Appendix H – Addressing the Terms of Reference (TOR) for Matters of National Environmental Significance (MNES) for the proposed Liverpool Range Wind Farm and Transmission Line

The following table demonstrates how each Commonwealth Department of Environment TOR has been addressed, either within the Environmental Assessment for the proposal or within the Biodiversity Assessment of the proposal. It cites the section number where the information is located and also provides relevant information in the table or as an attachment to this document, to facilitate assessment of Matters of National Environmental Significance (MNES).

Abbreviations:

BA TL: Biodiversity Assessment: Liverpool Range Wind Farm – Transmission Line Study Area, December 2013, included as Appendix C to the EA.

BA WF: Biodiversity Assessment: Liverpool Range Wind Farm – Wind Farm Study Area, December 2013, included as Appendix C to the EA.

DP&I: NSW Department of Planning and Infrastructure

EA: Environmental Assessment: Liverpool Range Wind Farm

MNES: Matters of National Environmental Significance

TOR: Terms of Reference

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
1	**The action**		
	Construction, operation and	Sections 3.10.1,	**Construction**

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	decommissioning details	3.10.2, 3.10.4 and Appendix G of the EA	The construction phase of the wind farm is likely to occur over at least a 24-36 month period and would include activities such as: • transportation of people, materials and equipment to site; • civil works for access track construction, turbine foundations and trenching for cables; • establishment, operation and removal at completion of any required construction equipment such as rock breaking equipment and concrete batching plants; • potential use of blasting in foundation excavation, if required; • installation of wind turbines using large mobile cranes; • construction of collection substations, connection to on-site 330kV transmission line, and onsite overhead powerlines and electrical cables; • construction of additional facilities (temporary and permanent) as required; • construction, use and removal of temporary offices and facilities; • temporary storage of plant and equipment; and • restoration and revegetation of disturbed onsite areas on completion of construction works. In general, construction would commence with site establishment, construction of access tracks and all other site civil works, including preparation of hardstand areas, and laying of cables. This would be followed by preparation of concrete and steel reinforced foundations, which must be cured prior to installation of wind turbines. Wind turbine construction and erection can be relatively fast once the foundations are prepared, with wind turbines installed at a rate of approximately 2-3 per week, subject to weather. The towers are erected in sections, the nacelles lifted to the top

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			of the towers, and finally blades lifted and bolted to the hub. The necessary substation construction and grid connection works would be carried out in parallel. The commissioning phase would include pre-commissioning checks on all high-voltage equipment prior to connection to the TransGrid transmission network. Once the wind farm electrical connections have been commissioned and energised, each wind turbine is then separately commissioned and placed into service. On completion of construction, disturbed areas would be remediated and all waste materials removed and disposed of appropriately. **Operation** While the wind farm operates largely unattended, the wind turbines and other equipment would require regular maintenance. It is possible that some equipment may require major repair or replacement. In addition, during the initial operating years, operator attendance may be more regular while wind farm operation is being fine-tuned and optimised. Once installed, the turbines would operate for an economic life of twenty to thirty years. After this time the turbines may be refurbished to improve their performance or decommissioned and removed from the site. *Routine Maintenance* - To ensure the wind farm operates in a safe and reliable manner, it would require regular inspection and maintenance on an 'as needs' basis. This would generally be carried out using standard light vehicles. In addition, regular scheduled maintenance is required, generally at 3, 6 and 12 monthly intervals. As a guide, each turbine requires approximately 7 days of maintenance per year. This does not require the use of major equipment, and could be carried out in a normal utility or small truck and would not require any additional

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			works or infrastructure. *Major Repairs* - It is possible that major unexpected or unscheduled equipment failures could take place during the life of the wind farm. While wind turbines and electrical components are designed for a 20 - 30 year life, failures can occur, for example due to lightning strike. Most repairs can be carried out in a similar manner to routine maintenance, with some exceptions: Replacement of wind turbine blades, if necessary, would require bringing new blades to the affected turbine and installation of these blades using large cranes. The requirements are similar to the construction phase, and the access tracks established for construction may need to be brought into operation again. Replacement of wind turbine generators or gearboxes may require a crane and low loader truck to access the wind farm. Replacement of substation transformers would require a low loader truck to access the site. *Site monitoring program* - A post-construction monitoring program would be established to determine any additional impacts resulting from the operation of the wind farm. The Operational Environmental Management Plan would contain specific monitoring programs required and would assess key issues such as noise compliance. **Decommissioning** Decommissioning the wind farm at the end of its commercial life is the Proponent's obligation and would be at their cost. It would involve reinstating similar road access arrangements to construction, and would require access for large cranes and transport vehicles to dismantle and remove the turbines. All underground foundations and cable trenches would remain in situ and all above ground

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			infrastructure would be removed. The decommissioning period is likely to be significantly shorter and with significantly fewer truck movements than the construction phase. It should be noted, based on current market data, that the scrap value of turbines and other equipment is expected to be more than sufficient to cover the costs of their dismantling and site restoration. Agreements with involved landowners ensure that the wind farm operator is responsible for decommissioning of the wind farm including the associated costs and site clean-up. A Decommissioning and Rehabilitation Plan for the proposal is attached as Appendix G to the EA.
	Staging and timing	Section 3.10 of the EA	It is possible that not all turbines, access tracks or other equipment outlined in this EA would be ultimately required for the project. Likewise, market, seasonal, or operational requirements may mean that the actual construction of the wind turbines may occur in stages or groups over a number of years. The precinct design concept outlined in Section **Error! Reference source not found.**0 of the EA indicates how construction of the site could be broken down into different stages over time. Each construction stage would go through similar processes and a similar timeframe to that outlined above.
	Other actions to which the action relates		Not applicable.
	Specific elements that may impact on MNES	BA TL, Sections: 7.2.2 Habitat Loss (Vegetation	The construction and operation of the wind farm and transmission line as described in the EA have potential for impacts on MNES, particularly White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, Finger Panic Grass *Digitaria porrecta, Bothriochloa biloba*, Bluegrass *Dichanthium setosum*, and

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
		Clearing), Box Gum Woodland CEEC, Hollows and Landscape Connectivity 7.2.3 Habitat Loss (microchiropteran bats) 7.2.4 Indirect and peripheral impacts BA WF, Sections: 9.2.1 Direct Habitat Loss (Vegetation Clearing) 9.2.2 Blade Strike/Collision Risk 9.2.3 Indirect habitat loss	the Large-eared Pied Bat *Chalinolobus dwyeri*. Specific infrastructure elements that would generate the impacts include clearing, noise and disturbance associated with wind farm and transmission line infrastructure construction: • Turbine components, Access roads and associated civil works, Electricity lines, overhead and underground, easement establishment. Additionally, operational impacts related to this infrastructure include: • Turbine operation, easement maintenance, access for component maintenance. Impacts of these activities are assessed in detail within the BA WF and BA TL.
2	**The environment including MNES**		
a	Listed species and communities		
	Scope, timing/effort and methods of surveys	BA TL, Sections: 4.4 Survey Effort	The survey methods, target species, number of surveys, effort expended (person-hours) and area covered are summarised in the BAs (also appended to this table, Attachment 1). The survey techniques include targeted searches in areas of suitable

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		BA WF, Sections: 4.2.2 Survey Effort Flora 4.3.2 Survey Effort Fauna	habitat as well as more general designed to detect a broad range of species. Specific to MNES, 26 threatened species, five vegetation communities and 14 migratory birds were returned for both the wind farm and transmission line study area searches. Relevant surveys included random meander, targeted flora surveys, bird census, reptile searches, spot lighting and call play back. Timing of surveys in mid-Spring corresponded with the peak flowering times for most plant species, to maximise likelihood of detecting threatened species. Threatened grass species are unlikely to have been seeding at the time of surveys and may have been less detectable as a result. Pre-construction surveys have been recommended to mitigate any potential impacts on these species. The timing of surveys was also appropriate for detection of threatened reptiles, frogs, migratory birds, and mammals (including bats). On the basis of the survey results, the evaluations undertaken in Appendix C (attached as Attachment 3 and 4) and Principle assessment of significance (undertaken where potential for impact was identified), the survey effort was considered sufficient to determine no community or species is at risk of a significant impact.
	Consistency with best practice guides and Australian Government guides	BA TL, Section 1.3.2 Guidelines and Approach for Assessment BA WF, Section 1.3.2 Guidelines and Approach for	Specific guidelines used in the preparation of this report include: • *Draft Guidelines for Threatened Species Assessment* (DEC, 2005); • *Biodiversity Offset Principles* (OEH); • *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities, Working Draft* (Department of Environment and Conservation NSW, November 2004);

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
		Assessment	• *National Wind Farm Development Guidelines – public consultation draft* (EPHC 2009); and • *Australian Wind Energy Association Best Practice Guidelines* (AusWind 2006).
3	**Impacts**		
a	Description of relevant impacts	BA TL, Sections: 7 Impact assessment 7.2.2 Habitat Loss (Vegetation Clearing), Box Gum Woodland CEEC, Hollows and Landscape Connectivity 7.2.3 Habitat Loss (microchiropteran bats) 7.2.4 Indirect and peripheral impacts 11 References (included as Attachment 2, below).	The nature and extent of direct and indirect, consequential, short and long-term impacts relevant to the proposal area are discussed in detail the BAs. Specific to MNES, the key impacts are: • Clearing native vegetation for construction of wind turbines and transmission lines and associated infrastructure – impact areas are estimated in each BA by vegetation type and infrastructure component. Relevant to MNES, loss of habitat for two entities (Box Gum Woodland and the Large-eared Pied Bat) and potential habitat for three entities (Finger Panic Grass*, Bothriochloa biloba*, Bluegrass) would result. No significant impacts on any of these entities are considered likely to occur. Additionally, removal of hollow-bearing trees and impacts on landscape connectivity would result from the proposal. Given the mitigation strategies proposed, no significant impacts to the number of hollows or landscape connectivity would result. • Collision risks and potential for alienation to EPBC listed birds and bats during wind turbine operation – this applies to those species likely to fly at rotor height and have low ability to manoeuvre around turbines. EPBC listed species at higher risk include the Wedged tailed Eagle, buffer distances are included in mitigation measures to address risks to this species. A large number of turbines were also removed from the proposal design after

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		BA WF, Sections: 9 Impact assessment 9.2.1 Direct Habitat Loss (Vegetation Clearing) 9.2.2 Blade Strike/Collision Risk 9.2.3 Indirect habitat loss 13 References (included as Attachment 2, below).	consideration of potential impacts to birds and bats from infrastructure. • Indirect impacts to residual habitat (exacerbation of fragmentation, weed ingress, spill risks, noise and dust) associated with clearing easements, in particular. Given the mitigation strategies proposed, these risks are highly manageable and non-significant. **Known, unpredictable or irreversible** The clearing impacts that will accompany construction have been estimated based on an indicative infrastructure layout overlaid on field validated vegetation mapping for the site and are therefore precise. Mechanisms to account for 'micrositing' or other changes to the layout have been addressed by the emphasis on the preparation of detailed management plans to carry through management prescriptions and design measures into the final onground action. The impacts are highly predictable and as plans must be endorsed prior to the clearing, are considered to be reliable to manage clearing impacts. Collision and alienation effects for birds and bats have been assessed with reference to the latest available literature. Little of this is specifically applicable to the Liverpool site, although specific studies of several species relevant to the site have been sourced– for example the Wedge-tailed Eagle. Mechanisms to account for uncertainty have been addressed by the emphasis on the preparation of detailed bird and bat management plan and design measures to reduce risk factors (such as buffers and turbine spacing). As a worst case scenario, turbines can be switched off for specific periods or decommissioned, should monitoring data detect a risk that was not apparent during the assessment of the proposal. The bird and bat plan is primarily a means to confirm the assumptions of the assessment while providing an 'insurance' against uncertainty. Indirect impacts, such as noise during construction and fragmentation of habitat have been assessed as manageable. These impacts accompany large construction

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			projects and have been assessed with a high degree of certainty. Similarly, their management is a routine part of large scale developments and subject to auditing and independent review. **Technical data used make a detailed assessment of relevant impacts** The assessment is primarily based on survey data collected from onsite and locality surveys to characterise environmental values, literature pertaining to ecological features (MNES including the Box Gum Woodland CEEC and threatened and migratory species) and literature pertaining to impact types and risks of the development. This includes published monitoring data from several wind farms. The references used to prepare the BA WF and BA TL are attached (Attachment 2).
b	Cumulative impacts	Sections 1.8 and 9.1.4 of the EA. BA TL, Sections: 7 Impact assessment 7.2.2 Habitat Loss (Vegetation Clearing), Landscape Connectivity BA WF, Sections: 9 Impact assessment 9.2.1 Direct Habitat Loss (Vegetation	The EA contains an assessment of cumulative environmental impacts. It considers the potential impact of a proposal in the context of existing developments and future developments to ensure that any potential environmental impacts are not considered in isolation. There are a number of proposed, approved and operating wind farm developments within New South Wales which are illustrated in the Landscape and Visual Impact Assessment attached as Appendix A to the EA). The number and location of wind farms is likely to change as more wind farm proposals are announced and enter the planning system. The Kyoto wind farm development is currently the only approved wind farm development in the Upper Hunter Renewable Energy Precinct. With an approval for up to 34 wind turbines, the Kyoto wind farm development has yet to commence construction. The Liverpool Range wind farm development would be located approximately 70 km to the west of the Kyoto project site. Specific to MNES, relevant cumulative potential impacts of multiple wind farms in close proximity of one another might be increased collision risks, alienation effects

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		Clearing) 9.2.2 Blade Strike/Collision Risk	(including barrier effects) and fragmentation due to clearing. (These impact types are discussed in the impact assessment sections of the BAs and have been summarised in Point 3a of this response). However, given the distance between the Kyoto wind farm and the Liverpool wind farm, no cumulative biodiversity impacts would result from their concurrent construction, operation or decommissioning.
c	Impact on local, regional, state, national and international scale	BA TL, Section 2 BA WF, Section 2	The installation and operation of wind farms have the following characteristics that make it necessary to examine a broad environmental context when assessing their impact: • Turbine arrays may cover multiple ridge tops in an area; • Turbine arrays may affect migration paths / movement corridors of local and non-local birds and bats; • The transmission easements required to connect the wind farms to the electricity grid can be long, potentially fragmenting areas of habitat for flora and fauna; • Avoidance behaviours by birds may result in indirect loss of habitat if the entire wind farm envelope is avoided. Information is provided in the TL and WF BA to provide the regional context to the development. It was considered in developing the survey plan for the proposal, including which threatened or high-risk species and/or communities to target and the methods applied. The information has also been considered when assessing impacts in relation to how the potential impact from the proposal may affect important regional resources and the dispersal or movement of native flora and fauna beyond the immediate Development Footprint. While outside of the scope of the Biodiversity Assessment, it should also be acknowledged that as a renewable energy proposal, the proposed development

