Referral of proposed action

Project title: Stockyard Hill Wind Farm and Related Projects

1 Summary of proposed action

1.1 Short description

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

The SHWF Wind Energy Facility (WEF) involves the installation of a maximum of 149 turbines and associated on-site infrastructure (including substations, internal overhead powerlines, cabling and access tracks).

The WEF site is made up of freehold agricultural land holdings totalling approximately 109.5 km². SHWF has entered into commercial agreements with 45 landholders to host the wind farm and associated infrastructure. Shown on the Amended Wind Energy Facility Indicative Layout Plans in Attachment B.

The related external overhead powerlines will enable the delivery of renewable energy from the Wind Energy Facility (WEF) to the national electricity grid. Proposed to extend approximately 75km (in total length) between the WEF and a terminal station (south of Lismore), the 132kV overhead powerlines will cross land in the Shire of Pyrenees and Shire of Corangamite in Victoria.

The related terminal station will enable the delivery of renewable energy from the Wind Energy Facility (WEF) to the national electricity grid. The terminal station will be located to the south of Lismore and adjacent the existing Moorabool to Heywood double circuit 500kV transmission line. The terminal station project includes:

- the construction and operation of the terminal station; and
- the upgrade of the intersection of Camperdown-Lismore Road and Lower Darlington Road.

The related quarry will provide construction materials to support the development of the Wind Energy Facility (WEF) and associated infrastructure. The quarry will produce an estimated total of 1,200,000 tonnes of crushed rock to be used for construction of internal access roads, turbine hardstands, power pole hardstands and concrete aggregate, associated with the SHWF project. In addition, general and bulk fill may be required for upgrade or remediation of local public roads which need to be upgraded to facilitate the construction of the WEF or which sustain wear beyond normal use during the construction.

The quarry is proposed to be located on a site within the boundary of the WEF area. Upon cessation of construction of the SHWF, the quarry will be rehabilitated to return to agricultural use.

1.2 Latitude and longitude

Location Point	Latitude, Longitude		
Wind Energy Facility			
North West	-37˚26'25.09", 143˚12'33.55"		
North East	-37˚28'2.91", 143˚26'49.34"		
South East	-37˚40'22", 143˚27'47.65"		
South West	-37˚35'59.42", 143˚12'37.67"		
External Overhead Powerlines			
From Western Sub to Terminal Station	-37˚33'22.90", 143˚17'40.83" -37˚33'24.54", 143˚17'40.07" -37˚34'39.78", 143˚,18,19.43 -37˚35'3.92", 143˚21'18.52"	-37˚41'2.92", 143˚23'28.61" -37˚41'28.64", 143˚24'21.82" -37˚42'43.71",143˚24'7.38" -37˚43'50.59",143˚25'0.15"	-37˚50'41.34", 143˚23'10.9" -37˚52'14.54",143˚22'54.96" -37˚52'39.84",143˚23'7.97" -37˚,54'1.07", 143˚22'53.44"

	-37˚35,40.41',143˚22'15.24" -37˚35'49.17",143˚23'21.37" -37˚36'43.55", 143˚23'16.30" -37˚37'29.17", 143˚23'4.55" -37˚39'2.96", 143˚22'41.76"	-37˚45'54.9",143˚24'36.41" -37˚,45',50.26",143˚24'1.48" -37˚48'47.21", 143˚23'30.37" -37˚48'56.16",143˚23'36.87" -37˚50'12.43",143˚23'24.28"	-37˚,54'3.95", 143˚23'24.48" -37˚,56'9.87", 143˚23'31.14" -37˚,59'8.56", 143˚19'21.63" -38˚,0'16.80",143˚19'7.14" -38˚,0'25.03",143˚18'58.01"
Eastern Sub to Main route	-37˚30'45.31", 143˚22'44.87" -37˚30'49.66", 143˚23'16.90"	-37˚34'36.25", 143˚22'29.59" -37˚34'31.76",143˚21'55.99"	-37˚35'3.92",143˚21'18.52
Southern Sub to Main Route	-37˚37'40.71",143˚24'40.56"	-37˚37'29.14",143˚23'4.54"	
Terminal Station			
North West	-38˚0'9.61",143˚18'28.91"		
North East	-38˚0'17.27",143˚19'8.10"		
South East	-38˚0'39.25",143˚19'4.08"		
South West	-38˚0'30.13",143˚18'24.84"		
Intersection	38˚00'22.61",143˚16'6.05"		
Quarry			
North West	-37˚32'25.06",143˚17'5.52"		
North East	-37˚32'37.16",143˚18'23.92"		
South East	-37˚33'22.11",143˚18'14.71"		
South West	-37˚33'16.70",143˚17'36.24"		

1.3 Locality and property description

Wind Energy Facility

The WEF site is located within Pyrenees Shire, approximately 150 km west, north-west of Melbourne and approximately 35 km west of Ballarat.

The revised WEF site extent comprises approximately 109.5 km^2 and is generally bound by Eurambeen-Streatham Road and Beaufort-Carranballac Road to the west, Stockyard Hill Road and Mt Emu Settlement Road in the south, Mount Emu Creek in the east and Ballyrogan Road, Long Gully Road and Dalgleishs Road in the north. Skipton Road runs north south and bisects the subject site.

The primary use of the site is agriculture with the majority cultivated for grazing and cropping. The site has a long history of agricultural use and accordingly is highly modified with little remnant vegetation remaining on the site.

The closest townships to the WEF site are Beaufort (approximately 4.5 km north of the site) and Skipton (approximately 4 km south of the site). There are a total of 15 dwellings within the WEF site boundary, owned by participants[1] or SHWFPL. Infrastructure on site is predominantly agricultural in nature and includes sheds, dams, access tracks and fencing. The site also contains water mains, electricity cables and telephone cables. Septic tanks are located at each dwelling.

There are six permanent anemometers located on site (constructed in accordance with Planning Permit No. PL-SP/05/0548), to allow the noise monitoring program required by Condition 19. Additionally, 1 temporary anemometer was constructed in late 2015 on the site, to validate the wind shear and wind conditions for the taller wind turbines proposed as part of this application.

The WEF site is located within the Victorian Volcanic Plain and the Central Victorian Uplands bioregions and within the jurisdiction of the Glenelg Hopkins Catchment Management Authority (CMA).

[1] A participant is a landowner whose land is listed in the Address of the Land in the Permit or where the landowner has a written agreement relating to their land and dealing with noise and/or shadow flicker from the permitted wind turbines. A non-participant is a landowner who is not a participant.

Several small wetlands (freshwater meadows and shallow freshwater marshes) are scattered within the site, in addition to minor drainage lines and creeks which traverse the site, mostly in the west and north. Some areas of pasture also become seasonally inundated or waterlogged. The shallow wetlands are ephemeral and do not hold water every year. Wetlands close to the WEF site boundary or occurring within the site include Lake Goldsmith and Black Lake.

The local geology of the site (and the surrounding area) is quaternary basalt derived from ancient eruption points, such as Stockyard Hill, which is an extinct volcano. Its crater currently holds Black Lake which is an ephemeral semi-saline water body.

The project area is zoned for agricultural purposes and largely comprises cleared land used for crops and stock grazing.

The surrounding landscape is generally comprises flat farmland, and is covered by existing infrastructure, including roads, rail, transmission lines, towers, powerlines, communication towers and fences.

The surrounding area includes a number of State parks, namely Langi Ghiran State Park which is located approximately 10 km north-west of the nearest site boundary, and Mount Buangor State Park located approximately 8 km north west of the nearest site boundary. The landscape also contains Monmot Hill, a volcanic cone and Mount Emu, which is a granite hill.

Existing WEFs closest to the site's boundary include Chepstowe Wind Farm approximately 4 km to the west, Challicum Hills Wind Farm approximately 7 km to the north-west, Mount Mercer Wind Farm approximately 40 km to the south-east, and Waubra Wind Farm approximately 32 km to the north-east. Additionally, the Ararat Wind Farm is currently under construction and is located approximately 21 km to the north-west.

The site context is shown on the figure in Attachment E.

Related Projects

External Overhead Powerlines

The proposed external overhead powerlines are proposed to extend approximately 75 km (in total length) between the WEF and the terminal station in south west Victoria generally between:

- the WEF in Stockyard Hill to Mt Emu Creek, to the east of Skipton (Shire of Pyrenees); and
- Mt Emu Creek, to the permitted terminal station site, on Lower Darlington Road, Lismore (Shire of Corangamite).

The route primarily traverses private properties, with the main land use being agriculture, including cropping and livestock. Dwellings in the surrounding area are associated with farming or rural living lots.

The closest regional towns to external overhead powerlines are Lismore and Skipton, with Beaufort located to the north and Camperdown located further to the south of the proposed alignment. The economy of the area is largely agriculturally based, with these towns acting as service towns to the surrounding agricultural region. Dwellings in the surrounding area are associated with farming or rural living lots.

The topography of the route is gently undulating with creek valley systems dissecting the area, draining generally southwards. The valleys are not deeply incised and have relatively gentle slopes, with only cliff lines observed along the route located on the northern side of Mount Emu Creek valley which is to the east of the Skipton Township. A general decrease in elevation occurs from north to south along the route. Occasional isolated hills exist above the rest of the landscape in the vicinity of the route. These hills are typically volcanic hills such as scoria cones, with some granite plutons. Some stony rises are present along the northern section of the overhead powerlines route.

Rows of planted trees are a common feature of the locality, with a number of creek watercourses traversing the landscape. The majority of the route supports cultivated heavily grazed land with introduced pasture grasses (greater than 70%). Planted trees and shrubs are present in the form of wind rows and wood lots, generally comprising of native Sugar Gums *Eucalyptus cladiocalyx* and Pine Trees *Pinus radiate.*

Protected vegetation is generally limited to road reserves with some areas of private land hosting vegetation and potential habitat for protected fauna. The majority of the vegetation patches impacted by the footprint of the powerlines include Plains Grassland, Higher Rainfall Plains Grassy Woodland, Plains Grassy Woodland, Plains Grassy Wetland and Creekline Tussock Grassland.

The external overhead powerlines route crosses a number of major roads including the Hamilton Highway, Glenelg Highway and Rokewood-Skipton Road. Other roads proposed to be crossed are generally unsealed with low traffic volume.

The route will intersect with privately owned properties, parcels of public land and will transect a number of used and unused government roads.

The surrounding area also supports a number of major infrastructure developments including the existing 220 kV and 500 kV transmission lines. Existing electricity infrastructure in the surrounding area includes:

- The 500 kV (Moorabool – Heywood) transmission line and supporting towers that run in a generally east to west direction in the southern area of the overhead powerlines alignment, including across the south-east corner of the permitted terminal station site.
- The 220 kV (Ballarat – Terang) transmission line and supporting towers that run in a generally south-west to north-east direction in the southern area of the overhead powerlines alignment and pass just north of the permitted terminal station site.
- 22 kV overhead lines are located throughout the area providing local access to the electricity network.

The area surrounding the subject site surrounding area is primarily used for agricultural purposes, cleared for grazing and cropping.

The topography of the surrounding area is generally similar to the route being subdued low relief terrain that is a product of the geologically recent volcanic regime of the Victorian Volcanic Plain and a relatively young drainage system that includes large lake systems and erratic drainage system in the heterogeneous volcanic terrain.

The external overhead powerlines alignment runs along some creek lines and water courses including Mount Emu Creek and Mundy Gully, and will traverse the following:

- Mount Emu Creek
- Mundy Gully
- Browns Waterholes
- Haunted Gully
- Oddie Swamp
- 18 unnamed waterways and 3 unnamed waterbodies

The alignment falls within the Victorian Volcanic Plan bioregion and is predominately zoned for agricultural activities. The alignment falls within two catchment management authorities, including the Corangamite Catchment Management Authority and the Glenelg Hopkins Catchment Management Authority.

The site context is shown in Attachment L.

Terminal Station

The subject site is located at the intersection of Lower Darlington Road and Smiths Road, approximately 5 km to the south of Lismore, and approximately 3 km east of the cross-over point of the existing 220kV Terang-Ballarat and the 500 kV Moorabool-Heywood powerlines.

The site has an area of approximately 158 ha. It has a frontage of 1,022 m to the unsealed Lower Darlington Road and 1,495 m to Smiths Road. The topography of the site shows low relief, with a variation of less than 10 m across the site, which is also a feature of the broader area. The development is limited to the southern part of the site.

Lower Darlington Road extends along the southern edge of the site and provides vehicle access to the site. Smiths Road is an unformed road that runs along the western boundary. Smiths Road will not be used for access other than for an emergency egress point at its southern extent near Lower Darlington Road. Both roads are managed by Council.

There is an existing open sided building in the south-east corner of the site that is used for hay storage and farm equipment. The site has been used for a wheat crop and is intermittently grazed by sheep following harvesting of crops. A short row of Sugar Gum trees has been planted along the northern property boundary. Haunted Gully is located to the north-east of the site within 100 m of the property boundary, while Salt Creek is to the south of the site. Two artificial dams are located on the subject site, one along the eastern boundary and the other close to the western boundary which is currently dry. The dam to the east is devoid of native vegetation, and the dam to the west supports a very small (0.13 ha) modified patch of native vegetation resembling 'Modified Treeless Vegetation'.

The area surrounding the subject site surrounding area is primarily used for agricultural purposes, cleared for grazing and cropping. Surrounding land is located within the Farming Zone.

The topography of the surrounding area is generally similar to the site being subdued low relief terrain that is a product of the geologically recent volcanic regime of the Victorian Volcanic Plain and a relatively young drainage system that includes large lake systems and erratic drainage system in the heterogeneous volcanic terrain.

Lake Gnarpurt (a Ramsar Wetland) approximately 5 km to the south east and Lake Tooliorook 4 km to the west of the site. In the immediate vicinity of the subject site are at least 3 significant waterways and a lake, all of which are 'designated' waterways:

- Haunted Gully (is close to the north east corner of the land)
- Salt Creek (immediately south of the site on the opposite side of Lower Darlington Road)
- Brown's Waterholes (approximately 2 km east of the site)
- Lake Tooliorook (approximately 4 km west of the site)

The surrounding area also supports a number of major infrastructure developments including the Hamilton Highway, existing 220 kV and 500 kV transmission lines, as well as the small towns of Lismore and Derrinallum. Existing electricity infrastructure in the surrounding area includes:

- The 500 kV (Moorabool – Heywood) transmission line and supporting towers that run in a generally east to west direction, including across the south-east corner of the subject site. Two supporting towers are located on the subject site.
- The 220 kV (Ballarat – Terang) transmission line and supporting towers that run in a generally south-west to north-east direction and pass just north of the subject site.
- A 22 kV overhead line is located on the southern side of Lower Darlington Road. A short section has been placed underground below the 500 kV transmission line to the southwest of the Lismore Terminal Station site. It is proposed that the auxiliary power supply for the Lismore Terminal Station control rooms would be drawn from this supply.

The closest regional towns to the north of subject site are Lismore and Skipton, with Camperdown located further to the south. The economy of the project area is largely agriculturally based, with Lismore and Skipton both acting as service towns to the surrounding agricultural region.

The economy of the project area is largely agriculturally based, with Lismore and Skipton both acting as service towns to the surrounding agricultural region. Lake Tooliorook is 4 km to the west and provides a small camping area and recreational area to the east of Mt Elephant and is associated with short term visitation.

Dwellings in the surrounding area are associated with farming or rural living lots. The closest dwellings are measured from the nearest point of the proposed works as follows:

- Dwelling 1: located approximately 670 m south east of the proposed Lismore Terminal Station on the southern side of Lower Darlington Road. The dwelling has a significant stand of trees around the

residence.

- Dwelling 2: located approximately 1,820 m southwest of the proposed Lismore Terminal Station on Lower Darlington Road.
- Dwelling 3: located approximately 2,720 m northwest of the proposed Lismore Terminal Station.

The Hamilton Highway is about 5 km to the north of the site with Camperdown-Lismore Road about 5 km west of the site. Other minor roads are generally unsealed with low traffic volume.

The site context is shown in Attachment L.

Quarry

The site is located within the bounds of the approved WEF to the west of Ballarat, approximately half way between the township of Beaufort (approximately 15 km to the north) and Skipton (approximately 15 km to the south).

The site is accessed from Stockyard Hill-Wangatta Road, Stockyard Hill. The site is currently used for grazing (cattle and sheep) and is predominately made up of pasture with isolated trees, windbreaks and an agricultural windmill.

The site is generally comprised of gently undulating farmland which falls from approximately RL 390 m at the eastern boundary to RL 365 at the western boundary (over approximately 1.3 km). As such, the site drains generally toward the north west where a small dam exists at the corner of the property. The landscape is characterised by an undulating plain consisting of grassy flats and associated stony rises dominated by protruding basalt rock formations.

The subject site is bounded to north by Stockyard Hill – Wangatta Road, to the south and east by private property.

The properties surrounding the site to the north, south, east and west are all used for farming purposes. A dwelling exists approximately 260 m to the north of the proposed quarry. SHWFPL has purchased this property and it will be vacant during the operation of the proposed quarry, or potentially used for caretaker accommodation associated with the proposed quarry or wind energy facility. A vacant church building exists approximately 1.3 km to the east of the subject site which is also owned by Origin. This building will remain vacant during the operation of the proposed quarry or may be used in association with the SHWF for the purposes of storage.

The closest residential building is approximately 1.7 km to the west of the subject site.

No water courses traverse the site. Black Lake is located approximately 1.6 km to the southeast of the site and an unnamed water course is located approximately 1.2 km to the west of the site.

The subject site is located within the Victorian Volcanic Plain bioregion. The Victorian Volcanic Plain bioregion covers large areas of the south west of Victoria from Melbourne to Hamilton.

The site context is shown on the figures in Attachment S.

1.4 Size of the development footprint or work area (hectares)

Wind Energy Facility – 278.1 ha *(land impacted by the construction / occupied by physical WEF infrastructure and roadworks and intersection upgrades)*

External Overhead Powerlines – 83.4 ha *(total ground disturbance footprint, including earthworks to accommodate pole foundations and ancillary powerlines installation activities including the creating of access tracks and hardstands)*

Terminal Station

Terminal Station – The site has an area of approximately 158 ha. Works are only impacting on 7 ha.

Intersection Upgrade – The works to upgrade to intersection at Camperdown-Lismore Road and Lower Darlington Road has an area of approximately 1.63 ha.

Quarry – The total site area is approximately 200 ha; however the development only occupies approximately 57 ha of the total land.

1.5 Street address of the site

A list of the properties is contained in Attachment B.

1.6 Lot description

A list of the properties is contained in Attachment B.

1.7 Local Government Area and Council contact (if known)

The projects are located within the Shire of Pyrenees and Shire of Corangamite.

Pyrenees

- *Shannon Meadows* (Manager Regulatory Services) - (03) 5349 1125
- *Douglas Gowans* (Director Assets and Development) - (03) 5349 1122

Corangamite

- *Greg Hayes* (Manager Planning and Building) – (03) 5593 7144
- *Ian Gibb* (Director Sustainable Development) – (03) 5593 7100

1.8 Time frame

The anticipated implementation of the SHWF WEF and related projects, with an overall expected timeframe of 36 months, is outlined in the table below.

Table 1 – Implementation Timeframe

Project	Timeframe
Detailed Design	**June 2017 – May 2018**
Wind Energy Facility	**June 2017 – May 2020**
▪ *Early works (site establishment)*	*July 2017 – November 2017*
▪ *Primary site civil and electrical works, turbine installation*	*December 2017 – May 2019*
▪ *Turbine installation and commissioning*	*June 2019 – May 2020*
External Overhead Powerlines	**February 2018 – August 2019**
▪ *Creation of access, clearing and foundations*	*February 2018 – July 2018*
▪ *Pole installation, stringing and commissioning*	*May 2018 – August 2019*
Terminal Station	**February 2018 – May 2019**
Quarry	**August 2017 – July 2019**
▪ *Site establishment*	*August 2017 – November 2017*
▪ *Operations*	*November 2017 – February 2019*
▪ *Rehabilitation*	*February 2019 – July 2019*

This timeline is dependent on numerous factors including gaining necessary approvals in a timely manner and commercial negotiations. The WEF operational life is anticipated to be 25 years.

1.9 Alternatives to proposed action		
		No
	X	*Yes, you must also complete section 2.2*

1.10	**Alternative time frames etc**		*No*
		X	*Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).*
1.11	**State assessment**		*No*
		X	*Yes, you must also complete Section 2.5*
1.12	**Component of larger action**	**X**	*No*
			Yes, you must also complete Section 2.7
1.13	**Related actions/proposals**	**X**	*No*
			Yes, provide details: Details provided in Section 2.7.
1.14	**Australian Government funding**	**X**	*No*
			Yes, provide details: Not applicable.
1.15	**Great Barrier Reef Marine Park**	**X**	*No*
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

2.1 Description of proposed action

Wind Energy Facility

Main components of the project

The WEF comprises up to 149 wind turbine locations (as shown on the Amended Wind Energy Facility Indicative Layout Plan in Attachment B), including the infrastructure components described in the table below (Table 2).

