



Environment, Climate Change & Water



PCU015386

Your reference : MP10_0156
Our reference : FIL10/12556 DOC10/43928
Contact : Duncan McGregor, 6229 7002

Mr Neville Osborne
The Manager – Water and Energy
Infrastructure Projects
Department of Planning
GPO Box 39
SYDNEY NSW 2001



5 October 2010

Dear Mr Osborne,

Re: Proposed Collector Wind Farm Development (MP10_0156)

I refer to your letter dated 21 September 2010, requesting the Department of Environment, Climate Change and Water's (DECCW) requirements for the preparation of an Environmental Assessment (EA) for the above proposal. DECCW understands that the project application for this proposal will be assessed by the Department of Planning (DoP) under Part 3A of the *Environmental Planning and Assessment Act 1979*.

DECCW has considered the details of the proposal, including the Preliminary Environmental Assessment prepared by Transfield Services (dated 17 September 2010). It appears that at this stage the proposal will not require any statutory approvals or licences under the environmental legislation administered by DECCW. The applicant should address the issues in **Attachments A-C** in the preparation of the EA to adequately assess the environmental impacts of the proposal. In summary these issues include:

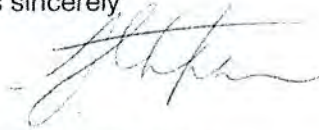
- the impacts of the project on threatened species and their habitat;
- the impacts on endangered ecological communities, including the Commonwealth listed Natural Temperate Grasslands;
- the impacts of the project on Aboriginal Cultural Heritage values;
- the environmental impacts of the project;
- the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts identified above.

DECCW also requests that the applicant is provided with a full unaltered version of DECCW's assessment requirements and guidelines as set out in Attachments A-C.

DECCW requests that 1 hard copy and an electronic copy of the EA are provided for assessment. These documents should be lodged at DECCW's South East Regional Office, 11 Farrer Place, Queanbeyan, NSW 2620.

If you require any additional information, or wish to discuss the matter further, please contact Duncan McGregor of this office on 6229 7002.

Yours sincerely

A handwritten signature in dark ink, appearing to read 'J. Thompson', written over a horizontal line.

JULIAN THOMPSON
Head of Operations Unit – South East Region
Environment Protection and Regulation Group

Attachment A

Specific Information required by DECCW

Environmental impacts of the project

The EA must provide sufficient information for DECCW to be able to fully assess the development in so far as how the impacts relate to environmental legislation administered by DECCW. The EA must include a comprehensive description of the production processes, all discharges and emissions to the environment, an assessment of likely environmental impacts, and a comprehensive description of any proposed control measures.

The environmental sensitivity of the site and surrounds should be discussed. Details are required on the location of the proposed development, including the affected environment, to place the proposal in its local and regional environmental context including surrounding landuses, planning zonings and potential sensitive receptors.

The EA should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

Although wind farms are not a scheduled activity under the *Protection of the Environment Operations Act 1997* (POEO Act) consideration should be given to the licensing requirements for activities listed in Schedule 1 of the POEO Act.

Should the proponent require an environment protection licence (EPL) under the POEO Act, a separate application to DECCW will be required to be made to obtain an EPL if project approval is given.

The following environmental impacts of the project need to be assessed, quantified and reported on:

- Water
- Air
- Noise
- Waste
- Construction
- Contaminated Land
- Threatened species
- Aboriginal cultural heritage

These should be assessed in accordance with the relevant guidelines listed in Attachment C.

Water

DECCW considers that the goals for ambient water quality are relevant environmental goals to the project. The central reference document for managing ambient water quality is the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC Guidelines) and Water Quality Objectives framework (<http://www.environment.nsw.gov.au/ieo/>).

The EA must demonstrate how the following environmental outcomes for the project will be achieved:

- Preventing the pollution of waters during construction or occupation of the site by the final users;
- There is no inconsistency with any relevant Statement of Joint Intent established by the Healthy Rivers Commission; and
- Consistency with the NSW Governments River Flow Objectives and Water Quality Objectives framework.

The EA should provide details of the project that are essential for predicting and assessing impacts to waters including the quantity and physio-chemical properties of all potential water pollutants and the risks posed to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters using technical criteria derived from the ANZECC Guidelines. The ANZECC Guidelines provide instructions for translating statements about desired environmental values and human uses into more practical management and numerical criteria.

The local drainage systems within the precincts are defined as 'waters' pursuant to the POEO Act. Section 120 of the POEO Act prohibits the pollution of waters by any person. DECCW notes the potential need for water sourcing during the construction phase, particularly to meet the needs of concrete batching. Accordingly consideration of water issues and the effects on local catchments should be fully investigated.

Air

Dust will be the main issue associated with air quality for the project corridor. The environmental assessment must describe in detail the measures proposed to mitigate the impacts and the extent to which the mitigation measures are likely to be effective in achieving the relevant environmental outcomes. A Cost Benefit Analysis on different mitigation measures/ technologies that have been investigated should also be included.

The existing ambient air quality in the vicinity of the proposal should be characterised and discussed. During the construction and operational phase of the project, impacts on amenity due to dust will need to be effectively managed.

Noise

DECCW supports the SA EPA Wind Farm Noise Guidelines (February 2003) and recommends that the SA Guideline (and criteria) be adopted as the sole basis for noise assessment of wind energy proposals in NSW. Use of other guidelines may be acceptable, provided compliance with these guidelines is also demonstrated. **The following information is designed to provide additional assistance, however it is the responsibility of the proponent to ensure that the assessment conforms with the aforementioned guideline.**

The EA must include a full assessment of how noise from this proposal will impact the surrounding environment and include information on the following:

- Identify all noise sources from the development (including both construction and operation phases). Detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials at the construction stage, and maintenance of the wind turbine generators (WTG's) during operation stage;
- Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, and other premises. This should include any residences on the property on which the WTG's are proposed (See also section 2.3 of the SA EPA Wind Farm Noise Guidelines February 2003);
- Typically the noise assessment should include a map of the locality showing any identified noise sensitive locations in relation to the site;

- Identify the land use zoning of the site and the immediate vicinity and the potentially affected areas.

1.1 Describe baseline conditions

- Determine the existing background noise levels for the identified noise sensitive residential receivers in accordance with the SA EPA Wind Farm Noise Guidelines (February 2003). The noise monitoring should comprise a minimum of 2000 measurement intervals (or the equivalent of two weeks worth of data), excluding any data adversely affected by the effects of wind and rain.
- Quantify winds that impinge on the microphone during noise monitoring. This is normally carried out at a height of 1200 to 1500mm above the ground.
- Prevailing wind speeds and directions shall be measured in accordance with the SA EPA Wind Farm Noise Guidelines (February 2003).

The noise impact assessment report should provide details of all monitoring of existing ambient noise levels including:

- Details of equipment used for the measurements;
- A description of the monitoring sites and where the equipment was positioned including photographs;
- A statement justifying the choice of monitoring site, including the procedure used to choose the site, having regards to the requirements of the SA EPA Wind Farm Noise Guidelines (February 2003);
- A description of the ambient noise environment including dominant and background noise sources at the assessment sites;
- The final L_{A90} values, based on the SA EPA's regression analysis method, for each integer wind speed from cut in to rated power;
- Graphs showing background noise at the receiver v's wind speed at the windfarm ,
- A record of periods of affected data (due to rain and/or excessive wind at the measurement location) methods used to exclude invalid data and a statement indicating that the data conforms to the SA EPA Wind Farm Noise Guidelines (February 2003) requirements;
- A statement qualifying the effectiveness of the microphone windshield protection for the range of wind speeds under consideration in the noise assessment.

1.2 Assess environmental impacts

Determine the noise criteria for the site. For each identified potentially affected receiver, this should include:

- Determination of the background noise levels for the range of integer wind speeds from cut in up to rated power;
- Determination of the noise criteria applicable to each assessment location based on the $L_{Aeq,10}$, adjusted for tonality, should not exceed 35dB(A) or the background noise (L_{A90}) by more than 5dB(A), whichever is the greater, at all relevant receivers for each integer wind speeds from cut in to rated power of the WTG.