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			would assist in the mitigation of rising global greenhouse gas emissions, and thereby the future impact of climate change, by providing a source of energy that is not dependent on the burning of fossil fuels. Therefore, long term outcomes of the proposal are also likely to have positive impacts on biodiversity at an international scale, due to the potential changes in community composition and species declines that have been linked to climate change. Specifically to MNES, no significant local, regional, state, national or international scale adverse effect is anticipated due to the development.
4	**Avoidance and mitigation measures / alternatives**		
a	Proposed avoidance and mitigation measures	BA TL, Section 11 References BA WF, Section 13 References Included as Attachment 2, below. BA TL, Section 1.3.2 Guidelines and Approach for Assessment BA WF, Section 1.3.2 Guidelines and Approach for Assessment	The full list of biodiversity mitigation measures that accompany the proposal are found in the BA WF and BA TL. Specific TOR queries are addressed below. **Relevant agreements and plans** The proposal is part of a bilateral agreement, meaning that, from the proponent's point of view, the NSW state government accepts the role of ensuring that MNES are met for the proposal. Plans accessed in the assessment of impact and the formulation of mitigation measures relevant to MNES include: • *National Recovery Plan for Superb Parrot Polytelis swainsonii* • *Threat abatement plan for beak and feather disease affecting endangered passerine species* • *National Wind Farm Development Guidelines – public consultation draft* (EPHC 2009)

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		BA TL, Section 9 Recommendations BA WF, Section 11 Recommendations	• Coolah Tops National Park Plan of Management **Responsibility for management** The proponent would be solely responsible for each of these measures, as a condition of the project being approved. No measures are proposed to be the responsibility of any government authority. **Efficacy of mitigation measures** The measures, as worded, are expected to be effective for the following reasons: • The have been developed by an organisation with experience in wind farm and electricity transmission projects as well as on-ground management of wind farm and transmission line development. **ngh**environmental have assessed over ten wind farm proposals, provided biodiversity assessments for over ten and have provided onground and environmental management support for an additional six projects during construction and or operation. **ngh**environmental have provided independent Environmental Representatives to four wind farms, responsible for ensuring that conditions of consent are met by the proposal. The measures therefore, have been developed specific to the requirements of this type of infrastructure proposal. The key feature being the need to retain some flexibility in the final infrastructure layout. Specific to MNES, measures include management plans to monitor bird and bat impacts of the operational turbines. Pre-clearance surveys for cryptic species including *Bothriochloa biloba*, *Dichanthium setosum*, and *Digitaria porrecta* will be carried out in appropriate habitat types to inform micrositing and mitigate any impacts on these species. In addition, three different TL routes were surveyed and assessed in order determine the most ecologically friendly option, particularly with respect to clearing of remnant and well-connected Box Gum Woodland, for which routes varied between 3.9 hectares and 23

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			hectares. • The have been worded so that they are not overly prescriptive, but are objective-orientated; they are structured as sets of protocols that apply to different aspects of the proposal. Specific to MNES, measures include weed management, general habitat management, habitat connectivity, etc. This will allow for the most practical on-ground implementation to achieve the objective. A series of subplans will be developed in construction and operation to ensure all of these protocols are captured and implemented in an auditable manner. • Collection of additional data has been included as a mitigation measure, where the information is required to provide more certainty regarding the success of the measure. Specific to MNES, measures include (1) additional survey work for Corben's Long-eared Bat, should very large areas of Sandstone Forest (e.g. in Durridgere SCA) be cleared for the proposal; (2) additional targeted surveys for cryptic threatened plant species within suitable Sandstone Forest habitat, pending final infrastructure layouts; (3) pre-clearance surveys for federally-listed grass species, as above; and (4) the production and implementation of an adaptive Bird and Bat Management Plan. **Scale of development** Overall, the scale and intensity of the development is reflected by the format of the mitigation measures. That is, an environmental management framework has been developed within which additional information will be required to produce the detailed management plans that will ensure effective on-ground outcomes. Endorsement of these plans will be a requirement of project consent. **Outcomes of mitigation measures**

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			The proposal has been refined in the following ways to avoid impacts: • The total number of turbines has been reduced from 417 to 288 by removing 130 turbines from the far north-eastern section of the wind farm adjacent Coolah Tops National Park. This area was identified in the 2012 assessment as highly constrained – it may have created a barrier to the movement of birds and bats given its close proximity to Coolah Tops National Park. • Turbine spacing has been maximised so that, in general, the turbines are between 350 m and 600 m apart. Approximately a quarter of the turbines are more than 500 m apart. This will allow birds and bats greater opportunity to pass between turbines, thereby reducing collision risk. • Avoidance of moderate-good or good quality EEC within the Wind Farm Study Area; the Wind Farm development envelope has been altered in this area to avoid CEEC. • Conduct searches for grasses Bluegrass (*Dichanthium setosum*), Lobed Bluegrass *(Bothriochloa biloba*) and Finger Panic Grass (*Digitaria porrecta*) - a pre-clearance survey should be undertaken and if found infrastructure should be microsited around populations if they are found. Specific to MNES, the outcomes tha**t** the avoidance and mitigation measures will achieve are: • Avoiding EEC and impacts to EPBC listed threatened flora • Monitoring of bird and bat collisions with operational turbines, to verify the assumptions of the assessment and take risk management actions should additional impacts be detected. This will take in all species though will be

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			focussed on higher risk species in terms of response actions. • Monitoring of bird and bat avoidance or alienation impacts, to verify the assumptions of the assessment and take risk management actions should additional impacts be detected. This will take in all species though will be focussed on higher risk species in terms of response actions. • Offsets, in accordance with NSW policies, to ensure that all impacts to native vegetation are appropriately offset and that an overall 'maintain or improve' environmental outcome is met for the project. This is more than is required under the EPBC Environmental Offsets Policy (EOP) but will have broader benefits by protecting and preserving habitat for species including those listed under the EPBC Act. **Statutory/policy basis and cost of measures** The proposal is considered a State Significant Development in NSW, and is assessed under Part 4 of the Environmental Planning and Assessment Act 1979. The mitigation measures detailed in the BAs and included in full within the EA for the proposal form part of the proposal's description. They are commitments which would become conditions of the project's consent, pending approval, along with any additional measures imposed by the NSW Department of Planning and Infrastructure (DP&I). DP&I are the consent authority. The cost of the mitigation measures has been factored into the proposal's development. The costs of the measures are practical and achievable for the proposal.
b	Detailed outline for continuing management, mitigation and monitoring, relevant to MNES	BA TL, Section 9 Recommendations BA WF, Section 11	The mitigation measures provided in EA are separated for each stage of the proposal – construction, operation and decommissioning. With regard to environmental outcomes, performance criteria, monitoring,

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		Recommendations	reporting, corrective actions, contingencies, responsibility and timing for each measure, these components would be captured during the preparation of environmental management plans, required to be prepared in accordance with DP&I guidance documents and endorsed by the DP&I, prior to impacts of each stage (refer to Guideline for the Preparation of Environmental Management Plans, Department of Infrastructure, Planning and Natural Resources, 2004 is attached, http://www.planning.nsw.gov.au/rdaguidelines/documents/emp_guideline_publication_october.pdf). As stated above, an environmental management framework, rather than the submission of detailed management plans, with this proposal submission reflects the scale of the development. It also reflects the nature of the development; flexibility which is retained in final infrastructure placement at this time. The additional detail required of the management plans will ensure effective on-ground outcomes. The detailed plans will be prepared in consultation with relevant stakeholders. For biodiversity, this will include the NSW Office of Environment and Heritage. Specific to MNES, not species-specific plans are anticipated to be required. Plans which will cover MNES however, include: • Soil and water management plan • Weed management • Flora and fauna management plan • Bird and bat monitoring These plans are endorsed by the DP&I, prior to impacts of each stage, and audited by an Environmental Representative, approved by DP&I, in environmental management reporting that would be required under the NSW project consent. It is usual that annual reports are prepared as well as more frequent reporting prior to operation. Bird and bat reporting is generally between 2-5 years.

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c	Agency responsible for approving or endorsing mitigation measures		DP&I is the consent authority for this proposal. Conditions of consent related to the detailed biodiversity management plans are likely to require consultation with NSW OEH as well as local Land Services and Councils. Overall responsibility for endorsement of these construction, operation and decommissioning plans however, will remain with DP&I. The proponent's preference is to establish Conservation Property Agreements to secure land in perpetuity to be managed for biodiversity outcomes. These are set up by Lands Services and attached to the land title, so are effectively administered by local Councils. Securing and managing the offset site however, remains a condition of project consent and so for the life of the development is also enforceable by DP&I.
	Alternatives		
a	Alternative of taking no action		Not Applicable.
b	Comparative description of impacts of alternatives on the NMES	Section 5 of the EA.	The alternatives considered for this proposal represent different infrastructure layouts for the wind farm and the powerline. Detailed maps of each of these alternatives have been provided in Appendix E of the attached Biodiversity Assessment. For the wind farm study area (which covers the northern section of the proposal area and includes the turbine array and a section of the powerline), two alternative infrastructure layouts were considered, a preferred option and an alternative option. The alternative option differs from the preferred option only slightly, in that it includes one additional substation, a shorter transmission line (by 2 km), and 200 m of additional overhead powerline. Thus the difference in impact areas between the preferred and alternative options is only 0.8 hectares. For the powerline study area (which covers the southern section of the proposal area and includes the majority of the powerline), three separate options were

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			considered, consisting of a preferred route, a first alternative and a second alternative. These routes differ in their total length (and thus maximum areas of vegetation to be cleared), with the preferred route being 39.7 km in length (impact area 233.1 hectares), the first alternative being 43.5 km long (impact area 261.3 hectares), and the second alternative being 51.8 km long (impact area 303.9 hectares). Regarding MNES, it is noted that the impact on Box Gum Woodland varies considerably between transmission line route alternatives, with the preferred option clearing just 3.9 hectares, the first alternative option clearing 23 hectares, and the second alternative clearing 14 hectares.
c	Why any alternative is preferred to another	Section 5 of the EA.	Flexibility in certain elements of the infrastructure is required until a competitive tender process is completed. Ongoing data being generated for the site will also be used to hone the final infrastructure layout, to maximise the efficiency of the infrastructure (movements in response to wind monitoring data, geotechnical surveys) and minimise impacts of the construction and operation (including noise, visual, biodiversity impacts among others). The BAs clearly state which options are of least biodiversity impact, so that this is a factor in finalisation of the layout Although some options would clearly have less environmental impact, all options presented in the BAs have been deemed acceptable and manageable, with respect to MNES. Specific recommendations have been made where alternatives are not deemed acceptable so that important features will be avoided. This is mostly with respect to the micrositing of infrastructure components to avoid areas of high conservation significance, including threatened plant populations, hollow-bearing trees, Box Gum Woodland, migratory birds (e.g. Square-tailed Kite, which is not listed as a MNES but is a rare migratory raptor).
5	**Residual impacts / offsets**		

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a	Residual impacts on MNES, after avoidance and mitigation		The development cannot be confined to wholly exotic dominated areas or existing developed areas. Avoidance of EPBC listed CEEC and flora has been able to be achieved by the proposal. Residual impacts are present to birds and bats, as habitat for these species will be removed and collision and alienation risks have been identified. No significant residual impacts have been assessed as likely to occur for any MNES. Therefore, no offsetting has been proposed under the EPBC Environmental Offsets Policy (EOP).
	Offsets	BA TL, Section 9.3 Measures to offset impact and Appendix F. BA WF, Section 11.3 Measures to offset impact and Appendix F.	In accordance with NSW policies, to ensure that all impacts to native vegetation are appropriately offset and that an overall 'maintain or improve' environmental outcome is met for the proposal, an offset package is proposed to mitigate residual impacts. An Offset Plan would be prepared in consultation with relevant stakeholders (likelyt to be NSW OEH, local Councils and Catchment Management Authorities). The offset plan could provide efficiencies by also satisfying the requirements of the EPBC Environmental Offsets Policy (EOP), if required. It is noted that offsetting MNES is only required where the impact is likely to be significant. The BAs have assessed that no significant residual impacts are likely to occur for any MNES.
6	**Environmental record of persons proposing to undertake the action**	Section 2.2 of the EA	Epuron is a leading Australian renewable energy company with a focus on development of utility-scale wind and solar energy and has been developing projects in NSW since 2003. Epuron has a successful track record in developing wind farms including the Conroys Gap, Cullerin Range, Gullen Range, Silverton Wind Farm and White Rock Wind Farm. The Cullerin Range Wind Farm is now in operation and the Gullen Range Wind Farm is under construction.

