriwa, NSW.	No parking area needs to be put in place and some vegetation to be trimmed. Islands to be made trafficable or chevrons lines put in place. Several signs and bollards will need to be made removable.	224.5 to 224.8 km (Route 2)	Located within heavily disturbed road reserve. Vegetation at works area confirmed as exotic planted street tree. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Mitchell Highway onto Derribong Street, Narromine, NSW.	Modifications to the existing hardstand on the outside of the corner to improve safety in all weather conditions.	450 km (Route 2)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Newell Highway intersection with Dowling Street at Forbes, NSW.	No parking area to be put in place. No physical road modifications proposed.	590 km (Route 2)	Sign posting change only. No specialist assessment required.
Newcastle	Newell Highway (Cadell St) at Narrandera, NSW.	Trees to be trimmed. No road modifications proposed.	824-827 km (Route 2)	Further assessment undertaken within the Amended BDAR (Appendix 5 of the Amendment Report).
Newcastle	Newell Highway onto Sturt Highway at Gillenbah, NSW.	Sign to be relocated or made removable.	829 km (Route 2)	Sign removal and relocation only proposed. Sign relocation will occur within heavily disturbed road reserve. No specialist assessment required.

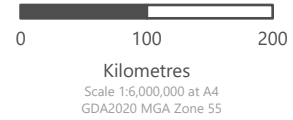
FIGURE 3.2
Port to Hay Transport Routes



- Legend**
- Project Boundary
 - State Border
 - NPWS Reserves
 - State Forest
 - Road
- Port of Newcastle Routes**
- Route 1 - 4.9m max loaded height - blades
 - Route 2 - 6.1m max loaded height - towers
 - Route 3 - 5.3m max loaded height - all remaining loads
- Port Adelaide Routes**
- Route 1 - 5.2m max loaded height - blades, motors, general loads
 - Route 2 - 6.5m max loaded height - towers

Note: Section 1.3.9.1 of the Amended Project Description discusses an alternative transport route for blades via the Newcastle Inner City Bypass. BWF is seeking the flexibility to use the Newcastle Inner City Bypass should the works be undertaken by the NSW Government or a third party, and which can accommodate the transportation of the blades described in the Project SSDA.

Note: Transport Route beyond NSW State border is shown for context, but not assessed for the Project SSDA.



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FIGURE 3.3A
 Port to Hay Transport Routes -
 Off-site Road Work Areas (Euston)



- Legend**
- Road
 - Lot/DP
 - NSW Road Corridor
 - Off-site Road Works Area - Euston
- Port Adelaide Routes**
- Route 1 - 5.2m max loaded height - blades, motors, general loads
 - Route 2 - 6.5m max loaded height - towers



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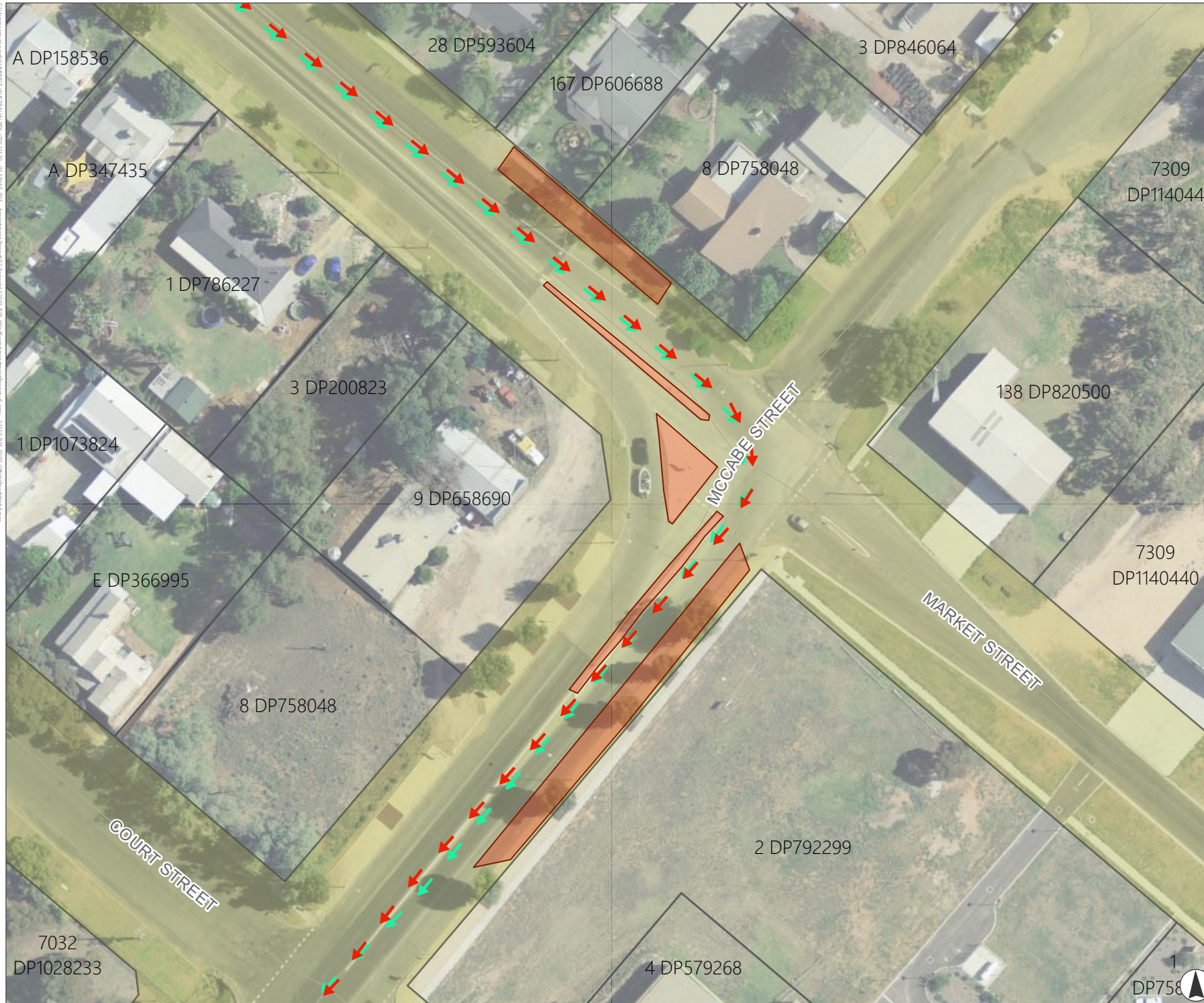
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FIGURE 3.3B

Port to Hay Transport Routes - Off-site Road Work Areas (Balranald)

Legend

- Road
 - Lot/DP
 - NSW Road Corridor
 - Off-site Road Works Area - Balranald
- Port Adelaide Routes**
- Route 1 - 5.2m max loaded height - blades, motors, general loads
 - Route 2 - 6.5m max loaded height - towers



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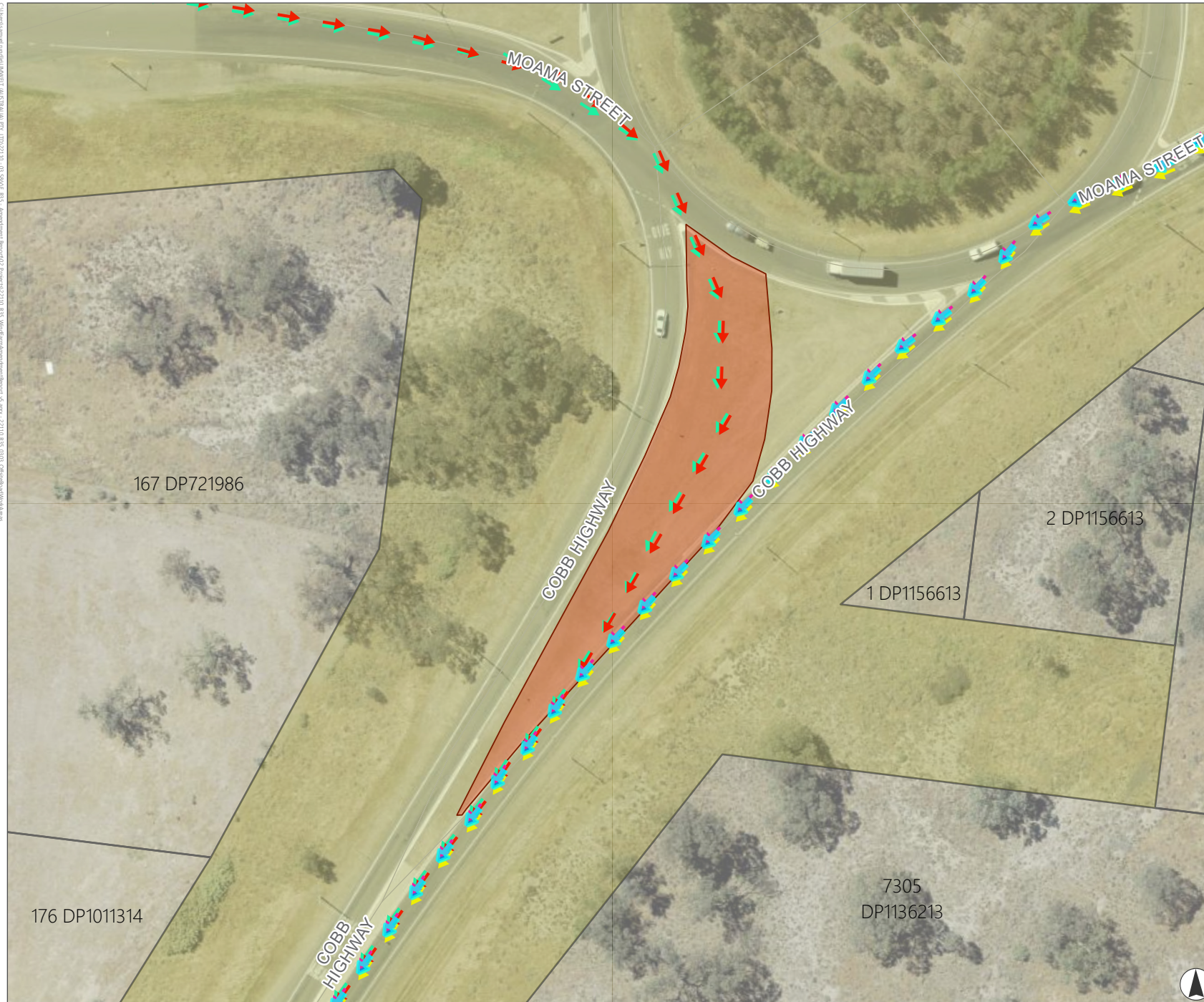
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FIGURE 3.3C

Port to Hay Transport Routes -
Off-site Road Work Areas (Hay)



Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Hay

Port Adelaide Routes

- Route 1 - 5.2m max loaded height - blades, motors, general loads
- Route 2 - 6.5m max loaded height - towers

Port of Newcastle Routes

- Route 1 - 4.9m max loaded height - blades
- Route 2 - 6.1m max loaded height - towers
- Route 3 - 5.3m max loaded height - all remaining loads



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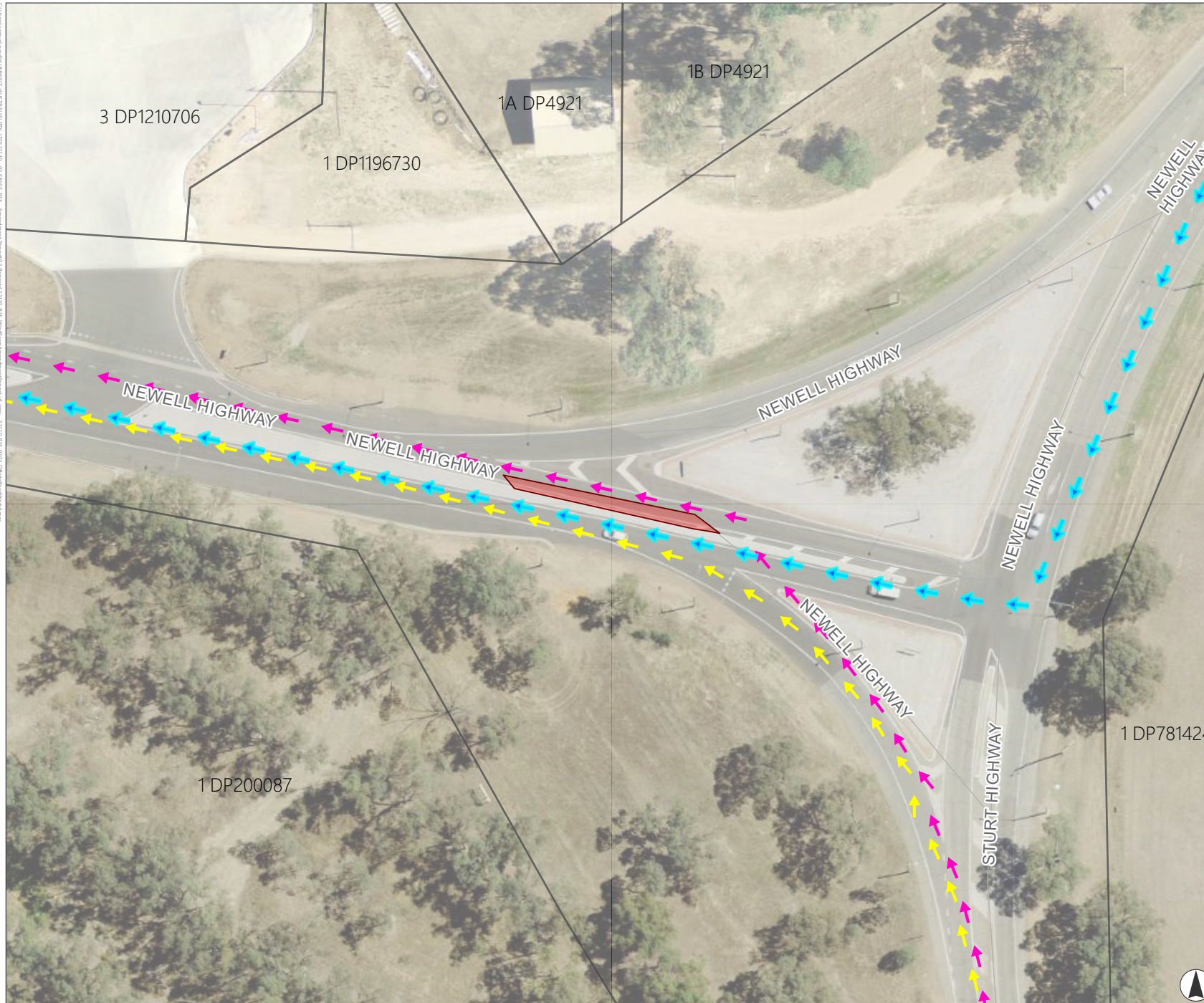
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FIGURE 3.3D

**Port to Hay Transport Routes -
Off-site Road Work Areas
(Gillenbah)**

Legend

- Road
- NSW Road Corridor
- Off-site Road Works Area - Gillenbah
- Port of Newcastle Routes**
- Route 1 - 4.9m max loaded height - blades
- Route 2 - 6.1m max loaded height - towers
- Route 3 - 5.3m max loaded height - all remaining loads



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FIGURE 3.3E

Port to Hay Transport Routes -
Off-site Road Work Areas
(Merriwa)

Legend

- Road
- Off-site Road Works Area - Merriwa
- Port of Newcastle Routes**
- Route 2 - 6.1m max loaded height - towers



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FIGURE 3.3F

**Port to Hay Transport Routes -
Off-site Road Work Areas
(Narrandera)**

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Narrandera

Port of Newcastle Routes

- ➡ Route 2 - 6.1m max loaded height - towers



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FIGURE 3.3G

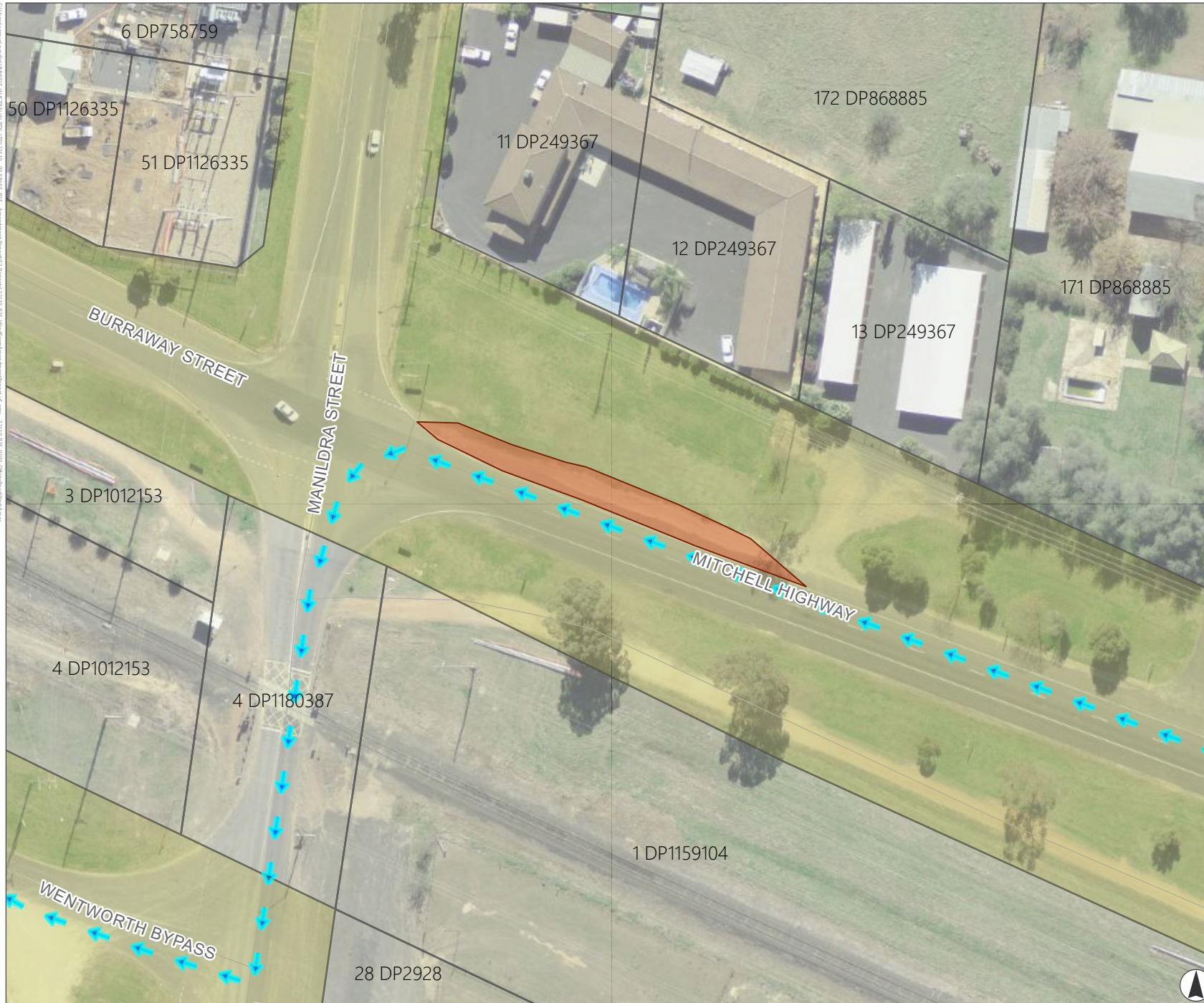
Port to Hay Transport Routes -
Off-site Road Work Areas
(Narromine)

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Narromine

Port of Newcastle Routes

- Route 2 - 6.1m max loaded height - towers



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FIGURE 3.3H

Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [1st Roundabout])

Legend

— Road

Off-site Road Works Area - Wagga
Wagga

Port of Newcastle Routes

Route 1 - 4.9m max loaded height -
blades

Route 3 - 5.3m max loaded height -
all remaining loads



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FIGURE 3.31

Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [2nd Roundabout])

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Wagga Wagga

Port of Newcastle Routes

- ➔ Route 1 - 4.9m max loaded height - blades
- ➔ Route 3 - 5.3m max loaded height - all remaining loads



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FIGURE 3.3J

**Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [3rd Roundabout])**

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Wagga Wagga

Port of Newcastle Routes

- ➔ Route 1 - 4.9m max loaded height - blades
- ➔ Route 3 - 5.3m max loaded height - all remaining loads



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FIGURE 3.3K

Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [4th Roundabout])

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Wagga Wagga

Port of Newcastle Routes

- Route 1 - 4.9m max loaded height - blades
- Route 3 - 5.3m max loaded height - all remaining loads



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3.4 WTG Amendments

The Project EIS identified a maximum turbine size, being a tip height of up to 300 m, a hub height of up to 200 m and a blade length of up to 100 m. Following further optimisation of the Project layout and design, BWF has identified a maximum alternative turbine size (being a tip height of up to 233 m, a hub height of up to 148 m and a blade length of up to 80 m). This alternative turbine size was utilised for the purposes of identifying and assessing required road upgrades to the Port to Hay Transport Routes. These Port to Hay Transport Routes and associated off-site road works form part of the Amended Project.

However, due to the extent of renewable energy development proposed within the South West Renewable Energy Zone (REZ), it is possible that road upgrades to accommodate a larger turbine (with a blade length exceeding 80 m) will be undertaken along some or all of the proposed Port to Hay Routes either by the NSW Government or by a third party developer.

Should these upgrades be undertaken prior to the Project's construction period, BWF is seeking flexibility to transport and install a larger turbine, provided that the:

- The proposed WTG dimensions do not trigger the need for any additional off-site road works.
- The maximum WTG dimensions do not exceed a tip height of 300 m, a hub height of 200 m and a blade length of 100 m.

The final dimensions of the preferred WTG model would be confirmed during detailed design.

Table 3.4 below reflects the WTG dimensions already assessed in the Project EIS i.e. the maximum dimensions assessed for WTG installation and Local Transport Route off-site road works, and the alternate WTG dimensions adopted and assessed for the purposes of this Amendment Report i.e. maximum dimensions assessed for Port to Hay off-site road works.

Table 3.4 Maximum Proposed WTG Dimensions – Amended Project

Component	Maximum dimensions assessed for WTG installation and Local Transport Route off-site road works	Maximum dimensions assessed for Port to Hay off-site road works
WTG height	Up to 300 m	Up to 233 m
Blade length	Up to 100 m	Up to 80 m
Rotor diameter	Up to 200 m	Up to 163 m
Upper-most Blade Tip	Up to 300 m	Up to 233 m
Lower-most blade tip (i.e. clearance from ground level)	Up to 100 m above ground level	Up to 66.5 m above ground level
Tower (Hub) height	Up to 200 m	Up to 148 m

Consistent with the Project EIS, this Amendment Report (and relevant assessments) has considered the ‘worst case’ i.e. if a potential increase in impact was identified for the alternate WTG (e.g. biodiversity, noise etc.) then additional assessment has occurred. **Table 3.5** below specifically addresses the Project EIS assessment and Amendment Report approach with regard to WTG dimensions, for each relevant assessment. It is noted that this table solely addresses the WTG dimensions and other assessment has occurred as a result of other Project amendments.

Table 3.5 WTG Dimensions Adopted for Assessment Purposes – Amended Project

Assessment Aspect	Assessment Approach
Biodiversity	A conservative worst-case assessment was undertaken in the Project EIS based on a 300 m WTG. The Amended BDAR (Appendix 5) conservatively considers both WTG dimension scenarios to ensure a worst-case assessment is provided. Generally, the 300 m WTG represents a worst case, having regard to biodiversity impacts, however, the smaller 233 m WTG has also been assessed for the purposes of the Prescribed Impact Assessment (refer to Appendix D of the Amended BDAR). Additionally, Appendix J and K of the Amended BDAR (Appendix 5) have been prepared specifically to address impacts associated with the Port to Hay off-site road works, which is based on a 233 m WTG.
Aboriginal Cultural Heritage	A conservative worst-case assessment was undertaken in the Project EIS and subsequently revised in the Submissions Report based on a 300 m WTG. An Addendum ACHA has subsequently been prepared specifically to address impacts associated with the Port to Hay off-site road works, which is based on a 233 m WTG (refer to Appendix 6).
Historical Heritage	A conservative worst-case assessment was undertaken in the Project EIS based on a 300 m WTG. As such, no further sensitivity analysis or assessment is required.
Landscape and Visual	A conservative worst-case assessment was undertaken in the Project EIS based on a 300 m WTG. As such, no further sensitivity analysis or assessment is required.
Noise and Vibration	A conservative worst-case assessment was undertaken in the Project EIS based on a 300 m WTG. A sensitivity analysis has subsequently been undertaken for the 233 m WTG (based on a candidate turbine model with similar dimensions) and is presented in Appendix 7 .
Transport	The Port to Hay Routes were not assessed in the EIS and associated upgrades and modifications did not form part of the EIS Project. However, required upgrades to the Local Transport Route were assessed based on a 300 m WTG. An Amended TIA has subsequently been prepared, incorporating updated Route Studies for all five (5) proposed Port to Hay Routes and based on a 233 m WTG (refer to Appendix 9). The Amended Project now includes any and all impacts associated with off-site road works and modifications between the nominated Ports and the Project Area.
Aviation	A conservative worst-case assessment was undertaken in the Project EIS and subsequently revised in the Submissions Report based on a 300 m WTG. As such, no further sensitivity analysis or assessment is required.
Telecommunications	A conservative worst-case assessment was undertaken in the Project EIS based on a 300 m WTG. As such, no further sensitivity analysis or assessment is required.

Assessment Aspect	Assessment Approach
Blade Throw	A conservative worst-case assessment was undertaken in the Project EIS based on a 300 m WTG. A sensitivity analysis has subsequently been undertaken for the 233 m WTG (based on two (2) candidate turbine models with similar dimensions) and is presented in Appendix 11 .
Other aspects (including social, water resources, soils land and agriculture, air quality, economics, preliminary hazards, bushfire, electric and magnetic fields (EMF) and waste)	These aspects were comprehensively assessed in the Project EIS and are not materially affected by changes to WTG dimensions. As such, no further sensitivity analysis or assessment is required.

3.5 Obstacle Lighting Amendments

BWF has incorporated additional aviation safety features in response to advice from CASA and Airservices Australia on the Project EIS, following a formal request for further information (RFI) from DPHI on 4 December 2024. This includes the provision of obstacle lighting on select WTGs and permanent meteorological masts (where masts are installed prior to WTG installation or are not in close proximity to a boundary WTG (>900 m)).

BWF has committed to install 200 candela medium-low intensity steady red obstacle lighting in accordance with the National Airports Safeguarding Framework Guideline D ‘Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation’ National Airports Safeguarding Framework Principles and Guidelines and section 9.31 of Part 139 Aerodromes Manual of Standards Part 139 (Aerodromes) Manual of Standards 2019.

Lighting of select WTGs and permanent meteorological masts (where required) is documented in the Project-specific Obstacle Lighting Plan (OLP). An OLP was previously included as Appendix 9 of the Submissions Report (Umwelt, 2025a). However, following further Project design refinement (refer to **Section 3.6** below) which resulted in the removal of two (2) WTGs, an Amended OLP has subsequently been prepared. The Amended OLP, which is provided in **Appendix 12**, conceptually illustrates the obstacle lighting proposed for the Amended Project. **Figure 3.4** shows indicative WTGs proposed for obstacle lighting, incorporating the Project design refinements outlined in **Section 3.6** below.

The final obstacle lighting design would be confirmed during detailed design and based on the parameters set out in the Amended OLP (**Appendix 12**).

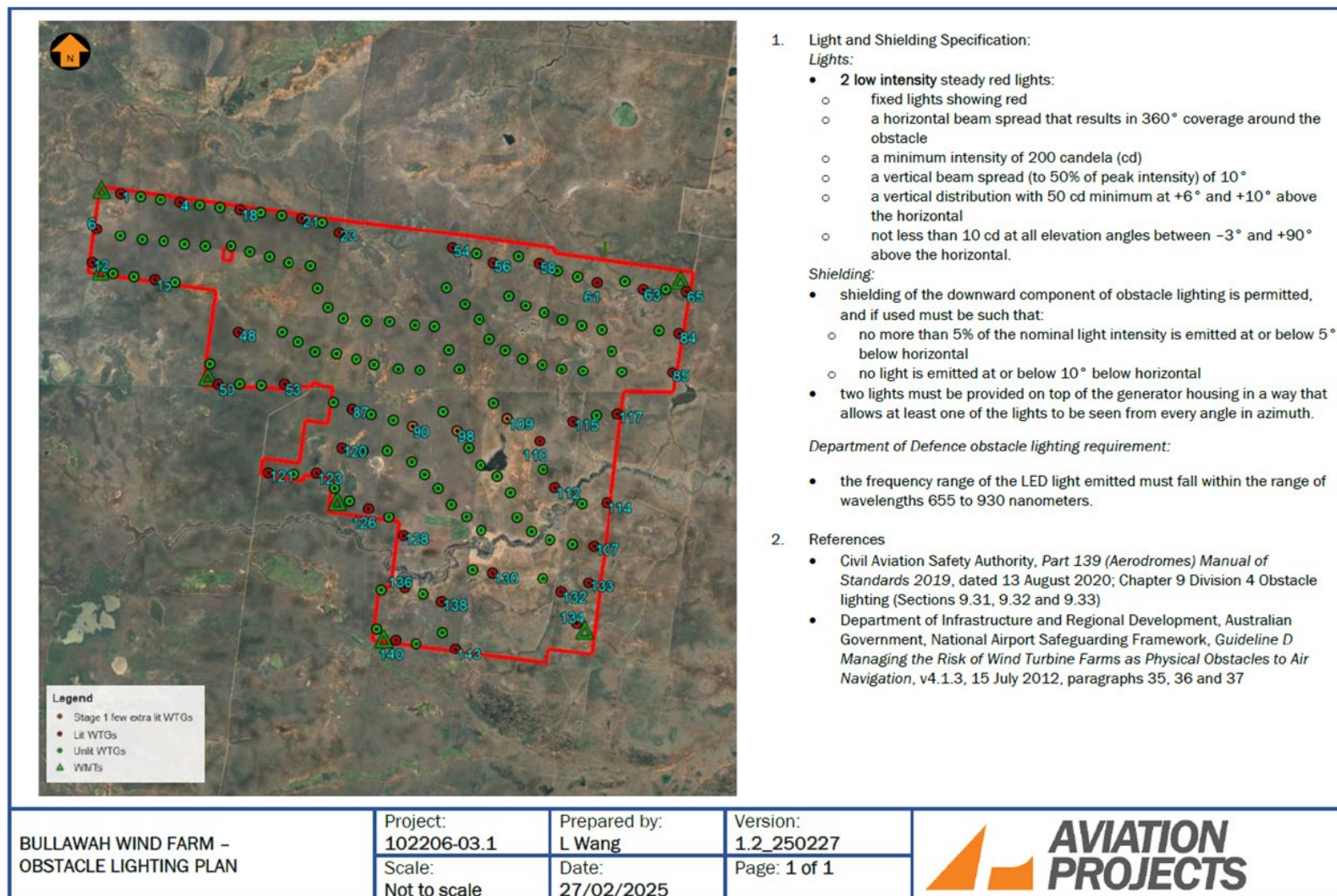


Figure 3.4 WTGs Proposed for Obstacle Lighting (Indicative)

Source: Aviation Projects (2025).

3.6 Project Design Refinements

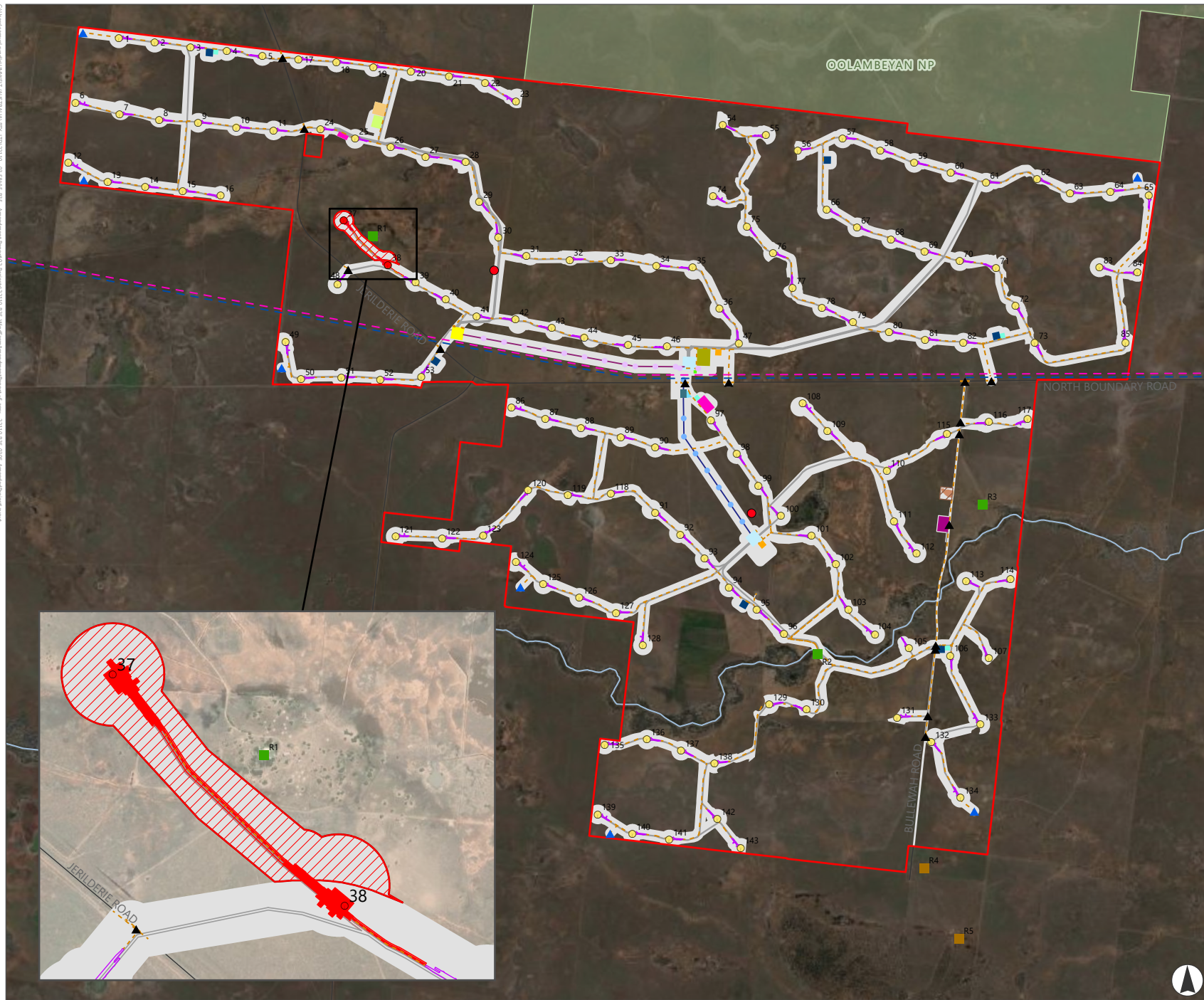
BWF has committed to the removal of two (2) WTGs from the Project design, in response to DPHI advice with respect to blade throw risk.

