



Woolnorth Wind Farm Holding Pty Ltd

ACN 154 051 617

Musselroe Wind Farm Public Environmental Report July 2016 – June 2019

Date: 30 September 2019



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1. General Managers Statement

This is the third Public Environmental Report (PER) published by Woolnorth Wind Farm Holding Pty Ltd (WNH) for the Musselroe Wind Farm (MRWF) project. The PER has been prepared in accordance with the Annual Fee Remission Guidelines (Sec Ed. 2010) produced under Part 7 of the Environmental Management and Pollution Control (general fees) Regulation 2007.

According to condition G5 of the Environment Protection Notice for the project (EPN 8657/2) an Annual Environmental Review, that is also publically available (www.woolnorthwind.com.au), must be submitted to the Director of the Environment Protection Authority within 3 months of the end of the reporting period. This PER is submitted, therefore, to fulfil the requirements of the EPN Condition G5 and the requirements set out in Section 2.3 and 3.4 of the Annual Fee Remission Guidelines (sec Ed. 2010). The PER reporting period is July 1 2016 to June 30 2019.

The information contained in this PER has been carefully prepared by our Health, Safety and Environmental team, in collaboration with project staff, and in many cases includes information contained in previous Annual Environmental Reviews.

I acknowledge and endorse this report.



Stephen Ross
General Manager
Woolnorth Wind Farm Holding Pty Ltd
30 September 2019

2. This Report and Reporting Period

This PER provides a summary of the environmental management activities and management actions undertaken at MRWF during the reporting period (July 1 2016 to June 30 2019). This report fulfils the requirements of the Annual Environmental Review requirements for 2018/19 in accordance with Condition G5 (EPN 8657/2). The reporting requirements relevant to the Commonwealth Environment Protection and Biodiversity Conservation Act (1999) (EPBC) approval (2002/683) are also reported in this document. It also provides additional information to satisfy the reporting requirements of a Public Environment Report, and a summary of additional work undertaken at this site to address any environmental issues or improve environmental values. Table 1 contains details of the sections within this report and the specific compliance requirements that each section addresses.

Table 1. Sections contained within this report and details of reporting requirements met.

Sections of this report	Compliance details
Statement from General Manager	Requirement of G5 of EPNs. PER requirement.
Reporting period Section 2	PER requirement
Profile – Woolnorth Wind Farm Holding Section 3	PER Requirement
Environmental Policy – Woolnorth Holding Section 4	PER requirement
Activity Profile Sections 3	PER requirement
Legislative requirements Section 6.2	PER requirement
Permit Conditions Section 6.1	Reporting on commitments contained within EPNs. PER requirement
Complaints Received From the Public Section 7.5	PER requirement
Non-trivial Environmental Incidents Section 7.6	PER requirement
Infringement Notices, Prosecutions or Enforcements Section 7.10, 7.11	PER requirement
Environmental Monitoring Section 7 & 8	PER requirement
Environmental Training Section 7.13	PER requirement
Community Engagement on Environmental Matters Section 7.14	PER requirement
Other Environmental Management Activities Section 7.16	PER requirement
Environmental Management Plans – State and Commonwealth Sections 8-16	Reporting on commitments contained within EPNs, EPBC Approval and the State Environmental Management Plan

3. Profile – Woolnorth Wind Farm Holding Pty Ltd

WNH is a joint venture partnership between Hydro Tasmania and Shenhua Clean Energy Holdings, and was formed in 2012. WNH owns and operates the Bluff Point Wind Farm (BPWF) Pty Ltd (65MW), the Studland Bay Wind Farm (SBWF) Pty Ltd (75MW) and the MRWF (168MW).

The company has a total installed capacity of 308MW and owns and operates around 100km of transmission line (110kV) connecting the wind farms to the national electricity grid. MRWF Pty Ltd leases the land for the wind farm from Hydro Tasmania, while WNH owns the properties that Bluff Point and Studland Bay Wind Farms are built on. It also manages commercial grazing licenses across all three properties. The Company's administrative base is in Launceston, Tasmania.

4. Environmental Policy



Woolnorth Wind Farm Holding Environmental Policy

We aim to minimise the impact of our wind farms on flora and fauna, the land and communities where we operate

We are committed to:

- Understanding and managing our impacts on flora and fauna
- Protecting the natural values of the land on which we operate
- Meeting our legal and compliance commitments
- Improving our management processes and prevent pollution
- Being transparent about our environmental issues and performance

We do this by:

- Maintaining a rigorous monitoring program to assess our impacts
- Implementing offsets and other measures to manage impacts
- Implementing measures to protect and improve the natural values of the land we operate on
- Strongly focussing on our compliance, regulatory and other commitments
- Undertaking regular checks on our performance, setting objectives and targets and implementing improvement measures
- Reporting regularly and openly about our environmental issues and performance

Stephen Ross
General Manager
10 December 2018



Woolnorth Wind Farm Holding

Document Number:
Version Number:

WNH Q8
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5. Activity Profile

5.1 Background

The MRWF is located in far north-east Tasmania (Figure 1). MRWF Pty Ltd was previously owned by Roaring 40s Renewable Energy Pty Ltd until 30 June 2011 when Roaring 40s was disaggregated. It was then owned by Hydro Tasmania. Ownership changed again in February 2013 and the wind farm is now owned by WNH. WNH manages MRWF, including compliance its obligations under the Environment Protection Notice (EPN), EPBC approval and other approval conditions. The regulatory compliance obligations of MRWF are the main focus of this report.