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7	**Economic and social matters**	Section 16.4 of the EA	The proposal generally enjoys broad community support and would provide temporary employment opportunities during construction and decommissioning. The increased demand for services in the local area, most likely during the construction phase, would also accompany the development, as contractors seek accommodation and utilise other services in the local area. While it is hard to predict the exact amount of investment that will be injected into the local economy, there have been studies conducted to calculate the likely impacts based on the size of a proposed wind farm. The Clean Energy Council commissioned Sinclair Knight Merz (SKM) to prepare a report into the investment costs and benefits of wind farms in Australia. SKM released the report '*Wind Farm Investment, Employment and Carbon Abatement in Australia'* in June 2012 which presents an updated national and state-based snapshot of wind farm investment, jobs and carbon abatement. Using the estimations from this report, it is anticipated that $259 million could be spent within the region as a result of the construction phase of the wind farm. There is an opportunity for local contracting and manufacturing services to be contracted during the site development. These may include concreting, earthworks, steel works and electrical cabling. As well, other service-related employment would follow, with the provisions for food, fuel, accommodation and other services for the contractors. Based on the construction phase spanning 24-36 months, employment would likely increase by around 829 full time equivalent jobs across the local area. It is considered that construction, property and business services and retail trade would make up most of the employment growth. Precise economic benefits would vary on the final site design, turbine suppliers, timing of works and other details. Currently there are no facilities capable of making turbine components (nacelles and blades) in Australia. There may be potential for manufacturing towers in Australia. There are a number of constraints related to the potential of the socioeconomic impacts described. These include supply-side constraints, primarily the supply of labour. Furthermore, the capacity of local business to service new contracts,

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
			together with the quality of local housing, amenities and other physical and social infrastructure are also factors that may affect the ability to attract and retain workers. Using the SKM model it is estimated that over $2.3 million would be spent during the construction period by workers in the local community. **Error! Reference source not found.** highlights these estimated annual values.
8	**Information sources provided**	BA TL, Section 11 References BA WF, Section 13 References Included as Attachment 2, below.	Attachment 2 cites the references relied on to assess the impacts of the proposal. The dates are supplied and they can be seen to be current. Most are published sources and therefore considered highly reliable. Uncertainties in information and information gaps have been cited within the assessment. Where the uncertainty has affected the assessment, we have (1) used our own site-specific data collected during field surveys, (2) been precautionary, or (3) applied a mitigation mechanism to address the uncertainty. Three examples of this relevant to MNES are further targeted survey for threatened flora (including three threatened grass species), strict management of Box Gum Woodland clearing, and bird (migratory species) and bat (e.g. Large-eared Pied Bat, Corben's Long-eared Bat) monitoring. Relevant wind farm assessment guidelines, plans and policies are included in the reference list.
9	**Conclusion**		
a	Requirements of EPBC Act and ESD		The proposal addresses the relevant requirements of the EPBC Act. Specifically, it: • Identifies all MNES relevant to the proposal, through data base searches and on-ground validation. It assesses the impacts and includes management measures to ensure that impacts are avoided where possible and minimised to an acceptable level, where avoidance is not possible. • In this way, it protects and conserves MNES and promotes sustainable use of natural resources.

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
			• The management frame work proposed provides a collaborative platform to ensure the input of all relevant stakeholders in the preparation of detailed management plans. • In considering MNES relevant to the proposal, it assists meet Australia's international environmental responsibilities for relevant entities (such as migratory birds). • It fulfils consultation requirements regarding indigenous people with an interest in the site and the proposal. The proposal addresses the principles of Environmentally Sustainable Development. Specifically, it: • Considers long-term as well as short term economic, environmental and social impacts of the proposal, for each separate stage of the development (construction, operation, decommissioning), where relevant. • It addresses uncertainty and does not use it as a reason for inaction. Three examples include: 1) the biodiversity assessments apply literature and data collected from other projects to inform the assessment and mitigation of impacts at this site, 2) it proposes a bird and bat management plan as an 'insurance' plan for unexpected consequences, and 3) it uses risk assessment which aims to identify higher risks (such as irreversible population level impacts) in the assessment of impact. • As above, it considers long-term impacts. It is noted that the transition from fossil fuel to renewable technologies marks an important action for future generations. • It considers the health and viability of listed entities in the assessment and thereby, the conclusions and recommendations of the assessment are aimed at maximising diversity and ecological integrity, at the local and regional scale.

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
b	Justification for undertaking the proposal in the manner proposed, acceptability of mitigation measures	Section 4 of the EA	Justification for the proposal has been considered in the context of its local and regional setting. It provides an overview of the energy supply/demand context and in particular the need for additional electricity supply in NSW. The key factors justifying the need for the proposal in the current market conditions include; ▸ Electricity consumption continues to grow, and the additional demand must be met by either increased fossil fuel generation or an increase in generation from renewable sources such as wind power. ▸ The use of renewable energy, such as wind, to provide additional capacity for electricity generation in NSW supports state and federal government policy objectives. These policy objectives are primarily set to combat climate change impacts through a reduction in greenhouse gases. ▸ In full operation, the proposal would generate more than 2,725 GWh of electricity per year - sufficient for the average consumption of around 340,600 homes. ▸ The proposal would reduce greenhouse gas emissions by approximately 2,634,800 tonnes of carbon dioxide equivalent (CO_2e) per annum[1] or the equivalent of 717,000 cars removed from the roads. ▸ The proposal would contribute to the State and Federal Governments' target of providing 20% of consumed energy from renewable sources by 2020. ▸ The proposal would contribute to the NSW Government's target of reducing greenhouse gas emissions by 60% by the year 2050. Suitability of the proposal site in terms of location, scale, wind energy potential and

[1] Calculated using the NSW Wind Farm Greenhouse Gas Savings Tool developed by DECCW

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
			compatibility with existing land uses has also been considered in terms of its overall justification. The key factors justifying development of the proposal at this location are; • The area's excellent wind resource which has been proven feasible for the development and long term operation of a wind energy facility. • The relatively sparse density of residences within the vicinity of the proposal site. • Suitable proximity to an existing high voltage electricity grid network for connection. • Acceptable environmental impacts, as demonstrated by the specialist technical studies and investigations. • General community support for the proposal in the region from the community and local government. • Creation of local employment opportunities and inject funds of up to $1,272 million into the Australian economy. • Creation of potential secondary benefits and opportunities for improvements in infrastructure, tourism and the establishment of a a community enhancement fund. • The proposal site is well suited to development in regards to landowner support, land use, wind resource and grid connection.
c	Residual impacts and offsets		Avoidance of EPBC listed CEEC and flora has been able to be achieved by the proposal. Residual impacts are present to birds and bats, as habitat for these species will be removed and collision and alienation risks have been identified. No significant residual impacts have been assessed as likely to occur for any MNES.

TOR Number	Requirement	Section in Assessment Documentation	Additional information / relevant information from EA or BAs
			Therefore, no offsetting has been proposed under the EPBC Environmental Offsets Policy (EOP). Management measures have been provided in an object-orientated manner, to allow more detailed information to inform the on ground management of construction and operational impacts, following the completion of the detailed design. This is considered highly appropriate to the type and scale of the proposal. It is noted that, in accordance with NSW offset policies, an offset plan would accompany the proposal. It would require a 'like for like' offset, meaning that any habitat for species listed under the EPBC Act affected by the development, would be offset, beyond what is required by the Commonwealth EOP. EPBC species would also be considered in the development and implementation of the bird and bat management program accompanying the proposal.

Attachment 1 Survey effort

Transmission line

Transmission line flora effort summary.

Date	Method	Target species	No. Surveys	Effort - Time			Effort - Area	
				Time Spent / per survey	No. People	Total (hrs)	Area Covered	Known Total (ha)
2012 Field survey								
Oct 8-19	Random meanders (including targeted searches)	All flora species	41	30mins ea.	1	20.5	50m X 50m	10.25 ha
	Inspection searches	All flora species	30	10 mins ea.	1	5	25x25m	1.875 ha
2013 Field survey								
Oct 1-8	Random meanders (including targeted searches)	All flora species	90	30mins ea.	1	45	50m X 50m	22.5 ha
	Inspection searches	All flora species	59	10mins ea.	1	9.8	25m X 25m	3.6875 ha
TOTAL						**80.3 hrs**		**38.3125 ha**

Transmission line fauna effort summary.

Date	Method		Target Species	No. Surveys	Effort - Time			Effort - Area	
					Time Spent	No. People	Total (hrs)	Area Covered	Known Total (ha)
2012 Field survey									
Oct 8-19	Habitat assessment, including Hollow-bearing tree survey		All species	49	20 mins ea.	1	16.3 hrs	50mx50m	12.25 ha
	Bird survey		All birds	49	10 mins ea.	1	8.2 hrs	50mx50m	12.25ha
	Herpetofauna search		All reptiles	49	10 mins ea.	1	8.2 hrs	50mx50m	12.25ha
	Bird utilisation survey		All birds	17	30 mins ea.	1-2	8.5 hrs	~100x100m	17 ha
	Extended herpetofauna search		All species	7	30 mins ea.	1-2	3.5 hrs	50mx50m	1.75ha
	Nocturnal Survey	Stagwatching / Evening listening	All nocturnal fauna, with focus on threatened species	10	20 mins ea.	2	6.7 hrs	N/A	N/A
		Spotlighting - On-foot	All nocturnal fauna, with focus on threatened species	10	60 mins ea.	2	20 hrs	N/A	N/A
		Spotlighting -Vehicle-based	All nocturnal fauna, with focus on threatened species	8	30 mins ea.	2	8 hrs	N/A	N/A
		Call Playback	All nocturnal fauna, with focus	8	30mins ea.	2	4 hrs	N/A	N/A

Date	Method		Target Species	No. Surveys	Effort - Time			Effort - Area	
					Time Spent	No. People	Total (hrs)	Area Covered	Known Total (ha)
			on threatened species						
	Anabat		Microchiropteran Bat species	11	8 hrs		88 hrs	N/A	N/A
2013 Field survey									
Oct 1-8	Habitat assessment, including Hollow-bearing tree survey		All species	86	20 mins ea.	1	28.7 hrs	50mx50m	21.5 ha
	Bird survey		All birds	86	10 mins ea.	1	14.3 hrs	50mx50m	21.5 ha
	Herpetofauna search		All reptiles	86	10 mins ea.	1	14.3 hrs	50mx50m	21.5 ha
	Bird utilisation survey		All birds	39	30 mins ea.	1-2	19.5 hrs	~100x100m	39 ha
	Extended herpetofauna search		All species	21	30 mins ea.	1-2	10.5 hrs	50mx50m	5.25 ha
	Nocturnal Survey	Stagwatching / Evening listening	All nocturnal fauna, with focus on threatened species	11	20 mins ea.	2	7.3 hrs	N/A	N/A
		Spotlighting - On-foot	All nocturnal fauna, with focus on threatened species	11	60 mins ea.	2	22 hrs	N/A	N/A
		Spotlighting -Vehicle-based	All nocturnal fauna, with focus on threatened species	9	30 mins ea.	2	9 hrs	N/A	N/A
		Call Playback	All nocturnal fauna, with focus on threatened species	11	30 mins ea.	2	11 hrs	N/A	N/A
	Anabat		Microchiropteran Bat species	31	8 hrs	N/A	248 hrs	N/A	N/A
	IR Camera		All nocturnal fauna, with focus on threatened species	67	8 hrs	N/A	536 hrs	N/A	N/A
TOTAL				**676**			**1092 hrs**		**164.25**

Wind farm

Wind farm flora survey effort summary.

Date	Method	Target Species	No. Surveys	Effort - Time			Effort - Area	
				Time Spent	No. People	Total (hrs)	Area Covered	Known Total (ha)
Oct 8-19 2012 Oct 1-9 2013	Random meanders (including targeted searches)	All flora species	79	30 mins ea.	1	39.5	50m X 50m	19.75 ha
	Inspection searches	All flora species	77	10 mins ea.	1	12.8	25x25m	4.81 ha
						52.3 hrs		**24.56 ha**

Wind farm fauna survey effort summary.

Date	Method		Target Species	No. Surveys	Effort - Time			Effort - Area	
					Time Spent /survey	No. People	Total (hrs)	Area Covered	Known Total (ha)
Oct 8-19 2012 Oct 1-9 2013	Habitat assessment, including Hollow-bearing tree survey		All species	84	20 mins ea.	1	28	50x50m	21
	Bird survey		All birds	85	10 mins ea.	1	13.2	50x50m	21.25
	Herpetofauna search		All reptiles	79	10 mins ea.	1	13.2	50x50m	21.25
	Bird utilisation survey		All birds	24	30 mins ea.	1-2	12 hrs	~100x100 m	24
	Extended Herptofauna search		All species	11	30 mins ea.	1-2	5.5 hrs	50x50m	2.75
	Nocturnal Survey	Stagwatching / Evening listening	All nocturnal fauna, with focus on threatened species	15	20 mins ea.	2	10hrs	N/A	N/A
		Spotlighting - On-foot	All nocturnal fauna, with focus on threatened species	15	60 mins ea.	2	30hrs	N/A	N/A

Date	Method		Target Species	No. Surveys	Effort - Time			Effort - Area	
					Time Spent /survey	No. People	Total (hrs)	Area Covered	Known Total (ha)
		Spotlighting - Vehicle-based	All nocturnal fauna, with focus on threatened species	13	30 mins ea.	2	13hrs	N/A	N/A
		Call Playback	All nocturnal fauna, with focus on threatened species	13	30mins ea.	2	6.5hrs	N/A	N/A
	Anabat		Microchiropteran Bat species	16	8 hrs		128hrs	N/A	N/A
							259.2hrs		**90.25 ha**

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Transmission line

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Attachment 3 EPBC listed matters evaluation table – transmission line

Entities returned from EPBC searches for the transmission line study area. This evaluation considers the potential for impact for each species. This evaluation is includes as Appendix C of each of the BAs.

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Flockton Wattle ***Acacia flocktoniae*** **V TSC** **V EPBC**	Shrub 2-3m in height, with angled glabrous branchlets, phyllodes straight, linear. Fl June-Aug. On sandstone, Blue Mountains and south.	Known from the Goulburn River NP.	Present	Unlikely	Low	No records within the Study Area.
Granite Boronia ***Boronia granitica*** **V TSC** **E EPBC**	Granite Boronia is a medium-sized shrub 0.6 - 2 m tall. It occurs in scattered localities on the New England Tablelands and North West Slopes north from the Armidale area to the Stanthorpe district in southern Queensland. It can be locally common in appropriate habitat.		N/A	N/A	N/A	No records within the Study Area.
Commersonia rosea **E TSC** **E EPBC**	Prostrate shrub with trailing branches to 60cm. Known from 4 localities within 8km radius of Sandy Hollow, upper Hunter Valley. Post-fire coloniser. Grows in skeletal sandy soils in scrub or heath with occas emergent *E. caleyi, E. crebra, Callitris endlicheri*.	Known to occur in Goulburn River NP.	Present	Unlikely	Low	No records within the Study Area.
White-flowered Wax Plant ***Cynanchum elegans*** **E TSC** **E EPBC**	A climber growing in rainforest gullies and on scree slopes, NC, CC, CWS, and west as far as Merriwa in the upper Hunter Valley. Habitat includes dry and littoral rainforest, red gum woodland, spotted gum open forest. Majority of known populations are <30 plants.	Records known from Goulburn River NP, Wollemi NP.	Marginal	Unlikely	Low	Suitable habitat is limited within the study area and no records in area.
Bluegrass ***Dichanthium setosum*** **V TSC** **V EPBC**	Grows in woodland and grassland, NT, NWS, CWS, NWP, Q, WA. Associated with heavy basalt soils, often in moderately disturbed areas such as cleared woodland or roadsides. Either tolerates or is advantaged by disturbance. Can be locally common or scattered plants. Associated species include *E. albens, E. melliodora, E. viminalis, Aristida ramosa, Themeda australis, Bothriochloa macra, Poa sieberiana*.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Marginal	Unlikely	Low	Possible occurrence in more suitable habitat at the northern end within Windfarm study area.