Determine expected noise level and noise character (eg: tonality, impulsiveness, vibration, etc) likely to be generated from noise sources during:

- site establishment;
- construction;
- operational phases;
- transport including traffic noise generated by the proposal, where appropriate; and

- Other services (such as maintenance).

The noise impact assessment report should include noise source data for each wind turbine generator (WTG) source in 1/3 octave band centre frequencies including methods or references used to determine noise source levels. This data should address all proposed operating modes for the WTG's.

Determine the noise & vibration levels to be received at all locations identified as relevant receivers under the SA EPA Wind Farm Noise Guidelines (February 2003) for each integer wind speed from cut in speed to the speed of rated power. Potential impacts should be determined for the operating meteorological conditions (including wind speeds from cut in to rated power). Predicted noise levels from site establishment and construction phases should be assessed following the guidelines in the EPA, Environmental Noise Control Manual.

The proponent's assessment of the potential noise impacts shall include consideration of low frequency noise including infrasound.

The noise impact assessment report should include:

- A plan showing the location of each noise source (WTG and ancillary equipment as relevant) for each prediction scenario as applicable;
- A list of the number and type of noise sources used in each prediction scenario to simulate all potential significant operating conditions on the site;
- Any assumptions made in the predictions in terms of source heights, directivity effects, shielding from topography, buildings or barriers, etc;
- Methods used to predict noise impacts including identification of the noise model used. The model used shall be supported with sufficient justification to demonstrate that the model has been proven to accurately predict noise from WTG under Australian conditions. Calibration of the model against existing wind farm operations is preferable, however other calibration methods may be considered on a case by case basis. An estimation of the models accuracy is essential;
- The predicted noise impacts from the operation scenario under the operating meteorological conditions (ie wind speeds from cut in to rated power) as well as calm conditions such as during maintenance periods where appropriate;
- Noise contours for the key prediction scenarios should be derived.

Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures to meet the criteria.

The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.

Where blasting is intended at the site establishment or construction stage, the following details of the blast design should be included in the noise assessment:

- bench height, burden spacing, spacing burden ratio;
- blast hole diameter, inclination and spacing;
- type of explosive, maximum instantaneous charge, initiation, blast block size, blast frequency.

The noise impact assessment should include contingency measures or safeguards that provide for additional noise attenuation measures that are feasible and reasonable (and committed to by the proponent) should higher noise levels than those predicted result following commissioning of the WTG.

1.3 Compliance Assessment

The noise impact assessment shall identify, and commit to, the compliance assessment requirements presented in the SA EPA Wind Farm Noise Guidelines (February 2003) and the measures to be employed in the wind farm development to ensure that, if approved, a compliance assessment satisfying these requirements can be undertaken.

The construction and operation of the WTG will increase noise and vibration levels at sensitive receivers. The proposal must be designed, constructed, operated and maintained so that there are no adverse impacts from noise (including traffic noise).

Road transport to and from the project corridor has the potential to increase disturbance at residential properties along private or public haulage routes. To assess the extent of the impact, the noise impact assessment should identify the transport route(s) to be used, the hours of operation, anticipated traffic movements, and expected increase in noise levels. The publication *Environmental Criteria for Road Traffic Noise* (EPA, 1999) describes the methods generally applied by the DECC to determine noise planning levels for road traffic noise in locations of varying sensitivity.

The methodology, data and assumptions used to assess the impact of road haulage on residential properties must be fully documented and justified. Where disturbance due to road transport is likely to exceed the recommended criteria, the EA must describe the measures proposed to mitigate the impacts and the extent to which the measures are likely to be effective in achieving the relevant criteria.

Waste

The EA should describe all wastes that will be generated by the proposal including, for each of the main waste streams, the process from which it will be generated; its quantity and composition; its classification under the *Protection of the Environment Operations Act 1997*; and the proposed arrangements for dealing with the waste. Consideration should also be given to disposal of cleared vegetation and excess spoil material.

Guidance on waste classification and management issues can be obtained from the publication *Waste Classification Guidelines* (DECC, 2008). The EA should clearly identify methods of reducing waste volumes and recycling and reusing wherever possible.

The avenues for disposal of industrial/hazardous waste are limited within New South Wales at present and the proponent should detail the likelihood of generation of these wastes and anticipated storage/disposal methods.

The EA must identify any fuel or chemical storage areas to be established on the site and describe the measures proposed to minimise the potential for leakage or migration of pollutants into the soil, groundwater or surface water systems.

Construction

DECCW notes the proposal would involve the construction, operation, and decommissioning of wind turbines as well as other associated infrastructure including:

- Wind farm infrastructure (wind turbines, nacelle, tower, footings and transformers);
- Electrical connections between wind turbines and on-site substations (including underground cable and overhead power lines);
- Onsite control building and equipment storage facilities;
- Onsite access roads to the wind turbines (unsealed) and upgrades to local haulage roads (sealed);
- Freestanding permanent masts for wind speed verification and monitoring.

The EA should identify and assess the impacts of any specific activity involved in site preparation associated with the construction of the turbines. DECCW considers grid connections and road upgrades outside of the development envelope should also be considered as part of the EA.

Details and design specifications of appropriate sediment and erosion controls to mitigate any impacts from this component of the development on the environment should be included in the EA. Further guidance is available in the guideline *Managing Urban Stormwater - Soils and Construction*, 4e (Landcom 2004). This should include reference to appendices such as *Volume 2a: Installation of Services* (DECC 2008), available from the DECCW website at <http://www.environment.nsw.gov.au/stormwater/publications.htm>

Access tracks and roads should be designed, constructed and maintained in accordance with *Managing Urban Stormwater: Soils and Construction Volume 2C: Unsealed Roads* (DECC 2008) and *Volume 2D: Main Road Construction* (DECC 2008), available from the DECCW website at the above address. This should include the careful choice of drainage line crossings to minimise disturbance to stream flow and ensure stability of the drainage line, bank and crossing.

The likelihood of disturbing acid sulphate soils and/or pre-existing site contamination during the construction phase must be detailed in the environmental assessment and, where applicable, contingency plans must be proposed for management of acid sulphate or contaminated soils.

The EA must also describe the rehabilitation works proposed to return disturbed areas to an appropriate state at the completion of the project. All areas disturbed during construction must be revegetated to a high standard.

DECCW emphasise that all activities must be carried out with due diligence, duty of care, and according with best management practices. Accordingly, all personnel involved in the construction works should be aware of the details of the works plans, legislation and associated pollution controls before any works commence.

Contaminated Land

The EA must document the management of any land contamination. This includes ensuring that land is not allowed to be put to a use that is inappropriate because of the presence of contamination, and incorporates mechanisms to ensure that:

- planning authorities consider contamination issues when they are making development decisions;
- local councils provide information about land contamination on planning certificates that they issue under section 149 of the Environmental Planning & Assessment Act; and
- Land remediation is facilitated and controlled through State Environmental Planning Policy 55 – Remediation of Land (SEPP55).

The following documents should form the basis for the contaminated land assessment for the proposed development:

- *Managing Land Contamination: Planning Guidelines - SEPP55 - Remediation of Land*, Department of Urban Affairs and Planning and NSW EPA, 1998;
- *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (Environment Protection Authority (EPA) 1997);
- *Contaminated Sites – Guidelines on Significant Risk of Harm and Duty to Report* (EPA, 1999).

Under the Contaminated Land Management Act there is a responsibility to notify the DECC of sites that pose a significant risk of harm to human health or the environment.

Impacts of the project on threatened species and their habitat

A number of threatened entities are known to occur or have potential to occur in the Collector area. A complete fauna and flora survey should be conducted and documented in accordance with the draft "Guideline for Threatened Species Assessment" (DEC and DPI, 2005) as it provides the assessment framework for threatened species issues associated with the site. All survey work should be undertaken at the appropriate time of year for each species to maximise the survey results.