Table 2 – WEF Infrastructure Disturbance Zones

Infrastructure	Current Design
Turbine Dimensions	The turbine envelope proposed includes: • overall maximum tip height must not exceed 180 m above natural ground level; • hub-height of no greater than 120 m above natural ground level; and • rotor diameter no greater than 140 m.
Access Tracks	General – 12.5 m wide Trunk – 13.5 m wide
Underground Cable	3 m wide
Hardstands and Foundations	50 m x 70 m including foundations
Temporary Construction Facilities (Concrete Batching Plant / Staging Areas / Compound)	2 x 100 m x 100 m (north/east area and south) 1 x 130 m x 250 m construction compound (west area) 1 x 100 m x 200 m (south area)
Permanent Maintenance Facility	1 (100 m x 40 m)
Substations / Switchyards	4 (100 m x 100 m)
Internal Powerlines	Ground clearance - 10 m wide Aerial clearance – 30 m wide

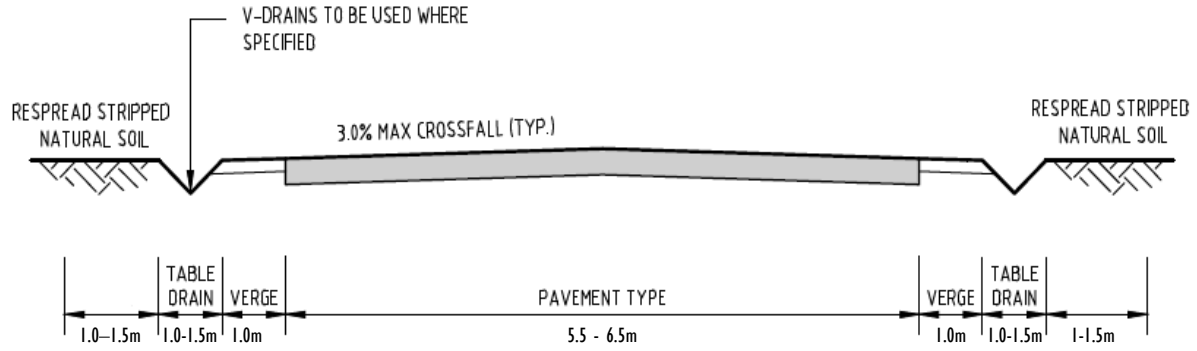


Figure 1 – Typical Wind Farm Access Track Cross Section *(Source: Catcon 2015)*

Additionally, a business identification sign is proposed on site shown on the Amended Wind Energy Facility Indicative Layout Plan in Attachment D).

Ancillary components of the project

Based on prior WEF construction and operations experience, SHWFPL are proposing to adopt a traffic management principle of minimising use of the existing road network where possible to achieve the following outcomes:

- Minimise interaction between public road users and wind farm construction traffic, specifically high vehicle movements such as concrete trucks and earth haulage trucks;

- Provide greater certainty to public road users of which specific roads are expected to experience high traffic volumes by light and heavy vehicles associated with the wind farm construction during specific periods of the construction schedule;
- Minimise new entry points from existing roads to private land to access the wind turbine locations to improve safety for public road users and minimise upgrade requirements on road verges for safe turn in/out of wind farm traffic;
- Limit the roads used for wind farm traffic to enable clear accountability and responsibility for road condition assessment, management and rehabilitation between the Road Management Authority and the wind farm operator; and
- Allow for a 'loop' traffic flow system connecting the distinct areas accessing the wind turbines from the main construction compound (located on Stockyard Hill Road) to minimise truck overtaking/passing. A 'loop' traffic flow system will also provide flexibility in avoiding school bus routes during set times.

Based on this approach, SHWFPL propose limiting the use of construction traffic to the below roads with a concept approach to design improvements/upgrades based on our existing data for these roads.

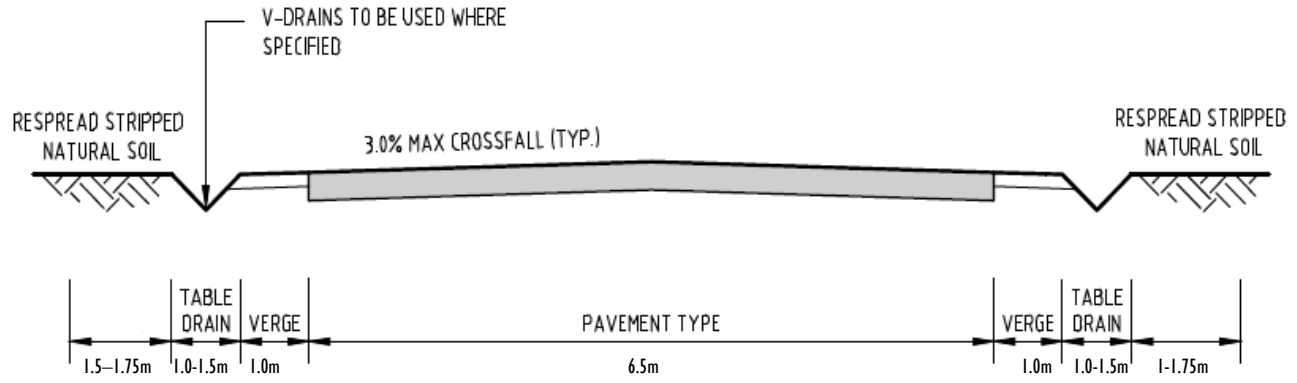
- Skipton Road – use existing road and maintain in accordance with VicRoads. Key intersections are proposed to be upgraded to cater for the increased construction traffic movements and over sized wind turbine deliveries (as noted in the separate dot points below).
- Stockyard Hill Road (section between Thompsons Road and Dunnets Road) – remove seal from section between Thompsons Road and Lake Goldsmith-Stockyard Hill Road and upgrade entire section to 6.5 m trafficable width gravel pavement. Following the completion of the construction activities, the road will be reinstated using a bitumen spray seal to approximately 5.0 m cross section of the road (as per existing condition).
- Dunnets Road – build new road to 6.5 m trafficable width gravel pavement, with north-bound turn onto Stockyard Hill Road and south-bound turn onto Skipton Road for Over Dimensional vehicles.
- Mt Emu Settlement Road (section between Skipton Road and ~5.8 km east of Skipton Road intersection) – remove seal and widen road verge to allow total 6.5 m trafficable width, with south bound turn onto Skipton Road for Over Dimensional vehicles. Following the completion of the construction activities the road will be reinstated using a bitumen spray seal to approximately 5.0 m cross section of the road (as per existing condition).
- Dooleys Road (section between Skipton Road and ~0.8 km east of Skipton Road intersection) – upgrade entire section to 6.5 m trafficable width gravel pavement, with south bound turn onto Skipton Road for Over Dimensional vehicles.
- Thompson Road – build new road to 6.5 m trafficable width gravel pavement (including installation of new culverts), with south-bound turn onto Skipton Rd for Over Dimensional vehicles.
- Toppers Lane – build new road (eastern section only) to 6.5m trafficable width gravel pavement, with south-bound turn onto Stockyard Hill Road and south-bound turn onto Eurambeen-Streatham Road for Over Dimensional vehicles.
- Eurambeen-Settlement Road (section between Eurambeen-Streatham Road and ~1.8 km west of Eurambeen-Streatham Road intersection) – build new road to 6.5m trafficable width gravel pavement, with south-bound turn onto Eurambeen-Streatham Road for Over Dimensional vehicles.

The exact location and design of the road works within the disturbance footprint will be determined during detailed design and through the development of the Traffic Management Plan prepared in accordance with Condition 35 of Planning Permit No PL-SP/05/0548 and Development Plans prepared in accordance with Condition 1 of Planning Permit No PL-SP/05/0548.

However, preliminary engineering design has been prepared for road cross sections and key intersections to enable the determination of total maximum ground disturbance associated with the roadworks proposed. It is expected that the typical cross section of ground disturbance of roads will be between 13.5 - 15 m depending on the existing conditions; topography and hydrology of the various roadworks zones (see Figure 2).

Importantly, the disturbance area is the maximum extent of impact and opportunities may exist to further reduce impacts to native vegetation through detailed design.

The total disturbance footprint of the roadworks (as shown on the Amended Wind Energy Facility Indicative Layout Plan Attachment D) is proposed to comprise approximately 47.4 ha. The disturbance area has been selected to minimise impacts to native vegetation. For example, the disturbance area has been located on alternative sides of the road reserves to avoid significant vegetation impacts. However, some impacts on native vegetation have been unavoidable.



Note: Image not to scale

Figure 2 – Typical Roadwork Cross Section *(Source: Catcon 2015)*

Key construction activities

It is anticipated that the key construction activities of the proposed WEF will be undertaken in three phases as follows:

- Phase 1 - Civil Construction: Preparation of the site including public road and intersection upgrades, construction of access tracks, creation of turbine footings and other minor civil works.
- Phase 2 - Installation: This phase involves the installation of towers, turbines, substations, cabling and other wind farm specific equipment.
- Phase 3 – Commissioning: The commissioning phase of the works involves ensuring that the turbines are operational (i.e. final safety checks, network tests, etc).

These phases may overlap with installation occurring at locations while civil works continue on the remainder of the site. In addition, it is anticipated that rehabilitation will occur on a 'rolling' basis as turbines are installed.

It is anticipated that all construction activities will be undertaken in approximately 36 month period.

Key operational activities

The operation of a WEF is considered to be 'self-sufficient' with the operational activities limited to monitoring, maintenance and repairs.

The operational life of the SHWF WEF is anticipated to be 25 years.

Key decommissioning activities

The key decommissioning activities will comprise of the removal of above ground infrastructure (i.e. turbines, substations, etc) and rehabilitation of civil works (i.e. access tracks).

Decommissioning work will be undertaken in consultation with the landholders to ensure that the land can be returned to agricultural use (i.e. certain access tracks may be retained at the request of the landholder).

Related Projects

External Overhead Powerlines

Main components of the project

The 132 kV overhead powerlines will include steel poles with a galvanized coating finish, and may including fixtures for climbing. The poles will support up to 3 main cross-arms (or 6 independent arms) which will in turn each support up to 2 pairs of conductors/wires that may be marked for safety or visibility if necessary and the poles may support additional cross-arms to carry communication and aerial earth wires.

The construction of the powerlines will conform to the specifications as per Australian Standard AS/NZS7000:2010. The circumference at the base of each pole will be up to 2 m in diameter at their base, with an approximate height of between 18 - 40 m. The height of the pole is driven by a number of factors, typically relating to span lengths that have been designed to respond to environmental, technical and landowner considerations. The average distance between each pole location will be approximately 300 m and the lowest point of the line will not be lower than 8.6 m above ground.

One commonly used foundation option to support overhead powerlines of this type includes a mass concrete pad to which the pole is secured by anchor bolts. The anchor bolts sit within a concrete pedestal that connects to the pad beneath the surface. The pedestal usually rises above the ground by approximately 0.3 m and is typically the same width as the base of the pole. A narrow strip of metal used for earthing usually runs from the base of the pole to the ground via the foundation. The total width of the foundation may be up to ~10 m x 10 m and is located within the hardstand area of 20 m x 25 m at each pole location. Bored pole foundations may be constructed to a depth of 8 m.

Ancillary components of the project

The total ground disturbance footprint of the route comprises approximately 83.4 ha which is results from earthworks to accommodate pole foundations and ancillary powerlines installation activities including the creating of access tracks and hardstands (the exact location of these activities within the disturbance footprint will be determined during detailed design) (**Figure 3**). Additionally, removal of vegetation within a 36 to 46 m corridor (which has a height greater than 3m) to ensure appropriate safety clearance (as shown in **Figure 4**) has been taken into consideration.

Access tracks of up to ~10 m width and ~0.3 m depth will be required along the alignment (**Figure 5**); however an alternative low-disturbance construction methodology of applying geofabric on top of the existing ground surface and gravel will be used in areas of cultural heritage sensitivity. Additionally, a number of new or altered access points are proposed from public roads, to enter the powerlines access tracks.

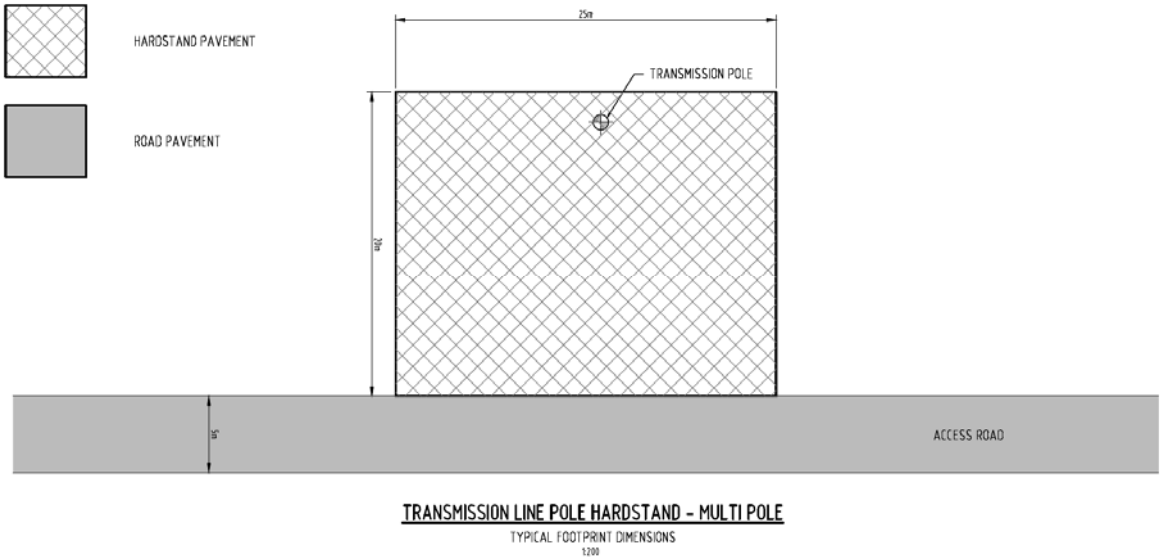


Figure 3 – Typical 132 kV Powerline Hardstand and Access Track *(Source: Catcon 2015)*

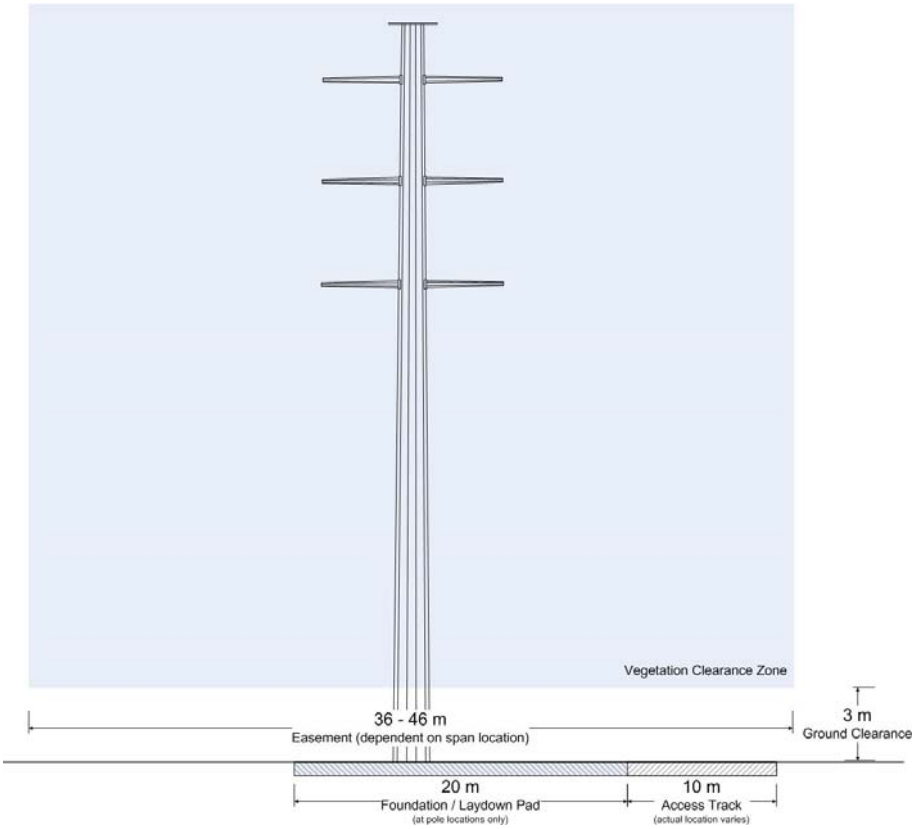


Figure 4 – Typical 132 kV Powerline Cross Section *(Source: SHWFPL, 28/04/2016)*

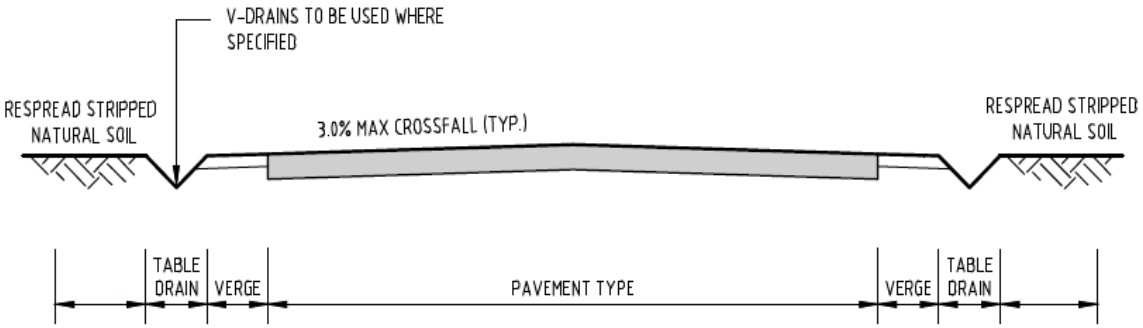


Figure 5 – Typical Powerline Access Track Cross Section *(Source: Catcon, 2015)*

Key construction activities

The key construction management activities to be undertake are as follows:

- Site mobilisation and the erection of temporary facilities for construction staff
- Surveying the pole locations, project features, and work areas
- Upgrading or construction of temporary and permanent access roads to accommodate heavy vehicle movements during construction.
- Construction of hardstands required for cranes during the pole erection and stringing machine hardstands.
- Clearing activities of the alignment (where required)
- Fencing and signage
- Construction of foundations with anchor bolts installed in mass concrete.
- The transmission line will be constructed on steel poles and be of single or twin circuit duplex conductors configuration with one or two Optical Ground Wire (depending on section of alignment).

Transport of large items to the subject site is anticipated to be via the Hamilton Highway, Glenelg Highway, Rokewood-Skipton Road, and Skipton Road in accordance with VicRoads and Council requirements. It is not anticipated that any road upgrades (apart from the new access points identified) will be required.

Key operational activities

The operation of a WEF is considered to be 'self-sufficient' with the operational activities limited to monitoring, maintenance and repairs.

The operational life of the SHWF WEF is anticipated to be 25 years.

Key decommissioning activities

The powerlines will be decommissioned upon cessation of all WEF generation, if no further use for the lines is required as part of the regulated or non-regulated network to support new generation or load.

Terminal Station

Main components of the project

The proposed terminal station will be located adjacent to the Lower Darlington Road frontage of the site and on land at the intersection with Smiths Road. It will occupy approximately 7 ha of the site.

The main built form components of the terminal station will involve:

- A new 500kV switchyard located between the two existing lattice tower structures and to the north of the existing 500kV lines.
- New lattice tower structures in the 500 kV lines to divert the lines into the 500 kV switchyard of the terminal station site. In effect, one or both circuits of the existing 500 kV line will be redirected through the new 500kV switchyard;
- A 132 kV/500 kV substation located adjacent to the eastern side of the 500 kV switchyard will raise the voltage of the wind farm output from 132 kV to 500 kV for connection to the grid.
- Two control rooms, one for the 500 kV switchyard and one for the 132 kV/500 kV substation.
- Access from Lower Darlington Road, including upgraded existing entry and onsite roadworks and carparking.
- Emergency egress to Smiths Road.
- Site screening – tree planting (possible earth mound).
- Temporary construction facilities that will be removed after construction is complete.

Planning Permit PP2012/152.A (discussed further in Section 2.4) states that Development Plans must be submitted to the responsible authority for their endorsement, and must be *"…generally in accordance with the layout and elevation concept plans as shown on the SKM Terminal Station Site Concept Plan and the concept drawings by Aurecon (Ref Project Number 228767.001 Drawing E021, C021, E022, E023, E024)"* but modified to show details of the construction area of the site, further details of the built form (e.g. colours and materials), access design and noise mitigation measures. The plans referenced within the terminal station planning permit are contained in Attachment Q.

Ancillary components of the project

Night lighting and security alarms are required for high voltage facilities but these will be designed to minimise disturbance to surrounding community and habitat. Night lighting will be directed inwards and downwards and will only be operated at full illumination for security purposes and if works are occasionally required at night times.

Limited amenities are required during operation as there will be limited people attending the site.

Water will be supplied by rainwater tanks collected from the Terminal Station and topped up as necessary. An additional water supply will be provided as a reserve for fighting purposes. This could involve an on-site storage tank of up to 25,000 litres capacity and would only be used for fighting fires in areas surrounding the terminal station.

The control rooms are proposed to be located respectively next to the switchyard and close to the substation transformers. They will each house a small office, amenities, a workshop and storage area. All the low voltage equipment, such as the protection and control equipment and batteries, power and air-conditioning services will also be installed in the control rooms.

The existing access point from Lower Darlington Road will need to be upgraded for the construction stage of the project. An upgraded entry at the point of the existing double gates will provide access for most vehicles entering the site but a wider temporary entrance may need to be formed for the delivery of the large transformer(s). A secondary emergency egress will be provided to Smiths Road near the intersection with Lower Darlington Road, away from the overhead lines (in accordance with CFA recommendations).

Construction of the access roads will include grading and removal of topsoil, placement and compaction of a suitable crushed road base and installation of appropriate drainage. A hardstand area will be provided for construction site office car parking, as shown on the concept plans.

