

**GOLDEN PLAINS WIND FARM**

**ASSESSMENT**

**under**

***ENVIRONMENT EFFECTS ACT 1978***

**Minister for Planning**

**October 2018**

## GLOSSARY

BAM	Bat and avifauna management plan
BL&A	Brett Lane and Associates
BSP	Brolga Scientific Panel
CFA	Country Fire Authority
CHMP	Cultural Heritage Management Plan
CRM	Collision risk modelling
dB L <sub>A90</sub>	Background noise level - the level exceeded for 90% of the time, expressed in decibels
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
EES	Environment effects statement
EMF	Environmental management framework
EMM	Environmental management measure
EPA	Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
ERR	Earth Resources Regulation
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
Host	An owner of land on which project infrastructure is to be built
IBG	<i>Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011</i> Revision 1 February 2012 (Interim Brolga guidelines)
LDRZ	Low Density Residential Zone
MNES	Matter(s) of national environmental significance
MRSD Act	<i>Mineral Resources (Sustainable Development) Act 1990</i>
NIRV	<i>Noise from industry in regional Victoria</i> (EPA publication 1411)
NTGVVP	Natural temperate grassland of the Victorian volcanic plain
PVA	Population viability analysis
RAP	Registered Aboriginal party
SHWTLP	Seasonal herbaceous wetland (freshwater) of the temperate lowland plain
VCAT	Victorian Civil and Administrative tribunal
WestWind	WestWind Energy Pty. Ltd. (the proponent)

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## EXECUTIVE SUMMARY

On 14 June 2017, WestWind Energy Pty Ltd (WestWind) referred the Golden Plains wind farm to me for a decision on the need for an environment effects statement (EES) for the project. On 9 July 2017, I decided that an EES was required.

WestWind prepared an EES which I authorised for public comment and exhibition from 4 May to 18 June 2018.

On 17 June 2018, I appointed a joint inquiry and planning permit application panel (the panel) to consider the EES and the planning permit application. Planning Panels Victoria received 27 submissions on the exhibited EES and 29 submissions on the planning permit application. The panel held a public hearing over nine days from 30 July to 13 August 2018. The panel provided its report to me on 26 September 2018. The report, along with the EES, its supporting technical reports, public submissions and relevant legislation, policy and guidelines have informed my assessment of the environmental effects of the project under the *Environment Effects Act 1978*.

My assessment is that, subject to specified modifications, particularly the exclusion of some 47 turbines from the windfarm to protect Brolga breeding wetlands, the project's environmental effects will be acceptable. This conclusion adopts the key findings and recommendations of the panel.

My assessment also makes recommendations for the consideration of relevant authorities about research and revision of guidelines which in my view will better inform prospective proponents and decision-makers about the configuration and approval of wind energy projects in future.

The project will have residual environmental impacts on threatened species and communities and landscape values. My assessment is that those impacts will be acceptable provided they are managed in accordance with my detailed recommendations. I also recommend further work to characterise potential noise and aviation effects, so that they may be managed appropriately. Therefore, provided that the findings and recommendations of my assessment, particularly those relating to Brolga, are considered and implemented, the project will provide a net community benefit, including a significant renewable energy contribution for the state.

My assessment will be provided to statutory decision-makers under Victorian law. Decision-makers must then consider this assessment before deciding whether and how the projects should proceed.

Under the assessment bilateral agreement between the Australian and Victorian governments, this assessment also serves the assessment purposes of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is my assessment that the residual impacts of the project, modified as described above, on matters of national environmental significance will be acceptable subject to specific management recommendations. The Australian Minister for the Environment or delegate will determine whether and under what conditions to approve the project after consideration of this assessment.



# 1 INTRODUCTION

On 14 June 2017, I received a referral under the Environment Effects Act from WestWind Energy Pty. Ltd. (WestWind) for the Golden Plains wind farm (the project). I decided on 9 July 2017 that an environment effects statement was required. My decision to require an EES included the procedures and requirements for the EES process for the project in accordance with section 8B(5) of the Act. I also published my reasons for decision.

The EES investigated impacts on biodiversity values, including threatened species and ecological communities and native vegetation along with potential impacts on landscape and other amenity and environmental values. The EES reviewed and refined design alternatives for the project in light of a better understanding of potential impacts and uncertainties and support integrated decision-making.

## 1.1 Purpose of this document

This report documents my assessment of the environmental effects of the project. It is the final step in the EES process by which I provide advice to decision-makers on the likely environmental effects of the proposal. My assessment also addresses the acceptability of those impacts and how they are to be addressed in relevant statutory decisions. My assessment is largely informed by the panel's report and the EES, together with public submissions.

This assessment will inform the decisions required under Victorian law for the proposal to proceed. Because the EES process has been accredited for the assessment purposes of the Commonwealth EPBC Act, it will also inform the decision to be made by the Commonwealth Minister for the Environment under the EPBC Act about whether and under what conditions the project will be approved.

## 1.2 Structure of the assessment

My assessment follows the general structure of the panel report as follows:

- Section 2 provides a brief description of the project;
- Section 3 outlines both the EES process and statutory approvals required for the project;
- Section 4 describes how I have undertaken my assessment and outlines the framework for managing the project's environmental effects;
- Section 5 assesses the environmental effects of the project based on the applicable legislative and policy framework and provides a summary of key project impacts; and
- Section 6 contains my conclusions, including responses to the recommendations of the panel, and comments on the panel's recommended planning permit conditions.

My advice to the Commonwealth Minister for the Environment for the assessment purposes of the EPBC Act is contained in Section 5.16.

## 1.3 Victorian Government and energy generating facilities

The Victorian Government is committed to increasing the proportion of Victoria's electricity needs generated from renewable sources. The *Renewable Energy (Jobs and Investment) Act 2017* legislates the Victorian renewable energy targets and Victoria's commitment to the development of the renewable energy sector.

A project intended to achieve benefits that align with government policy may still have adverse effects on environmental values or assets that warrant protection under other government policies. Wind farm development and the protection of threatened species provide a great example of that policy dilemma. Where policy objectives come into apparent conflict, it might not be possible in the context of a single project for the expression of different policies to be reconciled. The purpose of the EES process is in part to enable the tensions between policy imperatives to be explored and understood by stakeholders and decision-makers.

The requirement for an EES for the proposed Golden Plains wind farm reflected my understanding of the potentially significant environmental effects of the project. Regardless of the contribution that the project might make to achieving government policy objectives for renewable energy, this assessment is an objective appraisal of the environmental effects of the project and is to be taken into account by decision-makers in that light.

## 2 PROJECT DESCRIPTION

The EES identified the project as comprising the following broad components:

- 228 wind energy turbines (maximum blade tip height of 230 m, minimum clearance between the blade tips and the ground of 40 m and rotor swept area in the order of 150 m in diameter) to be mounted on towers 115 to 155 m high;
- construction of about 150 km of internal access tracks;
- four electricity substations;
- up to six permanent meteorological masts;
- a terminal substation adjacent and connected to the Melbourne-Portland 500 kV transmission line;
- underground and above ground power lines (about 170 km and 24 km, respectively);
- a quarry for the production of crushed rock products required during the construction phase for the project;
- works on public roads as required to enable the road transport of project components, including turbine blades up to 75 m long to the site;
- ancillary construction facilities such as construction compounds, batching plants and hardstand and laydown areas associated with each turbine; and
- ancillary facilities for the operation of the wind farm.

The EES addresses the effects of construction, operation, decommissioning and rehabilitation of the wind farm, including effects related to temporary activities such as the establishment and operation of the quarry for construction.

The project site has a total area of 16,739 ha. The works footprint of the proposed development is about 250 ha. The project site is located to the west, south and south east of Rokewood and north and north east of Cressy. The land is currently used for a range of farming purposes, which generally will be able to continue unchanged following construction and commissioning of the wind farm. WestWind will enter into commercial agreements with landholders about hosting turbines but will not need to acquire freehold tenure of the land for the project to proceed.

The project area for the proposal being assessed via the EES process is shown in Figure 1. The project is described in more detail in Chapter 5 of the EES.





Figure 1. Proposed location of the Golden Plains Wind Farm, quarry site and existing 500 kV transmission line (Source: WestWind, 2018).



### 3 STATUTORY PROCESSES

#### 3.1 Environment Effects Act

Section 8C of the Environment Effects Act provides that approvals decisions for the project may not be made until this assessment is completed and has been considered by the decision-makers who have been given notice. In this case, those decision-makers include the Minister for Planning, Minister for Energy, Environment and Climate Change, the Minister for Resources, Golden Plains Shire Council, Colac-Otway Shire Council, Aboriginal Victoria, Heritage Victoria and Corangamite Catchment Management Authority.

Draft Scoping Requirements were exhibited for public comment between 13 October 2017 and 3 November 2017. In December 2017, I issued final Scoping Requirements that specified the range of matters to be investigated and documented in the EES. The Department of Environment, Land, Water and Planning (DELWP) convened a technical reference group<sup>1</sup> in accordance with normal EES practice to provide advice to the proponent and DELWP on the scoping and preparation of the EES.

The EES prepared by WestWind was placed on public exhibition from 4 May to 18 June 2018. The EES attracted 27 submissions and 29 submissions were lodged in response to the planning permit application; some submitters made separate submissions in response to each document. Provision was made for submissions about the EES to be made online through the Engage Victoria website, as well as by more traditional methods. For the purposes of this assessment, all matters raised in submissions, whether specifically in response to the EES or to the permit application, have been taken into account, as the decision to be made about the permit application must be informed by this assessment.

On 17 June 2018, I appointed an inquiry under section 9(1) of the Environment Effects Act to review submissions and inquire into the environmental effects of the proposal, in accordance with its terms of reference, published on 27 May 2018. The inquiry members were also appointed as a panel under Part 8 of the *Planning and Environment Act 1987* to consider any objections received on the planning permit application. Planning Panels Victoria received all the submissions made in response to the EES and the planning permit application, including a number of submissions made after the formal closing date of the EES exhibition period, for consideration by the inquiry panel (the panel).

The panel held a directions hearing on 6 July 2018, followed by public hearings, which were held from 30 July to 13 August 2018. The panel provided its report to me on 26 September 2018. The panel report, along with a range of other resources, has informed the preparation of this assessment of the environmental effects of the project under the Environment Effects Act.

This assessment is the final step under the Environment Effects Act and summarises the environmental effects of the proposed Golden Plains wind farm for statutory decision-makers under Victorian law. The decision-makers must then consider this assessment before deciding whether and how the proposal should proceed. This assessment will inform approval decisions under the Victorian law outlined below.

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<sup>1</sup>The technical reference group comprised representatives of departments and authorities with statutory interests or specialised expertise relevant to the project, including DELWP (Planning and Environment portfolios), DEDJTR (ERR), VicRoads, Heritage Victoria, Aboriginal Victoria, Southern Rural Water, Corangamite Catchment Management Authority and Golden Plains and Colac-Otway Shire Councils. The proponent and relevant members of its consultant team also attended meetings.

### **3.2 Victorian statutory approvals**

The project requires a number of Victorian statutory approvals, including:

- approved cultural heritage management plans under the *Aboriginal Heritage Act 2006*;
- a planning permit under the Golden Plains Planning Scheme;
- a work authority and an approved work plan for a quarry under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act);
- consent to undertake works on or across a waterway under the *Water Act 1989*;
- consent to take groundwater under the *Water Act*;
- a permit to remove listed flora and/or fauna from public land under the *Flora and Fauna Guarantee Act 1988*;
- a permit to take or handle wildlife under the *Wildlife Act 1975*; and
- consent to undertake works on roads under the *Road Management Act 2004*.

### **3.3 Aboriginal Heritage Act**

In addition to any other triggers which may apply, the Aboriginal Heritage Act stipulates that an approved cultural heritage management plan (CHMP) must be prepared for works for which an EES is required. The project requires approval for two CHMPs, one for the wind farm and one for the quarry. The wind farm site is partly on land for which the Wathaurung Aboriginal Corporation, trading as Wadawurrung, is the registered Aboriginal party (RAP) under the Aboriginal Heritage Act, and partly on land for which no RAP has been appointed. This CHMP will be jointly evaluated by Wathaurung Aboriginal Corporation and Aboriginal Victoria. The second CHMP is for the quarry site which is located entirely within the area administered by the Wathaurung Aboriginal Corporation.

### **3.4 Planning and Environment Act**

The Planning and Environment Act sets out processes for the consideration of planning permit applications and decision-making about granting or refusing planning permits. WestWind applied to me, as the responsible authority, for a planning permit for the proposed project. On 19 September 2017, I called in the permit application under section 97B(1)(c) of the Planning and Environment Act to allow concurrent assessment and public exhibition processes under the Environment Effects Act and the Planning and Environment Act. Calling in the permit application also allowed the panel process required under the Planning and Environment Act to be combined with the inquiry process required under the Environment Effects Act.

The planning permit application may not be determined until any required CHMPs have been approved.

### **3.5 Mineral Resources (Sustainable Development) Act**

A work authority and approved work plan are required under the MRSD Act for the quarry proposed to be established and operated within the wind farm project area (on a site on the eastern side of Meadows Road) to supply construction materials for the project. The exhibited EES included an indicative draft work plan for the proposed quarry. The draft work plan had not been formally endorsed by ERR at the time of EES exhibition but was included in the exhibition documents for the better information of stakeholders.

Section 77T of the MRSD Act provides that, subject to certain conditions (which have not yet been fulfilled but which are expected to be fulfilled following the making of this assessment), a planning permit is not required for a quarry which has been subject to a completed EES process. Decisions about issuing a work authority and approving the work plan will be made under the MRSD Act following consideration of this assessment.



The draft work plan proposes that the quarry will supply crushed rock products only for the construction of the Golden Plains wind farm. The quarry is to be closed and the quarry footprint rehabilitated following completion of project construction works.

### **3.6 Water Act**

Consent under the Water Act is required for works on designated waterways, including works such as access track crossings. The relevant sections of the Water Act are administered for the project land by the Corangamite Catchment Management Authority.

Consent under the Water Act is also required for taking groundwater, for example if dewatering of the quarry excavation or turbine footings is required. The relevant sections of the Water Act are administered for the project land by Southern Rural Water.

### **3.7 Flora and Fauna Guarantee Act**

Consent under the Flora and Fauna Guarantee Act is required for removal of protected flora or fauna (including listed threatened ecological communities) from public land. DELWP administers the Flora and Fauna Guarantee Act.

### **3.8 Wildlife Act**

Consent under the Wildlife Act is required to take or handle protected wildlife. This will apply if protected wildlife needs to be relocated from works sites. DELWP administers the Wildlife Act.

### **3.9 Road Management Act**

Consent under the Road Management Act is required for works on or affecting public roads. This will apply to road improvement works required to accommodate delivery of over-dimensional loads to the project site. VicRoads and local government authorities administer the Road Management Act with respect to different classes of public roads.

### **3.10 Commonwealth statutory approval**

In June 2017, WestWind referred the proposed Golden Plains wind farm to the Commonwealth Government (Referral 2017/7965) for a determination on whether the project was a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On 24 July 2017, the project was determined to be a controlled action requiring assessment and approval under the EPBC Act because of its potential impacts on matters of national environmental significance (MNES): listed threatened species and communities (sections 18 and 18A). The Commonwealth determined that the project's impacts on MNES were to be assessed under the bilateral agreement made between the Australian and Victorian governments under section 45 of the EPBC Act. The EES process is therefore serving the assessment purposes of the EPBC Act, with the decisions about whether and under what conditions to approve the project to be made after consideration of this assessment.

## 4 ASSESSMENT FRAMEWORK

My assessment has been assisted by consideration of the EES, public submissions, evidence tabled with the panel, information and submissions presented at the panel's public hearing, and the panel report. The applicable legislation, policy, strategies and guidelines, summarised in Chapter 3 of the EES, and the objectives and principles of ecologically sustainable development, have also informed my assessment.

To provide an integrated structure for this assessment, key aspects of legislation and statutory policy relevant to the potential effects of the project have been synthesised into a set of evaluation objectives. Draft evaluation objectives were included in the scoping requirements for the EES and used by the proponent in its assessment of alternatives and effects within the EES. The panel also assessed the project having regard to the draft evaluation objectives. I have adopted them unchanged for the purposes of my assessment. The evaluation objectives are listed in full in Table 1. The second column of Table 1 refers to the section of this assessment where each of the evaluation objectives is addressed.

**Table 1. Assessment evaluation objectives.**

Final evaluation objective	Section
<b>Biodiversity.</b> To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species, and other protected flora and fauna.	5.1, 5.2, 5.3, 5.16
<b>Landscape and visual amenity.</b> To minimise and manage potential adverse effects for the community with regard to landscape and visual amenity.	5.4, 5.11
<b>Land use and Socio-economic.</b> To manage potential adverse effects and benefits for the community, businesses and associated land uses.	5.9
<b>Community amenity, roads and transport.</b> To manage potential adverse effects for the community, businesses and land uses with regard to construction noise, vibration, dust, traffic and transport and operational turbine noise, electromagnetic interference and aviation safety.	5.5, 5.6, 5.7, 5.10, 5.12, 5.14
<b>Cultural Heritage.</b> To avoid or minimise potential adverse effects on Aboriginal and historic cultural heritage.	5.13
<b>Catchment values.</b> To maintain the functions and values of aquatic environments, surface water and groundwater including avoiding adverse effects on hydrology and protected beneficial uses including downstream biodiversity values and their habitat.	5.8

### 4.1 Management of environmental effects

I acknowledge that the project will generate both positive and negative environmental effects. However, I am satisfied that under the existing regulatory framework, the project-specific environmental management regime will ensure that adverse effects of the project are effectively mitigated and managed. I have considered key elements of that regime, described below, when assessing the project's environmental effects.

