

STOCKYARD HILL WIND FARM

Application to Amend the Wind Energy Facility Planning Permit SUMMARY GUIDE

Origin Energy (via subsidiary entity Stockyard Hill Wind Farm Pty Ltd) is developing a wind farm project in south-west Victoria, known as the Stockyard Hill Wind Farm (SHWF).

The SHWF Wind Energy Facility (WEF) site is located within the Pyrenees Shire, approximately 150 kilometres west, north-west of Melbourne and approximately 35 kilometres west of Ballarat.

Planning Permit No. PL-SP/05/0548 (the Permit) was issued by the Minister for Planning in October 2010. Since this time wind turbine technology available in the market has continued to develop which allows for more energy to be generated at a lower cost, as such Origin is seeking to amend the original Permit to allow the latest technology to be used as part of the project.

The main purpose of the amendment is to increase the size of the turbines from 132 metres to 180 metres. By using these larger turbines, the energy from the wind farm is estimated to increase by approximately 40 per cent, meaning that an estimated 94,500 additional households will have access to renewable energy¹.

This guide has been prepared to provide a summary of the proposed changes to the project. It outlines the changes being sought to the Permit, including the proposed changes to wind turbines and associated infrastructure and the expected change in environmental and social impact. The amendment to the Planning Permit is supported by a number of specialist studies.

PROPOSED AMENDMENTS

Table 1 (overleaf) provides a summary of the key changes to the project, while Figure 2 (page 4) illustrates the difference between permitted and proposed wind turbine tip height. Under the proposed changes, the location of the wind farm generally remains the same; however the approved layout of the turbines would change due to the loss of eight (8) wind turbines and the infrastructure associated with it (shown in Figure 1 overleaf). Additionally, changes are needed to a number of the conditions on the existing Permit to ensure the Permit reflects current planning policy, guidelines and departments.

1. These calculations are based on a household average of 5.817 MWh per annum, sourced from ACIL Allen Consulting, A report to the Australian Energy Regulator Electricity Bill Benchmarks for Residential Customers, March 2015.

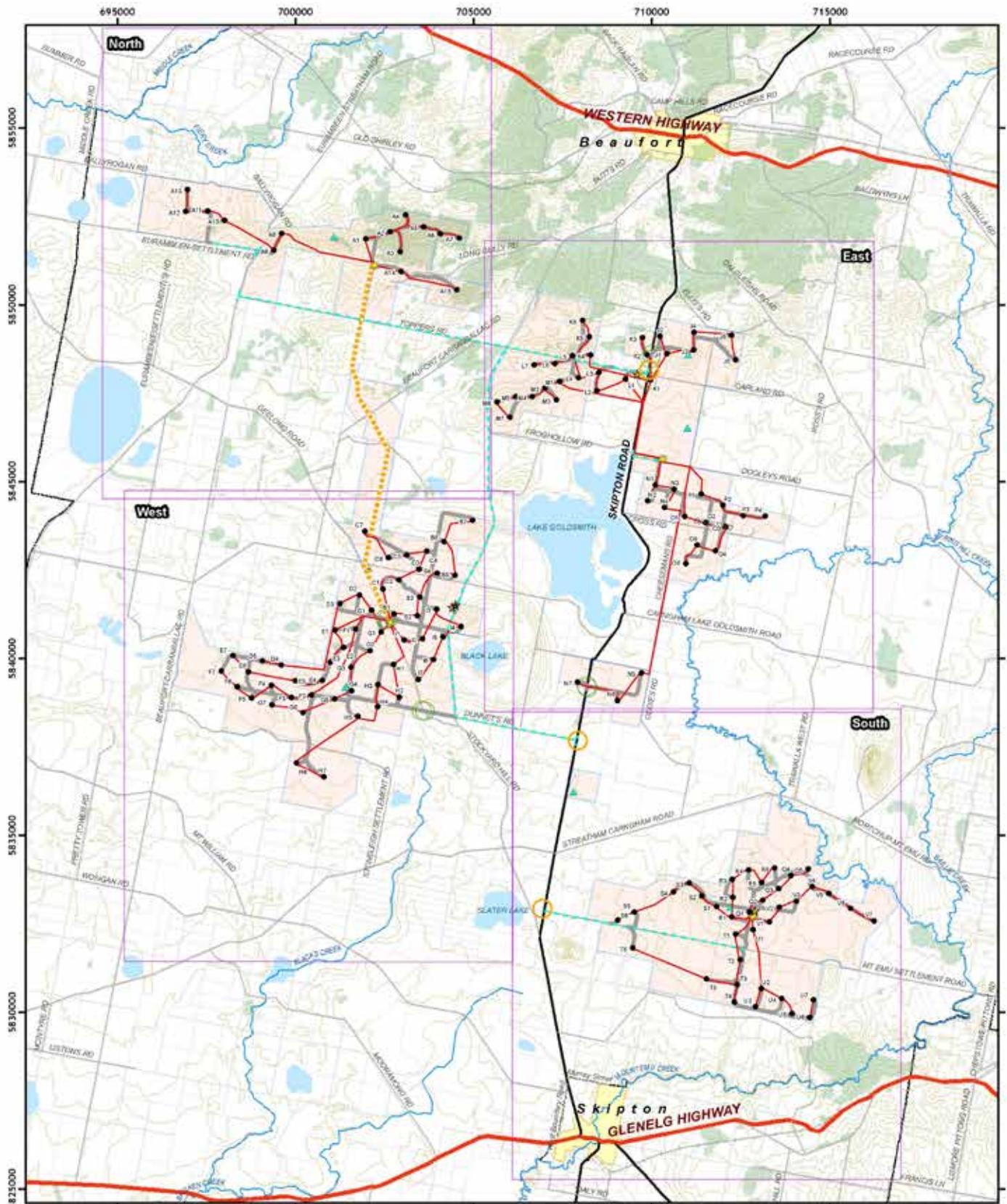
Table 1 – Key Amendments to the SHWF Wind Energy Facility