The project area may support Endangered Ecological Communities (EEC). Development will need to avoid EEC and provide an appropriate buffer and asset protection zone. The EA must describe what actions will be undertaken to avoid or mitigate impacts caused by the development on all threatened species described at the site. Threatened species that could potentially occur onsite and should be considered include:

- Box/Gum grassy woodland communities;
- Tableland Basalt Forest;
- Natural temperate grasslands;
- Tablelands Frost Hollow Grassy Woodlands;
- Black Gum, *Eucalyptus aggregata*
- Silky Swainson-pea *Swainsona sericea*;
- Pink-tailed Worm-lizard *Aprasia parapulchella*;
- Striped Legless Lizard *Delmar impar*;
- Little Whip Snake *Suta flagellum*.
- Superb parrot *Polytelis swainsonii*
- Squirrel glider *Petaurus norfolcensis*; and
- Small woodland birds

The above list is not exhaustive and there is potential for a number of other threatened species to occur at the site. See **Attachment B** for a complete list of relevant threatened species and associated assessment requirements to be assessed for this project.

Likely impacts on regionally significant, protected, and threatened species and their habitats need to be assessed, evaluated and reported. The assessment should specifically report on the considerations listed in Step 3 of the Draft Threatened Species Assessment Guidelines (DECC and DPI, 2005) as stated below.

- **Step 3, Involves identifying not only the magnitude and extent of impacts but also the significance of the impacts as related to the conservation importance of the habitat, individuals and population likely to be affected."**

The EA should clearly state whether it meets each of the key thresholds set out in Step 5 of the draft guidelines and describe the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on threatened species, populations, ecological communities, or their habitats. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after the measures are implemented.

Other vegetation clearing

The EA should clearly outline the extent to which the development footprint will impact on areas of native vegetation. It should also describe the tenure and conservation status of each parcel of land to be affected by the proposal or used as an offset.

Offsetting biodiversity and habitat loss would be required as identified in the threatened species guidelines. There are formulas associated with the "maintain and improve" principle of the Government's vegetation reforms that DECCW considers should apply.

Biodiversity Offset Principles

1. **Impacts must be avoided first by using prevention and mitigation measures**
Offsets are then used to address remaining impacts. This may include modifying the proposal to avoid an area of biodiversity value or putting in place measures to prevent offsite impacts.
2. **All regulatory requirements must be met**
Offsets cannot be used to satisfy approvals or assessments under other legislation, e.g. assessment requirements for Aboriginal heritage sites, pollution or other environmental impacts (unless specifically provided for by legislation or additional approvals).
3. **Offsets must never reward ongoing poor performance**
Offset schemes should not encourage landholders to deliberately degrade or mismanage offset areas in order to increase the value from the offset.
4. **Offsets will complement other government programs**
A range of tools is required to achieve the NSW Government's conservation objectives, including the establishment and management of new national parks, nature reserves, state conservation areas and regional parks and incentives for private landholders.
5. **Offsets must be underpinned by sound ecological principles**
They must:
 - include the consideration of structure, function and compositional elements of biodiversity, including threatened species
 - enhance biodiversity at a range of scales
 - consider the conservation status of ecological communities
 - ensure the long-term viability and functionality of biodiversity.Biodiversity management actions, such as enhancement of existing habitat and securing and managing land of conservation value for biodiversity, can be suitable offsets. Reconstruction of ecological communities involves high risks and uncertainties for biodiversity outcomes and is generally less preferable than other management strategies, such as enhancing existing habitat.
6. **Offsets should aim to result in a net improvement in biodiversity over time**
Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site.

Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset against the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation.

Offsets may include enhancing habitat, reconstructing habitat in strategic areas to link areas of conservation value, or increasing buffer zones around areas of conservation value and removal of threats by conservation agreements or reservation.
7. **Offsets must be enduring and they must offset the impact of the development for the period that the impact occurs**
As impacts on biodiversity are likely to be permanent, the offset should also be permanent and secured by a conservation agreement or reservation and management for biodiversity. Where land is donated to a public authority or a private conservation organisation and managed as a biodiversity offset, it should be accompanied by resources for its

management. Offsetting should only proceed if an appropriate legal mechanism or instrument is used to secure the required actions.

8. Offsets should be agreed prior to the impact occurring

Offsets should minimise ecological risks from time-lags. The feasibility and in-principle agreements to the necessary offset actions should be demonstrated prior to the approval of the impact. Legal commitments to the offset actions should be entered into prior to the commencement of works under approval.

9. Offsets must be quantifiable and the impacts and benefits must be reliably estimated

Offsets should be based on quantitative assessment of the loss in biodiversity from the clearing or other development and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset. The methodology should include:

- the area of impact
- the types of ecological communities and habitat/species affected
- connectivity with other areas of habitat/corridors
- the condition of habitat
- the conservation status and/or scarcity/rarity of ecological communities
- management actions
- level of security afforded to the offset site.

The best available information/data should be used when assessing impacts of biodiversity loss and gains from offsets. Offsets will be of greater value where:

- they protect land with high conservation significance
- management actions have greater benefits for biodiversity
- the offset areas are not isolated or fragmented
- the management for biodiversity is in perpetuity (e.g. secured through a conservation agreement).

Management actions must be deliverable and enforceable.

10. Offsets must be targeted

They must offset impacts on the basis of like-for-like or better conservation outcome. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance condition by management actions and the removal of threats. Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets. One type of environmental benefit cannot be traded for another: for example, biodiversity offsets may also result in improvements in water quality or salinity but these benefits do not reduce the biodiversity offset requirements.

11. Offsets must be located appropriately

Wherever possible, offsets should be located in areas that have the same or similar ecological characteristics as the area affected by the development.

12. Offsets must be supplementary

They must be beyond existing requirements and not already funded under another scheme. Areas that have received incentive funds cannot be used for offsets. Existing protected areas on private land cannot be used for offsets unless additional security or management actions are implemented. Areas already managed by the government, such as national parks, flora reserves and public open space cannot be used as offsets.

13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract

Offsets must be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes.

Impacts of the project on Aboriginal cultural heritage values

The EA for the project should address and document the information requirements set out in the *Draft Guidelines for Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, April 2010). This should include undertaking an independent archaeological report and assessment according to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010) and clearly demonstrate effective consultation with the Aboriginal community in accordance with the consultation requirements.

The assessment and consultation should identify the nature and extent of impacts on Aboriginal cultural heritage values across the study area; the extent and significance of each Aboriginal site and value located; formulate actions to mitigate impacts on Aboriginal cultural heritage values in association with the Aboriginal communities; and develop long term management recommendations for the Aboriginal cultural values located in the study area. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

The EA needs to clearly demonstrate that effective community consultation with Aboriginal communities has been undertaken in determining and assessing impacts, developing options and making final recommendations.

A copy of the archaeological report and Aboriginal community consultation should be provided to DECCW for comment and assessment.

Attachment B

DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR THE EVALUATION OF IMPACTS ON THREATENED SPECIES for THE COLLECTOR WIND FARM DEVELOPMENT – MP10_0156.

INTRODUCTION

The purpose of these Director General's requirements is to provide the assessment requirements to allow you, as the applicant, to identify the issues pertaining to threatened species, populations, ecological communities or their habitats, and provide appropriate amelioration for adverse impacts resulting from the action and to assist the consent or approval authorities in the assessment of your proposal pursuant to the *Environmental Planning and Assessment Act 1979* (EP&A Act).