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Finger Panic Grass ***Digitaria porrecta*** **E TSC** **E EPBC**	In grassland, woodland or open forest on better soils, NWS, Q. From near Moree south to Tambar Springs and from Tamworth to Coonabarabran, mostly on private property, roadsides or TSRs. Flowers mid-Jan to late Feb. Frequent associates include *E. albens, Acacia pendula, Austrostipa aristiglumis, Enteropogon acicularis, Hibiscus trionum*.	OEH Atlas – 3 records (dated 2004) located approx. 5km NW of the proposed wind farm site.	Marginal	Unlikely	Low	Possible occurrence in more suitable habitat at the northern end within Windfarm study area.
Lobed Blue-grass **Bothriochloa biloba** **V EPBC**	Bothriochloa biloba is an erect or decumbent perennial grass to 1 metre high. In NSW the species is widespread along the New England Tablelands and North West Slopes and Plains, including Warialda, Bingara, Merriwa, Hunter Valley and Dubbo areas. It also occurs in Southern Queensland. Prefers (but not limited to) heavy textured soils, such as brown or black clay soils. Flowers from November to June.	OEH Atlas – 2 records located north of Turill SCA and several records located along Warrumbungles Way towards Coolah.	Marginal	Possible at N end, records nearby	Mod	**Assessment of Significance under the EPBC Act undertaken**
Euphrasia arguta **CE EPBC**	An erect, semi-parasitic annual herb known from Nundle State Forest and adjacent private land where it was rediscovered in 2008 (NSW DPI 2008). These populations occur at the border between the New England Tableland and the North Coast Bioregions (NSW DECCW 2010). Prior to this, the species had not been sighted since 1904 and was previously known from Sydney to Bathurst and north to Walcha, NSW. Collections had also been made from Nundle on the New England Tableland; the Paterson and William Rivers in the Hunter Valley; Mudgee; and the plains near Bathurst (Bentham 1869 cited in Leigh *et al.* 1984). Habitat is said to be grassy area near rivers, presumably in good condition.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Present	Unlikely	Low	No records within the Study Area.
Diuris pedunculata **Small Snake Orchid** **E TSC** **E EPBC**	Moist grassy areas in sclerophyll forest, Sydney to Tenterfield. Flowers Aug-Sept (Flora of NSW) or Oct (DECCW). Distribution is "mainly NE Tableland, grassland, in stony soils on low ridges or moist flats." (Bishop, 2005).	No records within the Study area.	Marginal	Unlikely	Low	No records within the Study Area.
Eucalyptus camaldulensis **population in the Hunter catchment** **End. Pop. EPBC**	Widely distributed on alluvial soils near permanent water west from Singleton (from Bylong south of Merriwa east to Hinton in Port Stephens LGA, on the Hunter River, mostly on private property (only coastal occurrence in NSW).	OEH Atlas – one record (dated 1970) located approx. 16km SE of Ulan.	N/A	N/A	N/A	No records within the Study Area.

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Capertree Stringybark ***Eucalyptus cannonii*** **V TSC** **V EPBC**	Similar to the widespread *E. macrorhyncha*, with more angular buds and larger fruit with a medial rim. May co-occur and hybridise. Restricted to 100 x 60km area of CT with eastern edge on a line between Lithgow and Bylong (67 locations recorded, 460-1040m elevation, most situations except valley floors). Found with numerous other eucalypts *including E. rossii, dives, goniocalyx, melliodora, blakelyi, viminalis, dalrympleana, oblonga, sparsifolia*.	OEH Atlas – three records (dated 2004-2006) located south of the Ulan Colliery. Known to occur in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species.
Pokolbin Mallee ***Eucalyptus pumila*** **V TSC** **V EPBC**	A mallee-form eucalypt to 6 m high. Known from one small area on skeletal soil on a west-facing sandstone ridge in Pokolbin Flora Reserve and an adjacent private property (& old records from Sandy Hollow and Wyong). Grows in woodland with *E. fibrosa, C. maculata, Callitris endlicheri*. An additional two populations of about 150 plants have been found 4km NW of the type locality, occupying flat benches on a steep-sided N-facing spur, separated by a valley.	Closest record from Wollemi NP.	Marginal	Unlikely	Low	No records within the Study Area.
Homoranthus darwinioides **V TSC** **V EPBC**	Shrub 1-1.5m in height Grows in dry sclerophyll forest or woodland, usually on sandstone outcrops or ridges from Dubbo to Merriwa, chiefly Goonoo Forest and Lees Pinch.	OEH Atlas – 22 records (dated 1951-2000) located mostly in the eastern part of the Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Granite Homoranthus ***Homoranthus prolixus*** **V TSC** **V EPBC**	Grows in heath in skeletal soil among crevices in granite outcrops near Inverell and Bendemeer (NT and NWS botanical regions) (Flora of NSW)	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	No records within the Study Area.
Leafless Indigo ***Indigofera efoliata*** **E TSC** **E EPBC**	Only known from a few old collections in the Dubbo area (Harden, 2002). Grows in stony ground. Perennial herb or sub-shrub to 40cm with leaves absent or to 3.5cm long with 5-9 tiny obcordate leaflets, only present at base of annual growth. Flowers pink.	Not recorded on the NSW OEH Database or EPBC database.	Marginal	Unlikely	Low	No records within the Study Area.
Kennedia retrorsa **V TSC** **V EPBC**	Climber. Flowers in spring. Mt Dangar, Goulburn River valley to near Putty in dry sclerophyll forest and woodland.	Recorded in the Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Lasiopetalum longistamineum **V TSC** **V EPBC**	Shrub. Grows in rich alluvial deposits in Gungal-Mt Dangar area.	Recorded in Goulburn River NP.	Marginal	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Hoary Sunray ***Leucochrysum albicans var. tricolor*** **E EPBC**	An annual or biennial forb which occurs from Queensland to Victoria and in Tasmania, west from the tablelands. Records from Queensland are historic, and the species most current northern occurrence is Goulburn, NSW (OEH). The species could easily be confused with the unlisted *L. molle* (distribution NWS, CWS, plains and far inland).	OEH Atlas – 2 records (dated 2005-2008) located within semi-vegetated areas S and SW of Ulan Colliery.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Spiny Peppercress ***Lepidium aschersonii*** **V TSC** **V EPBC**	Erect perennial herb to 30 cm high. Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains).	Nearest record over 100 km to west of Study Area, from 2003 and in different vegetation community to any found on site.	Present	Unlikely	Low	No records within the study area.
Ozothamnus tesselatus **V TSC** **V EPBC**	Dense shrub to 1m high. Grows in eucalypt woodland north of Rylstone.	Recorded in the Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Omeo Stork's-bill ***Pelargonium sp. striatellum* MS** **E EPBC**	Pelargonium sp. striatellum (G.W.Carr 10345) is known to occur in NSW and Victoria (NSW SC, 2010) on 5 widely separated tableland lakes between Lake Omeo and Lake Bathurst. It grows just above the high water level of irregularly inundated or ephemeral lakes. During dry periods, the species is known to colonise exposed lake beds.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	No records within the study area.
Clandulla Geebung ***Persoonia marginata*** **V TSC** **V EPBC**	Low spreading shrub. Grows in dry sclerophyll forest on sandstone, restricted to area between Kandos and Portland.	Known to occur in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Philotheca ericifolia **V EPBC**	Shrub growing to 2 m high .This species inhabits the north-western slopes and central western slopes of NSW, from the upper Hunter Valley, to Pilliga and to the Peak Hill district (Harden 1991). The species is found at Goonoo Forest near Mogriguy, Pilliga Forest, Harvey Ranges and Peak Hill (Ayres *et al.* 1996). Grows from damp sandy flats to rocky ridges and clifftops (but possibly in seepage areas in this situation as it is said to be water-loving). Found after fire or other disturbance.	Known to occur in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Leek-orchid ***Prasophyllum* sp. Wybong** **CE EPBC**	*Prasophyllum* sp. Wybong is a terrestrial orchid known from nine populations between Muswellbrook and the Pilliga area, of which the Wybong population is the largest. Habitat is open eucalypt woodland and grassland, presumably principally or entirely on sedimentary substrates such as sandstone.	A number of populations are present more than 50 km to east of Study Area. This species is highly restricted.	Present	Unlikely	Low	Cryptic species that flowers in spring.
Denman Pomaderris ***Pomaderris reperta*** **CE TSC** **CE EPBC**	In dry sclerophyll woodland, along a single ridgeline over 1ha in the Denman area (Muswellbrook LGA). Growing with *E. crebra, E. blakelyi, Allocasuarina littoralis, Notelaea microcarpa*. Bell (2001): recently located at Myambat Logistics Company site W of Denman along the same sandstone ridgeline (20-40 plants).	Not found in surveys of Goulburn River or Wollemi NP or Manobalai NR.	Present	Unlikely	Low	No records within the study area.
Silky Pomaderris ***Pomaderris sericea*** **E TSC** **V EPBC**	Previously only an old record from Berrima area (CT) and Vic. Found in Benjang Gap area of NW Wollemi NP (Bell, 2001).	Not recorded on the NSW OEH Database or EPBC database.	Present	Unlikely	Low	No records within the study area.
Singleton Mint Bush ***Prostanthera cineolifera*** **V TSC** **V EPBC**	Strongly aromatic shrub. Apparently grows in sclerophyll forest, distribution unclear, NC? CC? DECC: restricted to a few localities near Walcha, Scone and St Albans in open woodland on exposed sandstone ridges. Presumed to be short-lived (10-20 years).	Nearest record over 50 km to the east of the Study Area.	Present	Unlikely	Low	No records within the study area.
Wollemi Mint-bush ***Prostanthera cryptandroides* subsp. *cryptandroides*** **V TSC** **V EPBC**	Strongly aromatic shrub. Grows in dry sclerophyll forest, heath or rock scrub, often in rocky sites, chiefly Lithgow to Sandy Hollow area. Also north from Sandy Hollow into Border Rivers/Gwydir catchment and Qld. In open forest,. Flowers Sept-May.	In Wollemi NP and probably in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Prostanthera discolor **V TSC** **V EPBC**	Narrow-leaved, strongly aromatic shrub. Flowers Sept-Oct. In dry sclerophyll forest in rocky gullies in Sandy Hollow-Merriwa area.	Known to occur in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Mount Vincent Mint-bush ***Prostanthera stricta*** **V TSC** **V EPBC**	Shrub to 2 x 3m, aromatic. Flowers winter-spring. Grows in sclerophyll forest, in sandy alluvium near streams, Widdin Valley area, CWS.	Known to occur in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Inland Rustyhood ***Pterostylis cobarensis*** **V EPBC**	Terrestrial orchid, flowering Sept-Oct, growing on "sparsely treed rocky hills, stony slopes and in mallee communities, sometimes on isolated rocky outcrops" (Jones, 2006). The known distribution of this species is Broken Hill-Nyngan area to Young (Jones, 2006). Terrestrial orchids seldom persist in heavily grazed areas and the likelihood of this species occurring in farming areas is very low.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Present	Unlikely	Low	No records within the Study Area.
Rulingia procumbens **V TSC** **V EPBC**	Prostrate shrub, stems to 30cm long. In sandy sites (often roadsides), mainly in Dubbo-Mendooran-Gilgandra area, also Pilliga and Nymagee areas, CWS, NWP, SWP. Also recent collections from upper Hunter (W-facing spur and a nearby ridge near Sandy Hollow on crown reserve between Goulburn River NP and Manobalai NR– Bell, 2001) and 4 populations in Goonoo SF. Associated spp = *E. dealbata, sideroxylon, fibrosa, albens, melliodora, Callitris glaucophylla, Acacia triptera, Philotheca salsolifolia, Calytrix tetragona*. Also found on slopes of Mt Dangar in Goulburn River NP, in a burnt area – may be a fire ephemeral.	Known to occur in Goulburn River NP.	Present	Unlikely	Low	Extensive surveys failed to locate this species and there are no records within close proximity to the study area.
Slender Darling Pea ***Swainsona murrayana*** **V TSC** **V EPBC**	Prostrate to erect forb to 25cm high. "Often grows with *Maireana* species on heavy soils, especially in depressions, west from Warialda district, NWS, CWS, SWS, NWP, SWP, Q, Vic, Tas" (Harden 2002). Mostly W slopes and plains, with records from between Dubbo and Moree. In saltbush, black box and grassland communities on plains, floodplains and depressions, occasionally on intermittently cultivated or grazed sites.	Nearest record over 60 km to the north of the Study Area.	Absent	None	N/A	No habitat present.
Austral Toadflax ***Thesium australe*** **V TSC** **V EPBC**	In *Themeda* grassland, coastal headlands and inland grassland or grassy woodland, NC, CC, SC, NT, ST, NWS, CWS, Q, Vic, Tas, E Asia. A partial root parasite on Kangaroo Grass (*Themeda australis*). Unlikely to persist in heavily grazed sites, or to occur where Kangaroo Grass is not at least moderately common.	OEH Atlas – one record (dated 1959) located in Cassilis.	Present in parts	Possible	Mod	**Assessment of Significance undertaken**

Species	Ecology and distribution	Records	Transmission line			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Tylophora linearis **V TSC** **E EPBC**	A small vine which grows In dry scrub and open forest in the Barraba, Mendooran, Temora and West Wyalong districts, NWS, CWS, Q. Common associated species are *E fibrosa, sideroxylon, albens, Callitris* spp, *Allocasuarina leuhmanii*, *Acacia hakeoides, A. lineata*.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Present	Unlikely	Low	No records within the Study Area.
Wollemi Pine ***Wollemia nobilis*** **E TSC** **E EPBC**	Restricted to remote canyons in the Wollemi National Park, north-west of Sydney. Occurs in warm temperate rainforest and rain forest margins in remote sandstone canyons.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	No records within the Study Area.
Keith's Zieria ***Zieria ingramii*** **E TSC** **E EPBC**	Slender, spindly shrub to 0.6 m high, known only from Goonoo SF near Dubbo (Harden 2002), growing in dry sclerophyll forest on light sandy soils.	Not recorded on the NSW OEH Database or EPBC database.	Present	Unlikely	Low	No records within the Study Area.