#### Environmental management framework

An environmental management framework (EMF) was presented in Chapter 23 of the exhibited EES. A key element of the proposed EMF is the environmental management measures (EMMs), which set out the commitments the proponent has made to manage the adverse environmental effects of the project. The EMMs are for the most part intended to be implemented through conditions of the planning permit. The panel was satisfied that there are alternative ways to implement the other EMMs through the relevant approvals processes under other acts, including the MRSD Act, EPBC Act, FFG Act, Water Act and Aboriginal Heritage Act or through landholder agreements.

The EMMs propose the preparation of a number of environmental management documents that the proponent and its operators and/or contractors will be required to prepare and



implement for the different phases of the project. The EMF published in the EES outlines the documentation to be prepared and, where applicable, the government office or agency that will be responsible for approval or will be consulted in the development of each document or plan.

The EMMs were the subject of discussion during the hearings and through submissions. The panel's consideration of the EMMs is reflected in its recommendations about planning permit conditions, which is provided in Appendix F of the panel's report. See Section 6.2 of my assessment for detailed comments and recommendations with regard to proposed planning permit conditions.

In its assessment of the EMF, the panel found that *subject to some specific considerations in the issues chapters, [the panel] considers that it provides, in conjunction with planning permit conditions, a sound framework for managing environmental impacts to an acceptable level.* The panel recommended permit conditions requiring the endorsed versions of various plans required under the permit to be made available on the project website, in order to achieve transparency consistent with the evaluation objective. I support the panel's recommendation in this regard.

### **Further investigations**

I am satisfied that the environmental effects of the project have been properly identified and assessed to an adequate level in the EES process, including via the public review process conducted by the panel. I note the panel made recommendations for some further investigations relating to some aspects of the project which can be managed through appropriate planning permit conditions. These aspects are addressed in Section 5 of my assessment.

## 5 ASSESSMENT OF ENVIRONMENTAL EFFECTS

On balance, **it is my assessment** that the project, subject to specific modifications and recommendations set out in this assessment, will have acceptable environmental effects.

The assessment of potential effects on Brolga was a significant focus of the EES, submitters and the panel. The panel was not convinced that the proponent had provided sufficient empirical evidence to justify its proposed project-specific turbine free buffers. I concur with the panel's reasoning and approach in recommending turbine free buffers derived through the Brett Lane and Associates (BL&A) habitat model developed for the Dundonnell wind farm EES.

As a result, part of the proposed wind farm footprint will be excluded from supporting turbines. Approximately 47 turbines will be excluded from the layout presented in the EES and the planning permit application to provide adequate protection for Brolga breeding wetlands in light of the *Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population* (Interim Brolga Guidelines – IBG), the current applicable guidelines.

I acknowledge the potential significant loss in renewable energy generation capacity associated with the loss of 47 turbines. Accordingly, **it is my assessment** that an application to amend the planning permit to install turbines within the part of the wind farm area designated as turbine-free in line with the BLA habitat model may be considered at a later date if consistent with revised DELWP guidelines. In this context I note that new and emerging scientific information since the publication of the IBG published by the then Department of Sustainability and Environment in 2012 may enable DELWP to prepare revised guidelines. The revised guidelines may specifically address Brolga or address Brolga in a broader avifauna or biodiversity context. I have included recommendations in my assessment for DELWP to consider in this regard.

The project will clear up to about 49 ha of native vegetation with much of the vegetation to be removed classified as threatened. **It is my assessment** that the proponent has demonstrated that it has appropriately applied the avoid and minimise principles in its refinement of the design of the project. I accept that impacts of the residual clearance of native vegetation can be managed subject to the implementation of my recommendations in my assessment below and the proponent's obtaining and maintaining suitable offsets in accordance with the Victorian and Commonwealth requirements.

Submissions highlighted the attractiveness of the landscape and how community members value the landscape in which they live. The panel found that the project would have significant visual effects that cannot be fully ameliorated through permit conditions. However, I accept the panel's finding that this must be balanced against the landscape not afforded, or recognised as warranting, special protection under the planning scheme.

The adverse effects associated with the project need to be balanced against the significant net social and economic benefits the project will bring to the local and regional communities. The project will also make significant contributions to achieving state and Commonwealth policy objectives with regard to reducing greenhouse gas emissions.

The panel made a number of findings and recommendations in respect of the project. My response to its key findings and recommendations, along with my own further recommendations and my assessment of the main environmental effects of the project, are detailed in Sections 5.1 to 5.16 below and collated in Section 6.

### 5.1 Brolga

Brolga issues are addressed in Chapter 11 and Appendix F of the EES and in Chapter 4 of the panel report. Potential Brolga impacts are the subject of recommendations by the panel.

### 5.1.1 Evaluation objective

To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.

### 5.1.2 Context

The Brolga, *Antigone* (formerly *Grus*) *rubicunda*, is a species of crane native to Australia and New Guinea. Since European settlement of south-eastern Australia, the species' southern range has contracted and its population has declined. The southern population appears to be functionally isolated from the larger population in tropical northern Australia<sup>2</sup>. It is listed as threatened under the *Flora and Fauna Guarantee Act 1988* (FFG Act), and an Action Statement has been prepared. It is also listed as vulnerable under both the New South Wales *Biodiversity and Conservation Act 2016* and the South Australia *National Parks and Wildlife Act 1972*. It is not listed under the Commonwealth EPBC Act.

Brolgas breed mostly in ephemeral wetlands<sup>3</sup>, with seasonal hydrology apparently a factor in breeding site selection. A successful breeding population requires multiple potential breeding sites, with different sites used in different years according to conditions: sites are used repeatedly, if irregularly, as long as they remain suitable. The Action Statement for the species under the FFG Act identifies loss of breeding wetlands as one of the key threats to Brolgas in Victoria<sup>4</sup>.

### Interim Brolga Guidelines

South-western Victoria has been attractive for wind farm development since the industry's earliest days in the late 1990s. South-western Victoria is also the stronghold of the surviving southern population of the Brolga. Following recognition of the potential for conflict between Victoria's expanding wind energy generation industry and the survival of the local Brolga population, the Brolga Scientific Panel was convened by the South-West Victorian Brolga Study under the auspices of the then Department of Sustainability and Environment. The Brolga Scientific Panel included scientists from government, university and consultancy backgrounds. It oversaw the establishment of a PhD study researching the ecology and movements of Victorian Brolgas and issued the IBG in 2011. Revision 1 of the IBG was issued in February 2012 and remains the latest version.

The IBG has been recognised by decision-makers since its publication as the primary standard for managing potential conflict between wind farm development and Brolga in the south-western Victorian range of the species.

The IBG identifies three ways in which wind farm development could impact on the Brolga. Firstly, direct mortality could result from collisions with turbines or other wind farm infrastructure. Secondly, Brolgas could abandon otherwise suitable habitat due to disturbance arising from construction and presence of turbines or other infrastructure. Thirdly, multiple adjacent wind farms could act cumulatively as a barrier for Brolgas undertaking seasonal movements between breeding sites and non-breeding flocking sites, forcing birds to travel further with resultant energy costs.

There are no traditional flock roosting sites within the IBG default buffer of 5.3 km (5 km flock roost site home range plus 300 m disturbance buffer) of the Golden Plains wind farm

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<sup>2</sup>*Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011*, Revision 1 February 2012, Department of Sustainability and Environment, Melbourne, p. 5.

<sup>3</sup>For the purposes of this assessment, "wetlands" are areas subject to permanent or temporary inundation, that hold still or very slow-moving water, and can support biota adapted to inundation. The extent of a wetland may be considered to include the area supporting wetland-dependent vegetation.

<sup>4</sup>*Brolga: Action Statement No. 119 under the Flora and Fauna Guarantee Act 1988*, Department of Sustainability and Environment, East Melbourne, 2003.



footprint, so the focus of this assessment in terms of Brolga home ranges is limited to breeding sites.

The IBG recommends what were considered at the time of publication to be safe adequate distances between Brolga breeding wetlands and wind farm infrastructure (primarily turbines, although it could also include powerlines, anemometer masts, guy-wires, terminal stations and fences). Scope is provided for the default home ranges to be varied based on robust site-specific assessment of variability in actual home range size. However, in the absence of site-specific assessment, the IBG provides that any wetland where breeding has been recorded and which has not been permanently drained is to be treated as a breeding wetland and provided with a turbine-free buffer comprising a home range extending 3.2 km from the edges of the breeding wetland and an additional 300 m disturbance buffer.

### **Breeding site turbine-free buffers**

The proponent's proposed project-specific breeding home range size documented in the EES for the project is smaller than has been endorsed through a statutory approval process for any wind farm in Victoria since the publication of the IBG. For such a significant departure from past practice to be accepted, a very high level of confidence based on site-specific observation of local breeding home ranges would be required.

The panel found no such confidence in the information and observations cited in the EES. At least eight Brolga pairs attempted to nest within or close to the proposed wind farm footprint in the 2016 and 2017 breeding seasons. BL&A recorded home range behaviour observations for two attempts which successfully hatched chicks (wetlands 11 and 17 in 2017)<sup>5</sup>. The average duration of observations for those nesting attempts was significantly less than the comparable observations that the panel was referred to, for example for the Dundonnell, Mt Fyans and Penshurst wind farm proposals<sup>6</sup>. Therefore, I accept the panel's conclusion that the proposed home ranges for the Golden Plains wind farm - 400 m in all directions measured from the breeding wetland boundary plus a 300 m disturbance buffer - is not substantiated and is likely to be too small.

Alternatives that the panel considered to the proposed approach in the EES were:

- IBG's default 3.2 km breeding home range plus 300 m disturbance buffer;
- the site-specific approach proposed by BL&A for the Dundonnell wind farm, which I approved in 2016 (BL&A is also the specialist ecological consultant for the project); and
- the site-specific approach adopted by a different consultant, Biosis Pty. Ltd., for the proposed Penshurst and Mt Fyans wind farms.

In the case of Dundonnell, and in light of substantially more intensive local observations than were made for the Golden Plains wind farm EES, BL&A proposed asymmetrical home ranges of a minimum 400 m radius from the wetland boundary, with the home range extended to include any wetland within 3.2 km of the nesting wetland and allowing a further 300 m disturbance buffer. This "habitat" approach reflected the observed willingness of birds to move further from the breeding wetland towards other wetlands, which may be likely to provide better foraging habitat than dry areas closer to the breeding site.

Mr Ian Smales, who served as peer reviewer for the EES Brolga study for the project, is employed by Biosis, and responded to questions during the Golden Plains wind farm panel hearing about the Biosis approach for Penshurst and Mt Fyans. The Biosis approach is based on a database of observations, also more extensive than those gathered for the Golden Plains wind farm EES, at breeding sites in the vicinity of the proposed Penshurst and Mt Fyans wind farm sites. It proposes a home range of about 830 m radius from the wetland

<sup>5</sup>Golden Plains wind farm EES, Appendix F

<sup>6</sup>Golden Plains Wind Farm Inquiry and Panel Report, pages 30-31

boundary (hence about 430 m larger than the home ranges proposed by BL&A for GPWF), plus a further 300 m disturbance buffer.

In 2016, I assessed the environmental effects of the Dundonnell wind farm under the Environment Effects Act and granted a planning permit consistent with my assessment. The assessment generally accepted the BL&A habitat approach adopted for that EES to determine Brolga breeding site home ranges. The proposed Penshurst wind farm, for which an EES was required, has now been abandoned by its proponent. The proposed Mt Fyans wind farm is the subject of a planning permit application lodged in September 2018, which is yet to be determined. Therefore, the Biosis approach remains untested in a statutory sense.

The Golden Plains wind farm panel heard references to the work of PhD student Ms Inka Veltheim, who conducted extensive field studies on Brolga breeding and flocking behaviour, supported by funding from the Commonwealth government, the former Department of Sustainability and Environment, Sustainability Victoria and the wind energy industry<sup>7</sup>. Ms Veltheim's studies included radio-tracking juvenile birds during their pre-fledging stage. Those movements therefore will provide an indication of breeding home ranges used by the breeding pairs to which the tracked juveniles belonged. Brolga chicks leave the nest at a young age, well before being able to fly, and forage on foot within and outside the breeding wetland, escorted by one or both parent birds until they fledge<sup>8</sup>. One parent bird might at times forage further afield than the young, while the other parent guards the offspring, so the breeding home range might for practical purposes be larger than the area traversed by the walking juveniles.

Although Ms Veltheim's work when published (expected shortly) will provide valuable empirical data about the dimensions of breeding home ranges for Victorian Brolgas, it will do so without direct reference to the influence of nearby wind farm infrastructure on Brolga's choice of breeding wetlands or on home range size<sup>9</sup>. I note that it has been claimed in submissions that Brolga use of historical breeding wetlands up to five kilometres from wind turbines is compromised<sup>10</sup>. On the other hand, Brolga nesting has been recorded within the footprint of the Macarthur wind farm in western Victoria.

### Population

While the actual needs of Brolgas with respect to breeding wetland characteristics and proximity to wind turbines are not fully known, it would be inappropriate to approve construction of turbines with smaller home range allowance than in any previous permitted instance, without substantiated site-specific home range characterisation, in an area used by up to eight Brolga pairs. The exact number of Brolgas in south-western Victoria (or even in south-eastern Australia, including birds in south-eastern South Australia, north-central Victoria and the southern Riverina of New South Wales) remains uncertain, but it is unlikely to exceed about 900 birds<sup>11</sup>. Brolgas take four to five years to attain breeding age and attempt to nest<sup>12</sup>, and the population might also include unpaired adults and older birds beyond the age of successful breeding. The population estimate adopted for population viability analysis (PVA) reflects the high count in 2013 and includes 753 adults<sup>13</sup>, of which eight pairs would represent >2%. A threshold for a "significant proportion" of a threatened

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<sup>7</sup>[http://www.swift.net.au/cb\\_pages/about\\_the\\_research\\_project.php](http://www.swift.net.au/cb_pages/about_the_research_project.php), viewed 1 October 2018.

<sup>8</sup>*Handbook of Australian, New Zealand and Antarctic Birds, Volume 2 Raptors to Lapwings*. Eds S. Marchant and P. J. Higgins, Oxford University Press, Melbourne, 1993 (HANZAB).

<sup>9</sup>I. Veltheim, pers. comm.

<sup>10</sup>Panel document 99.

<sup>11</sup>The highest census count recorded since the 1980s was 907 in 2013, shortly after a sequence of wet years that had followed the millennium drought. All other counts and population estimates have been <700.

<sup>12</sup>HANZAB

<sup>13</sup>Golden Plains wind farm EES, Appendix F.

population is commonly regarded as 1%<sup>14</sup>, so an adverse impact on the breeding Brolga pairs in the vicinity of the Golden Plains wind farm site would be a serious matter for the population. Either the deaths of the birds due to collisions with infrastructure or the failure of those pairs to continue to breed would be an adverse effect.

#### **Collision risk modelling, population viability analysis and Brolga compensation plan**

The IBG provides for residual collision risks to Brolga resulting from construction of the wind farm to be modelled through collision risk modelling (CRM). The CRM methodology used by BL&A was considered by peer reviewer Mr Ian Smales to be consistent with the IBG, although he had not reviewed the model's mathematics. The CRM predicted the deaths of up to 9.3 Brolgas due to collisions over the 25 year life of the project (modelled collisions vary according to the assumed "avoidance rate").

The output of the CRM is then fed into a PVA to estimate the impact of modelled casualties on the overall population over the life of the project. This figure informs the objectives of a Brolga compensation plan for the project.

I note that the proponent has proposed to implement a Brolga compensation plan should the Golden Plains wind farm be approved. According to the IBG, the number of birds to be recruited or casualties to be prevented under a compensation plan is intended to offset those deaths due to residual collisions after nesting sites and flocking sites have been adequately buffered. CRM and PVA applied under the IBG do not provide for losses to the long-term population resulting from the failure of mature birds to breed, as the provision of adequate home ranges and buffers is expected to negate that potential impact.

No Brolga compensation plan in accordance with the IBG has yet been implemented in Victoria, although such a plan is required for the Dundonnell wind farm when developed under permit conditions. It will take some time after the first plan has been put into practice before it will be possible to form a view about the success of the compensation plan approach.

#### **5.1.3 Discussion**

##### **Population viability**

I note that it was argued at the Golden Plains panel hearing that the predicted Brolga casualties for the Dundonnell wind farm effectively established a precedent, and as the number of predicted casualties at Golden Plains is lower than that predicted for Dundonnell, the predicted losses at Golden Plains should be considered acceptable<sup>15</sup>. I agree with the panel that this argument is not supported because it disregards the inconsistencies in the approaches taken to minimising potential casualties through turbine-free home ranges and buffers. It also fails to allow for the potential impact on the overall population through the foreseeable loss of recruitment from possibly >2% of the breeding population, even if they do not become collision casualties.

At the same time, I note that one of the key threats to the Victorian Brolga population is loss of suitable breeding wetlands due to anthropogenic climate change. Brolgas in Victoria are therefore threatened both by climate change and by one of the key technologies at our disposal to attempt to combat and mitigate climate change.

##### **Protection of breeding wetlands**

It remains uncertain what constitutes an adequate home range and buffer for Brolga breeding wetlands potentially affected by the Golden Plains wind farm proposal. I therefore consider it essential to apply the precautionary principle to protect those breeding sites at least to an extent consistent with the protection that has been applied through statutory

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<sup>14</sup>See for example *Ministerial guidelines for the assessment of environmental effects under the Environment Effects Act 1978*, p. 7.

<sup>15</sup>See for example Golden Plains wind farm panel report, Chapter 4.4(i).



approvals for wind farms to other breeding wetlands since the publication of the IBG. Accordingly, I support the panel's finding that the BL&A habitat approach should be applied in the case of the Golden Plains breeding wetlands in the absence of compelling evidence justifying smaller site-specific home ranges.