Parts of the land within the switchyard will be covered with gravel while areas around the facility will be re-vegetated.

Additionally, it is proposed to upgrade of the existing intersection of Lower Darlington Road and Camperdown-Lismore Road to cater for increased traffic movements during the construction phase and to enable safe passage for all vehicles using this intersection. A concept design has been prepared to convert the existing dual intersection points to a single “T” intersection with allowance for safe vehicle movements consistent with relevant road design standards.

Key construction activities

The key construction management activities to be undertaken are as follows:

- Site mobilisation and the erection of temporary facilities for construction staff
- Surveying the switchyard set-out points, project features, and work areas
- Upgrading or construction of temporary and permanent access roads
- Clearing and grading activities for switchyard and substation platforms
- Fencing and signage
- Excavating and installing switchyard and substation foundations including those for the two control rooms and installing cabling in cable trenches for the switchyard and substation
- Assembling and erecting equipment and gantry steelwork
- Assembling and erecting of high voltage equipment
- Assembling and erecting the 132 kV/500 kV transformers at the substation
- Construction of two control rooms
- Fitting out of control rooms with protection panels
- Stringing conductors and ground wires
- Testing and commissioning of all switchyard and substation high voltage and low voltage equipment
- Connection of the 500 kV line and the 500 kV switchyard
- Cleanup and reclamation of affected areas
- Construction site de-mobilisation

Transport of large items to the subject site is anticipated to be via the Hamilton Highway and – Camperdown-Lismore Road in accordance with VicRoads and Council requirements. Road works are required to the intersection of Camperdown-Lismore Road and Lower Darlington Road.

It is estimated that it will take 16 months to construct the terminal station.

Key operational activities

The operational arrangements of the 500 kV switchyard and 132 kV/500 kV substation are still to be confirmed. The switchyard and the substation will be remotely controlled and do not need operations staff to be based at the site. Staff will only make occasional visits as required for the purpose of inspection and maintenance. Amenity facilities will be provided as part of the two control rooms.

The equipment in the switchyard and substation will be energised at 500 kV and 132 kV. In compliance with High Voltage regulations, the terminal station will be securely fenced. Outages of the 500 kV circuits or the 132 kV WEF connection may be required from time to time, usually in accordance with scheduled maintenance events or when works are required at other locations in the electrical system.

The 132 kV/500 kV transformer(s) produce noise that will be heard at close distances, and tonal noise may be audible at further distances. The noise level and audibility of any tonal noise decrease with distance from the transformers and an acoustic assessment of the terminal station noise impacts and mitigation has been prepared by Sonus (2012).

Key decommissioning activities

The contestable component (132/500 kV substation) will be decommissioned upon cessation of all WEF generation, if no further use for the substation is required as part of the regulated or non-regulated network to support new generation or load connections.

Quarry

Main components of the project

The proposed quarry will have the following features:

- Quarry pit to cater for the volume of basalt required (approximately 1.2M tonnes)
- An area of approximately 450 m by 300 m and a depth of up to 8 m (approximately)
- Rock crushing and screening area
- Stockpiling areas
- A water dam for surface water management and sediment control
- Internal quarry access tracks
- Overburden and top soil storage areas.

The design of the proposed quarry has been based on the following considerations:

- Suitable material is available for extraction
- At least one side of the quarry is at current grade as to allow the pit to drain and to prevent water ponding in the excavation during or after extraction
- Post extraction, the quarry will be remediated and returned to farmland. Therefore, batter slopes will be no steeper than 5H in 1V, which will be generally consistent with the gently undulating nature of the existing terrain.
- Operation of the proposed quarry does not conflict with the proposed wind turbine areas of internal access tracks
- Feedback from referral agencies (DELWP, Powercor, Southern Rural Water, Heritage Victoria and the Pyrenees Shire Council) and the property owner
- Minimisation of the potential risk to the environment i.e. groundwater and native vegetation.

It is estimated that the quarry will produce up to approximately 1.2 million tonnes of crushed rock. It is estimated that the volume of material required equates to up to approximately 380,000 to 480,000 cubic metres. The exact quantities of these materials will be confirmed after detailed design although the amount of material to be removed will not exceed 1.2 million tonnes.

Upon cessation of construction of the WEF, the quarry would be rehabilitated to return the site to agricultural use. The rehabilitated landform will be designed to ensure that water does not collect as a permanent waterbody and generally drains naturally.

Further details can be found in the endorsed Work Plan contained in Attachment S.

Ancillary components of the project

Ancillary components include:

- Portable site office, weighbridge and amenities to be located within the crushing and screening area for the life of the quarries
- A generator for the powering the site office and amenities.
- Car parking areas, work shop and amenities building
- Site security fencing

Key construction activities

Up to approximately 1.2M tonnes of crushed rock will be required over approximately 3 years for the entire construction phase of the WEF, as such the construction of the quarry is required to be established prior to the commencement of the WEF.

The key construction management activities to be undertaken are as follows:

- Construction of the internal quarry site haul roads with imported material
- Construction of the water dam and associated drains
- Remove top soil from the crushing and screening area and initial extraction area
- Initial extraction will commence in the west of the site with proposed crushing and screening area hardstand to be constructed

Crushing and screening will be conducted with mobile crushers and screens (no fixed plant is proposed as part of the quarry).

Key operational activities

It is proposed to operate the quarry for the duration of the WEF construction period using conventional hard rock quarrying techniques. The process of the extraction will be dependent on project demands, starting in the west of the proposed excavation area and continuing to the east (with benches of approximately 2-3 m). The following points provide a summary of the key activities relating to the extractive operations.

- *Topsoil and Overburden Handling* – Approximately 0.1 to 0.5 m of top soil will be stripped and stockpiled for later use in the rehabilitation. Additionally, any overburden (rock and small quantity of soil) and reject from the crusher operation will be placed in an overburden stockpile.

  Topsoil and overburden will be progressively stripped to expose rock as extraction occurs. This is likely to involve an excavator loading dump trucks, but also may include bulldozers, scrapers and front end loaders. Topsoil stockpiles will be limited to approximately 2 m to assist in maintaining soil viability, and will be vegetated to prevent erosion.

- *Rock Extraction* – Once the topsoil and overburden has been removed and stockpiled, the basalt will be drilled and blasted. Equipment used is likely to include a hydraulic percussion drill rig and non-electric blast initiation. Blasting frequency has not been determined at this stage.

  The blasted material will be excavated and hauled to stockpiles prior to crushing and screening using an excavator and dump trucks. The material will be separated into a crusher feed stockpile and bulk fill

stockpile based on the quality of the material as it is excavated. Additionally, because different construction products are required, there will be corresponding stockpiles for the crushed and screened material. The size of each stockpile will depend on the peak usage of each material in the construction schedule.

The final extraction limit will be surveyed and marked out with survey posts.

- *Working Faces* – Working faces in the overburden will be developed with an excavator (or a bulldozer) in approximately 0-1.5 m high faces for soft material and 2-3 m high for basalt. The batter slope of soft material will be approximately 1V to 1H with the slope of working faces in competent rock (i.e. blasted faces) will be between 15° from vertical and vertical (90°).
- *Final Face Treatment* – Faces will be progressively backfilled once terminal positions are reached. Final faces will be rehabilitated once sufficient distance to the working faces have been established (typically 50m). Final faces will be developed with bulldozers pushing and tracking overburden (or excavator and trucks placing) directly into the rehabilitation areas, then spread and tracked by a bulldozer or scraper.
- *Explosives Usage* – Bulk explosives will be used for the blasting activities (supplied by an external contractor), however no explosives or detonators will be stored at the quarry. Blasting will comply with Department of Economic Development, Jobs, Transport and Resources (DEDJTR) *Guidelines for Ground Vibration and Airblast Limits for Blasting in Mines and Quarries.*

  Appropriate exclusions zones will be maintained for plant, equipment and personnel. The Traffic Management Plan, which will be prepared to satisfy planning approvals, will ensure public roads with the exclusion zone will be guarded and closed during the blasting period.
- *Processing Operations* – Materials will be transported from the pit to the processing plant primarily via an off road dump truck. A front end loader or excavator will be used to load the dump trucks. For safety reasons, the crusher and screens will be located to the northwest of the quarry, to allow sufficient room to manage stockpiling and minimise equipment interaction.

  Transport of the material in the crushing and screening plant will be via conveyors and chutes until the product discharge onto the ground. The product will then be loaded by a front end loader into trucks to sized aggregate stockpiles away from the plant area. Product from the stockpile area will be loaded directly onto delivery trucks with a front end loader, with a weighbridge provided on site to ensure compliance with statutory vehicle loading requirements and to assess weights of material removed from site.

The production rates from the proposed quarry have been planned to align with the indicative scheduling of the SHWF WEF construction which anticipates a large proportion of the total quarry output to be required within the first 7-12 months of the quarry operating. This is primarily due to the construction of the access tracks which require a large amount of material.

Key decommissioning activities

At the completion of the life of the proposed quarry, the site will be rehabilitated to ensure the final land form is consistent with the following principles:

- a final profile that would generally blend into the surrounding landscape and is suitable for return to pasture; and
- naturally draining to ensure water does not pond within the area of extraction.

The endorsed Work Plan identifies how the proposed quarry will be rehabilitated on completion of the operations Attachment S.

The basic steps include:

- Battering back the excavated rock slops to no steeper than 5H in 1V, with weathered rock or crusher reject rock used to fill wedges against the excavated rock slopes.
- The top surface of weathered rock will be covered with a layer of top soil which is proposed to be sourced from the stockpile area from the initial stages of the quarry.
- Topsoil area will be grass seeded.

2.2 Alternatives to taking the proposed action

Wind Energy Facility

A WEF project (the 'permitted WEF') has been approved under Commonwealth and state legislation however is no longer economically efficient given the current technology available. As such, applications/referrals for new or amended approvals are currently being sought for the 'amended WEF'.

On 8 July 2008, advice was sought from the Minister for Planning as to whether the SHWF WEF and related projects (then proposing 282 turbines) would require assessment under the *Environment Effects Act 1978* (Referral No. 2008R00007). The Minister determined on 29 September 2008 that no Environment Effects Statement was required to be prepared, subject to three conditions (these conditions were met through the planning permit process)

Additionally, a referral (2009/4719) under the *Environment Protection and Biodiversity Conservation Act 1999* was prepared and decision (11 February 2011) made to approve the SHWF project as a controlled action with conditions (Attachment F)

The decision on the controlled action was made following an assessment under the accredited State planning permit process (which assessed the planning permit application and the controlled action under the bilateral agreement), which resulted in the Planning Permit No PL-SP/05/0548 (Pyrenees Planning Scheme) being issued by the Minister for Planning on 26 October 2010 to enable the use and development of the SHWF WEF (the 'permitted' WEF)[2]. A copy of Planning Permit No. PL-SP/05/0548 is contained in Attachment G.

Planning Permit No. PL-SP/05/0548 was issued by the Minister for Planning to enable the use and development of the SHWF WEF, subject to 48 conditions. The preamble of the Planning Permit No. PL-SP/05/0548 allows for:

> *"Use and development of land for a wind energy facility comprising a maximum of 157 wind turbines and associated buildings and works including access tracks, underground cabling, overhead 132kV powerlines, not more than five substations, temporary concrete batching plants, up to 8 permanent anemometers (monitoring masts), a maintenance facility, car parking and bicycle facilities, a business identification sign, removal of native vegetation and the creation or alteration of access to roads in a Road Zone Category 1."*

The permitted layout is considered to be the layout shown on the indicative layout plan referenced within Condition 1 of Planning Permit No. PL-SP/05/0548 (*Map No. WF 02C; Rev. 01; dated 23/05/2010*)[3], but modified to show the deletion of turbines, removal of other infrastructure associated with the deleted turbines and re-siting of turbines as required by Condition 1(a), (b) and (c) of Planning Permit No. PL-SP/05/0548. The permitted layout is shown on the Permitted Wind Energy Facility Indicative Layout Plans contained in Attachment H.

Condition 4 of Planning Permit No. PL-SP/05/0548 provides detail of the total number, height, colour/finishing and other matters associated with the permitted wind turbines, essentially creating an envelope for development (including an overall maximum height of 132 m, tower height no greater than 80 m and blade length no greater than 52 m).

Additionally, Condition 6(f) of Planning Permit No. PL-SP/05/0548 states that the required native vegetation management plan must include "*a clear extent of the 5.28 ha (3.09 habitat hectares) of native vegetation to be removed".*

[2] Planning Permit No. 2009/104 and 2009/105 were also issued by the Minister for Planning on 26 October 2010 to enable the construction of a 132 kV / 500 kV terminal station near Berrybank and for the removal of native vegetation associated with the construction of a 132 kV overhead powerlines between the SHWF and the terminal station.
During the latter half of 2011, the 'permitted' overhead powerlines route and terminal station site were reviewed and it was determined that a terminal station site closer to the crossover of the 500 kV and 220 kV lines was preferable. A site to the south of Lismore on Lower Darlington Road was identified as suitable and permitted (Planning Permit No. PP2012/152.A) by the Shire of Corangamite in 2013. SHWFPL are currently seeking planning permits (for native vegetation and create/alter access to Road Zone Category 1) associated with the external overhead 132 kV powerlines.

[3] This plan has not been endorsed under Condition 1 of the Permit.

Between 2010 to mid 2014, development activities were progressed, including additional wind monitoring and background noise monitoring (in accordance with Condition 19 of Planning Permit No. PL-SP/05/0548), flora and fauna surveys (in accordance with Conditions 3, 9, and 11 of Planning Permit No. PL-SP/05/0548, and conditions of EPBC Decision 2009/4719), geotechnical testing and securing/amending the necessary land agreements for the project.

Stage 1 of the SHWF WEF development (the construction of 6 permanent anemometers) was undertaken in 2012 and constitutes the commencement of works in accordance with Planning Permit No. PL-SP/05/0548[4]. The purpose of Stage 1 was to allow the noise monitoring program required by Condition 19 of Planning Permit No. PL-SP/05/0548 to commence. As such, Planning Permit No. PL-SP/05/0548 is considered to be 'active' with an expiry date relating to the completion of development by 26 October 2020.

Following the commencement of the RET review in early 2014; the project was placed on hold. Since completion of the RET review in June 2015, and restored policy certainty to the large-scale renewable industry, works on the development have recommenced.

While the project was delayed, wind turbine technology available in the market has continued to evolve with newer wind turbines being developed which generate renewable energy at lower long-run average cost. As such, SHWFPL is currently seeking an amendment to Planning Permit No PL-SP/05/0548 to allow for the newer turbines, which would result in an increased tip height, blade length and tower height of each turbine (see Figure 6).

Additionally, Planning Permit No PL-SP/05/0548 (and environmental referrals) did not contemplate removal of native vegetation associated with roadworks for construction purposes. Detailed design has not been undertaken for the roadworks required to enable the construction of the WEF. However, enough information is known as to the maximum disturbance area that these works will require and consequently this native vegetation removal has been included as a part of the current planning permit amendment application and this referral.

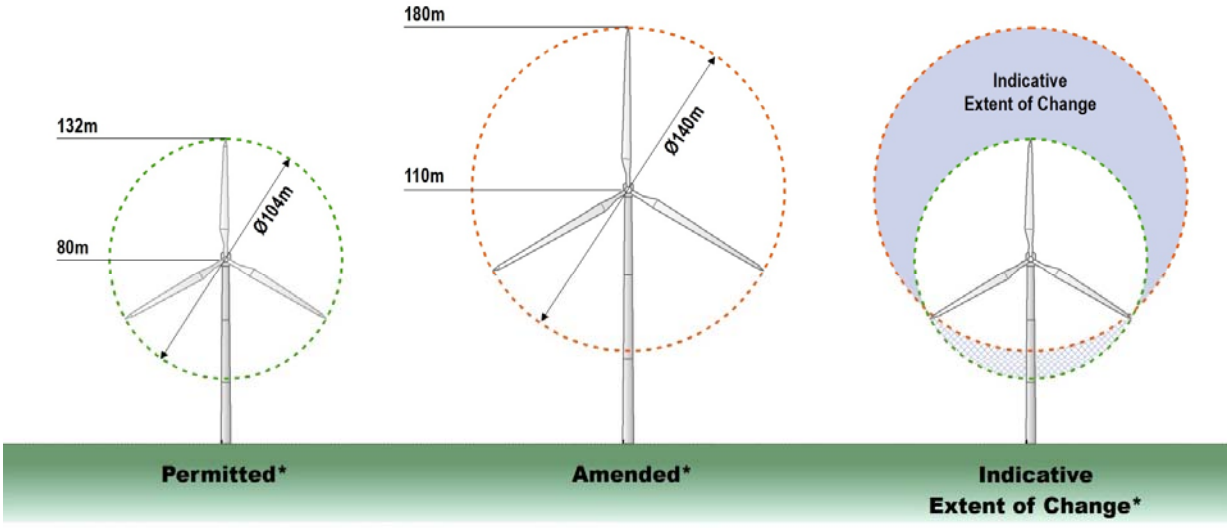


Figure 6 – Permitted and Proposed Amended Wind Turbines

Furthermore, since the original planning permit application (and environmental referrals) was prepared, and Planning Permit No PL-SP/05/0548 was issued, the turbine layout and other civil and electrical infrastructure impact areas have been refined to ensure they accurately represent what will be required to construct the SHWF WEF. The design assumptions used for the revised infrastructure footprint have been determined using the most conservative design outcomes for:

- the potential wind turbine options available within the specified dimensions, including craneage requirements (i.e. for turbine foundations, hardstands, access road widths and turn swept-paths);
- hydrology and geotechnical conditions (which influence the level of cut and fill and drainage); and

[4] This has been confirmed by the Department of Environment, Land, Water and Planning in a letter dated 7 January 2015.

- period of construction (i.e. ground breaking activities during wetter periods are likely to lead to an increased disturbance area).

The actual area of disturbance associated with the construction and operation of the WEF will be optimised for minimal impact pending final major procurement decisions, detailed civil and electrical design and timing of project construction.

Table 3 – WEF Footprint Assumptions

Infrastructure	Original Application	Current Design	Reason for difference
Access Tracks	5 m wide	General – 12.5 m wide Trunk – 13.5 m wide	Original design footprint assumed design as per minimal disturbance design (REpower MM92), being 4.4 m trafficable width with minimal verge. Revised design is based on largest design requirement for specified turbine dimensions, (5.5 m trafficable width) including allowance for road verges and drainage.
Underground Cable	Not specified	3 m wide	Original design footprint assumed cabling and access tracks followed the same alignment and did not account for their location side by side. Revised design assumes direct bury or open trenching construction outside of access track footprint.
Hardstands and Foundations	40 m x 25 m hardstands plus 16 m diameter foundations	50 m x 70 m including foundations	Original design footprint assumed design as per minimal disturbance design (REpower MM92). Revised design is based on largest design requirement for specified turbine dimensions.
Temporary Construction Facilities (Concrete Batching Plant / Staging Areas / Compound)	3 x 100 m x 100 m batch plants (north, south areas) 1 x 130 m x 250 m construction compound (west area)	2 x 100 m x 100 m (north/east area and south) 1 x 130 m x 250 m construction compound (west area) 1 x 100 m x 200 m (south area)	Original design assumes one batch plant located within main construction compound area. Revised design assumes west area batch plant located within quarry disturbance area (or alternatively within main compound). Revised design includes batching plant locations within other compound areas (i.e. substation construction area)
Permanent Maintenance Facility	1 (100 m x 40 m)	1 (100 m x 40 m)	No change.
Substations / Switchyards	5 x dimensions not specified	4 (100 m x 100 m)	One substation removed as part of project re-design. Revised design allows for temporary construction compound to be located adjacent to the substation site within the disturbance area.
Internal Powerlines	(dimensions not specified)	Ground clearance - 10 m wide Aerial clearance – 30 m wide	Revised design allows for a conservative disturbance corridor for access, temporary materials storage and foundation construction. Clearance of vegetation within a 30 m corridor (which has a height greater than 3m) to ensure appropriate safety clearance.

For the purpose of the application to amend Planning Permit No PL-SP/05/0548 (as well as environmental self-assessments and referrals) an assessment of each of the following footprints has been assessed using current guidelines (specifically in relation to the impact on flora) to ensure a comparison can be made of the differing scenarios:

1. Permitted WEF, using original application design assumptions.
2. Permitted WEF, using current design assumptions.
3. Amended WEF, using current design assumptions and overhead powerlines aerial footprint.

The key differences between the permitted WEF and proposed amended WEF is summarised in the below table.

Table 4 – Key WEF Changes

Component	Permitted WEF	Amended WEF	Change
Proposed turbine numbers	157[5]	149	Reduction of 8 turbines.
Overall height	132 m	180 m	Increased height of up to 48m.
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 year[6]	Approximately 232,100 households	Approximately 326,600 households	Increase of approximately 94,500 householders.
Greenhouse benefits[7]	Approximately 1.35 million tonnes of CO_2 savings per year	Approximately 1.9 million tonnes of CO_2 savings per year	Increase of approximately 0.55 million tonnes of CO_2 savings per year.
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 4 km of underground cable.
Length of internal overhead powerlines	Approximately 42 km	Approximately 11 km	Reduction of approximately 31 km of internal overhead powerlines.
WEF footprint area *(land impact by the construction of / occupied by physical WEF infrastructure)*	Original design assumptions - approximately 135.4ha 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 *(land impacted by roadworks and intersection upgrades required for construction)*	Not quantified.	Approximately 47.4 ha	Whilst works were permitted, the maximum footprint of 47.4 ha was not previously quantified. *(this area includes existing roads and road reserves)*
Native Vegetation Removal	The original referral made for the WEF included a 242 proposed turbines and corresponding infrastructure footprint (including access tracks and cabling). The planning permit was issued for 157 turbines and 5.28 ha (3.09Hha) of native vegetation removal. Additionally, the original referral / planning permit application was based on design assumptions (and	A maximum area of 38.267 ha of native vegetation is estimated to be impacted, including: • 34.415 ha (5.176 general biodiversity equivalence units) associated with the amended WEF (Scenario 3). • 3.852 ha (0.261 general biodiversity equivalence units and 0.202 specific units of habitat for Button	Increase of extent of native vegetation proposed to be impacted. *(Note: whilst the area of native vegetation is proposed to increase, the amended wind farm will reduce impacts on significant species and habitat)*

[5] Note that the original referral under the *Environment Effects Act 1978* proposed 282 turbines.
[6] 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.
[7] 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".