DEFINITIONS

The definitions given below are relevant to these requirements:

- **Development** has the same meaning as in the EP&A Act.
- **Activity** has the same meaning as in the EP&A Act
- **Proposal** is the development, activity or action proposed
- **Subject Site** means the area directly affected by the proposal.
- **Study Area** means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account.
- **Locality** is the area within a 5km radius of the subject site
- **Subject Species, Populations or Ecological Communities** means those threatened species, populations or ecological communities that are known or considered likely to occur in the study area. The EVALUATION OF IMPACTS is to explicitly consider the impacts of the proposal on each of these entities.
- **Direct Impacts** are those that directly affect habitat and individuals, usually within the footprint of the proposal. They include, but are not limited to, clearing and habitat removal. Consideration must be given to all of the likely direct impacts of the proposed activity or development.
- **Indirect Impacts** occur when project-related actions affect species, populations or ecological communities in a manner other than direct loss, usually beyond the footprint of the proposal. Indirect impacts can include loss of individuals through predation by domestic and/or feral animals, deleterious hydrological changes (including increased runoff and raising or lowering of the water table), erosion, weed invasion, pollution, trampling or other impacts due to increased human activity within or directly adjacent to sensitive habitat areas, altered fire regimes, habitat fragmentation and disruption of wildlife movement corridors. As with direct impacts, consideration must be given to all of the likely indirect impacts of the proposed activity or development.

- **Life Cycle** is the series or stages of reproduction, growth, development, aging and death of an organism.
- **Viable** means the capacity to successfully complete each stage of the life cycle under normal conditions.
- **Risk of Extinction** is the likelihood that the local population of the species or local occurrence of the endangered population or ecological community will become extinct either in the short, medium or long-term as a result of direct or indirect impacts on the viability of that population and includes changes to the ecological function of communities.
- **Local Population** is the population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions.
 - The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.
 - The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.
 - The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time.

In cases where multiple populations occur in the study area, each population should be assessed separately.

- **Local Occurrence** means the ecological community that occurs within the study area. However the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.
- **Composition** means both the plant and animal species present, and the physical structure of the ecological community. Note that while many ecological communities are identified primarily by their vascular plant composition, an ecological community consists of all plants and animals as defined under the TSC Act that occur in that ecological community.

All other definitions are the same as those contained in the TSC Act.

1 CONTEXTUAL INFORMATION

1.1 Description of proposal, subject site and study area

A full description of the action proposed includes a description of all associated actions. These actions may occur on or off the subject site.

In describing the action proposed, the proportion of the subject site and the study area that will be affected is to be provided, including details of the location of any auxiliary infrastructure and all component parts of the proposal including, but not restricted to, (i) roadworks and temporary access and egress routes, (ii) drainage and settling ponds, stockpile areas, diversion banks, vehicle parking areas (iii) changes in surface water flows (iv) utilities such as electricity, drainage, sewage, gas, (v) any actions necessary for fire management, (vi) stockpile areas, (vii) temporary buildings etc.

The type of action proposed shall be detailed, including the timetable for the construction of the proposal. If a staged construction approach is adopted then the timetable shall clearly indicate this.

If subsequent development of adjacent land is proposed by the proponent in the future, including any additional road construction then this shall be identified to the extent that it is known at the time of preparing the Environmental Assessment. If existing structures are to be relocated, this should also be described and assessed.

The vegetation within the study area that is to be retained is to be fully documented, and shown on the relevant plans and maps. The proposed management regimes for such areas are also to be documented.

2. PROVISION OF RELEVANT PLANS AND MAPS

A detailed plan of the *study area* shall be provided at a preferred scale of 1:4,000 or finer. This plan shall show the *proposal*, the location and type of vegetation communities present within the *study area*, the full extent of vegetation clearing anticipated, and the scale of the plan. This plan shall also show the location of any key habitat resources for threatened species (eg. hollow-bearing trees, identified feed trees, potential breeding sites, rock outcrops). Where the general habitat of each *subject species, population or ecological community* within the *study area* can be clearly delineated, this habitat shall be represented on the plan.

Colour aerial photography of the *locality* (or a reproduction of such a photograph) shall be provided. This aerial photograph shall clearly show the *subject site* and the scale of the photograph.

The locations of the *subject species, populations or ecological communities* recorded in any survey conducted for the purposes of the Environmental Assessment shall be represented on a map of the *study area* that shows the *proposal* (preferred scale 1:4,000 or finer).

A topographic map of the general *locality* at a scale of 1:25,000 is to be provided. This map is to detail the location of the action proposed, landscape features including rivers, swamps, wetlands, any locally significant sites of *subject species, populations or ecological communities*, and areas of high human activity such as townships and major roads. This map shall incorporate the area within a radius of 5km from the subject site. All available historical records are to be included of *subject species, populations or ecological communities* sourced from various databases and other sources are to be included on this map.

2.1 Land tenure information

The land tenure across the *study area* is to be described and any limitations to sampling across the *study area* resulting from this tenure (e.g. denied access to private land) shall be noted.

3 INITIAL ASSESSMENT

3.1 Identifying subject species and populations

For the purposes of this Evaluation of Impacts, the species listed in Table 1 are to be addressed as *subject species*:

Table 1. List of subject species.

SPECIES	SCIENTIFIC NAME	STATUS
FAUNA		
Little Whip Snake	<i>Suta flagellum</i>	Vulnerable
Pink-tailed Worm-lizard	<i>Aprasia parapulchella</i>	Vulnerable
Striped Legless Lizard	<i>Delma impar</i>	Vulnerable
Grassland Earless Dragon	<i>Tympanocryptis pinguicolla</i>	Endangered
Brown Treecreeper	<i>Climacteris picumnus victoriae</i>	Endangered
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Vulnerable
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	Vulnerable
Flame Robin	<i>Petroica phoenicea</i>	Vulnerable
Little Eagle	<i>Hieraaetus morphnoides</i>	Vulnerable
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Vulnerable
Glossy Black-cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable
Superb Parrot	<i>Polytelis swainsoni</i>	Vulnerable
Barking Owl	<i>Ninox connivens</i>	Vulnerable
Powerful Owl	<i>Ninox strenua</i>	Vulnerable
Scarlet Robin	<i>Petroica boodang</i>	Vulnerable
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable
Regent honeyeater	<i>Xanthomyza phrygia</i>	Endangered
Eastern Bentwing Bat	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable
Yellow Bellied Sheath-tailed bat	<i>Saccolaimus flaviventris</i>	Vulnerable
Greater Long eared Bat	<i>Nyctophilus timoriensis</i>	Vulnerable
Greater Broad Nosed bat	<i>Scoteanax rueppellii</i>	Vulnerable
Golden Sun Moth	<i>Synemon plana</i>	Endangered
FLORA		
Black Gum	<i>Eucalyptus aggregata</i>	Vulnerable
Yass Daisy	<i>Ammobium craspedioides</i>	Vulnerable
Aromatic Peppergrass	<i>Lepidium hyssopifolium</i>	Vulnerable
Doubletail Buttercup	<i>Diuris aequalis</i>	Endangered
Austral Toad Flax	<i>Thesium australe</i>	Endangered
Endangered Ecological Communities		
<i>White Box, Yellow Box, Blakely's Red Gum Woodland</i>		
<i>Natural Temperate Grassland of the Southern Tablelands (NSW and ACT) (EPBC community)</i>		
<i>Tablelands Frost Hollow Grassy Woodlands (preliminary)</i>		
<i>Tableland Basalt Forest in the Sydney Basin and South East Highlands Bioregions</i>		

One of the roles of the Evaluation of impacts is to determine which species, populations or ecological communities may be utilising, or present, on a development site. The entities to be considered for inclusion in the list of subject species, populations and ecological communities are listed in Table 2. This list is not exhaustive and other entities may also need to be included for assessment on the basis of desktop and habitat analyses and the outcomes of fieldwork.

Table 2. List of other entities for consideration as *subject species, populations or ecological communities*.

SPECIES	SCIENTIFIC NAME	STATUS
FAUNA		
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	Vulnerable
Koala	<i>Phascolarctos cinereus</i>	Vulnerable
Tiger Quoll	<i>Dasyurus maculatus</i>	Vulnerable
Myotis macropus	<i>Southern Myotis</i>	Vulnerable
Turquoise parrot	<i>Neophema pulchella</i>	Vulnerable
Swift Parrot	<i>Lathamus discolor</i>	Endangered
Flame Robin	<i>Petroica Phoenicea</i>	Vulnerable
FLORA		
Dwarf Kerrawang	<i>Rulingia prostrata</i>	Endangered
Button Wrinklewort	<i>Rutidosis leptorrhynchoides</i>	Vulnerable
Silky Swainson Pea	<i>Swainsona sericea</i>	Vulnerable
Mountain Swainson Pea	<i>Swainsona recta</i>	Endangered
Tarengo Leek orchid	<i>Prasophyllum petilum</i>	Endangered

In determining whether the entities listed in Table 2, as well as other entities, should also be addressed as *subject species, populations and ecological communities*, consideration shall be given to the habitat types present within the *study area*, recent records of threatened species, populations or ecological communities in the *locality* and the known distributions of threatened species, populations and ecological communities. This analysis and its conclusion are to be documented in the Evaluation of Impacts.