COMPONENT	PERMITTED WIND ENERGY FACILITY	AMENDED WIND ENERGY FACILITY	CHANGE
Proposed turbine numbers	157	149	Reduction of 8 turbines
Overall height	132 m	180 m	Increased height of up to 48 m
Generation capacity MW	Up to 524 MW	Up to 536 MW	Potential increase of up to 12 MW of installed nameplate capacity (based on current market offerings for dimensions defined for the permitted and amended specifications)
GWh per year	Approximately 1350 GWh	Approximately 1900 GWh	Increase of approximately 550 GWh per year
Average households powered per year¹	Approximately 232,100 households	Approximately 326,600 households	Increase of approximately 94,500 householders
Greenhouse benefits²	Approximately 1.35 M tonnes of CO ₂ savings per year	Approximately 1.9 M tonnes of CO ₂ savings per year	Increase of approximately 0.55 M tonnes of CO ₂ savings per year
Footprint area <i>(land impact by the construction of / occupied by wind farm physical infrastructure)</i>	Original design assumptions – approximately 135.4 ha Current design assumptions – approximately 227.5 ha	Approximately 230.7 ha	Comparison with original design assumptions – increase in approximately 95.3 ha. Comparison with current design assumptions - increase in footprint of approximately 3.2 ha.
Roadworks footprint area <i>(land impacted by roadworks and intersection upgrades required for construction)</i>	Not quantified	Approximately 47.4 ha	Whilst works were permitted, the maximum footprint of 47.4 ha was not previously quantified. <i>(this area includes existing roads and road reserves)</i>
Native vegetation removal	5.28 ha (3.09 habitat ha) of native vegetation <i>(area allowed by the Permit)</i>	A maximum area of 38.267 ha of native vegetation to be impacted, including: <ul style="list-style-type: none"> • 34.415 ha (5.176 general biodiversity equivalence units associated with the amended WEF). • 3.852 ha (0.261 general biodiversity equivalence units and 0.202 specific units of habitat for Button Wrinklewort) associated with the proposed roadworks. 	Increase of area of native vegetation proposed to be impacted. <i>(Note: whilst the area of native vegetation is proposed to increase, the amended wind farm will reduce impacts on significant species and habitat.)</i>
Length of access tracks	Approximately 116 km	Approximately 110 km	Reduction of approximately 6 km of access tracks
Length of underground cable	Approximately 142 km	Approximately 138 km	Reduction of approximately 3 km of underground cable
Length of internal overhead powerlines	Approximately 41.8 km	Approximately 10.7 km	Reduction of approximately 31.1 km of internal overhead powerlines