5.2 MRWF

The MRWF consists of:

- 56 Vestas (3MW) wind turbines.
- Underground 33 kV power collection system.
- An electrical substation, control room and associated buildings.
- Roads, fences and other associated infrastructure.
- A 110kV single circuit transmission line (49km in length, Figure 2), connecting the wind farm to the national electricity grid at the Derby substation.

Construction of the wind farm commenced in March 2009 and completion of the wind farm was contractually executed on 9 October 2013. For the purposes of several EPN requirements bound by the term 'commissioning/ed', July 1 2013 is used (as 55 of the 56 wind turbines were operating by that time).

MRWF has been issued a Municipal Planning Scheme Permit (PLN/03-0161 & PLN/08-0714), an EPN (8675/2, replacing conditions attached to PLN/03-0161) and an EPBC approval (2002/683). These regulatory instruments are administered by the Dorset Council, the EPA and the DoEE respectively. Attached to these legal instruments are environmental conditions with which MRWF must comply. The preparation of this AER is a requirement of the EPN. Environmental Management Plans that have been approved in accordance with the EPN and EPBC Approval also outline reporting commitments and requirements. This report contains the relevant

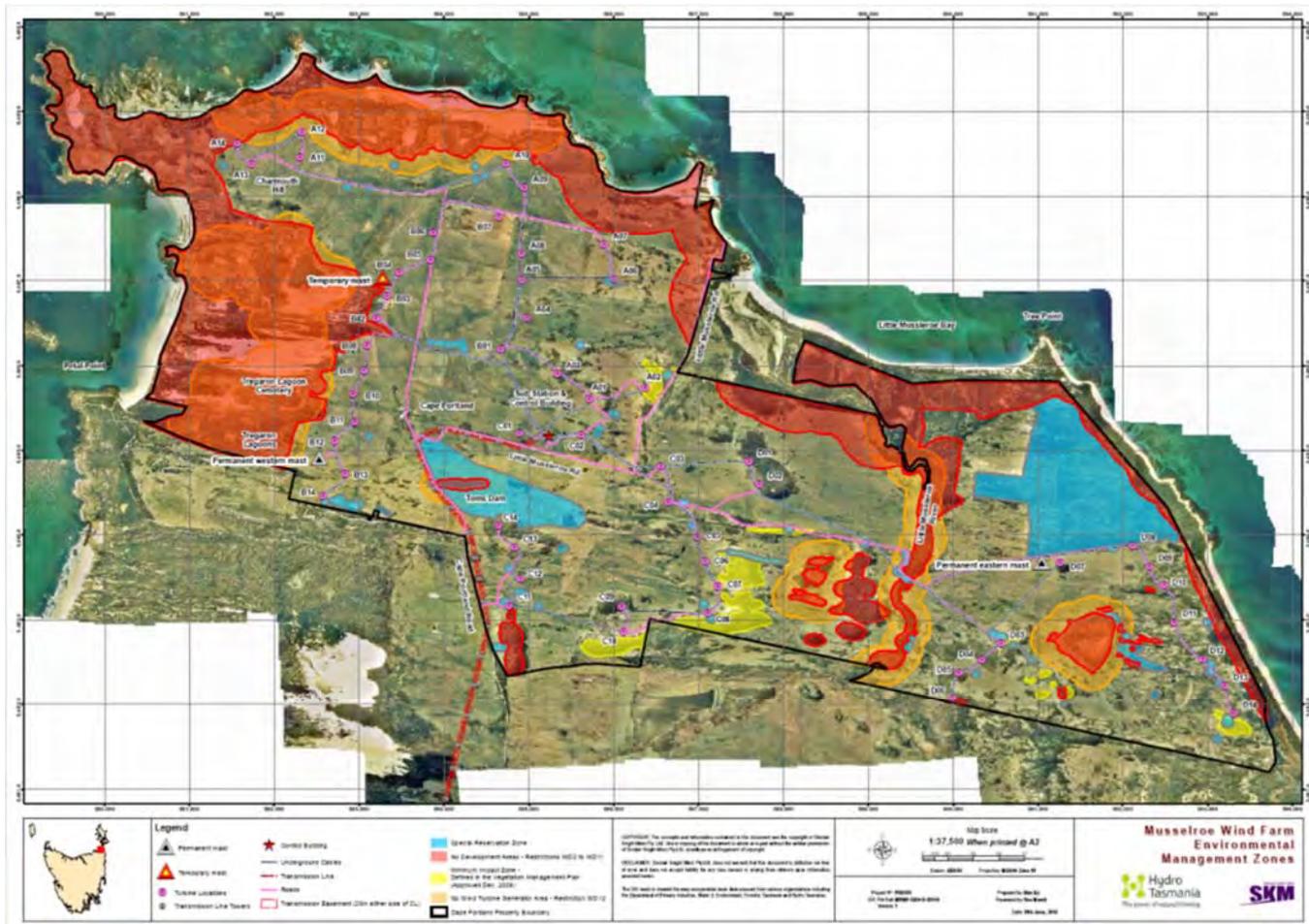


Figure 1. Musselroe Wind Farm layout.