As such, WTG 37 and WTG 38 have been removed from the design identified for the Amended Project, along with all related infrastructure including cabling, hardstand, access tracks, and all ground disturbance associated with the construction and operation of these two (2) WTGs.

Figure 3.5 below shows the WTGs, related infrastructure and associated disturbance which have been removed from the Amended Project design.

Further discussion regarding changes to impacts associated with the removal of these WTGs and associated infrastructure is provided in **Table 6.1**. In summary, removal of the WTGs will result in a reduction of the Project's Development Footprint and Disturbance Area, and associated reduction in impacts to biodiversity values within this area, as summarised in the Amended BDAR. Regardless, a precautionary assessment of the 143 WTG layout is retained in the Amended BDAR. As impacts to Aboriginal sites were already avoided in this area of the Disturbance Footprint, this Project amendment is considered to have a neutral impact with respect to Aboriginal Cultural Heritage values. This Project amendment has however warranted further consideration and updates to the economic impact assessment (to confirm economic benefits), blade throw assessment (to confirm compliance) and OLP (as WTG 37 was previously proposed to be lit), which are included in this Amendment Report. For all other environmental and social constraints this Project amendment is considered to have a neutral or reduced impact and is not assessed further.

FIGURE 3.5
Amended Project Layout



- Legend**
- Project Boundary
 - Development Corridor
 - Wind Turbine Generators
 - Host Residence
 - Associated Residence (Visual Impact)
 - 220kV Transmission Poles
 - 330kV Transmission Poles
 - ▲ Site Access Points
 - ▲ Permanent Meteorological Masts
 - Temporary Met Mast (As Built)
 - Tracks Connecting Hardstands
 - Hardstand Area
 - Cable Corridor
 - 330kV Project Energy Connect Line
 - 220kV External Transmission Line
 - 330kV Internal Transmission Line (North to Central)
 - 220kV Internal Transmission Line (Central to South)
 - Main Temporary Laydown
 - Temporary Satellite Laydown
 - Main Temporary Construction Compound
 - Temporary Construction Compound
 - Temporary Workers Accommodation Compound
 - Operations and Maintenance Facility
 - Collector Substation
 - 220 kV Switchyard
 - Switchyard Laydown Area
 - Main Substation
 - Main Substation Temporary Laydown
 - Battery Storage
 - Quarry South (Current)
 - Quarry South (Proposed)
 - Quarry North
 - NPWS Reserves
 - Road
- To Be Removed**
- Wind Turbine Generators
 - Development Corridor
 - Disturbance Footprint

Kilometres
Scale 1:110,000 at A4
GDA2020 MGA Zone 55

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APPROVED FOR AND ON BEHALF OF Umwelt

4.0 Statutory Context

Since exhibition of the Project EIS there has not been any significant change to the statutory context for the Project. An updated Statutory Compliance Table was provided as Appendix 2 of the Submissions Report (Umwelt, 2025a) and there have been no material changes to relevant legislation since then.

A summary of the status of the NSW and Commonwealth approvals processes is provided below.

4.1 NSW Assessment and Approval Process

The statutory context has not materially changed from the original application, as documented in the Project EIS which was submitted to DPHI in July 2024. Public exhibition of the EIS took place between 27 August 2024 and 23 September 2024 with 87 unique submissions made by the public as well as submissions from three (3) local councils and 19 government agencies. A formal response to these submissions and government agency advice was provided in the form of a Submissions Report (Umwelt, 2025a), prepared to address the key issues raised in the submissions. The Submissions Report has been submitted to DPHI alongside this Amendment Report.

This Amendment Report has been prepared in accordance with clause 37 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) which states that an application may, with the approval of the Planning Secretary, be amended at any time before the application is determined.

The Planning Secretary has been advised of BWF's intention to amend the Project with this Amendment Report describing the proposed Project amendments and assessing the associated impacts.

4.2 Commonwealth Assessment and Approval Process

On 20 March 2023, the Project was declared a Controlled Action requiring approval under section 75 of the EPBC Act (2022/09423) by the Commonwealth Minister for the Environment due to its potential impact on listed threatened species and ecological communities. 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 by the former NSW Department of Planning and Environment.

The Commonwealth Controlled Action Decision and Supplementary SEARs are provided in **Appendix 1** and are addressed in Appendix E of Appendix 6 of the Project EIS.

5.0 Engagement

This section outlines community and stakeholder engagement carried to support the Amended Project.

5.1 Engagement Carried Out

Following exhibition of the Project EIS, consultation and engagement activities were undertaken with a range of stakeholders including government agencies, local councils and utility owners. Specific engagement undertaken with government agencies to discuss their advice raised on the Project EIS is documented in the Submissions Report (Umwelt, 2025a).

A summary of the consultation that was specifically undertaken to inform the Amended Project is provided in **Table 5.1**.

Table 5.1 Summary of Government and Agency Consultation

Agency	Date(s) of Consultation	Summary of Consultation
DPHI	17 January 2025 - Ad-hoc phone and email correspondence 24 February 2025.	- Consultation with DPHI following preliminary submission of Submissions Report in January 2025. DPHI advised that the Submissions Report will not be formally distributed to agencies until the Amendment Report is provided. - BWF proposed targeted Government Agency consultation prior to formal engagement and distribution of the Submissions Report by DPHI, to confirm the responses within the Submissions Report are suitable in addressing agency advice. DPHI were supportive of this approach. - Technical consultation with DPHI Hazards Team regarding comments on the EIS Blade Throw Assessment methodology and non-compliance with HIPAP 4 with current design. Resulted in decision to refine the Project design to achieve compliance.
NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Conservation Programs, Heritage and Regulation (CPHR), formerly Biodiversity Conservation and Science	28 January 2025	Written response following consultation undertaken throughout preparation of Submissions Report. CPHR confirmed requirement for Bush-stone Curlew surveys and flight path mapping within Amended BDAR.
DCCEEW Water	20 February 2025	Targeted consultation to confirm if responses in Submissions Report are adequate in addressing DCCEEW advice.
National Parks and Wildlife Service (NPWS)	20 February 2025	Targeted consultation to confirm if responses in Submissions Report are adequate in addressing NPWS advice.
Department of Primary Industries – Regional Development (DPIRD)	20 February 2025	Targeted consultation to confirm if responses in Submissions Report are adequate in addressing DPIRD advice.
NSW DCCEEW – CHPR – formerly Heritage NSW	20 February 2025	Targeted consultation to confirm if responses in Submissions Report are adequate in addressing DCCEEW advice.
Heritage Council	20 February 2025	Targeted consultation to confirm if responses in Submissions Report are adequate in addressing the Council's advice.
Edward River Council	20 February 2025 - March 2025.	- Targeted consultation to confirm if responses in Submissions Report are adequate in addressing Council's advice. - Overview of components of proposed Local Transport Route road modifications within councils jurisdiction.

Agency	Date(s) of Consultation	Summary of Consultation
Hay Shire Council	- February 2025 - March 2025.	- Targeted consultation to confirm if responses in Submissions Report are adequate in addressing Council's advice. - Overview of components of proposed Local Transport Route road modifications within councils jurisdiction.
Murrumbidgee Council	- February 2025 - March 2025.	- Targeted consultation to confirm if responses in Submissions Report are adequate in addressing Council's advice. - Overview of components of proposed Local Transport Route road modifications within councils jurisdiction.
Additional councils along the Port to Hay Transport Routes	February–March 2025	Preliminary notification to introduce the Project, identify the component of the route proposed to be taken within the respective LGA, seek confirmation of any Council led road works that may interact with the Project, and confirm their desire for future engagement. This consultation included the following 34 councils: Newcastle City, Lake Macquarie City, Central Coast, Hornsby Shire, The Hills Shire, Blacktown City, Fairfield City, Liverpool City, City of Campbelltown, Wollondilly Shire, Wingecarribee Shire, Goulburn Mulwaree, Upper Lachlan Shire, Yass Valley, Hilltops, Cootamundra-Gundagai Regional, Wagga Wagga City, Narrandera Shire, Cessnock City, Singleton, Muswellbrook Shire, Upper Hunter Shire, Warrumbungle Shire, Dubbo Regional, Narromine Shire, Parkes Shire, Forbes Shire, Weddin Shire, Bland Shire, Coolamon Shire, Narrandera Shire, Murrumbidgee, Balranald Shire and Hay Shire.
Balranald Shire and Hay Shire Councils	February–March 2025	Similar consultation to that noted above, but included additional context around the extent of proposed road modifications required within respective LGA to facilitate Project OSOM movements
ARTC	January 2025	Email sent to ARTC on the proposed Port to Hay Transport Routes and any potential interactions with existing ARTC assets. ARTC have confirmed they will assess any risks to infrastructure
UGL	January 2025	Discussed the proposed Port to Hay Transport Routes and any potential interactions with existing UGL assets.
NorthConnex	January 2025	Discussed the proposed Port to Hay Transport Routes and any potential interactions with existing NorthConnex assets.

5.2 Future Engagement

BWF has developed a preliminary Social Impact Management Framework for the Project to manage residual negative impacts and to maximise positive impacts to affected communities. This Framework includes Community Benefit Sharing initiatives, a Community and Stakeholder Engagement Strategy, an Accommodation and Employment Strategy (AES) and an Industry and Aboriginal Participation Plan. This Framework would continue to be applied during key stages of Project construction and operation.

Ongoing consultation activities will aim to provide the community and stakeholders with awareness of construction processes and activities, updates on the proposed timing of construction and opportunities for ongoing feedback and input throughout the construction and operational phases of the Project.

6.0 Assessment of Impacts

This section summarises the additional assessment undertaken with respect to the potential construction, operational and decommissioning impacts of the Amended Project.

6.1 Assessment Approach

Table 6.1 provides a summary of the qualitative assessment undertaken against relevant environmental, social and economic features as assessed in the Project EIS (Umwelt, 2024a) and highlights where additional assessment has been undertaken to support the Amended Project. Technical assessments undertaken to support this Amendment Report are provided in **Appendix 5** to **Appendix 12**.

Where required, additional or revised mitigation measures have been proposed. A consolidated summary of all proposed commitments identified in the Project EIS (Umwelt, 2024a), Submissions Report (Umwelt, 2025a) and this Amendment Report are presented in **Appendix 3**.

Table 6.1 Qualitative Assessment of Impacts

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Biodiversity	A Biodiversity Development Assessment Report (BDAR) was prepared for the Project EIS. 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 identifies that the Project would directly impact up to 637.99 ha of native vegetation within the Disturbance Footprint and areas of offsite disturbance. The 637.99 ha of direct impacts to native vegetation represents approximately 3% of the native vegetation within the Project Area. The Project would directly impact listed threatened ecological communities (TEC), including: • 22.8 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions listed under the BC Act. Of this, 4.92 ha also comprises Weeping Myall Woodlands as listed EPBC Act. • 59.71 ha of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion listed under the BC Act. BWF 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), Plains Wanderer Management Plan, and BBAMP will be prepared for the Project. 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.	An Amended BDAR has been prepared to address agency advice on the EIS. Additionally, further assessment of biodiversity impacts has been undertaken as part of the Amended BDAR, focusing on the potential change in impacts to biodiversity values on the wind farm site associated with the amended WTG dimensions, as well as potential impacts at off-site road work areas along the additional Port to Hay Transport Routes. The results of this assessment are summarised in Section 6.2. A consolidated summary of impacts and credit requirements for biodiversity values requiring offset is also provided in Appendix 4.	An Amended BDAR has been prepared to assess potential impacts to biodiversity values within the Project Area and off-site road works along the Port to Hay Transport Routes. This is included as Appendix 5. The findings of both assessments are summarised in Section 6.2 below.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Aboriginal Cultural Heritage	An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared for the Project in collaboration with the Registered Aboriginal Parties (RAPs) to assess the Aboriginal heritage values of the Project Area and its surrounds. A Revised ACHAR was provided in the Submissions Report (Umwelt, 2025a) prepared in response to advice received from Heritage NSW. The Revised ACHAR found a total of 20 Aboriginal sites within the Project Area that are recommended to be avoided, along with a number of hearths located within identified site complexes. The EIS Project had the potential to directly impact 27 Aboriginal sites (to varying degrees) located within the Development Corridor, comprising isolated stone flakes, artefact scatters and areas of PAD. Of the 27 Aboriginal sites potentially directly impacted by the Project, one (1) site was assessed as having high significance (due to the presence of potential flaked glass); 19 sites were assessed as having moderate overall significance; and seven (7) sites were assessed as having low overall significance. The Project EIS includes a management strategy to address the potential impacts of the Project on the known and potential Aboriginal heritage resource of the Study Area. As part of this, BWF would seek to avoid or minimise impacts to the 27 Aboriginal sites potentially directed impacted by the Project through micro-siting where practical. Where avoiding impacts to these sites is not possible, a surface collection program is proposed.	Further assessment of potential Aboriginal cultural heritage values at select off-site road work areas along the Port to Hay Transport Routes has subsequently been undertaken in the Addendum ACHAR. The results of this assessment are summarised in Section 6.3. A consolidated summary of Aboriginal heritage items / management is also provided in Appendix 4.	An Addendum ACHAR has been prepared to assess potential impacts to Aboriginal Cultural Heritage values at select offsite impact areas on the Port to Hay Transport Routes, included as Appendix 6 and summarised in Section 6.3 below.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Historical Heritage	A Historic Heritage Impact Assessment (HHIA) was undertaken as part of the Project EIS. A Revised HHIA was provided in the Submissions Report (Umwelt, 2025a) prepared in response to advice received from Heritage Council. Two (2) potential heritage items with local heritage significance were identified within the Project Area, South Burrabogie Homestead Group (PHI1) and the Bullawah Homestead Group (PHI 3). The Project would result in a minor visual heritage impact on the two identified PHIs however, no physical impacts to this potential heritage item would occur during the construction and operation of the Project. The HHIA concluded that while the Project will result in changes to the landscape within the vicinity of the Project, the risk of visual or physical impacts to listed heritage items located in the vicinity of the Project is negligible. BWF has committed to the implementation of appropriate mitigation and management measures to minimise any risk of harm to the listed heritage items.	The HHIA prepared for the Project EIS concluded that the risk of visual or physical impacts to listed heritage items located in the vicinity of the Project is negligible. The Amended Project is not anticipated to increase this level of risk. As such, no further assessment or additional mitigation measures are proposed. A consolidated summary of historic heritage items / management is also provided in Appendix 4.	No further assessment undertaken, or additional mitigation measures proposed.
Landscape and Visual	A Landscape and Visual Impact Assessment (LVIA) was prepared as part of the Project EIS which assessed the visual impacts associated with the Project. Detailed residence assessments were undertaken as part of the LVIA, focussing on five (5) non-associated receivers located within 8,000 m of a WTG. Of these, impacts to R9 (located within the 'blue line') were assessed as low due to the presence of intervening vegetation. Impacts to R7a, R7b, R7c, R7d (located outside the 'blue line' but within 8,000 m of a WTG) were assessed as negligible.	The Amended Project would allow the option to use smaller WTGs with a maximum WTG dimension of 233 m for the upper-most blade tip, compared to 300 m in the Project EIS. This would result in a reduced magnitude of visual impact than what was assessed as part of the Project EIS.	No further assessment undertaken, or additional mitigation measures proposed.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
	There are three (3) host receivers (R1, R2 and R3) and the three (3) associated residences located within the 'black line' of visual magnitude (R4, R5 and R8). With respect to these, visual impacts are addressed under their respective host and impact agreements and no further assessment or mitigation was required. A total of 16 viewpoints were recorded and analysed from public locations. The LVIA concluded that the Project meets the relevant visual performance objectives in respect to these viewpoints. Additionally, the scenic quality of the five (5) landscape character units (LCUs) within the LVIA Study Area were rated as low and moderate. Impacts to Oolambeyan National Park were also rated as low, with no specific measures being required. Additionally, the LVIA determined that the Project meets the visual performance objectives defined by the Visual Bulletin for Shadow Flicker and Blade Glint. BWF has committed to a range of mitigation and management measures consistent with the recommendations of the LVIA. An Addendum to the LVIA was provided in the Submissions Report to address obstacle lighting impacts to Oolambeyan National Park. The Addendum LVIA notes that based on a nacelle height of 200 m, intervening vegetation and light shielding would minimise direct line of sight to the obstacle lighting. Additionally, a 2,000 candela light, which is ten times the intensity of the CASA recommended 200 candela light for the Project, has a visibility range of approximately 4,900 m. Given that the proposed obstacle lighting is one tenth of this intensity, its visibility range would be significantly shorter. The nearest non-associated residence (R9) is located approximately 6 km from the nearest lit WTG, and views of the WTGs are screened by vegetation at this location. Beyond that, the next closest non-associated residences (R7a to d) are located more than 7.5 km from the nearest lit WTG. Lighting impacts at these receivers are expected to be negligible.	Additionally, the Amended Project includes the provision of obstacle lighting on select WTGs and meteorological masts as an added mitigation measure as described in Section 3.5. It is noted that the screening effects stated in the Addendum LVIA would be further enhanced for a smaller 233 m turbine, which has a nacelle height of 148 m. A consolidated summary of residence status and distance to Project WTG's is also provided in Appendix 4.	

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Noise and Vibration	A Noise and Vibration Assessment (NVA) was prepared as part of the Project EIS. A total of eleven (11) receivers were identified within 8 km of a Project WTG for the purposes of the NVA, including three (3) host receivers (R1, R2 and R3) within the Project Boundary, and eight (8) receivers identified as non-associated for the purposes of the NVA. During construction, noise levels are predicted to be above the noise affected management levels at some of the nearest host receivers and non-associated receivers. These predicted noise levels are comparable to, and typical of, noise levels produced by general road maintenance works and activity and would occur for brief periods only. During operations, WTG noise levels are not predicted to exceed the reference level of 45 dB L_{Aeq} at any host receivers and are also predicted to be below the Noise Bulletin base (minimum) criterion of 35 dB L_{Aeq} at all non-associated receivers. Additionally, noise from the Project's ancillary infrastructure is predicted to be below the most stringent night-time noise level of 35 dB L_{Aeq}, 15 min. The NVA also noted that decommissioning activities are likely to be less intensive than during construction and occur over a shorter duration and on this basis, no further assessment was conducted. The NVA provided a detailed assessment of potential cumulative noise impacts. The assessment identified that Pottinger Wind Farm was the only development in proximity of the Project with the potential to generate potential cumulative noise impacts. It was determined that there would be no cumulative noise impacts between the Project and Pottinger Wind Farm.	The Amended Project includes flexibility to install a smaller WTG (up to 233 m). A Noise Sensitivity Analysis has been undertaken to compare WTG noise predictions for the smaller WTG against those previously presented in the Project EIS. Additionally, the construction of the road modifications at the proposed off-site road work areas along the Port to Hay Transport Routes has potential to impact nearby sensitive receivers. Any noise and vibration-related impacts would be managed in accordance with the measures presented in the Project EIS (Umwelt, 2024a). This would include consideration of the offsite road work areas with potential for noise and vibration-related impact to nearby non-associated receivers within the Construction Noise and Vibration Management Plan (CNVMP) to ensure specific measures are adopted at these locations, as required. The findings of this assessment are discussed in Section 6.4.	An NSA has been prepared as Appendix 7 and is summarised in Section 6.4 below. Existing measure NV06 (Appendix 2) has been updated to include consideration of specific noise management practices at select off-site road work areas.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
	The NVA notes that traffic generation during the operation of the Project would be limited, with construction traffic likely to comprise the majority of traffic movements. It was noted that both the existing traffic volumes and those associated with the construction of the Project are generally very low in absolute levels, particularly when considering traffic flows during the night on local roads. Where OSOM deliveries must be carried out during night periods, reasonable and feasible noise mitigations will be considered by BWF. Further, BWF has committed to a comprehensive range of noise mitigation and management measures over the life of the Project, consistent with the recommendations of the NVA. An Addendum NVA was also prepared in response to advice received from National Parks and Wildlife Service (NPWS) on the Project EIS.		
Social Impacts	A Social Impact Assessment (SIA) was prepared for the Project EIS to gain an understanding from a local community and business perspective of the issues, values and uses associated with the assessment area. Extensive community engagement was undertaken for the Project as part of the SIA, with engaged stakeholders raising both positive and negative impacts relating to the Project. A Preliminary Social Impact Management Framework was developed to manage residual negative impacts and to maximise positive impacts to affected communities. This includes a commitment to prepare a Community and Stakeholder Engagement Strategy, Accommodation and Employment Strategy, Industry and Aboriginal Participation Plan, and Community Benefit Sharing.	The Amended Project proposes for Stage 2 (North) to commence sooner than was previously indicated in the Project EIS. Consequently, the peak workforce would increase from 350 workers as identified in the Project EIS to 380 workers in the Amended Project. These peaks would occur during the height of construction in Stages One and Two and reduce thereafter. While this amendment reduces the overall duration of the construction period, it would result in an increase in the peak workforce. Potential social impacts associated with these changes have been assessed in Section 6.5.	An Amended SIA (inclusive of an amended Accommodation and Employment Strategy, AES) has been prepared as Appendix 8 and is summarised in Section 6.5 below.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Transport	A Traffic Impact Assessment (TIA) was prepared to assess the peak and average traffic generation, the likely transport impacts along the Project access route, the capacity and condition of the roads, road safety and intersection performance. The TIA also assessed the cumulative impacts of traffic from nearby developments and included measures to mitigate and/or manage potential impacts. The TIA found that traffic and transport impacts associated with the Project would primarily occur during the construction phase as a result of the increase in traffic movements associated with workforce mobilisation and delivery of materials and equipment. Heavy vehicle traffic accounts for most of the vehicle trips generated. During the operational phase, it was determined that the minor additional traffic generated by the Project can be readily accommodated by the road network. The decommissioning phase would require similar equipment and activities to the construction phase including mobile and heavy equipment. However, the decommissioning phase would generate fewer traffic movements than the construction phase, and over a shorter period of time. In terms of potential cumulative impacts, the assessment identified that while there is expected to be some potential overlap of construction traffic between this Project and other projects, there is significant available existing capacity along the roads used by the Project. In the event that cumulative traffic impacts are forecast to occur, these can be suitably managed through the implementation of mitigation measures. BWF has committed to a range of measures to manage traffic related impacts associated with the Project, consistent with the recommendations of the TIA.	The Amended Project includes the Port to Hay Transport Routes, and all associated off-site works required to accommodate OSOM deliveries. The Amended Project five (5) Port to Hay Transport Route options, including three (3) from the Port of Newcastle and two (2) from Port Adelaide. An Amended TIA has been prepared to assess impacts associated with the transport route amendments. Additionally, the Amended TIA addresses all traffic-related agency comments on the EIS. The results of this assessment are summarised in Section 6.6. A consolidated summary of all road and intersection upgrades along the proposed Port to Hay and Local Transport Routes is also provided in Appendix 4.	An Amended TTIA has been prepared as Appendix 9 and is summarised in Section 6.6 below.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Water Resources	A Water Resource Impact Assessment (WRIA) was prepared to support the Project EIS. The WRIA notes that in terms of water supply, the majority of raw/non-potable water required to meet Project water demands would be sourced on-site from licensed groundwater bores under agreement with host landholders. As a result, no impacts to surface water availability in the vicinity of the Project are anticipated and impacts to groundwater resources are also considered very unlikely across all stages of the project. Through the implementation of erosion and sediment control measures, potential construction-related stormwater pollution impacts can be appropriately managed and are expected to be negligible. The WRIA notes that the Project will require both potable and non-potable water supplies during the construction, operational and decommissioning phases. The total water demand during the construction phase is estimated to be approximately 224 ML. During operations, between 0.5 to 2 ML per annum of water per year would be required for ongoing maintenance activities. The results of the flood modelling show that there is generally no widespread flooding within the Project Area. The 1% Annual Exceedance Probability (AEP) event was utilised to determine appropriate mitigation measures for the Project. Based on the Project design utilised for this assessment, the 1% AEP flood extent has minimal interaction with the Project's Disturbance Footprint. BWF has committed to a range of mitigation and management measures consistent with the recommendations of the WRIA, which will be detailed in comprehensive management plans.	The proposed amendments are not expected to change predicted impacts to water resources as presented in the EIS. As such, it is anticipated that no further assessment or additional mitigation measures are proposed.	No further assessment undertaken, or additional mitigation measures proposed.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Soils, Land and Agriculture	A Soils, Land and Agriculture Impact Assessment (SLAIA) including a detailed Land Use Conflict Risk Assessment was prepared to support the Project EIS. The outcomes of this assessment indicated the Project will impact agricultural productivity within the Project Area through: • Temporary removal of up to 642 ha of land within the Project Area from agricultural land use for the duration of the Project, which equates to approximately 3% of the total Project Area. • Temporary removal of potential agricultural primary productivity to the estimated value of up to \$93,732 per year for the duration of the Project. • Temporary impacts on soil resources and Land and Soil Capability (LSC) within the Project Area where surface disturbance occurs. However, the impacts on agriculture listed above are considered negligible in the context of the gross commodity values and land use coverage of the agricultural industries operating within the Murrumbidgee, Hay Shire and Edwards River LGAs. Additionally, it is anticipated that there will be no impact to critical mass thresholds of agricultural enterprises needed to attract and maintain investment in agricultural industries and infrastructure. Additionally, current agricultural land use immediate to the Project Area, and in the broader Project locality will not change as a result of the Project, and there will be no fragmentation or displacement of existing agricultural industries as a result of reduced land used for agriculture. BWF has committed to a range of mitigation and management measures with respect to soils, land and agriculture. This includes the implementation of a Decommissioning and Rehabilitation Strategy (DRS) during the decommissioning phase of the Project at the end of its 30 year lifespan.	The proposed amendments are not expected to change predicted impacts to soils, land and agriculture as presented in the EIS. The Amended Project includes approximately 0.5 ha of additional ground disturbance within heavily modified road reserves.	No further assessment undertaken, or additional mitigation measures proposed.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Air Quality	An Air Quality Impact Assessment (AQIA) was prepared for the Project EIS. The AQIA notes that based on the activities identified as most likely to result in dust emissions, 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. On this basis, the AQIA indicates that dust impacts experienced as a result of the Project would be limited to host residences (R1, R2 and R3) and these impacts can be managed with appropriate mitigation measures. Potential impacts associated with off-site road works along the Local Transport Route were also considered, where it was determined that there is limited or no potential for dust annoyance or amenity impacts to occur with the implementation of proposed mitigation measures. BWF has committed to implement a comprehensive range of air quality mitigation and management measures for the Project. This includes the preparation and implementation of a Dust Management Plan (DMP) which details the air quality control measures and procedures to be undertaken.	There is potential for dust generation during construction of the road modifications at the offsite road work areas along the Port to Hay Transport Routes. Any dust-related impacts would be managed in accordance with the measures presented in the Project EIS (Umwelt, 2024a). This would include consideration of the offsite road work areas with potential for dust-related impact to nearby non-associated receivers within the Dust Management Plan (DMP) to ensure specific measures are adopted at these locations, as required.	An update to the existing air quality mitigation measures (AQ03) has been included to include consideration of relevant offsite road work areas. No further assessment has been undertaken.
Economic Impacts	An Economic Impact Assessment (EIA) was prepared as part of the Project EIS to assess the economic benefits and impacts of the Project for the region. The assessment calculated that the total estimated economic benefits within the Hay Shire, Edward River and Murrumbidgee LGAs associated with the construction and operational phases of the Project is approximately \$780 million. On average, the Project would also support 210 direct and 335 indirect FTE positions in the national economy over the construction period, with 350 direct FTE and 560 indirect FTE jobs during peak construction.	The Amended Project includes a greater overlap is anticipated between the construction periods for Stage 1 (South) and Stage 2 (North). Consequently, this would result in an increase in the peak construction workforce from 350 workers to 380 workers, with the additional 30 workers being housed within the on-site TWA facility.	An Addendum EIA has been prepared (refer to Appendix 10) and is summarised in Section 6.7 below.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
	However, the Project would also result in the temporary loss of approximately 642 ha of agricultural land over the 30 year life of the Project. The economic impact to agricultural primary productivity would equate to - \$93,732 per year for the duration of the Project. Additionally, the 'external' (or non-local) Project labour requirement would be expected to generate an accommodation need for 315 direct FTE workers at the peak of the Project, representing 50% of total commercial accommodation supply within a 60-minute drive of the Project Area. This indicates a constrained capacity in the EIA Study Area to accommodate the number of non-local workers expected during peak construction. To minimise potential Project impacts and maximise Project benefits, the EIA recommended that an Accommodation and Employment Strategy (AES) be prepared for the Project in consultation with stakeholders. Consistent with this recommendation, an AES was prepared and submitted as part of the Project EIS.	It is noted that this amendment reduces the overall duration of the construction period from 44 months to 35 months. Further assessment on these potential impacts has been undertaken in Section 6.7.	
Preliminary Hazard Assessment	A Preliminary Hazard Analysis (PHA) was prepared as part of the Project EIS. The PHA considered the hazards and risks posed to off-site receivers and associated residences related to the transport, storage and use of hazardous materials for the Project, including the battery storages. The PHA concluded that the risks associated with battery storage within the Project Area 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). As such, the Project would only be classified as potentially hazardous, and appropriate risk management measures will be undertaken by BWF consistent with the recommendations of the PHA.	No amendments are proposed with respect to the BESS facility that was previously assessed as part of the Project EIS. As such, no further assessment or additional mitigation measures are proposed.	No further assessment undertaken, or additional mitigation measures proposed.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Bush Fire	A Bush Fire Hazard Assessment (BFHA) was prepared as part of the Project EIS. The southern portion of the Project Area is identified as bush fire prone land by the NSW Rural Fire Service (RFS). Appropriate safeguards and controls were identified throughout the BFHA and include the establishment and maintenance of Asset Protection Zones (APZs) around key Project infrastructure, the construction and maintenance of the proposed site access points and internal road network, the establishment of a dedicated water supply for bush firefighting purposes, and the development of a Bush Fire Emergency Management and Operations Plan. Through the development and implementation of relevant bushfire management measures and identified hazards safeguards and controls, potential hazards associated with the Project including bushfire can be appropriately managed. The management and mitigation measures will be undertaken in accordance with a Bushfire Management Plan to be prepared following Project approval.	The proposed amendments are not expected to increase the level of bushfire risk, as there would be no changes to land use or the configuration and layout of project infrastructure. As such, it is anticipated that no further assessment or additional mitigation measures are proposed.	No further assessment undertaken, or additional mitigation measures proposed.
Telecommunications (EMI)	A Telecommunications Impact Assessment was completed for the Project EIS to assess potential impacts of the Project on existing telecommunications and ensure the level of service is maintained. The assessment concluded that the Project has been designed, situated, and positioned to prevent, minimize, and address electromagnetic interference that could disrupt the pre-existing television, radar, and radio transmission and reception systems. Additionally, based on analysis and consultation with key stakeholders, the Project will have no material impact on telecommunication services, subject to the implementation of proposed mitigation and management measures.	The assessment undertaken as part of the Project EIS determined that the Project would have no material impact on the telecommunication services. The Amended Project includes flexibility to install smaller WTGs, which would further reduce any risks of impact on telecommunication services. As such no further assessment or additional mitigation measures are proposed.	No further assessment undertaken, or additional mitigation measures proposed.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Health (EMF)	An Electromagnetic Field (EMF) study was undertaken as part of the Project EIS. The EMF study identified and modelled EMF emitters associated with the Project, and assessed potential impacts of the EMF emitters on human health. The EMF study concluded that the EMF emitted by the proposed electrical power infrastructure for the Project is estimated to be below the acceptable exposure limit as per the International Commission on Non-Ionizing Radiation Protection (ICNIRP). As such, it was found that the Project design has avoided, minimised and mitigated risks and impacts associated with EMF, and a recommended 8 m clearance to the 330 kV transmission line has been accommodated within the Project design.	No amendments are proposed with respect to the Project's electrical power infrastructure. As such, no further assessment or additional mitigation measures are proposed.	No further assessment undertaken, or additional mitigation measures proposed.
Blade Throw	A Blade Throw Assessment (BTA) was undertaken as part of the Project EIS to assess the potential blade throw risk for the Project. The assessment noted that 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 15.5 million years and therefore, likelihood of such an event occurring is very low and the level of risk is within the bounds of being considered acceptable. One (1) host residence (R1) is located within 800 m of two (2) WTGs (WTG 37 and 38), and the likelihood that it is struck in a blade throw event is estimated to be once in 3.4 trillion years. The low likelihood of adverse outcome is due to low incidence of failure and low rates of occupation in the vicinity of the WTGs. As such, it was concluded that the Project design has avoided, minimised and mitigated risks and impacts associated with blade throw and no Project-specific recommendations were made as part of the assessment.	BWF has amended the Project design to remove WTG 37 and 38 to manage risk of blade fragment impacts at an associated residence, in response consultation with DPHI following exhibition of the EIS. The Amended Project also proposes the option to install a smaller WTG model, which has required additional assessment to understand potential for blade throw-related impacts to residences. Further assessment on blade throw associated with the proposed WTG amendments has been undertaken, as summarised in Section 6.8 .	An Amended Blade Throw Assessment has been prepared as Appendix 11 and is summarised in Section 6.8 below. A new mitigation measure has been included in Appendix 3 to address the removal of WTG 37 and 38 from the Project design (refer to ID BT05).

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Aviation Safety	An Aviation Impact Assessment (AIA) was prepared for the Project EIS to review potential aviation impacts associated with the Project and to provide aviation safety advice. The AIA found that the Project satisfies relevant aviation safety requirements of both the Hay LEP and Deniliquin LEPs, and would not create incompatible intrusions, adversely affect or compromise the safety of existing airports and associated navigation and communication facilities. Additionally, the assessment concluded that the WTGs will not impact on the closest radar installations, and the proposed WTGs and meteorological masts would not require obstacle lighting to maintain an acceptable level of safety to aircraft. A range of mitigation and management measures would be implemented by BWF consistent with the recommendations of the AIA.	The Amended Project proposes the provision of obstacle lighting on select WTGs, in response to advice from CASA and Airservices Australia on the Project EIS. Details of the obstacle lighting to be included are outlined in an Amended Obstacle Lighting Plan (Appendix 12). Obstacle lighting for the Amended Project is conceptually shown on Figure 3.4 .	No further assessment undertaken, or additional mitigation measures proposed.
Waste Management	The Project EIS included consideration of waste-related impacts from the Project. The construction period of the Project will result in the largest contribution of waste (approximately 95%), most of which will be required to be disposed of off-site. During operations, waste generation would be limited to minor quantities of waste from staff amenities, redundant equipment and maintenance activities. The Project EIS also notes 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) has been prepared for the Project, providing the basis of a future Decommissioning and Rehabilitation Plan (DRP) that will be developed to address Development Consent conditions for the Project if approved. Further, 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.	Waste-related impacts associated with the construction and operational phases of the Amended Project are in line with those assessed within the Project EIS.	No further assessment undertaken, or additional mitigation measures proposed.