1. These calculations are based on a household average of 5.817 MWh per annum, sourced from ACIL Allen Consulting, A report to the Australian Energy Regulator Electricity Bill Benchmarks for Residential Customers, March 2015.

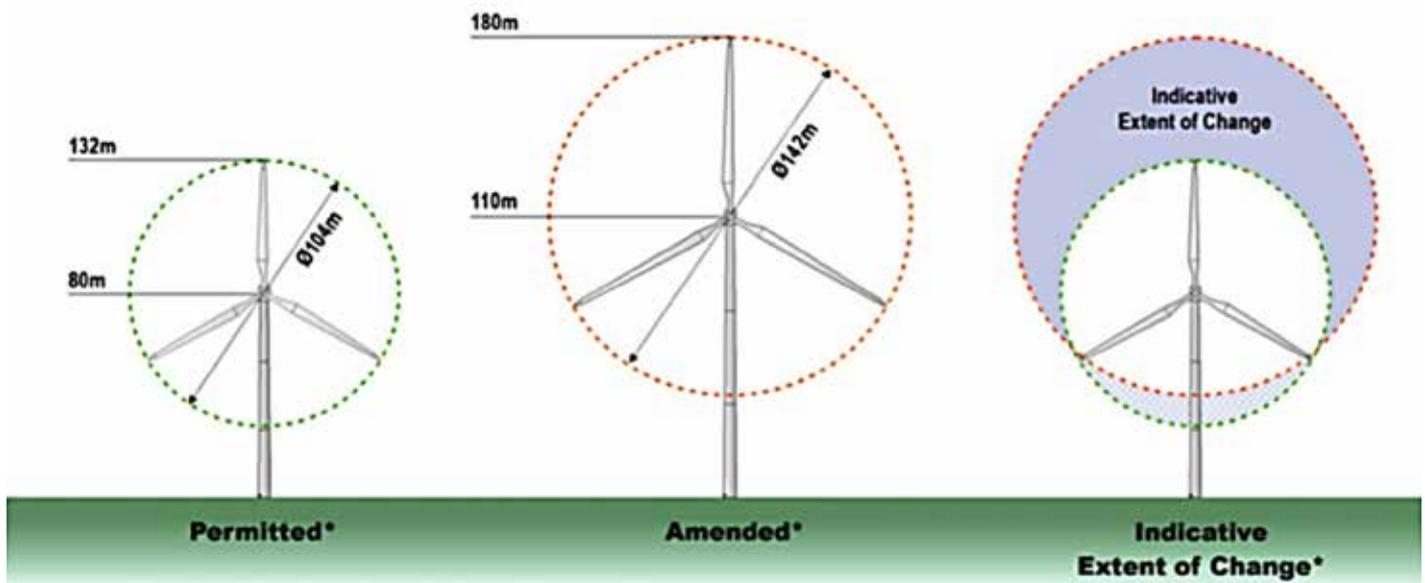
2. These calculations are based on the formula provided in DELWP's "Greenhouse Benefits, A guide to calculating greenhouse benefits of wind energy facility proposals, April 2015".