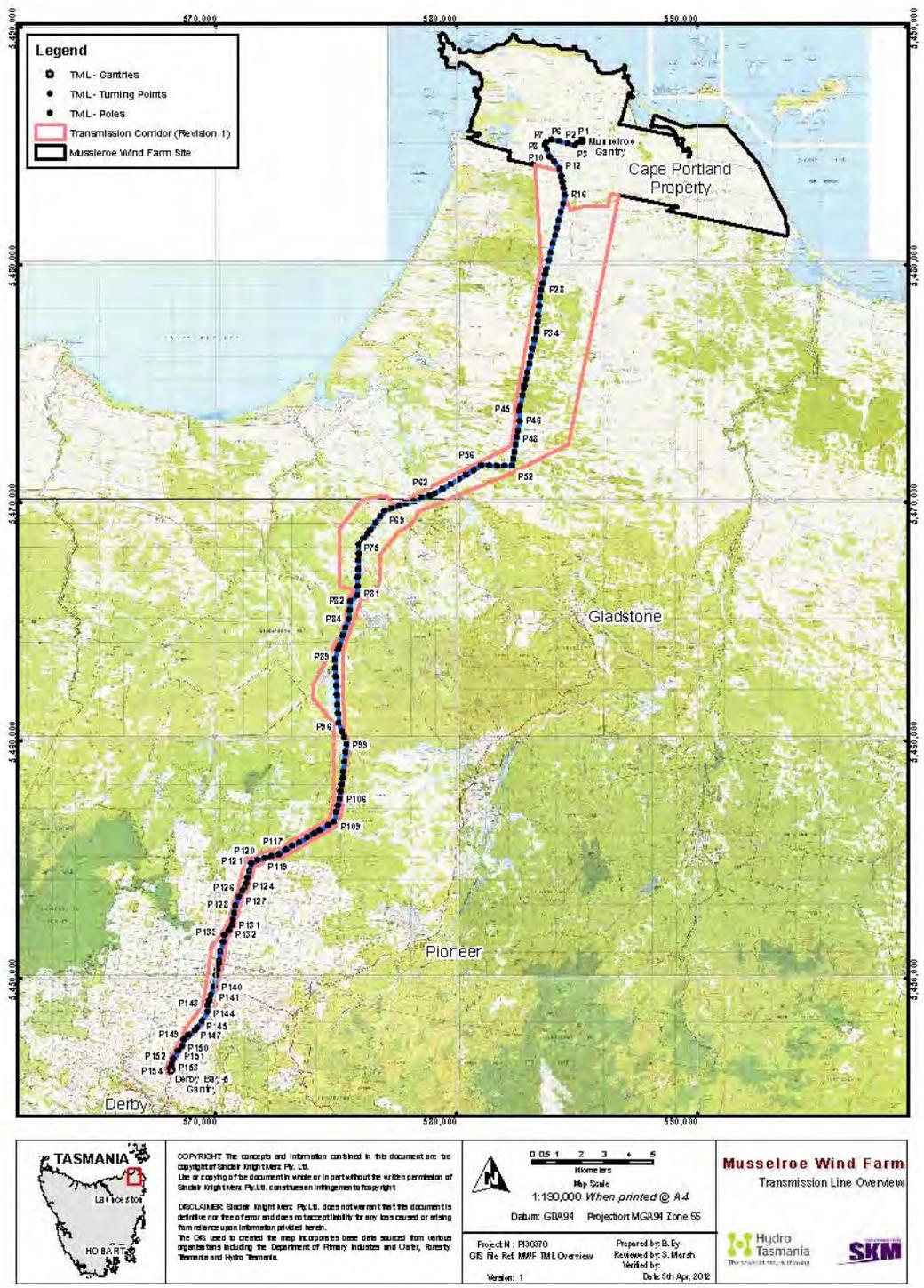


Figure 2. Transmission line alignment.

5.3 Plant and operations

Table 2 summarises the infrastructure at the MRWF, while Table 3 summarises that of the transmission line.

Table 2. Wind Farm Infrastructure.