Environmental Feature	Environmental Context (Project EIS and Submissions Report)	Qualitative assessment of impacts (Amended Project)	Further assessment undertaken or additional mitigation measures provided
Cumulative	The Project EIS included an assessment of the potential for cumulative impacts associated with the construction, operation, and decommissioning phases of the Project, given proximity of the Project to several renewables and other Stage significant projects within the region. The assessment centred on potential cumulative impacts related to biodiversity, visual amenity, noise, traffic, heritage, and social/economic impacts. The assessment concluded that potential cumulative impacts associated with the Project will be manageable via BWF's commitment to implement the mitigation and management measures presented in the Project 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.	The Amended Project includes the Port to Hay Transport Routes, and all associated off-site works required to accommodate OSOM deliveries. Further consideration of potential cumulative traffic and transport-related impacts along the Port to Hay Transport Routes is provided in Section 6.6.5. Further, the Amended Project has potential to contribute to cumulative social impacts associated with an increase in the peak construction workforce. This has been considered within the Amended SIA (Appendix 8).	Consideration of potential cumulative impacts resulting from the Amended Project has been undertaken in Section 6.6.5 and Section 6.9 below.

6.2 Biodiversity

An Amended BDAR has been prepared as **Appendix 5** and is summarised within this section. The Amended BDAR addresses:

- The SEARs issued by NSW DPHI, including agency advice (refer to Section 1.3.1 of the Amended BDAR).
- Supplementary SEARs issued by Commonwealth DCCEEW (refer to Section 1.3.1 and 1.3.2 of the Amended BDAR).
- Agency feedback on the EIS from NSW DCCEEW – CPHR (refer to Section 1.3.1 of the Amended BDAR).
- Project amendments, including:
 - Port to Hay off-site road works - two (2) streamlined BDARs have been prepared with respect to proposed off-site road works in Balranald and Euston; refer to Appendices J and K of the Amended BDAR, respectively.
 - WTG amendments (specifically the alternative turbine size scenarios outlined in **Section 1.3**).
 - Obstacle lighting with regard to the National Light Pollution Guidelines for Wildlife (May 2023, V2.0) Guidelines; refer Appendix E of the Amended BDAR (MNES Report).
 - Project design refinements, being the removal of WTGs 37 and 38 and associated infrastructure.¹

The Amended BDAR has been prepared in accordance with the NSW BC Act and Biodiversity Assessment Method (BAM) (DPIE, 2020a) 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.

Consistent with BAM requirements, the Amended BDAR utilises slightly different terminology to the Amendment Report and EIS. In particular, the Amended BDAR refers to the ‘Subject Land’ which encompasses the Development Corridor and disturbance areas associated with Local Transport Route off-site works. For consistency, this section will also refer to the ‘Subject Land’.

6.2.1 Engagement with NSW DCCEEW - CPHR

The South West Office of NSW DCCEEW - CPHR has been consulted during the assessment process via teleconferences, written communication, and offer of an onsite visit. Where feasible and appropriate, advice from CPHR (both prior to and following lodgement of the EIS) has been adopted and is reflected in the Amended BDAR accordingly.

¹ The proposed removal of WTG 37 and WTG 38 occurred late in the process of finalising the Amended BDAR. As such, the Amended BDAR and Biodiversity Assessment Method Calculator (BAM-C) includes the full assessment of the maximum proposed impacts, being the 143 WTG layout assessed in the Project EIS. The amended areas of impacts to ecosystem credits and species credits are however presented in separate tables in Section 10.1.1 and Section 10.1.2 of the Amended BDAR.

A summary and reference table addressing NSW DCCEEW's submission on the EIS is provided in Table 1.2 of the Amended BDAR. Key updates to the Amended BDAR in response to CHPR feedback include:

- Further detail regarding avoidance and minimisation of impacts.
- Additional information and justification regarding the extent of biodiversity surveys undertaken to date, along with details of further survey undertaken following the exhibition of the EIS, where relevant.
- Detailed analysis to assess the suitability of the benchmark attributed for each vegetation zone to support the use of wet versus average rainfall benchmarks where available.
- An updated collision risk assessment.
- Supplementary detail with respect to the conceptual Bird and Bat Adaptive Management Plan framework.
- Consideration of additional and appropriate measures to offset the impacts of the Project.

6.2.2 Engagement with Commonwealth DCCEEW

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 (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).

The Commonwealth DCCEEW has been consulted during the assessment process via teleconferences and written communication. Where feasible and appropriate, advice from Commonwealth DCCEEW has been adopted and is reflected in this report accordingly.

The BAM has been endorsed as the assessment method for Matters of National Environmental Significance (MNES) under a Bilateral Agreement made under the EPBC Act. The Australian Government is the decision-maker for whether the Project will be approved under the EPBC Act. Nationally-listed threatened species, threatened ecological communities (TECs) have been considered and assessed as part of this BDAR and in a separate MNES Assessment provided in support of the Amended BDAR. 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 (Commonwealth DCCEEW) are addressed within a stand-alone MNES biodiversity assessment report that is provided as Appendix E of **Appendix 5**. A detailed compliance matrix, identifying where each requirement is addressed, is provided within Section 1.6 of **Appendix 5**.

6.2.3 Existing Context

The Project Area comprises of a mix of native grassland and open woodland in a rural landscape. The elevation of the subject land is between 94.4 m and 103.2 m Australian Height Datum (AHD), a difference of less than 10 m between the highest and lowest points of the Project Area.

The Project Area is located within the Murrumbidgee IBRA Subregion, in the Riverina Bioregion of NSW. The Riverina Bioregion is an ancient riverine plain and alluvial fan composed of unconsolidated sediments with evidence of former stream channels. Vegetation across the bioregion consists of River Red Gum and Black Box forests, box woodlands, saltbush shrublands, extensive grasslands and swamp communities.

The Murrumbidgee Subregion blankets four Mitchell landscapes: Murrumbidgee Depression Plains, Murrumbidgee Scalded Plains, Murrumbidgee Source-bordering Dunes, and Murrumbidgee Channels and Floodplains. The Murrumbidgee Subregion is characterised by alluvial fan with distributary channels and floodplains, undulating plains with depressions. Vegetation consists of River Red gum and River Cooba on channels with Black Box, Lignum, and Old Man Saltbush on floodplains. White Cypress appears on dunes, with Myall, grasses, and saltbush formally being widespread on back plains.

The majority of the Subject Land is primarily comprised of native grassland and chenopod shrubland, with a smaller proportion of the vegetation consisting of a mosaic of freshwater wetlands and open woodland. River Red Gum – Black Box Woodland wetland of the semi-arid (warm) climatic zone, fringes the Coleambally Outfall Drain throughout the subject land. The vegetation within the Subject Land is subject to ongoing agricultural disturbance, primarily cattle and sheep grazing and low levels of pasture improvement. A small proportion of the Subject Land is comprised of cleared and disturbed land, which is sown with exotic grasses.

No Important Wetlands occur within the Subject Land. The closest wetland areas of significance are the mid-Murrumbidgee Wetlands located approximately 25 km north of the Project Area. Booligal Swamp is located approximately 130 km north of the Project Area. One wetland of international importance, NSW Central Murray Forests, is located approximately 80 km south west of the Project Area. The Coleambally Outfall Drain is an east to west connectivity irrigation drain that provides outflow to creeks south-west of Coleambally. It provides outflow to Eurolie Creek to the west, Carroonboon Creek and Werkenbergal Swap wetland areas to the south-west of the Project Area and traverses through South West Woodland Nature Reserve. It also provides connectivity to Blind Creek to the east of the Project Area and Bowna Swamp, then connecting to Bublebundie Creek.

Oolambeyan National Park is located along the north-eastern boundary of the Project Area, approximately 200 m north of the Project Area. The vegetation along the boundary of the national park is consistent with that within the Project Area, consisting of native grassland and chenopod shrubland.

Two conservation agreements have been established within the bounds of the Project Area. These include:

- A conservation agreement (CA0465) made under the BC Act.
- Land management agreements made by Murray Local Land Services (LLS) under the Regional Land Partnerships Program.

The purpose of each of these agreements is to conserve and maintain existing primary habitat for the Plains-wanderer which is present in patches of suitable habitat types across the Project Area. The Project's Disturbance Footprint has been specifically designed to avoid all areas of mapped Plains-wanderer important habitat, and existing land management practices within the areas of primary habitat would be maintained over the life of the Project, consistent with the obligations of those agreements.

There are no areas of karst, caves, crevices, cliffs, rocks or other geological features of significance in the Project Area. Soils found within the Project Area are Chromosols and Rudosols, forming scattered patches within the Subject Land of areas with very severe wind erosion capabilities and moderate to severe acidification hazard capabilities.

6.2.3.1 Port to Hay Off-Site Works Areas

Small areas of discrete vegetation clearing are proposed within existing road reserves at Balranald and Euston. These works have been assessed in standalone, streamlined BDARs which are provided in Appendix J and Appendix K of the Amended BDAR. Field surveys were undertaken at these locations in January 2025.

The Disturbance Footprints for these works comprise:

- 0.09 ha of native shrubland at the corner of the Murray Valley Highway and Sturt Highway in Euston
- 0.05 ha of planted native vegetation and planted mixed Australian natives at the intersection of Market Street and the Sturt Highway in Balranald.

6.2.3.2 Plant Community Types

Identification of the Plant Community Types (PCTs) occurring with the Subject Land and off-site areas of impact was guided by the results of the review of existing data (as detailed in Section 4.1.1 of **Appendix 5**) and surveys of the subject land (as detailed in Section 4.1.2 of **Appendix 5**).

The data collected during surveys of the subject land 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 Riverina IBRA bioregion.
- Vegetation formation.
- Vegetation class.
- Dominant upper, mid and ground strata species.
- Landscape position, soil types and edaphics.

A total of 10 PCTs comprising 12 vegetation zones were recorded across the Development Corridor and off-site disturbance areas. Details of these PCTs are provided in Section 4.3.1 to Section 4.3.11 of **Appendix 5**, and are summarised as follows:

1. PCT 10: River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
2. PCT 13: Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
3. PCT 17: Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

4. PCT 24: Canegrass swamp tall grassland wetland of drainage depressions: lakes and pans of the inland plains
5. PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
6. PCT 28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
7. PCT 44: Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
8. PCT 46: Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain: Riverina Bioregion
9. PCT 160: Nitre Goosefoot shrubland wetland on clays of the inland floodplains
10. PCT 164: Cotton Bush open shrubland of the semi-arid (warm) zone.

These PCT and their vegetation zones are identified in **Figure 6.1.1** to **Figure 6.1.4**.

Port to Hay Off-Site Works Areas

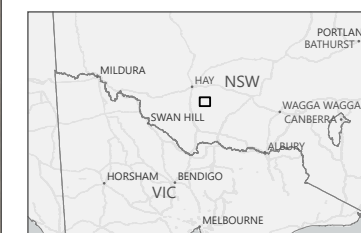
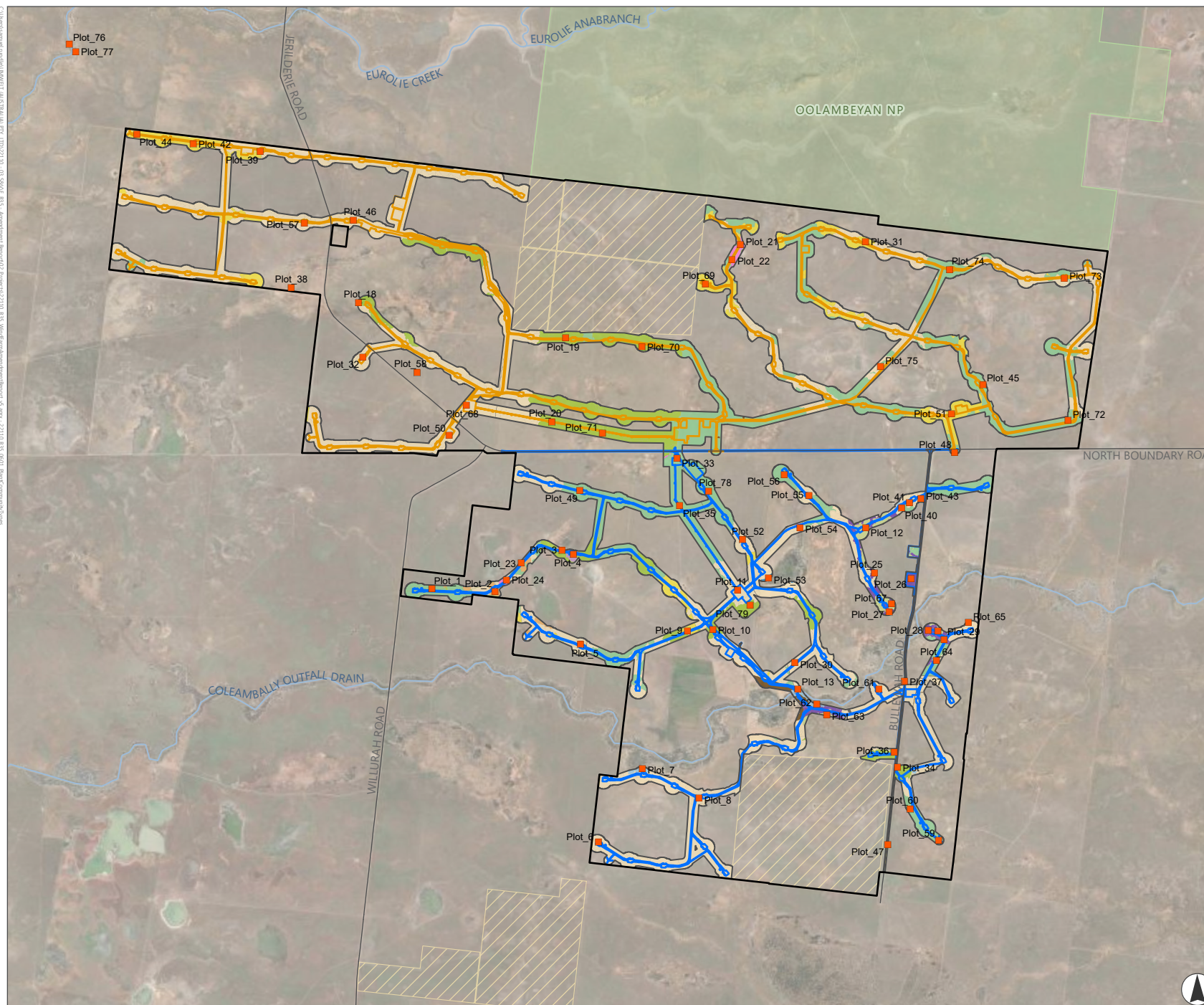
The native shrubland within the Euston off-site works area was identified as PCT 13, as listed above. The off-site works area at Balranald did not contain vegetation which could be reasonably assigned to a PCT. As such, no BAM Vegetation Integrity (VI) Plots were carried out at the Balranald off-site works area.

FIGURE 6.1.1

Plant Community Types Present within the Subject Land

Legend

- Project Boundary
 - Subject Land
 - Stage 1 (South) Development Footprint
 - Stage 2 (North) Development Footprint
 - Conservation Agreement Area
 - NPWS Reserves
 - Road
 - Watercourse
 - BAM Plot
- ### Plant Community Type
- PCT 10 Moderate-Good
 - PCT 13 Moderate-Good
 - PCT 17 Moderate-Good
 - PCT 24 Moderate-Good
 - PCT 26 Derived Native Grassland
 - PCT 26 Moderate-Good
 - PCT 28 Derived Native Grassland
 - PCT 28 Moderate-Good
 - PCT 44 Moderate-Good
 - PCT 46 Moderate-Good
 - PCT 160 Moderate-Good
 - PCT 164 Moderate-Good
 - Non-native vegetation
 - Water
 - Infrastructure



0 1,000 2,000

Meters

Scale 1:122,000 at A4
GDA2020 MGA Zone 55

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FIGURE 6.1.2

Plant Community Types Present within the Subject Land

Legend

- Stage 1 (South) Development Footprint
- Road
- BAM Plot

Plant Community Type

- PCT 164 Moderate-Good



0 20 40

Meters

Scale 1:2,000 at A4

GDA2020 MGA Zone 55

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FIGURE 6.1.3
Plant Community Types
Present within the Subject
Land

Legend

Stage 1 (South) Development Footprint

Road

BAM Plot

Plant Community Type

PCT 28 Derived Native Grassland



0 20 40

Meters

Scale 1:2,000 at A4

GDA2020 MGA Zone 55

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FIGURE 6.1.4
Plant Community Types
Present within the Subject
Land

Legend

- Stage 1 (South) Development Footprint
- Road
- Watercourse
- BAM Plot

Plant Community Type

- PCT 28 Derived Native Grassland



0 20 40
Meters

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6.2.3.3 Threatened Ecological Communities

PCTs and TECs are different classification systems that have been developed independently of each other. In the BioNet Vegetation Classification database, the relationship between PCTs and TECs are summarised in terms of their potential equivalence to each other where each PCT includes a description of its relationship and degree of fit to both State and Commonwealth listed TECs. However, the PCT-TEC relationships outlined within the BioNet Vegetation Classification database may not necessarily be correct, and therefore vegetation on site must be assessed against the respective Final Determination or Listing Advice for the TEC under each Act.

The assemblage of species, area of occupancy, and supplementary descriptors outlined within the NSW Scientific Committee's Scientific Determination under the BC Act for each of the potential TECs were compared against each associated PCT present within the Subject Land. The same activity was also carried out against the listing advice for the TEC under the EPBC Act.

Two (2) PCTs occurring in Subject Land were assessed as conforming to three (3) TECs listed under the BC Act and EPBC Act, refer to **Figure 6.2.1** to **Figure 6.3.4**.

A summary of the equivalencies between PCTs and TECs occurring in the Subject Land is provided in Table 4.27 of **Appendix 5**. Within BioNet Vegetation Classification, PCT 44 and PCT 46 are associated with Natural Grasslands of the Murray Valley Plains, a TEC listed as critically endangered under the EPBC Act. Although both PCTs were recorded within the Subject Land, this TEC was not found to be present.

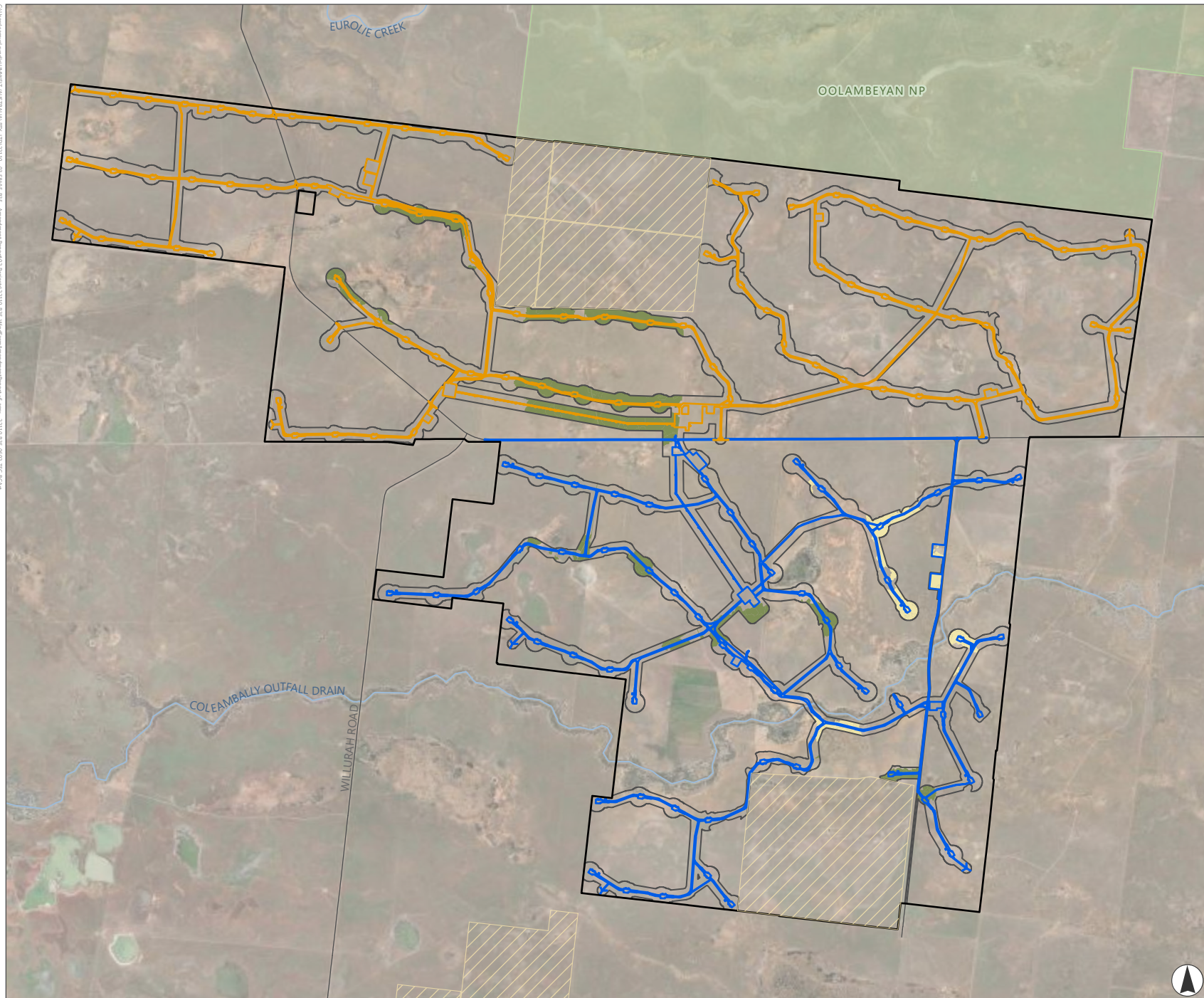
In summary, the three (3) TEC recorded within the Project Area are as follows:

1. Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion – listed as endangered under the BC Act.
2. Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions – listed as endangered under the BC Act.
3. Weeping Myall Woodlands – listed as endangered under the EPBC Act.

Port to Hay Off-Site Works Areas

There are no TECs present within the Port to Hay off-site works areas.

FIGURE 6.2.1
Distribution of Threatened Ecological Communities listed under BC Act across the Subject Land



- Legend**
- Project Boundary
 - Subject Land
 - Stage 1 (South) Development Footprint
 - Stage 2 (North) Development Footprint
 - Conservation Agreement Area
 - NPWS Reserves
 - Road
 - Watercourse
- Threatened Ecological Communities - BC Act**
- 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 in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion



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Meters

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FIGURE 6.2.2
Distribution of Threatened
Ecological Communities
listed under BC Act across
the Subject Land

Legend

- Stage 1 (South) Development Footprint
- Road



0 60 120

Meters

Scale 1:5,000 at A4
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FIGURE 6.2.3
Distribution of Threatened
Ecological Communities
listed under BC Act across
the Subject Land

Legend

- Stage 1 (South) Development Footprint
- Road



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Meters

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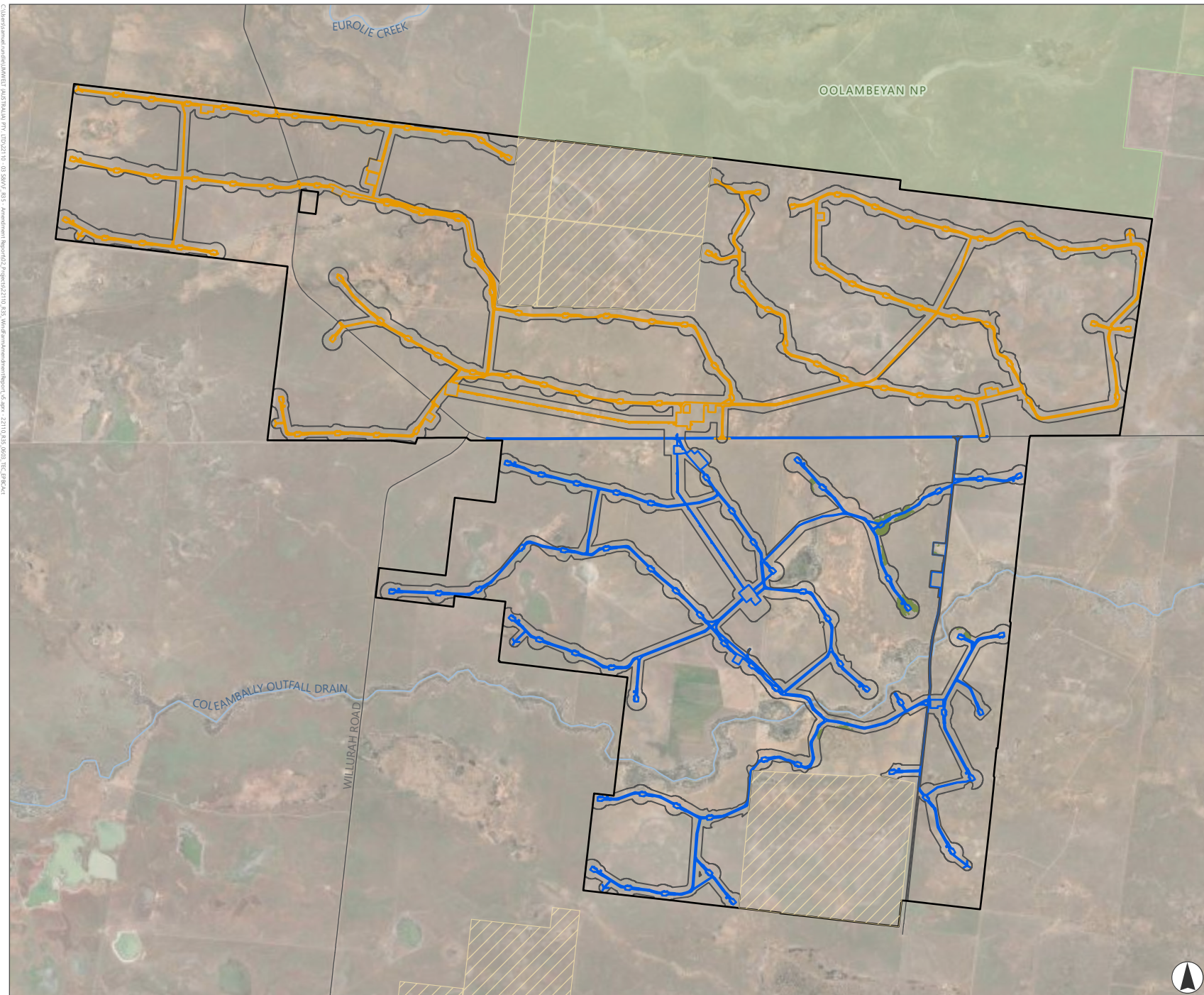
Legend

- Stage 1 (South) Development Footprint
- Road
- Watercourse



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FIGURE 6.3.1
Distribution of Threatened Ecological Communities listed under EPBC Act across the Subject Land



- Legend
- Project Boundary
 - Subject Land
 - Stage 1 (South) Development Footprint
 - Stage 2 (North) Development Footprint
 - Conservation Agreement Area
 - NPWS Reserves
 - Road
 - Watercourse
 - Threatened Ecological Communities - EPBC Act
 - Weeping Myall Woodland



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FIGURE 6.3.2
Distribution of Threatened
Ecological Communities
listed under EPBC Act across
the Subject Land

Legend

- Stage 1 (South) Development Footprint
- Road



0 90 180

Meters

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FIGURE 6.3.3
Distribution of Threatened Ecological Communities listed under EPBC Act across the Subject Land

Legend
 Stage 1 (South) Development Footprint
 Road



0 90 180

Meters

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FIGURE 6.3.4
Distribution of Threatened
Ecological Communities
listed under EPBC Act across
the Subject Land

Legend
 Stage 1 (South) Development Footprint
 Road
 Watercourse



0 90 180

Meters

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6.2.3.4 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 Subject Land 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 2017):

- 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, the Project Area is mapped as containing both terrestrial and aquatic GDEs. The following GDEs were mapped within the Project Area, all associated with wetland and riparian vegetation communities mapped throughout the Project.

- High potential terrestrial GDEs.
- Very high potential aquatic GDEs.
- High potential GDEs.
- Moderate potential GDEs.
- Low potential GDEs.

The high potential GDEs typically corresponds to River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone fringing the Coleambally Outfall Drain.

Mapping of GDEs is provided in the Amended BDAR (refer to Figure 4.5.1 to Figure 4.5.4).

Additional information and mapping also provided in the Submissions Report (refer to Figure 4.2 and Figure 4.3).

6.2.3.5 Threatened Species

In accordance with the BAM threatened species have been assessed as predicted or ecosystem credit species and species credit species.

Ecosystem credit species are those threatened species that can reliably be predicted to occur based on the PCTs identified within the subject land. The BAM-C generates a list of predicted ecosystem credit species from numerous inputs such as landscape features and the native vegetation communities present.

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 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 subject land and the presence of habitat features and components associated within these species.

A comprehensive process of ecosystem credit species and species credit species identification, habitat assessment and threatened species survey occurred as detailed in Section 5.1 to Section 5.3 of **Appendix 5**.

In summary, 41 ecosystem credit species are predicted to occur within the Subject Land (defined by the Amended BDAR). There were eight (8) ecosystem credit species recorded during field surveys:

1. Southern Whiteface (*Aphelocephala leucopsis*) – listed as vulnerable under the BC Act.
2. Spotted Harrier (*Circus assimilis*) – listed as vulnerable under the BC Act.
3. White-fronted chat (*Epthianura albifrons*) – listed as vulnerable under the BC Act.
4. Black Falcon (*Falco subniger*) – listed as vulnerable under the BC Act.
5. Blue-winged Parrot (*Neophema chrysostoma*) – listed as vulnerable under the BC Act and EPBC Act.
6. Flame Robin (*Petroica phoenicea*) – listed as vulnerable under the BC Act.
7. Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) – listed as vulnerable under the BC Act.
8. Diamond Firetail (*Stagonopleura guttata*) – listed as vulnerable under the BC Act and EPBC Act.

A total of nine (9) species credit species were recorded during field surveys. Of these, five (5) were threatened flora species and five (5) were fauna species.

1. Chariot Wheels (*Maireana cheelii*) – listed as vulnerable under the BC Act and the EPBC Act
2. Silky Swainson-pea (*Swainsona sericea*) – listed as vulnerable under the BC Act
3. Slender Darling Pea (*Swainsona murrayana*) – listed as vulnerable under the BC Act and EPBC Act
4. Winged Peppercress (*Lepidium monoplacoides*) – listed as endangered under the BC Act and EPBC Act
5. Spike-rush (*Eleocharis obicis*) – listed as vulnerable under the BC Act and EPBC Act
6. Plains-wanderer (*Pedionomus torquatus*) – listed as endangered under the BC Act and critically endangered under the EPBC Act
7. Little Eagle (*Hieraaetus morphnoides*) – listed as vulnerable under the BC Act
8. Barking Owl (*Ninox connivens*) – listed as vulnerable under the BC Act
9. Southern Bell Frog (*Litoria raniformis*) – listed as endangered under the BC Act and vulnerable under the EPBC Act.

Port to Hay Off-Site Works Areas

No threatened species were recorded at the off-site works areas during survey and the proposed Disturbance Footprints do not contain any significant habitat features such as notable hollow-bearing trees, nests or burrows. Likelihood of occurrence assessments have been undertaken for listed threatened species and are presented in Appendix J and Appendix K of the Amended BDAR.

6.2.4 Avoidance and Minimisation of Impacts

At each stage of the design process, from Project inception, through Project Scoping and the development of the BDAR (and broader EIS), BWF applied the following hierarchy (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 reasonably practicable.
- Mitigate – mitigation strategies have been identified and will be implemented to manage the extent and severity of the remaining impacts.
- Offset – biodiversity offsets are only used following all efforts to first avoid, minimise and mitigate impacts.

From the Scoping Report (October 2022) to the present, the Project Area, Development Corridor and Disturbance Footprint have reduced in size to respond to the emerging understanding of site-specific biodiversity constraints and to prioritise the avoidance of impacts on potential serious and irreversible impact entities. In summary:

- The Project Area has been reduced by 9,976 ha from the Scoping Report (~30,603 ha) to present day (20,627.56 ha). This represents a 32% reduction in total Project Area.
- The Development Corridor has been reduced by 1,490.9 ha from the Scoping Report (where it covered 5,802.8 ha of the Project Area) to present day (4,330.41 ha). This represents a 25% reduction in the total area considered for the placement of WTG and associated infrastructure.
- Importantly, the Development Footprint has been reduced by 351 ha from the Scoping Report (where it covered 1,012.6 ha of the Project Area) to present day (660.96 ha). This represents a 34% reduction in developable area to prioritise retention of ecological values.

Table 7.1 of the Amended BDAR (**Appendix 5**) shows how avoidance to biodiversity values has occurred across design iterations based on current PCT mapping, the SVTM, and Important Habitat Mapping.