Databases such as the DECCW Atlas of NSW Wildlife and BioNet, as well as databases held by the Australian Museum and Royal Botanic Gardens, should be consulted to assist in compiling the list of possible entities to be analysed. It should be noted that if the DECCW Atlas is the only database that is referred to, due to data exchange agreements, the data provided by DECCW will only include that for which DECCW is a custodian. In many cases, this may only be a small subset of the data available. Other databases must also be consulted to create a comprehensive list of entities for consideration as *subject species, populations or ecological communities*.

3.2 Identifying habitats

In describing the *study area*, consideration shall be given to the previous land uses and the effect of these land uses on the *study area*. Relevant historical events may include fire, clearing, logging, slashing, recreational use and agricultural activities.

A description of habitats including such components as the frequency of tree hollows, the presence of wetlands, the density of understorey vegetation, the composition of the ground cover, the soil type and the presence of heath and permanent or ephemeral swamps shall be given. The condition of these habitats within the *study area* shall be discussed, including the prevalence of introduced species. A description of the habitat requirements of threatened species, populations or ecological communities likely to occur in the *study area* shall be provided.

Any areas which may provide habitat connectivity between the *study area* and adjacent areas of likely habitat for *subject species, populations or ecological communities* shall be identified and described.

In defining the *study area*, consideration shall be given to possible *indirect impacts* of the proposed action on species/habitats in and surrounding the *subject site*. These could include impacts arising from altered fire and hydrology regimes, soil erosion or pollution, fencing, habitat fragmentation and disruption of wildlife movement corridors, edge effects, altered light and noise regimes, disturbance of roosting areas or other impacts due to increased use of the area by humans, and the impacts of increased levels of domestic and feral predators.

4 SURVEY

4.1 Requirement to survey

A flora and fauna survey is to be conducted in the *study area*. Targeted surveys shall be conducted for all *subject species, populations and ecological communities* determined in accordance with Section 3. Previous surveys and assessments may be used to assist in addressing this requirement. However, the efficacy of such previous surveys and assessments in meeting this requirement must be described in full. These previous surveys do not negate the need for the additional targeted survey work set out in Appendix 1 of these DGRs.

Particular attention shall be paid to the timing and climatic conditions for conducting fauna surveys including invertebrates, as many of the *subject species* will only be present or detectable for a few months each year or during certain climatic conditions. Additional advice on these matters should be sought from the DECCW contact officer.

Identification of all species is essential. Identification to genus only is not acceptable. Species of taxonomic uncertainty shall be confirmed by a recognised authority such as the Australian Museum or National Herbarium at the Royal Botanic Gardens, Sydney.

4.2 Documentation of survey effort and technique

Survey technique(s) shall be described and a reference given, where available, outlining the survey technique employed.

Survey site(s) shall be identified on a map with a clear legend. The size, orientation and dimensions of quadrat or length of transect shall be clearly noted for each type of survey technique undertaken. Full AMG grid references for the survey site(s) shall be provided.

DECCW survey proformas are to be used by field staff when applying a range of standard fauna survey techniques. Copies of standard proformas are included in Appendix 2 to these DGRs. Digital copies of these proformas can be requested from the nominated DECCW contact officer. These proformas shall be used by field staff when undertaking fauna surveys and completed data sheets are to be included as an appendix to the Evaluation of Impacts.

The time invested in each survey technique shall be summarised in the Evaluation of Impacts, based on completed proformas, e.g. number of person hours / transect, duration of call playback, number of nights that traps are set.

It is not sufficient to aggregate all time spent on all survey techniques. Effort must be expressed separately for each survey technique that is applied.

Personnel details including name of surveyor(s), contact phone number, qualifications and experience must be included. The person who identified records (e.g. Anabat, hair tubes, scat analysis) shall also be identified in this manner.

Environmental conditions during the survey shall be noted from the commencement of each survey technique until its completion. These conditions must be documented in the Evaluation of Impacts.

An assessment of the efficacy of each survey regime in detecting each species under the intensity utilised by the study is to be provided. The effect of the season and weather at the time of the field survey shall be considered with respect to the adequacy of survey results. An assessment will also be made of the adequacy of the survey and background information used to assess the likely area of use (home range) for each *subject species, population or ecological community*, and the areas providing habitat connectivity.

A full list of all flora and fauna species recorded during the course of surveys shall be included (such information is indicative of the habitat quality of the site). Completed Atlas of NSW Wildlife cards are to be provided for each threatened species record in any survey conducted for the purposes of the EA. For confidentiality, these cards are not to be included in the Evaluation of Impacts but rather shall accompany the Evaluation of Impacts when supplied to the DECC.

4.3 Specific survey requirements

Appendix 1 details the specific survey requirements for the *subject species, populations or ecological communities* identified in Table 1 of these DGEARs. These survey requirements can determine the presence of *subject species, populations or ecological communities* known or likely to be in the *study area* and/or can provide contextual information on habitats to allow appropriate assessment of impacts at a broader scale. The flora and fauna survey of the *study area* must include the use of these survey methods.

You are advised that discussions between the consultant(s) engaged to prepare the Evaluation of Impacts and DECCW may be necessary in order to derive an appropriate survey regime for some of these requirements, and to confirm the survey regimes proposed for any additional *subject species, populations and ecological communities* derived by analysis as part of this Evaluation Of Impacts.

5 ASSESSMENT OF LIKELY IMPACTS ON THREATENED SPECIES, POPULATIONS AND ECOLOGICAL COMMUNITIES

For all *subject species, populations and ecological communities*, the Evaluation of Impacts shall describe the following:

- a. the location, nature and extent of habitat removal or modification which will result from the action proposed;
- b. the likely and potential impact of the removal of habitat. Particular attention shall be given to the loss of:
 - i. Natural temperate grasslands , White Box, Yellow Box, Red Gum Woodlands & Tableland Basalt Forest
 - ii. Grassland habitat for Pink-tailed Worm Lizard, Little Whip Snake, Grassland Earless Dragon, Striped Legless Lizard and Golden Sun Moth.

- iii. the likelihood of and extent of loss of hollow-bearing trees, foraging habitat and termite mounds utilised for breeding, roosting or denning by threatened fauna such as micro-chiropteran bats, Squirrel Gliders, Superb Parrot and small woodland birds.
 - iv. Native grassland habitat for the Button Wrinklewort, Mountain Swainson Pea, Silky Swainson pea, Tarengo Leak Orchid.
 - v. Similarly, attention is to be given to the likelihood of and extent of loss of food resources and the impact this may have on the *subject species, populations or ecological communities*.
- c. Any direct and indirect impacts of the proposal including:
- i. Any potential indirect impact on the viability of breeding/ roosting habitat of micro-bats known to occur in and around the area.
 - ii. the fragmentation or isolation of *local populations* and/or *local occurrences*, and the increased distance required for the movement of individuals/genetic material between habitat patches,
 - iii. change in vegetation floristics and structure resulting from edge effects,
 - iv. altered hydrology regimes (including increased runoff and raising or lowering of the water table),
 - v. soil erosion and pollution,
 - vi. disturbance to feeding or nesting/breeding of species,
 - vii. trampling or other impacts due to increased use of the area by humans, and native grassland habitats, Box gum woodlands or other EEC.
 - viii. habitat fragmentation and disruption of wildlife movement corridors and pollination mechanisms,
 - ix. altered light and noise regimes,
 - x. the likely contribution of the action proposed to the threatening processes already acting on populations of those *subject species or populations* and occurrences of *subject ecological communities* in the *locality*.