KEY:

V EPBC	Listed as Vulnerable on the *Environmental Protection Biodiversity Conservation Act, 1999*
E EPBC	Listed as Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
CE EPBC	Listed as Critically Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
M EPBC	Listed as Migratory on the *Environmental Protection Biodiversity Conservation Act, 1999*

N/A indicates that the threatened species search did not return the species for the Transmission Line Study Area (returned for the Windfarm study area).

EEC name & Status*	Description	Transmission line	
		Presence on site	Potential to be impacted
Coolibah-Black Box woodland of the northern riverine plains in the DRP and BBS bioregions (*E. coolabah, E. largiflorens*) **EEC EPBC**	Grassy woodland on heavy black clay soils in seasonally flooded areas.	Absent	No

EEC name & Status*	Description	Transmission line	
		Presence on site	Potential to be impacted
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia **EEC EPBC**	A grassy woodland found on relatively fertile soils of the western slopes and plains of NSW, Victoria and Qld in which *Eucalyptus microcarpa* (Inland Grey Box) is the most characteristic species. Prober and Thiele (2004) identified a correlation between *Eucalyptus microcarpa* communities and soils of Tertiary and Quaternary alluvial origin. This ecological attribute helps distinguish between Inland Grey Box Woodlands and the White Box Yellow Box Blakely's Red Gum Woodland. The latter community generally occurs further east and typically occupies a wide variety of alluvial and non-alluvial soils. Grey Box woodland also more often contains chenopod shrubs in the understorey.	Absent. Although Inland Grey Box occurs on site, it is in shrubby sandstone forest and as remnant paddock trees in areas where the community has been historically cleared, and no longer forms part of the EEC.	No
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland **CEEC EPBC**	Essentially the same community as the preceding one, but with the Commonwealth listing covering a wider geographical area.	Absent, grasslands are all derived from clearing of woodland or forest.	No
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion **EEC EPBC**		Absent in this part of the site	No
White Box-Yellow Box-Blakely's Red Gum (Grassy) Woodland (and Derived Native Grassland) **EEC TSC** **CEEC EPBC**	Grassy woodland widespread on the NSW tablelands and slopes, growing on flats, slopes or ridges on higher fertility soils, restricted to drainage lines on poorer soils. Characteristic trees are Yellow Box (*E. melliodora*), White Box (*E. albens*) and Blakely's Red Gum (*E. blakelyi*).	Present	**Yes – Assessments of Significance carried out for both the TSC-listed community and the EPBC-listed community.**

KEY:

EEC EPBC Listed as an Endangered Ecological Community on the *Environmental Protection Biodiversity Conservation Act, 1999*

CEEC EPBC Listed as a Critically Endangered Ecological Community on the *Environmental Protection Biodiversity Conservation Act, 1999*

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Amphibians						
Giant Burrowing Frog ***Heleioporus australiacus*** **V TSC** **V EPBC**	The species is predicted to be associated with dry forest environments (elevation 150-900m) with high habitat complexity (Penman *et al.* 2007). It will travel several hundred metres to creeks to breed. It has also been recorded in roadside drains and near slow-flowing creek pools with fringing fern and sedge vegetation. Breeds summer and autumn, apparently in burrows in creek banks, favouring deep loam soils. Coastal lowlands are generally considered unsuitable habitat and the species is rarely associated with permanent ponds or streams (DEWHA 2009; Penman et al 2007). However, records around Vincentia and Ulladulla suggest this species may in fact be found on coastal lowlands (<100mASL).	Known to occur in Goulburn River NP.	Marginal	Unlikely	Low	No records within the Study Area.
Giant Barred Frog ***Mixophyes iteratus*** **E TSC** **E EPBC**	Giant Barred Frogs are large frogs, up to 115 mm in length. They are olive to dark brown above with paler or darker blotches, and cream to pale yellow below. The skin is finely granular. The pupil of the eye is vertical and the iris is pale golden in the upper half and brown in the lower half. Coast and ranges from south-eastern Queensland to the Hawkesbury River in NSW. North-eastern NSW, particularly the Coffs Harbour-Dorrigo area, is now a stro**ngh**old. Considered to have disappeared south of the Hawkesbury and there are no recent records from the Blue Mountains.	Goulburn River NP – 2 records (dates 2001-2002) SE of Ulan.	Marginal	Unlikely	Low	Inhabits flowing rocky streams, generally in rainforest. No typical habitat in Study Area.
Regent Honeyeater ***Anthochaera phrygia*** **E TSC** **E EPBC** **M EPBC**	There are now only a small number of known breeding sites in NSW, the most important of which are: Warrumbungles NP, Pilliga NR, Barraba district, central coast around Gosford, Hunter Valley, and Capertee Valley (DECCW 2010). Most records are from box-ironbark eucalypt associations and it appears to prefer wetter fertile sites within these associations (Menkhorst *et al.*, 1999). It is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Yellow Gum, Blakely's Red Gum and White Box (Menkhorst *et al.*, 1999). It also occurs in riparian forests of River She-oak and wet lowland coastal forests dominated by Swamp Mahogony and Spotted Gum and (DECCW 2010). The species can undertake large-scale nomadic movements in the order of hundreds of kilometres.	OEH Atlas – 11 records (dated 1985-2000) mostly from eastern Goulburn River NP and SW of Ulan.	Present	Possible	Low habitat loss	Habitat in the Transmission Line Study Area is generally unsuitable for this species, with just scattered occurrences of Box-Gum Woodland and River Oak Forest.

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Rufous Fantail ***Rhipidura rufifrons*** **M EPBC**	This species is found in a variety of habitats including eucalypt woodlands and watercourses where it nests in a horizontal fork of a tree up to 12m from the ground. Breeds in southern Australia, but is known to migrate to inland Australia, PNG, Solomon Islands, New Caledonia and Indonesia.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	Not recorded despite extensive surveys and habitat is marginal.
Swift Parrot ***Lathamus discolor*** **E TSC** **E EPBC**	This species breeds in Tasmania, migrating to south and eastern NSW in autumn/winter where it inhabits eucalypt forests and woodlands, particularly Box-Ironbark Forests of central Victoria and southern NSW (DECCW 2010; Smales, 2005). Mostly occurs on the south-west slopes. It feeds on nectar flowers of eucalypts and lerp-insects, also soft fruits and berries sometimes foraging in grass (Pizzey and Knight 2003). Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Mugga Ironbark, and White Box (DECCW 2010).	OEH Atlas – 2 records (dated 2005) located approx. 4km W of Curryall SF in a cleared area. Predicted to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Favoured feed trees uncommon in the Transmission Line Study Area and was not recorded despite extensive surveys.
Superb Parrot *Polytelis swainsonii* V TSC V EPBC	This species is found throughout eastern inland NSW. On the South-western slopes the core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west (DECCW 2010). It inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. The species nests in the hollows of large trees (dead or alive) in open Box Gum Woodland or isolated paddock trees. Species known to be used for nesting are Blakely's Red Gum, Yellow Box, Apple Box and Red Box (DECCW 2010). It forages on the ground in grassy woodland, also on fruit, seeds and blossoms of acacias, eucalypts and mistletoes (Pizzey and Knight, 2003).	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	No records from the Study Area or surrounding region.
Red Goshawk ***Erythrotriorchis radiatus*** **CE TSC** **V EPBC**	This raptor is distributed sparsely through northern and eastern Australia, from the western Kimberley Division of northern Western Australia to north-eastern Queensland and south to far north-eastern NSW, and with scattered records in central Australia. The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. Red Goshawks inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, *Melaleuca* swamp forest and riparian *Eucalyptus* forest of coastal rivers.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Marginal	Unlikely	Low	No records from region.

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Malleefowl ***Leipoa ocellata*** **E TSC** **V EPBC**	The Malleefowl is a large (60 centimetres long, 43 centimetres high and weighing between 1.5 and 2.5 kilograms), distinctive, ground-dwelling bird. It possesses robust, powerful legs, a short bill and a flattish head while the wings are short, broad and rounded at the tip. The head and neck is greyish above, topped with black, the chin is chestnut and the throat and chest are white with a central black stripe. The stro**ngh**old for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary, and is part of a larger population north of the Murray River in South Australia.	Goulburn River NP – one record (dated 1989) near Mogo.	Absent	Unlikely	No	Database searches did not show any records of this species within the Transmission Line Study Area.
Australian Painted Snipe or Painted Snipe ***Rostratula benghalis*** **E TSC** **V EPBC** **M EPBC**	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. It is most common in the Murray-Darling Basin (DECCW 2010). It inhabits inland and coastal ephemeral and permanent freshwater wetlands, especially where there is a cover of vegetation. It has been recorded on the margins of wetlands, dams and even sewage ponds, also found in wet pastures, marshy areas, irrigation systems, tea tree scrub and adjacent open woodlands (Pizzey and Knight 2003). The species is likely to be nomadic in response to suitable conditions, such as floods (DECCW 2010).	Predicted to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Database searches did not show any records of this species within the Transmission Line Study Area.
Australasian Bittern ***Botaurus poiciloptilus*** **E TSC** **E EPBC**	Little is known of the behaviour of this cryptic waterbird. May be nomadic as it has been observed occupying ephemeral wetlands. Seeds and invertebrates are foraged for on the water's edge.	Predicted to occur in Coolah Tops NP.	N/A	N/A	N/A	Database searches did not show any records of this species within the Transmission Line Study Area.
White-throated Needletail ***Hirundapus caudacutus*** **M EPBC**	Noted as one of the world's fastest birds, this species has been recorded in the airspace above woodlands, forests and farmlands. Often seen 'patrolling' favoured feeding grounds above ridges and hilltops. This species migrates to Australia from mid-October and is a regular summer migrant until April when it returns to breed.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.
Rainbow Bee-eater ***Merops ornatus*** **M EPBC**	This species inhabits open woodlands with sandy, loamy soil. It builds a burrow in sandy ground or bank cuttings such as roads or creeks. The species is a summer breeding migrant (Sept-Apr) to south-eastern Australia, but winters in northern Australia, Solomon Islands, PNG and Indonesia.	Predicted to occur from the EPBC Database. Observed in Study Area.	Marginal	Present	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Satin Flycatcher ***Myiagra cyanoleuca*** **M EPBC**	This species is found in heavily vegetated gullies in forests, usually above a shrub layer. During migration it is often found in coastal forests. It breeds mostly in south-east Australia, and usually departs in March to winter in northern QLD, PNG and the Torres Strait Islands. Occasional vagrant to New Zealand.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.
Fork-tailed Swift ***Apus pacificus*** **M EPBC**	This species breeds from central Siberia eastwards through Asia and winters south to Australia. Uncommon in eastern Australia. It spends most of its time in the air feeding on insects, occasionally roosting on cliffs or in large trees (Pizzey *et al.*, 2006). It occurs throughout mainland Australia, mostly west of the divide.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.
Great Egret ***Ardea alba*** **M EPBC**	The Great Egret has been reported in a wide range of wetland habitats (for example inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial). These include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs. The Great Egret can retreat to permanent wetlands or coastal areas when other wetlands are dry (for example, during drought). This may occur annually in some regions with regular wet and dry seasons or erratically where the availability of wetland habitat is also erratic.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.
Cattle Egret ***Ardea ibis*** **M EPBC**	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It has occasionally been seen in arid and semi-arid regions however this is extremely rare. High numbers have been observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures. It has been recorded on earthen dam walls and ploughed fields. It is commonly associated with the habitats of farm animals, particularly cattle, but also pigs, sheep, horses and deer. The Cattle Egret is known to follow earth-moving machinery and has been located at rubbish tips. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora. They have sometimes been observed in swamps with tall emergent vegetation (Marchant & Higgins 1990; Morton *et al.* 1989).	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Latham's Snipe, Japanese Snipe ***Gallinago hardwickii*** **M EPBC**	Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby.	Predicted to occur from the EPBC Database.	Marginal	Unlikely	Low	May occur on occasion but not likely to rely on Study Area for any stage of the lifecycle.
White-bellied Sea-eagle ***Haliaeetus leucogaster*** **M EPBC**	This species occurs around coastal areas, islands and estuaries, but is also found in inland areas around large rivers, wetlands and reservoirs. This species shows a high fidelity to nest sites, where it constructs conspicuous stick nests in the forks of tall trees and stags.	Predicted to occur from the EPBC Database. Observed at Ulan Mine dam.	Marginal	Possible	Low	May have nest in locality, but likely to be close to water and not in vicinity of proposed Transmission Line routes.
Reptiles						
Corben's Long-eared Bat ***Nyctophilus corbeni*** **V TSC** **V EPBC**	The south eastern form of the Greater Long-eared Bat is also known as Eastern Long-eared Bat and has recently been described as new species Corben's Long-eared Bat (N. corbeni). Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stro**ngh**old for this species. Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. It roosts in tree hollows, crevices, and under loose bark. The species is a slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground.	OEH Atlas – 6 records (dated 2000-2002) with the majority of records from vegetated valleys within Goulburn NP and one record near Turill SF. Also known from Coolah Tops NP.	Marginal	Present (Anabat record)	Moderate Habitat loss	**Assessment of Significance undertaken.**