Figure 1 – Amended WEF Indicative Layout Plan



<p>STOCKYARD HILL WIND FARM PTY LTD</p> <p><small>Disclaimer: Stockyard Hill Wind Farm Pty Ltd gives no warranty or guarantee as to the accuracy, completeness or reliability of any data, drawings or other documents prepared or issued by it or on its behalf in connection with the project. The user of any such documents shall be responsible for their use.</small></p> <p><small>© Stockyard Hill Wind Farm 2014.</small></p>	<ul style="list-style-type: none"> ● Wind Turbine Generator ★ Site Commissioning Plant ● Substation ▲ Permanent Mast Mast ● Temporary Mast Mast ● Business Identification Sign ○ Alteration of Access to RO21 ○ Creation of New Access to RO21 — Private Boundary — Woodstock Mosaic Estate — Internal Overhead Powerline — Underground Cable — Access Track 	<ul style="list-style-type: none"> — Highway — Major Road — Minor Road — Watercourse — Dam — Wetland or waterbodies — Major vegetation areas — Local government areas — Township — Parish — Contour line 	<p>Stockyard Hill Wind Farm</p> <p>Amended Wind Energy Facility Indicative Layout Plan</p> <p>DATE: 28/04/2016</p> <p>SCALE: 1:100,000 @ A3</p> <p>DRAWN: [Name]</p> <p>CHECKED: Clayton</p> <p>APPROVED: [Name]</p> <p>REVISIONS:</p> <p>Amended Indicative Layout Plan - 20180428 - Page 1 of 5</p>
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Figure 2 – Permitted and Proposed Amended Wind Turbines



* Not to scale. Indicative wind turbines. Utilising maximum turbine dimensions.



ENVIRONMENTAL AND PLANNING ASSESSMENT

A range of technical studies and reports have been prepared to support the amendment, to assess anticipated difference in environmental and social impact and whether the changes are consistent with the Pyrenees Planning Scheme.

The technical studies found that the anticipated change in impact of the amended project are generally minor when compared with the original permit. This has been achieved through redesigning the wind turbine layout, and subsequent changes to access tracks, underground cabling and powerlines within the project area. This is based on additional information obtained on the project site during works to complete conditions set down in the original Permit.

It is also consistent with national, state and local planning and environmental policies, as outlined in the following sections.

Noise

The proposed amendment will result in the application of the latest methodology for noise assessment (application of NZ6808:2010) to ensure the Permit aligns with current industry standards and guidelines, and to rectify some of the technical inaccuracies in the previous set of permit conditions (while still meeting the intent). It is anticipated that these proposed changes will have negligible change to the potential impact of environmental noise at dwellings.

The noise limits specified in the Permit (or any subsequent amendment) will be achieved at all participant and non-participant dwellings.

Shadow Flicker

The Shadow Flicker assessment found that the amended wind farm increases the number of dwellings that are predicted to experience *theoretical* shadow flicker durations above the 30 hours per year limit. However, once written agreements with landowners to accept shadow flicker durations above the specified limit (participant dwellings) are considered, there is no change in the number of dwellings that are expected to experience theoretical shadow flicker durations that would create inconsistencies with the Permit.

Additionally, there are a number of factors which may reduce the incidence of shadow flicker, such as cloud cover and

variation in turbine orientation, that are not taken into account in the calculation of the theoretical shadow flicker duration. The Shadow Flicker assessment quantifies the likely reduction in shadow flicker duration due to these effects and therefore produce a prediction of the actual shadow flicker duration likely to be experienced at a dwelling.

The amended wind farm decreases the number of dwellings that are predicted to experience actual shadow flicker durations above the recommended limit compared to the permitted wind farm.

Electromagnetic Interference

The amended wind farm has the potential to change the impact on telecommunication services (e.g. fixed point-to-point links, satellite television and internet signals, terrestrial television broadcasts etc.) These impacts vary across the project site – in some cases there is an increase in impact, whilst in others a decrease. In the event that interference is an issue during construction or operation of the wind farm, there are several mitigation options available to ensure these impacts are mitigated and are in compliance with the Permit (e.g. realignment of antennas, installation of satellite or television relay station etc.)



View West of Skipton Road, near Thompsons Road May 2014

Landscape and Visual Amenity

The proposed amendment will not result in a material change in potential landscape and visual impact, as:

- The reduction in the number of wind turbines from 157 to 149 wind turbines is not visually significant.
- The reduction of wind turbines in some views would have a minor or insignificant reduction on the visual impact of the wind farm. The relocation of some wind turbines makes no perceptible difference to the level of visual impact.
- The change between the visual impact of the dimensions (including increased height and rotor diameter) is not significant.