However, I expect that further information will shortly come to light through the imminent publication of the results of Ms Veltheim's research. This might lead after due consideration to a revision of the IBG with respect to breeding home range dimensions.

I note that new information about Brolga breeding home ranges may come to hand soon which may be considered by DELWP Environment as it seeks opportunities to provide better guidance to proponents and decision-makers about the impacts of wind farm development on biodiversity, especially avifauna. However, targeted research may be needed to characterise the potential disturbance effect of turbines on Brolgas' choice of nesting sites, as it is likely to be a key determinant in the design and approvals consideration of future wind farms.

Accordingly, in response to the panel's recommendations 1 and 2, I consider at this time that the approval for the Golden Plains wind farm should not permit the development of turbines falling within the BL&A habitat-based home ranges with 300 m disturbance buffer. Turbines mapped within the hatched area in Figure 2 (adapted from panel document No. 86) should be deleted from the plans for the planning permit.

However, if in future DELWP publishes new standards for establishing turbine-free buffers for Brolga breeding wetlands, it should be open to the proponent to apply for an amendment to the permit allowing additional turbines to be constructed within the hatched area, consistent with the revised standards. The revision process might include consideration of other biodiversity issues relative to wind farms, or management of a broader range of threats to Brolga. However, it should have regard to Ms Veltheim's published PhD thesis, empirical research into Brolga breeding site selection with regard to proximity of wind farm infrastructure and any other relevant and appropriately rigorous research findings that become available within the timeframe of the revision.

I wish to stress that this conclusion is made without pre-empting either the findings of Ms Veltheim's research, the findings of research into Brolga nest site selection relative to proximity of turbines, the findings of any other relevant research or the final form of guidelines or other standards that DELWP might issue. An amendment to the permit to allow installation of turbines in the hatched area should only be granted consistent with the current relevant DELWP guidelines or standards published at that time. Clearly this places an imperative on the need for work on gathering and analysis of necessary data leading to review of the IBG and publication of updated guidelines to be undertaken without undue delay.

I note that the panel considered submissions about Baths Swamp and concluded that it should not be treated as a breeding wetland. Baths Swamp does not meet the definition of the breeding wetland in the IBG. Accordingly, I support the panel's conclusion.

### **Terminal station**

The hatched area in Figure 2 includes land in the southern/ south-eastern sector of the wind farm. This area also includes the proposed terminal station, the site for which lies on the eastern side of Geggies Road at the southern boundary of the proposed wind farm footprint, adjacent to the 500 kV transmission line. I note that the proposed terminal station site is adjacent to a recognised historical Brolga breeding wetland (wetland no. 25).

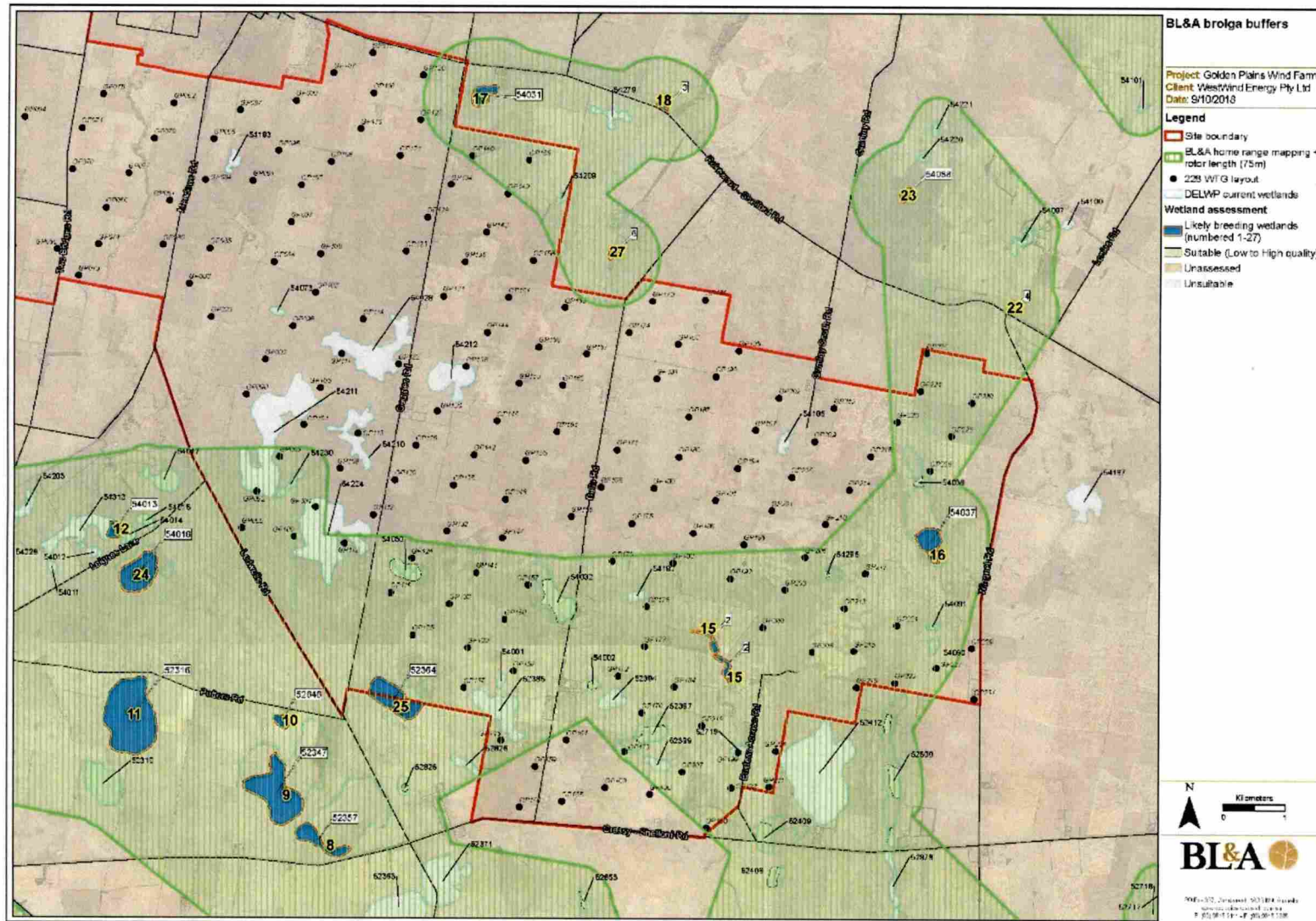


Figure 2. Turbine-free areas to be maintained according to BL&A habitat model. (WestWind)



The proximity of the terminal station site to wetland 25 is of concern, as noted in the panel's recommendation 3. At the same time, the wetland has been compromised to a degree as a suitable Brolga breeding wetland by the proximity of the Moorabool-Mortlake/Tarrone 500 kV transmission line, which in fact traverses the wetland, given that transmission line collisions are a known cause of Brolga mortality. The landholder has reported "occasional" Brolga nesting attempts in the wetland, but the EES does not document when the most recent attempt occurred, or whether attempts have been successful<sup>16</sup>.

The EES notes that the terminal station had previously been proposed to be sited west rather than east of Geggies Road. It was moved to the east due to the high quality of native vegetation present on the earlier preferred site.

On balance, I consider that the proposed location of the terminal station, notwithstanding its proximity to the wetland, is acceptable in the circumstances. I note that provision of screening vegetation is recommended to the south and east of the terminal station (the sides closest to the wetland)<sup>17</sup>, and I endorse such provision. As far as practicable, screening vegetation should be established early, to reduce the possible disturbance arising from construction of the terminal station. In the event that Brolga breeding no longer occurs in wetland 25 following construction of the terminal station, consideration should be given to making additional allowance for the loss of the site in the Brolga compensation plan.

#### **Powerline marking**

I also endorse the proposal to provide visual markers on the new overhead powerline delivering electricity from the wind farm to the terminal station. While a Brolga death due to a collision with a wind turbine has not yet been confirmed, Brolgas are known to have died following collisions with powerlines<sup>18</sup>. All new overhead powerlines installed for the project should be marked adequately wherever they traverse land within the BL&A habitat-based home range or home range buffer of a known breeding wetland.

#### **Brolga compensation plan**

I support the provision in the IBG for a Brolga compensation plan to offset predicted residual collision casualties. It is clear from the IBG that compensation is not intended to be applied for discontinued use of otherwise suitable habitat – no such effective habitat loss should occur if adequate turbine-free buffers fully accommodate home ranges. I note also that the proposed compensation plan is based on CRM, which does not make allowance for population impacts resulting from effective habitat loss. However, wetland 25, adjacent to the terminal station site, is a special situation which could warrant a different approach.

The CRM for the project assumes a very low rate of collision with powerlines – 0.001 birds per year. This figure seems unduly low in the light of documented Brolga collisions with powerlines. Prior to a target being adopted for the project's Brolga compensation plan, I consider that the proponent should review this aspect of the CRM in consultation with DELWP.

The precise detail of the Brolga compensation plan can be determined as a secondary consent under a planning permit condition.

I note that the IBG presents two options for offsets – reducing mortalities from collisions with existing powerlines and protection and enhancement of breeding sites. The draft Brolga compensation plan presented in the EES<sup>19</sup> proposes only measures addressing the second

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<sup>16</sup>Golden Plains wind farm EES, Appendix F.

<sup>17</sup>Ibid.

<sup>18</sup>Bird casualties from collisions with a 500 kV transmission line in southwestern Victoria, Australia. P. W. Goldstraw and P. B. Du Guesclin, 1991, in *Proceedings from the 1987 International Crane Workshop*, pp. 219-224; also G. Peterson, DELWP, pers. comm.

<sup>19</sup>Golden Plains wind farm EES, Appendix F7.

option. The practical effectiveness of either option is yet to be tested or measured (only one Brolga compensation plan has been required in the light of the IBG, for Dundonnell wind farm, the plan for which is yet to be approved). However, I am concerned that an exclusive focus on breeding site enhancement could (almost literally) represent an “all eggs in one basket” approach.

It appears that it will be challenging to monitor or demonstrate the direct effectiveness of either approach. Tracking birds hatched at enhanced breeding sites to be able to confirm their eventual recruitment into the breeding population several years later seems a highly problematic task. Assigning a collision reduction factor to powerline marking would also rely on assumptions and extrapolation, although there is an extensive literature documenting the efficacy of powerline marking overseas in reducing bird collision casualties (including cranes)<sup>20</sup>. But a more integrated approach might give stakeholders, especially those committed to Brolga conservation, greater comfort that the required benefits to the population are more likely to accrue over time.

### **Monitoring**

I note that CRM expresses predicted casualties to Brolgas to multiple decimal places, although the aggregate predicted collision casualties over the 25 year life of the project is less than ten deaths. I accept that even with best practice collision casualty monitoring under a bat and avifauna management (BAM) Plan it may be difficult if not impossible to validate those predictions with a high level of confidence. Such monitoring is essentially a sampling exercise – it is neither practicable nor reasonable to expect that the entire footprint of a wind farm extending across many thousands of hectares will be searched comprehensively and constantly. It will be necessary (as is always the case when dealing with sampling) to extrapolate from the observed results, relying on statistical principles to deliver sound conclusions.

This approach is adequate when dealing with relatively common events. But the predictions for the Golden Plains wind farm and experience over almost 20 years across the wind farm industry in south-western Victoria suggest that Brolga collisions will be rare events. It will be important to acknowledge that if such events occur, it is probable that some will go undetected by routine monitoring. Therefore, it will not be valid to assume that no finds of Brolga carcasses equates to no collisions. Likewise, if a collision casualty is detected, it will not be valid to apply some statistical multiplier to the event.

Collision monitoring and reporting is essential. It should be continued for existing wind farms in accordance with applicable approval conditions and should continue to be required for newly approved projects. Ongoing collection, collation and analysis of collision casualty data, which I understand DELWP has commenced since the Dundonnell wind farm assessment, is one important way of detecting unexpected trends in collision vulnerability, especially for species that might already be of concern for other reasons. Until our understanding of the vulnerability of all species of conservation concern to wind farm collisions is much better than it is yet, more and better data will be critical for continuously improved management of the environmental risks posed by wind farms.

But for the Brolga, it remains important to identify population and demographic trends in the population. I understand that surveys are conducted periodically to calculate the percentage of immature birds in non-breeding season flocks, which can indicate the level of success of breeding in recent years. Five-yearly attempts at a complete census have also been conducted, most recently earlier in 2018, which returned a low but inconclusive count of 377 birds, possibly because of unfavourable weather conditions. By contrast, the previous

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<sup>20</sup>See for example <https://www.conservationevidence.com/actions/265> (website viewed 12 October 2018)

(2013) count returned a figure of 907 birds, significantly larger than any comparable count or estimate in the past 30 or more years<sup>21</sup>.

While the species remains listed as threatened, it would be helpful for more frequent population census counts to be undertaken, to establish a sound population baseline and allow the early detection of any population or demographic trend. I note that the panel has made recommendations about actions it believes that DELWP should undertake with respect to gathering better information about Brolgas, both relative to wind farm impacts and more broadly.

#### **Brolga Scientific Panel**

I understand that the Brolga Scientific Panel (BSP) which produced the IBG has not met for several years. Mr Lane and Mr Smales were members of the BSP. DELWP might decide to reconvene the BSP to assist with revision of DELWP guidelines about Brolga protection. If so, it may be appropriate for the membership of the panel to be reviewed in the light of Mr Lane's and Mr Smales' close involvement with specific projects to which revised or finalised Brolga Guidelines are likely to be applied. Access to the advice of such experienced consultants working in the field would be invaluable to the Brolga Scientific Panel, but it would be better for the avoidance of any perceived conflict of interest if consultants working or likely to work on projects to which revised guidelines will apply do not have a determinative role in the revision process.

#### **5.1.4 Conclusion**

**It is my assessment** that for the appropriate protection of the Brolga, approval of the Golden Plains wind farm should provide for a reduced project, with no turbines to be constructed within the Brolga home range plus buffer mapping presented in panel document no. 86 and reproduced as Figure 2 of this assessment. Turbines located outside the home range plus buffer area may be approved generally as proposed.

If the wind farm developer or operator wishes at any future time to seek an amendment to the permit to allow construction of turbines in the presently excluded area, it should provide compelling evidence, consistent with the IBG or any successor guidelines, to confirm that adequate site-specific home ranges and buffers have been provided for all known Brolga breeding wetlands.

Development of the terminal station adjacent to Wetland 25 may proceed, with planting of appropriate screening between the works site and the wetland to be implemented as a priority. Brolga use of the wetland for breeding should be monitored and if successful breeding does not occur within the first five breeding seasons after construction of the terminal station commences, additional provision for the effective loss of the wetland as a Brolga breeding site should be made through the project's Brolga compensation plan.

All new overhead powerlines to be installed as part of the project within the hatched area in Figure 2 should be fitted with appropriate visual markers to mitigate the risk of collision by Brolgas.

In drafting, refining and approving a Brolga compensation plan for the Golden Plains wind farm, careful consideration should be given by all parties to the desirability of including a transmission line marking component as well as breeding wetland enhancement measures.

DELWP should consider conducting more frequent Brolga population censuses, if necessary as often as once every two years, to establish a clearer understanding of the Victorian (or south-eastern Australian) Brolga population level and trend. DELWP should continue to publish census results for the benefit of all stakeholders.

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<sup>21</sup>See [http://www.swifft.net.au/cb\\_pages/brolga.php](http://www.swifft.net.au/cb_pages/brolga.php) (website viewed 12 October 2018).



Investment decisions about wind farm footprints and layouts have significant economic implications for stakeholders including wind farm developers and operators, decision-makers and host landholders, an owner of land on which project infrastructure is to be built. I strongly encourage DELWP to review available and emerging information, identify information gaps, and provide regularly updated guidance for the industry relative to Brolga and other avifauna that may be impacted by wind farms.

In particular, given the extensive development of wind farms in south western Victoria since 2012 and uncertainty about the disturbance factor for Brolgas associated with turbines, DELWP should consider commissioning targeted research. The research should investigate whether proximity to wind turbines is a statistically demonstrable factor in Brolga selection of historical breeding wetlands for current nesting attempts in consideration of a range of other potential threats to Brolga. Findings from this work should be incorporated into revised guidelines. Ideally, industry stakeholders will contribute to this work.

## **5.2 Other fauna**

Issues associated with fauna other than Brolga are addressed in Chapters 11 and 22 and Appendices E and G of the EES and in Chapters 5 and 15 of the panel report. Impacts on fauna (other than Brolga) are the subject of recommendations by the panel.

### **5.2.1 Evaluation objectives**

To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.

### **5.2.2 Context and discussion**

The EES identified several significant fauna species that could be affected by the development and operation of the proposed wind farm. Table 6 of the panel report lists the fauna species listed under the EPBC Act (whether threatened or migratory) and the FFG Act that are known to occur or could occur on or close to the wind farm site.

For convenience, this section of my assessment firstly focuses on species threatened under the FFG Act, some of which are also listed under the EPBC Act. All listed species under the EPBC Act are addressed explicitly in section 5.16 of this assessment. This section then addresses the question of protected species which are not (yet) listed as threatened under the FFG Act.

#### **FFG-listed birds**

Gull-billed Tern forages over wetlands and adjacent open habitat. It has a wide range that includes south-western Victoria, generally in connection with larger lakes and wetlands. The panel has concluded that it is unlikely to be significantly affected by the project.

Plains-Wanderer (also EPBC Act listed, as Critically Endangered) is a rare, cryptic, partly nocturnal grassland bird, endemic to Australia and with no close relatives. Its Victorian stronghold appears to be native grasslands in the north-central part of the state but it occurs sporadically in grasslands in the west of Victoria. It also occurs in New South Wales, Queensland and South Australia.