Installed capacity	168MW
Number of turbines	56, Vestas V90
Tower height (m)	80
Rotor diameter (m)	90
Wind speed range (m/s)	4-25
Year commissioned	July 1 2013
Access roads	43 km access roads
Underground power collection system	33 kV
Control building including switch room (high voltage circuit breakers), administration offices, and workshop	Yes
Wind Monitoring Tower	2 permanent, 1 temporary (removed late in reporting period)
Hazardous material store	Yes
High voltage switchyard including transformers, disconnectors, circuit breakers, overhead gantry	Yes
Reactive support equipment	Yes
General storage facility	Yes
Visitors Centre	Yes

Table 3. Summary of Transmission Line Infrastructure

	Notes
Configuration	Overhead monopole construction, single circuit comprising 3 conductors and an OPGW (optic fibre ground wire)
Main transmission line length	46 km
No. monopole/towers	154 (not including structures in switchyards)
Length Underground Cable	0
Bird strike mitigation	Approximately 8 spans

From an operational perspective, MRWF has been fully operational since commissioning was completed at the end of June 2013. There have been a range of operational failures, generally associated with the balance of plant (e.g. failures in the switch yard componentry, control systems and ring main units at the base of each turbine). These have resulted in losses of production at the individual turbines level, circuits of turbines, or at the whole wind farm level from time to time. However, as outlined above they do not fall outside what is regarded as normal for an operational wind farm. During the reporting period (July 1 2016 through June 30 2019) the wind farm produced approximately 1695 GwH of electricity.

5.4 Raw material consumption

The MRWF EPN does not specify or limit the consumption of any raw materials. MRWF has however monitored a few commodity streams which are required for the operation of the wind farm (see Table 4). The vast majority of commodities and materials were brought to site occurred during the construction, rather than during the operational phase of the wind farm.

Table 4. Raw materials used/brought to site during the reporting period.

Purpose	Quantities			Source
	2016/17	2017/18	2018/19	
Stabilised sand	0	2 tonne	0	St Helens
Base course and other road materials (t)	1500	1500	1500	Rushy Lagoon
Energy Consumed (Gwh)	1.3	1.3	1.0	Grid
Diesel	25.53KL	29.68KL	22.18KL	Gladstone, Scottsdale, St Helens

5.5 Product markets

The energy produced by the wind farm is used in the National Electricity Market. The energy is metered (measured) at the Derby sub-station and distributed from there.

5.6 Pollution, greenhouse gas emissions, waste, other emissions and their control measures

Pollution

While the wind farm is an industrial facility, it is not a significant source of air, water or noise pollution. Vehicle exhaust emissions and dust from plant and vehicles used during would be the only sources of air pollution.

Hazardous materials used during the wind farm operational phase generate relatively small quantities of waste including liquid oils and oily wastes and coolant from turbine servicing. Minor quantities of solvents are also used on site. No spills of oil, chemicals or liquid wastes used in the facility were noted during the reporting period.

Chemical inventories and safety data sheets are held at the site and are regularly updated and audited. Hazardous materials and dangerous goods associated with the servicing and maintenance of turbines and other plant are managed by Vestas and are held in hazardous materials stores, with any hazardous waste disposed of by a licenced contractor. All hazardous

materials such as oils, fuels, coolants paints, solvents, glues and herbicides are retained on site at the lowest practical stock levels and if possible and practical only brought to site when needed.

Fuel usage and waste stream volumes are recorded and reported on a monthly basis and incidental losses are recorded as incidents in the company's HSE database. WNH utilises Hydro Tasmania's Health, Safety and Environment (HSE) procedures and associated documents to manage and control environmental aspects and impacts related to the activity.

Greenhouse gas emissions

The calculated amount of greenhouse gas emissions from electricity used during the reporting period was:

- In 2016/17 - 258 tCO₂e;
- In 2017/18 – 259 tCO₂e; and
- In 2018/19 – 201 tCO₂e.

Note: This is a theoretical calculation and it assumes that non-renewable sources of energy are used to supply electricity in times when the wind farm production does not the basic demands of the wind farm site.

The calculated amount of greenhouse gas emissions from diesel used during the reporting period was:

- In 2016/17 -69 tCO₂e;
- In 2017/18- 80 tCO₂e; and
- In 2018/19 - 60 tCO₂e.

The calculated amount of greenhouse gas emissions from SF6 loss (default annual leakage) during the reporting period was:

- In 2016/17- 84 tCO₂e;
- In 2017/18 - 80 tCO₂e; and
- In 2018/19– 80 tCO₂e.

Solid and liquid wastes and their control measures

Solid wastes and liquid wastes are divided into the following waste streams; general rubbish, steel and hydrocarbon waste (liquid and solid). The quantity of each of these streams produced during the reporting period is shown in Table 5.

Table 5. Solid and liquid waste generated from the MRWF during the reporting period.

Waste Stream	2016/17	2017/18	2018/19
General rubbish (m ³)	15	23	19.5
Steel (tonne)	1.2	0.5	0
Hydrocarbon Liquid (L)	400	0	0
Hydrocarbon solid (m ³)	9	15	10.5
Co-mingled recyclables (m ³)	4	4	4
Cardboard (m ³)	24	15	4

Water and Noise

No emissions to water have been recorded during operation of the wind farm and there have been no complaints regarding noise emissions from the site.

5.7 The local environment**Wind Farm**

MRWF is located on the Cape Portland property in Tasmania's far north-east (Figure 1). The site is approximately 5,500 ha. The area is dominated by consistent westerly winds with an annual rainfall of about 600 mm.