All of the above contextual information (which can be incorporated into Sections 5.1 - 5.5 below) will assist with the assessment of cumulative impacts on the *subject species, populations and ecological communities*.

5.1 Assessment of species likely to be affected

This requirement allows refinement of the list of *subject species or populations* (given the outcome of survey and analysis of likely impacts) in order to identify which threatened species or populations may be affected, and the nature of the impact.

The remaining requirements in this section (5.2 – 5.5) need only be addressed for those threatened species or populations that are likely to be affected by the proposal.

5.2 Discussion of local and regional abundance

5.2.1 Discussion of other known local populations

A discussion of other known *local populations* in the *locality* shall be provided. The long-term security of other habitats shall be examined as part of this discussion. The relative significance of the *subject site* for the *subject species, populations and ecological communities* in the *locality* shall

be discussed. It is essential that the Evaluation of Impacts includes some surveys conducted beyond the *study area* to clarify the conservation significance of the *subject site* to the *subject species and populations*.

The need for off-site surveys to provide context to the anticipated impacts of the *proposal* may also be required for other threatened species recorded during the surveys of the *study area* for the Evaluation of impacts.

5.2.2 Discussion of habitat utilisation

An estimate of the number of individuals of each *subject species* utilising the *study area* shall be provided as well as a description of how these individuals use the *study area* (e.g. residents, transients, adults, juveniles, nesting, foraging). A discussion of the significance of these individuals to the viability of the *subject species* in the *locality* shall be provided.

5.2.3 Description of vegetation

The vegetation present within the *study area* and the surface area covered by each vegetation community shall be mapped and described. Reference to the vegetation classification system used (e.g. Specht, Benson, Keith) and to the ecological communities determined as endangered by the NSW Scientific Committee shall be provided. Classification must have regard to both structural and floristic elements.

5.2.4 Discussion of corridors

Particular attention shall be given to identifying movement corridors for *subject species* within the *study area*. The impact of the proposal on these corridors and the resulting impact on the resident *subject species* shall be discussed.

5.3 Assessment of habitat

5.3.1 Description of habitat values

Specific habitat features in the *study area* shall be described and quantified (e.g. frequency and location of stags, hollow bearing trees, culverts, rock shelters, rock outcrops, crevices, caves, drainage lines, soaks, area of ecological communities etc.), as well as the density of understorey vegetation and groundcover.

The condition of the habitat within the *study area* shall be discussed, including the prevalence of introduced species, species of weeds present and an estimate of the total weed cover as a percentage of each vegetation community, whether trampling or grazing is apparent, effects of erosion, prevalence of rubbish dumping, history of resource extraction or logging and proximity to roads. Details of the *study area's* fire history (e.g. frequency, time since last fire, intensity) and the source of fire history (e.g. observation, local records), shall be provided.

5.3.2 Distribution and condition of regional habitats

For the habitats of *subject species and populations* found in the study area, the Evaluation of Impacts shall discuss the distribution and condition of similar habitats in the region. For the *subject ecological communities* found in the study area, the Evaluation of Impacts shall discuss the distribution and condition of these ecological communities in the region. Regional information may be obtained from existing datasets and from other sources.

5.4 Discussion of conservation status

Assessment shall include reference to the threatening processes that are generally accepted by the scientific community as affecting the *subject species, population or ecological community* and which are likely to be caused or exacerbated by the *proposal*. Assessment shall also include reference to any approved or draft recovery plans which may be relevant to the *proposal*. Up-to-date lists and copies of approved and draft recovery plans are available on the DECC website www.environment.nsw.gov.au by following the links to threatened species.

5.5 Description of feasible alternatives

All feasible alternative location for the wind turbines should be explored taking into account all known constraints.

6 IMPACT AMELIORATION

6.1 Description of ameliorative measures

In accordance with the Draft Guidelines for Threatened Species Assessment objective of Improve or Maintain, the ameliorative measures described for this development should meet the improve or maintain test for biodiversity values.

6.1.1 Long term management strategies

Consideration shall be given to the information contained in approved and draft recovery plans or threat abatement plans for existing taxa, known or likely to occur in the *study area*, and whether any recommendation is applicable to the *proposal*.

The development of long-term management strategies shall be considered to protect areas within the study area which are of particular importance for the *subject species, populations or ecological communities* likely to be affected by the *proposal*. This may include proposals to restore or improve habitat on site where possible. If mitigation is to include rehabilitation of the site, then the rehabilitation strategy shall be detailed.

Any measures proposed to mitigate the effect of the proposal on *local populations* of threatened species and populations and/or *local occurrences* of ecological communities shall be described. The potential effectiveness of any such amelioration in maintaining a viable *local population* and/or *local occurrence* in the short, medium and long term shall be discussed (e.g. fauna underpasses, vegetation management).

6.1.2 Compensatory strategies

If significant modification of the *proposal* to minimise impacts on *subject species, populations or ecological communities* is not possible, then compensatory strategies shall be considered. These may include other off-site or local area proposals that contribute to long term conservation of the *subject species, populations or ecological communities*.

The areas proposed to be used for compensatory strategies must be described in full including a detailed description of their biodiversity, tenure and conservation status. These areas should be assessed in accordance with the Principles for the use of biodiversity offsets in NSW, which can be found on the following link on the DECCW significant local populations of *subject species and populations* or significant local occurrences of *subject ecological communities* as determined by the EVALUATION OF IMPACTS should aim to:

- i. minimise the impacts by considering all possible alternatives to the *proposal*, such that a significant impact is not likely; and
- ii. manage the remaining habitat (if any) to ensure that the *local population* and/or *local occurrence* continues to exist in the long term.

The translocation of *subject species, populations and ecological communities* is only supported by DECCW in specific conservation programs (e.g. recovery planning).

7 ADDITIONAL INFORMATION

7.1 Qualifications and experience

An evaluation of Impacts must include details of the qualifications and experience in threatened species conservation of the person preparing the statement and of any other person who has conducted research or investigations relied on in preparing the statement.

7.2 Licensing matters relating to flora and fauna surveys

Persons conducting flora and fauna surveys must have appropriate licences or approvals under relevant legislation. The relevant legislation and associated licences and approvals that may be required are listed below:

National Parks and Wildlife Act 1974:

- General Licence (Section 120) to harm or obtain protected fauna (this may include threatened fauna).
- Licence to pick protected native plants (Section 131).
- Scientific Licence (Section 132C) to authorise the carrying out of actions for scientific, educational or conservation purposes.

Threatened Species Conservation Act 1995:

- Licence to harm threatened animal species, and/or pick threatened plants and/or damage the habitat of a threatened species (Section 91).

Animal Research Act 1985:

- Animal Research Authority to undertake fauna surveys.

Appendix 1: Survey Requirements for Subject Species - DGRs for Collector Wind Farm