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Greater Long-eared bat (south-eastern form)/ Eastern Long-eared Bat ***Nyctophilus timoriensis*** **V TSC** **V EPBC**	The species prefers more arid regions, the distribution of the south eastern form approximately coincides with the Murray Darling Basin with the Pilliga Scrub region being the distinct stro**ngh**old for this species. This species inhabits a variety of vegetation types, including mallee, bulloke but more commonly box/ironbark/cypress-pine communities that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland (DECCW). It is a slow flying agile species and forages in the lower parts of the canopy, even amongst the shrub layers and on the ground (Menkhorst and Knight 2001) and often over water bodies. The species roosts in tree hollows, and under loose bark.	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	Database searches did not show any records of this species within the Transmission Line Study Area.
Grey-headed Flying-fox ***Pteropus poliocephalus*** **V TSC** **V EPBC**	This species roosts in large camps, generally in wetter vegetation such as riparian areas, rainforest or swamp forest. Groups fly out at night to feed on fruit, nectar and blossom, particularly of *Eucalyptus, Melaleuca* and *Banksia*. This species shows fidelity to roosting areas but may feed in orchards. It appears to be showing increasing tolerance to human disturbance.	Predicted to occur in Coolah Tops NP.	Marginal	Possible	Low	Not recorded in the Study Area despite extensive surveys. Any individuals in region likely to be vagrants.
Spotted-tailed Quoll ***Dasyurus maculatus*** **V TSC** **E EPBC**	This species is found in a variety of forest types such as rainforest, wet and dry sclerophyll forest, woodland, coastal heath and scrub, sometimes Red Gum forest along inland waterways (Menkhorst and Knight, 2004). It utilises hollow-bearing trees, fallen logs, rock caves and crevices as denning and breeding sites (DECCW 2010). Mostly nocturnal it hunts mammals, birds and large arthropods. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creeklines.	OEH Atlas – 2 records (dated 1980-2008) located along roadsides NW of Coolah and along the Golden Hwy SE of Cassilis. Known to occur in Coolah Tops NP.	Marginal	Possible	Low	Unlikely to be any populations remaining in Study Area.
Bilby ***Macrotis lagotis*** **Extinct TSC** **V EPBC**	Extinct.		-	-	-	

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
Brush-tailed Rock-wallaby ***Petrogale penicillata*** **V TSC** **V EPBC**	Isolated populations along the Great Dividing Range. This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. In many parts of their range, rock-wallabies are closely associated with dense arboreal cover, especially fig trees (NSW NPWS 2003a). The vegetation on and below the cliff appear to be important to this species as a source of food and shelter and in some cases may provide some protection from predation (Wong 1993; 1997). A range of vegetation types are associated with Brush-tailed Rock-wallaby habitat, including dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophyll forest, and open forest (Murray *et al.* 2008).	OEH Atlas – 3 records (dated 1999-2009) located north of the Ulan Colliery and within the E part of Goulburn River NP. Known to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Unlikely to be any populations remaining in Study Area.
Koala ***Phascolarctos cinereus*** **V TSC** **V EPBC**	This species was historically abundant in the south of NSW, although now occurs in sparse and possibly disjunct populations. It occurs in woodland communities, coastal forests, woodlands of the tablelands and western slopes and the riparian communities of the western plains (NPWS, 2003b). May also utilise isolated paddock trees (NPWS, 2003b). Primary feed tree species listed for the central and southern tablelands are Ribbon Gum and River Red Gum, secondary species include Candle Bark, Blakely's Red Gum, White Box, Yellow Box and Brittle Gum (NPWS, 2003b).	OEH Atlas – 7 records (dated 1957-2002) with four of this located in close vicinity to the proposed wind farm site.	Marginal	Possible	Low Potential minor habitat loss	Feed trees common in parts of the Study Area, but species not recorded despite extensive surveys.
Pilliga Mouse ***Pseudomys pilligaensis*** **V TSC** **V EPBC**	The Pilliga Mouse is very sparsely distributed and appears to prefer areas with a sparse ground cover. Some evidence exists of marked population fluctuations by this species. The Pilliga Mouse is restricted to an isolated area of low-nutrient deep sand which has long been recognised as supporting a distinctive vegetation type (Pilliga Scrub). Recent studies indicate that the Pilliga Mouse were found in greatest abundance in recently burnt moist gullies, areas dominated by broombush and areas containing an understorey of kurricabah (*Acacia burrowii*) with a bloodwood (*Corymbia trachyphloia*) overstorey. Consistent features of the latter two habitats were: a relatively high plant species richness; a moderate to high low shrub cover; and a moist groundcover of plants, litter and fungi. The gully where high rates of capture were encountered had an extensive cover by low grasses and sedges, with little shrub cover and large areas of ash-covered ground. It is nocturnal and appears to live in burrows.	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	Database searches did not show any records of this species within the Transmission Line Study Area.

Species	Form and Habitat	Records	Transmission Line			Notes
			PH	L	PI	
New Holland Mouse ***Pseudomys novaehollandiae*** **V EPBC**	The New Holland Mouse has been found from coastal areas and up to 100 km inland on sandstone country. The species has been recorded from sea level up to around 900 m above sea level. Due to the largely granivorous diet of the species, sites where the New Holland Mouse is found are often high in floristic diversity, especially leguminous perennials.	Recorded in Goulburn River NP.	Marginal	Unlikely	Low	Most records located more than 30 km to the east of the Study Area; unlikely to be any populations in the Study Area.
Reptiles						
Pink-tailed Legless Lizard ***Aprasia parapulchella*** **V TSC** **V EPBC**	This species is only known from the Central and Southern Tablelands, and the South Western Slopes (Osborne and Jones, 1995). It inhabits sloping, open woodland areas with predominantly native grass groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Typically these areas are well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks in burrows below these rocks; the burrows usually have been constructed by and are often still inhabited by small black ants and termites (Osborne and Jones, 1995). This species feeds on the larvae and eggs of these ants (DECCW 2010).	Goulburn River NP – One record (dated 2000) near Mogo.	Marginal	Unlikely	Low	Not recorded in Study Area despite extensive surveys.
Broad-headed Snake ***Hoplocephalus bungaroides*** **E TSC** **V EPBC**	The Broad-headed Snake is generally black above with yellow spots forming narrow, irregular cross-bands. Other yellow scales may link these cross-bands laterally to form a straight or zigzagged stripe along the body. These cross-bands help distinguish it from the similar-looking but harmless juvenile Diamond Python. Its head is flattened on top and distinct from the body. The belly is grey or greyish-black. The average length is about 60 cm, with a maximum of around 150 cm. The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Marginal	Unlikely	Low	Database searches did not show any records of this species within the Transmission Line Study Area.

Key:

V EPBC Listed as Vulnerable on the *Environmental Protection Biodiversity Conservation Act, 1999*
E EPBC Listed as Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
CE EPBC Listed as Critically Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
M EPBC Listed as Migratory on the *Environmental Protection Biodiversity Conservation Act, 1999*

N/A indicates that the threatened species search did not return the species from the transmission line development area searches, and is therefore only applicable to the Wind Farm Study Area.

Attachment 4 EPBC listed matters evaluation table – wind farm study area

Entities returned from EPBC searches for the wind farm study area. This evaluation considers the potential for impact for each species. This evaluation is includes as Appendix C of each of the BAs.

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Flockton Wattle ***Acacia flocktoniae*** **V TSC** **V EPBC**	Shrub 2-3m in height, with angled glabrous branchlets, phyllodes straight, linear. Fl June-Aug. On sandstone, Blue Mountains and south.	Known from the Goulburn River NP.	N/A	N/A	N/A	
Granite Boronia ***Boronia granitica*** **V TSC** **E EPBC**	Granite Boronia is a medium-sized shrub 0.6 - 2 m tall. It occurs in scattered localities on the New England Tablelands and North West Slopes north from the Armidale area to the Stanthorpe district in southern Queensland. It can be locally common in appropriate habitat.		N/A	N/A	N/A	
Commersonia rosea **E TSC** **E EPBC**	Prostrate shrub with trailing branches to 60cm. Known from 4 localities within 8km radius of Sandy Hollow, upper Hunter Valley. Post-fire coloniser. Grows in skeletal sandy soils in scrub or heath with occas emergent *E. caleyi, E. crebra, Callitris endlicheri*.	Known to occur in Goulburn River NP.	N/A	N/A	N/A	
White-flowered Wax Plant ***Cynanchum elegans*** **E TSC** **E EPBC**	A climber growing in rainforest gullies and on scree slopes, NC, CC, CWS, and west as far as Merriwa in the upper Hunter Valley. Habitat includes dry and littoral rainforest, red gum woodland, spotted gum open forest. Majority of known populations are <30 plants.	Records known from Goulburn River NP, Wollemi NP.	N/A	N/A	N/A	
Bluegrass ***Dichanthium setosum*** **V TSC** **V EPBC**	Grows in woodland and grassland, NT, NWS, CWS, NWP, Q, WA. Associated with heavy basalt soils, often in moderately disturbed areas such as cleared woodland or roadsides. Either tolerates or is advantaged by disturbance. Can be locally common or scattered plants. Associated species include *E. albens, E. melliodora, E. viminalis, Aristida ramosa, Themeda australis, Bothriochloa macra, Poa sieberiana*.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Present	Possible at S end where less pasture improvement and on side slopes	Mod	**Assessment of significance undertaken.**

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Lobed Blue-grass **Bothriochloa biloba** **V EPBC**	Bothriochloa biloba is an erect or decumbent perennial grass to 1 metre high. In NSW the species is widespread along the New England Tablelands and North West Slopes and Plains, including Warialda, Bingara, Merriwa, Hunter Valley and Dubbo areas. It also occurs in Southern Queensland. Prefers (but not limited to) heavy textured soils, such as brown or black clay soils. Flowers from November to June.	OEH Atlas – 2 records located north of Turill SCA and several records located along Warrumbungles Way towards Coolah.	Marginal	Possible at S end where less pasture improvement and on side slopes	Mod	**Assessment of Significance under the EPBC Act undertaken**
Finger Panic Grass ***Digitaria porrecta*** **E TSC** **E EBC**	In grassland, woodland or open forest on better soils, NWS, Q. From near Moree south to Tambar Springs and from Tamworth to Coonabarabran, mostly on private property, roadsides or TSRs. Flowers mid-Jan to late Feb. Frequent associates include *E. albens, Acacia pendula, Austrostipa aristiglumis, Enteropogon acicularis, Hibiscus trionum*.	OEH Atlas – 3 records (dated 2004) located approx. 5km NW of the proposed wind farm site.	Present	Possible at S end where less pasture improvement and on side slopes	Mod	**Assessment of significance undertaken.**
Euphrasia arguta **CE EPBC**	An erect, semi-parasitic annual herb known from Nundle State Forest and adjacent private land where it was rediscovered in 2008 (NSW DPI 2008). These populations occur at the border between the New England Tableland and the North Coast Bioregions (NSW DECCW 2010). Prior to this, the species had not been sighted since 1904 and was previously known from Sydney to Bathurst and north to Walcha, NSW. Collections had also been made from Nundle on the New England Tableland; the Paterson and William Rivers in the Hunter Valley; Mudgee; and the plains near Bathurst (Bentham 1869 cited in Leigh *et al.* 1984). Habitat is said to be grassy area near rivers, presumably in good condition.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Absent	None	No	
Diuris pedunculata **Small Snake Orchid** **E TSC** **E EPBC**	Moist grassy areas in sclerophyll forest, Sydney to Tenterfield. Flowers Aug-Sept (Flora of NSW) or Oct (DECCW). Distribution is "mainly NE Tableland, grassland, in stony soils on low ridges or moist flats." (Bishop, 2005).		Marginal	Unlikely	Low	