Plains-Wanderer has not been recorded on the project site and was not detected during surveys undertaken for the project. It is readily overlooked and given the estimated extent of native grassland across the wind farm site of several thousands of hectares, its occasional presence on the site cannot be ruled out.

Plains-Wanderers are terrestrial and are rarely observed to fly. However, given the distribution of the species and its ability to abandon and later return to localities according to habitat suitability, it seems probable that Plains-Wanderers are capable of long flights, probably undertaken at night at unknown height.

On balance it is unlikely that the project will have a significant effect on Plains-Wanderer. Nonetheless, as wind farm development continues to expand over western Victoria, it would be prudent for wind farm operators to be aware of the possibility and ensure that staff conducting searches for collision casualties are aware of the potential for species such as Plains-Wanderer to be struck.

#### **FFG-listed bats**

Bats are vulnerable to wind turbines both through direct collision and through “barotrauma”<sup>22</sup>, whereby the abrupt change in air pressure as a blade passes close to the bat causes damage to body tissues such as lungs. Small insectivorous bats rely on echolocation to detect both prey and obstacles in the darkness.

Yellow-Bellied Sheath-tail Bat is widely distributed in Australia, with Victoria on the edge of its range. Although it is considered rare in Victoria, it has been detected by recording its echolocation call at several wind farm sites, including Golden Plains. The significance of the records is yet to be determined. However, as most if not all of the recorded calls were from individuals passing below the proposed minimum height of the rotor-swept area (40 m), the scope for impact appears to be small.

Eastern Bent-Wing Bat is rare in western Victoria, most of its population occurring east of Melbourne. Only one call was recorded on the site. No significant impact is expected.

#### **FFG-listed reptiles**

Striped Legless Lizard (also EPBC-listed, as Vulnerable). A substantial population was detected within the wind farm footprint, mostly in the eastern part of the site. An area in the north-western part of the site has not been systematically surveyed for the species. In the absence of sufficiently intensive targeted surveys, it is prudent to assume the presence of the species in suitable habitat throughout the site (noting that Striped Legless Lizard is known to occur in weedy and degraded grassland).

I support the assumption that all native grassland habitat to be removed should be regarded and treated as Striped Legless Lizard habitat for offsetting purposes. Both Victoria and the Commonwealth (under the EPBC Act) have offset systems for biodiversity and it would be preferable for the offset requirements under both jurisdictions to be integrated as closely as possible.

Aside from habitat loss (which will occur through the construction of access tracks and wind farm infrastructure, primarily turbines, distributed across the site), Striped Legless Lizard is vulnerable to injury or death during project construction. Adequate protocols will be required to ensure construction personnel are fully aware of the nature and significance of the species. Techniques to minimise the risk of animals being struck by vehicles or becoming trapped in excavations will be required and should be addressed through permit conditions.

#### **FFG-listed amphibians**

Growling Grass Frog (also EPBC-listed) was recorded in two wetlands within the project footprint during project surveys. Provided (as is proposed to be the case) infrastructure is not constructed within or close to those wetlands, and impacts on wetlands generally are minimised, adverse impacts on the species’ habitat should be effectively avoided. Measures to avoid construction phase impacts on Striped Legless Lizard should serve to protect mobile Growling Grass Frogs.

#### **FFG-listed fish**

Yarra Pygmy Perch (also EPBC-listed, as Vulnerable) is known to occur in two streams, Woody Yallock River and Kuruc A Ruc Creek, which traverse the wind farm footprint.

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<sup>22</sup>Golden Plains wind farm EES, p. 11-17.

Provided project works avoid those waterways (as proposed), no adverse impacts on Yarra Pygmy Perch should be expected.

### **FFG-listed invertebrates**

Golden Sun Moth (also EPBC-listed, as Critically Endangered) has been recorded on the project site and is assumed to be present in suitable grassland habitat. Offsets integrating the requirements of Victoria and the Commonwealth will be required. Offsets for this species are slightly more complex than for the Striped Legless Lizard and are further discussed in Section 5.16 of this assessment. However, subject to adequate offsets being secured, adverse impacts on the species are considered acceptable.

### **Other protected fauna species**

It is known that birds and bats in flight are susceptible to being killed by wind turbine blades. The nature of the Golden Plains wind farm site is such that the species most likely to be involved in collisions are generally common farmland species, of least conservation concern. This conclusion is supported by the bird utilisation surveys undertaken for the EES by the proponent's flora and fauna consultant. The surveys also indicated that most flights across the site by birds during daylight passed below the minimum height of the rotor swept area (that is, within 40 m of the ground).

Concern has been expressed at hearings about other wind farms, and was expressed at the Golden Plains panel hearing, that some bird species might be disproportionately vulnerable to wind turbine collisions. Although considered common and secure now, those species might become vulnerable if aggregate casualties on wind farms combine with other causes of mortality to exceed recruitment.

Wind farm approvals routinely include a requirement for the operator to prepare and implement a BAM plan, including searches for collision casualty carcasses. Previous panel reports and my assessment of the environmental effects of the proposed Dundonnell wind farm (February 2016) have recommended that DELWP Environment should gather, collate and analyse the results of all monitoring data from Victorian wind farms to determine objectively which, if any, species may be of particular concern. I understand that work has been commissioned but no results have yet been published.

In light of evidence and submissions presented at the Golden Plains wind farm panel hearing, it seems probable that Wedge-tailed Eagle and possibly some other raptor (bird of prey) species may be found through analysis of the available data to be at greater risk of collision than most other bird species. Eight raptor species including Wedge-tailed Eagle were recorded during surveys for the EES on the Golden Plains wind farm site; none of those species is currently listed as threatened under the FFG Act or the EPBC Act. White-striped Freetail Bat has also been found on other wind farms to be a relatively frequent casualty.

Some casualties may be unavoidable if the wind energy industry is to be an element of Victoria's renewable electricity generation mix into the future. The risk of collisions can be managed to a degree by siting and design decisions that are made prior to wind farm construction, for instance by avoiding areas likely to attract large numbers of birds such as wetlands, by spacing turbines well apart and by placing the rotor swept area well above the ground.

Wind farm site management may also serve to mitigate collision risk for raptors, for example by prompt removal of dead livestock or other carcasses that might attract carrion-eating birds and by control of rabbits which are an important prey species for several larger raptor species.

I note also that technologies to reduce the risk of collision through operational management have been developed in other parts of the world. As the number of approved and operational wind turbines in Victoria continues to grow, I consider that the Victorian industry

should pay close attention to the advances that are being made in collision mitigation, and in consultation with DELWP should consider implementing or adapting such technologies for future wind farm proposals.

A consistent approach to wording and implementation of wind farm planning permit conditions about BAM plans should help to make the data that are gathered from different wind farms more readily comparable. This will be important in assessing aggregated impacts on potentially susceptible species.

### **5.2.3 Conclusion**

**It is my assessment** that impacts on listed threatened fauna species other than Brolga will be acceptable, provided that:

- Project works, including construction of access tracks, are separated and adequately buffered from wetlands and watercourses, in particular those where the presence of Yarra Pygmy Perch or Growling Grass Frog has been identified. This factor should be taken carefully into account in any project layout refinement (including “micro-siting”) that might be allowed under permit conditions.
- Adequate protocols for the construction phase are implemented to minimise risk to Striped Legless Lizard and Growling Grass Frog, including measures in suitable habitat (not only good quality native grassland) to reduce the risk of mobile animals from entering works sites (including crossing access tracks while in regular use), rescue of animals trapped in temporary excavations subject to approval under the Wildlife Act and effective induction of construction personnel.
- Appropriate offsets meeting the requirements of Victorian and (as relevant) Commonwealth guidelines or prescriptions are secured prior to works affecting habitat for any listed threatened fauna species.
- A BAM plan is required under permit conditions designed to promote consistency with best practice BAM plan requirements for other wind farms.
- Personnel undertaking collision casualty monitoring searches are adequately trained to find and recognise evidence of protected species having been struck.

DELWP should seek as a matter of urgency to finalise the investigations into collision risk for protected species that were initiated following the Minister’s assessment of the environmental effects of the Dundonnell wind farm. Action might include initiating research into species found to be of concern relative to wind farms or commencing procedures to list species that could meet listing criteria under the FFG Act.

DELWP should investigate and monitor advances in techniques and technologies for reducing collision risks and actual incidences of collisions in the wind energy industry internationally. Moreover, DELWP should work to encourage and facilitate the adoption of options suitable for the Victorian context in consultation with local wind industry bodies.

## **5.3 Flora and native vegetation**

Flora and native vegetation effects are addressed in Chapters 11 and 22 and Appendices E and G of the EES and in Chapters 6 and 15 of the panel report. Flora and native vegetation matters have been the subject of recommendations by the panel. Flora and native vegetation matters which are specific to listings under the EPBC Act are addressed in Section 5.16 of my assessment.

### **5.3.1 Evaluation objective**

To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.



### 5.3.2 Context

Native vegetation removal will occur in the course of construction of access tracks and installation of turbine footings and other wind farm infrastructure. Establishment and operation of the proposed temporary quarry and works for the over-dimensional transport route could also affect native vegetation.

Given the extent of the site and the way infrastructure is distributed across a wind farm footprint, with direct impacts on only a very small fraction of the site, the proponent has understandably not surveyed or mapped native vegetation across the entire site. Instead, investigation of flora values for the EES has focused on the proposed works sites and access tracks where impacts may occur.

As a result, if variations occur to the project layout, either in the light of my assessment or for other reasons, additional work to identify significant flora species and ecological communities and to quantify native vegetation that may be removed will be required. This also applies to “micro-siting” of turbines, which is commonly provided for in wind farm planning permits, providing flexibility to build towers within up to 100 m of the approved location.

Native vegetation which is removed due to the project must be offset under Victorian policy. Although the current native vegetation removal regulations came into effect in 2017, the project’s native vegetation impacts were quantified under the previous (2013) standard which continues to apply for the purposes of the project under transitional arrangements.

The approach to permitted clearing of native vegetation in Victoria requires removal of native vegetation to be avoided, then minimised, with unavoidable native vegetation losses to be offset. The native vegetation to be removed for the project as described in the EES to be implemented totals about 49 ha. This compares to a total of about 102 ha for the earlier version of the project which was referred under the Environment Effects Act in 2017. The refinements to the project since the referral demonstrate attempts to avoid and minimise native vegetation losses. The extent of native vegetation to be removed with the deletion of turbines in the Brolga home range and buffer areas will be reduced from that proposed in the EES.

At the same time, a substantial proportion of the native vegetation still to be removed meets the definition for one of three ecological communities listed as Critically Endangered under the EPBC Act. The total mostly comprises scattered strips and small patches of vegetation to be removed for the discrete construction tasks. However, it is still a significant aggregate extent of threatened native vegetation and habitat (see Table 2), clearing of which should not be approved lightly. Where construction will further fragment remnant patches, edge effects may initiate or exacerbate ongoing deterioration of native vegetation quality.

**Table 2: EPBC Act listed ecological communities proposed to be removed.**

Listed community	Extent
Natural Temperate Grassland of the Victorian Volcanic Plain	27.74 ha
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	0.82 ha
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	0.36 ha

The Western (Basalt) Plains Grassland community, listed as threatened under the FFG Act, was identified on the project site. About six hectares of the community is proposed to be removed. Mapping of the FFG listed community was inadvertently omitted from the exhibited EES. The proponent has subsequently provided mapping (see Figure 3), which indicates that most if not all of the vegetation classified as Western (Basalt) Plains Grassland community is included in the vegetation mapped as the EPBC-listed Temperate Grassland of the Victorian Volcanic Plain. Some of the mapped FFG community is within the area where turbine construction is not recommended to be permitted in the assessment.



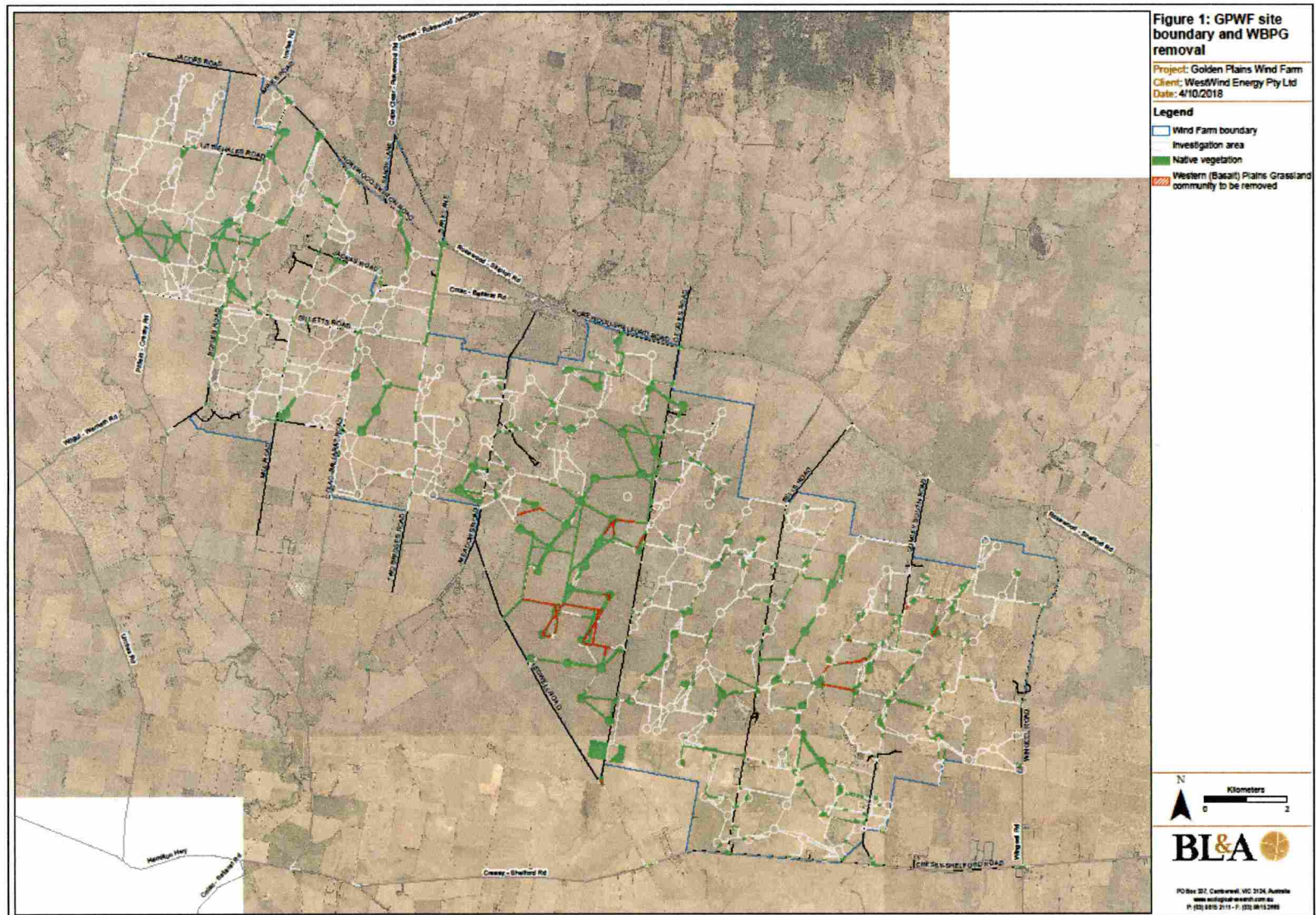


Figure 3: Native vegetation proposed to be removed for development of Golden Plains wind farm (with vegetation classified as FFG-listed Western (Basalt) Plains Grassland shown in red). Source: WestWind.

Three threatened flora species were identified that could be affected by the project.

Spiny Rice-Flower is listed as critically endangered under the EPBC Act and as threatened under the FFG Act. Plants were identified along roadsides and on private property within the wind farm footprint. None of the plants is within a works area and all can be retained. Plants in areas close to project works can be protected by "no-go" zone fencing. Accordingly, there should be no impact on Spiny Rice-Flower because of the project.

Trailing Hop-Bush is listed as vulnerable under the EPBC Act. It is not listed under the FFG Act. Plants were identified along roadsides within the wind farm footprint. None of the plants is within a works area and all can be retained. Accordingly, there should be no impact on Trailing Hop-Bush because of the project.

Small Milkwort is listed as threatened under the FFG Act. Plants were identified along roadsides and on private property near but not within the wind farm footprint. Accordingly, there should be no impact on Small Milkwort because of the project.

Removal and offsetting of about 0.13 ha of native vegetation for the quarry will be addressed through the work plan approval process under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act). There is potential for about 0.7 ha of native vegetation to be affected by roadworks to enable delivery of over-dimensional loads, in particular turbine blades up to 75 m long.

### 5.3.3 Discussion

The panel expressed concern about the discrepancy between the extent of Natural Temperate Grassland of the Victorian Volcanic Plain and the extent of Western (Basalt) Plains Grassland calculated for removal. I share this concern and support the panel's recommendation. Further, while the criteria for listing communities under the EPBC Act and the FFG Act are different, it seems that the listed community under both Acts is supposed to refer to the same ecological community. It would be helpful to authorities, proponents and other stakeholders if the State and Commonwealth experts could agree on definitions of threatened ecological communities which match more closely when the listings are intended to cover the same vegetation.

The reduction in the wind farm footprint recommended elsewhere in this assessment will reduce the extent of removal of native vegetation including listed threatened communities.