SPECIES	SURVEY REQUIREMENTS
Pink-tailed Worm-lizard and Little Whip Snake	Surveys of the <i>subject site</i> and <i>study area</i> shall be undertaken for this species. All rocky slopes should be systematically surveyed. This shall involve rock rolling and searching under logs and debris. Surveys shall be undertaken between mid-August and the end of October preferably after rain. Daily temperatures shall not exceed 25°C during the survey period. Rocks, logs and debris shall be replaced carefully to sustain habitat integrity. Surveys of the <i>locality</i> for habitat of the species shall be undertaken. These shall involve determining the extent of potentially suitable habitat from aerial photographs or other means, and ground-truthing selected sites to validate habitat suitability, condition and extent. The sites sampled shall be used to provide context to the habitat affected by the action proposed.
Striped Legless Lizard <i>Delma impar</i>	Pitfall trapping for <i>Delma impar</i> should be undertaken for 6 weeks, starting in early to mid November and extending through to mid/late December. Pitfall traps or funnel traps should be placed in suitable habitat being natural temperate grassland or nearby secondary grassland, with a preference for denser Kangaroo grass <i>Themeda australis</i> or other grassland, including <i>Phalaris</i> . Traps should be positioned in cross-shaped arrays of 5 traps each, 10 metres apart, with a trap at the centre and drift fencing extending 5 metres past the outside traps. Traps must be checked daily. In addition, roof tiles should be placed within likely habitat for at least 4 months prior to checking. Checking of tiles should be undertaken at least fortnightly throughout spring and early summer.
Grassland Earless Dragon <i>Tympanocryptis pinguicolla</i>	Spider-tubes should be used to survey areas of suitable habitat, being natural temperate grassland or nearby secondary grassland, with a preference to lower, open areas dominated by wallaby grasses. Survey season should be for 10 weeks from February to April with tubes checked twice a week. Density of tubes should approximate 2/ha and be placed within transects of 10 tubes per transect spaced ten metres apart. Tubes should be left at least 2 weeks and no longer than one month prior to checking. In areas where grass is dense, grass around the tubes should be whipper-snipped for a radius of 1 metre around each tube to facilitate location and use by dragons. All spiders found in tubes should be removed at least 10 metres to reduce chance of re-colonisation.
Squirrel Glider	The consultant needs to determine the distribution and abundance of the species on the subject site and its status in the region. Squirrel Gliders may occur across a wide variety of forest and woodland vegetation types. Live-trapping in trees is the preferred survey method for detecting Squirrel Gliders. Traps should be either large Elliott box traps or wire mesh 'bandicoot' traps (200 mm wide x 170 mm tall x 500 mm long; Figure 2) (manufactured by R.E. Walters Pty. Ltd., Sunshine, VIC). Live-trapping is a preferred sampling technique as it allows for unequivocal identification of animals. This is particularly important as the Squirrel Glider is very similar in appearance to the smaller Sugar Glider, <i>P. breviceps</i>. If definite identification cannot be made then any captured animals should be photographed and measured. Subsequent identification of the animal in question can then be made by an appropriate expert.

SPECIES	SURVEY REQUIREMENTS
	Bait should consist of a mixture of peanut butter, honey and rolled oats. A honey and water solution may be sprayed above and below the trap entrance. The number of traps set at a site will vary according to the extent of suitable habitat, the area over which possible den sites are present, and the scale of the proposed clearing or activity. Traps should ideally be positioned horizontally in low tree branches. Traps must be attached to trees and spaced approximately 50-100 m apart in a transect or grid layout, as the habitat allows. Traps must be set for a minimum period of 3-4 consecutive nights. On each day traps should be set at dusk and checked the following morning. Where possible, traps should not be left open during daylight hours, particularly during periods of hot weather. In situations where the same animals are being repeatedly trapped, individual trap stations may need to be closed. If the species is present, given the rarity of the species in the region, any proposed development must avoid direct impacts on the species in the first instance, minimise any unavoidable or indirect impacts, and then set up processes which establish long-term conservation of the species on-site.
Regent Honey eater	The regional significance of the subject site for the Regent Honeyeater is unknown. There are potential breeding and foraging habitats on the subject site that should be surveyed using diurnal fixed-width transect or point-count surveys and call playback techniques, as the species responds to taped calls during the breeding season. Whilst surveys can be conducted at any time of the year, the optimal time is spring and summer during the breeding season.
Brown Treecreeper, Diamond Firetail, Hooded Robin, Speckled Warbler and Varied Sittella.	Diurnal bird census shall be undertaken in the early morning and/or late afternoon within the <i>subject site</i> on three occasions each separated by a period of one week. Each census shall comprise observations for birds, including call recognition, for a period of 45 minutes at a minimum of three locations spread across the subject site. Surveys can be undertaken at any time of the year, but shall avoid high-wind and/or rainy days.
Scarlet Robin	Diurnal bird census shall be undertaken in the early morning and/or late afternoon within the <i>subject site</i> on three occasions each separated by a period of one week. Each census shall comprise observations for birds, including call recognition, for a period of 45 minutes at a minimum of three locations spread across the subject site. Additional opportunistic bird census shall be employed across the <i>study area</i> and <i>locality</i> during the course of other surveys for the EA. Surveys should be concentrated on ridges, hills and foothills. Surveys should be between July to January however can be undertaken at any time of the year, but shall avoid high-wind and/or rainy days.
Barking Owl & Powerful Owl	Nocturnal call playback (1 site per 100 ha) with an initial listening period of 10 min then play the call of each subject species separated by at least a 2 min listening period, then finish with a 10 minute listening period. Identify and map all hollow-bearing trees (potential nest trees) on the subject site and estimate the availability of hollow-bearing trees in the locality.
Gang Gang Cockatoo / Glossy Black-cockatoo/ Superb Parrot	Undertake diurnal bird surveys across the study area and nesting assessments using a combination of stagwatching and listening for calls of the birds returning to nests in the late afternoon during the known breeding season of the species, to ascertain the locations of any nest sites in the study area.

SPECIES	SURVEY REQUIREMENTS
	These surveys should target hollow-bearing trees with hollows of suitable size (>10cm diameter) for the species that are to be removed for the proposal or which lie within 50m of areas to be disturbed by the proposal. Estimate the availability, condition and security of potential breeding habitat for the species in the locality by ground-truthing existing vegetation mapping datasets.
Eastern False Pipistrelle, Eastern Bent Wing Bat, Large footed Myotis. Greater Broad nosed bat, Yellow Bellied Sheath Tailed Bat Greater long eared bat	Surveys using anabat recorders and stag watching should aim to identify the number and location of roost sites for the subject bats and identify important foraging habitat in the study area and the locality. If required, the DECCW can provide further advice on bat survey techniques to acquire this information. Surveys of the subject site, study area and locality shall be undertaken for hollow-bearing trees. This shall involve intensive searches for hollow-bearing trees in the subject site and study area. Representative sampling of the locality for hollow-bearing trees shall involve the use of transects in selected locations and the gathering of data in conjunction with ground-truthing for endangered ecological communities. The number of hollow-bearing trees recorded shall be used to provide context to the potential breeding habitat affected by the action proposed.
Golden Sun Moth	Surveys of the <i>subject site</i> and <i>study area</i> shall be undertaken for this species. These surveys should target areas with higher than 40% <i>Austrodanthonia</i> in the groundcover. Areas of habitat should be hand-netted during known flight periods. The flight period for this species is short therefore surveys should be undertaken when other known populations in the area are flying. The consultant should discuss these periods with the DECCW prior to the survey being conducted. Surveys of the <i>locality</i> for habitat of the species shall be undertaken. These shall involve determining the extent of potentially suitable habitat from aerial photographs or other means, and ground-truthing selected sites to validate habitat suitability, condition and extent. The sites sampled shall be used to provide context to the habitat affected by the action proposed.
ENDANGERED ECOLOGICAL COMMUNITIES	SURVEY REQUIREMENTS
Yellow box white box Blaklyis red gum woodlands, Natural temperate grasslands, Tablelands Frost Hollow Grassy Woodlands (preliminary) and Tableland Basalt Forest.	Surveys shall identify the extent and condition of these ecological communities in the <i>subject site</i>, <i>study area</i> and <i>locality</i>. This shall involve the use of vegetation surveys in the <i>subject site</i> and the <i>study area</i>. The use of existing datasets held by DECCW in combination with ground-truthing of selected sites within areas mapped by DECCW as the ecological community is recommended for surveys of the <i>locality</i>. The sites sampled shall be used to provide context to the ecological community affected by the action proposed. Surveys can be undertaken at any time of the year under varied seasonal conditions.
FLORA	SURVEY REQUIREMENTS
Button Wrinkle wort, Yass Daisy and Aromatic Peppercreess	Systematic surveys using evenly spaced transects located about 10 m apart through all areas of woodland and grassland.
Austral Toad flax	Systematic surveys using evenly spaced transects located about 10m apart through all

SPECIES	SURVEY REQUIREMENTS
	areas of wet Kangaroo grass and any other damp areas located in the study area. DECCW should be consulted to confirm flowering times with known population and seasons, and appropriate survey methods.
Silky Swainson Pea (<i>Swainsona sericea</i>), Mountain Swainson Pea (<i>Swainsona recta</i>), and Tarengo Leek Orchid (<i>Prasophyllum petilum</i>),	Systematic surveys using evenly spaced transects located about 10 m apart through all areas of woodland/grassland must be undertaken. DECCW should be consulted to confirm flowering times with known population and seasons, and appropriate survey methods.
Doubletail Buttercup, (<i>Diuris aequalis</i>)	Systematic surveys using evenly spaced transects located about 10 m apart through all areas of woodland/grassland must be undertaken. Surveys should be undertaken between late October to early November, between the known flowering season.