The project area rises from coastal dunes to undulating plains and low hills up to approximately 80 m above sea level. The lower areas of the site are generally poorly drained, containing a number of small naturally occurring water bodies and wetlands. Several intermittent and perennial swamps are scattered throughout the site, as are numerous man-made farm dams

The Cape Portland Wildlife Sanctuary (a private sanctuary proclaimed under the *National Parks and Wildlife Act 1970*) occupies the western side of the property, and includes numerous lagoons, the largest named the Tregaron Lagoon. These water bodies range from fresh water to saline, depending on their distance from the coast, and constitute most of the surface water on the site. In addition to the lagoon areas, other wetlands habitats occur in the north-east of the property. Six of the wetlands are listed in the Directory of Important Wetlands in Australia and have been nominated for their ecological value.

The headwaters of the Little Musselroe River is south of the Rushy Lagoon township, draining in a north east direction into the Little Musselroe Bay estuary. The catchment includes large parts of the Rushy Lagoon property as well as the south western part of the project area.

Adjoining the Cape Portland Wildlife Sanctuary is the Cape Portland Conservation Area (209 ha). This area is a narrow coastal Crown Land reserve that extends from high water marks to the lower water mark and includes the Petal Point area.

An area of Crown coastal reserve borders most of the north boundary of the wind farm site and extends east to link to the Musselroe Bay Conservation Area (1,750 ha).

The wind farm site and the land immediately around it are reasonably representative of the local environment. The landscape has been progressively cleared to make way for agricultural

enterprises, resulting in a mosaic of relatively large expanses of cleared pasture dissected by smaller remnant patches of native vegetation. The 'Rushy Lagoon' agricultural property is located to the south of the wind farm.

There are no known significant local sources of pollution within the vicinity of the wind farm.

Aboriginal people have a deep spiritual connection to the immediate and local area. In particular it is the clan country of *Mannalargenna*, a significant leader, to whom many Tasmanian Aborigines today can trace their lineage. It is also important because of various significant historical events that have occurred there, and these strong connections continue into the present.

There are many records of Aboriginal heritage across the wind farm site and extensive studies were undertaken prior to the construction of the wind farm (and transmission line) to minimise any possible impacts to physical heritage. Wind turbines, cable routes, roads and part of the transmission line were moved or realigned to avoid impacts to Aboriginal Heritage.

There are also a number of other significant heritage artefacts and features that represent heritage value to other cultures, including a private grave yard and building ruins.

Transmission Line

The transmission line is approximately 46 km long and runs in a SSW direction from the wind farm site and terminates at the Derby sub-station, approximately 3km north of the Derby township (Figure 2). The transmission line passes through various landscape types including farmland (high and low productive, grazing and cropping), scrub forests, private Eucalypt and Pine plantations and Eucalyptus woodland and forest. These landscapes provide diverse and wide ranging habitats for numerous species of flora and fauna. Land tenures include private freehold, State Forest, State Reserve (Mt Cameron Regional Reserve) and Crown Land.

The Ringarooma and Little Boobyalla Rivers are the main drainage lines intersecting the transmission route and flow into Ringarooma Bay. Others include March Creek, Vicary's Creek and Walpole Creek. The lower floodplain of the Ringarooma River, which includes the Chimneys and Hardwickes Lagoons, is declared a Ramsar wetland.

There are no known significant local sources of pollution within the vicinity of the transmission line.

5.8 The regional environment

The regional area includes a variety of environments ranging from marine, coastal dunes and heath, to pastoral and intensive agricultural land to forests and low rocky hills. The project site is located in the Dorset Municipality and is part of the Flinders Bioregion, which is described as:

"Devonian granites dominate the elevated areas of the subregion forming low rugged ranges. These are overlain by shallow stony/gravelly gradational or duplex soils carrying *Eucalyptus amygdalina* open forest and woodland with *E. nitida* open heath on higher peaks. Quaternary/Tertiary materials overlain by deep sandy soils typify extensive lowland plains, coastal deposits and dunes. Coastal plains have been heavily

modified by agricultural (grazing).”(Interim Biogeographic Regionalisation for Australia, 2000).

Winds tend from the north-west to the southerly sector for most of the year, but with occasional rain bearing north-easterlies in the summer months. Rainfall patterns in coastal areas average less than 800 mm but increases to over 1200 mm with elevation.

Prior to European settlement most of the north-east region was covered by forest. With the advent of increased human activity and fire frequency, structural changes in vegetation have occurred. The wind farm site and transmission corridor have been substantially modified as a consequence of land clearing for agriculture. Ongoing clearing, fertiliser use, regular burning and other practices associated with the agricultural land use continue to take place. Within the region a diverse range of vegetation communities exist including coastal dune vegetation scrub, scrubby coastal heath, wet heath, dry Eucalypt forest, She Oak forest, Melaleuca and Leptospermum scrub forest, wet Eucalypt forest and isolated areas of rainforest.

The fauna populations of the region are diverse. Many of the birds are found in association with the shoreline and wetland areas, and some 144 native species have been documented in total. Seven of these native species have been listed under the relevant Commonwealth and state legislation. The area also has a rich mammal population, with 23 species of mammal, along with five species of frog and four species of reptile recorded in the region.