### 5.3.4 Conclusion

**It is my assessment** that the impact of the proposed removal of native vegetation for the project, although substantial, is acceptable provided that:

- native vegetation removal does not exceed that described in the EES (and documents tabled by the proponent at the panel hearing) for the part of the wind farm footprint proposed to be permitted in accordance with this assessment;
- micro-siting of towers or other windfarm infrastructure, including consequential changes to access track layouts and placement of transmission line poles, may occur only where the impact on native vegetation or threatened flora species is no greater than the impacts considered and quantified through the EES process and considered acceptable under this assessment;
- direct impacts on Spiny Rice-flower, Trailing Hop-Bush and Small Milkwort are avoided, including through precautionary measures to avert any risk of unintentional damage; and
- an offset strategy meeting the requirements of both the Victorian and Commonwealth systems is prepared and implemented.

The panel's recommendations regarding flora and native vegetation are generally supported. Therefore, **it is my assessment** that the planning permit should include conditions requiring

the proponent to prepare and implement a Native Vegetation Management Plan, and the project's Flora and Fauna Management Plan to include a requirement to undertake targeted flora surveys along the transmission line route. Further, DELWP should publish a standard for the assessment of the Western (Basalt) Plains Grassland Ecological Vegetation Class for native vegetation clearance applications.

DELWP should also liaise with the Commonwealth Department of the Environment and Energy to seek closer correspondence between the listing definitions of Temperate Grassland of the Victorian Volcanic Plain and Western (Basalt) Plains Grassland to provide better protection for the threatened community and to simplify the evaluation and assessment tasks for proponents and decision-makers.

## **5.4 Landscape and visual**

Landscape and visual effects are addressed in Chapter 15 and Appendix L.1 and L.2 of the EES and in Chapter 7 of the panel report. Landscape and visual matters have been the subject of recommendations by the panel.

### **5.4.1 Evaluation objective**

To minimise and manage potential adverse effects for the community with regard to landscape and visual amenity.

### **5.4.2 Context**

The project, as described in the EES, would comprise a maximum of 228 wind turbines with a maximum tip height of 230 m above ground level. The project will also comprise ancillary infrastructure such as electrical substations, overhead powerlines, meteorological masts and a quarry which all have the potential to lead to landscape and visual effects. If the project proceeds as recommended in this assessment, the number of turbines will be reduced to about 180, but the other components of the wind farm will change little, relative to potential landscape and visual impacts.

The EES defined two landscape character types for the project viewshed, consistent with the *South West Victoria Landscape Assessment Study*: Western Volcanic Plain (where the project will be sited) and Uplands (elevated areas to the north and east of the project). The Western Volcanic Plain is an open and flat plain without significant existing barriers to screen developments the size of this project. The Uplands area to the north and east of the project is elevated and, in some locations, will have views across the project site.

Other wind farms, including the existing Mt. Mercer Wind Farm (64 turbines), Mount Gellibrand Wind Farm (44 turbines) and the Berrybank Wind Farm (79 turbines approved but not yet constructed) fall within the 26 km viewshed for the project. Five other existing wind farms were identified in the EES as being potentially visible from within the 26 km viewshed of the project.

The site is not within an area designated to be of special landscape significance under the Golden Plains Planning Scheme or any other relevant instrument.

Several submissions to the EES and the planning permit application addressed landscape and visual effects and broadly covered aspects including the height of turbines, the rotor diameter, the prominence of the turbines within the landscape, the size of the project and site, the proximity of the project to some residences and cumulative effects associated with other wind farms.

Aviation lighting was also raised in submissions from the perspective of visual effects. Aviation lighting is addressed in Section 5.6 of my assessment.

### **5.4.3 Discussion**

The EES described the project area as being flat with extensive agricultural operations that have created a landscape that has the ability to accommodate the project. The EES



identified a number of selected viewpoints from public locations within the Western Volcanic Plains Landscape Unit, Uplands Landscape Units, nearby towns, local creeks and watercourses and selected nearby residences. Photomontages were prepared for the viewpoints for an assessment of the visual impacts.

Visual impacts for public locations within the Western Volcanic Plains were assessed as low and for the Uplands as low to medium in the EES. The EES assessed towns as having minimal visual impacts due to screening of views to the project by vegetation or structures. The EES also assessed visual impacts from viewpoints from 13 residences with impacts rated from nil to medium depending on existing screening vegetation, proximity to the project and the topography on which the residence is situated.

The panel considered the accuracy of the photomontages of the project and agreed that the photomontages were accurate. However, the panel also identified alternative viewpoints from residences that would have represented properties with higher visual effects and cumulative visual effects with other wind farms in the area.

Mr Taylor, of the neighbouring Warrambeen Farm, noted in his submission to the panel that the type of vegetation to be used to mitigate views towards the project should be selected with regard to its suitability to mitigate visual impacts. The panel agreed with Mr Taylor and recommended a planning permit condition to address his concern.

The potential failure of landscaping mitigation and costs of maintaining landscape mitigation was raised in a number of submissions. The panel sought to address these concerns through a recommended planning permit condition making the proponent responsible (through action or cost) for establishing and maintaining the landscaping mitigation.

The panel found that the wind farm will be a visually dominant element in the landscape due to the size of the turbines, scale of the project and the landscape on which the project will be situated. It was clear from submissions that the landscape of the area is highly valued. The absence of policy and planning protection for the landscape of this area led the panel to conclude that the visual effects of the wind farm are generally acceptable, and it is appropriate that these effects be managed through permit conditions.

I note that viewer associations with the landscape and its values can vary and lead to somewhat subjective understandings of potential impacts. Nevertheless, it is valid for such perceptions and value judgements about new features proposed to be introduced to the landscape context to be considered when assessing and mitigating impacts.

#### **5.4.4 Conclusion**

**It is my assessment** that while the project will be visually dominant in its landscape context, the visual effects can be managed to an acceptable level particularly for residences.

I agree with the panel's finding that there is limited recognition and protection of the landscape values of the area in the Golden Plains Planning Scheme and that the landscape and visual effects are acceptable in this context.

I support the panel's recommendations that landscaping mitigation offered to affected landowners should be tailored to the relevant property. Permit conditions should require the proponent to meet the costs of watering and maintaining landscaping mitigation during its establishment. It is my assessment that in defining the period of landscaping establishment and maintenance, the type of vegetation that may be agreed upon with affected landowners will be a key factor.

### **5.5 Noise and Vibration**

Noise and vibration effects are addressed in Chapter 17 and Appendices N.1 to N.3 of the EES and in Chapter 8 of the panel report. Noise and vibration effects have been the subject of recommendations by the panel.

### 5.5.1 Evaluation objective

To manage potential adverse effects for the community, businesses and land uses with regard to construction noise, vibration, dust, traffic and transport and operational turbine noise, electromagnetic interference and aviation safety.

### 5.5.2 Context

Noise and vibration effects will be generated as part of the construction, operation and decommissioning of the wind farm. Noise and vibration effects during construction of the wind energy facility will result from activities associated with construction of wind farm infrastructure, establishment and operation of the on-site quarry and construction traffic. The EES proposed EMMs including preparation of Construction and Decommissioning Noise and Vibration Management Plans to ensure compliance with *Noise from Industry in Regional Victoria* (NIRV), the relevant EPA guidelines. Predicted noise effects associated with the quarry were shown to be compliant with guideline thresholds at all receptors with the exception of the closest residence. The proponent has committed to undertaking all reasonable and practical measures to ensure compliance with all sensitive noise receptors prior to seeking a noise agreement with the affected residence. Noise and vibration effects associated with decommissioning are expected to be similar to those generated during construction.

Construction noise must be managed in accordance with EPA Publication 1254 *Noise Control Guidelines*. EPA Publication 1411 *Noise from Industry in Regional Victoria and Environmental Guidelines – Ground Vibration and Airblast Limits for Blasting in Mines and Quarries* define the operational noise and vibration guidelines for the quarry.

The EES identified 137 non-host noise sensitive receptors within three kilometres of proposed turbines. Residential dwellings accounted for 135 of these, with one school and one child-care facility also identified. 45 host landholder residential dwellings were also identified, 34 within the project boundary and 11 outside the project boundary.

Operational wind farm noise was assessed for the EES in accordance with the New Zealand Standard *NZS6806:2010 Acoustics Wind Farm Noise* (the standard). Wind farm noise was assessed for two candidate turbine models. Predictive modelling found that for all non-host noise sensitive receptors the predicted noise level was below 40 dB  $L_{A90}$  for both candidate wind turbines, which would comply with the standard. Four host landholder dwellings were predicted to have noise levels exceeding 45 dB  $L_{A90}$ , depending on the turbine model and configuration. The standard does not consider host landholder dwellings as sensitive receptors and provides that they should be managed in accordance with landholder noise agreements. Background noise monitoring was undertaken over a period of about three weeks at 15 receiver locations where the wind farm noise levels are predicted to be higher than 35 dB  $L_{A90}$ .

Clause 52.32 of the planning scheme requires that operational noise associated with new wind farms must be assessed against and comply with the standard. The standard sets noise limits (general and high amenity noise limits) and defines the noise assessment approach.

The standard identifies circumstances where a more stringent noise limit may be justified to afford a greater degree of protection during the evening and night. The high amenity noise limit should be considered where a plan (such as a planning scheme) promotes a higher degree of protection of amenity relating to the sound environment. The high amenity noise limit specified by the standard is 35 dB  $L_{A90}$  or background sound level +5 dB, whichever is greater. Section 5.3 of the standard outlines the approach to determining whether high amenity noise limits apply. The first step is to determine whether the area is a high amenity area. This is addressed in the discussion section below in relation to the Farming Zone and the Township Zone and Low Density Residential Zone (LDRZ) within the vicinity of Rokewood. The second step, outlined in clause 5.3.1 of the standard, applies if an area is determined to be a high amenity area. Clause 5.3.1 of the standard outlines the approach to

determine if a high amenity noise limit is justified for the area based on whether the area falls within the predicted 35 dB  $L_{A90}$  wind farm sound level contour and the night time background noise level is about 8 dB lower than the predicted noise levels from the wind farm.

### 5.5.3 Discussion

Most of the project area and its surroundings are in the Farming Zone. Some submissions argued for the application of the high amenity limit to areas within the Farming Zone. The *Cherry Tree Wind Farm Pty Ltd v Mitchell Shire Council & Ors* decision by the Victorian Civil and Administrative Tribunal (VCAT) found that the Farming Zone does not expressly or by implication promote a higher degree of protection of amenity related to the sound environment and a high amenity limit should not apply to this zone. The panel was not convinced that the high amenity limit should apply to areas within the Farming Zone.

In the EES (Appendix M), the proponent's land use and planning consultant and acoustic consultant argued that the Cherry Tree Wind Farm decision should also be applied to the Township Zone and LDRZ for Rokewood and surrounds. They contended that neither the purpose of these zones nor any other provisions of the Golden Plains Planning Scheme indicate that these zones warrant a higher degree of protection of amenity related to the sound environment.

The panel considered the Golden Plains Planning Scheme as a whole and compared the provisions of the Township Zone, LDRZ and Farming Zone. It found that the Township Zone and LDRZ implicitly promote a higher degree of amenity in relation to the sound environment. In reaching its conclusion, the panel considered the purposes of the zones, the types of land uses encouraged or restricted in the zones, and the exemptions and restrictions that apply for each zone. I agree with the panel that the Golden Plains Planning Scheme appears at a minimum both to presume and to protect a higher degree of protection of amenity including for the sound environment.

As the EES did not consider the Township Zone and LDRZ areas around Rokewood as high amenity areas, the EES does not explicitly discuss whether the high amenity noise limits are justified with respect to background noise limits in accordance with Clause 5.3.1 of the standard. The panel formed the view that it is appropriate for this matter to be addressed by the proponent through a pre-construction noise assessment under an appropriate planning permit condition, for the assessment and consideration of the responsible authority.

The adequacy of background noise monitoring in support of the EES was raised by a number of submitters. Background noise monitoring was undertaken at 15 locations for the EES. Six of the 15 locations monitored had fewer than the 1,440 minimum valid data points specified by the standard, while 12 of the 15 locations monitored had fewer than 2,000 valid data points. Mr Evans, the proponent's expert noise peer reviewer, noted that fewer than 2,000 data points may indicate a lack of data for a particular wind direction. All noise experts presenting to the panel agreed additional background noise monitoring will be required prior to construction. The panel accepted that further background monitoring may not be necessary for the predictive modelling. However, additional background noise monitoring will be critical for determining the applicable limits for operational noise for the wind farm. The further monitoring will enable pre-construction noise assessment and post-construction acoustic compliance assessment, as outlined in the Victorian Wind Farm Guidelines.

In recommending requirements for further background noise monitoring the panel considered the standard, the noise expert recommendations and the Stockyard Hill Wind Farm panel recommendation. It found that a minimum 28 day program, equating to 4,032 valid data points, would represent an appropriate balance, and a robust and comprehensive approach which would serve the proponent, community and decision makers well during operations.

Submitters to the panel raised concerns about special audible characteristics (aspects of noise such as tone which may make noise more annoying) and submitted that it would be appropriate to apply a noise penalty to the predictive noise modelling as a conservative approach to the assessment. The noise experts presenting to the panel all agreed that the wind farm could generate special audible characteristics. They also agreed it would be appropriate for special audible characteristics to be assessed during commissioning and operational compliance testing in accordance with the standard. The panel concluded that special audible characteristics should be assessed as part of post-construction acoustic compliance testing and recommended planning permit conditions to assess and manage special audible characteristics.

Earth Resources Regulation (ERR), part of the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), submitted that it is not satisfied with the draft quarry work plan published in the exhibited EES with regard to risks from noise and vibration. This was due to blasting having the potential to create risk for nearby sensitive receptors or the proposed nearby wind turbine foundations. ERR submitted that it is likely to require a blasting impact assessment and blast monitoring for the quarry once operational. It will also require that these risks are appropriately managed in light of any monitoring data. ERR's submission was supported by the proponent's noise and vibration expert witnesses. Other effects associated with the quarry are addressed in Section 5.7 of my assessment.

#### **5.5.4 Conclusion**

**It is my assessment** that the proponent has demonstrated that the project is capable of being developed and operated in compliance with the applicable noise standards, to an appropriate level of confidence, except for the residual uncertainty associated with applying a higher amenity noise limit to the areas in and around Rokewood.

In accordance with the panel's finding, it is my assessment that the areas within and surrounding Rokewood zoned Township Zone and LDRZ should be classified as a high amenity area for the purposes of applying the standard for wind farm noise.

I generally support the recommendations of the panel that a pre-construction noise assessment will need to be prepared including requirements to:

- acknowledge that the areas in and around Rokewood that are zoned Township Zone and Low Density Residential Zone are a high amenity area for the purposes of the standard;
- assess whether a high amenity noise limit should apply to these areas in accordance with clause 5.3.1 of the standard; and
- conduct background noise monitoring including a minimum of 4,032 valid data points collected for each site, analysed by 24 hour and night (10 pm to 7 am) only periods, and for each time sector analysed for each 45° wind rose direction.

I note that the collection of 4,032 valid data points as recommended by the panel may prove impractical depending on site wind conditions. It is my assessment that this requirement should be modified to allow some flexibility if the proponent can demonstrate to the responsible authority that it has undertaken all reasonable efforts to collect representative background noise data.

I support the recommendation of the panel for a near-field compliance testing report. An operating acoustic compliance assessment should also be prepared to require the proponent to assess and manage special audible characteristics.

The above recommendations should be reflected in planning permit conditions for the project, generally in accordance with those recommended by the panel in appendix F of its report.

In order to ensure that noise and vibration effects associated with the quarry are appropriately managed, the proponent should finalise its work plan for the quarry in



accordance with direction from ERR, including demonstrating that it has taken all practicable measures at the source to ensure compliance with NIRV.

## **5.6 Aviation**

Aviation effects are addressed in Chapter 10 and Appendices D.1 to D.3 of the EES and in Chapter 9 of the panel report. Aviation matters have been the subject of recommendations by the panel.

### **5.6.1 Evaluation objective**

To manage potential adverse effects for the community, businesses and land uses with regard to construction noise, vibration, dust, traffic and transport and operational turbine noise, electromagnetic interference and aviation safety.

### **5.6.2 Context**

The EES included two aviation assessments which investigated potential effects on aviation operations, primarily associated with the potential for collision with wind turbines with a maximum tip height of 230 m above ground level, and with meteorological masts. The aviation assessment identified only one registered aerodrome within a 55 km radius of the project site, located about 52 km north of the wind farm. A further 25 unlicensed airfields and airstrips were identified within the study area, 11 of which were classified as closed.

The EES identified one aerial agricultural operation which operates out of an airstrip near the eastern boundary of the project at Wingeel Road. A further aerial agricultural operation which operates out of the Glenfine property, located about 2.5 km west of the project site boundary, was identified in submissions to the EES.

The original aviation assessment undertaken for the project by SGS Hart recommended that the wind turbines warrant aviation lighting to reduce the risk to aviation operations that could occur in the area. The proponent engaged Chiron Aviation Consultants to undertake a peer review of the SGS Hart assessment to respond to concerns regarding the visual effects associated with aviation lighting. Chiron Aviation Consultants found there was not adequate evidence to support the conclusion that aviation lighting should be required and contributed a qualitative risk assessment and obstacle lighting review for the EES. The risk assessment and review concluded that on the basis the project area was not within the vicinity of any certified or registered aerodrome and does not penetrate any Obstacle Limitation Surface and Procedures for Air Navigation Services – Aircraft Operation airspace, the overall risk to aviation in the area is low and obstacle lighting should not be required. Mr Jennings, the proponent's aviation expert witness, argued that the Civil Aviation Safety Authority (CASA) has statutory power to require obstacle marking and lighting only within approximately 30 km of a certified or registered aerodrome.