Appendix 2: Examples of suitable survey pro-formas

DIURNAL HERPETOFAUNA CENSUS SURVEY PROFORMA

Survey Details

Date of survey	_____		
Name of surveyor	_____	Contact number	_____
Number of surveyors	_____		_____
Total effort expressed in person-hours	_____	Total effort expressed in number of rocks/logs rolled	_____

Location Details

Location (including basic habitat) description _____

Map number	_____	Map name	_____
Type of survey, e.g. transect or quadrat	_____	AMG Zone	_____
Active or passive search	_____	Size of survey area (ha)	_____
Survey area			
Eastings (6 digits)	_____	Northings (7 digits)	_____
Eastings (6 digits)	_____	Northings (7 digit)	_____
Start time (24hr)	_____	End time (24 hr)	_____

Weather Details

At start of survey, record:		Cloud cover*	_____
Wind direction and speed*	_____	Rain*	_____
Temperature (°C)	_____	Moon*	_____
At end of survey, record:			
Temperature (°C)	_____		
Comments	_____		

Appendix 2: Examples of suitable survey pro-formas

[illegible]

* See Appendix 3: Standard reporting codes

Appendix 2: Examples of suitable survey pro-formas

DIURNAL BIRD CENSUS SURVEY PROFORMA

Survey Details

Name of surveyor _____ Contact number _____

Number of surveyors _____ Date of survey _____

Total effort expressed in person hours _____ Number of hectares covered or transect or point dimensions _____

Location Details

Location description _____

Map number _____ Map name _____

Full AMG reference(s) for survey site or transect _____ AMG Zone _____

Start details _____ Finish details _____

Easting (6 digits) _____ Easting (6 digits) _____

Northing (7 digits) _____ Northing (7 digits) _____

Start time (24hr) _____ End time (24 hr) _____

Weather Details

At start of survey, record: _____ Cloud cover* _____

Wind direction and speed* _____ Rain* _____

Temperature (°C) _____ Moon* _____

At end of survey record: _____

Temperature (°C) _____

Comments _____

Species name	Ob. type	MH type	Grid reference (full AMGs)	Accuracy

* See Appendix 3: Standard reporting codes

Appendix 2: Examples of suitable survey pro-formas

DIURNAL HOLLOW-BEARING TREE CENSUS SURVEY PROFORMA

Survey Details

Date of survey _____

Name of surveyor _____ Contact number _____

Number of surveyors _____

Total effort expressed in person-hours _____

Location Details

Location (including basic habitat) description _____

Map number _____ Map name _____

Type of survey, e.g. transect or quadrat _____ AMG Zone _____

_____ Size of survey area (ha) _____

Survey area Eastings (6 digits) _____ Northings (7 digits) _____

Eastings (6 digits) _____ Northings (7 digit) _____

Start time (24hr) _____ End time (24 hr) _____

Appendix 2: Examples of suitable survey pro-formas

[illegible]

* See Appendix 3: Standard reporting codes

DIURNAL TERMITE MOUND CENSUS SURVEY PROFORMA

Date of survey

Date of survey

Name of surveyor

Contact number

Number of surveyors

Total effort expressed in person-hours

Location (including basic habitat) description

Map number

Map name

Type of survey, e.g.
transect or quadrat

AMG Zone

Size of survey area (ha)

Survey area
Easting (6 digits)

Northings (7 digits)

Easting (6 digits)

Northings (7 digit)

Start time (24hr)

End time (24 hr)

[illegible]

Appendix 2:

Examples of suitable survey pro-formas

[illegible]

Appendix 2: Examples of suitable survey pro-formas

Cloud cover. Record cloud cover in eights of sky.

Moon. Record using the following codes. 0=None, 1=1/4 moon, 2=1/2 moon, 3=3/4 moon, 4=full moon.

Wind direction and speed. Record wind direction to nearest cardinal point. Record wind speed using the following codes. 0=calm 1= Light, leaves rustle 2= Moderate, branches move 3=Strong, tops of trees move

Rain. Record using the following codes. 0=none, 1=drizzle - light, 2=drizzle - heavy 3=heavy rain

Sizes of hollows. Record using the following codes. S=Small (1-5cm diameter), M=Medium (5-15cm diameter), L=Large (greater than 15cm diameter).

Types of hollows. Record using the following codes. T=Trunk hollow, B=Branch hollow

Observation type

Use the following codes:

O	Observed (sighted)	R	Road kill	F	Tracks, scratching
W	Heard call	D	Dog kill	Z	In raptor/owl pellet
X	In scat	C	Cat kill	M	Miscellaneous
P	Scat	V	Fox kill	E	Nest or roost
T	Trapped or netted	K	Dead	B	Burnt
H	Hair or feathers	S	Shot	Y	Bones or teeth
A	Stranded/beached	I	Fossil/subfossil	N	Not located

MH (microhabitat) type

Use the following codes:

AC	Flying above canopy	IB	In burrow	OB	On (beach) sand
BR	In/on bridge	IC	In cave	OL	On log
BU	In building	IG	In grass	OR	On rock
CK	Crevice in rock	IH	In tree hollow	OW	Over water
CL	Crevice in log	IL	In litter	RD	On road
DA	Farm/fire dam	IR	In reeds	TK	On trunk
DT	In dead tree (stag)	IS	In soil	UB	Under bark
EW	Edge of water	IT	In (live) tree	UC	Upper canopy
FC	In/on post or stump	IW	In water	UG	Undergrowth
FL	Flying within canopy	LC	Lower canopy	UL	Under log
GR	On ground	LS	Low shrub	UR	Under rock
HS	High shrub	MC	Mid canopy	UT	Under iron
				WH	Waterhole

The Department of Environment and Climate Change is now known as the Department of Environment, Climate Change and Water

Attachment C - Guidance Material

Assessing Environmental Impact

Water quality

- National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)
- NWQMS Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC 2000)
- Healthy Rivers Commission Report into Coastal Lakes and Statement of Joint Intent
- The relevant targets within the State Water Management Outcomes Plan

Air

- Approved Methods and Guidance for the modelling and Assessment of Air Pollutants in NSW (EPA, 2001)

Noise and vibration

- SA EPA Environmental Noise Guidelines (Interim Guidelines) (EPA, 2007)
- NSW Environmental Criteria for Road Traffic Noise (EPA, 1999)
- NSW Industrial Noise Policy (EPA, 2000)
- NSW Interim Construction Noise Guideline (DECC, 2009)

Construction

- Managing Urban Stormwater - Soils and Construction", NSW Landcom, Fourth Edition, March 2004.

Contaminated Land

- Managing Land Contamination: Planning Guidelines - SEPP55 - Remediation of Land, (Department of Urban Affairs and Planning and NSW EPA, 1998)
- Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites (Environment Protection Authority (EPA) 1997);
- Contaminated Sites – Guidelines on Significant Risk of Harm and Duty to Report (EPA, 1999).

Waste

- Waste Classification Guidelines (DECC, 2008).

Assessing Threatened Species Impacts

- Draft Guidelines for Threatened Species Assessment - Available from Department of Planning.

Assessing Aboriginal Cultural Heritage Impacts

- Draft Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation - Available from Dept of Planning
- Interim Community Consultation Requirements for Applicants
- <http://www3.environment.nsw.gov.au/npws.nsf/Content/Protecting+Aboriginal+objects+and+places>
- Aboriginal Cultural Heritage Standards and Guidelines Kit - Available on-line through DECCW's webpage.