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Eucalyptus camaldulensis **population in the Hunter catchment** **End. Pop. EPBC**	Widely distributed on alluvial soils near permanent water west from Singleton (from Bylong south of Merriwa east to Hinton in Port Stephens LGA, on the Hunter River, mostly on private property (only coastal occurrence in NSW).	OEH Atlas – one record (dated 1970) located approx. 16km SE of Ulan.	N/A	N/A	N/A	
Capertree Stringybark ***Eucalyptus cannonii*** **V TSC** **V EPBC**	Similar to the widespread *E. macrorhyncha*, with more angular buds and larger fruit with a medial rim. May co-occur and hybridise. Restricted to 100 x 60km area of CT with eastern edge on a line between Lithgow and Bylong (67 locations recorded, 460-1040m elevation, most situations except valley floors). Found with numerous other eucalypts *including E. rossii, dives, goniocalyx, melliodora, blakelyi, viminalis, dalrympleana, oblonga, sparsifolia*.	OEH Atlas – three records (dated 2004-2006) located south of the Ulan Colliery. Known to occur in Goulburn River NP.	N/A	N/A	N/A	
Pokolbin Mallee ***Eucalyptus pumila*** **V TSC** **V EPBC**	A mallee-form eucalypt to 6 m high. Known from one small area on skeletal soil on a west-facing sandstone ridge in Pokolbin Flora Reserve and an adjacent private property (& old records from Sandy Hollow and Wyong). Grows in woodland with *E. fibrosa, C. maculata, Callitris endlicheri*. An additional two populations of about 150 plants have been found 4km NW of the type locality, occupying flat benches on a steep-sided N-facing spur, separated by a valley.		N/A	N/A	N/A	
Homoranthus darwinioides **V TSC** **V EPBC**	Shrub 1-1.5m in height Grows in dry sclerophyll forest or woodland, usually on sandstone outcrops or ridges from Dubbo to Merriwa, chiefly Goonoo Forest and Lees Pinch.	OEH Atlas – 22 records (dated 1951-2000) located mostly in the eastern part of the Goulburn River NP.	N/A	N/A	N/A	
Granite Homoranthus ***Homoranthus prolixus*** **V TSC** **V EPBC**	Grows in heath in skeletal soil among crevices in granite outcrops near Inverell and Bendemeer (NT and NWS botanical regions) (Flora of NSW)	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Leafless Indigo ***Indigofera efoliata*** **E TSC** **E EPBC**	Only known from a few old collections in the Dubbo area (Harden, 2002). Grows in stony ground. Perennial herb or sub-shrub to 40cm with leaves absent or to 3.5cm long with 5-9 tiny obcordate leaflets, only present at base of annual growth. Flowers pink.	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	
Kennedia retrorsa **V TSC** **V EPBC**	Climber. Flowers in spring. Mt Dangar, Goulburn River valley to near Putty in dry sclerophyll forest and woodland.	Recorded in the Goulburn River NP.	N/A	N/A	N/A	
Lasiopetalum longistamineum **V TSC** **V EPBC**	Shrub. Grows in rich alluvial deposits in Gungal-Mt Dangar area.	Recorded in Goulburn River NP.	N/A	N/A	N/A	
Hoary Sunray ***Leucochrysum albicans var. tricolor*** **E EPBC**	An annual or biennial forb which occurs from Queensland to Victoria and in Tasmania, west from the tablelands. Records from Queensland are historic, and the species most current northern occurrence is Goulburn, NSW (OEH). The species could easily be confused with the unlisted *L. molle* (distribution NWS, CWS, plains and far inland).	OEH Atlas – 2 records (dated 2005-2008) located within semi-vegetated areas S and SW of Ulan Colliery.	Present in parts	Unlikely	Low	
Spiny Peppercress ***Lepidium aschersonii*** **V TSC** **V EPBC**	Erect perennial herb to 30 cm high. Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains).		Present	Unlikely	Low	
Ozothamnus tesselatus **V TSC** **V EPBC**	Dense shrub to 1m high. Grows in eucalypt woodland north of Rylstone.	Recorded in the Goulburn River NP.	N/A	N/A	N/A	
Omeo Stork's-bill ***Pelargonium sp. striatellum*** **MS** **E EPBC**	Pelargonium sp. striatellum (G.W.Carr 10345) is known to occur in NSW and Victoria (NSW SC, 2010) on 5 widely separated tableland lakes between Lake Omeo and Lake Bathurst. It grows just above the high water level of irregularly inundated or ephemeral lakes. During dry periods, the species is known to colonise exposed lake beds.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Clandulla Geebung ***Persoonia marginata*** **V TSC** **V EPBC**	Low spreading shrub. Grows in dry sclerophyll forest on sandstone, restricted to area between Kandos and Portland.	Known to occur in Goulburn River NP.	N/A	N/A	N/A	
Philotheca ericifolia **V EPBC**	Shrub growing to 2 m high .This species inhabits the north-western slopes and central western slopes of NSW, from the upper Hunter Valley, to Pilliga and to the Peak Hill district (Harden 1991). The species is found at Goonoo Forest near Mogriguy, Pilliga Forest, Harvey Ranges and Peak Hill (Ayres *et al.* 1996). Grows from damp sandy flats to rocky ridges and clifftops (but possibly in seepage areas in this situation as it is said to be water-loving). Found after fire or other disturbance.	Known to occur in Goulburn River NP.	N/A	N/A	N/A	
Leek-orchid ***Prasophyllum* sp. Wybong** **CE EPBC**	*Prasophyllum* sp. Wybong is a terrestrial orchid known from nine populations between Muswellbrook and the Pilliga area, of which the Wybong population is the largest. Habitat is open eucalypt woodland and grassland, presumably principally or entirely on sedimentary substrates such as sandstone.		Absent	None	No	
Denman Pomaderris ***Pomaderris reperta*** **CE TSC** **CE EPBC**	In dry sclerophyll woodland, along a single ridgeline over 1ha in the Denman area (Muswellbrook LGA). Growing with *E. crebra, E. blakelyi, Allocasuarina littoralis, Notelaea microcarpa*. Bell (2001): recently located at Myambat Logistics Company site W of Denman along the same sandstone ridgeline (20-40 plants). Not found in surveys of Goulburn River or Wollemi NP or Manobalai NR.		N/A	N/A	N/A	
Silky Pomaderris ***Pomaderris sericea*** **E TSC** **V EPBC**	Previously only an old record from Berrima area (CT) and Vic. Found in Benjang Gap area of NW Wollemi NP (Bell, 2001).	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Singleton Mint Bush ***Prostanthera cineolifera*** **V TSC** **V EPBC**	Strongly aromatic shrub. Apparently grows in sclerophyll forest, distribution unclear, NC? CC? DECC: restricted to a few localities near Walcha, Scone and St Albans in open woodland on exposed sandstone ridges. Presumed to be short-lived (10-20 years).		N/A	N/A	N/A	
Wollemi Mint-bush ***Prostanthera cryptandroides* subsp. *cryptandroides*** **V TSC** **V EPBC**	Strongly aromatic shrub. Grows in dry sclerophyll forest, heath or rock scrub, often in rocky sites, chiefly Lithgow to Sandy Hollow area. Also north from Sandy Hollow into Border Rivers/Gwydir catchment and Qld. In open forest,. Flowers Sept-May.	In Wollemi NP and probably in Goulburn River NP.	N/A	N/A	N/A	
Prostanthera discolor **V TSC** **V EPBC**	Narrow-leaved, strongly aromatic shrub. Flowers Sept-Oct. In dry sclerophyll forest in rocky gullies in Sandy Hollow-Merriwa area.	Known to occur in Goulburn River NP.	N/A	N/A	N/A	
Mount Vincent Mint-bush ***Prostanthera stricta*** **V TSC** **V EPBC**	Shrub to 2 x 3m, aromatic. Flowers winter-spring. Grows in sclerophyll forest, in sandy alluvium near streams, Widdin Valley area, CWS.	Known to occur in Goulburn River NP.	N/A	N/A	N/A	
Inland Rustyhood ***Pterostylis cobarensis*** **V EPBC**	Terrestrial orchid, flowering Sept-Oct, growing on "sparsely treed rocky hills, stony slopes and in mallee communities, sometimes on isolated rocky outcrops" (Jones, 2006). The known distribution of this species is Broken Hill-Nyngan area to Young (Jones, 2006). Terrestrial orchids seldom persist in heavily grazed areas and the likelihood of this species occurring in farming areas is very low.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Rulingia procumbens **V TSC** **V EPBC**	Prostrate shrub, stems to 30cm long. In sandy sites (often roadsides), mainly in Dubbo-Mendooran-Gilgandra area, also Pilliga and Nymagee areas, CWS, NWP, SWP. Also recent collections from upper Hunter (W-facing spur and a nearby ridge near Sandy Hollow on crown reserve between Goulburn River NP and Manobalai NR– Bell, 2001) and 4 populations in Goonoo SF. Associated spp = *E. dealbata, sideroxylon, fibrosa, albens, melliodora, Callitris glaucophylla, Acacia triptera, Philotheca salsolifolia, Calytrix tetragona*. Also found on slopes of Mt Dangar in Goulburn River NP, in a burnt area – may be a fire ephemeral.	Known to occur in Goulburn River NP.	N/A	N/A	N/A	
Slender Darling Pea ***Swainsona murrayana*** **V TSC** **V EPBC**	Prostrate to erect forb to 25cm high. "Often grows with *Maireana* species on heavy soils, especially in depressions, west from Warialda district, NWS, CWS, SWS, NWP, SWP, Q, Vic, Tas" (Harden 2002). Mostly W slopes and plains, with records from between Dubbo and Moree. In saltbush, black box and grassland communities on plains, floodplains and depressions, occasionally on intermittently cultivated or grazed sites.		Marginal	Unlikely	Low	
Austral Toadflax ***Thesium australe*** **V TSC** **V EPBC**	In *Themeda* grassland, coastal headlands and inland grassland or grassy woodland, NC, CC, SC, NT, ST, NWS, CWS, Q, Vic, Tas, E Asia. A partial root parasite on Kangaroo Grass (*Themeda australis*). Unlikely to persist in heavily grazed sites, or to occur where Kangaroo Grass is not at least moderately common.	OEH Atlas – one record (dated 1959) located in Cassilis.	Present in the NE corner of the study area.	Possible	Low	Areas dominated by Kangaroo grass in the NE part of the site have been avoided as part of the revised design.
Tylophora linearis **V TSC** **E EPBC**	A small vine which grows In dry scrub and open forest in the Barraba, Mendooran, Temora and West Wyalong districts, NWS, CWS, Q. Common associated species are *E fibrosa, sideroxylon, albens, Callitris* spp, *Allocasuarina leuhmanii*, *Acacia hakeoides, A. lineata*.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	
Wollemi nobilis **Wollemi Pine** **E TSC** **E EPBC**	Restricted to remote canyons in the Wollemi National Park, north-west of Sydney. Occurs in warm temperate rainforest and rain forest margins in remote sandstone canyons.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	

Species	Ecology and distribution	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Keith's Zieria ***Zieria ingramii*** **E TSC** **E EPBC**	Slender, spindly shrub to 0.6 m high, known only from Goonoo SF near Dubbo (Harden 2002), growing in dry sclerophyll forest on light sandy soils.	Not recorded on the NSW OEH Database or EPBC database.	N/A	N/A	N/A	

KEY:

V EPBC	Listed as Vulnerable on the *Environmental Protection Biodiversity Conservation Act, 1999*
E EPBC	Listed as Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
CE EPBC	Listed as Critically Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
M EPBC	Listed as Migratory on the *Environmental Protection Biodiversity Conservation Act, 1999*

N/A indicates that the threatened species search did not return the species from the wind farm development area searches, and is only therefore applicable to the transmission line.

EEC name & Status*	Description	Wind Farm		Notes
		Presence on site	Potential to be impacted	
Coolibah-Black Box woodland of the northern riverine plains in the DRP and BBS bioregions (*E. coolabah, E. largiflorens*) **EEC EPBC**	Grassy woodland on heavy black clay soils in seasonally flooded areas.	Absent	No	
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia **EEC EPBC**	A grassy woodland found on relatively fertile soils of the western slopes and plains of NSW, Victoria and Qld in which *Eucalyptus microcarpa* (Inland Grey Box) is the most characteristic species. Prober and Thiele (2004) identified a correlation between *Eucalyptus microcarpa* communities and soils of Tertiary and Quaternary alluvial origin. This ecological attribute helps distinguish between Inland Grey Box Woodlands and the White Box Yellow Box Blakely's Red Gum Woodland. The latter community generally occurs further east and typically occupies a wide variety of alluvial and non-alluvial soils. Grey Box woodland also more often contains chenopod shrubs in the understorey.	Absent	No	

EEC name & Status*	Description	Wind Farm		Notes
		Presence on site	Potential to be impacted	
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland CEEC EPBC	Essentially the same community as the preceding one, but with the Commonwealth listing covering a wider geographical area.	Absent, grasslands are all derived from clearing of woodland.	No	
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion EEC EPBC		N/A as this part of the site is not within Sydney Basin bioregion.	No	
White Box-Yellow Box-Blakely's Red Gum Woodland EEC TSC CEEC EPBC	Grassy woodland widespread on the NSW tablelands and slopes, growing on flats, slopes or ridges on higher fertility soils, restricted to drainage lines on poorer soils. Characteristic trees are Yellow Box (*E. melliodora*), White Box (*E. albens*) and Blakely's Red Gum (*E. blakelyi*).	Present	**Yes**	**Assessment of Significance under TSC Act and EPBC Act undertaken.**

KEY:

EEC TSC Listed as an Endangered Ecological Community on the *NSW Threatened Species Conservation Act, 1995*

CEEC TSC Listed as a Critically Endangered Ecological Community on the *NSW Threatened Species Conservation Act, 1995*

EEC EPBC Listed as an Endangered Ecological Community on the *Environmental Protection Biodiversity Conservation Act, 1999*

CEEC EPBC Listed as a Critically Endangered Ecological Community on the *Environmental Protection Biodiversity Conservation Act, 1999*

N/A Species was not recorded or predicted to occur within the Wind Farm Study Area. These species were recorded or predicted to occur within the Transmission Line Study Area.

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Amphibians						

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Giant Burrowing Frog ***Heleioporus australiacus*** **V TSC** **V EPBC**	The species is predicted to be associated with dry forest environments (elevation 150-900m) with high habitat complexity (Penman *et al.* 2007). It will travel several hundred metres to creeks to breed. It has also been recorded in roadside drains and near slow-flowing creek pools with fringing fern and sedge vegetation. Breeds summer and autumn, apparently in burrows in creek banks, favouring deep loam soils. Coastal lowlands are generally considered unsuitable habitat and the species is rarely associated with permanent ponds or streams (DEWHA 2009; Penman et al 2007). However, records around Vincentia and Ulladulla suggest this species may in fact be found on coastal lowlands (<100mASL).	Known to occur in Goulburn River NP.	N/A	N/A	N/A	Database searches did not show any records of this species within the Wind Farm Study Area.
Giant Barred Frog ***Mixophyes iteratus*** **E TSC** **E EPBC**	Giant Barred Frogs are large frogs, up to 115 mm in length. They are olive to dark brown above with paler or darker blotches, and cream to pale yellow below. The skin is finely granular. The pupil of the eye is vertical and the iris is pale golden in the upper half and brown in the lower half. Coast and ranges from south-eastern Queensland to the Hawkesbury River in NSW. North-eastern NSW, particularly the Coffs Harbour-Dorrigo area, is now a stro**ngh**old. Considered to have disappeared south of the Hawkesbury and there are no recent records from the Blue Mountains.	Goulburn River NP – 2 records (dates 2001-2002) SE of Ulan.	N/A	N/A	N/A	Database searches did not show any records of this species within the Wind Farm Study Area.
Regent Honeyeater ***Anthochaera phrygia*** **E TSC** **E EPBC** **M EPBC**	There are now only a small number of known breeding sites in NSW, the most important of which are: Warrumbungles NP, Pilliga NR, Barraba district, central coast around Gosford, Hunter Valley, and Capertee Valley (DECCW 2010). Most records are from box-ironbark eucalypt associations and it appears to prefer wetter fertile sites within these associations (Menkhorst *et al.*, 1999). It is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Yellow Gum, Blakely's Red Gum and White Box (Menkhorst *et al.*, 1999). It also occurs in riparian forests of River She-oak and wet lowland coastal forests dominated by Swamp Mahogony and Spotted Gum and (DECCW 2010). The species can undertake large-scale nomadic movements in the order of hundreds of kilometres.	OEH Atlas – 11 records (dated 1985-2000) mostly from eastern Goulburn River NP and SW of Ulan.	Present	Possible	Low minor habitat loss	Habitat for this species within the Wind Farm Study Area is marginal and there are no recent records of this species.

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Rufous Fantail ***Rhipidura rufifrons*** **M EPBC**	This species is found in a variety of habitats including eucalypt woodlands and watercourses where it nests in a horizontal fork of a tree up to 12m from the ground. Breeds in southern Australia, but is known to migrate to inland Australia, PNG, Solomon Islands, New Caledonia and Indonesia.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	
Swift Parrot ***Lathamus discolor*** **E TSC** **E EPBC**	This species breeds in Tasmania, migrating to south and eastern NSW in autumn/winter where it inhabits eucalypt forests and woodlands, particularly Box-Ironbark Forests of central Victoria and southern NSW (DECCW 2010; Smales, 2005). Mostly occurs on the south-west slopes. It feeds on nectar flowers of eucalypts and lerp-insects, also soft fruits and berries sometimes foraging in grass (Pizzey and Knight 2003). Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Mugga Ironbark, and White Box (DECCW 2010).	OEH Atlas – 2 records (dated 2005) located approx. 4km W of Curryall SF in a cleared area. Predicted to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records.
Superb Parrot ***Polytelis swainsonii*** **V TSC** **V EPBC**	This species is found throughout eastern inland NSW. On the South-western slopes the core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west (DECCW 2010). It inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. The species nests in the hollows of large trees (dead or alive) in open Box Gum Woodland or isolated paddock trees. Species known to be used for nesting are Blakely's Red Gum, Yellow Box, Apple Box and Red Box (DECCW 2010). It forages on the ground in grassy woodland, also on fruit, seeds and blossoms of acacias, eucalypts and mistletoes (Pizzey and Knight, 2003).	Not recorded on the NSW OEH Database or EPBC database.	Marginal	Possible	Low	Database searches did not show any records of this species within the Wind Farm Study Area.