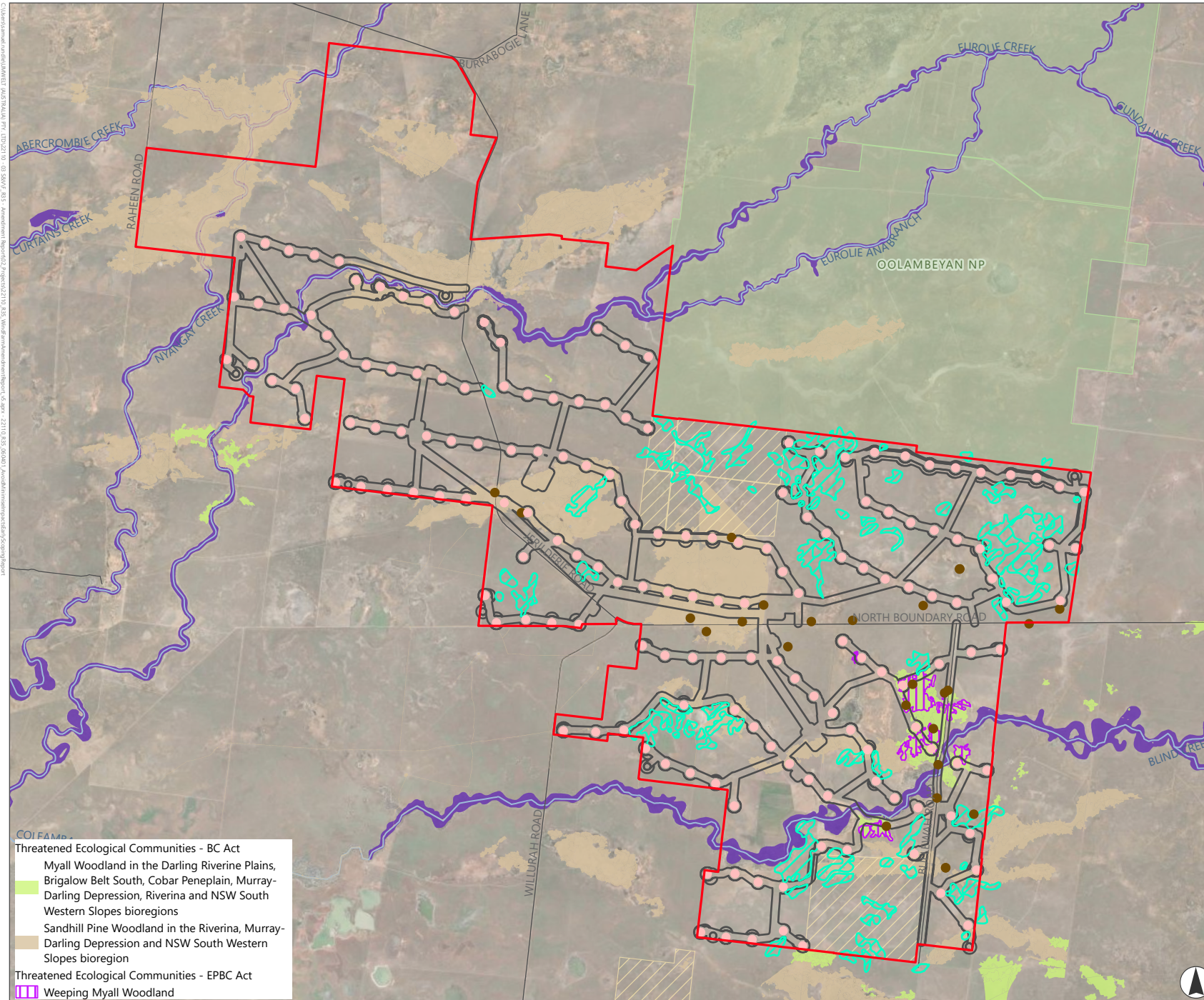
Figure 6.4.1 to Figure 6.4.4 below provide a summary view of the evolution of the Project layout over time.

FIGURE 6.4.1

Avoid and Minimise Impacts - Early Scoping Report

Legend

- Scoping Report Project Boundary
- Early Scoping Development Corridor
- Early Scoping Report Wind Turbine Generators
- Conservation Agreement Area
- NPWS Reserves
- Road
- Watercourse
- Little Eagle Stick Nests
- Plains Wanderer Important Habitat Mapping
- Biodiverse riparian land



Threatened Ecological Communities - BC Act

- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion

Threatened Ecological Communities - EPBC Act

- Weeping Myall Woodland



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Meters

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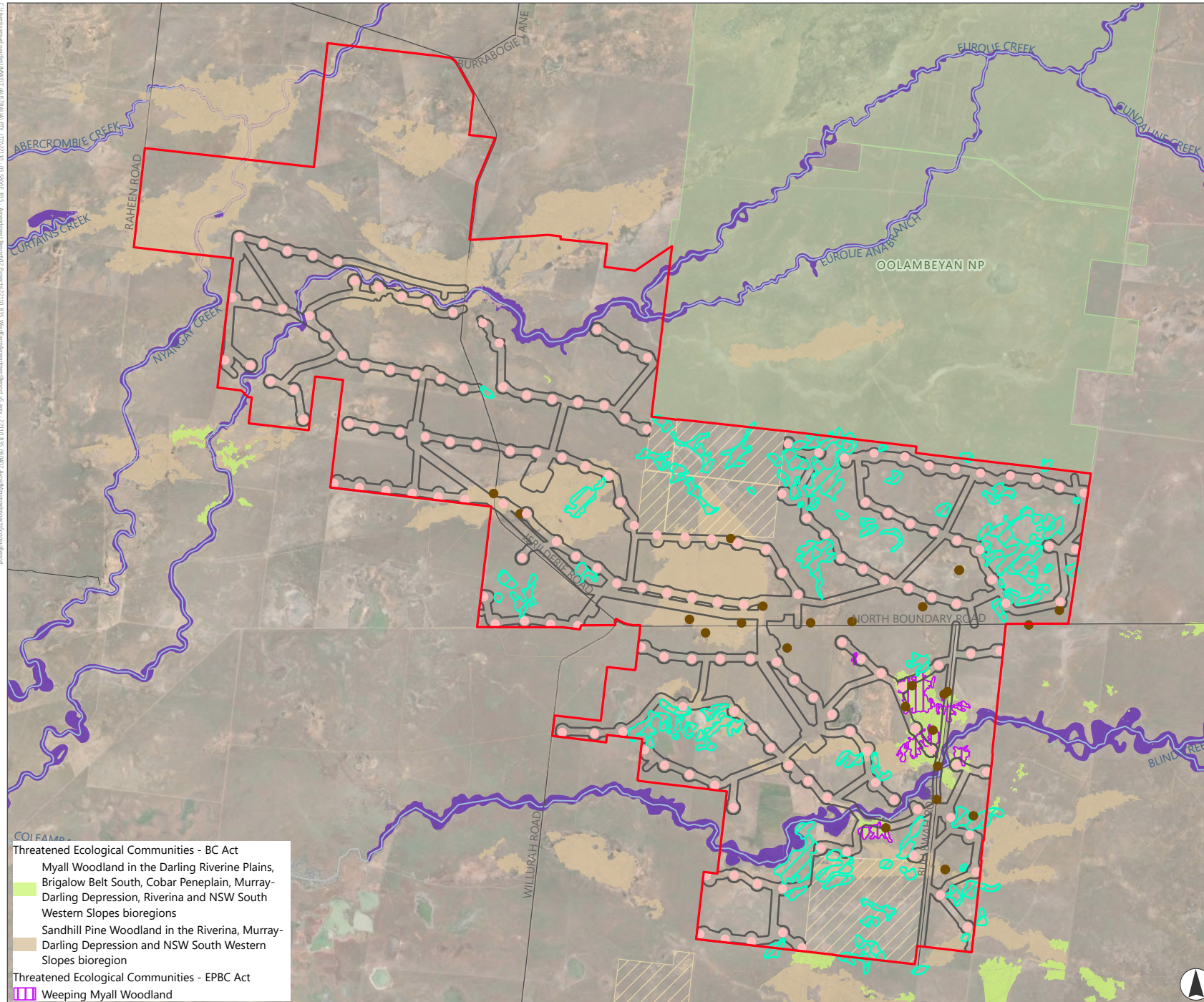
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FIGURE 6.4.2

Avoid and Minimise Impacts - Scoping Report

Legend

- Scoping Report Project Boundary
- Scoping Report Development Corridor
- Scoping Report Wind Turbine Generators
- Conservation Agreement Area
- NPWS Reserves
- Road
- Watercourse
- Little Eagle Stick Nests
- Plains Wanderer Important Habitat Mapping
- Biodiverse riparian land



Threatened Ecological Communities - BC Act

- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion

Threatened Ecological Communities - EPBC Act

- Weeping Myall Woodland



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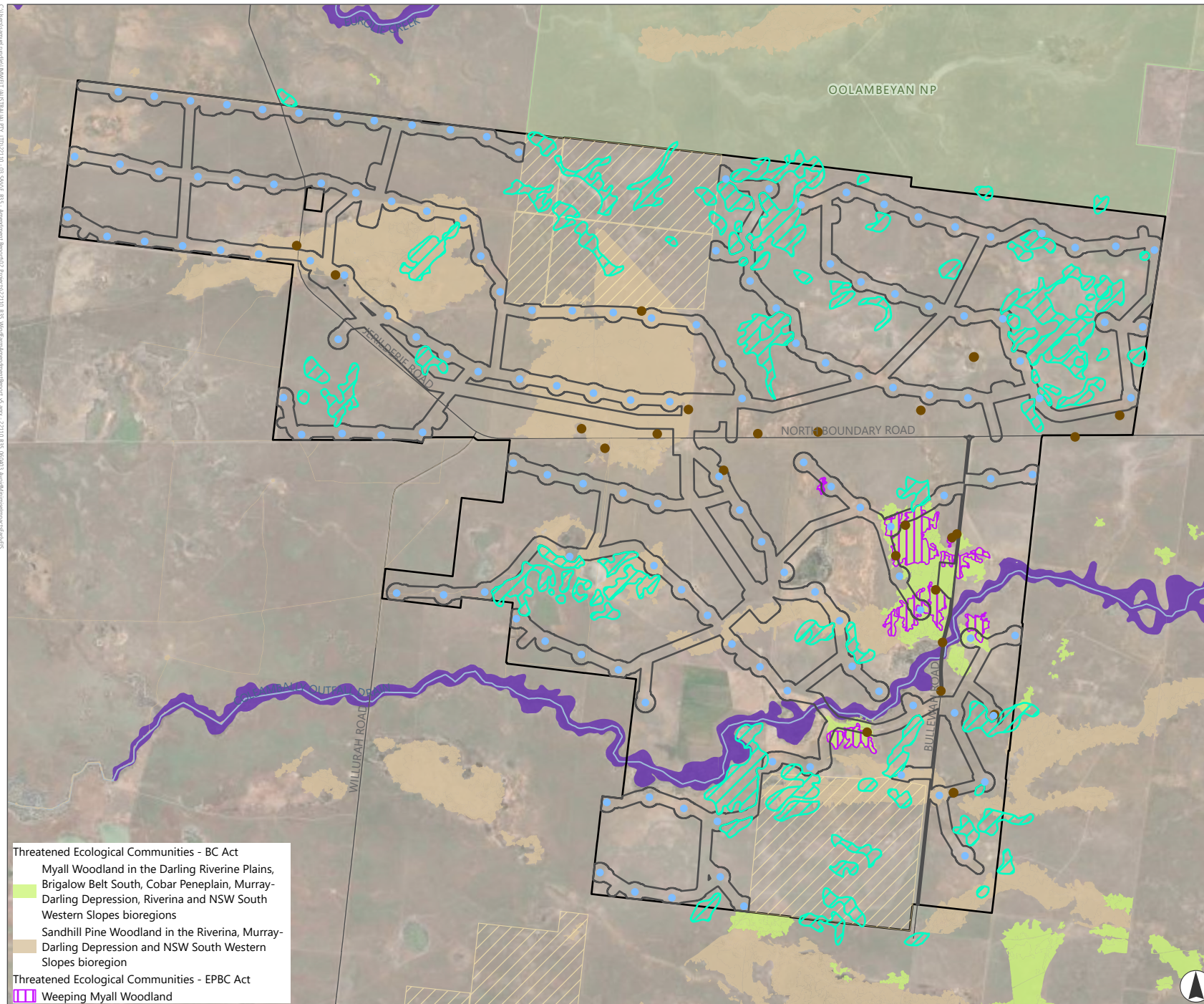
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FIGURE 6.4.3

Avoid and Minimise Impacts - Early EIS

Legend

- Project Boundary
- Early EIS Development Corridor
- Early EIS Wind Turbine Generators
- Conservation Agreement Area
- NPWS Reserves
- Road
- Watercourse
- Little Eagle Stick Nests
- Plains Wanderer Important Habitat Mapping
- Biodiverse riparian land



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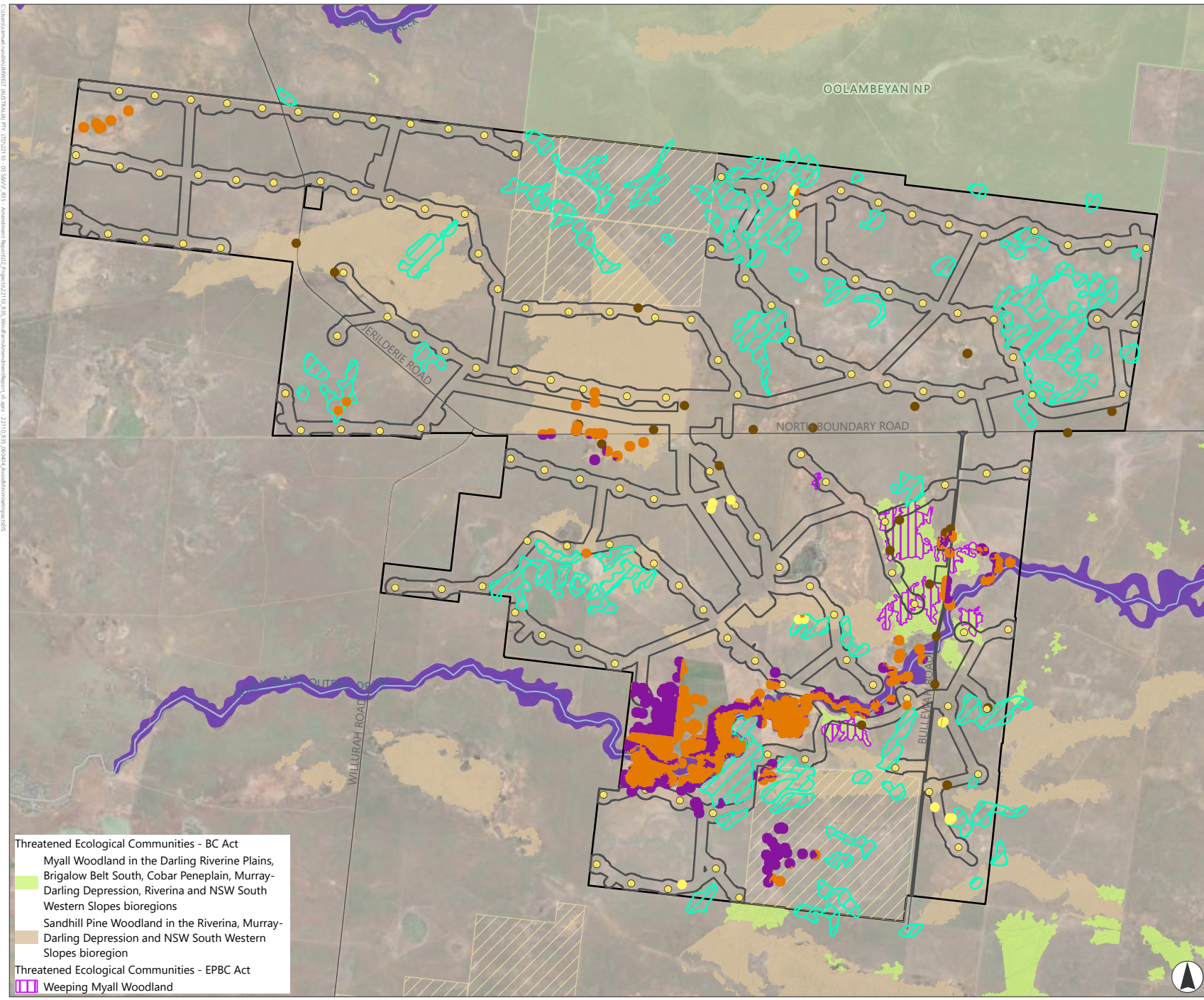
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FIGURE 6.4.4.
Avoid and Minimise Impacts
- EIS

- Legend**
- Project Boundary
 - EIS Development Corridor
 - EIS Wind Turbine Generators
 - Conservation Agreement Area
 - NPWS Reserves
 - Road
 - Watercourse
 - Little Eagle Stick Nests
 - Plains Wanderer Important Habitat Mapping
 - Biodiverse riparian land
- Plains-Wanderer Supplementary Habitat**
- Associated PCTs (100m buffer on Umwelt records)
 - Non-Associated PCTs derived from Spatial Analysis Areas
 - Overlap of Associated PCTs and Spatial Analysis Areas



Threatened Ecological Communities - BC Act

- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion

Threatened Ecological Communities - EPBC Act

- Weeping Myall Woodland



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6.2.5 Assessment Results

6.2.5.1 Direct Impacts on Native Vegetation and Threatened Ecological Communities

The Project would directly impact up to 638.01 ha of native vegetation within the Development Footprint across the three (3) assessment areas as follows:

- Stage 1 – Linear assessment: 269.69 ha.
- Stage 1 – Site based assessment: 0.91 ha.
- Stage 2 – Linear assessment: 367.41 ha.

Additionally, the Port to Hay off-site road works (Appendix J and Appendix K of the Amended BDAR) would directly impact a further 0.14 ha of native vegetation and planted native vegetation. This equates to a total of 638.15 ha of native vegetation which would be directly impacted by the Amended Project.

The anticipated duration of the Project construction period is approximately 3.5 years (44 months). Stage 1 is planned to commence in approximately Q4 of 2025 and take approximately 24 months to complete. Stage 2 is planned to commence in approximately Q1 of 2027 (overlapping with Stage 1 construction for 10 months) and take approximately 30 months to complete. Hence, direct impacts associated with Stage 1 of the Project (269.69 ha) are proposed to take place within 12 months of project approval, while the direct impacts associated with Stage 2 (367.41 ha) of the Project are proposed to take place 14 months into the overall construction period.

The proposed direct impacts to native vegetation represents approximately 3% of the native vegetation within the Project Area. The native vegetation to be directly impacted within the Subject Land comprises 10 PCTs across 11 vegetation zones² as follows:

- Zone 1 - PCT 10: River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) – Moderate-good
- Zone 2 – PCT 13: Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) – Moderate-good
- Zone 3 - PCT17: Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion) – Moderate-good
- Zone 4 – PCT 24: Canegrass swamp tall grassland wetland of drainage depressions: lakes and pans of the inland plains – Moderate-good
- Zone 5 – PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion – DNG
- Zone 6 – PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion – Moderate-good

² While 12 vegetation zones have been identified in the Development Corridor, only 11 would be directly impacted. The Project has avoided direct impacts to Zone 8 - PCT28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone – Moderate-good.

- Zone 7 – PCT 28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone – DNG
- Zone 9 – PCT 44: Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion – Moderate-good
- Zone 10 – PCT 46: Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain: Riverina Bioregion – Moderate-good
- Zone 11 - PCT160: Nitre Goosefoot shrubland wetland on clays of the inland floodplains – Moderate-good
- Zone 12 - PCT164: Cotton Bush open shrubland of the semi-arid (warm) zone – Moderate-good.

The Project has avoided direct impacts to Zone 8 - PCT28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone – Moderate-good.

Two (2) of the PCTs to be directly impacted by the Project were found to conform to three (3) TECs listed under the BC Act and EPBC Act.

- **PCT26:** Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion was identified as being a component of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions, listed as endangered under the BC Act. The Project would result in the removal of 22.80 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions across both stages of the Project.
- **Components of PCT26:** Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion was also found to conform to Weeping Myall Woodland, listed as endangered under the EPBC Act. Only Zone 6 – PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion – Moderate-good conformed to the TEC under the EPBC Act. Zone 5 – PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion – DNG did not meet the necessary condition requirements of the listing advice under the EPBC Act. The Project would result in direct impacts to 4.92 ha of Weeping Myall Woodland across both stages of the Project.
- **PCT 28:** White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone was identified as being a component of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion, listed as endangered under the BC Act. Both of the two condition zones, DNG and Moderate-good, mapped within the Development Footprint meet the final determination for the TEC under the BC Act. The Project would result in the removal of 59.70 ha of TEC across both stages of the Project. Direct impacts to this TEC would be limited to the DNG form of the TEC. The Project has avoided all of the TEC in Moderate-good condition mapped within the Subject Land.

The direct impacts associated with the Project are summarised in **Table 6.2** below.

Table 6.2 Summary of Impacts to Native Vegetation

Vegetation Zone	PCT	Condition	TEC	BC Act	EPBC Act	SAIL	Area to be Impacted (ha) Stage 1 – Linear	Area to be Impacted (ha) Stage 1 – Site based	Area to be Impacted (ha) Stage 2 – Linear	Total Area to be Impacted (ha)	Change (Loss) in Vegetation Integrity Score
Zone 1	PCT 10: River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	-	-	-	No	2.23	0.00		2.23	-34.9
Zone 2	PCT 13: Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	-	-	-	No	0.08	0.00		0.08	-66.4
Zone 3	PCT 17: Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	-	-	-	No	2.05	0.00		2.05	-85.4
Zone 4	PCT 24: Canegrass swamp tall grassland wetland of drainage depressions: lakes and pans of the inland plains	Moderate-good	-	-	-	No	1.97	0.00		1.97	-37.2
Zone 5	PCT 26: open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	DNG	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	E	-	No	17.88	0.00	0.00	17.88	-34.3
Zone 6	PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Moderate-good	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions Weeping Myall Woodlands	E	E	No	4.92	0.00	0.00	4.92	-54.7
Zone 7	PCT 28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	DNG	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion	E	-	No	20.44	0.53	38.74	59.70	-49.2
Zone 8¹	PCT 28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Moderate-good	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion	E	-	No	0.00	0.00	0.00	0.00	0.00
Zone 9	PCT 44: Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	Moderate-good	-	-	-	No	76.46	0.00	92.79	169.25	-48.2
Zone 10	PCT 46: Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain: Riverina Bioregion	Moderate-good	-	-	-	No	138.83	0.00	197.59	336.43	-68.4
Zone 11	PCT 160: Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Moderate-good	-	-	-	No	0.91	0.00	1.63	2.55	-58.4
Zone 12	PCT 164: Cotton Bush open shrubland of the semi-arid (warm) zone	Moderate-good	-	-	-	No	3.91	0.38	36.65	40.95	-48.6
Total							269.69	0.91	367.41	638.01	

Note ¹: The Project has avoided direct impacts to Zone 8 - PCT28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone – Moderate-good.

6.2.5.2 Direct Impacts to Threatened Species

Direct impacts are described in the BAM as those impacts 'on biodiversity values and threatened species habitat that relate to clearing native vegetation and impacts on biodiversity values prescribed by the BC Regulation. This includes impacts from activities related to the construction or operational phase of the proposal'. Within the Development Footprint, clearance of native vegetation has presumed to result in complete loss of biodiversity values, with complete loss of individuals occupying that area of vegetation and complete loss of any habitat values.

Associated with the direct impacts as clearing of native vegetation there will be clearing of areas of occupancy and habitat for nine (9) species credit species as recorded during the completed field surveys in the Stage 1 – Linear and Stage 2 – Linear Development Footprints:

1. *Maireana cheelii*
2. *Swainsona sericea*
3. *Swainsona murrayana*
4. *Lepidium monoplacoides*
5. *Eleocharis obcis*
6. Plains-wanderer
7. Little Eagle
8. Barking Owl
9. Southern Bell Frog.

All these species are assessed as area-based assessment species credit species. **Table 6.3** details the areas of all species credit species being directly impacted by the Subject Land.

It is noted that two (2) previously assumed present species, *Austrostipa wakoolica* and *Cullen parvum*, have had targeted flora surveys completed in the Project Area since exhibition of the BDAR. Neither target species was recorded through these detailed surveys. As such, there is no species polygon applicable for these two (2) species and the Project is not considered to impact them.

Table 6.3 Summary of Direct Impacts on Threatened Species Credit Species

Type	Species Name	Common Name	BC Act	EPPC Act	Sensitivity to gain class	SAII?	Area to be impacted (ha) Stage 1 – Linear	Area to be impacted (ha) Stage 1 – Site based	Area to be impacted (ha) Stage 2 – Linear	Total Area to be Impacted (ha)
Flora	<i>Eleocharis obicis</i>	Spike-rush	V	V	Moderate	No	0.0	0.0	7.31	7.31
Flora	<i>Lepidium monoplacoides</i>	Winged Pepper-cress	E	E	High	No	3.52	0.0	0.0	3.52
Flora	<i>Maireana cheelii</i>	Chariot Wheels	V	V	High	No	2.01	0.0	2.66	4.67
Flora	<i>Swainsona murrayana</i>	Slender Darling Pea	V	V	High	No	52.23	0.0	70.86	123.09
Flora	<i>Swainsona sericea</i>	Silky Swainson-pea	V	-	High	No	4.18	0.0	5.6	9.78
Fauna	<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	Moderate	No	20.46	0.0	15.35	35.81
Fauna	<i>Litoria raniformis</i>	Southern Bell Frog	E	V	Moderate	No	34.87	0.0	17.29	52.16
Fauna	<i>Ninox connivens</i>	Barking Owl	V	-	High	No	4.16	0.0	0.0	4.16
Fauna	<i>Pedionomus torquatus</i>	Plains-wanderer*	E	CE	High	Yes	20.20	0.0	0.69	20.89**

Notes:

* Impacts presented for Plains-wanderer are based on the assessment of supplementary habitat, it does not include any impacts to NSW identified Important Habitat Mapping as all of that critical species habitat mapping was avoided by the Project.

** 2.61 ha comprising infrastructure, non-native vegetation and/or waterbodies.

6.2.5.3 Indirect Impacts

Indirect impacts are those ‘that occur when the proposal affects native vegetation and threatened species habitat beyond the subject land 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 (**Table 6.4 to Table 6.6**) was applied to indirect impacts, as specified in the BAM Section 8.2, to assess the likelihood of each occurring following the implementation of all mitigation measures. The potential consequences to biodiversity during the construction and operational phases of the Project are described in **Table 6.9**.

Table 6.4 Risk Criteria – Likelihood of Impact

Score	Description
Almost certain	Very high or certain probability that impact will occur or event is of continuous nature
Likely	Likely probability that impact will occur or event is frequent (1–5 years)
Possible	Moderate probability that the impact will occur or the event is infrequent (5–20 years)
Unlikely	Low probability that impact will occur or event is very infrequent (100+ years)
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)

Table 6.5 Risk Criteria – Likelihood of Consequence

Score	Description
Significant	An impact that is widespread, permanent and may result in large-scale loss of ‘critical’ habitat
Major	An impact that is widespread, long lasting and may result in large-scale loss of important habitat*
Moderate	Large-scale conversion of natural habitat or small-scale conversion of important habitat*
Minor	Temporary and localised impact to natural habitat
Insignificant	No measurable impact

* refers to general importance of habitat to biodiversity values, not necessarily ‘Important Habitat’ as defined within the BAM.

Table 6.6 Risk Matrix

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 6.7 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, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species, including: - Plains-wanderer - Southern Bell Frog. Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	Construction phase (short-term, permanent)	Zones 1-12	During clearing	Almost certain	Moderate	VH	- 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, EECs and habitat. - Edge effects may result in increased competition between native fauna species for resources and displacement of native fauna species. - Installation of infrastructure including fencing may result in increased risk of predation on Plains-wanderer.
Reduced viability of adjacent habitat due to edge effects	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species, including: - Plains-wanderer - Southern Bell Frog. Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	Operational phase (long-term, permanent)	Unknown	Throughout operational phase	Almost certain	Moderate	VH	- 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, EECs and habitat. - Edge effects may result in increased competition between native fauna species for resources and displacement of native fauna species. - Installation of infrastructure including fencing may result in increased risk of predation on Plains-wanderer.
Reduced viability of adjacent habitat due to noise, dust or light spill	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog - Barking Owl - Black Falcon, Little Eagle, Spotted Harrier and another non-threatened raptor species.	Construction phase (short-term)	Zones 1-12	Throughout construction phase	Likely	Minor	M	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.

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 noise, dust or light spill	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog - Barking Owl - Black Falcon, Little Eagle, Spotted Harrier and another non-threatened raptor species.	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, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog. Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	Construction phase (short-term)	Unknown	Throughout construction phase	Almost certain	Moderate	VH	- 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, EECs, and habitat for native fauna species.
Transport of weeds and pathogens from the site to adjacent vegetation	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog. Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	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, EECs, and habitat for native fauna species.

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 fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog - Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler).	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.
Increased risk of starvation or exposure, and loss of shade or shelter	Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog - Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler).	Operational phase (long-term, permanent)	Unknown	Throughout operational phase	Unlikely	Minor	VL	- 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 and their habitat, including: - Plains-wanderer - Southern Bell Frog - Wedge-tailed Eagle - Barking Owl - Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler).	Construction phase (short-term, permanent)	Zones 1-12	During clearance	Almost certain	Significant	E	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 and their habitat, including: - Plains-wanderer - Southern Bell Frog - Wedge-tailed Eagle - Barking Owl - Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler).	Operational phase (long-term, permanent)	Unknown	Throughout operational phase	Possible	Major	H	Removal of breeding habitat may disrupt the breeding cycle of species, and potentially lead to displacement of affected species.
Trampling of threatened flora species	Native flora species, including: <i>Eleocharis obicis</i> <i>Lepidium monoplacoides</i> <i>Swainsona murrayana</i> <i>Swainsona sericea</i> <i>Maireana cheelii</i>.	Construction phase (short-term)	Zones 1-12	Throughout construction phase	Likely	Moderate	H	Trampling may result in the mortality of a threatened flora species, and therefore may decrease the size of threatened flora species populations.
Trampling of threatened flora species	Native flora species, including: <i>Eleocharis obicis</i> <i>Lepidium monoplacoides</i> <i>Swainsona murrayana</i> <i>Swainsona sericea</i> <i>Maireana cheelii</i>.	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Moderate	M	Trampling may result in the mortality of a threatened flora species, and therefore may decrease the size of threatened flora species populations.

Indirect Impact	Impacted Biodiversity	Timing and Duration	Extent	Frequency	Likelihood of Impact	Likelihood of Consequence	Indirect Impact Level	Summary and Potential Consequences
Rubbish dumping	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog - Wedge-tailed Eagle - Barking Owl - Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler). Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	Construction phase (short-term)	Zones 1-12	Throughout construction phase	Almost certain	Moderate	VH	- The dumping of rubbish may reduce the quality of native vegetation. - May result in increasing predatory and pest animal species - May result in injury or mortality to native fauna species.
Rubbish dumping	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog - Wedge-tailed Eagle - Barking Owl - Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler). Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Moderate	M	- The dumping of rubbish may reduce the quality of native vegetation. - May result in increasing predatory and pest animal species - May result in injury or mortality to native fauna species.
Wood collection	Native fauna species and their habitat	Construction phase (short-term)	Unknown	Throughout construction phase	Unlikely	Minor	VL	- Unlawful harvesting of timber and fallen logs may reduce quality of native vegetation, EECs, and the amount of habitat available for native species. - Injury or mortality of native fauna species as a result of the removal.

Indirect Impact	Impacted Biodiversity	Timing and Duration	Extent	Frequency	Likelihood of Impact	Likelihood of Consequence	Indirect Impact Level	Summary and Potential Consequences
Wood collection	Native fauna species and their habitat	Operational phase (long-term)	Unknown	Throughout operational phase	Unlikely	Minor	VL	- Unlawful harvesting of timber and fallen logs may reduce quality of native vegetation, EECs, 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	Construction phase (short-term)	Unknown	Throughout construction phase	Unlikely	Minor	VL	- 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	Operational phase (long-term)	Unknown	Throughout operational phase	Remote	Minor	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, including: - Plains-wanderer - Southern Bell Frog.	Construction phase (short-term)	Unknown	Throughout construction phase	Likely	Major	VH	- 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 mortality 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, including: - Plains-wanderer - Southern Bell Frog.	Operational phase (long-term)	Unknown	Throughout the operational phase	Possible	Major	H	- 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 mortality of native fauna species as a result of increased competition and predation with pest species.
Increased fire risk	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species, including: - Plains-wanderer - Southern Bell Frog. Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	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.

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, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species, including: - Plains-wanderer - Southern Bell Frog. Native flora species, including: <i>Maireana cheelii</i> <i>Swainsona sericea</i> <i>Swainsona murryana</i> <i>Eleocharis obicis</i> <i>Lepidium monoplocoides</i>.	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.
Disturbance to specialist breeding and foraging habitat	Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog.	Construction phase (short-term)	Unknown	Throughout construction phase	Possible	Moderate	M	- Potential disturbance of low-lying depressions that may be utilised as breeding sites by frogs species. - This disturbance may result in a disruption in the breeding cycle of frog species on the site.
Disturbance to specialist breeding and foraging habitat	Native fauna species and their habitat, including: - Plains-wanderer - Southern Bell Frog	Operational phase (long-term)	Unknown	Throughout operational phase	Possible	Minor	VL	- Potential disturbance of low-lying depressions that may be utilised as breeding sites by frogs species. - This disturbance may result in a disruption in the breeding cycle of frog species on the site.
Pollutant spills	Native vegetation, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Southern Bell Frog.	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, including three Threatened Ecological Communities: - Sandhill Pine Woodland EEC - Myall Woodland EEC - Weeping Myall Woodlands EEC. Native fauna species and their habitat, including: - Southern Bell Frog.	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 to of the Project to Oolambeyan National Park, this assessment has considered a EUROBAT Publication article by Rodrigues et al (2015) regarding the proximity of wind turbines 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 200 m distance is to be measured from the tip of the wind turbine blade, not the wind turbine tower itself. In the case of this Project, with approximately 100 m long wind turbine blades, the recommended buffer is in the order of 300 m from the WTG locations as mapped.

Consideration of Oolambeyan National Park

The Rodrigues et al (2015) article focuses on the minimisation of impacts to microbats; however we have considered both bird and bat species known, likely or with the potential to inhabit Oolambeyan National Park.

Oolambeyan National Park provides high quality habitat for woodland and forest birds, and due to its size and lack of ongoing disturbances provides better habitat than the woodlands and forests within the Project Area. The National Park provides a large tract of suitable habitat for Barking Owl, which was heard calling during nocturnal surveys works.

It is likely that Oolambeyan National Park contains suitable breeding habitat for Barking Owl. Oolambeyan National Park may also provide suitable foraging and breeding habitat for hollow dependant microbats species, predicted to occur within the Subject Land. The habitat buffer described in the Rodrigues et al (2015) article was considered by BWF during the design phase of the Project.

No WTG are located within 300 m of the Oolambeyan National Park. The closest WTG are located 450 m to 600 m away from the boundary of the National Park, exceeding the recommended buffer by 150 to 200 m.

6.2.5.4 Prescribed Biodiversity Impacts

Prescribed impacts are described in in the BDAR and an assessment of prescribed impacts is provided below.

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 wind turbine strike on protected animals are considered in detail in Appendix D of **Appendix 5**.

Human-Made Structures and Non-Native Vegetation

An assessment of the impacts on threatened entities associated with non-native vegetation is provided in **Table 6.8**.

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 Project Area is provided in **Table 6.9**.