The closest human population centre (other than Musselroe Bay) to the wind farm is Gladstone (population less than 100 people). Industrial sectors that dominate the employment in the region area include agricultural, forestry and fishing, followed by manufacturing and retail. These latter sectors are concentrated predominantly in the larger urban centres of Scottsdale (< 2,000 people) and Bridport (approximately 1,500 people), and collectively these two towns account for approximately 44% of the Dorset Municipality population.

5.9 Significant changes to wind farm operations and environmental procedures over the reporting period

No major changes to the wind farm activity have taken place over the reporting period. Specific changes to environmental monitoring are discussed in Section 7.

No significant changes to the activity are expected over the next 12 months.

6. Legislative requirements

6.1 Permit conditions

MRWF Pty Ltd has been issued a Municipal Planning Scheme Permit (PLN/03-0161 & PLN/08-0714), an EPN (8675/2, replacing conditions attached to PLN/03-0161 and EPN 8675/1). A copy of the current EPN is provided in Appendix 1. MRWF also operates under an approval issued under the EPBC (approval no. 2002/683). These regulatory instruments are administered by Dorset Council, Tasmanian Environment Protection Authority (EPA) and the Commonwealth Department of Environment and Energy (DoEE).

Attached to these legal instruments are conditions with which the wind farm must comply. The preparation of an Annual Environmental Review (embodied in this PER) is a requirement of the wind farm's EPN. Environmental management plans approved in accordance with the EPN and Commonwealth approval conditions also outline reporting commitments and requirements. This report therefore contains the relevant reporting requirements for MRWF and the associated 110 kV transmission line.

6.2 Relevant Environmental legislation

The following legislation and policy documentation are particularly applicable to the operation and maintenance of the MRWF. Changes and updates to legislative requirements are monitored each month.

TASMANIAN LEGISLATION AND REGULATIONS

- Aboriginal Relics Act 1975
- Agricultural and Veterinary Chemicals (Control of Use) Act 1995
- Agricultural and Veterinary Chemicals (Control of Use) Order 2001
- Animal Welfare Act 1993
- Animal Welfare Regulations 1993
- Building Act 2000
- Building Regulations 2004
- Crown Lands Act 1976
- Crown Lands Regulations 2001
- Dangerous Substances (Safe Handling) Act 1995
- Dangerous Substances (Safe Handling) Regulations 2009
- Dangerous Goods (Safe Transport) Act 1998
- Dangerous Goods (Road and Rail Transport) Act 2010
- Dangerous Goods (Road and Rail Transport) Regulations 2010
- Electricity Supply Industry Act 1995
- Electricity Supply Industry Regulations 2008
- Electricity Wayleaves and Easements Act 2000
- Environmental Management and Pollution Control Act 1994
- Environmental Management and Pollution Control (Atmospheric Emissions) Regulations 2007
- Environmental Management and Pollution Control (Environment Improvement Programme Fees) 2004
- Environmental Management and Pollution Control (General Fees) Regulation 2007
- Environmental Management and Pollution Control (Infringement Notices) Regulations 1996

- Environmental Management and Pollution Control (Miscellaneous Noise) Regulations 2004
- Environmental Management and Pollution Control (Waste Management) Regulations 2000
- Fire Service Act 1979
- Forest Practices Act 1985
- Forest Practices Regulations 2007
- Historic Cultural Heritage Act 1995
- Historic Cultural Heritage Regulations 2006
- Land Use Planning and Approvals Act 1993
- Land Use Planning and Approvals Regulations 2004
- Living Marine Resources Management Act 1995
- Local Government Act 1993
- Mineral Resources Development Act 1995
- National Parks and Reserves Management Act 2002
- National Parks Act 1970
- Natural Resource Management Act 2002
- Nature Conservation Act 2002
- Resource Management and Planning Appeal Tribunal Act 1993
- State Policies and Projects Act 1993
- Movement of Controlled Wastes Between States and Territories 1998
- State Coastal Policy 1996
- Draft State Policy on the Protection of Agricultural Land 2009
- State Policy on Water Quality Management 1997
- Threatened Species Protection Act 1995
- Water and Sewerage Industry Act 2008
- Water and Sewerage Industry (General) Regulations 2009
- Weed Management Act 1999
- Weed Management Regulations 2000
- Workplace Health and Safety Act 2012
- Vermin Control Act 2000

COMMONWEALTH LEGISLATION AND REGULATIONS

- Aboriginal and Torres Strait Islander Heritage Protection Act 1984
- Australian Heritage Commission Act 1975
- Environment Protection and Biodiversity Conservation Act 1999
- Environment Protection and Biodiversity Conservation Regulations 2000
- Civil Aviation Act 1988
- Civil Aviation Safety Regulations 1998
- National Environment Protection Council Act 1994
- National Greenhouse and Energy Reporting Act 2007
- National Greenhouse and Energy Reporting Regulations 2008
- Native Title Act 1993
- Renewable Energy (Electricity) Act 2000
- Renewable Energy (Electricity) Regulations 2001

OTHER CODES AND STANDARDS

- Australian Dangerous Goods Code
- ESAA Sustainable Practice Framework
- Threatened Tasmanian Eagles Recovery Plan (current ed.)
- Forest Practices Code 2015

7. Environmental Management and Monitoring

7.1 Overview of the Regulatory Approved Environmental Management Plans

Environmental monitoring at the wind farm is conducted in accordance with the approved Environmental Management Plans (EMPs).