The proponent has committed, through EMMs which could be applied as planning permit conditions, to ensure:

- endorsed plans of the wind farm are to be provided to the appropriate agencies to ensure the wind farm is shown on aeronautical charts of the area;
- preparation and implementation of an emergency response plan in consultation with the Country Fire Authority (CFA) to provide for adequate fire-fighting access within the wind farm; and
- meteorological masts are to be painted in contrasting colours and to install marker balls and flags on the outer guy wires to increase visibility in accordance with National Airports Safeguarding Advisory Group Guideline D.

The EES concluded that the project will not have a significant impact on aviation operations provided the proposed EMMs are implemented.



### 5.6.3 Discussion

The proximity of turbines to the Glenfine private airstrip (about 2.8 km from nearest turbine) and the Wingeel Road private airstrip (about 1 km from nearest turbine) and the impact on the safe use of those airstrips was raised in a number of submissions to the panel. The airstrips are used for aerial agricultural operations in the area.

Submissions to the panel regarding the Glenfine private airstrip stated that aerial agricultural activities may be precluded on certain days due to the proximity of the airstrip to turbines. The proponent's aviation expert witness, Mr Jennings, asserted that an aircraft taking off to the south-east, the closest part of the runway to the wind farm, is not flying toward the wind farm and would have sufficient room to manoeuvre clear of the wind farm. It was Mr Jennings' view that the wind farm will not preclude the safe use of the Glenfine airstrip.

The panel was not able to reach a conclusion on the potential aviation safety effects of the wind farm on the Wingeel Road private airstrip. There was disagreement in evidence and submissions to the panel regarding the capacity of commercial aerial agricultural operations to continue to occur if turbines GP227, GP229 and GP231 are constructed. Ms and Mr Woods' submission included letters from aviation companies undertaking aerial agricultural operations from their airstrip stating their concern that the airstrip would not remain viable if the turbines are constructed<sup>23</sup>. The viability of the Wingeel Road private airstrip remains uncertain after consideration of the EES documents, submissions and the panel report. The Woods submitted that a number of local agricultural operations utilise aerial services from the Wingeel Road airstrip<sup>24</sup>. I note that turbine GP227 falls within the Brolga home range turbine-free buffers recommended elsewhere in my assessment and that turbines GP231 and GP229 would be isolated from the remainder of the wind farm, potentially affecting the viability of these turbines.

Some submitters raised concerns that the wind farm could restrict aerial fire-fighting operations. Mr Jennings' evidence to the panel asserted that access for ground-based fire-fighting resources is enhanced by the access roads constructed to support wind farms. The panel report referred to the CFA's *Emergency Management Guidelines for Wind Energy Facilities in Victoria* which simply require that wind turbines are located approximately 300 m apart to provide adequate distance for aircraft to operate around a wind farm. The proponent advised that is the case for this wind farm. The proponent's EMMs include preparing an emergency response plan in consultation with the CFA and Rural Ambulance Victoria to ensure provision of adequate fire-fighting access within the wind farm.

CASA recommended that the wind farm be lit with steady red medium intensity lighting at night and supported an earlier lighting plan to install obstacle lighting on 99 of the 228 wind turbines in line with the proponent's draft planning permit application. CASA has statutory power to require obstacle marking and lighting only within about 30 km of an aerodrome. Outside this area lighting is a decision for the developer or the approving authority. The closest certified or registered aerodrome is substantially more than 30 km from the wind farm. A number of submitters raised concerns that aviation lighting increased the collision risk for birds and bats and would have an unacceptable visual effect including impacts on the region's dark skies. The panel accepted the proponent's view that the aviation safety risk is acceptably low and aviation lighting is not required.

### 5.6.4 Conclusion

**It is my assessment** that the project will not create unacceptable adverse effects for aviation safety in the region, with the possible exception of localised effects on the airstrip at 1944 Wingeel Road Barunah Park. I am satisfied that the project will not significantly impact aerial fire-fighting operations.

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<sup>23</sup>Panel document 79.

<sup>24</sup>Ibid.

I accept the panel's reasoning and finding that aviation lighting is not required on the turbines for the Golden Plains Wind Farm.

It is my view that the proponent has not adequately characterised the potential aviation risks associated with turbines GP227, GP229 and GP231 relative to existing operations conducted from the airstrip at 1944 Wingeel Road, Barunah Park. I support the recommendation of the panel that, given the potential effects on local agricultural operations, prior to construction of any turbines in that vicinity, the proponent should demonstrate that the airstrip can continue to operate safely or that it has established an appropriate agreement with the affected landholder.

The permit conditions recommended by the panel in Appendix F of its report are generally appropriate.

## **5.7 Quarry**

Environmental effects from the quarry are addressed in each of the applicable EES effect-themed chapters. The draft quarry work plan (PLN-000834) is appended to the EES in Volume 1 of the technical appendices. The quarry is addressed in Chapter 10 of the panel report.

### **5.7.1 Evaluation objective**

There is no specific evaluation objective for the quarry. Rather, evaluation objectives for biodiversity, landscape and visual amenity, land use and socio-economic, community amenity, roads and transport, cultural heritage and catchment values are all relevant to the quarry as a component of the project.

### **5.7.2 Context**

The project includes a temporary on-site quarry to service the project during construction. As described in the EES, the quarry is expected to provide about 1.2 million tonnes of crushed rock for the project for construction of project infrastructure such as access roads and turbine hardstands and for concrete aggregate. The proposed quarry site is on a stony rise east of Meadows Road, roughly in the centre of the project area (see Figure 1). Operational hours of the quarry are proposed to be restricted to 7 am until 6 pm Monday to Friday and 7 am until 1 pm Saturday. The closest residence to the quarry site is about 840 m to the north-east of the edge of the quarry extraction area; the next closest residence is 1.5 km to the south.

Environmental effects associated with the quarry are addressed in the relevant environmental effect sections of this assessment (Sections 5.2 to 5.16, as relevant). A quarry-specific assessment of air quality effects was prepared as part of the EES. The predictive air quality modelling undertaken for the quarry found that no exceedances of particulate matter size classes PM<sub>2.5</sub> or PM<sub>10</sub> or deposited dust are predicted to occur at residential dwellings close to the quarry site.

The operation of the quarry is to be confined to the construction phase of the project. It will reduce off-site traffic and transport effects including traffic delays and damage to road infrastructure and will protect public safety. The EES estimated that about 42,000 trips would be limited to the road network within the site due to sourcing material from the on-site quarry. Socio-economic benefits could be realised as a result of the quarry by reducing demand for significant volumes of crushed rock from local quarries that might be compete with other needs.

The primary approval for the quarry is a work plan and work authority issued under the MRSD Act. The panel report stated in error that a work authority (WA006594) had been issued under the MRSD Act. DEDJTR ERR has confirmed that it has received an application for the work authority for the quarry and has allocated a number. Decisions about issuing a work authority and approving the work plan will be made under the MRSD

Act following consideration of my assessment. As the quarry has been subject to an EES, it will not require a planning permit provided the requirements of section 77T of the MRSD Act are fulfilled.

### **5.7.3 Discussion**

Some submitters argued that the quarry site should be protected on the basis of landscape, geological, cultural heritage and biodiversity effects. The panel was not provided with any policy or statutory reference which recognised or protected the geological features of the quarry site.

Biodiversity effects associated with the quarry are covered in further detail in Section 5.3 of this assessment. The quarry will result in the loss of 0.13 ha of native vegetation which the proponent is proposing to offset through on-title agreements in negotiation with landholders and relevant agencies. Given the quarry is exempt from the need for a planning permit, the offset obligation can be given statutory weight through the work plan.

Landscape and visual amenity effects associated with the quarry are considered in further detail in Section 5.4 of my assessment. The project area, including the quarry, is not within an area designated to be of special landscape significance under the Golden Plains Planning Scheme or any other relevant instrument. The quarry will be excavated such that the active face of the quarry is hidden from views from Meadows Road. Existing and additional landscaping is proposed to mitigate visual effects further.

Noise and vibration effects associated with the quarry are covered in further detail in Section 5.5 of this assessment. The noise and vibration study in the EES predicted that the quarry could comply with EPA's NIRV guidelines, with the possible exception of the nearest residential receptor. The proponent proposed that all practicable mitigation measures would be exhausted before seeking to establish an operational noise agreement with the residents if compliance with NIRV cannot be achieved. ERR advised in its submission that it would require the proponent to submit a blasting impact assessment in support of its work plan and to undertake blast monitoring for the quarry once operational. ERR will also require that those risks are appropriately managed in light of any monitoring data.

Surface water and groundwater effects associated with the quarry are covered in further detail in Section 5.8 of this assessment. Quarry excavations are not expected to intercept the groundwater table with the maximum depth of the quarry being at least a metre above the expected groundwater level. The panel found that surface water and groundwater effects from the quarry can be managed acceptably through the applicable approvals.

Traffic and transport effects associated with the quarry are covered in further detail in Section 5.10 of this assessment. The inclusion of an on-site quarry in the project to supply crushed rock for project construction has removed a very substantial number of heavy vehicle trips from the road network outside the site footprint.

Aboriginal and historic cultural heritage effects associated with the quarry are covered in further detail in Section 5.13 of this assessment. The preliminary quarry assessments, still being undertaken at the time of EES exhibition, have identified a number of Aboriginal artefacts across the quarry site. The panel considered the Aboriginal cultural heritage effects associated with the project could be acceptably managed through the CHMP process. Historic heritage was not raised as an issue with respect to the quarry site.

### **5.7.4 Conclusion**

**It is my assessment** that the environmental effects associated with the quarry will be acceptable. I note that it must be managed in accordance with the approvals procedures and requirements under the MRSD Act, as well as in line with an approved CHMP and other relevant legislation.



My assessment is predicated on the inclusion of an on-site quarry as a key part of the project, which will significantly reduce the volume of off-site traffic and risks of potential damage to local road infrastructure. It will also mitigate potential significant economic effects such as reduced supply from local quarries during project construction. Therefore, the quarry must be established in time to supply construction materials from the beginning of wind farm construction works. The proponent will need to satisfy the responsible authority that the potential significant adverse effects can be managed acceptably should the proponent wish to proceed with development of the wind farm without the on-site quarry.

## **5.8 Surface water, groundwater and salinity**

Surface water, groundwater and salinity effects are addressed in Chapters 13 and 20 of the EES, Appendices I, J and Q of the EES and in Chapter 11 of the panel's report. Groundwater and salinity matters have been the subject of recommendations by the panel.

### **5.8.1 Evaluation objective**

To maintain the functions and values of aquatic environments, surface water and groundwater including avoiding adverse effects on hydrology and protected beneficial uses including downstream biodiversity values and their habitat.

### **5.8.2 Context**

Mount Misery, Kuruc-a-Ruc, Ferrers and Mia creeks are the major waterways that cross the project site. Sections of the project area can flood and a Land Subject to Inundation Overlay covers sections of the site. Wetlands also occur in the project area, particularly the southern and eastern parts of the site. The EES noted that seven turbines and associated infrastructure are sited within the 1 in 100 year flood extent. The EES also found that the project was unlikely to alter surface water flow paths or flood levels within or downstream of these areas.

The EES investigated potential groundwater effects associated with the project and the temporary quarry. The groundwater assessment predicted the foundations for 19 turbines could potentially intercept groundwater. One wind turbine (GP173), including associated infrastructure, is located within a salinity management overlay. A further three turbines (GP176, GP182 and GP207) are located close to the salinity management overlay. An increase in salinisation could adversely affect biodiversity values, agricultural productivity and beneficial uses of surface water and/or groundwater. However, I note that all four turbines fall within the turbine-free Brolga home range buffers recommended elsewhere in my assessment.

Quarry excavations are not expected to intercept the groundwater table, with the maximum depth of the quarry being between one and three metres above the expected groundwater level.

The EES proposed a number of EMMs, which could be applied as planning permit conditions, in order to manage potential effects on surface water or groundwater values and increased salinity risks. The EMMs include specific design measures and the development and implementation of management plans.

### **5.8.3 Discussion**

The proponent and Corangamite CMA agreed on proposed planning permit conditions relating to surface waters and overland flows including:

- distance of turbine foundations from the major creeks and designated waterways;
- works are to be designed to ensure no adverse impacts on off-site hydrologic or hydraulic impacts, overland flow regimes and flood storage capacity; and
- any fill to be used within flood affected areas is to be approved by the CMA.

The proposed terminal station is located close to a wetland which supports important native vegetation and has been used as a breeding wetland by Brolgas. Water Technology, which

prepared the surface water assessment for the EES, provided evidence to the panel that the terminal station is not located within a designated waterway. Jacobs submitted on behalf of the proponent that the potential for spills and surface water run-off from the terminal station can be managed through the design process and effective environmental management (e.g. appropriate bunding and spill controls) and with reference to a monitoring program and complaints process.

DELWP raised concerns over potential groundwater and salinity effects to biodiversity values including Brolga, Growling Grass Frog and native vegetation including seasonal herbaceous wetlands and groundwater dependent ecosystems. On the basis of further evidence from the proponent's water and salinity experts at the panel, DELWP concluded that it was satisfied that groundwater concerns can be addressed through monitoring of potential groundwater and biodiversity effects and implementation of appropriate mitigation measures to be outlined in an environmental management plan. DELWP's response to the proponent's additional assessment of salinity effects was to require a salinity assessment report and management plan to be undertaken after the final wind farm design is complete. This recommendation was supported by the panel to ensure that the specific mitigation responses identified by the proponent's consultants can be implemented if the salinity assessment identifies a heightened risk.

#### **5.8.4 Conclusion**

**It is my assessment** that the environmental effects of the project on surface water and groundwater and in regard to salinity will be acceptable provided they are managed in accordance with the EMMs and generally in accordance with the planning permit conditions recommended by the panel.

I support the panel's recommendation that the environmental management plan should include requirements to monitor potential groundwater effects on biodiversity values and implement appropriate mitigation strategies in the event effects occur.

Prior to construction, a salinity assessment report and management plan should be prepared for any project components located within or in close proximity to the salinity management overlay.

### **5.9 Land use and socio-economic**

Land use and socio-economic effects are addressed in Chapters 16 and 19 of the EES, Appendices M and P of the EES and in Chapter 12 of the panel's report.

#### **5.9.1 Evaluation objective**

To manage potential adverse effects and benefits for the community, businesses and associated land uses.

#### **5.9.2 Context**

Existing land use within the project area and surrounds is predominantly farming, mostly livestock grazing and broad-acre cropping. The towns of Rokewood and Cressy are the communities located closest to the project, Rokewood bordering the project and Cressy being about 10 km from the wind farm boundary. The EES asserts that the wellbeing of the community is linked to the performance of the farming sector.

The proponent submitted that the project will result in an annual investment of about \$3.5 million into existing agricultural businesses from lease payments to landholders over the life of the project<sup>25</sup>. The proponent also committed to:

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<sup>25</sup>WestWind opening submissions to the panel hearing, paragraph 9. The panel report refers incorrectly to \$3.5M over the life of the project (p. 107).

- a neighbour benefit scheme, providing annual incentive payments for eligible residences (outside of Rokewood) located within two kilometres of one or more turbines;
- a neighbour free power scheme, offsetting annual electricity usage for eligible residences within three kilometres of a turbine, including eligible residences and businesses in Rokewood; and
- an annual community benefit fund of up to \$1,000 per turbine to finance community-based initiatives, scholarships, business, development projects and events.

The EES states the project will result in significant rate payments to Golden Plains Shire and will result in improved local roads. The project is expected to create 200 jobs during the construction period and 40 ongoing jobs during the operation of the project.

As described in the EES, the project would be expected to produce up to 3,500 gigawatt hours of renewable energy per year, contributing to state and Commonwealth renewable energy and/or greenhouse gas emission reduction targets.

The EES acknowledged potential adverse land-use and social effects associated with the project, including unequal distribution of benefits between host landholders and other members of the community. Adverse amenity effects would also have potential to detract from the social well-being of the community.

Complaints management is a key community engagement obligation for a responsible proponent. The proponent has proposed a complaints management approach which meets the relevant Australian/New Zealand standard. The panel has observed that it exceeds the requirements of the Victorian Wind Farm Guidelines.

### 5.9.3 Discussion

The proponent submitted that the significant direct financial contributions the project would make to the host landholders would support their respective agricultural operations. The benefit schemes offered to non-host neighbours collectively represent significant benefits to the local community. The proponent also highlighted the indirect benefits the project would enable for the community through increased rates to the Golden Plains Shire, such as improved local roads.

Some community members submitted that the additional revenue gained from hosting turbines would assist in making their agricultural operations sustainable.

Public submissions on the EES that expressed opposition to the project on socio-economic and land use grounds mostly focused on potential adverse effects of the project on agricultural land-use, for example through turbulence created by the turbines affecting spraying or bee pollination or adverse effects to efficient agricultural operations through turbines restricting aerial agricultural operations or GPS guided agricultural operations. Potential effects to aerial agricultural operations are discussed further in Section 5.6 and potential effects to GPS guided agricultural operations are addressed in Section 5.12.

The panel found that effects to agricultural land-use associated with the project are likely to be minor. It also concluded the project represents a benefit to the state, regional and local communities and economies.

### 5.9.4 Conclusion

**It is my assessment** that the project (in the reduced form supported by this assessment) represents a significant net benefit to the state, region and local community. Potential effects on agricultural operations will be greatest to those hosting turbines and this will be offset through agreements negotiated with those landholders. I acknowledge that non-host landholders will not benefit from hosting agreements and may be adversely affected by the project. However, it is my assessment that these effects can be managed to an acceptable



degree under the proposed EMMs, including the proposed neighbour and community benefit initiatives, as well as appropriate planning permit conditions.

It is my assessment that the proponent's commitment to implement a neighbour benefit scheme, neighbour free power scheme and community benefit fund are essential elements of the project. They will serve to offset some of the inevitable local adverse effects of the project and will help ensure the benefits of the project are spread more evenly through the local community. The proponent's commitments should be documented and implemented as defined prerequisites for development of the project through appropriate, legally robust mechanisms that ensure the programs continue for the life of the project.