The assessment concluded that if the level of visual impact at an assessed location was determined to be low, medium or high for the permitted wind farm, the larger wind turbines do not change the level of impact. This conclusion can be demonstrated by a comparison between Figure 2 and Figure 3, a viewpoint approximately 200 metres from the nearest wind turbine, looking east from Skipton Road (north of Thompsons Road).

The application to amend the Permit requests an extension of the requirement to offer voluntary landscape mitigation to residents within 4 kilometres (an extension from 3 kilometres) of the nearest wind turbine.

Figure 2 – Permitted WEF

Photomontage taken from Skipton Road, north of Thompsons Road intersection, looking east towards Big Hill



Figure 3 – Amended WEF



Flora and Fauna

Ground Flora and Fauna

An assessment has been undertaken to provide a comparison of the construction impact of the permitted and amended wind farm. The assessment included a consideration of each of the following scenarios:

1. Permitted WEF, using original application design assumptions
2. Permitted WEF, using current design assumptions
3. Amended WEF, using current design assumptions

Additionally, a separate assessment was undertaken of the potential impact on flora and fauna as a result of roadworks, as this is now proposed to be considered as part of the wind farm permit (rather than a separate application).

The assessment found that the permitted wind farm requires specific offsets for three species including Button Wrinklewort, White Sunray, and Matted Flax Lily. In comparison, the amended wind farm does not, and is therefore considered to have a reduced impact. Additionally, given the highly modified nature of the patches of vegetation and the subsequent low habitat score this has led to a very similar offset requirement. The offset obligations generated can be satisfied through existing credits registered through the over the counter scheme managed by the Victorian Government.

The design of the amended wind farm (including roadworks) has taken into consideration a number of factors, including the avoidance of state and federal significant species and native vegetation. The disturbance area is considered the maximum extent of impact, there may be opportunity to further reduce impact on native vegetation through detailed design and the implementation of Environmental Management Plan(s) (as required by the Permit).

Birds and Bats

The Bird and Bat assessment found that for all listed threatened and migratory bird and bat species, any potential impacts of the wind farm on relevant species would be low or negligible and is unchanged from the permitted wind farm.

There is potential for a low impact on Brolgas for both the permitted and amended wind farm. The difference between the modelled effects on the Victorian Brolga population is considered to be negligible. Additionally, it is considered that due to mitigation and offset mechanisms, there will be no net impact on the Victorian Brolga population.

Heritage

A review of the approved Cultural Heritage Management Plan (CHMP) for the site has been undertaken, which found that two additional CHMPs should be prepared. One CHMP to include two new areas not currently included within the activity area (one of which is not within an area of cultural heritage sensitivity) and to ensure that mitigation measures are appropriate for the proposed new layout (amend the management recommendations at two sites to ensure impact is minimised). The other CHMP will include the activities (and area) associated with the roadworks.

The amended wind farm will not result in a change in impact on cultural heritage places listed on the Victorian Heritage Register or Victorian Heritage Inventory, under the Heritage Act 1995, or local heritage places recognised under a Heritage Overlay within the Pyrenees Planning Scheme.

Aircraft Safety

The Aircraft Safety assessment found that the Wind Energy Facility will not be of operational significance or a hazard to aviation safety. Additionally, aviation safety lighting is not considered necessary as the assessed risk is 'low' and no additional mitigation is required. It is anticipated that the proposed amendment will not result in a change in potential impact on aircraft safety.

Construction and Decommissioning Impacts

The amended wind farm will result in a reduction in length of access tracks, underground cabling and overhead powerlines, resulting in the potential for construction and decommissioning impacts to be reduced. Any residual impact will be managed through the existing requirement for an Environmental Management Plan.

The Traffic Impact Assessment found that the amended wind farm will have a neutral to positive traffic impact compared to the permitted wind farm.

CONSULTATION

Since the commencement of the project, Origin has been informing and listening to the local community.

The Department of Environment, Land, Water and Planning can be contacted on **136 186**.

For more information visit www.stockyardhillwindfarm.com.au or call our project hotline on **1800 753 730**.

CONTACT US

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