Component	Permitted WEF	Amended WEF	Change
	footprint) which is no longer considered appropriate (e.g. often it does not allow for the area required for construction, only the footprint of the physical infrastructure). In order to assess the change between the permitted wind farm and the amended WEF 3 scenarios have been assessed to provide like for like comparison, including: • Scenario 1 - permitted layout (using original design assumptions) • Scenario 2 - permitted layout (using current design assumptions) • Scenario 3 - amended layout (using current design assumptions) Flora and fauna assessment found: • Scenario 1 – 15.915 ha ha (1.993 general biodiversity equivalence units and specific offsets). • Scenario 2 – 31.991 ha (4.172 general biodiversity equivalence units and specific offsets).	Wrinklewort) associated with the proposed roadworks.	

As such, the permitted WEF is no longer economically efficient given the current technology available.

Related Projects

External Overhead Powerlines and Terminal Station

Planning Permit No. 2009/104 and 2009/105 were issued by the Minister for Planning on 26 October 2010 to enable the construction of a 132 kV / 500 kV terminal station near Berrybank and for the removal of native vegetation associated with the construction of a 132 kV overhead powerlines between the SHWF and the terminal station near Berrybank.

However, during the latter half of 2011, the 'permitted' overhead powerlines route and terminal station site were reviewed and it was determined that a terminal station site closer to the crossover of the 500 kV and 220 kV lines was preferable.

Matters considered as part of the review included:

- The number of turbines allowed by the WEF Planning Permit No PL-SP/05/0548 (Pyrenees Planning Scheme, issued by the Minister for Planning on 26 October 2010) (from the 242 contemplated in the planning permit application to the permitted 157 turbines) and how the project's transmission infrastructure could deliver the maximum amount of renewable energy to customers.
- Australian Energy Market Operator (AEMO) advice that it would be preferable that wherever possible, terminal stations should be located in areas that provide greater flexibility for the future development of the transmission network.

- Updated electrical safety clearance guidelines to develop an improved overhead powerlines route to ensure that required vegetation clearances can be satisfied.
- The cost effectiveness of the various options to maintain or reduce the overall cost of the electricity supplied to customers.

As a result, using the criteria listed in AEMO's Victorian *Guidelines for Establishing Terminal Stations, June 2011* coupled with the review of potential environmental and social issues for a number of site options and consultation with planning agencies, SHWFPL identified a new site for the terminal station near the intersection of Lower Darlington Road and Smiths Road, Lismore. A permit was issued for the terminal station by the Shire of Corangamite in 2013 (Attachment Q).

A Multi-Criteria Analysis was undertaken to assess a number of corridor options to connect the WEF with the terminal station with overhead powerlines. The purpose of the Multi-Criteria Analysis was to identify a suitable 750 m corridor in which an overhead powerlines may be developed. The Multi-Criteria Analysis process is a proven means of simplifying complex decision-making tasks, serving both as a process and a tool to aid the identification of a preferred solution from a range of alternatives.

Preliminary environmental assessments were completed on the potential terminal station site and the preliminary overhead powerlines corridor options.

The analysis used a "triple bottom line" approach to addressing economic, social and environmental issues, and used a framework of goals, principles and weighted criteria to compile GIS datasets and assess corridor options spatially. These criteria informed the GIS route selection tool which was run to find a series of corridors to be assessed by environmental specialists. A series of workshops were held with agencies and regulators in the region in 2011 to identify the environmental constraints and permitting requirements. The workshops assessed route alignments as well as pole locations.

Seven corridors were identified, including creating a 750m corridor buffer on the centreline or the permitted overhead powerlines route in order to compare this option with the newly identified options. The assessment of options was then used to inform the final assessment against the Risk Assessment Framework to confirm the preferred corridor.

The preferred corridor was further refined to form the proposed overhead powerlines route and construction footprint, informed by detailed flora and fauna investigations and landowner negotiations.

Quarry

SHWFPL assessed options for providing the necessary materials for the construction of the SHWF, including sourcing the material from quarries within 50 km of the WEF site and the establishment of a quarry within the WEF site boundary. It was determined that an option of an onsite quarry source of material would be preferred, with 8 areas within the vicinity of the WEF site initially being reviewed as potential quarry sites.

An assessment of the options for the sourcing of construction materials for the SHWF was prepared. This assessment looked at the geotechnical, environmental and planning constraints that affected the 8 possible areas for quarries and identified a number of options for sourcing of materials including:

- Entirely on-site sources (one centralised quarry)
- Entirely on-site sources (establishment of two quarries within the project area to service different areas of the SHWF site)
- A mixture of on-site and off-site sources
- Entirely off-site sources

To understand the availability, proximity and cost of material from local quarries, the following was undertaken:

- Obtained data from DPI (now DEDJTR) for established quarry sites within 65km of Stockyard Hill (broadly equivalent to 50 km from the wind energy facility boundaries)
- Internet searches for quarries in the local area not included in DPI data

- Limited the search to those quarries over 20 ha – these are more likely to have the capacity to produce the volumes required
- Limited the search to those quarries that produce the materials required
- Consulted with the Pyrenees Shire Council to confirm findings

This process identified 11 quarries in the area that could potentially supply required material (from basalt to hornfels) for use in the construction of the wind energy facility including access tracks and repair of local roads.

The large volumes required for the construction of the wind energy facility and the limited appropriate resource makes off-site sources less desirable than on-site sourcing. In addition, the impact of the increase in heavy vehicle traffic on local roads and traffic makes this option less desirable.

SHWFPL identified two sites within the wind energy facility site area that were selected for further assessment.

A geotechnical study provided input into the identification of the preferred quarry location. This report focused on an assessment of the quality of material available at two on site locations. This study assessed the suitability of land by conducting an assessment of the following site aspects:

- hydrogeological studies
- geotechnical studies
- planning assessments
- landowner support
- proximity to construction areas
- transport management

As a result, the preferred location for the proposed quarry was selected.

Ultimately, SHWFPL found that the subject site was the most appropriate site to establish a quarry as:

- The site could assist in the provision of the necessary quality and quantity of necessary materials for the construction of the SHWF.
- The site is located on developed farm land and the quarry will have minimal impact on remnant vegetation.
- The site has a topography which will assist in managing water related issues during operation and rehabilitation.
- There is limited potential conflict with surrounding land uses (agriculture or residential).
- Operation of the quarry does not conflict with the proposed turbine areas or access tracks.
- The site is within the boundaries of the WEF. The bulk of movements associated with the transport of aggregate will be confined to the internal road network, therefore minimising the potential for impacts to public roads and safety issues for other road users in the areas well as local material supplies.
- Post extraction, the quarry is able to be rehabilitated and returned to farm land.

The use of the site was supported by relevant statutory agencies and the property owner.

2.3 Alternative locations, time frames or activities that form part of the referred action

Micro-siting of Turbine Locations

The turbine layout shown on Amended Wind Energy Facility Indicative Layout Plans (Attachment D) has been developed using the results of the specialist assessments undertaken, wind monitoring data collected and preliminary construction assessment.

Minor modification to the layout may occur in the future based on detailed design. In accordance with Condition 1 of Planning Permit No. PL-SP/05/0548, before the development starts, development plans which are generally in accordance with the indicative layout plans, must be prepared to the satisfaction of the Minister for Planning. It is anticipated that this requirement will remain unchanged as a result of the amendment process.

Turbine Selection

The final turbine selection will be dependent on commercial negotiations; however, the maximum turbine dimensions outlined in Section 2.1 of this referral will not be exceeded. Furthermore, specialist assessments undertaken to inform this referral are based on a worst case scenario turbine model for each study.

2.4 Context, planning framework and state / local government requirements

Act	
Planning and Environment Act 1987	**Wind Energy Facility** Clause 74 Land Use Terms of the Victoria Planning Provisions defines a wind energy facility as: *Land used to generate electricity by wind force. It includes land used for:* *a) any turbine, building or other structure or thing used in or in connection with the generation of electricity by wind force* *b) an anemometer.* *It does not include turbines principally used to supply electricity for domestic or rural use of the land.* The site is predominately located within the Farming Zone and a small area within the Road Zone, Category 1. Turbines are not proposed to be located within the Road Zone, Category 1 (Skipton Road and Old Geelong Road), however underground cables and new access points are proposed. The site is also partially affected by Clause 42.01 (Environmental Significance Overlay - Schedule 1 'Designated Water Supply Areas'), Clause 42.02 (Vegetation Protection Overlay – Schedule 1 'Roadside Grassland Protection And Conservation'), and Clause 44.06 (Bushfire Management Overlay). Planning approval is required for the use and development of a wind energy facility (and associated activities), pursuant to Clause 35.07 (Farming Zone), Clause 36.04 (Road Zone, Category 1), Clause 42.01 (Environmental Significance Overlay (Schedule 1 - Designated Water Supply Areas)), Clause 52.17 (Native Vegetation), Clause 52.29 (Land Adjacent to a Road Zone, Category 1, or a Public Acquisition Overlay for a Category 1 Road), and Clause 52.32 (Wind Energy Facility) of the Pyrenees Planning Scheme. An application to amend Planning Permit PL-SP/05/0548 was lodged with the Minister for Planning on 12 May 2016. **Related Projects** *External Overhead Powerlines* The Corangamite and Pyrenees Planning Schemes define the external overhead powerlines as a 'minor utility installation'. The external overhead powerlines alignment will predominately traverse the Farming Zone along with small areas of Road Zone, Category 1. Planning approval is not required for a minor utility installation within these zones. It is not considered that the construction of the overhead powerlines constitute earthworks. Planning approval is required for: • for native vegetation removal, pursuant to Clause 42.02 (Vegetation Protection Overlay – Schedule 2 'Roadside Vegetation Protection Area') (Pyrenees Planning Scheme) and Clause 52.17 (Native Vegetation) (Pyrenees and Corangamite Planning Schemes); and • to create and alter access to Road Zone Category 1, pursuant to Clause 52.29 (Land Adjacent to a Road Zone, Category 1, or a Public Acquisition Overlay for a Category) (Pyrenees and Corangamite Planning Schemes). A planning permit application was lodged with the Minister for Planning on 12 May 2016. *Terminal Station* In applying the Corangamite Planning Scheme, the most appropriate or 'best fit' definition for the terminal station is a 'utility installation'. The site is predominately located within the Farming Zone and a small area within the Road Zone, Category 1. No overlays apply to the site. Planning approval is required for the use and development of a utility installation (and associated works), pursuant to pursuant to Clause 35.07 (Farming Zone) and Clause 52.29 (Land Adjacent to a Road Zone, Category 1, or a Public Acquisition Overlay for a Category 1 Road) (Corangamite Planning Scheme). Planning Permit PP2012/152.A was issued by the Shire of Corangamite on 22 February 2013. An amendment to the expiry date condition of the permit was made by the Shire of Corangamite on 16 November 2015 (A copy is included in Attachment Q. *Quarry*

Act	
	A quarry is best described as 'stone extraction' which is defined in Clause 72 (Land Use Terns) of the Pyrenees Planning Scheme as: *"Land used for the extraction or removal of stone in accordance with the Mineral Resources (Mineral Resources (Sustainable Development) Act 1990".* 'Stone extraction' is defined as 'Earth and Energy Resources Industry: *"Land used for the exploration, removal or processing of natural earth or energy resources. It includes any activity incidental to this purpose including the construction and use of temporary accommodation".* The site is located within the Farming Zone. No overlays apply to the quarry development area. Planning approval is required for the use and development of extractive industry, pursuant to Clause 35.07 (Farming Zone) and Clause 52.08 (Earth and Energy Resources Industry) of the Pyrenees Planning Scheme. A planning permit application was lodged with the Shire of Pyrenees on 13 May 2016.
Mineral Resources (Sustainable Development) Act 1990	A Work Plan and Work Authority are required to be obtained under the *Mineral Resources (Sustainable Development) Act 1990* for the quarry. As part of a Work Authority process, a draft Work Plan (WA1518) was prepared and endorsed by the Department of State Development and Business Innovation, now the DEDJTR on 5 May 2014. Once a planning permit is issued, the following will need to be undertaken: • Lodge 'Information Package' (including planning permit and Work Plan) with DEDJTR. • Once Work Plan is approved, submit Work Authority Application (including the payment of a rehabilitation bond) to the DEDJTR. The removal of native vegetation (of which none is proposed) from the site, including the referral to the Department of Environment, Land, Water and Planning was managed as part of the Work Plan process. As such, no planning permit is required to remove native vegetation pursuant to Clause 52.17 (Native Vegetation) of the Pyrenees Planning Scheme.
Aboriginal Heritage Act 2006	**Wind Energy Facility** On 22 October 2009, the Wathaurung Aboriginal Corporation approved a Cultural Heritage Management Plan (CHMP) for the WEF (CHMP 10530) under the Aboriginal Heritage Act 2006. A review of CHMP 10530 found that an additional two CHMPs should be prepared for the amended WEF. One CHMP to include 2 new areas not currently included within the activity area (1 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. As such, CHMP 14281 and CHMP 14279 are currently being prepared, in consultation with the Wathaurung Aboriginal Corporation. **Related Projects** *External Overhead Powerlines* Cultural Heritage Management Plan (CHMP) No. 12177 is currently being prepared under the Aboriginal Heritage Act 2006, for the external overhead powerlines in consultation with the Wathaurung Aboriginal Corporation. *Terminal Station* Cultural Heritage Management Plan (CHMP) No. 12081 was approved on 19 July 2012 and CHMP No. 12402 on 15 January 2013, under the Aboriginal Heritage Act 2006, associated with the development of the terminal station. *Quarry* A voluntary CHMP (12648) was prepared for the Quarry and approved under the Aboriginal Heritage Act 2006, by Wathaurung Aboriginal Corporation on 14 May 2014.
Other	The requirements of other relevant Victorian Acts, including (but not limited to) the following, will also be addressed through the development of the SHWF project: • Civil Aviation Act 1988 • Crown Land (Reserves) Act 1978 • Land Act 1958

Act	
	• Electricity Industry Act 2000 • Electricity Safety Act 1988 • Environment Protection Act 1970 • Flora and Fauna Guarantee Act 1988 • Heritage Act 1995 (Vic) • Land Acquisition and Compensation Act 1986 • Road Management Act 2004 • Rail Corporation Act 1996 • Water Act 1989 • Wildlife Act 1975

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

Environment Protection and Biodiversity Conservation Act 1999

EPBC decision 2009/4719 was made on 11 February 2011 under the *Environment Protection and Biodiversity Conservation Act 1999* to approve the WEF and related projects (as a controlled action).

The referral contemplated a range of activities to support the use and development of the WEF and related projects, however the proposed changes to the WEF and related projects now means that it is considered a different action as compared to the action described in the original referral for the project[8].

A referral was made (2012/6620) associated with the new terminal station however it a request to withdraw this referral has been made by SHWFPL.

As such, a self-assessment of the amended WEF (as well as the other related projects) has been undertaken considering the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance*, and in particular the 'significant impact criteria', as relevant, and SHWFPL has prepared this referral under the EPBC Act.

Environment Effects Act 1978

On 8 July 2008, SHWFPL sought advice from the Minister for Planning as to whether the WEF and related projects would require assessment under the *Environment Effects Act 1978*. The Minister for Planning determined on 29 September 2008 that no Environment Effect Statement was required to be prepared, subject to conditions being met through planning permit process.

A self-assessment of the current proposed SHWF and related projects has been undertaken in accordance with the Ministerial Guidelines for assessment of environmental effects under the *Environment Effects Act 1978*. The assessment found that the SHWF and related projects is not likely to have a significant effect on the environment; however a referral has been prepared and lodged with the Minister for Planning.

2.6 Public consultation (including with Indigenous stakeholders)

Since the commencement of the project, SHWFPL has been communicating, informing and listening to the local community (including the host landowners, neighbours (within 2 km of a permitted turbine), objectors of original planning permit application, the wider community, and the Pyrenees Shire Councillors). Engagement has been undertaken through a number of forums, including:

- Operating a project specific website providing information and updates.
- Operating a project specific 1800 phone number for community members to call for further information.
- Distributing project newsletters on a quarterly (or otherwise as appropriate given the level of development progress) basis distributed through the local postal service.
- Briefings of the councillors and officers of the local councils (Pyrenees and Corangamite) on a quarterly (or otherwise as appropriate given the level of development progress) basis.

[8] The definition of an action within the EPBC Act includes an alteration of a project. As such, the revised WEF is a different action to the action approved, because it is an alteration to the project described in the original referral.

- A dedicated full-time SHWFPL project representative is regularly on-site to meet face-to-face with landowners and the general community regarding the project, including meeting with all landowners (host landowners and neighbours with 2 km of a permitted turbine) several times though all stages of the planning process.

SHWFPL also regularly advertises and provides information via the local media through advertisements and media articles; it has also sponsored the local community calendar which features in the local paper.

Additionally, a Stakeholder Engagement Plan has been prepared (as part of the Endorsed Work Plan - Attachment S) to assist SHWFPL to consult and communicate with stakeholders about the development and operation of the quarry. In particular the plan has been developed in line with the relevant extractive industry guidelines and considers the scale, nature and potential community related aspects of the quarry.

The plan includes discussion of:

- Consultation undertaken to date
- Identifies affected communities and stakeholders
- The overall quarry engagement strategy
- Consultation planned and achieved for the development and approvals phase
- Proposals for communication and engagement measures to be employed during the operational phase.

The plan also includes a proposal for registering, documenting and responding to complaints and other communications from the community in relation to the quarry.

The Wathaurung Aboriginal Corporation has been consulted during the preparation of the CHMPs.

2.7 A staged development or component of a larger project

The development is not part of a larger or staged project.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

There are no World Heritage Properties listed within the area of the proposed actions.

Nature and extent of likely impact

There will be not impacts to any World Heritage Properties.

3.1 (b) National Heritage Places

Description

There are no National Heritage Places listed within the area of the proposed actions.

Nature and extent of likely impact

There will be not impacts to any National Heritage Places.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

Wind Energy Facility

The actions is located approximately 40 km north of Lake Gnarpurt, part of the Western Districts Lakes Ramsar Wetland, which comprises nine separate lakes (Beeac, Bookar, Colongulac, Corangamite, Cundare, Gnarpurt, Milangil, Murdeduke and Terangpom).

Related Projects

External Overhead Powerlines

The action is located at its closest point 5 km, and at its furthest point approximately 57 km north west of Lake Gnarpurt, which forms part of the Western Districts Lakes Ramsar Wetland site. The route crosses Haunted Gully Creek (in the property north of the terminal station) which drains into Lake Gnarpurt.

Terminal Station

The site is located approximately 5 km north west of Lake Gnarpurt, which forms part of the Western Districts Lakes Ramsar Wetland site. Haunted Gully Creek that runs through the eastern bordering property to the site drains into Lake Gnarpurt. Salt Creek is to the south of and close to the Lower Darlington Road.

Quarry

The action is located approximately 50 km north of Lake Gnarpurt, which forms part of the Western Districts Lakes Ramsar Wetland site.

Nature and extent of likely impact

Wind Energy Facility

Significant impact to the Ramsar site is unlikely due to the localised nature of the proposed works and the distance between the Ramsar site and the proposed WEF site.

Related Projects

External Overhead Powerlines

Construction methods will employ appropriate controls to ensure that run-off from the site is contained and does not impact on Haunted Gully or Salt Creek. It is not expected that the proposed action will have a significant impact on any Ramsar Wetland.

Terminal Station

Construction methods will employ appropriate controls to ensure that run-off from the site is contained and does not impact on Haunted Gully or Salt Creek. It is not expected that the proposed action will have a significant impact on any Ramsar Wetland.

Quarry

Significant impact to the Ramsar site is unlikely due to the localised nature of the proposed works and the distance between the Ramsar site and the proposed quarry site.

3.1 (d) Listed threatened species and ecological communities

Description

Wind Energy Facility

Table 5 and Table 6 outline the nationally significant species and ecological communities recorded within the local area.