## **5.10 Traffic and transport**

Traffic and transport effects are addressed in Chapter 21 of the EES, Appendix R of the EES and in Chapter 13.2 of the panel's report.

### **5.10.1 Evaluation objective**

To manage potential adverse effects for the community, businesses and land uses with regard to construction noise, vibration, dust, traffic and transport and operational turbine noise, electromagnetic interference and aviation safety.

### **5.10.2 Context**

Traffic and transport effects will be predominantly associated with the project's construction and decommissioning phases, each of which is anticipated to last about four years. The EES predicted in the order of 250,000 one-way trips associated with the project during both the construction and decommissioning phases of the project.

The EES transport modelling predicted that the existing road network has sufficient capacity to accommodate the peak construction and decommissioning traffic associated with the project. The EES also identified key intersections requiring upgrades to accommodate the project and the preferred over-dimensional route between Geelong and the project site for transport of large project materials (e.g. 75 m long turbine blades). Inclusion of an on-site quarry to supply crushed rock for project construction will limit an additional 42,000 trips to the road network within the site.

The proponent will manage traffic and transport effects through the preparation, prior to construction, and implementation of a traffic management plan and a pavement impact assessment.

### **5.10.3 Discussion**

Submissions to the panel on traffic and transport effects were largely focused on the existing condition of local roads and the potential for conflict with agricultural traffic. The management plans the proponent will be required to prepare and implement are generally consistent with the model permit conditions outlined by the Victorian Wind Farm Guidelines. The management plans proposed will include identification and management of traffic hazards, maintenance of appropriate levels of service, identification of required road upgrades and an outline of a program to inspect, maintain and repair public roads affected by construction traffic. The panel found that the proposed EMMs which require consultation with VicRoads, Golden Plains Shire and Colac Otway Shire will ensure that traffic effects can be managed.

### **5.10.4 Conclusion**

**It is my assessment** that traffic and transport effects associated will be acceptable if managed in accordance with the EMMs proposed in the EES and generally in accordance with the recommended planning permit conditions in Appendix F of the panel's report.

### **5.11 Shadow flicker and blade glint**

Shadow flicker and blade glint effects are addressed in Chapter 18 of the EES, Appendix O of the EES and in Chapter 13.4 of the panel's report.

#### **5.11.1 Evaluation objective**

To minimise and manage potential adverse effects for the community with regard to landscape and visual amenity.

#### **5.11.2 Context**

Shadow flicker occurs as a consequence of the position of the sun in relation to the turbine and the rotation of the turbine blades. It can be modelled mathematically with reference of location, hub height and blade length. The Victorian Wind Farm Guidelines require that shadow flicker must not exceed 30 hours per year in the area immediately surrounding dwellings and fenced garden areas. The EES predicted that all non-host landholder residences are predicted to experience no more than 30 hours of shadow flicker a year.

Blade glint is the reflection of sunlight off the wind turbine rotor. The Victorian Wind Farm Guidelines state that blade glint can best be minimised by finishing blades with a non-reflective treatment. The EES notes that this can be applied as a planning permit condition.

#### **5.11.3 Discussion**

The proposed EMMs include a commitment that non-host landholder dwellings will not be exposed to more than 30 hours of shadow flicker per year. Landholder agreements are to be established for host dwellings where the 30 hour per year threshold is predicted to be exceeded. An updated shadow flicker assessment must also be completed once the final turbine layout is confirmed, including micro-siting.

The panel was satisfied that the EMMs, which can be applied as planning permit conditions, can effectively address shadow flicker and blade glint effects.

#### **5.11.4 Conclusion**

**It is my assessment** that shadow flicker and blade glint effects are acceptable and can be managed through planning permit conditions in general accordance with those set out in Appendix F of the panel's report.

### **5.12 Electromagnetic interference**

Electromagnetic interference effects are addressed in Chapter 12 of the EES, Appendix H of the EES and in Chapter 13.5 of the panel's report. Electromagnetic interference matters have been the subject of recommendations by the panel.

#### **5.12.1 Evaluation objective**

To manage potential adverse effects for the community, businesses and land uses with regard to construction noise, vibration, dust, traffic and transport and operational turbine noise, electromagnetic interference and aviation safety.

#### **5.12.2 Context**

Electromagnetic interference (EMI) occurs when a signal between a transmitter and receiver is disturbed. EMI can occur when infrastructure blocks, reflects or refracts a signal resulting in loss of the signal or a weaker, fragmented signal.

The EES assessed the potential EMI risks and potential effects on electronic signals including point to point microwave links, television, radar and radio transmission signals. The proposed EMMs include commitments which can be summarised as:

- prior to construction, to consult all potential parties potentially affected by EMI to confirm potential effects on services and develop and implement a mitigation strategy in consultation with the affected organisations as per the Draft National Wind Farm Development Guidelines; and

- to undertake a pre-development survey to determine average radio and television reception within five kilometres of the site.

If a complaint is received the operator would be required to investigate the complaint and if the investigation indicates the facility has experienced an adverse impact, the operator will restore reception to at least the quality determined in the pre-development survey.

### **5.12.3 Discussion**

Submissions expressed concern about potential adverse effects on already poor quality of existing telecommunications and other electronic signals in the area, including mobile phone networks, internet services, emergency services communications, TV reception and GPS guidance systems for agricultural operations.

The proponent's consultant undertook additional consultation with mobile phone operators, internet providers and emergency services to respond to concerns raised by submitters.

Although the GPS base station at Rokewood for guidance of GPS based agricultural operations was not included within the EES investigations, the panel was satisfied that mitigation measures were available to the proponent should effects be identified (e.g. moving base stations).

The panel recommended that the pre-development survey be extended beyond radio and television reception to address potential effects to other services.

### **5.12.4 Conclusion**

**It is my assessment** that EMI effects can be acceptably managed through the EMMs proposed as part of the EES, subject to a broader approach in general accordance with that proposed by the panel which requires EMI impacts on to services other than radio and television signals to be addressed. The panel has recommended permit conditions to regulate the required response to EMI issues in Appendix F of its report.

## **5.13 Aboriginal and historic cultural heritage**

Aboriginal and historic cultural heritage effects are addressed in Chapters 8 and 14 of the EES, Appendices B and K of the EES and in Chapter 13.8 of the panel's report. Aboriginal and historic cultural heritage matters have been the subject of recommendations by the panel.

### **5.13.1 Evaluation objective**

To avoid or minimise potential adverse effects on Aboriginal and historic cultural heritage.

### **5.13.2 Context**

The project site is divided into two separate areas of interest with regard to registered Aboriginal parties (RAPs). The Wathaurung Aboriginal Corporation is the RAP for the section of the project area located west of Ferrers Creek. The area east of Ferrers Creek is under application by the Eastern Maar Aboriginal Corporation and the Guligad Aboriginal Corporation also has an interest in the area.

Two CHMPs are being prepared in support of the project. One, for the wind farm project site (CHMP 14795), will be co-evaluated by Wathaurung Aboriginal Corporation and Aboriginal Victoria, as there is no RAP currently appointed for the project area outside of the Wathaurung Aboriginal Corporation's boundary. The second CHMP (CHMP 15823) is being prepared for the on-site quarry and will be evaluated by the Wathaurung Aboriginal Corporation.

The standard and complex assessment process undertaken for the CHMPs have identified an additional 32 Aboriginal places which have been submitted to the Victorian Aboriginal Heritage Register. The preliminary quarry assessments, still being undertaken at the time of EES exhibition, have found a number of artefacts across the quarry site.



The EES states that the project has adopted the avoid and minimise principle for effects to Aboriginal cultural heritage. However, some impacts are likely to be unavoidable. The proponent will manage potential effects in accordance with mitigation measures developed through and documented in the CHMPs, once approved.

Two registered historic places in the vicinity of the project were identified in the EES: McMillans Bridge on Rokewood–Skipton Road and the Queen of the Plains Co. mining site. However, the current site layout does not impact any known historical places or features. Dry stone walls are known to occur within the project site and may need to be modified to accommodate access for the project or underground cables.

#### **5.13.3 Discussion**

The proponent proposed to relocate the proposed grid connection powerlines around Baths Swamp, rather than through Baths Swamp, following consultation with Aboriginal Victoria and the Wathaurung Aboriginal Corporation<sup>26</sup>. The panel supported the proposed realignment of powerlines around Baths Swamp.

The panel was satisfied that the CHMPs are an appropriate means of managing residual impacts on Aboriginal cultural heritage as a result of the project.

The panel heard submissions that visual impacts and changes to the landscape would affect several of the historic homesteads in the vicinity of the project. However, the panel did not consider this to be a reason to refuse the project.

The panel considered the heritage effects associated with the project could be acceptably managed through the EMMs presented in the EES and planning permit conditions. The panel recommended that the construction environmental management plan should provide for reconstruction of dry stone walls, if affected, under the supervision of a suitable qualified stonemason.

#### **5.13.4 Conclusion**

**It is my assessment** that Aboriginal and historic cultural heritage effects can be acceptably managed through the CHMP process and the EMMs proposed as part of the EES. This is subject to permit conditions generally in accordance with the panel's recommended permit conditions in Appendix F of its report.

#### **5.14 Other**

The EES and the panel discussed other predicted residual effects on the social or environmental setting including landfill gas, health and fire fighting. I support the findings of the panel that generally these residual effects can be appropriately managed through the EMMs and the panel's recommended permit conditions in Appendix F of its report.

Table 3 outlines how each of these effects were assessed and discusses the overall significance of impacts against the management regime proposed. Generally, I support the findings of the panel in relation to these effects. **It is my assessment** that the effects can be effectively managed through comprehensive EMMs, that can be adopted as conditions in approvals for the project, a robust EMF and planning permit conditions, generally in accordance with those recommended by the panel.

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<sup>26</sup> See Panel document 3.

**Table 3: Panel findings on other environmental and social effects.**

Issue	Panel findings
Landfill Gas	The closed landfill at Rokewood Common in Meadows Road does not present a risk in terms of land fill gas effects, based on the findings of ESG Environmental's assessment which was submitted to the panel.
Health	The evaluation objective "to manage potential adverse effects for the community, businesses and associated land uses" can be achieved through the EMMs and planning permit conditions recommended by the panel.
Fire fighting	The evaluation objective "to manage potential adverse effects for the community, businesses and associated land uses" can be achieved through the EMMs and planning permit conditions requiring an emergency response plan to be prepared in consultation with the CFA and Rural Ambulance Victoria.

### 5.15 Planning permit application

The Planning and Environment Act sets out processes for the consideration of planning permit applications and decision-making about granting or refusing planning permits. WestWind applied to me, as the responsible authority, for a planning permit for the proposed project.

Section 5 of the *Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria* sets out the matters that I must consider in assessing wind energy proposals. Broadly these include:

- contribution to government policy objectives;
- amenity of the surrounding area including noise, blade glint, shadow flicker, and electromagnetic interference;
- landscape and visual amenity;
- flora and fauna impacts;
- aircraft safety impacts; and
- construction and decommissioning impacts.

The panel considered these impacts in its assessment of the environmental effects of the project. The panel found that the impacts required to be considered in assessing the planning permit application are on balance able to be managed to an acceptable level, subject to changes to the number and location of turbines to provide adequate protection for Brolga breeding wetlands. The panel recommended that given the strong policy support in the planning scheme and other adopted government policy for renewable energy projects, a permit should be granted, subject to the planning permit condition recommendations appended to its report.

### 5.16 Matters of Commonwealth interest

Matters of national environmental significance, comprising threatened fauna and flora species and ecological communities listed under the EPBC Act, are addressed in Chapters 11 and 22 and Appendices E and G of the EES and in Chapters 5, 6 and 15 of the panel report. Fauna, flora and native vegetation matters have been the subject of the recommendations by the panel, which are addressed in Sections 5.2 and 5.3 of this assessment. This section focuses solely on consideration of impacts on MNES to inform whether and under what conditions approval should be granted for the project under the EPBC Act.

#### 5.16.1 Evaluation objective

To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.

### 5.16.2 Context

MNES and the conclusions of this assessment about the extent of any likely impact are shown in Table 4 for ease of reference.

**Table 4: Anticipated impacts on MNES.**

<b>MNES</b>	<b>Reference</b>	<b>Assessment</b>
Plains-Wanderer	Section 5.2	No significant impact expected. Collision casualty monitoring program under the proposed Bird and Avifauna Management (BAM) plan should be attuned to the possibility that Plains-Wanderer may occasionally use or traverse the site. No EPBC Act offsets are required.
Striped Legless Lizard	Section 5.2	A significant population has been detected on the project site. Impacts are considered acceptable subject to appropriate risk mitigation during the construction phase and an offset program. All (about 44.1 ha) native vegetation meeting the habitat requirements of the species that is to be removed will be treated for offset purposes as Striped Legless Lizard habitat to be offset.
Growling Grass Frog	Section 5.2	Known to occur in suitable wetland habitat with the project site. The proposed project avoids construction works within or impacting on those wetlands. Subject to appropriate risk mitigation during the construction phase, no impact on Growling Grass Frog is expected and no EPBC Act offsets are required.
Yarra Pygmy Perch	Section 5.2	Known to occur in two stream systems which flow across the project site. The proposed project avoids construction works crossing, adjacent to or impacting on those streams. No impact on Yarra Pygmy Perch is expected and no EPBC Act offsets are required.
Golden Sun Moth	Section 5.2	A significant population has been detected on the project site. Impacts are considered acceptable subject to appropriate risk mitigation during the construction phase and an adequate offset program. All (about 44.1 ha) native vegetation meeting the habitat requirements of the species that is to be removed will be treated for offset purposes as Golden Sun Moth habitat to be offset.
Spiny Rice-Flower	Section 5.3	Known to occur within the wind farm footprint, mostly on public roadsides. No known plants will be impacted by project works. Suitable precautionary measures should be put in place wherever necessary to prevent the possibility of inadvertent damage to the species. No EPBC Act offsets are required.



MNES	Reference	Assessment
Trailing Hop-Bush	Section 5.3	Known to occur within the wind farm footprint, mostly on public roadsides. No known plants will be impacted by project works. Suitable precautionary measures should be put in place wherever necessary to prevent the possibility of inadvertent damage to the species. No EPBC Act offsets are required.
Natural Temperate Grassland of the Victorian Volcanic Plain	Section 5.3	Up to 28.74 ha to be cleared (across both Stages as discussed elsewhere in this assessment) and offset.
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Section 5.3	Up to 0.82 ha to be cleared and offset.
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Section 5.3	Up to 0.36 ha to be cleared and offset.

### 5.16.3 Discussion

The site is well separated from the nearest Ramsar site. Some species listed as migratory under the EPBC Act have been recorded from the site or are expected to occur from time to time, in particular Latham's Snipe and White-Throated Needletail. However, potential impacts on migratory species was not cited as a controlling provision when the proposed Golden Plains wind farm was determined to be a controlled action.

Since the controlled action decision was made, I understand that White-Throated Needletail has been nominated for listing as threatened under the EPBC Act. The nomination is still under consideration. In light of the species' consideration as threatened, the available information does not indicate that the project is likely to have a severe or unacceptable impact on White-throated Needletail. However, if its listing status changes, this should be reflected in the BAM plan for the project, in particular by devising a collision casualty monitoring program to optimise the chances of detecting collisions involving the species.

I understand that the proponent intends to adopt an integrated approach to fulfilling the biodiversity offset requirements of both Commonwealth and State governments. Offsets are proposed as far as possible to be provided in places within the wind farm area which will not support turbines due to their existing high biodiversity sensitivities. There is no offset available for Grassy Eucalypt Woodland of the Victorian Volcanic Plain within the wind farm project area, so the proponent has identified a proposed offset site at Elaine, about 30 km north east of the wind farm site.

**Table 5. Proposed MNES offsets (adapted from EES Table 22.6).**

MNES	Predicted area of impact (ha)	Required offset area (ha)	Proposed offset area (ha)
Striped Legless Lizard habitat	44.1	150	474
Golden Sun Moth habitat	44.1	90	474
NTGVVP	28.74	100	474
SHWTLP	0.82	3	4.74
GEVVVP	0.36	0.71	10

I note that some of the figures in Table 5 will require revision to reflect the recommended smaller development footprint. Some fieldwork remains to be done during the present

spring/early summer to confirm that the Elaine site meets the ecological definition of the ecological community and to confirm whether Golden Sun Moth is present in the proposed offset area for that species. Alternative offset sites to the satisfaction of the Commonwealth Department of the Environment and Energy will be required if the present proposed sites cannot be shown to meet the required thresholds.

#### **5.16.4 Conclusions**

**It is my assessment** that the project may be conditionally approved under the EPBC Act, in the light of the conditions proposed to be attached to approvals under Victorian legislation, in particular the planning permit for the wind farm.

Offsets required to satisfy EPBC Act requirements overlap to a substantial degree with the offset requirements under Victorian prescriptions. Therefore, I support an integrated approach to an offset management strategy for the project. The offset management strategy should:

- quantify the offset requirements for each environmental value to be removed under both Victorian and Commonwealth jurisdictions;
- identify opportunities to meet Victorian and Commonwealth requirements with the same offset;
- specify the location and dimensions of each offset site and explain how it meets the relevant guidelines or requirements; and
- specify the long-term management and tenure arrangements under which required offset actions will be implemented, maintained, secured and monitored in the long term.

I support the provision of offsets within the original wind farm footprint area as far as feasible in light of prescribed requirements for offsets relative to Victorian and Commonwealth prescriptions.

No impacts are anticipated on Plains-Wanderer or Yarra Pygmy Perch.