Table 6.8 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
Southern bell frog	The non-native vegetation consists of agricultural grazing land and cleared banks of the Coleambally Outfall Drain.	Approximately 3.73 ha of non-native vegetation will be permanently removed during construction for the life of the Project.	Suitable native and non-native habitat for Southern bell frogs will remain within the Subject Land and surrounds. Given this, it is unlikely that the non-native vegetation to be removed within the Subject Land is significantly important to these threatened entities.	As the non-native vegetation within the Subject Land is not considered important to the threatened entities, it is unlikely that the removal will impact the local and bioregional persistence of these species.
Threatened microbats including Yellow-bellied Sheath-tail-bat, Little Pied Bat, Inland Forest Bat	The bridges crossing Coleambally Outfall Drain have the potential to be habitat for microbats, however no bats were observed roosting under the structures. Southern Myotis was not recorded during targeted surveys.	There is currently no design work for be bridge upgrades, however, two options have been proposed. The upgrades will either involve strengthening the bridge by underpinning or building additional piers which would require excavation or drilling; or building an additional temporary road alongside the bridge to take the abnormal loads.	No microbat species were recorded frosting under the bridge during field surveys. The bridges are made of cement and currently possess limited habitat for roosting microbats. While possessing marginal rooting habitat, it is unlikely the two bridges are important to threatened bat species, such as Southern Myotis, or non-threatened bats species with the locality.	As the bridges over Coleambally Outfall Drain are not considered important to the threatened entities, it is unlikely that the removal will impact the local and bioregional persistence of these species.
Raptor species including Black Falcon, Little Eagle, and Wedge-tailed Eagle	The non-native vegetation consists of agricultural grazing land and cleared banks of the Coleambally Outfall Drain. Black Falcons nest on transmission towers within the Project Area.	Approximately 3.73 ha of non-native vegetation will be permanently removed during construction for the life of the Project. No transmission towers will be removed as part of the Project.	Threatened and non-threatened raptor species, such as Black Falcon, Little Eagle, and White-bellied Sea-Eagle, 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 Subject Land is significantly important to these threatened entities.	As the non-native vegetation within the Subject Land is not considered important to the threatened entities, it is unlikely that the removal will impact the local and bioregional persistence of these species.

Table 6.9 Potential Impacts on Connectivity of Habitat of Threatened Entities

Threatened entity	Movement patterns key to the life cycle of the 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
Threatened birds (Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler)	The vegetation along Coleambally Outfall Drain may facilitate the movement of threatened birds, including Southern Whiteface, White-fronted Chat, Flame Robin, Diamond Firetail, Blue-winged Parrot, Grey-crowned Babbler through the Subject Land, and across the wider Project Area and locality.	During construction up to 638.01 ha of native vegetation, including 1.8 ha of vegetation along Coleambally Outfall Drain will be permanently removed.	Impacts to 1.8 ha of native vegetation surrounding Coleambally Outfall Drain would remove suitable foraging habitat for threatened bird species and fragment a key movement corridor through the Project Area. The removal of 638.01 ha of native vegetation connectivity for smaller threatened birds, however given the long linear nature of the development and mobility of these species, the impacts to would be expected to be negligible and unlikely affect connectivity at a bioregion scale.	The threatened birds recorded during field surveys are highly mobile and are unlikely to be impacted by the removal of 638.01 ha of native vegetation, including 1.8 ha of vegetation along the drain, such that the Project impacts local or bioregional persistence.
Threatened microbats including Yellow-bellied Sheath-tail-bat, Little Pied Bat, Inland Forest Bat	The vegetation along Coleambally Outfall Drain may facilitate the movement of microbats, including Yellow-bellied Sheath-tail-bat, Little Pied Bat, and Inland Forest Bat	During construction up to 638.01 ha of native vegetation, including 1.8 ha of vegetation along Coleambally Outfall Drain will be permanently removed.	Impacts to 1.8 ha of native vegetation surrounding Coleambally Outfall Drain would remove suitable foraging habitat for threatened microbats and fragment a key movement corridor through the Project Area. The removal of 638.01 ha of native vegetation connectivity for smaller threatened birds, however given the long linear nature of the development and mobility of these species, the impacts to would be expected to be negligible and unlikely affect connectivity at a bioregion scale.	The threatened microbats recorded during field surveys are highly mobile and are unlikely to be impacted by the removal of 638.01 ha of native vegetation, including 1.8 ha of vegetation along the drain, such that the Project impacts local or bioregional persistence.

Threatened entity	Movement patterns key to the life cycle of the 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
Southern Bell Frog	The vegetation along Coleambally Outfall Drain may facilitate the movement of threatened fauna, including Southern Bell Frog through the Subject Land, and across the wider Project Area and locality.	During construction up to 52.16 ha of Southern Bell Frog habitat, including 1.8 ha of vegetation along Coleambally Outfall Drain will be permanently removed.	The removal of 638.01 ha of native vegetation, including 1.8 ha of vegetation along Coleambally Outfall Drain, would fragment suitable habitat for Southern Bell Frog. However, given the long linear nature of the development and the extensive areas of native vegetation that would be retained across the Project Area and wider locality, the removal of suitable habitat is unlikely to be important for connectivity within the bioregion or the lifecycle of the species.	Southern Bell Frogs are mobile and are unlikely to be impacted by the removal of 638.01 ha of native vegetation, including 1.8 ha of vegetation along the drain, such that the Project impacts local or bioregional persistence.
Plains-wanderer	The Project would result in the fragmentation of native vegetation between areas of Plains-wanderer Important Habitat across the Project Area. The Project may also result in the fragmentation of Plains-wanderer home-ranges, potentially disrupting movements between denser nesting habitat and more open foraging habitat.	The Project has completely avoided mapped Important Habitat within the Project Area. Notwithstanding, during construction up to 20.89 ha of supplementary Plains-wanderer habitat would be permanently removed. This total extent of impact comprises 2.61 ha of infrastructure, non-native vegetation and/or waterbodies.	The Project has completely avoided mapped Important Habitat within the Project Area. The removal of 638.01 ha would fragment native vegetation and connectivity between areas of mapped Important Habitat for Plains-wanderer. It would also fragment the native vegetation connecting suitable habitat for Southern Bell Frog.	Plains-wanderers are generally a sedentary species which make movements in response to changes in habitat suitability. The removal of native vegetation may impede movement of the species between areas of suitable habitat at multiple spatial scales and reduce breeding success by fragmenting individual home-ranges and disrupting dispersal between habitat patches.

Water Bodies, Water Quality and Hydrological Processes

An assessment of the impact threatened entities associated with water bodies or hydrological processes is provided in **Table 6.10**.

Aquatic Impacts to Eurolie Creek, Nyangay Creek and Abercrombie Creek (a requirement of the SEARs) is provided in Section 6.2.5 of the Amended BDAR (**Appendix 5**).

Table 6.10 Potential Impacts to Water Quality, Water Bodies and Hydrological Processes that Sustain Threatened Entities

Threatened entity	Waterbodies impacted	Nature, extent and duration of short and long-term impacts on water quality and hydrological process	Nature, extent and duration of short and long-term impacts on habitat and life cycle	Importance within the bioregion of the waterbody or hydrological process	Consequences of the impacts for the local and bioregional persistence
Southern bell frog	Coleambally Outfall Drain	The Project has the potential to cause short-term minor reduction in water quality during construction phase. However, potential impacts to surface water resources are primarily limited to the construction and decommissioning phases of the Project and can be mitigated to represent negligible risk. The operational phase of the Project presents minimal risk. Furthermore, the modelling prepared for the Project found that the large extent of the Project Area and distributed nature of minor impacts (if any) does not pose a risk to drainage features, downstream watercourses or receiving waters.	Short-term reduction in the quality of habitat, which may affect the life cycle of threatened entities during the construction phase. This potential impact can be mitigated to represent negligible risk to Southern Bell Frog habitat and life cycle.	The Murray and Murrumbidgee Rivers and their major tributaries occur within the Riverina Bioregion. Given how prominent natural watercourses are within the Bioregion, it is unlikely that the Coleambally Outfall Drain is significantly important to fauna species within the area.	Farm dams that provide habitat for Southern Bell Frogs will remain within the Project Area, and risks associated with a short-term reduction in water quality through sedimentation can be readily mitigated. More broadly there are many watercourses within the Bioregion. Hence, it is unlikely that there will be a significant impact to the local and bioregional persistence of threatened entities. The Project does not pose a risk to drainage features, downstream watercourses or receiving waters.

Threatened entity	Waterbodies impacted	Nature, extent and duration of short and long-term impacts on water quality and hydrological process	Nature, extent and duration of short and long-term impacts on habitat and life cycle	Importance within the bioregion of the waterbody or hydrological process	Consequences of the impacts for the local and bioregional persistence
Migratory birds and waterbirds including Australasian Bittern, Australian Painted Snipe, Blue-billed Duck, Brolga, Magpie Goose	Ephemeral Wetlands	The Project would result in the permanent removal 4.02 ha of ephemeral wetlands across the Subject Land. The disturbance of the ground surface during construction poses the risk of erosion and sediment transport and deposition during significant rainfall events. Additional areas of ephemeral wetlands may be affected by sedimentation. The Project has the potential to cause short-term minor reduction in water quality during construction phase. However, potential impacts to surface water resources are primarily limited to the construction and decommissioning phases of the Project and can mitigated to represent negligible risk. The operational phase of the Project presents minimal risk. Furthermore, the modelling prepared for the Project found that the large extent of the Project Area and distributed nature of minor impacts (if any) does not pose a risk to drainage features, downstream watercourses or receiving waters.	Short-term reduction in the quality of habitat, which may affect the life cycle of threatened entities during the construction phase. This potential impact can be mitigated to represent negligible risk to migratory and waterbird habitat and life cycle.	The Riverina Bioregion is dominated by river channels, floodplains, backplains, swamps and lakes. There are also extensive areas of PCTs associated with ephemeral wetlands throughout out the Bioregion. It is therefore unlikely that the ephemeral wetlands within the Subject Land are significantly important.	The ephemeral wetlands within the Subject Land likely provide habitat for threatened entities. However, given the extent of similar habitat throughout the Bioregion the removal is unlikely to impact on the local and bioregional persistence of the threatened entities. The Project does not pose a risk to drainage features, downstream watercourses or receiving waters.

Threatened entity	Waterbodies impacted	Nature, extent and duration of short and long-term impacts on water quality and hydrological process	Nature, extent and duration of short and long-term impacts on habitat and life cycle	Importance within the bioregion of the waterbody or hydrological process	Consequences of the impacts for the local and bioregional persistence
Ephemeral pools within habitat	Ephemeral pools within habitat	Short-term and potentially long-term changes to hydrology and sediment transport. The Project has the potential to cause short-term minor reduction in water quality during construction phase. However, potential impacts to surface water resources are primarily limited to the construction and decommissioning phases of the Project and can be mitigated to represent negligible risk. The operational phase of the Project presents minimal risk.	Short-term and potentially long-term changes to the extent, distribution and quality of open grassland habitat. This could be due to the creation or expansion of ephemeral wetlands. The Plains-wanderer does not use wetland habitat. However, the study area is very flat and therefore, small variations in elevation and slope affect landscape drainage patterns. Thus, hydrological processes affect the distribution of various habitat types, including those used by the Plains-wanderer. However, the Water Resources Impact Assessment found that potential impacts to drainage features and downstream watercourses as a result of Project infrastructure are considered as imperceptible due to the relative size of the Project Area in relation to the size of the receiving catchments, and the distributed nature of minor impacts.	The Riverina Bioregion is dominated by river channels, floodplains, backplains, swamps and lakes. There are also extensive areas of PCTs associated with ephemeral wetlands throughout the Bioregion. It is therefore unlikely that the ephemeral pools within the Subject Land are significantly important.	The loss of open groundcover vegetation due to altered hydrological processes may result in the loss of individual home-ranges and reduce the regional population size. However, the Water Resources Impact Assessment found that potential impacts to drainage features and downstream watercourses as a result of Project infrastructure are considered as imperceptible due to the relative size of the Project Area in relation to the size of the receiving catchments, and the distributed nature of minor impacts.

Wind Turbine Strikes

Umwelt has prepared detailed Prescribed Impact Assessments 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 D of **Appendix 5**.

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

- Ecosystem credit predicted species database (BAM-C).
- Protection Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) (DAWE 2023).
- BioNet Atlas Threatened Biodiversity Profile Data Collection (DPE 2022a).

Candidate bird and bat species lists comprising species that were either recorded or are predicted to occur in the vicinity of the Project are provided in Section 3.0, Appendix D of **Appendix 5**. The candidate bird and bat lists comprise 144 and 18 species respectively. Of these a total of 121 bird and 17 bat species were considered for further assessment due to their known presence in the Project Area or their likelihood of occurrence being low-moderate, moderate or high.

To assess the likelihood and consequence of impacts on aerial species, a qualitative risk-based assessment based on an assessment methodology developed by the Arthur Rylah Institute (Lumsden et al. 2019) has been conducted. The assessment approach comprises consideration of the likelihood of blade strike based on a species' recorded flight behaviour and status in the Project Area, as well as consideration of existing turbine strike data from Australia. The relative consequence of potential collisions and/or barotrauma is assessed with consideration of a species' total population size and degree of concentration in certain areas, conservation status and demographic resilience.

The prescribed impact assessment assessed those aerial species considered to have a Moderate or High risk rating further in the context of mitigation measures that would be considered and applied in the event of an impact trigger. In the event of such an impact trigger, through the BBAMP, the Project will be required to implement species-specific mitigation measures to manage the risk of turbine strike on the species. The intended result of implementing species specific mitigation measures is that the risk rating for the species is reduced, i.e. mitigated risk rating. Full detail of the impact trigger thresholds, post trigger responses and mitigation measures will be prepared and finalised in the BBAMP through consultation with CPHR and/or Commonwealth DCCEEW.

The findings of this risk-based assessment are presented in Section 8 of the Prescribed Impact Assessment (Appendix D of **Appendix 5**).

A total of 12 bird species were recorded in the Project Area, of which 11 were threatened bird species. Of the total 12 species recorded, two (2) bird species (black falcon and little eagle) were assigned a mitigated risk rating of moderate. Of these, black falcon is a listed threatened species. A further five (5) bird species were assigned a mitigated risk rating of minor and the remaining five (5) were assigned a negligible risk rating (with or without mitigation).

A total of 17 bat species were recorded within the Project Area, of which four (4) were threatened species. Of the total bat species recorded, two (2) bat species (white-striped freetail-bat and yellow-bellied sheath-tail bat) were assigned a mitigated risk rating of moderate. Of these, yellow-bellied sheath-tail bat is a listed threatened species. A further 14 bat species were assigned a minor mitigated risk rating and one (1) species was assigned a negligible risk rating (with or without mitigation).

The results of the risk assessment for the 12 bird species and 17 bat species that were recorded in the Project Area are summarised in **Table 6.11**.

Table 6.11 Turbine Risk Assessment Summary

Type	Common Name	Species Name	Likelihood	Consequence	Unmitigated Risk Rating	Mitigated Risk Rating
Bird	Barking owl*	<i>Ninox connivens</i>	Low	Moderate	Minor	Minor
Bird	Black falcon*	<i>Falco subniger</i>	High	Moderate	High	Moderate
Bird	Blue-winged parrot*	<i>Neophema chrysostoma</i>	Moderate	Moderate	Moderate	Minor
Bird	Diamond firetail*	<i>Stagonopleura guttata</i>	Low	Low	Negligible	Negligible
Bird	Flame robin*	<i>Petroica phoenicea</i>	Low	Low	Negligible	Negligible
Bird	Grey-crowned babbler*	<i>Pomatostomus temporalis</i>	Low	Low	Negligible	Negligible
Bird	Little eagle*	<i>Hieraaetus morphnoides</i>	High	Moderate	High	Moderate
Bird	Plains-wanderer*	<i>Pedionomus torquatus</i>	Low	High	Moderate	Minor
Bird	Southern whiteface*	<i>Aphelocephala leucopsis</i>	Low	Low	Negligible	Negligible
Bird	Spotted harrier*	<i>Circus assimilis</i>	Moderate	Moderate	Moderate	Minor
Bird	White-fronted chat*	<i>Epthianura albifrons</i>	Low	Low	Negligible	Negligible
Bird	Wedge-tailed eagle	<i>Aquila audax</i>	High	Low	Moderate	Minor
Bat	White-striped freetail-bat	<i>Austronomus australis</i>	High	Moderate	High	Moderate
Bat	Inland free-tailed bat	<i>Ozimops petersi</i>	Moderate	Moderate	Moderate	Minor
Bat	Southern free-tailed bat	<i>Ozimops planiceps</i>	Moderate	Moderate	Moderate	Minor
Bat	Ride's free-tailed bat	<i>Ozimops ridei</i>	Moderate	Moderate	Moderate	Minor
Bat	Chocolate wattled bat	<i>Chalinolobus morio</i>	Moderate	Low	Minor	Minor
Bat	Gould's wattle bat	<i>Chalinolobus gouldii</i>	High	Low	Moderate	Minor
Bat	Little forest bat	<i>Vespadelus vulturnus</i>	Moderate	Low	Minor	Minor

Type	Common Name	Species Name	Likelihood	Consequence	Unmitigated Risk Rating	Mitigated Risk Rating
Bat	Lesser long-eared bat	<i>Nyctophilus geoffroyi</i>	Moderate	Low	Minor	Minor
Bat	Large forest bat	<i>Vespadelus darlingtoni</i>	Low	Low	Negligible	Negligible
Bat	Southern forest bat	<i>Vespadelus regulus</i>	Low	Low	Minor	Minor
Bat	Yellow-bellied sheath-tail bat*	<i>Saccolaimus flaviventris</i>	High	Moderate	High	Moderate
Bat	Corben's long-eared bat*	<i>Nyctophilus corbeni</i>	Moderate	Moderate	Moderate	Minor
Bat	Inland forest bat*	<i>Vespadelus baverstocki</i>	Moderate	Moderate	Moderate	Minor
Bat	Little pied bat*	<i>Chalinolobus picatus</i>	Low	Moderate	Minor	Minor
Bat	Gould's long-eared bat	<i>Nyctophilus gouldi</i>	Moderate	Low	Minor	Minor
Bat	Inland broad-nosed bat	<i>Scotorepens balstoni</i>	Moderate	Low	Moderate	Minor
Bat	Little broad-nosed bat	<i>Scotorepens greyii</i>	Moderate	Low	Minor	Minor

* Threatened species (BC Act and/or EPBC Act).

6.2.5.5 Serious and Irreversible Impact

Assessment for Serious and Irreversible Impacts on Biodiversity Values

The determination of a Serious and Irreversible Impact (SII) is to be made by the decision maker in accordance with the principles set out in the 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 of the following four 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 2019b) and the Threatened Biodiversity Profile Data Collection was reviewed to determine the SAI candidates relevant to the assessment.

Additional Impact Assessment Provisions for TECs at Risk of an SAI

No TECs present in the Subject Land are listed as SAI entities.

Additional Impact Assessment Provisions for Threatened Species at Risk of an SAI

One (1) threatened fauna species, the Plains-wanderer, are SAI entities recorded or assumed present in the Subject Land.

The additional impact assessment provisions for threatened species at risk of an SAI have been addressed for the Plains Wanderer in **Table 6.12**. This species is listed as endangered under the BC Act and critically endangered under the EPBC Act.

Table 6.12 SAI Impact Assessment – Plains Wanderer

BAM Section 9.1.2 Criteria	Response
1. The assessor is required to provide further information in the BDAR or BCAR for any species at risk of an SAI, including the action and measures taken to avoid the direct and indirect impact on the species at risk of an SAI. Where these have been addressed elsewhere the assessor can refer to the relevant sections of the BDAR or BCAR.	Measures proposed to avoid direct and indirect impacts on this species are documented in Section 7.0 of the Amended BDAR. Impact and impact avoidance areas for areas of mapped Important Plains Wanderer Habitat are shown in Figure 6.4.1 to Figure 6.4.4 .
2. The assessor must consult the TBDC and/or other sources to report on the current population of the species including:	Refer below.
a. Evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the: i. Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or	The TBDC identifies that this species meets the criterion for Principle 1: a population reduction of >80% in 10 years or three generations. A generation time of 7.3 years was estimated by extrapolation from related Charadriiformes of similar size and ecology based on the age of first breeding (one year) and a maximum longevity on the wild of 13.5 years (Garnett et al. 2011; Department of the Environment 2015).
ii. Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	The Plains Wanderer National Recovery Plan (Department of the Environment and the Government of South Australia Department of Environment, Water and Natural Resources 2016) confirms that significant population declines occurred in the species' two main strongholds (northern Victorian plains and the Riverina in NSW) due to above average rainfall (see also Baker-Gabb 2016). This follows declines in the Riverina in 2002 due to drought. Combined, the Plains Wanderer declined by 93% in the Riverina between 2001 and 2014. Previously, Plains Wanderer populations have recovered from drought but recently have remained historically low (Department of the Environment and the Government of South Australia Department of Environment, Water and Natural Resources 2016). There is concern that the small size of the current population and regular population fluctuations makes it vulnerable to extinction. The current population size is estimated to be 200 in the Riverina and 50 in northern Victoria (Department of the Environment 2015), but the total number of mature individuals may be up to 1,000 (Baker-Gabb 2015).
b. Evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by: i. An estimate of the species' current population size in NSW, and ii. An estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and	The Plains Wanderer's population size declined by 93% between 2001 and 2014. The size of its Riverina/northern Victoria stronghold population is estimated to be 250 individuals, but the total number of mature individuals may be up to 1,000 (Baker-Gabb 2015). The species is known to undergo extreme population fluctuation and declines of 80% may occur over a couple of years during droughts (Department of the Environment and the Government of South Australia Department of Environment, Water and Natural Resources 2016).

BAM Section 9.1.2 Criteria	Response
iii. Where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	
c. Evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by: i. Extent of occurrence ii. Area of occupancy iii. Number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and iv. Whether the species' population is likely to undergo extreme fluctuations	The Plains Wanderer's total extent of occurrence is estimated to be 35,000 km², with an area of occupancy of 1,000 km². The respective values for NSW are 13,000 km² and 650 km² (NSW Scientific Committee 2009). The Plains Wanderer's population undergo extreme fluctuations due to drought. Drought may affect large areas of the species' range simultaneously. Given the relatively small area occupied by its stronghold populations in NSW and Victoria, it is particularly likely that these populations would be simultaneously affected by drought.
d. Evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because: i. Known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g., Species is clonal) on, a biodiversity stewardship site ii. The species is reliant on abiotic habitats which cannot be restored or replaced (e.g., Karst systems) on a biodiversity stewardship site, or iii. Life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g., Frogs severely impacted by chytrid fungus).	The Plains Wanderer is sexually mature at one year and produces clutches of two to four offspring. The species is known to undergo large fluctuations in population size in response to climatic conditions. In the absence of heavy grazing, it is capable of rapid population recovery (Baker-Gabb et al. 1990; 2016). Baker-Gabb et al. (2016) described the Plains Wanderer as an r-selected species (i.e. a species in which reproduction is prioritised over survival). The Plains Wanderer is not reliant on abiotic habitat that cannot be easily replaced. The life history traits of the Plains Wanderer are relatively well known. While drought cannot be controlled at a BSS, grazing pressure, feral animal control and tree establishment (which facilitates predation by native raptors) can. These are the major threats to the Plains Wanderer (Department of the Environment and the Government of South Australia Department of Environment, Water and Natural Resources 2016).

BAM Section 9.1.2 Criteria	Response
3. Where the TBDC indicates data is 'unknown' or 'data deficient' for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR or BCAR.	The TBDC does not specifically indicate that data is unknown or deficient for this species.
4. In relation to the impacts from the proposal on the species at risk of an SAI, the assessor must include data and information on:	Refer below.
a. The impact on the species' population (Principles 1 and 2) presented by: i. An estimate of the number of individuals (mature and immature) present in the subpopulation on the Development Footprint (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and ii. An estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or iii. If the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal	The species' unit of area specified by the TBDC is area. The estimated number of birds in the Riverina population is 200 (Department of the Environment 2015). Population densities reported for the Plains Wanderer are about 0.11 ha⁻¹ (Baker-Gabb at al. 1990). There is an estimated 3,263.9 ha of habitat on the Project Site, suggesting 359 birds are present. This appears to be an over-estimate given the total Hay population may only be 200 birds. The Project would remove 505.68 ha of habitat (PCTs 44 and 46). Based on the density estimate, up to 56 birds may be directly impacted (15% of the site's population). The NSW population is estimated to be about 200 birds. This suggests 28% of the NSW population may be indirectly impacted
b. Impact on geographic range (Principles 1 and 3) presented by: i. The area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW ii. The impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted	The Plains Wanderer's total extent of occurrence is estimated to be 35,000 km², with an area of occupancy of 1,000 km². The respective values for NSW are 13,000 km² (37% of the total) and 650 km² (65% of the total) (NSW Scientific Committee 2009). The Development Footprint has completely avoided all extents of mapped important habitat for the Plains-wanderer. This habitat would not be directly cleared by the Project but may be indirectly impacted during the construction and operation of BWF. However, there is 3,309.68 ha of habitat within the Project Boundary (PCTs 44 and 46), representing 0.33% of the species' national area of occupancy. The Project would require 505.68 ha (15% of that within the Project Boundary and 0.51% of its total area of occupancy) this habitat to be cleared for turbine pads, access roads and other infrastructure. The presence of turbines, noise impacts and partial clearing of adjacent habitat for turbine pads, ancillary structures that may be used as perches and access tracks may affect the presence of raptors and feral predators (foxes, cats, dogs) and the vulnerability of the Plains Wanderer to them.

BAM Section 9.1.2 Criteria	Response
iii. To determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g., Seed dispersal) and pollination distance for the species iv. To determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections.	The Plains Wanderer is unlikely to fly at heights that would result in turbine collisions. The grassland habitat is already fairly open and feral predators are currently unlikely to have difficulty moving throughout the entire site. The Plains-wanderer is vulnerable to death, injury and nest destruction during clearing operations. It is also vulnerable to vehicle strike across the Project Area, mostly during construction when vehicle movements will be highest. Some residual risk of vehicle strike would remain during the operation of the Project. The Project is unlikely to fragment the habitat of the Plains Wanderer as no mapped important habitat would be removed. Access roads may represent partial barriers to movement but are not expected to be absolute barriers as they would only be several metres wide (i.e. slow down rates of movement rather than prevent it). The TBDC indicates the minimum patch size able to be occupied by the Plains Wanderer is less than 5 ha. However, it should be noted that mean home-range areas reported ranged from 12 ha (Baker-Gabb et al. 1990) to 32 ha (Nugent et al. 2022a). The Plains Wanderer was historically regarded as occupying open grassland habitat on red soils. Recently, radio-tracking studies have suggested that the Plains Wanderer requires a mosaic of landscape elements including denser grass swards (Nugent et al. 2022a). Denser habitats may have previously been overlooked as the detection probability would be lower in these areas relative to open habitats as visual searching (either diurnal searches or nocturnal spotlighting) was used. This suggests that suitable habitat is more connected than previously assumed. The Plains Baker-Gabb et al. (1990) suggest that 450 ha of habitat may be required to maintain viable sub-populations that maintain some connection to other sub-populations. The proposed development may affect fire regimes at a local scale by requiring fire management in the vicinity of turbines (e.g. increased frequency but reduced severity). The formation of pads and access tracks may affect surface water flows and sub-surface hydrology. There may be some risk of pollution during construction (e.g. fuel spills) but this would be minimal during operation. The Project may alter species interactions (e.g. perch sites for raptors on suitable ancillary structures) (Baker-Gabb 2014 cited in Department of the Environment and South Australian Department of Environment, Water and Natural Resources 2016). Noise during construction and/or operation may have a localised effect on habitat use by the Plains Wanderer. The Project would not result in habitat/population fragmentation, increase edge effects or introduce disease, pathogens or parasites.
5. The assessor may also provide new information that can be used to demonstrate that the principle identifying the species as at risk of an SAIL, is inaccurate.	Not applicable.

6.2.6 Matters of National Environmental Significance

A detailed MNES Report for threatened and migratory entities listed under the EPBC Act is provided in Appendix E of **Appendix 5**. The MNES Report has been prepared in accordance with 'BCD recommendations for MNES assessments in an Environmental Impact Statement (EIS) or Biodiversity Development Assessment Report (BDAR)'. 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 others that have a moderate to high likelihood of occurrence.

Assessments of Significance for threatened and migratory entities were undertaken for threatened entities and is contained within Appendix 2 of the MNES Report (Appendix E in **Appendix 5**). The outcomes of these assessments are summarised in the following sections.

6.2.6.1 Threatened Ecological Communities

One (1) TEC listed under the EPBC Act was recorded in the Subject Land defined by the BDAR and the likelihood of significant impact is summarised in **Table 6.13**.

Table 6.13 Threatened Ecological Communities Recorded in the Subject Land

Community Name	Threat Category	Associated PCTs	Area Impacted (ha)	Indirect Impacts
Weeping Myall Woodlands	Endangered	PCT 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion (Mod-Good, Zone 6)	4.92	• Transport of weed species. • Edge effects. • Increased fire risk. • Pollutant spills.

6.2.6.2 Threatened Species

Nine (9) threatened species listed under the EPBC Act were recorded during field surveys. Of these, four (4) are threatened flora species and five (5) are threatened fauna species. **Table 6.14** and **Table 6.15** provide details of species assessed.

Table 6.14 Summary of Direct and Indirect Impacts on Threatened Flora Species and the Likelihood of a Significant Impact

Species Name	Common Name	EPBC Threat Category	Area Directly Impacted (ha)	Direct/Indirect Impacts
Chariot Wheels <i>Maireana cheelii</i>	Chariot Wheels	V	4.67	• Altered hydrology resulting in land salinity. • Degradation and destruction of habitat by weed invasion.
<i>Eleocharis obcis</i>	Spike-rush	V	7.31	• Removal of habitat. • Direct loss of species through clearing. • Degradation and destruction of habitat by weed invasion. • Potential increase in direct grazing pressure from stock and rabbits. • Altered hydrology resulting in land salinity.

Species Name	Common Name	EPBC Threat Category	Area Directly Impacted (ha)	Direct/Indirect Impacts
<i>Swainsona murrayana</i>	Slender Darling Pea	V	123.09	- Removal of habitat. - Direct loss of species through clearing. - Degradation and destruction of habitat by weed invasion. - Potential increase in direct grazing pressure from stock and rabbits. - Increased fire regimes.
<i>Lepidium monoplacoides</i>	Winged Pepper- cress	E	3.52	- Removal of habitat. - Change in agricultural practices increasing trampling. - Increase in off road vehicle movement disturbing habitat. - Potential increase in direct grazing pressure from rabbits.

Table 6.15 Summary of Direct and Indirect Impacts on Threatened Fauna Species and the Likelihood of a Significant Impact

Species Name	Common Name	EPBC Threat Category	Area Directly Impacted (ha)	Direct/Indirect Impacts
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	638.01	- Loss of foraging and potential breeding habitat. - Potential vehicle strike during construction. - Potential weed impacts on habitat.
<i>Pedionomus torquatus</i>	Plains-wanderer ¹	CE	20.89 ²	- Loss of foraging and potential breeding habitat with secondary habitat for the species (i.e. non-mapped Important Habitat). - Potential injury and mortality during clearing. - Potential vehicle strike during construction. - Potential weed impacts on habitat.
<i>Aphelocephala leucopsis</i>	Southern Whiteface	V	638.01	- Loss of foraging and potential breeding habitat. - Potential vehicle strike during construction. - Potential weed impacts on habitat.
<i>Litoria raniformis</i>	Southern Bell Frog	V	52.16	- Loss of foraging and disturbance to potential breeding habitat. - Potential injury and mortality during clearing. - Vehicle strike during construction. - Altered hydrology.

Species Name	Common Name	EPBC Threat Category	Area Directly Impacted (ha)	Direct/Indirect Impacts
				- Potential altered water quality. - Potential weed impacts to aquatic habitat.
<i>Stagonopleura guttata</i>	Diamond Firetail	V	638.01	- Loss of foraging and potential breeding habitat. - Potential vehicle strike during construction.

Note ¹: Impacts presented for Plains-wanderer are based on the assessment of supplementary habitat, it does not include any impacts to NSW identified Important Habitat Mapping as all of that critical species habitat mapping was avoided by the Project.

Note ²: No mapped Important Habitat impacted. 20.89 ha comprises 2.61 ha of infrastructure, non-native vegetation and/or waterbodies.

6.2.6.3 Migratory Species

No migratory species were recorded during surveys and none were considered to have a high likelihood of occurrence.

6.2.7 Consideration of Obstacle Lighting Impacts to Wildlife

In developing the Project Obstacle Lighting Plan (OLP) for the Project BWF has considered the requirements of Australian Government – Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) - National Light Pollution Guidelines for Wildlife (May 2023, V2.0). The implementation of the National Light Pollution Guidelines for Wildlife was supported by Umwelt with specialist inputs sought from Moir Studio with regard to landscape character and visual impact assessment. This assessment is included as Appendix 3 of the MNES Report (Appendix E of the Amended BDAR) and provides an environmental assessment of the effects of artificial light on wildlife as per the six (6) steps outlined in the National Light Pollution Guidelines for Wildlife, including the adaptive management of artificial light process.

It concludes that the risk of indirect impacts to wildlife from artificial light associated with the OLP are not significant but provides additional mitigation measures to ensure a lighting audit occurs, and then review and improvement measures are allowed for as required.

6.2.8 Aquatic Impacts

Areas of aquatic habitat, including Eurolie Creek, Nyangay Creek and Abercrombie Creek have been considered to provide moderate likelihood of occurrence for one threatened species listed under the FM Act; the Silver Perch (*Bidyanus bidyanus*) listed as vulnerable under the FM Act.

Under the NSW *Fisheries Management Act 1994*, a '7 part test' is carried out to assess the likelihood of significant impact upon a threatened entity. Appendix F of **Appendix 5** contains these assessments of significance, which conclude that due to the negligible aquatic impacts to the Coleambally Outfall Drain, a significant impact is unlikely to occur.

Two (2) unnamed first order tributaries of Eurolie Creek intersect with the north-east and north-west corners of the Project Area, however these waterways are highly ephemeral and occur across areas of mapped grassland. These tributaries are highly unlikely to provide any habitat for aquatic species. One (1) of the three (3) off-site disturbance areas assessed (associated with the Amended BDAR Stage 1 – site based assessment) occurs approximately 350 m north of Eurolie Creek. This creekline is ephemeral and may provide marginal suitable habitat for aquatic species. Nyangay and Abercrombie Creek are located approximately 10 km north east of the Project Area.

6.2.9 Cumulative Impacts

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 in the region.

A review of publicly available information was undertaken at the time of finalisation of the EIS BDAR. This review identified other developments within approximately 75 km of the Project and the results are provided in Section 8.7 of the Amended BDAR (**Appendix 5**).

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 present. The intended capacity of the South West REZ is 2.5 GW 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.

6.2.10 Management and Mitigation Measures

BWF has committed to the design and implementation of a comprehensive biodiversity mitigation strategy to minimise the residual impacts of the Project. A CEMP, Operational Environmental Management Plan (OEMP), Plains Wanderer Management Plan, and BBAMP will be prepared for the Project. 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 Development 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 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.

6.2.10.1 Mitigation Measures

Proposed mitigation measures are summarised in **Table 6.16**.