Table 5 – Nationally significant species and ecological communities (WEF Infrastructure)

Species	
Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*	A desktop assessment found that there are no previous records of the species within the study area. Although small areas of suitable habitat (i.e. Plains Grassland) was identified in the study area for this species, Spiny Rice-flower was not detected despite targeted survey being conducted within the permitted WEF during the species' flowering period (July-August 2011). Similarly, the species was not detected within the amended WEF footprint study area.
Matted Flax-lily *Dianella amoena*	While this species was recorded at two locations within the broader study area (i.e. in Heavier-Soils Plains Grassland along Cheesemans Road reserve and Carngham – Streatham Road reserve), the species was not recorded within the permitted and amended WEF footprint and is not likely to be impacted.
White Sunray *Leucochrysum albicans* var. *tricolor*	Approximately 30 White Sunray plants were recorded within the broader study area during targeted surveys. Plants were recorded within the road reserve on the east side of the Eurambeen Streatham Road and along sections of Stockyard Hill Road. Under the permitted WEF, the White Sunray population was proposed to be bisected by an access track leading to a turbine location. However, as a result of changes to the amended WEF footprint in this area plants will be avoided.
Striped Legless Lizard *Delma impar*	This species has a patchy distribution within the study area, and has been recorded during targeted surveys from areas of suitable grassland habitat primarily along roadside remnants. Under the permitted WEF Striped Legless Lizard low quality habitat was proposed to be impacted in areas supporting native grassland (principally in the southern portion of the study area). Areas of potentially suitable habitat for Striped Legless Lizard are likely to be impacted by the amended WEF.
Golden Sun Moth *Synemon plana*	All suitable areas within the study area have been surveyed for this species. The species was detected in high numbers from a single property within the study area, in both the permitted or amended WEF footprints with a reduction in impact in the amended footprint.

Species	
Natural Temperate Grassland of the Victoria Volcanic Plain	This community was recorded during pervious detailed ecological surveys and occurs mostly in road reserves. Areas of Natural Temperate Grassland of the Victoria Volcanic Plain are largely restricted to road reserves and intersections within the study area. A reduction of 0.49 ha of this community is proposed to be disturbed by the amended WEF (now 0.06 ha), compared with the permitted WEF (0.55 ha).

Despite the presence of suitable habitat and nearby documented records, Ben Major Grevillia, Clover Glycine, Adamson's Blown Grass, Button Wrinklewort, Swamp Everlasting, and Salt-Lake Tussock-Grass, specimens were not recorded during targeted surveys. It is therefore considered unlikely that any of these EPBC Act-listed species will be impacted by either the permitted or amended WEF footprint.

Similarly, with the exception of Growling Grass Frog where this is low quality habitat in the form of artificial waterbodies (e.g. farm dams) and ephemeral drainage lines, and where the species or its habitats are unlikely to be impacted by the amended WEF, no other EPBC Act-listed fauna species are expected to reside within the study area and be impacted by either the permitted or amended WEF footprint.

Table 6 – Nationally significant species and ecological communities (Roadworks)

Species	
Natural Temperate Grassland of the Victoria Volcanic Plain	One ecological community listed under the EPBC Act was recorded within the study area; Natural Temperate Grassland of the Victoria Volcanic Plain. The criteria to determine if remnant grassland meets the condition thresholds for Natural Temperate Grassland of the Victoria Volcanic Plain. Habitat zones representative of Plains Grassland located along Dunnets Road meet the condition thresholds to constitute Natural Temperate Grassland of the Victoria Volcanic Plain. All remaining Plains Grassland patches within the study area do not qualify as Natural Temperate Grassland of the Victoria Volcanic Plain given the insufficient cover (<50%) of perennial native grasses and a high (>30%) non-grassy weed cover. Three patches of Natural Temperate Grassland of the Victoria Volcanic Plain were identified and cover a total of 0.26 ha. No additional ecological communities listed under the EPBC Act are present within the study area. Vegetation identified as Plains Grassy Wetland within the study area did not qualify as EPBC Act-listed Lowland Seasonal Wetlands of South-eastern Australia due to the lack of native grasses and dominance of Common Spike-sedge.
Matted Flax-lily *Dianella amoena*	Matted Flax-lily was recorded at two locations along Cheesemans Road reserve and Carngham – Streatham Road reserve, which is outside of the current study area.
White Sunray *Leucochrysum albicans* var. *tricolor*	Several White Sunray individuals were detected immediately outside of the study area along the western edge of Stockyard Hill Road south of the intersection with Beaufort-Carranballac Road. A population of White Sunray also occurs along Eurambeen-Streatham Road, outside of the road and intersection upgrades footprint.
Striped Legless Lizard *Delma impar*	Striped Legless Lizard was detected along the western side of the Stockyard Hill Road roadside reserve, and there is suitable grassland habitat for this species within this section of the road (albeit isolated and highly modified with less than 25% cover of native grasses).

Additionally, an additional nationally listed species have either been recorded or are predicted to occur within the local area, however were not identified during surveys.

Related Projects

External Overhead Powerlines

Table 7 outlines the nationally significant species and ecological communities recorded within the local area.

Table 7 – Nationally significant species and ecological communities (Overhead Powerlines)

Species	
Natural Temperate Grassland of the Victoria Volcanic Plain	Habitat zones representative of Plains Grassland EVCs (PG 1 and 2) meet the condition thresholds and are considered part of the ecological community Natural Temperate Grasslands of the Victorian Volcanic Plain (i.e. a total area of 0.128 ha). The remaining habitat zones of Creekline Tussock Grassland and Plains Grassland do not qualify as Natural Temperate Grassland of the Victoria Volcanic Plain due to having insufficient cover (<50%) of perennial native grasses and a high (>30%) non-grassy weed cover.
Grassy Eucalypt Woodland of the	Habitat zones representative of Plains Grassy Woodland EVCs (PGW 5) meet the condition thresholds and are considered part of the ecological community Grassy Eucalypt Woodland of the Victorian Volcanic Plain (i.e. a

Species	
Victorian Volcanic Plain	total area of 0.002 ha). The remaining habitat zones of Plains Grassy Woodland (EVC 55_61) and *Higher Rainfall* Plains Grassy Woodland (EVC 55_63) do not qualify as Grassy Eucalypt Woodland of the Victorian Volcanic Plain P due to having insufficient cover (<50%) of perennial native grasses, are heavily invaded by perennial weeds (>70%) and do not have more than 10 native perennial species per 100 m^2 AND a density of at least 3 big trees per hectare.
White Sunray *Leucochrysum albicans var. tricolor*	This species was recorded within roadside reserves along Rokewood-Skipton Road south of Notmans Road and north of Mount Bute Road. The overhead powerlines is proposed to be located within private property to the north of the roadside reserve, thereby avoiding the populations of this species and the EPBC Act-listed Natural Temperate Grassland of the Victoria Volcanic Plain ecological community that occur at this location.

No nationally significant fauna species were recorded during the present survey. Eighteen nationally significant fauna species have previously been recorded from the local area or, are predicted to occur. However, based on habitat type and conditions present within the study area, it is unlikely that most of these species would occur within the study area on a regular basis and use the site as preferred habitat. Due to the linear nature of the powerlines and minimal ground disturbance associated with the development, it is considered unlikely that the proposed action will have a significant impact on these species. Further information can be found in Attachment M and Attachment N.

Terminal Station

The flora and fauna assessment (Attachment R) of the site confirmed that Natural Temperate Grasslands of the Victorian Volcanic Plain and Grassy Eucalypt Woodland of the Victorian Volcanic Plain are not present at the site. Vegetation identified as *Plains Grassy Wetland (EVC 125)* did not meet the condition thresholds to constitute the EPBC-listed *Seasonal Herbaceous Wetlands of the Temperate Lowland Plains.* No threatened flora or fauna species listed under the EPBC Act were identified during the flora and fauna assessment within the Lismore Terminal Station site.

The terminal station site is considered to support very limited habitat for threatened fauna species that are modelled as likely to occur within the area or have previously been recorded within the wider vicinity. The stand of Sugar Gums may provide sub-optimal species for some woodland species, and these trees are proposed to be retained (i.e. not be impacted by the proposed works). While the patches of native grassland identified along Smiths Road are considered to provide potential habitat for the Striped Legless Lizard, these patches will not be impacted by the proposed action.

It is considered that the patches of Plains Grassland identified along Smiths Road, within the Lower Darlington Road reserve and within the Camperdown – Lismore Road and Lower Darlington Road intersection, may provide habitat for the Spiny Rice-flower. The patches in Lower Darlington Road Reserve and near the Intersection at Camperdown Lismore Road are not within the proposed disturbance area and will not require removal.

Additionally, two tile grids have been established at or near the Camperdown-Lismore Road and Lower Darlington intersection and are being surveyed from October to December 2012 for the presence of the Striped Legless Lizard. A single tile grid was also located in the Lower Darlington Road reserve near the proposed site entry point. The three tile grids have been checked twice in October and no Striped Legless Lizards observed.

Quarry

A flora and fauna assessment has been undertaken at the site (Appendix G of Attachment S. A review of the relevant databases and previous studies outlined in the assessment suggested that the site may support the Threatened Ecological Community, Natural Temperate Grasslands of the Victorian Volcanic Plain. As such, the ecological assessment included:

- Winter targeted surveys for Spiny Rice flower
- Spring targeted flora surveys (particularly for Slender Bindweed)
- A flora, fauna and Net Gain assessment
- Assessment of the presence of ecological communities such as the Natural Temperate Grassland of the Victoria Volcanic Plain

Low numbers of Striped Legless Lizard have been recorded in previous surveys of the SHWF area (undertaken in spring and summer 2011/12 and 2012/13 across the WEF area) and there is potential habitat at the site, however given that low numbers were detected in the wider area, it is considered unlikely the proposed quarry will have significant impact on the species. Furthermore, no individuals were recorded within the proposed SHWF quarry site during targeted field investigations undertaken during the 2011 and 2012 active seasons.

Golden Sun Moth habitat was recorded in high quality native grassland habitat approximately 9 km north of the site; however the vegetation at the quarry site includes a mixture of native and introduced grasses and is unlikely to support the Golden Sun Moth habitat.

In conclusion the assessment found that:

- No EPBC Act listed flora species were recorded during the flora surveys.
- There is no suitable habitat to other nationally significant species on the site due to the low quality of habitat and persistent grazing and lack of wetland flora species.

No ecological communities listed under the EPBC Act are present within the quarry site.

Nature and extent of likely impact

Wind Energy Facility

Natural Temperate Grassland of the Victoria Volcanic Plain

The WEF will result in the removal and/or disturbance of approximately 0.08 ha of Natural Temperate Grassland of the Victoria Volcanic Plain (a reduction of approximately 0.49 ha compared with the permitted WEF).

An assessment against *EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines* is provided in the table below.

Table 8 – Assessment against the Significant Impact Guidelines for Endangered or Critically Endangered Ecological Communities (Natural Temperate Grassland of the Victoria Volcanic Plain

Significant impact Criteria	Comment
1. Reduce the extent of an ecological community.	The proposed development will result in the loss of very small area of modified NTGVVP (i.e. 0.08 ha).
2. Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	The proposed removal of small patches of NTGVVP will not lead to the fragmentation of a much larger patch of NTGVVP (i.e. patches of NTGVVP are already fragmented and isolated for any larger patches).
3. Adversely affect habitat critical to the survival of an ecological community.	The proposed removal of NTGVVP will not adversely affect the long-term survival of the ecological community.
4. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	Given the localised nature of the proposed action, groundwater levels, water drainage patterns and nutrient loads will not be affected by the proposed development.
5. Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	Due to the small, localised nature of the NTGVVP and the extent of the proposed removal, the overall functionality of the community within a landscape context will not be affected by the proposed development.
6. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: a. assisting invasive species, that are harmful to the listed ecological community, to become established or; b. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	The proposed development will result in the loss of 0.08 ha of NTGVVP, however this loss is considered marginal due to the small area and isolated nature of the vegetation.

7. Interfere with the recovery of an ecological community.	The proposed development will not allow for the recovery of this community, however due to the minimal area of NTGVVP the loss is considered to be minimal.

The proposed development will result in the removal of 0.08 ha of the NTGVVP ecological community and this does not meet the significant impact thresholds outlined in the significant impact guidelines for this ecological community.

Golden Sun Moth

The WEF has the potential to impact approximately 1.57 ha of known Golden Sun Moth habitat (a reduction of approximately 1.1 ha compared with the permitted WEF).

As outlined to DoE (2013), an action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- Lead to a long-term decrease in the size of a population
- Reduce the area of occupancy of the species
- Fragment an existing population into two or more populations
- Adversely affect habitat critical to the survival of a species
- Disrupt the breeding cycle of a population
- Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
- Introduce disease that may cause the species to decline, or
- Interfere with the recovery of the species.

Given that approximately 1.57 ha of suitable grassland habitat that is known to support a population of Golden Sun Moth is proposed to be permanently removed as a result of the construction of internal access tracks and turbine bases, the extent of impacts are considered to be significant under the EPBC Act.

However it is considered that through the use of a conservation management plan, on the property where the Golden Sun Moth and the known habitat have been found, it provides an opportunity for a defined offset area to protect the Golden Sun Moth and its 'known' habitat as a conservation reserve in perpetuity, resulting in a net benefit to the species.

Striped Legless Lizard habitat

The project may result in the loss and/or disturbance to approximately 37.13 ha of low-medium quality and 2.5 ha of modified grassland Striped Legless Lizard habitat.

An assessment against *EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines* is provided in the table below.

Table 9 – Assessment against the Significant Impact Guidelines for Vulnerable species (Striped Legless Lizard)

Significant impact Criteria	Comment
1. Disrupt the breeding cycle of an 'important population', defined as: key source populations either for breeding or dispersal populations that are necessary for maintaining genetic diversity populations that are near the limit of the species range. Sites less than 0.5 ha Small isolated areas of habitat which are currently under pressure, or are likely to experience long-term pressures (for example sites	Despite targeted surveys being undertaken across the proposed WEF footprint (i.e. in areas of proposed internal access tracks and turbine locations) no Striped Legless Lizards were detected. However, the species was recorded along Stockyard Hill Road and Dunnets Roads. The proposed action will result in the removal of approximately 37.13 ha of medium quality and 2.5 ha of modified grassland Striped Legless Lizard habitat.

located within urban settings, such as adjacent to factories or in residential subdivisions) Small sites which support marginal or low quality habitat (for example dominated by high threat weeds).	The grassland habitat across the WEF infrastructure area is highly modified and subject to ongoing land use practices (principally grazing) and is connected to extensive areas (i.e. it forms part of an area greater than 0.5 ha) within the agricultural landscape. These areas (i.e. several hectares) of available habitat (not impacted by the proposed amended WEF)are consistent with the areas proposed to be impacted (e.g. is similar habitat) and support the species' breeding and dispersal requirements in the future. Therefore, the breeding and dispersal capabilities of this population are unlikely to be significantly impacted given the highly localised nature of the proposed WEF infrastructure works. Additionally, given that several individual Striped Legless Lizards were detected during targeted surveys over several months along Stockyard Hill Road roadside reserve and a single Striped Legless Lizard specimen was captured along Dunnets Road, it is apparent that these two sections of the roadside reserves supports an extant population of the species, where ongoing breeding and dispersal occurs. However, given the location of the site, this population is not considered to be near the limit of the species range, nor is it likely to be an important population for maintaining genetic diversity across the species geographical range. As outlined above, the proposed action will result in a minor reduction in the extent of potential Striped Legless Lizard habitat, with the proposed removal of linear strips of highly modified grassland along either side of Stockyard Hill Road and Dunnets Road. The total area of potentially suitable habitat that is proposed to be disturbed along either side of the roadside is approximately 2.5 ha. It is important to note that the small linear strips proposed to be disturbed either side of Stockyard Hill Road and Dunnets Road constitute a small proportion of grassland habitat present, and areas along the roadside will be avoided during the road works (i.e. retained areas will be clearly demarcated or fenced as no-go areas). The vegetation along both Stockyard Hill Road and Dunnets Road roadside reserves is connected to extensive areas (i.e. it forms part of an area greater than 0.5 ha) within the agricultural landscape, and these areas (i.e. several hectares) of available habitat are likely to support the species' breeding and dispersal requirements in the future. Therefore, the breeding and dispersal capabilities of this population are unlikely to be significantly impacted given the highly localised nature of the proposed road works.
2. Lead to a long-term decrease in the size of an important population of a species	Given the breeding and dispersal capabilities of the population are unlikely to be significantly affected by the proposed works, there is not likely to be a long-term decrease in the size of this population in direct response to the proposed works.
3. Reduce the area of occupancy of an important population 4. Fragment an existing important population into two or more populations	Approximately 37.13 ha of medium quality grassland habitat is proposed to be removed. However, given the nature of the proposed works and the availability of suitable dispersal habitat across properties (i.e. extensive areas of medium quality habitat), the removal of modified grassland is not likely to fragment the existing population into two or more populations. Indeed, individuals are likely to continue to disperse across the landscape within and between areas of suitable habitat. Approximately 2.5 ha of modified grassland habitat where the species has previously been detected along Stockyard Hill Road and Dunnets Road is proposed to be removed. However, given the availability of suitable dispersal habitat within the road reserve and across adjacent paddocks, the removal of a linear strip of modified grassland either side of the existing roads is not likely to fragment

	the existing population into two or more populations. Indeed, individuals are likely to continue to disperse across the landscape (i.e. along and outside of the roadside reserve) within and between areas of suitable habitat
5. Adversely affect habitat critical to the survival of a species	The proposed works will result in the removal of modified vegetation / habitat that does not constitute habitat that is critical to the survival of the species.
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Given the availability of the same habitat across paddocks adjacent to the proposed WEF infrastructure works, the proposed removal of medium quality habitat is not likely to lead to the long-term decline of the species in the immediate area, nor is the proposed action likely to impact the population on a regional, state or national level. Additionally, given the availability of the same habitat (modified grassland) along the roadside reserves and similar habitats across the adjoining paddocks, the proposed removal of habitat will not lead to the long-term decline of the species in the immediate area, nor is the proposed action likely to impact the population on a regional, state or national level.
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is not likely to result in invasive species that are harmful to the Striped Legless Lizard habitat, introduce disease that may cause the species to decline, and interfere substantially with the recovery of the species.
8. Introduce disease that may cause the species to decline, or	
9. Interfere substantially with the recovery of the species.	

Given that medium quality habitat Striped Legless Lizard habitat is proposed to be impacted the proposed action has the potential to significantly impact the species (i.e. potential for resident populations of the species and associated grassland habitats).

However, it is proposed that SHWFPL maintain the current EPBC Act Approval requirement to, prepare and submit for a salvage and translocation plan for approval, to ensure the potential impact on this species is minimised and/or secure an on-site (including the preparation of a Conservation management Plan) or an off-site offset where an existing population is known.

Other

The amended WEF has resulted in the avoidance of populations of the EPBC Act-listed White Sunray and Matted Flax-lily, compared with the permitted WEF.

Further information can be found in Attachment I, Attachment J and Attachment K.

Related Projects

External Overhead Powerlines

Two ecological communities listed under the EPBC Act (Grassy Eucalypt Woodland of the Victorian Volcanic Plain and Natural Temperate Grassland of the Victorian Volcanic Plain) are present within the external overhead powerlines route. There is approximately 0.128 ha of Natural Temperate Grassland of the Victorian Volcanic Plain and 0.002 ha of Grassy Eucalypt Woodland of the Victorian Volcanic Plain proposed to be impacted by the proposed development. Based on the significant impact guidelines for both of these listed ecological communities it is not considered that the proposed development will not result in a significant impact to any threatened species and ecological communities listed under the EPBC Act.

The action will not have a significant impact on listed threatened species and communities.

Terminal Station

The site does not supports preferred habitat for any listed flora or fauna species listed as threatened or threatened ecological community listed under the EPBC Act. There is some potential habitat for the Striped Legless Lizards and the Spiny Rice-flower within the road reserve along Smiths Road adjoining the site and the Camperdown – Lismore Road and Lower Darlington Road intersection and within the Lower Darlington Road

reserve. It is not expected that these sites will be impacted.

The project is not considered to have potential to have a significant impact on any listed flora or fauna species or threatened ecological community.

Quarry

The site does not supports any preferred habitat for any listed flora or fauna species listed as threatened or threatened ecological community listed under the EPBC Act.

The project is not considered to have potential to have a significant impact on any listed flora or fauna species or threatened ecological community.

Further information is contained with the flora and fauna assessment in Appendix G of Attachment S.

3.1 (e) Listed migratory species

Description

Several Migratory and Marine species have been recorded within 10 km of the study area. However, the sit would not be classed as an 'important habitat' as defined under the *EPBC Act Policy Statement 1.1 Princip Significant Impact Guidelines*, and therefore the proposed development is not likely to lead to significant impac to migratory species.

Additionally, Environmentally sensitive construction methods will be employed so as not to impact on potenti habitat for species within the wider landscape.

Further information can be found in Attachment I, Attachment J and Attachment K, Attachment M, Attachment N Attachment R, Appendix G of Attachment S.

Nature and extent of likely impact

The action will not have a significant impact on listed migratory species.

3.1 (f) Commonwealth marine area

Description

The projects are not within a Commonwealth marine area.

Nature and extent of likely impact

There is no likely impact to any Commonwealth marine area.

3.1 (g) Commonwealth land

Description

The proposed actions do not take place on Commonwealth land.

Nature and extent of likely impact

There is no likely impact to Commonwealth land.

3.1 (h) The Great Barrier Reef Marine Park

Description

The proposed actions are not within the Great Barrier Reef Marine Park.

Nature and extent of likely impact

There is no likely impact to the Great Barrier Reef Marine Park.

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

The proposed actions are not related to the development of coal seam gas or coal mining.

Nature and extent of likely impact

There is no impact related to the development of coal seam gas or coal mining.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	**Is the proposed action a nuclear action?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))		

3.2 (e)	**Is the proposed action to be taken in the Great Barrier Reef Marine Park?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))		

3.3 Other important features of the environment

3.3 (a) Flora and fauna

<u>Wind Energy Facility</u>

WEF Infrastructure

There were over 100 native vegetation patches mapped, ranging in quality from a site assessed condition score of 0.11 to 0.77. The Ecological Vegetation Classes recorded were: Creekline Grassy Woodland, Grassy Dry Forest, Grassy Woodland, Heathy Dry Forest, Plains Grassland, Plains Grassy Wetland, Plains Grassy Woodland, Stony Rises Woodland and Stony Knoll Shrubland.