No impacts are expected on Spiny Rice-Flower or Trailing Hop-Bush, provided precautionary measures are put in place to prevent accidental damage during the construction phase. Precautionary measures should include marking locations of plants within the wind farm footprint area as "no go" zones on relevant works plans and protecting plants with temporary fencing if construction works are planned to occur nearby. Precautionary measures are to be specified in the Flora and Fauna Management Plan to be required under planning permit conditions.

No impacts are expected on Growling Grass Frog, subject to appropriate protocols being implemented during the construction phase. Appropriate protocols should include induction for construction personnel about awareness and recognition of threatened species including Growling Grass Frog, measures to reduce the risk of mobile Growling Grass Frogs entering works sites and contingency measures for rescuing individuals trapped in excavations. The protocols are to be specified in the Flora and Fauna Management Plan to be required under planning permit conditions.

Striped Legless Lizard will be significantly impacted by removal of up to 44 ha of habitat, requiring a minimum offset of up to 150 ha of habitat. Adequate offsets are available within the wind farm site and can be secured under an offset management strategy to be required through planning permit conditions.

In addition, Striped Legless Lizard could be vulnerable to impacts during the construction phase of the wind farm. These impacts may be addressed through appropriate protocols including induction for construction personnel about awareness and recognition of threatened species including Striped Legless Lizard, measures to reduce the risk of mobile Striped Legless Lizards entering works sites and contingency measures for rescuing

individuals trapped in excavations. The protocols are to be specified in the Flora and Fauna Management Plan to be required under planning permit conditions.

Conservation advice for Striped Legless Lizard has been issued under the EPBC Act, and a recovery plan is in place. The management arrangements for land identified as offsets for Striped Legless Lizard should be consistent with the conservation advice and the recovery plan. The Flora and Fauna Management Plan to be required under planning permit conditions should also reflect the provisions and recommendations of the Striped Legless Lizard conservation advice and recovery plan as far as relevant and practicable.

While the impact on Striped Legless Lizard is acknowledged as significant, it is considered acceptable for the following reasons:

- the wind farm footprint supports some thousands of hectares of potential Striped Legless Lizard habitat, only a very small proportion of which (<2%) will be impacted by the project;
- the impact on potential Striped Legless Lizard habitat has been substantially reduced by refinement of the project layout through the EES – the habitat impact of the project described in the EES and planning permit application is less than half the area affected by the project when referred under the Environment Effects Act and EPBC Act in 2017;
- the impact is likely to have been reduced further by the deletion of approximately 47 turbines and consequent reduction in the works footprint for adequate protection of Brolga breeding wetlands; and
- the available offsets exceed the minimum requirements under relevant guidelines<sup>27</sup>.

Golden Sun Moth will be significantly impacted by removal of up to 44 ha of habitat, requiring a minimum offset of about 90 ha of habitat. Adequate offsets are potentially available within the wind farm site and can be secured under an offset management strategy to be required through planning permit conditions (see Section 6). The suitability of the proposed offset sites must be confirmed by determining the presence of Golden Sun Moth in those sites according to Golden Sun Moth survey prescriptions. If the site or sites are found not to meet thresholds for Golden Sun Moth offsets, alternative offset sites must be identified, confirmed to meet habitat thresholds and secured under the project offset management strategy before project works in confirmed Golden Sun Moth habitat may commence.

Conservation advice for Golden Sun Moth has been issued under the EPBC Act. The management arrangements for land identified as offsets for Golden Sun Moth should be consistent with the conservation advice. The Flora and Fauna Management Plan to be required under planning permit conditions should also reflect the provisions and recommendations of the Golden Sun Moth conservation advice as far as relevant and practicable.

While the impact on Golden Sun Moth is acknowledged as significant, it is considered acceptable for the following reasons:

- the wind farm footprint supports some thousands of hectares of potential Golden Sun Moth habitat, only a very small proportion of which (<2%) will be impacted by the project;
- the impact on potential Golden Sun Moth habitat has been substantially reduced by refinement of the project layout through the EES – the habitat impact of the project described in the EES and planning permit application is less than half the area affected by the project when referred under the Environment Effects Act and EPBC Act in 2017;

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<sup>27</sup> See EES Main Report, Table 22.6



- the impact is likely to have been reduced further by the deletion of approximately 47 turbines and consequent reduction in the works footprint for adequate protection of Brolga breeding wetlands; and
- the available offsets exceed the minimum requirements under relevant guidelines<sup>28</sup>.

I note that the extent of removal of native vegetation, including listed threatened communities, has been substantially reduced by refinement of the project layout relative to the layout depicted and proposed native vegetation losses in earlier versions of the project. I am therefore satisfied that reasonable efforts have been made to avoid and minimise removal of native vegetation meeting thresholds for ecological communities that are MNES.

Notwithstanding, Natural Temperate Grassland of the Victorian Volcanic Plain will be significantly impacted by removal of up to 28.74 ha of the listed ecological community. The offset area available to be provided in the EES exceeds the minimum requirement under EPBC Act guidelines<sup>29</sup>.

Conservation advice for Natural Temperate Grassland of the Victorian Volcanic Plain has been issued under the EPBC Act. The management arrangements for land identified as offsets for Natural Temperate Grassland of the Victorian Volcanic Plain should be consistent with the conservation advice. The Native Vegetation Management Plan to be required under planning permit conditions should also reflect the provisions and recommendations of the Natural Temperate Grassland of the Victorian Volcanic Plain conservation advice as far as relevant and practicable.

While the impact on Natural Temperate Grassland of the Victorian Volcanic Plain is acknowledged as significant, it is considered acceptable for the following reasons:

- the wind farm footprint supports some thousands of hectares of native vegetation (much of which is likely to meet the definition of Natural Temperate Grassland of the Victorian Volcanic Plain), only a very small proportion of which (<2%) will be impacted by the project;
- the impact on Natural Temperate Grassland of the Victorian Volcanic Plain has been substantially reduced by refinement of the project layout through the EES – the habitat impact of the project described in the EES and planning permit application is less than half the area affected by the project when referred under the Environment Effects Act and EPBC Act in 2017;
- the impact is likely to have been reduced further by the deletion of approximately 47 turbines and consequent reduction in the works footprint for adequate protection of Brolga breeding wetlands; and
- the available offsets exceed the minimum requirements under relevant guidelines.

Provided the offset is adequately protected through the offset management strategy to be required under planning permit conditions, the residual impact on the community is considered acceptable.

Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains will be impacted by removal of up to 0.82 ha of the listed ecological community.

Conservation advice for Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains has been issued under the EPBC Act. The management arrangements for land identified as offsets for Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains should be consistent with the conservation advice. The Native Vegetation Management Plan to be required under planning permit conditions should also reflect the

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<sup>28</sup> Ibid.

<sup>29</sup> Ibid

provisions and recommendations of the Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains conservation advice as far as relevant and practicable.

The offset area available exceeds the minimum requirement under EPBC Act guidelines<sup>30</sup>. Provided the offset is adequately protected through the Offset Management Strategy to be required under planning permit conditions, the residual impact on the community is considered acceptable.

Grassy Eucalypt Woodland of the Victorian Volcanic Plain will be impacted by removal of up to 0.36 ha of the listed ecological community.

Conservation advice for Grassy Eucalypt Woodland of the Victorian Volcanic Plain has been issued under the EPBC Act. The management arrangements for land identified as offsets for Grassy Eucalypt Woodland of the Victorian Volcanic Plain should be consistent with the conservation advice. The Native Vegetation Management Plan to be required under planning permit conditions should also reflect the provisions and recommendations of the Grassy Eucalypt Woodland of the Victorian Volcanic Plain conservation advice as far as relevant and practicable.

The offset area available exceeds the minimum requirement under EPBC Act guidelines<sup>31</sup>. Provided the offset is adequately protected through the Offset Management Strategy to be required under planning permit conditions, the residual impact on the community is considered acceptable.

I note that further field work is required to confirm that the vegetation community at the proposed offset site adequately corresponds to the listed ecological community. If the proposed offset site is found not to meet requisite thresholds, an alternative offset site which does meet the relevant thresholds must be identified, confirmed to meet relevant ecological community and quality standards and secured under the project offset management strategy before project works affecting Grassy Eucalypt Woodland of the Victorian Volcanic Plain may commence.

The panel's recommendations regarding flora and native vegetation are generally supported. Therefore, **it is my assessment** that the planning permit should include conditions to prepare and implement a Native Vegetation Management Plan, and the project's Flora and Fauna Management Plan to include a requirement to undertake targeted flora surveys, including for MNES, along the transmission line route.

DELWP should also liaise with the Commonwealth Department of the Environment and Energy to seek closer correspondence between the listing definitions of Natural Temperate Grassland of the Victorian Volcanic Plain, listed as Critically Endangered under the EPBC Act, and Western (Basalt) Plains Grassland Community, listed as threatened under the FFG Act, to provide better protection for the threatened ecological community and to simplify the evaluation and assessment tasks for proponents and decision-makers.

In granting approval for the modified project under the EPBC Act, it is my assessment that conditions should be included to ensure:

- an integrated and seamless environmental management and compliance framework in light of relevant Victorian approvals, noting that the planning permit decision may not be made before CHMPs for the project have been approved and therefore it is not possible to be definitive at this time about the precise form of planning permit conditions;

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<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

- an integrated approach to ensuring required offsets under the EPBC Act are aligned as far as practicable with offsets for equivalent environmental assets required under Victorian approvals;
- the suitability of proposed Golden Sun Moth offsets is confirmed by confirming the presence of the species within the proposed offset area to the satisfaction of the Department of the Environment and Energy before clearing or other adverse impacts on Golden Sun Moth habitat commences in connection with the project; and
- the suitability of the proposed offset for Grassy Eucalypt Woodland of the Victorian Volcanic Plain is confirmed by confirming that the canopy composition of the woodland within the proposed offset area meets the definition of the listed community to the satisfaction of the Department of the Environment and Energy before clearing or other adverse impacts on Grassy Eucalypt Woodland of the Victorian Volcanic Plain commences in connection with the project.



## 6 CONCLUSION

My overall conclusion is that the environmental effects of the project as I have recommended it be modified will be acceptable, subject to the findings and recommendations of my assessment, particularly those relating to Brolga.

The project will provide significant net social and economic benefits to the local and regional communities. Even in the reduced form supported by the assessment, the project will also make significant contributions to achieving state and Commonwealth policies with regards to reducing greenhouse gas emissions.

My assessment recommends amendments to the project's proposed layout, management and monitoring measures consistent with the panel's recommendations which I have supported.

### 6.1 Summary of response to panel recommendations

The panel made five primary recommendations within the Executive Summary of their report and a number of other recommendations throughout the main body of their report. Table 6 summarises my responses to all of the panel's recommendations and references the relevant section of this assessment.

The panel also offered guidance on many matters of detail, primarily in the context of recommended planning permit conditions. My responses to that guidance are presented in the relevant sub-sections of sections 4 and 5.

**Table 6. Response to panel recommendations.**

No	Panel recommendation	Summary response	Sect.
<i>Primary panel recommendations</i>			
1	Modify the Project generally in accordance with the plan shown in Document 86, to apply the Brett Lane & Associates habitat model turbine free buffer to each of the 27 Brolga breeding sites identified in and within 3.2 km of the wind farm site.	Supported	5.1
2	Require the Proponent to clearly map the full extent of the turbine free buffers, with the final home range polygon boundaries determined in conjunction with Department of Environment, Land, Water and Planning - Environment.	Supported	5.1
3	Define the boundary for wetland 25 from the edge of the Plains Grassy Wetland Ecological Vegetation Class as mapped in the vegetation assessment, not the edge of the wetland. The final boundary of the terminal station site should be determined in conjunction with Department of Environment Land Water and Planning - Environment.	Supported with modifications discussed in Section 5.1	5.1, 5.3
4	Issue planning permit PA170266 for the Golden Plains wind energy facility subject to the permit conditions contained in Appendix F of the panel's report.	Supported with modifications summarised in section 6.2	6.2
5	Department of Environment, Land, Water and Planning - Environment should: <ul style="list-style-type: none"> <li>i. continue to compile the monitoring results of Brolga impacts at all Victorian wind farms, to provide data to: <ul style="list-style-type: none"> <li>a. enable validation of Brolga collision risk modelling</li> </ul> </li> </ul>	Supported	5.1
		Supported	5.1

No	Panel recommendation	Summary response	Sect.
	b. clarify the limits and approximations in Brolga collision risk modelling	Supported	5.1
ii.	conduct a regular state census or coordinated count of Brolga, to enable a better understanding of overall trends in the Victorian Brolga population and the cumulative impacts on the overall population from wind farms	Supported, with modifications discussed in section 5.1	5.1
iii.	coordinate a regional response to Brolga habitat planning, restoration and management to ensure the survival of the species in Victoria, including the coordinated mapping of Brolga turbine free buffer areas	Supported, with modifications discussed in section 5.1	5.1
iv.	make the information referred to in Recommendations 5(i) to (iii) publicly available	Supported	5.1
v.	continue to undertake evaluation of the cumulative effects of wind farms on raptor populations and other native species that may be vulnerable to wind farm mortality, and determine the need for appropriate mitigation measures	Supported	5.2
vi.	publish a standard for the assessment of the Western (Basalt) Plains Grassland Ecological Vegetation Class for native vegetation clearance applications.	Supported, with modifications discussed in section 5.3	5.3

*Other panel recommendations*

6	Include conditions on the planning permit requiring: <ul style="list-style-type: none"> <li>i. preparation and implementation of a Native Vegetation Management Plan</li> <li>ii. the Flora and Fauna Management Plan to a requirement to undertake targeted flora surveys along the transmission line route.</li> </ul>	Supported	5.3
		Supported	5.2 & 5.3
7	Include conditions on the planning permit requiring landscaping mitigation offered to affected landowners to be tailored to the relevant property, and to require the Proponent to meet the costs of watering and maintaining landscaping mitigation during its establishment.	Supported with modifications discussed in section 5.4	5.4
8	Prepare a Pre-Construction Noise Assessment to include: <ul style="list-style-type: none"> <li>i. a specific acknowledgement that the areas in and around Rokewood that are zoned Township Zone and Low Density Residential Zone are a high amenity area for the purposes of the New Zealand Standard</li> <li>ii. a requirement to determine whether a high amenity noise limit should apply to these areas, based on the guidance in Clause C5.3.1 of the New Zealand Standard</li> <li>iii. a requirement for background noise monitoring that include a minimum of 4,032 valid data points collected for each site, analysed by 24 hour and night (10 pm to 7am) only periods, and for each time sector analysed for each 45° wind rose direction</li> </ul>	Supported	5.5
		Supported	5.5
		Supported with modifications discussed in Section 5.5	5.5

No	Panel recommendation	Summary response	Sect.
9	The Near-field Compliance Testing Report and the Operating Acoustic Compliance Assessment is to require the proponent to assess and manage special audible characteristics.	Supported	5.5
10	Include a permit condition that provides that prior to turbines GP 227, GP 231 and GP 229 being constructed, the Proponent must provide an aircraft safety assessment by a suitably qualified person which demonstrates that the existing operations conducted from the airstrip at 1944 Wingeel Road, Barunah Park will be able to continue safely without significant impact from the turbines, to the satisfaction of the Responsible Authority, unless a satisfactory alternative arrangement is agreed between the parties.	Supported	5.6
11	Include planning permit conditions requiring: <ul style="list-style-type: none"> <li>i. the flora and fauna management plan to address impacts on 'habitat' rather than 'vegetation'; and</li> <li>ii. a salinity assessment report and management plan.</li> </ul>	Supported	5.8
		Supported	5.8
12	Include planning permit conditions requiring electromagnetic interference to services other than radio and television signals to be addressed.	Supported	5.12
13	Dry stone walls impacted by the construction of the Project to be reconstructed under the supervision of a suitably qualified stonemason.	Supported	5.13
14	Include planning permit conditions requiring the endorsed versions of various plans required under the permit to be made available on the project website.	Supported	0
15	Include planning permit conditions to require the proponent to: <ul style="list-style-type: none"> <li>i. negotiate a suitable offset strategy with the Commonwealth Government.</li> <li>ii. Include and implement recommended mitigation measures in a Flora and Fauna Management Plan and Native Vegetation Management Plan.</li> <li>iii. Conduct pre-construction targeted flora surveys for listed flora species during the detailed design of the project to assist with the location of transmission line poles to avoid impacts on listed flora species.</li> <li>iv. Conduct pre-construction targeted flora surveys for listed flora species at the quarry site</li> </ul>	Supported	5.16
		Supported	5.3, 5.16
		Supported	5.3, 5.16
		Supported	5.3, 5.16
16	The Commonwealth Minister for the Environment should have regard to the requirements of EMMs BD002 and 006 when considering whether (and on what terms) to approve the Project as a controlled action under the EPBC Act.	Supported	5.16



## 6.2 Summary of response to recommended panel permit conditions

I support the planning permit conditions generally in accordance with those contained within Appendix F of the panel report. With regard to the management of environmental effects, I recommend the planning permit conditions proposed by the panel may need to be modified in accordance with the following guidance:

- Permit Condition 9 refers to the preparation of an off-site landscaping program including reference to a two year period of maintenance. It is my assessment that in defining the period of landscaping establishment and maintenance, the type of vegetation that may be agreed upon with affected landowners will be a key factor.
- Permit Condition 18b requires the collection of background noise monitoring of at least 4,032 valid data points for each representative site, analysis by 24 hour and night (10pm to 7am) only periods, and for each time sector analysis for each 45 degree wind rose direction. I note that the collection of 4,032 valid data points as recommended by the panel may prove impractical depending on site wind conditions. It is my assessment that this requirement should be modified to allow some flexibility if the proponent can demonstrate to the responsible authority that they have undertaken all reasonable efforts to collect representative background noise data.



**HON RICHARD WYNNE MP**  
Minister for Planning

20/10/18