All necessary Environmental Management Plans (EMPs) for the MRWF were prepared and approved prior to commissioning of the wind farm, as required by the approval conditions, permit and/or EPN. In November 2016, the suite of State EMPS approved for the for the project were reviewed and consolidated into a single Plan ('State Environmental Management Plan 2016') and submitted for approval. The Plan was approved by the EPA in July 2017. The review and consolidation of the Plans, primarily focussed on removing the information and commitments relating to the planning, construction and commissioning phases of the wind farm which are/were no longer relevant.

Also relevant is the Bird Utilisation, Behaviour and Mortality Monitoring Plan which was submitted and re-approved by DoEE during the reporting period (2017). The Plan was primarily amended to reflect the changes made in the State Environmental Management Plan 2016 (Section 7.4, Bird and Bat Mortality Monitoring Plan).

The following table (Table 6) summarises the relevant management plans and their details (the current Departmental names are used).

Table 6. Status of State Environmental Management Plans for the MRWF.

Environmental Management Plan and relevant permit condition	Authority	Years of Approval/ Review	Status	Reporting required in AER?*
Wader Monitoring Plan	EPA	2008, 2016**	Active, but all requirements completed	Yes
Fauna Monitoring Report	EPA	2007	Requirement completed	No
Avian Collision mitigation Report (Transline)	EPA	2007	Requirement completed	No
Schayer's Grasshopper surveys	EPA	2007	Requirement completed	No
Construction Rehabilitation Plan	EPA	2008	Requirements completed	No
Weed and Disease Management Plan	EPA	2008, 2016**	Active	Yes
Construction Solid Waste Management Plan	EPA	2009	Requirements completed	No, internal auditing
Hazardous Materials Management Plan	EPA	2009, 2016**	Active	No, internal auditing
Eagle Impact Offset Plan	EPA	2008, 2016**	Active	Yes
(Wind Farm) Vegetation Management Plan	EPA	2008, 2016**	Active	No, general comments included
Transmission Line Vegetation Management Plan	EPA	2008, 2016**	Active	No, general comments included
Wind Monitoring Tower Avifauna Management Plan	EPA	2012	Requirements completed	No
Bird and Bat Mortality Monitoring Plan	EPA	2011, 2016**	Active	Yes
Final Wind Farm Design Report	EPA	2012	Requirements completed	No
Final Transmissions Line Design Report	EPA	2012	Requirements completed	No
Construction and/or Operational Environmental Management Plan	Internal	Not Required	Active	Internally approved

Table 6. Status of State Environmental Management Plans for the MRWF.

** Plans reviewed and consolidated to *State Environmental Management Plan 2016*

Table 6 (cont). Status of Commonwealth Environmental Management Plans for the MRWF.

Environmental Management Plan and relevant permit condition	Authority	Years of Approval/ Review	Status	Reporting required in AER?*
CEM2 Turbine 6 Migratory Bird Impact Mitigation Plan	DoEE	Not approved	Not Required	Turbine 6 on Tank Hill was not built
CEM3 Wind Farm Listed Species Impact Mitigation Plan#	DoEE	2012	Active	No, summary and general comments included (some monitoring is reported as part of the Bird behaviour, Utilisation and mortality Monitoring Plan)
CEM4 Bird Utilisation, Behaviour and Mortality Monitoring Plan#	DoEE	2017	Active	Yes
CEM5 Transmission Line Listed Species Impact Mitigation Plan#	DoEE	2009	Active	No, general comments included.
CEM6 Wedge-tailed Eagle Impact Offset Plan#	DoEE	2009	Active	No, general comments included

#compliance reporting is also conducted in accordance with Condition 7 of the EPBC Approval, e.g. "On 1 July of each year after the date of this approval, the person taking the action must provide a certificate stating that the conditions of this Approval have been complied with".

In summary, the following sections of the State Environmental Management Plan 2016 require reporting:

- Wader Monitoring Plan.
- Weed and Disease Management Plan.
- Eagle Impact Offset Plan (a consolidated version of the Wedge-tailed Eagle Impact Offset Plan and the White-bellied Sea Eagle Impact Offset Plan).
- Bird and Bat Mortality Monitoring Plan.

Relevant aspects of the Commonwealth Bird Utilisation, Behaviour and Mortality Monitoring Plan EMP are also reported in this PER.

All of the above are reported in Section 8 and 9 of this report. A summary and general comments for the following plans is also provided in the same sections of this report:

- (State) Construction Rehabilitation Plan
- (State) Wind Farm Vegetation Management Plan
- (State) Transmission Line Vegetation Management Plan
- (State) Wind Monitoring Tower Avifauna Management Plan
- (Commonwealth) Wind Farm Listed Species Impact Mitigation Plan

- (Commonwealth) Transmission Line Listed Species Impact Mitigation Plan
- (Commonwealth) Wedge-tailed Eagle Impact Offset Plan.