Roadworks

A total of 135 patches of remnant native vegetation are mapped within the study area, ranging in quality from a site assessed condition score of 0.15 to 0.49. Areas proposed to be impacted include Grassy Woodland (1.939 ha); Plains Grassland (0.522 ha); Higher Rainfall Plains Grassy Woodland (0.493 ha); Plains Grassy Woodland (0.143 ha); Heathy Dry Forest (0.001 ha); and, Plains Grassy Wetland (< 0.001 ha).

Further information can be found in Attachment I, Attachment J and Attachment K.

Related Projects

External Overhead Powerlines

In total there were 42 native vegetation patches mapped within the external overhead powerlines alignment, ranging in quality from a site assessed condition score of 0.05 to 0.56. The majority of the vegetation patches impacted are Plains Grassland (0.531 ha), followed by Higher Rainfall Plains Grassy Woodland (0.197 ha), Plains Grassy Woodland (0.044 ha), Plains Grassy Wetland (0.037 ha) and Creekline Tussock Grassland (0.012 ha).

Further information can be found in Attachment M.

Terminal Station

The vast majority of the terminal station site has been cleared for agriculture. At the time of the initial flora and fauna assessment the site comprised a harvested crop of wheat. Sheep are also grazed on the stubble following harvesting. To the north of the site is a stand of Sugar Gums. Two dams are also present at the site, one at the western edge and the other on the eastern perimeter. The dam to the west is surrounded by a small area of 'modified treeless vegetation' (0.13 ha) that supports two indigenous species. Both dams are subject to frequent disturbance through grazing.

An assessment was also undertaken of road reserves within close proximity to the site that may be utilised by traffic associated with the project, including heavy and wide loads. Two highly modified, small patches of Plains Grassland (EVC 132_61) (totalling 0.1 ha) were identified along the Smiths Road reserve but Smiths Road is no longer proposed for access to the site.

The majority of road reserves, at the time of the assessment were dominated by introduced species including Toowoomba Canary Grass (*Phalaris aquatica*). Small areas of native grassland were identified that comprised some Kangaroo Grass (*Themeda triandra*), Kneed Spear Grass (*Austrostipa bigeniculata*) and Common Tussock Grass (*Poa labillardierei*). A further assessment was undertaken in October 2012 which found that Plains Grassland patches were in poor condition, and were identified within the north side of the Lower Darlington Road reserve adjacent to the terminal station site.

Vegetation within the Camperdown –Lismore Road and Lower Darlington Road intersection contained patches of Plains Grassy Wetland and patches of Plains Grassland. These areas are proposed to be avoided. Nevertheless, it is important to note that none of these grassland patches met the condition threshold to constitute the EPBC Criteria of 'Natural Temperate Grasslands of the Victorian Volcanic Plain' or Seasonal Herbaceous Wetlands of the Temperate Lowland Plains.

The flora and fauna survey identified 35 plant species, 31% of which were introduced species and 22 fauna species, 23% of which were introduced. No flora or fauna species listed at the state or federal levels were identified on site.

Quarry

The site has been cleared for farming use. The site supports a mixture of native and introduced grasses, stony rises and a small patch of scattered trees. The ground vegetation is comprised mostly of improved pasture dominated by pasture grasses, with environmental weeds also present.

Some scattered and isolated occurrences of native grasses will be impacted on by the proposal, however all areas that qualify as a remnant patch and the scattered indigenous tree (Swamp Gum *Eucalyptus ovata*) will be avoided. The proposed action includes the removal of scattered and isolated occurrences of native flora species

that qualify as Minor Treeless Vegetation.

3.3 (b) Hydrology, including water flows

Wind Energy Facility

The land is used almost entirely for agricultural purposes; the majority has been cultivated for grazing and cropping, including most low-lying drainage lines and floodplains and has therefore been highly modified from its pre-agricultural state.

The crater of Stockyard Hill currently holds Black Lake, which is a permanent, semi-saline water body. Major wetlands found either abutting the wind farm site boundary or occurring within the site include Lake Goldsmith and Black Lake. Several other smaller wetlands, such as freshwater meadows and shallow freshwater marshes, are scattered within the site, in addition to minor drainage lines and creeks which traverse the site, mostly in the west and north. Some areas of pasture also become seasonally inundated or waterlogged.

There will be adequate set-backs between proposed works areas and the lake shore so indirect impacts from runoff and sedimentation during construction will be avoided. Additionally, environmentally sensitive construction measures will be employed including sediment and erosion controls to ensure that the project does not affect stream flows.

It is anticipated that the foundations of the turbines will have minimal impact on underground water bodies, and/or groundwater. It is anticipated that the development of the proposed wind farm will not impact on the water environment due to the small turbine footprint and the ability to respond to any potential water issues during the micro-siting of the turbines. The amended WEF is not expected to result in a change of impact on groundwater resources.

Related Projects

External Overhead Powerlines

The project falls within two catchment management authorities: the Corangamite Catchment Management Authority and the Glenelg Hopkins Catchment Management Authority.

The external overhead powerlines alignment runs along some creek lines and water courses including Mount Emu Creek and Mundy Gully, and will traverse the following:

- Mount Emu Creek
- Mundy Gully
- Browns Waterholes
- Haunted Gully
- Oddie Swamp
- 18 unnamed waterways and 3 unnamed waterbodies

The preliminary design of the siting of the pole locations has taken into consideration the location of waterways to minimise potential impact. Detailed design will be refined in consultation with the Glenelg Hopkins and Corangamite Catchment Management Authorities to ensure impact is minimised.

Geotechnical investigations have been undertaken for the overhead powerlines alignment. Groundwater was not encountered in most boreholes and all test pits, indicating that groundwater levels were most likely below the termination depth. Groundwater was present in 4 boreholes (a total of 18 boreholes were drilled and 17 test pits were excavated as part of the investigations), between 1.6m and 6.2m below ground level. These boreholes were at located in topographic lows, either in alluvium at the base of valleys, immediately adjacent to dry lake or the base of a valley.

Groundwater levels are expected to vary depending on climatic conditions. The investigation was undertaken following a relatively dry period and it is likely that the ground water levels were relatively low. After a period of significant wet weather the groundwater levels are likely to rise, particularly in the low level area of alluvium. However, it is not considered that the construction of pole foundations will affect the groundwater resources of

the region.

A Construction Environmental Management Plan will be prepared (which is anticipated to be a condition of the planning permit) to manage potential effects on water environments, associated with the construction of the external overhead powerlines.

Terminal Station

Two artificial dams are located on the site. A drainage line also runs across the centre of the site. The drainage line is devoid of native vegetation.

Haunted Gully runs to the east of the site with Salt Creek to the south of the site.

Quarry

Groundwater is estimated to be between 14 m - 25 m below ground level. The maximum depth of excavation for the quarry is not expected to exceed 8 m and therefore will not affect groundwater.

3.3 (c) Soil and Vegetation characteristics

Wind Energy Facility

The southern part of the study area is mostly cleared of native vegetation and the land use is agricultural, i.e. cropping and grazing. Some native vegetation remains, associated with wetlands or with remnant native grasslands. The north of the study area contains remnant patches of heathy dry forest amongst cleared grazing land. In this part of the site, there is less agricultural development because of the poor nature of the sandy soils, and therefore some pastures still contain remnant native vegetation.

The local geology of the site (and the surrounding area) is quaternary basalt derived from ancient eruption points, such as Stockyard Hill, which is an extinct volcano. Its crater currently holds Black Lake which is an ephemeral semi-saline water body. Low stony rises, including surface and embedded rock, are common across the site, especially in unimproved and uncultivated areas of pasture.

It is anticipated that the WEF will not have a significant impact on the soil environment. The amended WEF is not expected to result in a change of impact on the soil environment. Additionally, preliminary geotechnical assessments has not indicated that there are to be any geotechnical hazards that may affect, or be affected by, the SHWF WEF Further assessment will be undertaken in conjunction with detailed design and construction works.

Related Projects

External Overhead Powerlines

The project falls within the Victorian Volcanic Plan bioregion and is dominated by predominantly volcanic deposits, with extensive flat to undulating basaltic plains with some stony rises, old lava flows and volcanic features. The soil is generally shallow reddish-brown to black loams and forms a fertile base for agricultural activity. The region supports a range of ecological vegetation classes typically from treeless heavy-soils plains grasslands, to open herbaceous ground cover and eucalypt woodlands.

There were no signs of slope instability along the overhead powerlines alignment observed during the geotechnical assessment of the alignment. It is considered that the likelihood of the proposed infrastructure being affected by natural slop instability to be low, due to the relatively shallow soil profile and the gentle slopes present along the route.

It is acknowledged that slope instability may be triggered by cut and fill activities, such as access road cuts and embankments and cuts into hillsides to form people cap/pad footings. Where permanent cuts and fills are designed on hillsides, a quantitative slop stability analysis will be carried out during the detailed design process for both the cut slop above the excavation and any fill slope below the footing. Adequate slop protection and drainage measure will be designed into permanent cuts and embankments, as water ingress is likely to detrimentally affect exposed soil slopes.

Soil samples were taken as part of the geotechnical assessments, residual basalt soils; residual granite soils as well as alluvium were tested to assess soil agressivity. The assessment found that that the soils tested had a classification of 'Non-aggressive' for both buried concrete and steel, and soil conditions classification of Type A – low permeability soils.

A desktop acid sulfate soils (ASS) assessment was undertaken as part of the geotechnical assessment in accordance with the requirements outlined in the inland ASS guidance. The assessment concluded that the proposed alignment is unlikely to intersect or disturb ASS. In addition, due to the small volume of disturbance expected as part of the project, the potential consequences would likely be low and readily manageable, if needed. If areas of swamp, stream, river or lake materials are unavoidable then further ASS investigations will be undertaken. Additionally, if black organic sludge is encountered during construction, then works will immediately cease at that location. The black organic sludge will be contained to ensure that it cannot disperse into the wider environment and a suitably qualified scientist / engineer will be engaged to assess whether these materials are Monosulfidic Black Ooze (MBO), and if required, implement management measures.

Additionally, preliminary geotechnical assessments has not indicated that there are to be any geotechnical hazards that may affect, or be affected by, the external overhead powerlines.

Terminal Station

The site is dominated by basalt derived soils with sandy soils to the north east of the property near Haunted Gully derived from fluvial and minor shallow marine deposits.

Vegetation present at the site comprises a cultivated wheat crop, with planted Sugar Gums at the northern boundary of the site. A minor area of Modified Treeless Vegetation is present to the west of the site surrounding the dam. This area of native vegetation comprises only two indigenous species Additional grassland areas were mapped in Lower Darlington Road reserve in October 2012 but these do not need to be impacted during access to the site.

Quarry

The landscape is characterised by an undulating plain consisting of grassy flats and associated stony rises dominated by protruding basalt rock formation. The site has basaltic soils.

3.3 (d) Outstanding natural features

Wind Energy Facility

Part of the WEF site is located within the Vegetation Protection Overlay (Schedule 1 - 'Roadside Grassland Protection and Conservation) (Pyrenees Planning Scheme), which includes the purpose to "*recognise vegetation protection areas as locations of special significance, natural beauty, interest and importance";* however no vegetation is proposed to be removed, destroyed or loped within this area.

Additionally, the Department of Environment, Land, Water and Planning completed an assessment of the character and significance of landscapes throughout the south west of Victoria in 2014. This region has a wide range of landscape types and features from the volcanic plains and cones that dominate much of the area, to the Great Dividing Range in the north, and the Grampians in the west.

The study area comprises all non-coastal, non-urbanised areas in the south west region of Victoria, from Port Phillip Bay in the east to the South Australian border in the west, and extending to the Great Dividing Range in the north.

The study also recognises and values the geological formations that occur within the landscape of the Western Volcanic Plains and therefore increasing the landscape sensitivity of areas that have stony rises as well as the more noticeable features such as remnant volcanic cones. This was recognised in the landscape and visual impact assessment which accompanied the original planning permit application, and therefore the amended WEF does not result in different conclusions with respect to potential landscape and visual impact.

Additionally, the study recognises the change that this landscape has undergone since European settlement and the anticipated increased level of development suggesting lower landscape sensitivity.

Furthermore, the SHWF WEF is not within areas which have been identified as having a local, regional or state level of significance.

Related Projects

External Overhead Powerlines

The external overhead powerlines alignment will traverse the Vegetation Protection Overlay – Schedule 2 'Roadside vegetation protection area') (Corangamite Planning Scheme). The Vegetation Protection Overlay includes the purpose "*to recognise vegetation protection areas as locations of special significance, natural beauty, interest and importance*", however the vegetation proposed to be removed within this area (0.016 ha of native vegetation (Plains Grassland)) is not anticipated to have a significant impact on the area.

Additionally, the Department of Environment, Land, Water and Planning completed an assessment of the character and significance of landscapes throughout the south west of Victoria in 2014. This region has a wide range of landscape types and features from the volcanic plains and cones that dominate much of the area, to the Great Dividing Range in the north, and the Grampians in the west.

The study area comprises all non-coastal, non-urbanised areas in the south west region of Victoria, from Port Phillip Bay in the east to the South Australian border in the west, and extending to the Great Dividing Range in the north.

The study also recognises and values the geological formations that occur within the landscape of the Western Volcanic Plains and therefore increasing the landscape sensitivity of areas that have stony rises as well as the more noticeable features such as remnant volcanic cones. This was recognised in the landscape and visual impact assessment which accompanied the original planning permit application, and therefore the amended WEF does not result in different conclusions with respect to potential landscape and visual impact.

Additionally, the study recognises the change that this landscape has undergone since European settlement and the anticipated increased level of development suggesting lower landscape sensitivity.

Furthermore, the external overhead powerlines are not within areas which have been identified as having a local, regional or state level of significance.

Terminal Station

The Department of Environment, Land, Water and Planning completed an assessment of the character and significance of landscapes throughout the south west of Victoria in 2014. This region has a wide range of landscape types and features from the volcanic plains and cones that dominate much of the area, to the Great Dividing Range in the north, and the Grampians in the west.

The study area comprises all non-coastal, non-urbanised areas in the south west region of Victoria, from Port Phillip Bay in the east to the South Australian border in the west, and extending to the Great Dividing Range in the north.

The study also recognises and values the geological formations that occur within the landscape of the Western Volcanic Plains and therefore increasing the landscape sensitivity of areas that have stony rises as well as the more noticeable features such as remnant volcanic cones. This was recognised in the landscape and visual impact assessment which accompanied the original planning permit application, and therefore the amended WEF does not result in different conclusions with respect to potential landscape and visual impact.

Additionally, the study recognises the change that this landscape has undergone since European settlement and the anticipated increased level of development suggesting lower landscape sensitivity.

Furthermore, the external overhead powerlines are not within areas which have been identified as having a local, regional or state level of significance.

Quarry

The Department of Environment, Land, Water and Planning completed an assessment of the character and

significance of landscapes throughout the south west of Victoria in 2014. This region has a wide range of landscape types and features from the volcanic plains and cones that dominate much of the area, to the Great Dividing Range in the north, and the Grampians in the west.

The study area comprises all non-coastal, non-urbanised areas in the south west region of Victoria, from Port Phillip Bay in the east to the South Australian border in the west, and extending to the Great Dividing Range in the north.

The study also recognises and values the geological formations that occur within the landscape of the Western Volcanic Plains and therefore increasing the landscape sensitivity of areas that have stony rises as well as the more noticeable features such as remnant volcanic cones. This was recognised in the landscape and visual impact assessment which accompanied the original planning permit application, and therefore the amended WEF does not result in different conclusions with respect to potential landscape and visual impact.

Additionally, the study recognises the change that this landscape has undergone since European settlement and the anticipated increased level of development suggesting lower landscape sensitivity.

Furthermore, the quarry is not within areas which have been identified as having a local, regional or state level of significance.

3.3 (e) Remnant native vegetation

Wind Energy Facility

The estimated area of native vegetation that may need to be cleared for the WEF is outlined in the table below.

Table 10 – Estimated area

Project	Total Extent (ha)	Remnant Patch (ha)	Scattered Trees	Strategic Biodiversity Score	Offsets
WEF Infrastructure	34.415	32.657	25	0.369	5.176 general biodiversity equivalence units
Roadworks	3.852	2.587	18	0.244	0.261 general biodiversity equivalence units 0.202 specific biodiversity equivalence units for Button Wrinklewort

For the purpose of the application to amend Planning Permit No. PL-SP/05/0548, an assessment (Attachment I) of each of the following footprints has been undertaken under the *Permitted Clearing of Native Vegetation – Biodiversity Assessment Guideline, September 2013* to provide a like for like comparison of the construction impact of all scenarios:

1. Permitted WEF, using original application design assumptions
2. Permitted WEF, using current design assumptions
3. Amended WEF, using current design assumptions and overhead powerlines aerial footprint

Additionally, the assessment discussed the likely outcomes if assessed under the old *Victoria's Native Vegetation Management - A Framework for Action*, to allow comparison with the quantity of native vegetation specified in Planning Permit No. PL-SP/05/0548.

A comparison of impacts to remnant native vegetation and associated offset requirements between the permitted WEF footprint and the amended WEF footprint is provided in Table 11.

Table 11 – Comparison of offset targets between the permitted WEF and amended WEF

	Permitted WEF	Permitted WEF	Amended WEF
	Original Design Assumptions	*Current Design Assumptions*	
Total Extent	15.915	31.991	34.415
Remnant Patch (ha)	15.071	30.936	32.657

Scattered Trees (no.)	12	15	25
Strategic Biodiversity Score	0.358	0.364	0.369
General Offsets Required	1.993 general biodiversity equivalence units	4.172 general biodiversity equivalence units	5.176 general biodiversity equivalence units
Specific Offsets Required	Button Wrinklewort (0.575 specific biodiversity equivalence units), White Sunray (1.010 specific biodiversity equivalence units)	Button Wrinklewort (1.044 specific biodiversity equivalence units), White Sunray (1.853 specific biodiversity equivalence units), Matted Flax-lily (1.252 specific biodiversity equivalence units)	None
Minimum Strategic Biodiversity Score	0.283	0.289	0.296

The most significant difference between the permitted WEF and the amended WEF is the extent of offsets required under the Planning Permit No. PL-SP/05/0548 and proposed amended Planning Permit No. PL-SP/05/0548, in accordance with *Permitted Clearing of Native Vegetation – Biodiversity Assessment Guideline, September 2013*. The permitted WEF (original or current design assumptions) requires specific offsets for three species including Button Wrinklewort, White Sunray, and Matted Flax Lily, along with general offsets. In comparison, the amended WEF would only require general offsets and is therefore considered to have a reduced impact on biodiversity.

Additionally, while the total extent of remnant native vegetation proposed to be removed associated with the amended WEF footprint is greater than the area allowed for in Planning Permit No. PL-SP/05/0548, given the highly modified nature of the patches of vegetation and the subsequent low habitat score (i.e. the majority of patches have a habitat score of 0.23 or less), along with the low Strategic Biodiversity Score of the native vegetation proposed to be removed (i.e. 0.292) this has led to a similar offset requirement for the amended WEF footprint.

The design of the amended WEF (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 to be the maximum extent of impact and there may be an opportunity to further reduce impact on native vegetation through detailed design and the implementation of Environmental Management Plan(s) (as required by Condition 6 of Planning Permit No. PL-SP/05/0548).

It is understood that the offset obligations generated (as shown in Table 10) can be satisfied through existing credits registered through the over the counter scheme without difficulty.

Further information can be found in Attachment I and Attachment J.

Related Projects

External Overhead Powerlines

The estimated area of native vegetation that may need to be cleared for the external overhead powerlines is outlined in the table below.

Table 12 – Estimated area

Project	Total Extent (ha)	Remnant Patch (ha)	Scattered Trees	Strategic Biodiversity Score	Offsets
Pyrenees	3.562	0.528	32	0.136	0.041 general biodiversity equivalence units 0.614 specific units of habitat for Button Wrinklewort
Corangamite		0.363	6	0.265	0.088 general biodiversity equivalence units

There were 42 native vegetation patches mapped within the external overhead powerlines route, ranging in

quality from a site assessed condition score of 0.05 to 0.56. The majority of the vegetation patches impacted are Plains Grassland (0.531 ha), followed by Higher Rainfall Plains Grassy Woodland (0.197 ha), Plains Grassy Woodland (0.044 ha), Plains Grassy Wetland (0.037 ha) and Creekline Tussock Grassland (0.012 ha).

Terminal Station

There is a small patch (0.13 ha) of Modified Treeless Vegetation surrounding the dam to the west of the terminal station site. The patch comprises only two indigenous species and is subject to regular disturbances from cattle. This area will be retained during construction activities.

Three highly modified small patches of EVC 132: Plains Grassland (0.17 ha) were identified within the Smiths Road reserve but Smiths Road is no longer proposed for access to the site. A further 10 patches of Plains Grassland (total 1.15 ha), in poor condition, were identified within the north side of the Lower Darlington Road reserve adjacent to the Terminal Station site. These patches do not coincide with the site entrance and will not be impacted.

Vegetation within the Camperdown –Lismore Road and Lower Darlington Road intersection contained two patches of Plains Grassy Wetland (total 0.1 ha) and five patches of Plains Grassland (total 0.52 ha). These areas are proposed to be avoided and do not meet the criteria to constitute 'Natural Temperate Grasslands of the Victorian Volcanic Plain' or Seasonal Herbaceous Wetlands of the Temperate Lowland Plains. All areas of mapped native vegetation will be avoided by the development.