Table 6.16 Mitigation Measures

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
Removal of native vegetation and threatened species habitat during the construction of the Project.	BIO1	Native vegetation removal, habitat and fauna displacement will be minimised through detailed design. The design that includes access roads crossing waterways will provide an option that allows the stream flow to be unaffected. Additionally, breeding habitat for fauna, threatened species, and habitat trees will be avoided and minimised with the design of the access tracks. Buffers of threatened species habitat and nest trees show the areas of potential and known threatened species habitat to be avoided and minimised in the detailed design. These buffers will aid in informing the plans of construction and operational management to the relevant future construction teams. To avoid and minimise further clearing of vegetation, utilising existing tracks for cabling corridors and access tracks will be established and considered.	The avoidance and minimisation of vegetation and habitat clearing during the project planning	Detailed design, the project surveys, and pre-construction	Proven effective	The Proponent
Removal of native vegetation and threatened species habitat during the construction of the Project.	BIO2	Buffer mapping for habitats aid in providing the construction and maintenance teams with the information necessary for the OEMP and the CEMP.	The avoidance and minimisation of vegetation and habitat clearing during the project planning	Pre-construction	Proven effective	The Proponent
Removal of native vegetation and threatened species habitat during the construction of the Project.	BIO3	The design that includes access roads crossing waterways will provide an option that allows the stream flow to be unaffected.	The avoidance and minimisation of vegetation and habitat clearing during the project planning	Detailed design	Proven effective	The Proponent

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
The clearing of habitat, native vegetation and TECs	BIO4	The preparation and approval of a Biodiversity Management Plan (BMP) prior to construction which will be prepared by a qualified ecologist with CPHR consultation. Prior to clearing, the operational management component will be approved with CPHR 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. The BMP will also include Plains-wanderer subplan to manage potential impact to Plains-wanderer and its habitat adjacent to the Survey Corridor.	Planning and management to avoid, minimise and mitigate biodiversity impacts	Pre-clearing, pre-construction, construction and operation	Proven effective	The Proponent and contractor
The clearing of habitat, native vegetation and TECs	BIO5	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.	Planning and management to avoid, minimise and mitigate biodiversity impacts	Pre-clearing, pre-construction, construction and operation	Proven effective	The Proponent and contractor
The clearing of habitat, native vegetation and TECs	BIO6	Barbed wire will be avoided for fencing to avoid entrapment of fauna on fences. Fences will be designed to ensure that fauna are not funnelled toward dead ends or to create barriers between areas of habitat across the Project Area.	Planning and management to avoid, minimise and mitigate biodiversity impacts	Detailed design	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
The clearing of habitat, native vegetation and TECs	BIO7	The preparation and approval of a Rehabilitation Plan (RP) prior to clearing will be prepared in consultation with CPHR. The RP will detail the implementation of rehabilitation in areas of the Development Footprint. The detailed design will include areas requiring rehabilitation and areas of disturbance during the construction that do not require maintenance or clearance for 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 CPHR 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.	The avoidance and minimisation of soil erosion, weeds in disturbed areas and the spread to adjoining edges of native vegetation	Pre-construction, pre-clearing, during and post construction	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		During construction, the topsoil and subsoil generated will be used for rehabilitation and stored on-site.				
The clearing of habitat, native vegetation and TECs	BIO8	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.	Mitigating, avoiding and minimising impacts to biodiversity	Pre-clearance	Proven effective	The Proponent and contractor
The clearing of habitat, native vegetation and TECs	BIO9	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, including known Plains-wanderer habitat.	Mitigating, avoiding and minimising impacts to biodiversity	Pre-clearance, during construction and early operation	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
The clearing of habitat, native vegetation and TECs	BIO10	Staged habitat removal is required to remove habitat such as hollow-bearing trees, stick nests and habitat trees. It minimises the direct impact on fauna by allowing the fauna an opportunity to leave hollows and relocate naturally. The process is detailed in the BMP which will also include a ' Fauna handling and rescue procedure ' and a ' Unexpected threatened species finds procedure '.	Avoiding and minimising impacts to fauna during the clearing and construction processes	Construction	Proven effective	The Proponent and contractor
The clearing of habitat, native vegetation and TECs	BIO11	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 including habitat, near all waterbodies, 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.	Avoiding and minimising impacts to fauna during the clearing and construction processes	During construction	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	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	BIO12	Measures to mitigate the impacts associated with construction activities on native vegetation and habitat will include: - Prior to all vegetation removal, pre-clearance inspections will be undertaken by a qualified ecologist within one month of planned removal. - Where possible, trim vegetation rather than clear or removal whole plants within the Development Footprint, inspecting vegetation in pre-clearance inspections one month prior to removal. - Micro-siting will be used to minimise the construction of access roads, stockpiles, vehicle parking, site compounds, hardstands and WTGs to avoid unnecessary removal or impacts to native vegetation and/or fauna habitat. This will be incorporated into the daily pre-clearance surveys a qualified ecologist conducts during construction stage.	Avoiding and minimising impacts to fauna during the clearing and construction processes	During construction	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		- During construction, retain tree roots where the tree roots do not impact the construction required, or the tree is to be retained outside of the Development Footprint. - Retain dead trees and tree trunks where they are regarded as integral habitat for native fauna, inspecting vegetation in pre-clearance inspections within one-month of planned removal.				
Increase in weeds and disease pathogens in adjacent vegetation	BIO13	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 CPHR. Any deviation from measures approved by DPHI are to be raised and approved. Additional monitoring and control measures for introduced plant establishment and spread should be implemented at and around locations utilised for sediment control structures. Monitoring of exotic plants with waterborne propagules and a Trigger Action Response Plan for control must be undertaken along drainage lines outside of the Project Area. Monitoring of locations where runoff drains from the construction site, and from locations where sediment control has failed. Weed monitoring and control programs will include adaptive management strategies for priority weed species during construction, and early operational phase.	Spreading of weed controls from the Project	Pre-clearance, construction and operation	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		Details of the monitoring program will be established during the preparation of the BMP and follow principles outlined in Section 9.2.1 of the Amended BDAR.				
Increase in weeds and disease pathogens in adjacent vegetation	BIO14	All weeds will be identified, mapped and removed before pre-construction clearance. Locations of weeds and sprayed areas for use in ongoing weed management and monitoring programs, particularly for <i>Lycium ferocissimum</i> .	Spreading of weed controls from the Project	Pre-clearance, construction and operation	Proven effective	The Proponent and contractor
Increase in weeds and disease pathogens in adjacent vegetation	BIO15	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 measures stated in the strategy protocol must be applied during construction and operation to ensure vehicle and machinery hygiene.	Spreading of weed controls from the Project	Pre-clearance, construction and operation	Proven effective	The Proponent and contractor
Increase in weeds and disease pathogens in adjacent vegetation	BIO16	Weeds will be disposed and managed appropriately during clearing works, to stop the spread of invasive weed species.	Spreading of weed controls from the Project	Pre-clearance, construction and operation	Proven effective	The Proponent and contractor
Increase in weeds and disease pathogens in adjacent vegetation	BIO17	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 <i>Phytophthora cinnamomi</i> , amphibian chytrid fungus, agricultural weeds, and exotic rust fungi) and the introduction of new species to the site.	Spreading of weed controls from the Project	Pre-clearance, construction and operation	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
Increase in predatory and pest species	BIO18	Refuse and personal waste generated throughout the construction and operational phases will be stored in bins and discarded in a suitable waste storage facility.	Controlled action to mitigate, avoid and minimise introduced predators and pests to the area of construction	During construction and operation	Proven effective	The Proponent and contractor
Increase in predatory and pest species	BIO19	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.	Controlled action to mitigate, avoid and minimise introduced predators and pests to the area of construction	During construction and operation	Proven effective	The Proponent and contractor
Impacts on protected animals from wind farm strikes	BIO20	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 in Section 9.2.2 of the Amended BDAR.	Monitoring fauna blade strike collision	During construction and operation	Effectiveness with an adaptive response method and management	The Proponent
Impacts on protected animals from wind farm strikes	BIO21	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.	Monitoring fauna blade strike collision	During construction and operation	Effectiveness with an adaptive response method and management	The Proponent

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		- 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.				
Fragmentation resulting in reduced connectivity	BIO22	Clearing/works will be contained within approved areas.	No reduction in connectivity	During Construction	Proven effective	Contractor
Wildlife impacts from vehicle strikes	BIO23	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.	No wildlife vehicle strikes	During construction and operation	Proven effective	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.	BIO24	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.	Avoiding and minimising impacts to aquatic habitats and threatened fish species	Pre-construction, during construction and decommissioning	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	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.	BIO25	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).	Avoiding and minimising impacts to aquatic habitats and threatened fish species	Pre-construction and during construction	Proven effective	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.	BIO26	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.	Avoiding and minimising impacts to aquatic habitats and threatened fish species	During construction and decommissioning	Proven effective	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.	BIO27	Prior to, during and following construction and decommissioning, a surface water monitoring program will be prepared and implemented as part of the CSWMP. The monitoring program will include, but is not limited to: • Routine monitoring of physico-chemical parameters and contaminants at downstream SREs during construction and decommissioning.	Avoiding and minimising impacts to aquatic habitats and threatened fish species	Pre-construction, during construction and decommissioning	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		Weekly visual assessments of surface water quality control structures including after heavy rainfall during construction and decommissioning.				
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.	BIO28	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.	Avoiding and minimising impacts to aquatic habitats and threatened fish species	During construction and decommissioning	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	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.	BIO29	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.	Avoiding and minimising impacts to aquatic habitats and threatened fish species	During construction	Proven effective	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.	BIO30	A concrete slab adjacent to the construction compound will locate all batch plants. Avoiding ingress from concrete waste into downstream waterways will be outlined with measures in the CEMP.	Avoiding and minimising impacts to aquatic habitats and threatened fish species	Pre-construction and during construction	Proven effective	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.	BIO31	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.	Avoiding and minimising impacts to aquatic habitats and threatened fish species During construction and decommissioning	During operation	Proven effective	The Proponent and contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		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.	BIO32	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.	Avoiding impacts to GDEs	Detailed design and during construction	Proven effective	The Proponent and contractor
Fire risk during operation	BIO33	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). - 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.	Mitigate risks to biodiversity	During construction and operation	Effective	The Proponent

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
Fire risk during operation	BIO34	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.	Mitigate risks to biodiversity	During construction and operation	Effective	The Proponent

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		- 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.				
Light and noise vibration impacts during night works	BIO35	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.	Mitigate risks to biodiversity	During construction and operation	Effective	The Proponent and Contractor
Light and noise vibration impacts during night works	BIO36	Standard noise mitigation measures will be implemented where reasonably practicable, including the following: - Work limited to standard hours of construction unless permitted by the development consent. - 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.	Mitigate risks to biodiversity	During construction and operation	Effective	The Proponent and Contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
		- 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 where 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 is required.				

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
Light and noise vibration impacts during night works	BIO37	Standard vibration mitigation measures from the Assessing Vibration: a technical guideline (DECC, 2006) will be implemented were reasonably practicable, including the following: • Were 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.	Mitigate risks to biodiversity	During construction and operation	Effective	The Proponent
Light and noise vibration impacts during night works Dust pollution	BIO38	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.	Avoid, minimise and mitigate impacts from dust pollution.	During construction	Effective	The Proponent and Contractor

Impact	Action ID	Mitigation Measures	Outcome	Timing and frequency	Likely efficacy of mitigation	Responsibility
Edge effects on adjacent native vegetation and habitat	BIO39	Exclusion zones will be set up at the limit of clearing	Identify residual edge effects	During construction	Effective	The Proponent and Contractor
Obstacle lighting impacts to wildlife	BIO40	Implementation of the measures outlined in Appendix 3 of the MNES Report (Appendix E of this Amended BDAR) defined as per Step 4 to Step 6 of the National Light Pollution Guidelines for Wildlife.	Confirm obstacle lighting is installed as per design; the Project's lighting objectives have been met.	During operation	Effective	The Proponent and Contractor

6.2.10.2 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 6.17 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 6.17 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.

Impact being mitigated	Monitoring schedule	Example methods and triggers to be applied	Example performance criteria
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 and threatened flora species 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 bodies, 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 an 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.
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 CPHR 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.

6.2.10.3 Adaptive Management of Bird and Bat Strike

Being a wind energy Project, the realised impacts that the Project will have on avifauna species can only be predicated during the impact assessment. 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 aerial fauna by the Project. The development and implementation of the BBAMP is an integral part of managing impacts to bat and bird species and a key mitigation measure to address the prescribed impacts associated with turbine strike outlined in Section 8.3 and Appendix D.

The plan will develop trigger levels and mitigation measures designed to manage such impacts through Project operation, in consultation with CPHR. 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 the Amended BDAR (**Appendix 5**).

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 CPHR:

- Carrion removal program.
- Pest animal control.
- Raptor perch management.
- Lighting and deterrents.
- Alteration of cut-in speeds.
- Temporary shutdown of turbines.
- Acoustic deterrents.
- Radar consideration.
- Additional offset requirements.

6.2.11 Biodiversity Credit Impact Summary

The Project will have direct impacts on 638.01 ha of native vegetation within the Subject Land, and an additional 0.14 ha of native vegetation and planted native vegetation within the Port to Hay offsite road work areas.

Within the Subject Land, the impacts will be finalised following the completion of the detailed design and micro-siting of turbines and associated infrastructure. In doing so, BWF will seek to further minimise impacts to biodiversity values. A range of impact mitigation strategies are proposed to mitigate 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 both ecosystem and species credits.

The proposed offset obligation based on the disturbance area has been calculated based on **the 143 WTG Project layout (as assessed in the Amended BDAR)**, resulting in the following biodiversity credits being required:

- 10,874 ecosystem credits, being:
 - 10,873 ecosystem credits relating to the Project Area
 - one (1) additional ecosystem credit relating to Euston offsite road works – refer to Appendix K of the Amended BDAR).
- 7,085 species credits.

The proposed offset obligation based on the disturbance area has been calculated based on **the 141 WTG Amended Project**, resulting in the following biodiversity credits being required:

- 10,779 ecosystem credits, being:
 - 10,778 ecosystem credits relating to the Project Area
 - one (1) additional ecosystem credit relating to Euston offsite road works – refer to Appendix K of the Amended BDAR).
- 7,061 species credits.

6.2.11.1 Plains-wanderer and Black Falcon

Measures in relation to SAI – Plains-wanderer

One (1) SAI entity, the Plains-wanderer, has been recorded or assumed present in the Subject Land.

Section 6.2.5.5 provides an assessment of impacts to Plains-wanderer, having regard to the requirements of BC Regulation 2017, relevant criteria under Section 9.1.2 of the BAM and Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (DPIE 2019b).

As detailed above, the Project has been designed and progressively refined to avoid all impacts to the NSW Important Habitat Mapping for the Plains-wanderer. Notwithstanding, there is 3,309.68 ha of habitat within the Project Boundary (PCTs 44 and 46), representing 0.33% of the species' national area of occupancy. The Project would require 505.68 ha (15% of that within the Project Boundary and 0.51% of its total area of occupancy) of this habitat to be cleared for turbine pads, access roads and other infrastructure. It is estimated that up to 56 birds may be directly impacted (15% of the site's population) as a result of the Project.

In consultation with Commonwealth DCCEEW, a detailed analysis of habitat within the Subject Land has been undertaken to identify supplementary habitat present and that would be impacted by the Project. As detailed above, a species credit liability (Stage 1 – Linear: 708 credits, Stage 2 – Linear: 25 credits) has been generated to offset the disturbance to supplementary habitat. These species credits would be retired as part of the overarching Biodiversity Offset Strategy for the Project.

In addition, while there is no policy framework for such matters, BWF has proposed additional and appropriate measures, being a proposed partnership with Riverina Local Land Services to support pest and weed management, as well as contributions to local land management, as detailed in the subsections below.

It is noted that feral predators including feral cats, pigs and foxes are identified as key threats to the recovery of the Plains-wanderer, as identified in the National Recovery Plan for the Plains-wanderer (*Pedionomus torquatus*) (Australian Government, 2016) and relevant threat abatement plans including the Threat abatement plan for predation by feral cats 2024 (Commonwealth of Australia), Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*) (2017) and Threat abatement plan for predation by the European red fox (Commonwealth Department of the Environment, Water, Heritage and the Arts, 2008).

Additionally, the National Recovery Plan for the Plains-wanderer states that that a key strategy to mitigate the threat of climate change is to build resilience into the grasslands upon which plains-wanderers rely through weed management.

With respect to mitigation for offsetting potential impact to Plains-wanderer, BWF is of the view that it has:

- made all reasonable efforts to reduce impacts to Plains-wanderer
- proposed offsets in accordance with relevant offset policies, and
- proposed additional and appropriate measures beyond the requirements of the Biodiversity Assessment Method (BAM), that are additional and appropriate measures to offset all impacts to the Plains-wanderer.

Measures in relation to Black Falcon

Umwelt has prepared detailed Prescribed Impact Assessments 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.

To assess the likelihood and consequence of impacts on aerial species, a qualitative risk-based assessment based on an assessment methodology developed by the Arthur Rylah Institute (Lumsden et al. 2019) has been conducted. The assessment approach comprises consideration of the likelihood of blade strike based on a species' recorded flight behaviour and status in the Project Area, as well as consideration of existing turbine strike data from Australia. The relative consequence of potential collisions and/or barotrauma is assessed with consideration of a species' total population size and degree of concentration in certain areas, conservation status and demographic resilience.

One (1) threatened bird species, black falcon, was assigned an unmitigated risk rating of high. This species was frequently observed foraging within the Project Area and Disturbance Footprint during field surveys including BBUS surveys, vegetation assessment and targeted threatened species surveys. Potential nests for the species were observed on the existing transmission towers present within the Project Area, with potentially two (2) breeding pairs present within the Project Area.

As discussed in **Section 6.2.10.3**, turbine strike risks will be adaptively managed under a BBAMP which would include consideration of ongoing monitoring, pest animal control, raptor perch management, lighting and deterrents, alteration of cut-in speeds and temporary shutdown of turbines. With the application of the BBAMP framework, the species has been assigned a mitigated risk rating of moderate.

Section 10.2.1 of the Amended BDAR outlines a proposed offsetting approach to be implemented where impacts to a threatened bird and/or bat species listed under the BC Act and/or EPBC Act are recorded on the Project through the implementation of the BBAMP. In summary, this would involve the funding of a biodiversity conservation action, as permitted under the Biodiversity Conservation Regulation 2017. Any biodiversity conservation action proposed would be agreed to through consultation with both CPHR, the Nature Markets and Offsets Division, and DCCEEW where necessary.

In addition, while there is no policy framework for such matters, BWF has proposed additional and appropriate measures, being a proposed partnership with Riverina Local Land Services to support pest and weed management, as well as contributions to local land management, as detailed in the subsections below.

The proposed BBAMP framework, offsetting approach and additional and appropriate measures proposed by BWF relating to black falcon are considered to more than adequately mitigate and, where impacts cannot be avoided, offset the prescribed impacts to species. The proposed additional and appropriate measures seek to manage key threats to the black falcon at the regional level and are considered to represent a nature positive outcome.

Riverina Local Land Services Partnership

Riverina Local Land Services (LLS) is currently leading conservations programs within the Riverina Region aimed at safeguarding vulnerable and endangered species and their habitat. Relevantly, current LLS programs include:

- **Bringing the Plains-wanderer back from the Brink:** In collaboration with the NSW Department of Climate Change, Energy, the Environment, and Water, and with funding from the Australian Government's National Landcare Program/Natural Heritage Trust and the NSW Government's Saving Our Species Program, LLS successfully implemented a conservation program for the Plains-wanderer. The program, commenced in 2017 and involves working with seven (7) landholders in the Murray & Riverina area to improve grazing management practices on areas of plains-wanderer grassland habitat. Additionally, the program supports landholders in managing paddocks for both livestock production and Plains-wanderer conservation, by offering incentives for pest and weed control, fencing, water points, saltbush plantations, stock management areas, and feeding infrastructure.
- **Securing the Black Falcon in the Riverina:** With funding from the Natural Heritage Trust, LLS has partnered with 12 landholders in the Riverina area to protect and enhance native active nest sites, as well as establishing new artificial nest sites. The program has also included pest animal control and targeted box thorn removal within habitat areas.

To ensure the ongoing success of these two (2) programs, effective pest animal control and management of African boxthorn is critical in safeguarding the Plains-wanderer, Black Falcon, and their respective suitable habitat areas:

- *Feral animal night-shooting*: Night shooting is a key strategy to reduce predation pressure on native species like the Plains-wanderer and Black Falcon. While existing methods like baiting, trapping, and fencing help control foxes and feral cats, additional night shooting is needed.
 - *Target Bait-Resistant and Trap-Shy Predators*: Some foxes and feral cats learn to avoid baits or don't take them due to alternative food sources. Night shooting targets these survivors, ensuring they don't continue hunting endangered wildlife.
 - *Immediate Response to Threats*: If a managed habitat site has a sudden increase in predator activity, night shooting can rapidly remove the threat.
 - *Reducing Predator Numbers Before Bird Releases*: to support existing programs such as the release of captive-bred Plains-wanderers, intensive predator control is needed. Night shooting can help to ensure the success of bird release programs.
- *African boxthorn removal*: African boxthorn creates dense thickets which reduce suitable habitat and foraging areas while providing shelter for pest animals.

Through ongoing engagement, BWF has identified an opportunity to partner with Riverina LLS to support the above activities. The control measures will target conservation sites established through the Bringing the Plains-wanderer back from the Brink and Securing the Black Falcon in the Riverina Programs. BWF has committed to provide monetary support for feral animal night shooting and African boxthorn removal to a total value of \$300,000. Nominally, this would equate to \$60,000 per year for five (5) years, beginning at the commencement of Project construction.

6.2.11.2 Contributions to Local Land Management

BWF has committed to provide funding to Hay Local Aboriginal Land Council (LALC) to support ongoing land management, with a focus on weed and pest control, in the vicinity of the Oolambeyan National Park boundary. This support is valued at \$10,000 per year and forms part of the BWF's overarching commitments to First Nations collaboration and participation under the South West REZ Access Rights Benefits Scheme.

6.2.12 Biodiversity Offset Strategy

BWF 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 the Amended BDAR, BWF has, wherever practicable, optimised the Project to avoid and minimise ecological impacts in the planning and design stages.

Additionally, the impacts will be finalised following the completion of the detailed design and micro-siting of turbines and associated infrastructure. In doing so, BWF will seek to further minimise impacts to biodiversity values. A range of impact mitigation strategies are proposed to mitigate the impact on ecological values prior to the consideration of offsetting requirements for unavoidable impacts.

The offset requirements and additional and appropriate measures for the Project are summarised below in **Table 6.18**.

Table 6.18 Summary of Credit Requirements and Additional and Appropriate Measures

	Ecosystem Credits	Species Credits	Other Measure
Project Area credit requirements in accordance with the BAM	10,778	6,328 ¹	-
Port to Hay offsite works credit requirements in accordance with the BAM	1	-	-
Additional and appropriate measures: offset requirements for impacts to Plains-wanderer supplementary habitat	-	Stage 1 – Linear: 708 credits Stage 2 – Linear: 25 credits Total: 733	-
Additional and appropriate measures: Plains-wanderer and Black Falcon	-	-	Riverina LLS Partnership funding feral animal night-shooting and African boxthorn removal to a total value of \$300,000 (nominally, \$60,000 per year from commencement of construction)
Additional and appropriate measures: contributions to Local Land Management	-	-	Funding to Hay Local Aboriginal Land Council (LALC) to support ongoing land management, with a focus on weed and pest control, in the vicinity of the Oolambeyan National Park boundary. This support is valued at \$10,000 per year and forms part of the BWF's overarching commitments under the South West REZ Access Rights Benefits Scheme.

Note 1: based on the 141 WTG Amended Project.

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.

BWF will retire the credits required to offset the impacts of the Project as specified in Section 10.1 of the Amended BDAR (**Appendix 5**). BWF is seeking flexibility to retire the required credits on a staged basis. For the purposes of assessment in this Amended BDAR, it has been assumed that the Project will be constructed and operated in two (2) stages. However, final staging would be determined post development consent and subject to detailed design and procurement processes. The applicable credits for each stage would be confirmed during detailed design and the requisite credits retired prior to commencing vegetation clearing in each stage.

BWF 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. BWF 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. And/or
- Paying into to the Biodiversity Conservation Fund (BCF).

The current base case option for credit retirement will be the establishment of Biodiversity Stewardship Agreements (BSA) within the local area. During the EIS BWF conducted a desktop feasibility assessment to determine potentially suitable Stewardship Sites based on regionally mapped PCT (SVTM). This feasibility assessment identified extensive areas of PCT 46 and PCT 44, as well as smaller areas of PCT 160, PCT 17, PCT 28 and PCT 24 which correlate to PCT impacted most by the Project. BWF has actively consulted with landholders identified during the feasibility study, and others, in the locality about the potential to establish Stewardship Sites for the purpose of generating suitable ecosystem and species credits to retire for the Project through the available like-for-like and variation rules. This consultation has confirmed potential interest in hosting Stewardship Sites on their land and land access permissions for survey. Surveys have subsequently occurred on candidate Stewardship Sites, and will continue during 2025, alongside ongoing engagement activities, to confirm the suitable ecosystem and species credits that would be generated on these candidate sites and available to retire for the Project.

If the option of a local Stewardship Site is pursued, any surplus ecosystem and/or species credit liability for the Project will be done so through the other approved offsetting options within NSW.

6.2.13 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 NSW Biodiversity Offsets Scheme (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 Development Corridor 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 in a '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

6.3.1 Assessment of Off-site Road Works

As relevant to the Amended Project, an Addendum ACHAR has been prepared as **Appendix 6** and is summarised within this section, noting that the results of the Addendum ACHAR did not identify any new Aboriginal sites, and hence the items identified in **Appendix 4** are consistent with the Project EIS (Umwelt, 2024) and Submissions Report (Umwelt, 2025a).

6.3.1.1 Assessment Approach

As described in **Section 3.3**, several areas along the Port to Hay Transport Routes have been identified where road modifications would be required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in disturbance outside of the existing road pavement, which has warranted further assessment of potential impacts to Aboriginal cultural heritage values.

The additional areas of disturbance, where further consideration of potential impacts to Aboriginal cultural heritage values is warranted, comprise the following three (3) 'off-site road works areas':

- **Euston:** Murray Valley Highway onto Sturt Highway at Euston, NSW. Additional hardstand and associated fill required to bring new hardstand area level with the highway. Sign to be relocated.
- **Balranald:** Right hand bend on Sturt Highway at Balranald, NSW. Hardstand will be required on the outside of corner along with the removal of vegetation, light poles and numerous signs. Median strips to be made trafficable/replaced with painted lines.
- **Hay:** Roundabout on Sturt Highway at Hay, NSW onto Cobb Highway. Several light poles and signs to be removed or relocated. Hardstand to be installed on exit of corner.

Preliminary desktop review of the off-site road works areas (comprising review of historical and contemporary aerial photography and mapping) undertaken within the Addendum ACHAR indicated that all were located in highly disturbed road corridors.

Accordingly, the approach and method adopted to meet the archaeological objectives comprised a targeted visual inspection based on information obtained from the desktop assessment to ground-truth the supposition that there was a low likelihood of extant Aboriginal sites being present.

6.3.1.2 Assessment Results

The visual inspection of the off-site road works areas did not identify any new Aboriginal sites and/or areas of potential archaeological deposit (PAD). The results of the inspection indicated extensive ground disturbance associated with road prior construction activities, with negligible archaeological potential (surface or subsurface).

The Addendum ACHAR described earthworks associated with road modifications including construction of hardstands and other works to make sections of the road 'trafficable' as activities associated with the construction of the off-site road works with potential to impact Aboriginal cultural heritage values. However, no Aboriginal sites were identified within proposed disturbance areas associated with off-site road works.

On this basis, the assessment determined that it is unlikely that surface and/or subsurface Aboriginal objects would be directly impacted by the construction of the off-site road work areas. In addition, the assessment also determined that the Project would not cause direct harm to Aboriginal objects and/or the potential resource across the off-site road works areas.

6.3.1.3 Cumulative Impacts

No new or previously recorded Aboriginal objects and/or sites were identified in the off-site road works areas. As identified in **Section 6.3.1.1**, the Project has low potential to impact Aboriginal objects or sites, and low potential to impact the Aboriginal cultural heritage values of the off-site road works areas and their environs. As such, there are no potential cumulative impacts to intergenerational equity with regards to Aboriginal cultural heritage.

6.3.1.4 Management and Mitigation Measures

The Addendum ACHAR includes a management strategy to address the potential impacts of the Project on the potential Aboriginal heritage resource of the off-site road works areas. The Addendum ACHA expands on select mitigation strategies as identified in the Project EIS and Submissions Report to specifically include appropriate management at off-site road works areas. These updated commitments are reflected in **Appendix 2** (refer to **ID ACH09**).

6.4 Noise

se Sensitivity Analysis (NSA) was undertaken by Marshall Day Acoustics (MDA) to support the assessment of the alternative WTG dimensions as discussed in **Section 3.4**. The outcomes of the NSA have been summarised below, with the full document included as **Appendix 7**.

The assessment was undertaken for the Amended candidate WTG model and 143 WTG Project layout already assessed in the Project EIS. It identified that predicted WTG noise levels were below the base (minimum) criterion of 35 dB LAeq 10 min (as set out in the EIS Noise Assessment) at all non-associated receivers, but marginally above the 45 dB LAeq 10 min reference level at the host residence (referred to as a receiver with regard to noise) R1, by approximately 0.3 dB.

Given this noise compliance issue, additional noise modelling for the Amended candidate WTG model occurred to assess the Project design refinements in **Section 3.6** and again provide a comparison of those predicted WTG noise levels at receivers, to the noise limits set out in the EIS Noise Assessment.

This additional noise modelling was undertaken as the two (2) WTGs to be removed (WTG 37 and WTG 38, because of blade throw risks) were close to host receiver R1 and were contributing to predicted WTG noise levels being above 45 dB LAeq 10 min. Accordingly, the results set out in **Appendix 7** are for the 141 WTG Project layout, as identified in this Amendment Report.

A noise sensitivity screening process has also been undertaken with respect to construction works within the Port to Hay off-site works areas, to support the assessment of amenity-based impacts at these locations. The outcomes of this process are summarised below.

6.4.1 Assessment

6.4.1.1 Wind Turbine Noise

Consistent with the Noise and Vibration Assessment (NVA) prepared to support the Project EIS (Umwelt, 2024a) (i.e. the EIS NVA), the NSA:

- Assesses the WTG operational noise against the NSW Wind Energy: Noise Assessment Bulletin (Noise Bulletin) (DPE, 2016).
- Relies on the existing noise environment and background noise assessment set out in Section 5 of the EIS NVA.
- Assesses the noise impacts against the same list of receivers identified during the EIS phase which include:
 - Three (3) host receivers (R1, R2 and R3).
 - Eight (8) non-associated receivers (R4, R5, R7a, R7b, R7c, R7d, R8 and R9). It should be noted, some private impact agreements with landholders (R4, R5 and R8) do not explicitly reference a potential noise impact, as such these residences have been classified within the NSA to be non-associated although they are classified as an associated receiver in the broader Project EIS.

The additional WTG design options do not change the construction noise impacts associated with the Project. As such, no change to the construction noise assessment since the EIS NVA has been considered.

Amended WTG Dimensions and Project Refinements Operational Noise Assessment

The NSA has assessed an alternative WTG model proposed by BWF (Nordex N163 5.7 MW) which has a hub height of 148 m, and compared the predicted noise levels at receivers to the noise management levels presented in the EIS NVA (based on a hub height of 200 m). To ensure a precautionary assessment, the highest possible noise emission level has been applied to each receiver.

In line with the methodology applied during the EIS phase, the NSA presents the predicted A-weighted noise levels from the WTGs at all receivers within 8 km of a WTG and assesses compliance with noise limits. These predictions are for conditions when WTG noise emissions are at their peak (with hub height wind speeds of 12 m per second (m/s) for the candidate WTG model) and the wind is blowing from the Project towards each receiver. The predicted noise levels include a +1 dB allowance for measurement uncertainty. This additional noise modelling was undertaken for the 141 WTG Project layout, as identified in this Amendment Report.

Operational noise levels were predicted for the alternative WTG model proposed under the Amended Project (and 141 WTG layout) at all host and non-associated receivers. The results of the NSA indicate that predicted noise levels are below the reference level of 45 dB L_{Aeq} at all host receivers (with a minimum compliance margin of 1.1 dB), and below the reference level of 35 dB L_{Aeq} at all non-associated receivers, with a minimum compliance margin of 0.5 dB.

6.4.1.2 Offsite Road Works Areas

As discussed in **Section 3.3.1**, road modifications along the Port to Hay Transport Routes are required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in disturbance outside of the road pavement, which has warranted further assessment of relevant environmental constraints within this Amendment Report.

A noise sensitivity screening process has been undertaken to support the assessment of amenity-based impacts at these offsite road work areas. The screening process involved generating a buffered area around select offsite work areas where more substantive road modifications are proposed (i.e. making the road 'trafficable'), based on a list of assumed plant, equipment and machinery and associated 'time of use' within a 15 minute period needed to deliver the road modifications. These assumptions are provided in **Table 6.19** below.

Table 6.19 Road Modification Construction Noise Assumptions

Plant/equipment	Quantity	Time in use – 15 minute period (resultant dBA reduction)	Base Sound Lower Level (L_w)	Adjusted (time in use) Sound Power Level (L_w)
Bulldozer (small)	1	50% (-3 dB)	108	105
Dump truck	1	10% (-10 dB)	105	95
Excavator (small)	1	50% (-3 dB)	108	105
Road grader	1	50% (-3 dB)	108	105
Total	4	-	-	110

These assumptions result in a total sound power level (L_w) of 110 dBA and estimated noise levels that vary depending on the proximity of the receiver to the works, and any shielding already provided by intervening structures. Generally, those closest to the works (e.g. 30 m to 50 m) may experience noise levels of up to approximately 68 dBA to 73 dBA, with receivers further away (but within 400 m of the work area) experiencing noise levels greater than 45 dBA, again depending on any shielding already provided.

This resulted in an estimated 'impact radius' buffer of 400 m being generated around select off-site road works areas. This off-site road work areas buffer has formed the basis of further consideration of potential noise-related impacts to receivers near these works.

Receivers identified within the 400 m offsite road works area buffer but located on a state road (i.e. a highway or freeway) or proximally to industrial/commercial facilities were assumed to be exposed to elevated ambient and background noise levels associated with frequent traffic movements on the road network, as well as emissions from existing industrial/commercial operations. Anticipated noise levels associated with the proposed road modifications at these locations are temporary in nature, and are not expected to dominate the acoustic environment and are expected to be masked by existing elevated ambient noise levels. As such, these receivers have not been considered further.

The screening process enables a targeted assessment approach by identifying 'sensitive' receivers within the area of influence of off-site road works, with assumed low existing ambient and background noise levels, who may be subject to potential amenity-based impacts. The off-site road work areas with assumed low ambient noise levels include Balranald, Hay and Narromine.