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Red Goshawk ***Erythrotriorchis radiatus*** **CE TSC** **V EPBC**	This raptor is distributed sparsely through northern and eastern Australia, from the western Kimberley Division of northern Western Australia to north-eastern Queensland and south to far north-eastern NSW, and with scattered records in central Australia. The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. Red Goshawks inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, *Melaleuca* swamp forest and riparian *Eucalyptus* forest of coastal rivers.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	Marginal	Unlikely	Low	Database searches did not show any records of this species within the Wind Farm Study Area.
Malleefowl ***Leipoa ocellata*** **E TSC** **V EPBC**	The Malleefowl is a large (60 centimetres long, 43 centimetres high and weighing between 1.5 and 2.5 kilograms), distinctive, ground-dwelling bird. It possesses robust, powerful legs, a short bill and a flattish head while the wings are short, broad and rounded at the tip. The head and neck is greyish above, topped with black, the chin is chestnut and the throat and chest are white with a central black stripe. The stro**ngh**old for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary, and is part of a larger population north of the Murray River in South Australia.	Goulburn River NP – one record (dated 1989) near Mogo.	Absent	Unlikely	No	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records.
Australian Painted Snipe or Painted Snipe ***Rostratula benghalis*** **E TSC** **V EPBC** **M EPBC**	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. It is most common in the Murray-Darling Basin (DECCW 2010). It inhabits inland and coastal ephemeral and permanent freshwater wetlands, especially where there is a cover of vegetation. It has been recorded on the margins of wetlands, dams and even sewage ponds, also found in wet pastures, marshy areas, irrigation systems, tea tree scrub and adjacent open woodlands (Pizzey and Knight 2003). The species is likely to be nomadic in response to suitable conditions, such as floods (DECCW 2010).	Predicted to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Database searches did not show any records of this species within the Wind Farm Study Area and any areas of suitable habitat occur outside of the development footprint.

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Australasian Bittern ***Botaurus poiciloptilus*** **E TSC** **E EPBC**	Little is known of the behaviour of this cryptic waterbird. May be nomadic as it has been observed occupying ephemeral wetlands. Seeds and invertebrates are foraged for on the water's edge.	Predicted to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Database searches did not show any records of this species within the Wind Farm Study Area and any areas of suitable habitat occur outside of the development footprint.
White-throated Needletail ***Hirundapus caudacutus*** **M EPBC**	Noted as one of the world's fastest birds, this species has been recorded in the airspace above woodlands, forests and farmlands. Often seen 'patrolling' favoured feeding grounds above ridges and hilltops. This species migrates to Australia from mid-October and is a regular summer migrant until April when it returns to breed.	Predicted to occur from the EPBC Database.	Moderate	Possible	Moderate potential blade-strike	Will possibly occur infrequently in the study area during migration to southern hemisphere during our spring and summer months. Predominantly coastal.
Rainbow Bee-eater ***Merops ornatus*** **M EPBC**	This species inhabits open woodlands with sandy, loamy soil. It builds a burrow in sandy ground or bank cuttings such as roads or creeks. The species is a summer breeding migrant (Sept-Apr) to south-eastern Australia, but winters in northern Australia, Solomon Islands, PNG and Indonesia.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	
Satin Flycatcher ***Myiagra cyanoleuca*** **M EPBC**	This species is found in heavily vegetated gullies in forests, usually above a shrub layer. During migration it is often found in coastal forests. It breeds mostly in south-east Australia, and usually departs in March to winter in northern QLD, PNG and the Torres Strait Islands. Occasional vagrant to New Zealand.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	
Fork-tailed Swift ***Apus pacificus*** **M EPBC**	This species breeds from central Siberia eastwards through Asia and winters south to Australia. Uncommon in eastern Australia. It spends most of its time in the air feeding on insects, occasionally roosting on cliffs or in large trees (Pizzey *et al.*, 2006). It occurs throughout mainland Australia, mostly west of the divide.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Great Egret ***Ardea alba*** **M EPBC**	The Great Egret has been reported in a wide range of wetland habitats (for example inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial). These include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs. The Great Egret can retreat to permanent wetlands or coastal areas when other wetlands are dry (for example, during drought). This may occur annually in some regions with regular wet and dry seasons or erratically where the availability of wetland habitat is also erratic.	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	
Cattle Egret ***Ardea ibis*** **M EPBC**	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It has occasionally been seen in arid and semi-arid regions however this is extremely rare. High numbers have been observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures. It has been recorded on earthen dam walls and ploughed fields. It is commonly associated with the habitats of farm animals, particularly cattle, but also pigs, sheep, horses and deer. The Cattle Egret is known to follow earth-moving machinery and has been located at rubbish tips. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora. They have sometimes been observed in swamps with tall emergent vegetation (Marchant & Higgins 1990; Morton *et al.* 1989).	Predicted to occur from the EPBC Database.	Marginal	Possible	Low	
Latham's Snipe, Japanese Snipe ***Gallinago hardwickii*** **M EPBC**	Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby.	Predicted to occur from the EPBC Database.	Marginal	Unlikely	Low	

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
White-bellied sea eagle ***Haliaeetus leucogaster*** **M EPBC**	This species occurs around coastal areas, islands and estuaries, but is also found in inland areas around large rivers, wetlands and reservoirs. This species shows a high fidelity to nest sites, where it constructs conspicuous stick nests in the forks of tall trees and stags.	Predicted to occur from the EPBC Database.	Marginal	Possible	Moderate potential blade-strike	
Australian Painted Snipe or Painted Snipe ***Rostratula benghalis*** **E TSC** **V EPBC** **M EPBC**	See Diurnal Birds Above	See Diurnal Birds Above				
Regent Honeyeater ***Anthochaera phrygia*** **E TSC** **E EPBC** **M EPBC**	See Diurnal Birds Above	See Diurnal Birds Above				
Corben's Long-eared Bat ***Nyctophilus corbeni*** **V TSC** **V EPBC**	The south eastern form of the Greater Long-eared Bat is also known as Eastern Long-eared Bat and has recently been described as new species Corben's Long-eared Bat (N. corbeni). Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stro**ngh**old for this species. Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. It roosts in tree hollows, crevices, and under loose bark. The species is a slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground.	OEH Atlas – 6 records (dated 2000-2002) with the majority of records from vegetated valleys within Goulburn NP and one record near Turill SF. Also known from Coolah Tops NP.	Marginal	Present (Anabat record)	Moderate forages beneath canopy	**Assessment of Significance undertaken**

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Greater Long-eared bat (south-eastern form)/ Eastern Long-eared Bat ***Nyctophilus timoriensis*** **V TSC** **V EPBC**	The species prefers more arid regions, the distribution of the south eastern form approximately coincides with the Murray Darling Basin with the Pilliga Scrub region being the distinct stro**ngh**old for this species. This species inhabits a variety of vegetation types, including mallee, bulloke but more commonly box/ironbark/cypress-pine communities that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland (DECCW). It is a slow flying agile species and forages in the lower parts of the canopy, even amongst the shrub layers and on the ground (Menkhorst and Knight 2001) and often over water bodies. The species roosts in tree hollows, and under loose bark.	Not recorded on the NSW OEH Database or EPBC database.	Marginal	Possible	Low forages beneath canopy	
Grey-headed Flying-fox ***Pteropus poliocephalus*** **V TSC** **V EPBC**	This species roosts in large camps, generally in wetter vegetation such as riparian areas, rainforest or swamp forest. Groups fly out at night to feed on fruit, nectar and blossom, particularly of *Eucalyptus, Melaleuca* and *Banksia*. This species shows fidelity to roosting areas but may feed in orchards. It appears to be showing increasing tolerance to human disturbance.	Predicted to occur in Coolah Tops NP.	Marginal	Possible	Low	
Spotted-tailed Quoll ***Dasyurus maculatus*** **V TSC** **E EPBC**	This species is found in a variety of forest types such as rainforest, wet and dry sclerophyll forest, woodland, coastal heath and scrub, sometimes Red Gum forest along inland waterways (Menkhorst and Knight, 2004). It utilises hollow-bearing trees, fallen logs, rock caves and crevices as denning and breeding sites (DECCW 2010). Mostly nocturnal it hunts mammals, birds and large arthropods. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creeklines.	OEH Atlas – 2 records (dated 1980-2008) located along roadsides NW of Coolah and along the Golden Hwy SE of Cassilis. Known to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records.
Bilby ***Macrotis lagotis*** **Extinct TSC** **V EPBC**	Extinct.		N/A	N/A	N/A	

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
Brush-tailed Rock-wallaby ***Petrogale penicillata*** **V TSC** **V EPBC**	Isolated populations along the Great Dividing Range. This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. In many parts of their range, rock-wallabies are closely associated with dense arboreal cover, especially fig trees (NSW NPWS 2003a). The vegetation on and below the cliff appear to be important to this species as a source of food and shelter and in some cases may provide some protection from predation (Wong 1993; 1997). A range of vegetation types are associated with Brush-tailed Rock-wallaby habitat, including dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophyll forest, and open forest (Murray *et al.* 2008).	OEH Atlas – 3 records (dated 1999-2009) located north of the Ulan Colliery and within the E part of Goulburn River NP. Known to occur in Coolah Tops NP.	Marginal	Unlikely	Low	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records.
Koala ***Phascolarctos cinereus*** **V TSC** **V EPBC**	This species was historically abundant in the south of NSW, although now occurs in sparse and possibly disjunct populations. It occurs in woodland communities, coastal forests, woodlands of the tablelands and western slopes and the riparian communities of the western plains (NPWS, 2003b). May also utilise isolated paddock trees (NPWS, 2003b). Primary feed tree species listed for the central and southern tablelands are Ribbon Gum and River Red Gum, secondary species include Candle Bark, Blakely's Red Gum, White Box, Yellow Box and Brittle Gum (NPWS, 2003b).	OEH Atlas – 7 records (dated 1957-2002) with four of this located in close vicinity to the proposed wind farm site.	Marginal	Possible	Moderate potential habitat loss	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records. It was not recorded during the fauna survey.
Pilliga Mouse ***Pseudomys pilligaensis*** **V TSC** **V EPBC**	The Pilliga Mouse is very sparsely distributed and appears to prefer areas with a sparse ground cover. Some evidence exists of marked population fluctuations by this species. The Pilliga Mouse is restricted to an isolated area of low-nutrient deep sand which has long been recognised as supporting a distinctive vegetation type (Pilliga Scrub). Recent studies indicate that the Pilliga Mouse were found in greatest abundance in recently burnt moist gullies, areas dominated by broombush and areas containing an understorey of kurricabah (*Acacia burrowii*) with a bloodwood (*Corymbia trachyphloia*) overstorey. Consistent features of the latter two habitats were: a relatively high plant species richness; a moderate to high low shrub cover; and a moist groundcover of plants, litter and fungi. The gully where high rates of capture were encountered had an extensive cover by low grasses and sedges, with little shrub cover and large areas of ash-covered ground. It is nocturnal and appears to live in burrows.	Not recorded on the NSW OEH Database or EPBC database.	Absent	None	Low	Database searches did not show any records of this species within the Wind Farm Study Area.

Species	Form and Habitat	Records	Wind Farm			Notes
			Presence of Habitat	Likelihood of Occurrence	Potential for Impact	
New Holland Mouse ***Pseudomys novaehollandiae*** **V EPBC**	The New Holland Mouse has been found from coastal areas and up to 100 km inland on sandstone country. The species has been recorded from sea level up to around 900 m above sea level. Due to the largely granivorous diet of the species, sites where the New Holland Mouse is found are often high in floristic diversity, especially leguminous perennials.	Recorded in Goulburn River NP.	Marginal	Unlikely	Low	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records.
Reptiles						
Pink-tailed Legless Lizard ***Aprasia parapulchella*** **V TSC** **V EPBC**	This species is only known from the Central and Southern Tablelands, and the South Western Slopes (Osborne and Jones, 1995). It inhabits sloping, open woodland areas with predominantly native grass groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Typically these areas are well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks in burrows below these rocks; the burrows usually have been constructed by and are often still inhabited by small black ants and termites (Osborne and Jones, 1995). This species feeds on the larvae and eggs of these ants (DECCW 2010).	Goulburn River NP – One record (dated 2000) near Mogo.	Marginal	Possible	Low	Habitat for this species within the Wind Farm Study Area is marginal and there are few local records. It was not recorded during the fauna survey despite an extensive search effort.
Broad-headed Snake ***Hoplocephalus bungaroides*** **E TSC** **V EPBC**	The Broad-headed Snake is generally black above with yellow spots forming narrow, irregular cross-bands. Other yellow scales may link these cross-bands laterally to form a straight or zigzagged stripe along the body. These cross-bands help distinguish it from the similar-looking but harmless juvenile Diamond Python. Its head is flattened on top and distinct from the body. The belly is grey or greyish-black. The average length is about 60 cm, with a maximum of around 150 cm. The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney.	Not recorded on the NSW OEH Database. Predicted to occur from the EPBC Database.	N/A	N/A	N/A	Database searches did not show any records of this species within the Wind Farm Study Area.

KEY:

V EPBC Listed as Vulnerable on the *Environmental Protection Biodiversity Conservation Act, 1999*
E EPBC Listed as Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
CE EPBC Listed as Critically Endangered on the *Environmental Protection Biodiversity Conservation Act, 1999*
M EPBC Listed as Migratory on the *Environmental Protection Biodiversity Conservation Act, 1999*
N/A indicates that the threatened species search did not return the species from the Wind Farm Study Area.