Quarry

Remnant vegetation on the site is in poor condition due to the lack of floristic diversity and can generally be described as containing scattered and isolated occurrences of native flora species that qualify as Minor Treeless Vegetation. A total of 35 plant taxa (13 indigenous, 22 introduced) were recorded within the subject site. The site supports degraded remnants of Heavier Soils Plains Grassland (EVC 132_61) and Stony Rises Woodland (EVC 203). Higher Rainfall Plains Grassy Woodland (EVC 55_63) occurs within the road reserve of the Stockyard Hill – Wangatta Road road reserve. A single scattered Swamp Gum is also present on the site.

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

Wind Energy Facility

The site is generally undulating with occasional higher points. Stockyard Hill represents a significantly higher area and a former volcano.

Related Projects

External Overhead Powerlines

A general decrease in elevation occurs from north to south along the proposed action, with the northernmost point of the project at elevation RL 356m AHD and the southernmost point at RL 144m AHD. Occasional isolated hills exist above the rest of the landscape in the vicinity of the route. These hills are typically volcanic hills such as scoria cones, with some granite plutons. Some stony rises are present along the northern section of the overhead powerline route.

Terminal Station

The topography of the site shows low relief, with a variation of less than 10 m across the site, which is also a feature of the broader area.

Quarry

The site is generally comprised of gently undulating farmland. The site falls from approximately RL390 m at the eastern boundary to RL 365 m at the western boundary over a distance of 1.3 km. It drains generally towards the north west.

3.3 (g) Current state of the environment

Wind Energy Facility

The primary use of the site is agriculture with the majority cultivated for grazing and cropping. The site has a long history of agricultural use and accordingly is highly modified with little remnant vegetation. A number of weeds listed as noxious under the *Catchment and Land Protection Act 1994 (Vic)* were recorded during the flora and fauna assessments (Blackberry, Spear Thistle), as well as evidence that the area is currently occupied by several pest fauna species (Red Fox, European Rabbit).

Related Projects

External Overhead Powerlines

On-going agricultural land use throughout the study area has reduced remnant indigenous vegetation significantly, such that the study area was largely devoid of remnant patches of indigenous vegetation. The study area mostly consists of predominantly introduced vegetation, highly modified and dominated by exotic vegetation such as pasture grasses. Agricultural and environmental weeds are common in the area. Larger vegetation such as planted trees and shrubs were present in wind rows and wood lots. Roadside verges are in some have been heavily slashed. The state of the environment generally is of a highly modified agricultural landscape. Significant extents of EVCs are largely absent from the study area, although EVCs previously identified were present in smaller isolated patches throughout the study area and in some cases are able to persist in the absence of significant or ongoing agricultural activity.

Terminal Station

The area is currently cropped with wheat and supports a number of other introduced species including Toowoomba Canary Grass (*Phalaris aquatic*), Cocksfoot (*Dactylis glomerata*) and Spear Thistle (*Cirsium vulgare*). Spear Thistle is listed as a noxious weed within Victoria.

Introduced fauna species identified at the site include the European Rabbit (*Oryctolagus cuniculus*) and the European Hare (*Lepus europaeus*).

Quarry

The primary land use is livestock grazing and as such, any native vegetation (except the one scattered indigenous tree) on the site is highly modified. The site supports areas dominated by introduced species including two species listed under the *Catchment and Land Protection (CaLP) Act 1994* as noxious weeds, the Spear Thistle (*Cirsium vulgare*) and Variegated Thistle (*Silybum marianum*)

Introduced fauna species identified through previous surveys include the European Rabbit (*Oryctolagus cuniculus*), European Hare (*Lepus europaeus*), Red Fox (*fam. Canidae gen. Vulpes*) and a number of introduced bird species.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

There are not commonwealth Heritage Places within or surrounding the area of proposed actions. Additionally, there are no cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the area.

However, during the original WEF planning permit application assessment process addressed the degree to which turbines, located in the views from the “Mawallok” homestead across the garden and lake to the Pyrenees and Mt Cole, would adversely impact on the cultural heritage significance of the property (Heritage Overlay – Schedule HO32 ‘Mawallok Homestead, 3802 Geelong Road, Stockyard Hill’, Victorian Heritage Register Number HO563) was considered. The conclusion of the panel was that a cluster of turbines (near Topper’s Road and beyond) which presented in this view, would adversely impact and accordingly they were not permitted.

Photomontages of the view assessed during the original planning panel have been prepared as part of the

landscape and visual impact assessment prepared to accompany the application to amend Planning Permit No PL-SP/05/0548. The assessment found that the amended WEF (including increased turbine dimensions) does not present more prominently than the permitted WEF and the number of turbines in the view shed has reduced.

3.3 (i) Indigenous heritage values

Wind Energy Facility

A total of ten places (VAHR 7522-0021, VAHR 7522-0083, VAHR 7522-0082, VAHR 7523-0233, VAHR 7523-0234, VAHR 7522-0084, VAHR 7522-0086, VAHR 7522-0085, VAHR 7523-0235 and VAHR 7523-0236) have been recorded to date during the preparation of complex CHMP 10530 (approved in 2009).

The known cultural heritage in the activity area was assessed, VAHR 7522-0021 has no specific cultural and moderate scientific significance. VAHR 7522-0085, VAHR 7522-0083, VAHR 7522-0082, VAHR 7522-0084, VAHR 7522-0086,VAHR 7523-0235, VAHR 7523-0236, VAHR 7523-0233 and VAHR 7523-0234 have no specific cultural and extremely or very low scientific significance. The known Aboriginal cultural heritage was assessed having no research potential apart from VAHR 7522-0021 (low) and to a lesser extent VAHR 7522-0086 (very low). On this basis salvage excavations cannot be justified on scientific grounds for the mitigation or management of harm to places VAHR 7522-0085, VAHR 7523-0235 and VAHR 7523-0236.

Six Aboriginal heritage places were assessed as not going to be harmed by the activity (VAHR 7522-0086, VAHR 7522-0082, VAHR 7522-0084, VAHR 7522-0083, VAHR 7523-7523-0233 and VAHR 7523- 0234). Three Aboriginal heritage places were identified to be harmed by the activity (VAHR 7522-0085, VAHR 7523-0235 and VAHR 7523-0236), but have been effectively salvaged during the complex assessment. Part of VAHR 7522-0021 (less than 10%) will be harmed by the activity. A program of salvage excavation has been recommended to manage this harm.

In the statement of significance, within this CHMP, the activity area was considered to have very low scientific or specific cultural values. It is not considered likely that unknown Aboriginal cultural heritage with scientific significance is present in impact zones within the activity area. Any inadvertent harm to unknown Aboriginal cultural heritage will be managed by a Contingency Plan.

A review of CHMP 10530 was undertaken in response to the proposed amended WEF. The review found that that an additional two CHMPs should be prepared. One CHMP to include 2 new areas not currently included within the activity area (1 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 associated with the roadworks for the areas which require a mandatory CHMP to be prepared (Dooleys Road and Mt Emu Settlement Road). CHMP 14281 and CHMP 14279 are currently being prepared, in consultation with the Wathaurung Aboriginal Corporation.

Related Projects

External Overhead Powerlines

A total of eleven places (VAHR 7522-0090, 7522-0091, 7522-0092, 7522-0093, 7522-0094, 7522-0095, 7522-0096, 7522-0097, 7522-0098, 7522-0099 & 7522-0100) have been recorded to date during the preparation of this CHMP. They are either artefact scatters or low density artefact distributions. All the places are found in the WAC RAP area. Typically they are found within 200m of waterways. Two low density artefact distributions (VAHR 7522-0090 & 7522-0091) were found in the vicinity of Mount Emu Settlement Road on the plain more than 200m from the major waterways. A total of 180 stone artefacts were collected and analysed.

Based on their archaeological attributes places lack the attributes required to have significance research potential (e.g. they have no potential for stratified high integrity occupation deposits, a large diversified sample of artefacts with relatively complete reduction sequences, a wide variety of data classes or raw material or detailed spatial patterning of artefacts and features). Only VAHR 7522-0100 has some limited research potential being restricted to that part with moderate artefact density.

The statement of cultural heritage significance assessed the activity area having low scientific Aboriginal cultural values compared to other known regional cultural heritage values, in particular, to the south of the project area (e.g. Lake Gnarpurt).

CHMP 12117 is still currently under preparation, however the majority of the field survey has been undertaken and it is not anticipated that the final CHMP will result in considerably different conclusions.

Terminal Station

CHMP 12081 has been prepared and approved for the terminal station site. Two stone artefacts were recovered on the subsurface and one artefact was found on the surface. Three new Aboriginal places were registered (VAHR 7522-0089, 7521-0130 & 7521-0131). All three places were assessed as having extremely low scientific significance and no harm avoidance, minimisation or management measures are required prior to the activity commencing.

Additionally, voluntary CHMP 12402 has been prepared and approved for the intersection upgrade associated with the terminal station. Artefact scatter VAHR 7521-0133 was registered during the preparation of this CHMP. VAHR 7521-0133 was assessed as having extremely low scientific significance and no research potential. No harm is likely to occur to known tangible Aboriginal cultural heritage associated with the place because the stone artefacts have been removed from the place and the complex assessment has demonstrated that no additional archaeological component is likely to remain.

Contingency measures are described within the CHMPs.

Quarry

Voluntary CHMP 12648 demonstrated that in relation to the activity area:

- There are no registered places within the activity area
- There are no areas of Aboriginal cultural heritage scientific sensitivity
- It is unlikely that Aboriginal cultural heritage is present

As such, the proposed activity will not impact any known Aboriginal cultural heritage therefore no consideration of avoiding, minimising or managing harm to known Aboriginal cultural heritage is required. However, a Contingency Plan forms part of the CHMP and must be adopted in case unknown Aboriginal cultural heritage is unexpectedly discovered during the conduction of the activity.

3.3 (j) Other important or unique values of the environment

There are no other important or unique values of the environment determined within the area of the project.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

Attachment B a list of the private and public properties affected by the projects.

SHWFPL has an option arrangement in place with the current landowners to purchase the terminal station site once full financial commitment to the project is achieved and construction is to commence.

A Caveat (AJ004127e) exists on the title in favour of future use for SHWFPL. The land is being leased from the landowner for the purposes of the project.

3.3 (l) Existing land / marine uses of area

The sites are currently used for agricultural uses (cropping / grazing) and road reserves (used and unused).

3.3 (m) Any proposed land / marine uses of area

Proposed use of land is limited to the proposed project as described.

4 Environmental outcomes

Wind Energy Facility

'Loss of terrestrial climatic habitat by anthropogenic emissions of greenhouse gases' has been listed as a key threatening process under the EPBC Act and the FFG Act. The SHWF represents development of a renewable energy project that provides a low greenhouse gas emission form of electricity generation consistent with the Federal Government RET objectives. The SHWF will result in approximately 1,900,000 tonnes of CO_2 savings per year (550,000 tonnes of CO_2 savings per year more than the permitted WEF).

Additionally, as the WEF is likely to impact Golden Sun Moth and known habitat and Striped Legless Lizard habitat, SHWFPL propose a number of measures to ensure there is no net impact on these species, including:

- the use of a conservation management plan, on the property where the Golden Sun Moth and the known habitat have been found, it provides an opportunity for a defined offset area to protect the Golden Sun Moth and its 'known' habitat as a conservation reserve in perpetuity, resulting in a net benefit to the species.
- maintain the current EPBC Act Approval requirement to prepare and submit for a salvage and translocation plan for approval and/or secure an on-site offset (including the preparation of a Conservation Management Plan) or an off-site offset where an existing population is known.

A set of proposed conditions (based on the conditions specified in EPBC decision 2009/4719), including the proposed commitments associated with the Golden Sun Moth and Striped Legless Lizard is contained in Attachment C.

Related Projects

External Overhead Powerlines

SHWPL have avoided and minimised the proposed removal of remnant native vegetation, and also areas supporting EPBC Act-listed listed species and communities, and sensitive sites such as roadsides and waterways and alternation by locating the external overhead powerlines in areas of exotic vegetation / areas devoid of ecological values.

The alignment sections and pole siting process also included a Multi-Criteria Analysis to select route options, as well as extensive consultation with government agencies and private landowners.

Biodiversity assessments undertaken have determined that there are not likely significant impacts to Matters of National Environmental Significance.

Terminal Station

The project site has been previously cleared of native vegetation, apart from one area of minor remnant. Native vegetation has been located within the road reserve of Smiths Road and at the intersection of Camperdown-Lismore Road and Lower Darlington Road. The siting of the development results in the avoidance of all native vegetation. It is not considered that the proposed works will have a significant impact on any matter of National Environmental Significance.

Quarry

The site is does not support any threatened ecological communities or species. It is not considered that the proposed works will have a significant impact on any MNES.

The use of an on- site quarry for the Stockyard Hill Wind Farm will provide environmental and social benefits. Recently the region has seen a number of major projects developed with several more proposed including wind farms and the duplications of the Princes Highway and the Western Highway. In at least one project, the cartage of crushed rock from off-site quarries resulted in community concern. This concern resulted from perceived impacts on road safety and damage to roads caused by heavy vehicles.

Additionally, these projects cumulatively place significant demand on crushed rock in the region. If this cumulative demand continues to grow, the price will increase potentially impacting the ability of local landholders to secure crushed rock for their properties, affecting their future plans. An insufficient supply of crushed rock could also affect the feasibility of major projects, including the SHWF, endangering the employment opportunities that these projects may generate.

The establishment of a dedicated on-site quarry for the SHWF project will enable potential impacts on the local community, including roads, traffic and local material supplies to be minimised. The movement of aggregate material from the proposed quarry to construction sites within the wind farm will be predominantly be via internal haul roads established as part of the construction of the SHWF WEF.

5 Measures to avoid or reduce impacts

Wind Energy Facility

The revised layout of the amended WEF was designed:

- in response to the spacing required for larger rotor diameters to reduce predicted turbulence;
- to ensure compliance with shadow flicker and noise conditions of Planning Permit No. PL-SP/05/0548; and
- to improve project efficiencies and avoid / minimise impact on biodiversity (e.g. significant species or habitat).

Additionally, the actual area of disturbance associated with the construction and operation of the WEF will be optimised for minimal impact pending final major procurement decisions, detailed civil and electrical design and timing of project construction.

Flora and Fauna

Condition 14 of Planning Permit No. PL-SP/05/0548 requires that "*before the clearing of any native vegetation starts, a native vegetation offset management plan must be prepared by a suitably qualified ecological specialist and submitted to an approved*" by the Department of Environment, Land, Water and Planning, and specifies what the plan must include.

Additionally, several measures have been (and will be) undertaken to minimise the impacts of the proposed removal of native vegetation on biodiversity, including (but not limited to) the following:

- The avoidance of areas supporting remnant native vegetation, including EPBC Act-listed listed species and communities, and sensitive sites such as roadsides and waterways;
- Alteration and reductions in the development footprint (e.g. internal access);
    - Further, as part of the detailed design process and the preparation of the Environmental Management Plan (in accordance with Condition 6 of Planning Permit No. PL-SP/05/0548) measures will be undertaken to ensure that further impacts to biodiversity are minimised, including (but not limited to):
    - Further micro-siting techniques, including fencing retained areas of native vegetation. If necessary, trees will be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation into drainage lines / dams will be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
    - All contractors will be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Habitat zones (areas of sensitivity) will be included as a mapping overlay on construction plans;
    - Tree Retention Zones will be implemented to prevent indirect losses of native vegetation during construction activities; and
    - Construction stockpiles, machinery, roads, and other infrastructure will be placed away from areas supporting native vegetation and/or other ecological sensitive areas.

Additionally, Condition 15 of Planning Permit No. PL-SP/05/0548 requires that a Bat and Avifauna Management Plan is prepared.

Water Environments

There are number of conditions in Planning Permit No. PL-SP/05/0548 which will help mitigate potential effects on water environments, including (but not limited to) the preparation of:

- a construction and site works management plan (Condition 6a);
- a sediment, erosion, and water quality management plan (Condition 6b)
- a blasting plan (Condition 6c);
- a hydrocarbon and hazardous substances plan (Condition 6d)

Related Projects

External Overhead Powerlines

Only the vegetation required to be cleared for construction and operation of the proposed works will be taken, and where possible remnant and regrowth vegetation will be retained. The external overhead powerlines will fly over watercourses and where possible only trimming of riparian vegetation that falls within the safety zones of the line will occur. Where trimming is not possible clearing for the proposed external overhead powerlines will only be for trees that fall entirely within the safety zone of the line. Grasses and shrubs where practical will remain.

Post construction grasses and shrubs will be encouraged to regrow within the easement with only a narrow grassed access track required for maintenance and emergency situations.

A Construction Environmental Management Plan will be developed and implemented during construction and will include measures relating to:

- Erosion, sediment and water quality management
- Hydrocarbon and Hazardous Substances
- Flora and Fauna management
- Traffic and Transport
- Cultural Heritage
- Noise
- Landscaping / Reinstatement

Additionally, the Construction Environmental Management Plan will describe the steps that will be taken to manage and minimise environmental and farm management impacts during construction. These will be managed by SHWFPL or the appointed construction contractor. Measures may include:

- Further micro-siting techniques, including fencing retained areas of native vegetation. If necessary, trees will be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation into drainage lines / dams will be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
- All contractors will be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Habitat zones (areas of sensitivity) will be included as a mapping overlay on construction plans;
- Tree Retention Zones (TRZs) will be implemented to prevent indirect losses of native vegetation during construction activities; and
- Construction stockpiles, machinery, roads, and other infrastructure will be placed away from areas supporting native vegetation and/or other ecological sensitive areas.

Terminal Station

An Environmental Management Plan will be prepared to address the environmental impact of the proposal. In accordance with Condition 6 of Planning Permit No. PP2012/152.A, the Environmental Management Plan will address:

- Construction and site works management
- Erosion, sediment and water quality management
- Hydrocarbon and hazardous substances management
- Blasting management
- Fire prevention and emergency response management
- Native vegetation management
- Fauna management
- Pest animal management

- Traffic management
- Cultural Heritage Management
- Landscape Management
- Operational and Maintenance Management

Planning Permit No. PP2012/152.A also prescribes other conditions relating (but not limited) to general amenity provisions, noise and dust control, control of light spill, run off control, ongoing soil erosion control, and batters. Additionally, Planning Permit No. PP2012/152.A requires the following plans to be prepared:

- Construction Management Plan (Condition 4)
- Traffic Management Plan (Condition 5)
- Drainage and Water Storage Management Plan (Condition 8)
- Environmental Noise Assessment Plan (Condition 7)

Quarry

An Environmental Management Plan has been prepared to address the environmental impact of the quarry through construction and operation. The Environmental Management Plan forms part of the endorsed Work Plan (Attachment S), which addresses:

- Air Quality – Particles
- Noise
- Blasting
- Groundwater
- Stormwater
- Flora and Fauna
- Noxious Weeds
- Cultural Heritage
- Visual Impact
- Erosion Control
- Fire Management
- Waste Management
- Fuels and Chemicals

Specifically, the following measures (recommended as a result of the flora and fauna assessment in Appendix G of Attachment S) will be put in place to minimise impacts of the proposed development on the ecological features of the site:

- While native vegetation that is classified as Minor Treeless Vegetation will be removed (and does not meet the threshold for remnant vegetation patch), no remnant vegetation patches or scattered indigenous trees will be removed from the site.
- Site operations, including ground disturbance, stockpiling of soils and storage and operation of plant and machinery, will not occur within an area of 12 m around the tree and remnant patches of native vegetation
- The tree and a 12 m ‘no go zone’ will be protected by fencing. Signage on the fencing will state that the area is not be disturbed
- A Striped Legless Lizard Salvage and Translocation Plan will be developed before construction commences. This has been recommended as a precautionary measure given the low probability of occurrence of the species within the quarry areas
- The spread of weeds and pathogens will be minimised through the implementation :
    - Vehicles entering and exiting the site will be visually inspected for weeds, and where required vehicles will be cleaned prior to exiting the site
    - All vehicles exiting the site will pass through a wheel wash to remove soil and weeds prior to leaving the site
    - Site personnel will be made aware of potential risks associated with removing soil and weeds from the site
    - Weeds will be controlled using chemical products with herbicidal action registered by the Australian Pesticides and Veterinary Medicines Authority. Any products used will be applied by personnel experienced and trained in the application of such products

6 Conclusion on the likelihood of significant impacts

6.1 Do you THINK your proposed action is a controlled action?

	No, complete section 6.2
X	Yes, complete section 6.3

6.2 Proposed action IS NOT a controlled action.

Wind Energy Facility

The design of the amended WEF (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 to be the maximum extent of impact and there may be an opportunity to further reduce impact on native vegetation through detailed design and the implementation of Environmental Management Plan(s) (as required by Condition 6 of Planning Permit No. PL-SP/05/0548).

It is not considered that the proposed action will have a significant impact on any MNES, except for Golden Sun Moth and Striped Legless Lizard, discussed further in Section 6.3.

The WEF will result in the removal and/or disturbance of approximately 0.08 ha of NTGVVP (a reduction of approximately 0.49 ha compared with the permitted WEF). The proposed development will result in the removal of 0.08 ha of the NTGVVP ecological community and this does not meet the significant impact thresholds outlined in the significant impact guidelines for this ecological community.