These sensitive receivers within the 400 m off-site road works buffer around the off-site road work areas in Balranald, Hay and Narromine have been identified and mapped on **Figure 6.5**, **Figure 6.6** and **Figure 6.7**.

The sensitive receivers located within the 400 m off-site road works buffer in an assumed low ambient noise environment may be at risk of experiencing construction noise levels above the noise affected management level as documented in the Interim Construction Noise Guideline (ICNG). As such, additional measures have been proposed in **Section 6.4.3** and **Appendix 3**.

Balranald Nurses Accommodation

Consultation undertaken by BWF has identified that nurses accommodation / quarters have been constructed in the western extents of Lot 2 / DP792299, approximately 35 m to 110 m from the proposed works near the right hand bend on Sturt Highway at Balranald, NSW. These quarters are not identifiable in aerial imagery available the time of this assessment.

For the purposes of this assessment the nurses accommodation has been considered a residential receiver along with others identified in proximity to the works. BWF consultation has however identified that the nurses accommodation consists of four (4) units, housing four (4) occupants, with shifts for two (2) occupants generally being from 7 am to 7 pm and from 7 pm to 7 am.

Given this land use includes shift workers that may utilise the facility for sleep and rest during the daytime (when works would occur), careful planning and engagement will be required to ensure that suitable actions (e.g. respite, agreed time for noisy activities, alternate accommodation etc) are discussed and agreed prior to the works occurring. This is reflected in the updated mitigation measures presented in **Appendix 3** of this Amendment Report.

FIGURE 6.5

**Balranald Offsite Road Works Area
- Sensitive Receivers**

Legend

- Road
- Watercourse
- ⬜ 400m Buffer
- ⬜ Off-site impact area - Balranald
- ⬜ Sensitive Lots
- Port Adelaide Routes**
- Route 1 - 5.2m max loaded height - blades, motors, general loads
- Route 2 - 6.5m max loaded height - towers

Sensitive Receivers

- ⬜ Ambulance Station
- ⬜ Childcare
- ⬜ Commercial
- ⬜ Community Facility
- ⬜ Community Medical Centre
- ⬜ Fire Station
- ⬜ Hospital
- ⬜ Industrial
- ⬜ Local Government Chambers, Court House
- ⬜ Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks; Nurses Accommodation;
- ⬜ Nurses Accommodation (indicative)
- ⬜ Place Of Worship
- ⬜ Police Station
- ⬜ Residential
- ⬜ Tourism
- ⬜ Utilities



Metres

Scale 1:6,000 at A4
GDA2020 MGA Zone 55

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FIGURE 6.6

Hay Offsite Road Works Area - Sensitive Receivers

Legend

- Road
- Watercourse
- Off-site impact area - Hay
- 400m Buffer
- Sensitive Lots

Port Adelaide Routes

- Route 1 - 5.2m max loaded height - blades, motors, general loads
- Route 2 - 6.5m max loaded height - towers

Port of Newcastle Routes

- Route 1 - 4.9m max loaded height - blades
- Route 2 - 6.1m max loaded height - towers
- Route 3 - 5.3m max loaded height - all remaining loads

Sensitive Receivers

- Commercial
 - Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks
- Residential
- Tourism
- Petrol Station



Metres

Scale 1:6,000 at A4
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FIGURE 6.7
Narromine Offsite Road Works Area - Sensitive Receivers



Legend

- Road
- Off-site impact area - Narromine
- Sensitive Lots
- Port of Newcastle Routes**
 - Route 2 - 6.1m
- Sensitive Receivers**
 - Commercial
 - Community Facility
 - Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks
 - Place Of Worship
 - Residential
 - Petrol Station
 - School
 - Utilities



Metres

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6.4.2 Cumulative Impacts

6.4.2.1 Amended WTG Dimensions

An assessment of cumulative noise was undertaken considering the Amended Project and the nearby Pottinger Wind Farm, in line with the cumulative noise assessment approach undertaken within the EIS NVA. The results indicate that predicted cumulative noise levels at R1 and R7 for the alternative candidate WTG model are less than the predicted cumulative noise levels for the EIS Project candidate WTG model adopted in the EIS NVA.

On this basis, cumulative noise levels for the Amended Project are not predicted to affect the compliance outcomes for the Project. As such, there is no change in the outcome of potential cumulative noise-related impact are proposed as a result of the Amended Project, from that presented in the Project EIS.

6.4.2.2 Off-site Road Works Areas

The off-site road works areas and road modifications along the Port to Hay Transport Routes are required to enable the safe transport of Project components using OSOM vehicles. These road works and modifications are proposed to be undertaken by BWF, in which instance other renewable energy developers would benefit from their construction and use (where their design elements permit). Similarly, if undertaken by others then BWF would benefit also. There is also substantial distance offsets between the off-site road works areas and areas nominated for road modifications, such that these substantial spatial boundaries prevent any risk of cumulative impacts occurring.

Accordingly, these works are highly unlikely to be undertaken concurrently by multiple renewable energy developers. Works might be required at a later time to augment these (e.g. if another developer has a larger WTG proposed) but sufficient temporal boundaries would likely apply to mitigate any risk of cumulative impact.

Furthermore, preliminary consultation with Councils at the respective locations has identified that there are no other significant road construction works planned to occur that might increase impacts beyond that assessed here.

On this basis, cumulative noise levels for the off-site works are not predicted to affect the compliance outcomes for the Project. As such, there is no change in the outcome of potential cumulative noise-related impacts, when compared with previously assessed impacts in the Project EIS.

6.4.3 Management and Mitigation Measures

Mitigation measure NV06 within **Appendix 3** has been updated to include specific consideration of management practices for sensitive receivers identified to experience construction noise levels above the noise affected management level in the ICNG.

The assessment of the alternative WTG model demonstrated compliance at all nearby associated and non-associated receivers. As such, no additional management and mitigation measures are warranted.

6.5 Social Impacts

An Addendum SIA has been prepared as **Appendix 8** and is summarised within this section.

6.5.1 Assessment Results

A revised assessment of the potential social impacts associated with the Amended Project has been undertaken as part of the Addendum SIA. Each impact identified and assessed in the Project EIS SIA (Umwelt, 2024a) has been considered as to whether the proposed amendments are likely to affect the likelihood and magnitude ratings, and thus impact significance.

Section 3 of the Addendum SIA report identified and assessed potential change in impact magnitude as a result of the proposed Project amendments on the following social impacts:

- Predicted population change.
- Changes in community composition, sense of community and social cohesion.
- Increased strain on local accommodation and housing, local healthcare provision and emergency service provision.
- Reduced road safety and access for road users.
- Mental health and wellbeing effects for incoming workers.
- Loss of visual amenity due to industrialisation of the landscape.
- Loss of social amenity due to noise and dust impacts.
- Increase in local employment and procurement opportunities.
- Increased economic activity within townships due to incoming workforce.

Despite some dimensions of impact magnitude having changed from the Project EIS SIA, it has been determined that the impact significance remains consistent with the rankings presented in the Project EIS SIA. Additional impacts identified and assessed in the Project EIS SIA were deemed unlikely to change in response to the proposed amendments.

It should be noted that all impacts related to the construction phase of the Amended Project will be somewhat mitigated by the reduced construction schedule. As such, while the peak workforce is higher than originally anticipated, the shorter timeframe is likely to result in lower impacts in other instances.

Given the conclusions outlined above, the proposed amendments are unlikely to change the significance of social impacts of the Project and consequently no further social impact mitigation strategies have been considered.

6.5.2 Cumulative Impacts

The proposed amendments to the construction phase of the Project will likely impact this cumulative development landscape, as a greater workforce will be required though for a shorter and more condensed period. Additional projects have been identified along the amended transport route that may result in cumulative traffic and transport impacts (refer **Section 6.6.7**). However, no further assessment of cumulative impacts was undertaken to inform the Addendum SIA report as significant impacts are considered unlikely.

Given the location of the Amended Project within the South West REZ, the potential cumulative population change when considering the many concurrent projects is likely to be more substantial. **Table 6.20** models the cumulative population change of the 20 known SSD projects within 110 km of the Project Area. These calculations have been updated from the prior analysis to account for the reduced average workforce total and the shorter construction schedule, despite a slightly higher peak.

Table 6.20 Cumulative Population Change Prediction for the Construction Period

Type	Host LGAs ³	Social Locality ⁴	Regional ⁵
Existing population	14,691	41,777	164,013
Workforce ⁶	2,829	2,829	2,829
Scenario 1 – High (95% workforce influx)			
Population Influx	2,688	2,688	2,688
Population Change %	18.3%	6.4%	1.6%
Scenario 2 – Medium (90% workforce Influx)			
Population Influx	2546	2546	2546
Population Change %	17.3%	6.1%	1.6%
Scenario 3 – Low (80% workforce influx)			
Population Influx	2263	2263	2263
Population Change %	15.4%	5.4%	1.4%

As identified above, the projected cumulative population change accounting for the Amended Project's peak workforce and construction schedule is <.02% less than the previous cumulative population change projections across all scenarios. This indicates only a minor change from the original Project assessment and does not significantly alter the impact rating and mitigating factors.

6.5.3 Management and Mitigation Measures

No additional mitigation measures have been proposed for the Amended Project outside of those proposed within the Project EIS SIA, as reflected in **Appendix 3**.

³ The Host LGA populations of Hay, Murrumbidgee and Edward River.

⁴ Social Locality LGA populations of Hay, Murrumbidgee, Edward River and Griffith.

⁵ Regional LGA populations of Hay, Murrumbidgee, Edward River, Griffith, Murray River and Wagga Wagga.

⁶ The average construction workforce of 19 SSD projects as well as considering 2 peaks for the Project.

6.6 Transport

A Traffic Impact Assessment was prepared by The Transport Planning Partnership (TPPP) for the Project EIS in July 2024 (EIS TIA). An update to the TIA has been prepared by TPPP to respond to agency submissions and Project design refinements associated with the Amended Project. The Amended TIA (TPPP, 2025) is provided in **Appendix 9** and is summarised below.

As discussed in **Section 3.3**, updated Route Study Reports have been undertaken by Rex J Andrews Engineered Transportation (RJA) for the respective Port to Hay Transport Route options from the Ports of Newcastle and Adelaide, based on a maximum blade length of up to 80 m. These reports are included as Appendix A of the Amended TIA. These Route Study Reports identify road modifications required to enable the safe transport of Project components using OSOM vehicles, which now form part of the Amended Project. These Port to Hay offsite road works are described in **Table 3.3** and strategic concept designs for required upgrades are provided in **Appendix 2**.

6.6.1 Existing Environment

The Amended TIA includes a description of the existing condition of the State, regional and local road network in the vicinity of the Project, which is unchanged from the EIS TIA. Overall, it is noted the roads utilised by the Project are generally very flat, with few bends and that road verges are mostly devoid of trees and shrubs, providing excellent visibility.

- Jerilderie Road is a sealed two-lane, two-way road aligned in the northwest-southeast direction. It connects to Cobb Highway 40 km northwest of the Project Area and terminates at the intersection with Willurah Road and North Boundary Road within the Project Area. It has a default speed limit of 100 km/h.
- North Boundary Road is an unsealed two-lane, two-way road aligned in the east-west direction. Half of the road length is located within the Project Boundary, separating the southern portion of the Project Area from the northern. It connects with Conargo Road/Carrathool Road to the west and has a default speed limit of 100 km/h.
- North Boundary Road provides access to Bullewah Road, an unsealed two-lane, two-way public road aligned in the north-south direction in the southern portion of the Project Area. Bullewah Road terminates approximately 10 km south of North Boundary Road and provides access to four (4) residences. Bullewah Road incorporates an existing bridge where the road crosses over the Coleambally Outfall Drain.
- Willurah Road is an unsealed two-lane, two-way road aligned in the north-south direction. It connects the Project Area to Conargo which is approximately 50 km south of the Project Area and has a default speed limit of 100 km/h.
- Conargo Road/Carrathool Road is a two-lane, two-way road aligned in the north-south direction 10 km east of the Project Area. It serves as a connection between Conargo and Carrathool and intersects with North Boundary Road west of the Project Area and Willurah Road south of the Project Area.

- Cobb Highway (B57) is a state highway in the western Riverina and is aligned in the north-south direction approximately 40 km west of the Project Area. In the vicinity of the Project Area it is a sealed two-lane, two-way road and intersects with the Sturt Highway to the northwest of the Project Area at a large roundabout in South Hay. It is the primary connection south to Victoria from Hay and the surrounding area and has a posted speed limit of 110 km/h.
- Sturt Highway (A20) is a national highway that links between Sydney and Adelaide and the regions along the route including Mildura and Wagga Wagga. It is aligned in the east-west direction 35 km north of the Project Area. In the vicinity of the Project Area, it is a sealed two-lane, two-way road and has a posted speed limit of 110 km/h.

TTPP completed turning movement counts at the following intersections for 24-hour periods on Thursday 29 February 2024 and Saturday 2 March 2024:

- Sturt Highway and Cobb Highway (roundabout).
- Sturt Highway and Conargo Road (priority-controlled).
- Jerilderie Road, Willurah Road and North Boundary Road (priority-controlled).
- Cobb Highway and Jerilderie Road (priority-controlled).
- Conargo Road and North Boundary Road (priority-controlled).

In addition, automatic tube counters were installed on Jerilderie Road, six (6) km north of North Boundary Road to record two-way traffic flows for the duration of the survey period.

Recorded traffic volumes were generally low at all surveyed locations, but particularly on the Local Roads (being Jerilderie Road, North Boundary Road and Willurah Road). Tube counts on Jerilderie Road were typically less than eight (8) vehicles per hour except for a one-hour period on Thursday, 29 February 2024 which recorded 14 vehicles per hour.

6.6.2 Assessment Results

6.6.2.1 Pre-Construction

During the pre-construction phase, the primary work will consist of the following:

- Assembling the concrete batching plant.
- Setting up the temporary workforce accommodation and site sheds.
- Mobilising the earth moving equipment.

The pre-construction stage is expected to be between November 2025 and January 2026. The pre-construction phase will generate up to:

- 13 heavy vehicle trips and 14 light vehicle trips per hour during peak construction
- 136 heavy vehicle trips and 28 light vehicle trips per hour during construction.

Additionally, there will be a total of two (2) OSOM deliveries associated with the transport of the concrete batching plant. This will be delivered across two (2) days in the first month of pre-construction works.

6.6.2.2 Construction

Construction activities, which are the highest traffic generating activities by the Project. The Amended TIA provides an updated assessment of construction traffic impacts for the Amended Project. Estimated hourly and daily construction traffic generated by the Project has increased from previous predictions in the EIS TIA to reflect the arrival and departure of construction workers at the TWA facility, along with a greater overlap in Stage 1 (South) and Stage 2 (North) construction periods.

The Amended TIA indicates that the Project will generate up to:

- 56 heavy vehicle trips and 265 light vehicles trips per hour during peak construction
- 528 heavy vehicle trips, 14 OSOM trips⁷ and 530 light vehicle trips per day during peak construction.

‘Trips’ refers to combined inbound and outbound vehicle movements. The peak hour for construction would occur during the Monday AM period, when it is conservatively assumed that 100% of on-site workers (i.e. those non-local workers residing at the TWA) would arrive on-site in a single hour during peak construction.

Construction Workforce

Of the approximately 380 workers (FTE) expected on-site during peak construction, 35 workers (approximately 9%) are expected to be housed off-site (including workers living locally) with the remainder housed on-site at the TWA. Off-site worker locations are likely to include:

- Hay (travelling via the Local Transport Route)
- Coleambally (via North Boundary Road/Four Corners Road)
- Deniliquin (via Willurah Road)
- Conargo (via Willurah Road)
- Jerilderie (via Willurah Road).

It is conservatively estimated that off-site workers will travel independently, with a vehicle occupancy of one (1) person per car (i.e. 35 additional light vehicles during the AM and PM peak hour).

For on-site workers residing at the TWA, a conservative vehicle occupancy of approximately 1.5 people per car has been adopted to calculate the light vehicle traffic generation. It is assumed that workers would stay at the TWA site during the week, leaving the site on Friday and Saturday, and returning on Monday morning. It is estimated that 70% of the workforce will leave on Friday afternoon with the remaining leaving on Saturday afternoon. During peak construction, this results in approximately 254, 175, and 79 additional vehicles during the Monday AM peak, Friday PM peak and Saturday PM peak respectively based on the above assumption of 1.5 workers per car.

⁷ All OSOM trips would occur outside of peak hour.

On-site workers are also expected to travel via the same general routes as off-site workers, being via Hay, Coleambally, Deniliquin, Conargo and Jerilderie. Indicative light vehicle travel routes for the construction workforce (both on-site and off-site) are shown in **Figure 6.8**.

Quarried Materials

While gravel will be sourced from the two (2) proposed on-site borrow pits where possible, importation of quarried materials including gravel, aggregate and sand will be required for the construction of hardstands and WTG foundations and to support Project infrastructure including internal access roads, laydown areas and installation of electrical cabling.

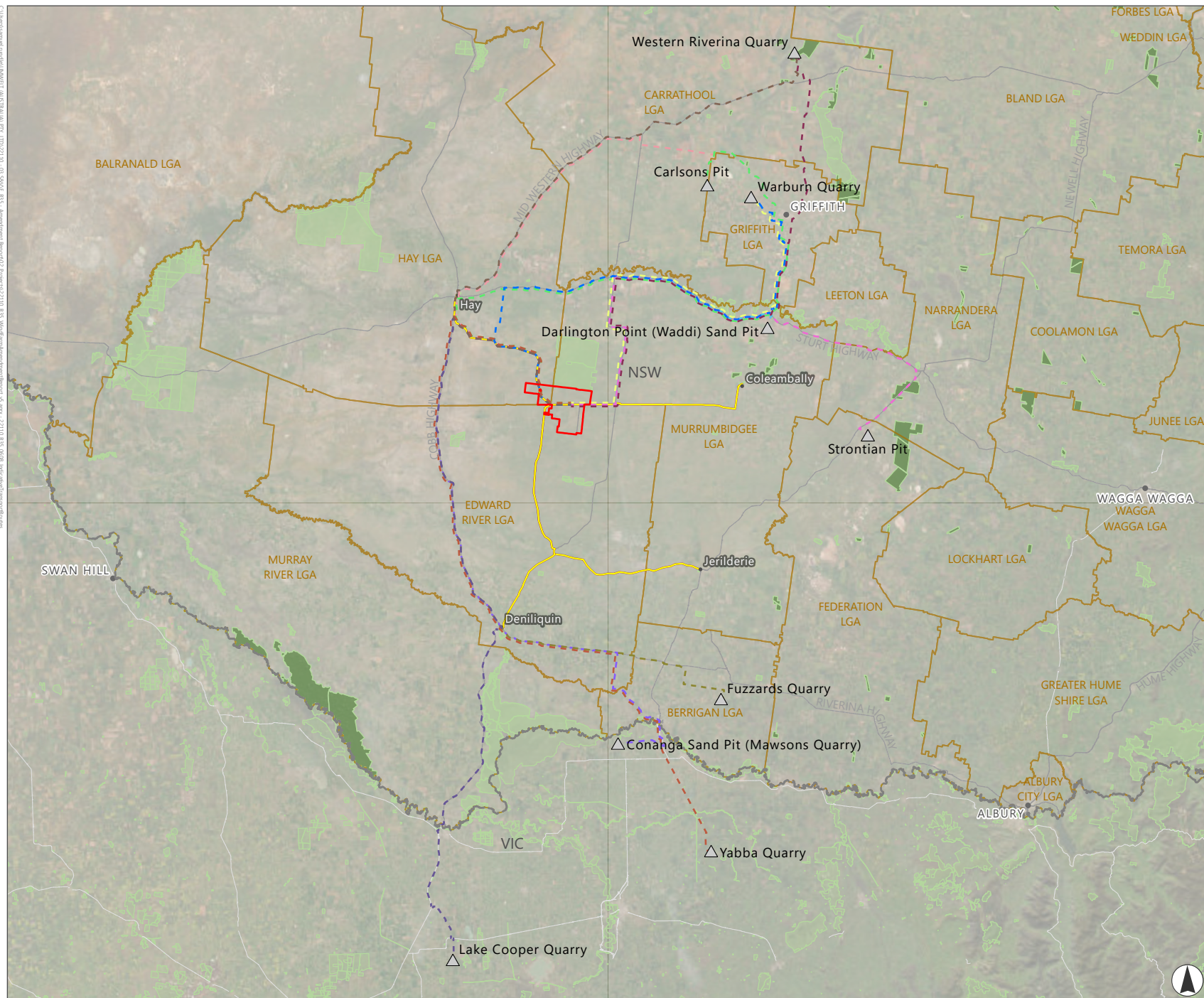
To provide a worst-case assessment of traffic impacts, it has been conservatively assumed that 100% of gravel, aggregate and sand would be sourced externally from quarries within the surrounding region. However, if suitable gravel of sufficient quantities is confirmed to be available within the proposed borrow pits, the number of trips generated would likely reduce significantly. Additionally, it is anticipated that excavation material will be recycled where suitable, which will reduce the estimated traffic volumes upon confirmed geotechnical testing and construction procurement.

In discussion with local quarry operators, BWF has identified nine (9) regional quarries which could supply quarried materials including aggregates and sand for Project construction. These quarries and their respective transport routes are shown in **Figure 6.8**, with further detail provided in Section 5.3.2 of the Amended TIA (**Appendix 9**) and Section 1.4.1 of the Amended Project Description (**Appendix 1**).

Each of the identified quarries holds relevant approvals for the extraction, processing and transport of quarry products to the State road network, in some cases, subject to hourly or daily trucking limits. These are detailed in Section 5.3.2 of the Amended TIA (**Appendix 9**). All vehicle trips associated with the construction of the Project (i.e. Bullawah Wind Farm) would be carried out within the respective limits of the quarry approvals (where applicable).

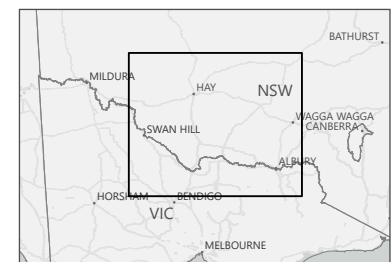
A comprehensive traffic impact assessment has then been undertaken for the remainder of the journey, from the State road network to the Project (refer to **Section 6.6.3** and **Section 6.6.4**). Quarry trucks may approach the Project via the Local Transport Route (via the Cobb Highway and Jerilderie Road) to the north west, via Willurah Road to the south west, or via Conargo Road to the north east.

FIGURE 6.8
Indicative Light Vehicle and Quarry Transport Routes



- Legend**
- △ Quarry
 - Townships
 - Project Boundary
 - State Border
 - NPWS Reserves
 - State Forest
 - Road
 - Indicative Light Vehicle Routes for Construction Workforce

- Indicative Regional Quarry Transport Routes**
- Carlsons Pit A
 - Carlsons Pit B
 - Conanga Sand Pit
 - Darlington Point Sand
 - Fuzzards Quarry
 - Lake Cooper Quarry
 - Strontian Pit
 - Warburh Quarry A
 - Warburh Quarry B
 - Western Riverina Quarry A
 - Western Riverina Quarry B
 - Yabba Quarry



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6.6.3 Traffic Capacity Analysis Results

A mid-block capacity assessment has been used in this study to assess the impact of the Project on road capacity and performance. This approach is considered to be appropriate given the rural location of the Project where intersections are less frequent, and as such, are less of a determinant of rural road capacity (RMS, 2002).

Section 5.2 of Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis specifies the capacity for a two-lane highway to be 1,700 passenger car units per hour (pcu/h) for each direction of travel. Accordingly, a capacity of 1,700 pcu/h for each direction of travel has been adopted for two-lane highways in the study area, including Cobb Highway (A75) and Sturt Highway (A20).

In accordance with the Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis, heavy vehicles have been considered to be equivalent to two passenger cars.

Local unsealed roads have reduced capacity resulting from lower vehicle operating speeds (due to factors such as reduced vehicle control) and increased headways between vehicles (due to factors such as dust). As such, a capacity of 1,000 pcu/h for each direction of travel has been conservatively assumed for unsealed local roads in the study area, including Jerilderie Road, North Boundary Road and Conargo Road.

The criteria for evaluating road performance used in this study 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).

Based on the indicative construction schedule, 2028 is the latest that construction traffic is expected to be generated. Therefore, a five (5) year time-frame was used when assessing traffic capacity.

Additionally, the TIA included a review of driver sight distance has been undertaken at each of the proposed site access points for the Project in accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersection (2021). In assessing the available sight distances at the proposed site access points, the Safe Intersection Sight Distance (SISD) criteria as defined by Austroads was applied. SISD is the minimum sight distance which should be provided on the major road at any intersection.

The key findings of the TIA, having regard to the construction traffic impacts of the Project are as follows:

- With construction traffic generated by the Project and background traffic growth (to 2028) all assessed roads in the vicinity of the Project will continue to operate at LoS A. After adding the traffic from nearby developments, all roads will operate at LoS A with the exception of the Cobb Highway which will operate LoS B, which is still acceptable. Further details regarding cumulative construction traffic impacts are provided in **Section 6.6.7** below.
- It is expected that the proposed site access points will meet the minimum sight distance required to comply with Austroads requirements.

6.6.4 Turn Warrant Assessments

Turn warrant assessments were undertaken for the peak period of construction traffic generation to determine whether project traffic would require a higher-order turn treatment. Each intersection has been conservatively assessed using the peak volume of traffic during either the weekday AM and PM peak whilst adding the background traffic growth up until 2028 and the cumulative traffic from nearby projects.

It is noted that turn warrant assessments have been undertaken for intersections along the approaches near to the Project Area. This includes the Local Transport Route, and other secondary approaches via Willurah Road and Conargo Road. Importantly:

- Turn warrant assessments have not been undertaken for the full Port to Hay Transport Routes as the only Project-related traffic extending all the way to back to the Port(s) will be OSOM movements. The Project will generate a maximum of 14 OSOM trips per day during peak construction, which is insufficient to require a higher order turn treatment.
- Similarly, for quarry traffic, truck movements from the quarry to the State road network are already authorised under the respective quarry approvals (refer to Section 5.3.2) and no higher order turn treatments are required.
- For all other Project-related traffic, including the construction workforce and other non-OSOM deliveries), vehicle trips could originate from anywhere across NSW or interstate, and cannot therefore be meaningfully assessed. However, these trips will be dispersed spatially and temporally, meaning that impacts to the broader road network would necessitate higher order turn treatments.

In relation to the turn warrant assessment for intersections along the approaches near to the Project, the Amended TIA indicates that basic left-turn and basic right-turn treatments are sufficient for the existing and proposed scenarios for the Conargo Road and North Boundary intersection and Sturt Highway and Conargo Road intersection.

The intersection of Cobb Highway and Jerilderie Road will require an upgrade of the existing basic left-turn treatment (BAL) to a channelised left-turn treatment (CHL), primarily due to the construction traffic generated by the Pottinger Wind Farm. It is noted that this upgrade was also identified in the Pottinger Wind Farm Traffic Impact Assessment, and forms part of that Project. However, it is noted that these requirements are only just met, and this upgrade would only be applicable for the Monday morning AM peak. Furthermore, the estimation of the traffic is extremely conservative, using the peak construction traffic volumes for the site and the Pottinger Wind Farm and assuming all workers arrive in the same hour. The peak traffic generated is expected to be lower than anticipated, and the criteria for this upgrade being required will not be met.

Additionally, it is noted that the Amended Project now includes a right turn movement from the Cobb Highway onto Jerilderie Road for potential quarry traffic travelling from the south and south east of the Project. BWF has committed to a maximum heavy vehicle flow of up to four (4) trucks per hour for quarry trucks turning right at the intersection of the Cobb Highway and Jerilderie Road to minimise traffic impacts at this location.

Therefore, the Amended TIA indicates that the upgrade of the Cobb Highway and Jerilderie Road to CHL is not necessary at this time and no additional upgrades (beyond those described in **Section 3.3.1**) are triggered as a result of the Project.

6.6.5 Operations

Once operational, the Project will operate 24 hours per day, seven (7) days a week. The WTGs will be monitored remotely; however, regular maintenance will be required. During the operational phase of the Project, it is estimated that the Project would employ up to 40 on-site workers who would access the site by car / utility vehicles. The occasional heavy vehicle would be required for the delivery of parts for a repair to the WTGs.

Given the low traffic flows present on the Local Transport Route, the minor additional traffic generated by the Project during the operational phase can be readily accommodated by the road network, and as such no further assessment or operational-specific mitigation measures are required.

6.6.6 Decommissioning

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). However, the decommissioning phase would generate fewer traffic movements than the construction phase, and over a shorter period of time.

Prior to the commencement of decommissioning activities, BWF would prepare a detailed decommissioning plan, incorporating a Traffic Management Plan (TMP), in consultation with DPHI and the relevant Councils to guide the implementation of the decommissioning works.

6.6.7 Cumulative Impacts

A Cumulative Impact Assessment (CIA) was undertaken as part of the Amended TIA, focusing on potential cumulative impacts in the vicinity of the Project Area and along the Local Transport Route. As cumulative traffic impacts are much less likely during the operational and decommissioning phases of the Project (refer to **Section 6.6.5** and **Section 6.6.6**) the CIA has focussed on the Project's construction phase.

As previously identified in the EIS CIA, there are several solar and wind farms either proposed, approved or under construction in the vicinity of the Amended Project. As such, there are expected to be some construction traffic interactions between these Projects, particularly along the Sturt Highway and in the towns of Hay and Deniliquin.

The following projects are expected to have their primary transport route along the Cobb Highway during the construction period:

- Pottinger Wind Farm (commencing 2026) is expected to generate a peak of 675 vehicles per hour over a 28 month peak construction period.
- The Plains Wind Farm (commencing 2025) is expected to generate a peak of 206 vehicles per hour over a two (2) year peak construction period.
- The Plains Solar Farm (commencing 2026) is expected to generate a peak of 82 vehicles per hour over a one (1) year peak construction period.

Peak traffic generation estimates for all three (3) projects listed above were considered in the cumulative assessment undertaken as part of the EIS TIA, using the traffic report to determine the distribution of traffic during the AM and PM peaks. Additionally, the peaks of all three (3) projects are not expected to occur simultaneously, so the assessment of all project peaks occurring at the same time is an assessment of the worst-case scenario.

The results of the capacity analysis undertaken in the Amended TIA determined that all studied roads are expected to operate at LoS A, with a Volume to Capacity ratio of less than 0.1 in 2028 with the Project traffic. With traffic from nearby projects added, all studied roads are expected to operate at LoS A or B, with a Volume to Capacity ratio of less than 0.4 (rounded) in 2028.

As such, the Amended TIA concluded that the cumulative traffic generation of the Project and known nearby projects is not expected to have any notable impact on the surrounding road network from a capacity and operations perspective.

6.6.7.1 Port to Hay Transport Route Cumulative Impact Considerations

As the Amended Project now includes the Port to Hay Transport Routes and associated off-site works required to facilitate OSOM deliveries for the Project, a supplementary CIA has been undertaken to assess cumulative traffic impacts on the Port to Hay Transport Routes. To avoid an overly exhaustive list of projects, and to ensure the approach to understanding potential cumulative impacts stayed targeted to relevant projects, a screening process was undertaken which involved the following steps:

- A preliminary review of all listed SSD projects on the NSW Major Projects Planning Portal across all 36 LGAs in NSW which the Port to Hay Transport Routes intercept. This resulted in a preliminary list of approximately 1000 major projects.
- Refinement of the original project list via project type and status (for example, filtering out projects which have not progressed far through the NSW planning approvals process and do not have an EIS and associated traffic impact assessment publicly available for review, projects that will generate no or minimal heavy vehicle traffic during construction, and projects which are already in operation or have been inactive for more than five (5) years).
- The screening process then targeted the remaining Projects with overlapping construction timeframes, and potential for cumulative traffic impacts associated with overlapping transport routes and proposed OSOM or heavy vehicle movements.

The screening process resulted in a list of 35 remaining projects with potential for cumulative traffic and transport-related impacts. Of these projects, 10 were previously identified within the EIS CIA, being:

- Dinawan Solar Farm (SSD-50725959)
- Dinawan Wind Farm (SSD-50725708)
- Baldon Wind Farm (SSD-40138508)
- Pottinger Wind Farm (SSD-59235464)
- The Plains Wind Farm (SSD-50629707)

- Yanco Delta Wind Farm (SSD-41743746)
- Argoon Wind Farm (SSD-64935522)
- Tchelery Wind Farm (SSD-59701722)
- Conargo Wind Farm (SSD-70611708)
- Booroorban (Saltbush) Wind Farm (SSD-70636459).

Further discussion regarding potential cumulative traffic and transport-related impacts for each project is provided in **Table 6.21**.

Overall, the findings of the supplementary transport route CIA are generally consistent with those presented in the EIS. While there is potential for construction traffic interactions to occur along the Port to Hay Transport Routes, these potential conflicts can be appropriately managed through ongoing consultation with key stakeholders (including TfNSW) and the development of a detailed Traffic Management Plan. Additionally, it is noted that the inclusion of Port Adelaide Route Options in the Amended Project may assist in mitigating cumulative impacts, by providing an alternative in the event that traffic congestion from the Port of Newcastle becomes an issue.

Table 6.21 Amended Project – Transport Route Traffic CIA

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Baldon Wind Farm	SSD-40138508	Hay	Response to Submissions	4 years; commencing Q4 2025 subject to approval; staging option included	There is potential for construction of both projects to overlap. The construction period is expected to commence in Q4 of 2025 and would take approximately 3.5 years, with the peak construction period expected to occur between months 9 to 24. Traffic generated from both projects may interact within the town of Hay.
Birriwa Solar Farm	SSD-29508870	Warrumbungle	Determination (Approved August 2024)	28 months; construction dates not specified	There is the potential for construction of both projects to overlap. While the construction dates have not yet been specified, the project was approved in August 2024 with construction expected to take approximately 28 months. Cumulative traffic impacts are possible along the two proposed transport routes for this project from Newcastle via the Golden Highway and Sydney via Castlereagh Highway, with both projects proposing OSOM vehicle movements. It is anticipated that approximately 75% of all heavy vehicle movements to and from the site will be from Newcastle with the remaining 25% to and from Sydney.
Bowmans Creek Wind Farm	SSD-10315	Muswellbrook; Singleton; Upper Hunter	Determination (Approved February 2024)	18 months; construction dates not specified	There is the potential for construction of both projects to overlap. While the construction dates have not been specified, the project was approved in February 2024, with construction expected to take approximately 18 months. As such, it is likely that the construction phase of this project and the Amended Project may overlap in 2026. Cumulative impacts to traffic are possible along the proposed transport route for this project from the Port of Newcastle to the intersection between the New England Highway and Golden Highway in Whittingham, involving OSOM vehicle movements.
Burrendong Wind Farm	SSD-8950984	Dubbo Regional	Response to Submissions	18-24 months; construction to commence 1–5 years following project approval	This project is currently at the Response to Submissions phase, following the submission of the EIS in November 2023. Construction is anticipated to take approximately 18–24 months, and is likely to commence between 1–5 years following project approval. There is the potential for the construction phases of both projects to overlap, including possible cumulative traffic impacts involving OSOM vehicle movements along the proposed transport route for this project from the Port of Newcastle (two routes via the Golden Highway – Routes 2A and 2B).