Related Projects

External Overhead Powerlines

The area subject to the proposed action is highly modified from its natural state. The footprint of the current overhead powerline alignment may have an impact on very small isolated areas of Natural Temperate Grassland of the Victorian Volcanic Plain (i.e. 0.128 ha) and Grassy Eucalypt Woodland of the Victorian Volcanic Plain (0.002 ha). However, the proposed development is not likely to have a significant impact on these listed communities or listed threatened species, or any other Matters of National Environmental Significance.

Terminal Station

The terminal station site has been previously cleared and is subject to ongoing disturbance due to the current agricultural practice. The terminal station site and the Camperdown – Lismore Road and Lower Darlington Road intersection are not considered to support any threatened ecological communities. There is habitat for Spiny Rice-flower however these areas are in poor condition and will be avoided by the proposed development. As such, it is not considered that the proposed action will have a significant impact on any MNES.

Quarry

The site of the proposed works has cleared previously and is subject to ongoing disturbance due to the current agricultural practice. The site is not considered to support any threatened ecological communities or species. It is not considered that the proposed works will have a significant impact on any MNES.

6.3 Proposed action IS a controlled action

Matters likely to be impacted

N/A	World Heritage values (sections 12 and 15A)
N/A	National Heritage places (sections 15B and 15C)

N/A	Wetlands of international importance (sections 16 and 17B)
X	Listed threatened species and communities (sections 18 and 18A)
N/A	Listed migratory species (sections 20 and 20A)
N/A	Protection of the environment from nuclear actions (sections 21 and 22A)
N/A	Commonwealth marine environment (sections 23 and 24A)
N/A	Great Barrier Reef Marine Park (sections 24B and 24C)
N/A	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
N/A	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
N/A	Protection of the environment from Commonwealth actions (section 28)
N/A	Commonwealth Heritage places overseas (sections 27B and 27C)

Wind Energy Facility

The SHWF WEF is likely to be considered a controlled action given that:

- up to approximately 1.57 ha of suitable grassland habitat that is known to support a population of Golden Sun Moth is proposed to be permanently removed as a result of the construction of internal access tracks and turbine bases, the extent of impacts are considered to be significant under the EPBC Act; and
- medium quality habitat Striped Legless Lizard habitat is proposed to be impacted the proposed action has the potential to significantly impact the species (i.e. potential for resident populations of the species and associated grassland habitats).

However, as discussed in Section 4 of this referral, SHWFPL propose a number of measures to ensure there is no net impact on these species.

Additionally, whilst the amended WEF is proposed to impact 1.57 ha of Golden Sun Moth habitat, the amended WEF has resulted in a reduction of approximately 1.1 ha of confirmed habitat (2.67 ha in the permitted WEF footprint compared with 1.57 ha for the amended WEF footprint).

7 Environmental record of the responsible party

		Yes	No
7.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** SHWFPL is a subsidiary of Origin Energy; as such this section has been prepared based on the environmental record of Origin Energy. Origin Energy believes that it has a satisfactory record of responsible environmental management. Origin's operations are subject to environmental regulation under Commonwealth, State and Territory legislation. Our activities, products and services have potential to impact the environment so these are managed to comply with applicable laws as well as in accordance with the company's integrated Health, Safety and Environment management system. Whenever there are environment-related incidents, these are recorded and follow-up action implemented commensurate with the actual and environment impacts associated with the incident. By way of example, during the year ended 30 June 2015, the Company's Australian operations recorded a number of environmental incidents arising from Origin's activities including those where Origin was the operator of a joint venture. These incidents resulted in environmental impacts of a minor and/or temporary nature. Regulators were notified of reportable environmental incidents and there were no prosecutions or fines resulting from these reportable incidents. Appropriate remedial actions have been taken or are being undertaken in response to each notice and reportable environmental incident.	X	
7.2	**Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details** No. Origin Energy has not been subject to legal court proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.		X
7.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** Yes, this action will be managed within the Company's our integrated Health, Safety and Environment management system (HSEMS). , with additional detailed controls specified in a suite of HSE and operational risk directives Origin operates its business in accordance with our HSEMS, with additional detailed controls specified in a suite of HSE and operational risk directives. Leading the HSEMS is the Company Health, Safety and Environment Policy which has an overriding aspiration to conduct our business in a way that causes no harm to the health and safety of people and has no unforeseen impacts to the environment. A copy of the HSE Policy can be found on Origin's website (www.originenergy.com.au/content/dam/origin/about/investors-media/health-safety-environment-policy.pdf). The HSEMS is aligned with the requirements of company HSE Policy and recognised international and Australian standards including ISO 14001, OHSAS 18001, ISO 31000	X	

and AS 4801 and supports the Company in its efforts to comply with legal obligations. The HSEMS includes a suite of environmental controls to reduce the risk of environmental harm through:

- exercising due care in complying with legal and other obligations
- identifying environmental hazards and managing the associated risks
- using energy and resources efficiently
- minimising wastes and emissions
- supporting business units achieve appropriate objectives and conduct ongoing monitoring and reporting.

The HSEMS ensures we are all contributing to the delivery of a world class energy business through leading environmental practices to leave a positive environmental legacy.

7.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Provide name of proposal and EPBC reference number (if known)

X

Yes, Origin Energy has previously referred or has been responsible for referring an action under the EPBC Act. The most significant referral was in relation to the Australia Pacific LNG project for the development, construction, operation and decommissioning of infrastructure associated with Origin's coal seam gas resources in south central Queensland. Origin is a joint venture partner with Australia Pacific LNG holding 37.5% interest in the project. The Commonwealth approved the project under the EPBC Act including approval for the development of the gas fields, construction of transmission pipelines and an LNG (liquefied natural gas) plant on Curtis Island.

Origin Energy has submitted other referrals under the EPBC Act some of which were not deemed to be controlled actions. Previous referrals include:

2016/7694	Origin Energy Darling Downs Solar Farm Pty Ltd/Energy Generation and Supply (renewable)/Lot 119 SP227731/Queensland/Darling Downs Solar Farm, west of Dalby, Qld
2015/7551	Origin Energy Resources Ltd/Energy generation and supply (non-renewable)/Otway Basin/VIC/Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic
2012/6565	Origin Energy Resources Limited/Exploration (mineral, oil and gas - marine)/Otway Basin/VIC/The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic
2012/6421	Origin Energy Resources Limited /Exploration (mineral, oil and gas - marine)/Otway Basin/Commonwealth Marine/Otway Astrolabe 3D Marine Seismic Survey, Otway Basin
2011/6125	Origin Energy Resources Limited /Exploration (mineral, oil and gas - marine)/S of Vic, the Otway Basin, Southern Eastern Marine region/Commonwealth Marine/Otway Basin Exploration Drilling Campaign, Vic
2011/6091	Origin Energy ATP Pty Limited/Mining/300km west of Brisbane /QLD/Ironbark Coal Seam Gas Project
2011/6048	Origin Energy Resources Ltd/Exploration (mineral, oil and gas - marine)/100km northwest King Island/VIC/Astrolabe 3D Marine Seismic Survey
2011/5879	Origin Energy Resources Limited /Energy Generation and Supply (non-renewable)/Halladale and Black Watch/Victoria/Gas Fields

	Development		
2010/5702	Origin Energy Resources Limited /Exploration (mineral, oil and gas - marine)/Exploration permit T/44P within the Bass Basin/Commonwealth Marine/Origin Energy Silvereye-1 Exploration Drilling Programme		
2010/5558	Origin Energy Resources Limited /Exploration (mineral, oil and gas - marine)/VIC/RL2, PEP168, PPL10, Otway region 10km NW of Peterborough/Victoria/Speculant 3D Transition Zone Seismic Survey		
2010/5417	Origin Energy Resources Limited /Energy Generation and Supply (non-renewable)/qld/Queensland/Darling Downs Power Station 2		
2009/4913	Origin Energy Resources Limited /Energy Generation and Supply (non-renewable)/Approx. 2.2 kms SE of Garvoc/Victoria/Gas Pipeline Crossing at Mount Emu Creek		
2009/4776	Origin Energy Resources Ltd/Exploration (mineral, oil and gas - marine)/Approx 160kms North-West of Devonport/TAS/Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P		
2009/4719	Stockyard Hill Wind Farm Pty Ltd/Energy Generation and Supply (renewable)/150km south-west Melbourne, 35 km west of Ballarat /Victoria/Stockyard Hill Wind Farm		
2008/4456	Origin Energy CSG Limited/Mining/Condamine-Kogan Rd, Chinchilla/QLD/Proposed Coal Seam Gas Development & Associated Infrastructure		
2007/3551	Origin Energy Resources Limited/Exploration (mineral, oil and gas - marine)/Bass Basin of Bass Strait/Commonwealth Marine/Silvereye 3D Seismic Survey		
2006/2881	Origin Energy Power Limited/Transport - Water/Mortlake/Victoria/Water pipelines, Mortlake Power Station		
2005/2180	Origin Energy /Exploration (mineral, oil, gas)/Bass Strait/TAS/Shearwater 2D and 3D marine seismic s urvey		
2005/1995	Origin Energy Power Ltd/Energy generation and supply/Spring Gully/QLD/Construction and operation of a gas fired power station		
2005/1984	Origin Energy Power Limited/Energy Generation and Supply (non-renewable)/Port Campbell-Mortlake/Victoria/Victorian Generator Project		
2005/1942	Origin Energy Retail Ltd/Energy generation and supply/Poolaijelo to Penola/VIC/SESA Pipeline		
2004/1924	Origin Energy CSG Limited /Energy Generation and Supply (non-renewable)/Spring Gully/Queensland/Spring Gully Gas Field (Stage 2)		
2004/1644	Origin Energy CSG Limited/Energy generation and supply (non-renewable)/Spring Gully/QLD/Spring Gully gas field development (Stage 1) within petroleum leases PL195, PL204, PL200 and PL203		
2003/1058	Origin Energy Resources Limited/Exploration (mineral, oil, gas)/Bass Strait/Commonwealth Marine/Exploration Drilling Well Trefoil-1		
2001/321	Origin Energy Resources Limited /Mining/Bass Strait/Victoria/Yolla Gas Field (TRL1) Development		

8 Information sources and attachments

(For the information provided above)

8.1 References

Wind Energy Facility

- Ecology Heritage and Partners, 'Biodiversity Assessment to Accompany an Application to Amend Planning Permit No. PL-SP/05/0548, Stockyard Hill' (May 2016)
- Ecology Heritage and Partners, 'Biodiversity Assessment of Roadside and Intersection Upgrades, Stockyard Hill Wind Farm, Victoria' (May 2016)
- Ecology and Heritage Partners, 'Preliminary Ecological Assessments for the Stockyard Hill Wind Farm, Stockyard Hill, Victoria' (2011).
- Ecology and Heritage Partners, 'Stockyard Hill Wind Farm, Natural Temperate Grassland of the Victorian Volcanic Plain and Targeted Flora Surveys' (2011).
- Ecology and Heritage Partners, 'Stockyard Hill Wind Farm targeted Spiny Rice-flower surveys' (2011).
- Ecology and Heritage Partners, 'Targeted Striped Legless Lizard Delma impar surveys of the Stockyard Hill Wind Farm, Stockyard Hill, Victoria' (2012).
- Ecology and Heritage Partners, 'Targeted Striped Legless Lizard surveys of proposed borrow pits within Stockyard Hill Wind Farm, Stockyard Hill, Victoria' (2013).
- Ecology and Heritage Partners, 'Detailed Flora Investigations for the Stockyard Hill Wind Farm, Victoria' (2014).
- Ecology and Heritage Partners, 'Targeted Golden Sun Moth *Synemon plana* Surveys for 2011/12 and 2012/13 at Stockyard Hill Wind Farm, Stockyard Hill, Victoria' (2014).
- Biosis Research, 'Bird & Bat Impact Assessment to Accompany an Application to Amend Planning Permit No. PL-SP/05/0548', (May 2016)
- Archaeology At Tardis, 'Stockyard Hill Wind Farm, Stockyard Hill, Cultural Heritage Management Plan, AAV CHMP No. 10530' (21 October 2009). Approved by Aboriginal Affairs Victoria on 22 October 2009.
- Archaeology At Tardis, 'Cultural Heritage Management Plan No. 14281, Additional Wind Energy Facility Works' – *In preparation.*
- Archaeology At Tardis, 'Cultural Heritage Management Plan No. 14279, Road and Intersection Upgrades' – *In preparation.*
- Environmental Resource Management, 'Landscape and Visual Impact Assessment to Accompany an Application to Amend Planning Permit No. PL-SP/05/0548', (April 2016)

Related Projects

External Overhead Powerlines

- Ecology and Heritage Partners, 'Detailed Flora and Fauna Assessment of the Preferred Overhead Powerline Corridor and Alternative Alignment Options, Stockyard Hill Wind Farm, Victoria', (May 2016).
- Ecology and Heritage Partners, 'Detailed Flora and Fauna Assessment of Several Proposed Overhead Powerline Alignment Options, Stockyard Hill Wind Farm, Victoria' (January, 2013).
- Ecology and Heritage Partners, 'Targeted Golden Sun Moth *Synemon plana* Surveys 2012/13, within the Transmission Line alignment options, Stockyard Hill Wind Farm, Stockyard Hill, Victoria', (March 2013).
- Ecology and Heritage Partners, 'Preliminary Flora and Fauna Assessment for the Proposed Transmission Line Corridor at the Stockyard Hill Wind Farm' (March 2012).
- Ecology and Heritage Partners, 'Flora and Fauna Assessment for the proposed Terminal Station at the Stockyard Hill Wind Farm, Victoria', (June 2012).
- Ecology and Heritage Partners. 'Targeted Striped Legless Lizard Delma impar surveys of the Stockyard Hill Wind Farm, Stockyard Hill, Victoria', (March 2012).

- Ecology and Heritage Partners, 'Targeted Golden Sun Moth Synemon plana surveys of the Stockyard Hill Wind Farm, Stockyard Hill, Victoria' (March 2012).
- Archaeology At Tardis, 'Cultural Heritage Management Plan No. 12177, Stockyard Hill Wind Farm Transmission Line to Grid Lot 1 TP746129 Skipton Road Stockyard Hill' – *In preparation.*
- Brolga Collision Risk Modelling, Biosis Research (May 2016)
- Golder Associates, 'Preliminary Geotechnical Investigation Report, Stockyard Hill Wind Farm Transmission Line Lismore, Victoria', (2 July 2013)
- Zinfra, 'Constructability Assessment, Stockyard Hill Wind Farm 132kV Transmission Line', (13 August 2012)

Terminal Station

- Ecology and Heritage Partners 'Flora and Fauna Assessment' (July 2012)
- SKM, 'Traffic Assessment and Framework Management Plan' (July 2012)
- SKM, 'Environmental Management Plan' (July 2012)
- Sonus, Environmental Noise Assessment (July 2012)
- SKM, 'Visual Impact Assessment and Indicative Landscape Plan' (July 2012)
- Archaeology at Tardis, 'Cultural Heritage Management Plan 12081, Stockyard Hill Wind Farm Terminal Station Lower Darlington Road Lismore' (June 2012) Approved by OAAV on 19 July 2012.
- Archaeology at Tardis, 'Cultural Heritage Management Plan No. 12402, Intersection Upgrade of Camperdown-Lismore Road and Lower Darlington Road, Lismore' (11 January 2013). Approved by OAAV on 15 January 2013.
- SKM, 'Framework Construction Management Plan', (July 2012)
- Biosis Research, 'Potential Impacts of a proposed electricity Lismore Terminal Station to the threatened Brolga *Grus rubicund'* (July 2012)
- SKM, 'Concept Design – Upgrade of Intersection of Camperdown-Lismore Road and Lower Darlington Road', (September 2012)

Quarry

- Ecology and Heritage Partners report 'Stockyard Hill Wind Farm: Detailed Flora and Fauna Investigation of the Proposed Quarry Site' (July 2013)
- Golder Associates, 'Options for the Sourcing of Construction Materials for the Stockyard Hill Wind Farm' (29 October 2012)
- Golder Associates report 'Stockyard Hill Borrow Pit Investigation' (5 February 2013)
- Archaeology At Tardis Pty Ltd, 'Cultural Heritage Management Plan 12648, Stockyard Hill Wind Farm Quarry Lot 2 PS604561 143 Stockyard Hill- Wangatta Road Stockyard Hill' (9 May 2014). Approved by Wathaurung Aboriginal Corporation on 14 May 2014.
- Golder Associates, 'Stockyard Hill Wind Farm Pty Ltd, Extractive Industry Work Authority 1218, Work Plan: Proposed Quarry' (5 December 2013). Endorsed by DEDJTR on 5 May 2014
- Jacobs, 'Stockyard Hill Wind Farm Quarry – Landscape and Visual Assessment' (June 2014)
- Jacobs, 'Stockyard Hill Wind Farm Quarry – Desktop Social Impact Assessment' (June 2014)
- Jacobs, 'Stockyard Hill Wind Farm, Quarry Traffic Assessment and Framework Management Plan' (June 2014)

8.2 Reliability and date of information

The level and reliability of information used in Section 3 is considered high and sufficient to allow a comprehensive assessment of likely impacts to Matters of National Environmental Significance. It includes flora and fauna and cultural heritage assessments completed in 2011-2016 by experienced and reputable

specialist consulting firms. All additional information relied on in the compilation of this document is from reliable, sources, such as industry groups, government agencies and established authors.

8.3 Attachments

General

Attachment A – Geographic Information System (GIS) data
Attachment B – Land Tenure Spreadsheet
Attachment C – Proposed Draft Conditions of Approval

Wind Energy Facility

Attachment D – Amended Wind Energy Facility Indicative Layout Plans
Attachment E – Wind Energy Facility Site Context Plan
Attachment F – EPBC Referral 2009/4719 Decision
Attachment G – Existing Wind Energy Facility Planning Permit
Attachment H – Permitted Wind Energy Facility Indicative Layout Plans
Attachment I – Biodiversity Assessment (WEF Infrastructure)
Attachment J – Biodiversity Assessment (WEF Roadworks)
Attachment K – Bird and Bat Assessment (WEF)

Overhead Powerlines

Attachment L – External Overhead Powerlines Site Context Plan
Attachment M – Biodiversity Assessment (External Overhead Powerlines)
Attachment N – Brolga Collision Risk Modelling

Terminal Station

Attachment O – Terminal Station Site Context Plan
Attachment P – Terminal Station Preliminary Design Plans
Attachment Q –Terminal Station Planning Permit
Attachment R – Flora and Fauna Assessment (Terminal Station)

Quarry

Attachment S – Endorsed Work Plan

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Attachment D – Amended Wind Energy Facility Indicative Layout Plans Attachment E – Wind Energy Facility Site Context Plan Attachment L – External Overhead Powerlines Site Context Plan Attachment O – Terminal Station Site Context Plan Attachment P – Terminal Station Preliminary Design Plans Attachment S – Endorsed Work Plan
	GIS file delineating the boundary of the referral area (section 1)	✓	General Attachment A – Geographic Information System (GIS) data

	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Attachment I – Biodiversity Assessment (WEF Infrastructure) Attachment J – Biodiversity Assessment (WEF Roadworks) Attachment K – Bird and Bat Assessment (WEF) Attachment M – Biodiversity Assessment (External Overhead Powerlines) Attachment N – Brolga Collision Risk Modelling Attachment R – Flora and Fauna Assessment (Terminal Station) Attachment S – Endorsed Work Plan
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)	✓	Attachment F – EPBC Referral 2009/4719 Decision Attachment G – Existing Wind Energy Facility Planning Permit Attachment Q –Terminal Station Planning Permit Attachment S – Endorsed Work Plan
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	N/A	
	copies of any flora and fauna investigations and surveys (section 3)	✓	Attachment I – Biodiversity Assessment (WEF Infrastructure) Attachment J – Biodiversity Assessment (WEF Roadworks) Attachment K – Bird and Bat Assessment (WEF) Attachment M – Biodiversity Assessment (External Overhead Powerlines) Attachment N – Brolga Collision Risk Modelling Attachment R – Flora and Fauna Assessment (Terminal Station) Attachment S – Endorsed Work Plan
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	N/A	
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	N/A	

9 Contacts, signatures and declarations

Project title: Stockyard Hill Wind Farm – Wind Energy Facility

9.1 Person proposing to take action

1. Name and Title:	Peter Marriott Generation Project Development Manager
2. Organisation:	Stockyard Hill Wind Farm Pty Ltd (a subsidiary of Origin Energy)
3. EPBC Referral Number:	*Unknown*
4: ACN / ABN:	ABN 71 118 119 501
5. Postal address:	Level 12, 321 Exhibition St, Melbourne VIC 3000
6. Telephone:	03 9652 5203
7. Email:	peter.marriott@originenergy.com.au
8. Name of proposed proponent (if not the same person at item 1 above:	Stockyard Hill Wind Farm Pty Ltd
9. ACN/ABN of proposed proponent (if not the same person named at item 1 above):	ABN 71 118 119 501
I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:	*Not applicable*
If you are small business entity you must provide the Date/Income Year that you became a small business entity:	*Not applicable*
I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations. Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made:	*Not applicable*
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence. I agree to be the proponent for this action. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.
Signature	Date 15/07/2016

9.2 Person preparing the referral information (if different from 8.1)

Name	Cara Layton
Title	Land Use and Approvals Planner
Organisation	Jacobs Group (Australia) Pty Ltd
ACN / ABN (if applicable)	ABN 37 001 024 095
Postal address	Level 11, 452 Flinders Street, Melbourne
Telephone	03 8668 3000
Email	cara.layton@jacobs.com
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.
Signature	Date 16/07/2016