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Burroway Solar Farm	SSD-55968733	Narromine	Response to Submissions	18 months; construction to commence in the 2026/2027 financial year	This project is currently at the Response to Submissions phase, following the submission of the EIS in April 2024. If approved, construction is anticipated to take approximately 18 months and would commence in the 2026/27 financial year. Cumulative traffic impacts are possible along the proposed transport route from the Port of Newcastle via the Golden Highway. However, cumulative impacts would likely be minor or negligible given only six (6) OSOM vehicle movements are proposed across all project phases.
Central-West Orana REZ Transmission	SSI-48323210	Dubbo Regional; Upper Hunter; Warrumbungle	Determination (Approved June 2024)	33 months; initial construction timeframes from Q3 2024 to Q1 2027	There is the potential for construction of both projects to overlap. Construction of this project is expected to take approximately 33 months, with initial construction timeframes in the EIS identified as being from Q3 of 2024 to Q1 of 2027. However, these timeframes are likely to be pushed back given the approval of this project in June (Q2) 2024, allowing for greater crossover with the proposed construction timeframe of the Amended Project. Cumulative traffic impacts are possible along the proposed transport route from the Port of Newcastle via the Hunter Expressway and Golden Highway, a route that has been pre-approved for OSOM vehicle transport.
Coppabella Wind Farm	SSD-6698	Hilltops; Yass Valley	Determination (Mod-1 approved December 2018)	24–36 months; construction to commence in 2025	There is the potential for the construction phases of both projects to overlap. This project was initially approved in March 2026 and was last modified in December 2018. According to the project website, construction of this project is expected to commence in 2025 and is estimated to take 24–36 months, therefore overlapping with the proposed construction timeframes of the Amended Project. There is the potential for cumulative traffic impacts along the proposed transport route from Port Kembla via the Hume Highway, associated with the use of OSOM vehicles for both projects.
Dalswinton Sand and Gravel Quarry	SSD-9094	Muswellbrook Shire	Assessment	Construction dates and timeframes not specified	This project is currently under assessment. While the construction dates and timeframes have not yet been specified, construction timeframes have the potential to overlap with the Amended Project. Cumulative traffic impacts are possible along the proposed transport routes for this project via the Golden Highway, involving the use of OSOM vehicles.

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Daroobalgie Solar Farm	SSD-10387	Forbes	Determination (Approved June 2024)	12–18 months; construction likely to commence in 2025/26	There is the potential for the construction phases of both projects to overlap. This project was approved in June 2024, with construction likely to commence in 2025/26 across a period of 12–18 months. Cumulative traffic impacts are possible along a section of the proposed transport routes from Port Botany, the Port of Newcastle, or Port Kembla. However, any impacts would likely be minor, given there are 18 OSOM vehicle movements proposed across all phases of this project.
Dinawan Solar Farm	SSD-50725959	Murrumbidgee	Assessment	18–36 months; likely commencing in 2025	This project is currently under assessment, with construction likely to commence in 2025 over a period of 18–36 months, if approved. There is the potential for the construction phases of both projects to overlap from 2026 onwards. This project proposes to utilise similar transport routes to the Amended Project from the Port of Newcastle and the Port of Adelaide. There is the potential for cumulative traffic impacts as both projects propose the use of OSOM vehicles along these routes.
Dinawan Wind Farm	SSD-50725708	Murrumbidgee	Response to Submissions	36 months (or 60 months allowing for overlap between stages)	This project is currently at the response to submission stage, and while dates have not been specified, construction is likely to take approximately 36 months. As such, there is the potential for the construction phase of both projects to overlap. There are two OSOM transport routes proposed for this project from the Port of Newcastle, creating the potential for cumulative traffic impacts along these routes.
Eraring Battery Energy Storage System	SSD-15950052	Lake Macquarie City	Determination (Approved August 2023)	36–54 months (Across three separate stages) including Stage 1 (2025), Stage 2 (2026–2027) and Stage 3 (TBC)	This project was approved in August 2023, with construction to occur across three separate stages over a period of 36–54 months. There is the potential for the construction phase of the Amended Project to overlap with this project across Stages 2 and 3 from 2026 onwards. Cumulative traffic impacts are also possible along the proposed transport route from the Port of Newcastle, which would involve the use of OSOM vehicles.
Goulburn River Solar Farm	SSD-33964533	Upper Hunter	Determination (Approved August 2024)	27 months; construction initially projected to commence in early 2025)	This project was approved in August 2024, with construction expected to occur over a period of 27 months commencing in early 2025. There is the potential for the construction phases of both projects to overlap from 2026 onwards. Cumulative traffic impacts are possible along the proposed transport route from the Port of Newcastle, involving the use of OSOM vehicles.

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Gregadoo Solar Farm	SSD-8825	Wagga Wagga	Response to Submissions (Approved in December 2018; Mod-4 currently at the RtS phase)	12–18 months; construction to commence in 2025	This project was initially approved in December 2018, with Mod-4 currently at the Response to Submissions stage. Construction is expected to commence in 2025 over a period of 12–18 months, creating the potential for the construction phases of both projects to overlap in 2026. OSOM vehicle movements are also proposed along a portion of the proposed transport route from Port Botany, allowing for the potential for cumulative traffic impacts.
Gundry Solar Farm	SSD-48225958	Goulburn Mulwaree	Response to Submissions	18–24 months; construction commencing Q4 2025/Q1 2026	There is the potential for the construction phases of both projects to overlap. This project is currently at the Response to Submissions stage, with construction expected to commence in Q4 of 2025 or Q1 of 2026 if approved for a period for a period of 18–24 months. Cumulative impacts to traffic are also possible along the proposed transport routes from Port Botany or Port Kembla along the Hume Highway, however these impacts would likely be minor given there are only 10 OSOM vehicle movements proposed across all phases of the project.
Hills of Gold Wind Farm	SSD-9679	Upper Hunter	Determination (Approved September 2024)	18–24 months; construction likely to commence in 2025/2026	There is the potential for the construction phases of both projects to overlap. This project was approved in September 2024, with construction likely commencing in 2025 or 2026 across a period of 18–24 months, overlapping with that of the Amended Project. Cumulative traffic impacts are possible along the proposed transport route from the Port of Newcastle, involving the use of OSOM vehicles.
HumeLink	SSI-36656827	Cootamundra-Gundagai Regional; Goulburn Mulwaree; Upper Lachlan; Wagga Wagga; Yass Valley	Determination (Approved November 2024)	30 months; construction to commence in 2025	This project was approved in November 2024 and spans across five (5) LGAs. Construction is proposed to commence in 2025 over a period of 30 months, creating the potential for the construction phases of both projects to overlap. Cumulative traffic impacts are possible along the proposed transport route from the Port of Newcastle, involving the use of OSOM vehicles.

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Junction Rivers Wind Farm (formerly Burrawong Wind Farm)	SSD-30448824	Murray River	Response to Submissions	48 months; construction to commence within 6 months of project approval	This project is currently at the Response to Submissions stage. Construction is projected to occur over a period of 48 months, with construction dates yet to be specified. Cumulative impacts to traffic are possible along the proposed transport route from Port Adelaide, involving the use of OSOM vehicles.
Keri Keri Wind Farm	SSD-38358962	Murray River	Response to Submissions	24 months; construction commencing in late 2027	This project is currently at the Response to Submissions stage, with construction expected to commence in late 2027 subject to approvals over a period of 24 months. The construction phases of both projects have the potential to overlap in 2028. Cumulative traffic impacts are likely along the proposed transport routes from the Port of Newcastle and the Port of Adelaide, given the similar nature and location of each project and the use of OSOM vehicles for each project.
Kyoto Wind Farm (now known as Upper Hunter Energy Park)	MP06_0055	Muswellbrook; Upper Hunter	Determination (Approved January 2010)	20 months; construction period between 2025-2027	This project was originally approved in January 2010. According to the project website, this project was formerly known as Kyoto Wind Farm and is now known as the Upper Hunter Energy Park. Construction is expected to commence in late 2025 and be completed in 2027 across a period of 20 months, creating the potential for the construction phases of both projects to overlap in 2027. Cumulative traffic impacts are also possible along the proposed transport route from the Port of Newcastle, involving the use of OSOM vehicles. It should be noted however, that the traffic assessment prepared for this project EIS dates from 2008.
Liverpool Range Wind Farm	SSD-6696	Upper Hunter; Warrumbungle	Determination (Approved in March 2018; last modified in October 2024)	36 months; construction dates not specified	There is the potential for the construction phases of both projects to overlap. While construction dates have not been specified, construction is expected to take place across a period of 36 months. Cumulative traffic impacts are possible along the proposed transport route from the Port of Newcastle, involving the use of OSOM vehicles.

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Marulan Solar Farm	SSD-13137914	Goulburn Mulwaree	Determination (Approved August 2023)	18 months; construction expected to commence in 2025	There is the potential for the construction phases of both projects to overlap. This project was approved in August 2023, with construction expected to commence in 2025 over a period of 18 months. The proposed transport route for this project from Port Botany along the Hume Highway overlaps with the proposed transport route for the Amended Project. However, cumulative traffic impacts are considered unlikely or negligible given there are only three (3) OSOM vehicle movements proposed across all stages of the project.
Maryvale Solar Farm	SSD-8777	Dubbo Regional	Determination (Approved December 2019; last modified in December 2023)	14 months; construction to commence in early 2025	This project was last modified in December 2023, with construction expected to commence in early 2025 for a period of 14 months. As such, the construction phases of both projects are possible, though unlikely to overlap. Cumulative traffic impacts are therefore also possible along the proposed transport routes from the Port of Newcastle or Port Botany involving the use of OSOM vehicles, however this is also considered unlikely given the proposed construction timeframe.
Pottinger Wind Farm	SSD-59235464	Hay	Assessment	55 months; dates not specified	This project is currently under assessment, with a proposed construction timeframe of 55 months. Although construction dates have not been specified, the construction phases of both projects are likely to overlap given the long construction timeframe. In terms of traffic, there is potential for interactions along the transport route from the Port of Adelaide involving OSOM vehicle movements. However, as this project elects a route from Port of Adelaide via Broken Hill, interactions are expected to be limited.
The Plains Wind Farm	SSD-50629707	Hay	Response to Submissions	40 months; commencing Q1 2027	The construction phases of both projects are likely to overlap. Construction is expected to commence in Q1 2027 across a period of 40 months, subject to approval. This project proposes a to utilise a transport route from the Port of Adelaide, using a different route from the Amended Project. However, the proposed transport route is still subject to review and therefore cumulative traffic impacts are still possible including through OSOM vehicle interactions.

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Sandy Creek Solar Farm	SSD-41287735	Dubbo Regional; Warrumbungle	Assessment	22–28 months; construction to commence in Q2 2026	There is the potential for the construction phases of both projects to overlap. Subject to approval, construction of this project is expected to commence in Q2 2026 over a period of 22–28 months, with similar timeframes to the Amended Project. The project proposes a transport route for OSOM vehicles from the Port of Newcastle, however cumulative traffic impacts are likely to be negligible given only occasional OSOM vehicle movements are proposed.
Spicers Creek Wind Farm	SSD-41134610	Dubbo Regional; Warrumbungle	Determination (Approved in October 2024)	40 months; early works commencing in 2025	There is the potential for the construction phases of both projects to overlap. This project was approved in October 2024, with early works commencing in 2025 and an overall construction period of approximately 40 months. OSOM vehicle movements are expected along the proposed transport route from the Port of Newcastle, creating the potential for cumulative traffic impacts.
Muswellbrook Solar Farm	SSD-46543209	Muswellbrook	Recommendation	31 months; construction commenced in Q3 2024	There is the potential for the construction phases of both projects to overlap. Construction of this project commenced in Q3 2024 and is anticipated to take approximately 31 months. There is the potential for cumulative traffic impacts along sections of the proposed transport route from Melbourne to Muswellbrook, specifically between Dubbo and Muswellbrook along the Golden Highway, given both projects propose OSOM vehicle movements along this route.
Uungula Wind Farm	SSD-6687	Dubbo Regional	Determination (Approved May 2021; last modified in December 2022)	24–30 months; project currently at the 'early works and design' phase	This project is currently at the early works and design phase, with construction works to occur over a period of 24–30 months. There is the potential for cumulative impacts to traffic along the proposed transport route from the Port of Newcastle, involving the use of OSOM vehicles.
Valley of the Winds Wind Farm	SSD-10461	Warrumbungle	Assessment	24–42 months; construction initially anticipated to commence from Q1 2023	The EIS for this project identifies that construction was initially expected to commence in Q1 2023 over a period of 24–42 months. However, given the project is still currently under assessment, there is the potential for the construction phases of both projects to overlap. Cumulative traffic impacts are also possible along the proposed transport route from the Port of Newcastle along the Golden Highway, involving the use of OSOM vehicles.

Project Name ¹	SSDA Number	LGA(s)	Status (February 2025)	Construction Timeframe	Potential for Cumulative Impacts
Yanco Delta Wind Farm	SSD-41743746	Edward River	Determination	Three years. Estimated completion 2028.	Construction periods between the two projects are likely to overlap, however the projects do not share common transport routes. The approved transport route for the Yanco Delta Wind Farm project includes transport of WTG components from the Port of Geelong. There is a potential overlap for portions of the Sturt Highway, however, results of the Amended TIA (Appendix 7) note that there is available capacity along all roads used by the Projects in each direction, which suggests that cumulative construction traffic and transport-related impacts are unlikely and able to be accommodated. No cumulative operational traffic impacts are anticipated. Residual cumulative impacts are considered acceptable with the application of mitigation and management measures presented in Appendix 2.

Note: Argoon Wind Farm (SSD-64935522), Tchelery Wind Farm (SSD-59701722), Conargo Wind Farm (SSD-70611708) and Boorooban (Saltbush) Wind Farm (SSD-70636459) were identified within the EIS CIA. These projects are at the 'Prepare EIS' stage of the NSW planning approval process, and as such there is limited publicly available information to inform the assessment of potential cumulative traffic and transport-related impact resulting from these projects. Given the difference in project status, it is also expected that peak construction periods for both projects are unlikely to overlap. As such, these projects were not considered further within this Transport Route Traffic CIA. Management and Mitigation Measures.

Management and mitigation measures identified by TTPP to manage and/or mitigate the traffic and transport related impacts associated with the Amended Project are consistent with those presented in the Project EIS. However, BWF has committed to the following additional mitigation measure to manage quarry related traffic impacts (refer to **Appendix 3**):

TT11: To minimise traffic impacts associated with quarry transport, BWF will manage the delivery of quarried materials such that:

- Quarry truck movements do not exceed any hourly or daily trucking limits imposed under the respective approvals held by each quarry operator.
- A maximum heavy vehicle flow of up to four (4) trucks per hour is permitted for quarry trucks turning right at the intersection of the Cobb Highway and Jerilderie Road.

6.7 Economic Impacts

An Addendum EIA has been prepared as **Appendix 10** and is summarised within this section.

The Addendum EIA provides an updated assessment of the Amended Project's economic impacts, based on:

- An increase in the peak construction workforce from 350 FTE jobs to 380 FTE jobs. Consistent with the EIS Project, it is assumed that up to 35 workers would be sourced locally (within the Hay Shire, Edward River or Murrumbidgee LGAs), which represents 9% of the peak construction workforce for the Amended Project.
- A reduction in the overall construction period from 44 months to 35 months, with a resulting decrease in the average construction workforce (FTE per month) from 210 FTE jobs to 180 FTE jobs.
- A reduction in the total number of wind turbines from 143 to 141, with a resulting reduction in the Project's maximum generating capacity from 815.1 MW to 803.7 MW.

6.7.1 Assessment Results

The Addendum EIA indicates that:

- The Project will generate approximately \$1 billion in capital investment within NSW during construction.⁸
- A total of 180 FTE direct jobs will be supported on average over the Project's 35 month construction phase, increasing to 380 FTE jobs during peak construction. This includes an average of 15 FTE direct jobs sourced within the Hay Shire, Edward River and Murrumbidgee LGAs, rising to 35 during peak construction.
- An average of 290 FTE indirect jobs will be supported by Project construction, increasing to 610 FTE jobs during peak construction. This includes an average of 60 indirect jobs within the Hay Shire, Edward River and Murrumbidgee LGAs, rising to 120 FTE jobs during peak construction.

⁸ Capital investment within NSW is calculated at 40% of EDC. In the Project EIS, the EDC was calculated at \$2.5b, based on a 143 WTG layout. The EDC has not been recalculated to reflect the removal of two (2) WTGs in the Amended Project.

- Consistent with predictions in the Project EIS, the overall construction phase stimulus generated by the Project within the Hay Shire, Edward River and Murrumbidgee LGAs is estimated at 15% of the Project's EDC, or approximately \$380 million.⁹ The total local construction phase stimulus includes approximately \$17.9 million in non-local worker wage stimulus, which represents a reduction from approximately \$26 million for the EIS Project, however this reduction is expected to be offset by higher expenditure on local materials and contracts with local service providers, meaning the total construction stimulus across the three (3) LGAs is unlikely to change.
- During construction, workforce accommodation is expected to be required for an average of 165 FTE non-local workers, rising to 345 FTE non-local workers during peak construction. The proposed TWA has been designed with sufficient capacity to accommodate the minor increase in the peak construction workforce generated by the Amended Project.
- Consistent with predictions in the Project EIS, ongoing economic stimulus associated with the operation of the Project is estimated at approximately \$400 million (over 30 years, CPI adjusted), relating to landholder leasing payments, operational wage stimulus, and community payments.

6.7.2 Cumulative Impacts

Due to the minor changes to the construction workforce and accommodation requirements of the Amended Project, there is no amendment to the cumulative impacts as assessed during the EIS phase.

6.7.3 Management and Mitigation Measures

Due to the minor changes to the construction workforce and accommodation requirements of the Project, there is no additional management and mitigation measures beyond those outlined during the EIS phase.

6.8 Blade Throw

An Amended Blade Throw Assessment (BTA) has been prepared by Middleton Group (MG) to assess the annual probability of a whole blade or a blade fragment striking a residence, when considering the Amended Project layout and alternative WTG model proposed in this Amendment Report. The Amended BTA adopts a revised assessment methodology which has been confirmed through consultation with DPHI on its advice provided on the EIS BTA following exhibition of the Project EIS. Details of this consultation is provided in **Section 5.1**.

The Amended BTA has also undertaken an assessment of the candidate WTG model proposed in the Project EIS in line with the revised assessment methodology, to demonstrate compliance for both the EIS and Amended WTG options presented in this Amendment Report.

The Amended BTA is summarised below and provided in **Appendix 11**.

⁹ Based on the calculation of EDC presented with the Project's EIS. The EDC has not been recalculated to reflect the removal of two (2) WTGs in the Amended Project

6.8.1 Assessment Results

The Amended BTA 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. The Amended BTA includes risk calculations which evaluate the annual probability of a whole blade or a blade fragment striking a residence, with fatality being the assumed consequence. The results are then compared to the limits presented in the *Hazardous Industry Planning Advisory Paper No. 4 (HIPAP 4) - Risk Criteria for Land Use Safety Planning* (DoP, 2011) to evaluate compliance with HIPAP 4.

Maximum impact ranges have been derived for both the EIS candidate WTG and Amended candidate WTG for both blade fragment and whole blade drop scenarios, as follows:

- EIS candidate WTG: 1018 m blade fragment and 388 m whole blade drop.
- Amended Project candidate WTG: 700 m fragment; 274 m whole blade drop.

Superimposing the maximum blade fragment impact radius of the EIS candidate WTG onto the Project layout shows that one residence (R2) is located 801 m within the impact radii of WTG 96. No residences are located within the maximum blade fragment impact radius for the Amended candidate WTG. Additionally, no residences are located within the maximum whole blade drop scenario for both the EIS and Amended Project candidate WTGs.

A risk calculation process was then undertaken to determine the probability of blade fragment impact on from the EIS candidate WTG potentially impacting a residence (R2). The results of the risk calculation indicated a probability of blade fragment impact of 0.8×10^{-6} , being risk in a million, per year. This is lower than the 1×10^{-6} risk per year location specific individual fatality risk (LSIFR) criteria stated for “Residential, hotels, motels, tourist resorts” in Table 2 of HIPAP 4. Using the Amended Project candidate WTG specifications, no residences fall within the calculated maximum impact radius of any turbine and therefore there is no basis on which to calculate a LSIFR value. Ultimately, there is no deemed risk because no WTG are located within the blade throw range of any residences.

With the removal of WTG 37 and WTG 38 from the Project design, all residences are either outside of potential blade drop and blade fragment impact radii, or are below the acceptable threshold for impacts as stated within HIPAP 4.

The results of the Addendum BTA demonstrate the Project’s compliance with the requirements of HIPAP 4.

6.8.2 Cumulative Impacts

The removal of two WTGs from the Project design and consideration of alternative WTG model as proposed under the Amended Project are unlikely to increase potential for cumulative impacts outside of those assessed in the Project EIS. As such, no further consideration of cumulative impacts has been undertaken.

6.8.3 Management and Mitigation Measures

The removal of WTG 37 and WTG 38 from the Project design has been implemented to demonstrate compliance with HIPAP 4 and has been updated as a new management measure in **Appendix 3 (ID BT05)**.

Further mitigation measures are proposed outside of those proposed in the Project EIS.

6.9 Cumulative Impacts

A Cumulative Impact Assessment (CIA) was prepared to assess the Project's impacts both alone and in combination with impacts generated by other existing and planned development within the Project EIS (Umwelt, 2024a), in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (CIA Guidelines) (DPE, 2022). All environmental and social matters were considered with respect to potential cumulative impacts.

Due consideration of potential cumulative impacts on select environmental features has been undertaken in the respective sections of this Amendment Report. This included consideration of potential traffic and transport-related cumulative impacts along the proposed Port to Hay Transport Routes, as discussed in **Section 6.6.5**.

Given the minor changes proposed under the Amended Project, no material change to cumulative impacts (outside of those assessed in the Project EIS) is considered likely.

7.0 Justification of Amendment Project

This section provides a justification of the Amended Project, taking into consideration the environmental, social and economic impacts, as compared to the EIS Project, as well as considering the strategic context and suitability of the Project site. The Amended Project is also considered in the context of the principles of ecologically sustainable development (ESD) as defined in Schedule 2 of the EP&A Regulation.

This section builds on the updated Project justification and evaluation presented in the Submissions Report (Umwelt, 2025a).

7.1 Environmental, Social and Economic Impacts

The changes proposed by the Amended Project were developed in response to ongoing consultation with agencies, progression of detailed design, and submissions received during the EIS exhibition period. BWF, in consultation with landowners and agencies, has sought to progress the design and reduce environmental impacts wherever possible.

Key changes from the EIS Project to the Amended Project include the construction staging amendments, transport route amendments, WTG amendments, the inclusion of obstacle lighting on select WTGs, and minor design refinements including the removal of two (2) WTGs. These design changes have been assessed and will not result in any impacts above those assessed in the Project EIS. The Project can comply with statutory requirements and relevant standards, policies and guidelines.

Table 7.1 provides a summary of the environmental, social and economic impacts resulting from the Amended Project.

Table 7.1 Amended Project Environmental, Social and Economic Impact Summary

Environmental Feature	Environmental, Social and Economic impacts resulting from the Amended Project
Biodiversity	- The Project would directly impact up to 638.15 ha of native vegetation within the Project Area and in areas impacted by proposed off-site road works. This represents approximately 3% of native vegetation within the Project Area. This includes listed TECs and habitat for threatened flora and fauna species. - The Project has been designed to avoid areas of high biodiversity values, including all areas of mapped Plains-Wanderer Important Habitat.
Aboriginal Cultural Heritage	- BWF has committed to avoiding 20 Aboriginal sites within the Development Corridor and its surrounds, including all hearths within identified site complexes within the Project Area. - The Project has the potential to directly impact 27 Aboriginal sites located within the Development Corridor, comprising isolated stone flakes, artefact scatters and areas of PAD. Of these, one (1) site was assessed as having high overall significance due to the presence of flaked glass, 19 were assessed as having moderate overall significance and seven (7) were assessed as having low overall significance. - No Aboriginal sites were identified within the proposed disturbance areas associated with off-site road works, and it is unlikely that surface and/or subsurface Aboriginal objects would be directly impacted by the construction of the off-site road work areas.

Environmental Feature	Environmental, Social and Economic impacts resulting from the Amended Project
Historic 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 through the implementation of targeted mitigation and management measures.
Landscape and Visual	• The Project will result in changes to the landscape, however impacts to non-associated residences are limited, and are generally 'low' or 'negligible'. • Impacts to public viewpoints and landscape character, and impacts associated with shadow and blade flicker are within acceptable environmental standards. • Visual impacts to the neighbouring Oolambeyan National Park and its landscape character have been assessed 'low' or 'negligible'.
Noise and Vibration	• Construction noise levels above management levels are anticipated for select works and activities associated with the Project. These works and activities are however temporary in nature, will not be experienced continuously, and are only expected to occur when select works are undertaken in proximity to receivers, after which time noise levels will reduce substantially. • Predicted WTG operational noise levels are below the Noise Bulletin base (minimum) criterion of 35 dB LAeq at all non-associated receivers. • No vibration impacts are anticipated. • Construction noise levels at sensitive receivers located proximally to select off-site road work areas may exceed the noise affected management level in the ICNG, and would be managed through additional measures included in Appendix 3.
Social and Economic	• Assessments of potential social and economic impacts identified that whilst the number of developments within the South West REZ presents a complex challenge and opportunity for the region, the Projects impacts can be managed. • During engagement, stakeholders identified a range of perceived social impacts (both positive and negative impacts) relating to the Project. In response to perceived negative impacts, BWF has committed to a range of measures to mitigate and manage impacts to key matters as noted by the community, including biodiversity and cultural heritage values, amenity, agricultural productivity and to minimise hazards, consistent with the recommendations of the respective specialist assessment reports. • BWF has developed a preliminary Social Impact Management Framework for the Project to manage residual negative impacts and to maximise positive impacts to affected communities. This Framework including, Community Benefit Sharing, a Community and Stakeholder Engagement Strategy, the AES and Industry and Aboriginal Participation Plan. • No material change to social and economic impacts are anticipated as a result of the Amended Project from that assessed in the Project EIS.
Transport	• The Amended Project includes an Amended TTIA which has been prepared to address TfNSW advice on the Project EIS. The Amended TTIA considers the additional Port to Hay Transport Routes and associated off-site road work areas required to facilitate OSOM vehicle transport to the Project Area. • The road network can accommodate the traffic, loads and type of vehicle movements associated with the Project (and other nearby developments) during construction, operation and decommissioning. Limited or no impact from the Amended Project on the road network is expected. • A Traffic Management Plan (TMP) will be prepared to mitigate the impacts of site traffic generated along the proposed transport route, along with additional measures included in Appendix 3.

Environmental Feature	Environmental, Social and Economic impacts resulting from the Amended Project
Water Resources	- WTGs are situated within areas of acceptable flood risk based on the modelled 1% AEP scenario. Construction of Project infrastructure (i.e. access tracks and transmission cables) will occur near select waterfront lands i.e. within 40 m of watercourses. - Due to the availability of on-site water supply, the reliance of the Project on other local (or regional) water resources is limited. - No impacts on groundwater are anticipated and risks to surface water quality are manageable. The risk of erosion, sedimentation and spills, due to construction activities and the disturbance to the Project Area is manageable.
Soils, Land and Agriculture	The Project is not anticipated to result in any significant impacts to soils and agriculture, and similarly land use conflicts are not anticipated. All impacts are within acceptable standards.
Air Quality	- The construction of the Project is expected to have minor air quality-related impacts; however, all impacts are within acceptable standards. This includes at the off-site road work areas described in this Amendment Report. - Consistent with other projects under development in the region, the Project will provide an air quality benefit as it is anticipated to contribute towards achieving the United Nations SDG Goal 11 relating to reducing the adverse impacts of cities, with a focus on air quality and waste. This is because the Project will provide a source of renewable energy, increasing the proportion of renewable energy generation in Australia, assist to reduce reliance on fossil fuels for energy generation, and result in a reduction of GHG emissions, ultimately improving air quality.
Hazards and Risks	Assessments of aviation safety, BESS hazards, bushfire, telecommunications, human health (EMF) risk identified that impacts associated with the Project are within acceptable standards.
Blade Throw	Refinements to the Project design have resulted in the removal of two (2) WTGs and associated infrastructure, which has reduced the potential for blade throw risk across the broader Project Area to acceptable levels in line with the requirements of HIPAP 4.
Waste Management	- The Project EIS has identified, quantified and classified the likely waste streams to be generated by the Project during construction, operation and decommissioning, and has described measures to be implemented to manage, reuse, recycle and safely dispose of this 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. In this case BWF, will liaise with the relevant local authorities to manage this, alongside cumulative impacts, which may result from the waste disposal needs of multiple developments in the region. - Management of waste will be documented within a Project-specific Waste Management Plan (WMP) prepared in consultation with local authorities, following approval of the Project. A Decommissioning and Rehabilitation Strategy has been developed for the Project, and a more detailed Decommissioning and Rehabilitation Plan would be developed in consultation with key stakeholders, nearer to the end of the Project.
Cumulative	- A detailed cumulative assessment of key matters such as biodiversity, noise, visual, traffic, social and economic aspects was prepared with the Project EIS and identified that while impacts are present, acceptable environmental and social outcomes can be achieved. - Cumulative impacts to other environmental aspects were also assessed within the Project EIS, and were deemed as negligible with the implementation of mitigation and measures presented in Appendix 3. - No additional cumulative impacts are anticipated as a result of the Amended Project outside of those assessed within the Project EIS.

7.2 Strategic Context

NSW is in a transition to build a reliable, affordable and sustainable electricity future with the NSW Government taking action to deliver cheap, reliable, and clean electricity for homes and businesses in NSW (EnergyCo, 2023a). The REZs were formally declared under the *Electricity Infrastructure Investment Act 2020*, with the Project being located within the South West REZ. The NSW Government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the retirement of thermal power stations over the coming decades.

The Amended Project continues to be aligned with the 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. Being in the South West REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. BayWa r.e., as an existing renewable energy operator in Australia with a track record of delivering large-scale renewable energy projects, is well placed to progress the delivery of the Project.

7.3 Suitability of the Site

The Project is a direct response to the NSW Government's commitment to transition to renewable electricity generation.

As discussed in Section 2.0 of the EIS (Umwelt, 2024a), the Project Area was selected based on a range of factors, including its strategic position within the South West REZ, the reliability of the wind resource, the low density of potentially affected residences within the surrounding area, access to existing and approved transmission infrastructure and the State road network, and mostly supportive or neutral attitudes towards the Project from potentially affected landholders.

The Project design has been developed and refined in response to key environmental constraints. This has included maintaining sufficient buffers to Oolambeyan National Park to minimise biodiversity and visual impacts. Detailed consideration of potential impacts to Oolambeyan National Park is provided in Section 7.0 of the Submissions Report.

In addition, the following specific principles were adopted:

- Avoidance of all Important Habitat for the Plains-wanderer.
- Protect Aboriginal cultural heritage values.
- Minimise amenity impacts to residences.
- Minimising interactions with Biodiverse Riparian Land.
- Protect agricultural values.

Based on the assessment findings outlined in the EIS and supplemented by the Submissions Report and this Amendment Report, and subject to the implementation of the management, mitigation and offset measures to address these residual impacts (refer to **Appendix 3**), the site is considered suitable for the carrying out of the Amended Project.

7.4 Ecologically Sustainable Development (ESD)

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 and socio-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.

An updated evaluation of the Project against the principles of ESD is documented in the Submissions Report (Umwelt, 2025a), and has not materially changed as a result of the Amended Project. No further evaluation is required.

7.5 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 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 Infrastructure Road Map (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of approximately 803.7 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 collaboration with key stakeholders to avoid and minimise impacts to key environmental, cultural and social values where practicable, and to maximise potential benefits to impacted communities.

The assessment findings outlined in Section 6.0 of the Project EIS (Umwelt, 2024a), supported by further clarification and assessment presented in the Submissions Report (Umwelt, 2025a) and this Amendment Report, indicate that while there will be environmental and social impacts associated with the Project, the extent of impacts have been minimised through the design process. Where residual impacts are predicted, BWF has committed to management, mitigation and offset measures to address these residual impacts.

The Amended Project will provide long-term, strategic benefits to NSW, and at the regional and local levels, including:

- Renewable energy supply to assist with fulfilling the current obligations under State 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.
- Generating approximately \$1 billion in capital investment within NSW during construction.¹⁰
- Supporting a total of 180 FTE direct jobs on average over the Project's 35 month construction phase, increasing to 380 FTE jobs during peak construction. This includes an average of 15 FTE direct jobs sourced within the Hay Shire, Edward River and Murrumbidgee LGAs, rising to 35 during peak construction.
- Supporting an average of 290 FTE indirect jobs during Project construction, increasing to 610 FTE jobs during peak construction. This includes an average of 60 indirect jobs within the Hay Shire, Edward River and Murrumbidgee LGAs, rising to 120 FTE jobs during peak construction.
- Providing an overall construction phase stimulus within the Hay Shire, Edward River and Murrumbidgee LGAs estimated at 15% of the Project's EDC, or approximately \$380 million.¹¹ The total local construction phase stimulus includes approximately \$17.9 million in non-local worker wage stimulus.
- The Project's non-local construction workforce is expected to generate an accommodation need for an average of 165 FTE workers, rising to 345 FTE workers during peak construction. The proposed TWA has been designed with sufficient capacity to accommodate the minor increase in the peak construction workforce.
- Ongoing economic stimulus associated with the operation of the Project is estimated at approximately \$400 million over 30 years (CPI adjusted), relating to land holder leasing payments, operational wage stimulus, and community payments.
- Supporting an estimated average of 40 direct and 115 indirect FTE jobs nationally during operations. This includes 40 direct and 23 indirect operational jobs within the Hay Shire, Edward River and Murrumbidgee LGAs.

¹⁰ Capital investment within NSW is calculated at 40% of EDC. In the Project EIS, the EDC was calculated at \$2.5b, based on a 143 WTG layout. The EDC has not been recalculated to reflect the removal of two (2) WTGs in the Amended Project.

¹¹ Based on the calculation of EDC presented with the Project's EIS. The EDC has not been recalculated to reflect the removal of two (2) WTGs in the Amended Project.

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

- Payments to host and neighbouring landowners via private agreements and a community benefit sharing scheme.
- Annual payments to the community under Planning Agreements with each of the three (3) Councils.
- 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 the Project EIS, Submissions Report, and supplemented by the additional measures presented in **Appendix 2** this Amendment Report, 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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