7.2 Environmental Management System

WNH (including operations at BPWF and SBWF) operates its business under a Health, Safety and Environmental management system. WNH was certified to ISO 14001 in 2013 and has maintained its certification since.

The HSE system includes Policies, Procedures, Forms and other documents that assist to establish and set high-level directives to all areas of the business. This includes defining document accountabilities and responsibilities, effectively outlining business and operational risks, developing procedures and protocols to effectively control and manage these risks. In addition, the system includes methods to check and review system performance and implementation and ensure a systematic continuous improvement cycle is established and implemented.

The HSE management system is described (including access to most system documents) and available on the WNH website www.woolnorthwind.com.au/health-safety.

7.3 Annual audit reports

Internal and external audits of MRWF have been conducted through the PER period. Audits included compliance with local, state and commonwealth requirements, internally prepared project documentation and HSE system documentation. Internal audits are conducted in accordance with system procedures. All audit findings are entered into a dedicated database and audit actions tracked. Table 7 lists the audits conducted during the PER period.

Table 7. Audits conducted during the PER period

Year	Audit focus	Year	Audit focus
2016/17	Site operational audit	2017/18	Site operational audit
2016/17	Bushfire audit	2017/18	ISO14001 external audit
2016/17	Site Internal environmental audit	2018/19	Bushfire audit
2016/17	ISO 14001	2018/19	Site Internal Environmental Audit
2017/18	EPBC Approval audit	2018/19	Site operational audit
2017/18	Bushfire audit	2018/19	ISO14001 external audit
2017/18	Site Internal Environmental Audit	2018/19	Paddock weed audit

7.4 Report on any changes made or intended to the activity or EMS in response to the annual audits

Audits conducted over the PER period continued to drive continuous improvement in environmental management at the MRWF. All audit actions including opportunities for improvement were evaluated and where possible actions developed to address them. Implementation of actions is tracked at various levels.

There have been no material changes made or intended to be made to the activity. All audit issues have been addressed promptly.

7.5 Public Complaints

There were no public complaints in relation to environmental matters received by WNH during the reporting period. A free-call 1800 number was established during the reporting period.

7.6 Environmental Incidents (non-trivial) and non-compliances

Environmental Occurrences

It is a requirement under section 32 of EMPCA that incidents resulting from the release of a pollutant are reported to the EPA. The EPN and EPBC approval and accompanying management plans also require reporting of some incidents. All incidents relating to birds and bat collisions with wind turbines were reported to the EPA (see section 8.4). Incidents relating to birds listed under the Threatened species Protection Act (TSPA) were reported according to the Bird and Bat Mortality Monitoring plan and the Bird Utilisation, Behaviour and Mortality Monitoring Plan. These are also reported in Section 8.4.

There were no incidents that required reporting under Section 32 of EMPCA during the reporting period. Other non-reportable/trivial incidents were documented and managed by WNH through internal procedures.

Occurrence follow-up, mitigation and preventative measures

The only non-trivial incidents to occur during the reporting period relate to bird collisions with wind turbines. There is a bird/bat strike form completed for each incident. In relation to collision of birds not listed under the TSPA/EPBC there are no mitigation or preventative measures to report. For the two eagle species that are listed under the TSPCA/EPBC there are several measures implemented on an on-going basis. In addition, during the reporting period several projects and trials were completed or commenced in response to wedge-tailed eagle collisions. These are described in section 7.16 of the report. Several offsets have also been completed during the reporting period and these are described in sections 8.3 and 9.4 of the report.

Non-compliance

WNH continued to comply with the latest approved State and Commonwealth EMPs.

There were no non-compliances with the EPNs or other approval conditions identified. Internal audits conducted as a part of WNH internal audit schedule found no EPN or other approval condition related non-compliances. External audits against ISO 14001 found the sites to be maintaining the standard required to continue their certification, and audits by both the Commonwealth and State regulators also found no non-compliances.

Infringement and environment protection notices

No legal proceedings such as infringement notices or EPNs were served on the wind farms during the reporting period.

7.7 Environmental Procedure or process changes

As previously outlined, the state approved environmental management plans for the project were reviewed, consolidated into a single Plan ('State Environmental Management Plan 2016') and submitted for approval in 2016. The Plan was approved by the EPA in July 2017. This review primarily focussed on removing the information and commitments relating to the planning, construction and commissioning phases of the wind farm which are/were no longer relevant.

A significant environmental procedural or process changes during the reporting period was the removal of the additional bird and bat mortality monitoring surveys conducted in the 'North West Wader Zone' of the wind farm. Further details on this change are provided in section 8.4. The change did not come into effect until December 2017 following the re approval of the Bird Utilisation, Behaviour and Mortality Monitoring Plan (pursuant to Condition 4 of the EPBC approval).

7.8 Environmental Management activities and meetings

A summary of environmental management activities and meetings for the period July 2016 to June 2019 is provided in Table 8.

Table 8. Summary of environmental management activities and meetings during the reporting period.

Date	Activity or meeting	Comment
Activities undertaken and outlined in the approved EMPs are outlined in the relevant sections of this report. Other management activities and meetings held in conjunction or addition to the approved EMPs are listed in this table.		
2016/17		
August 2016	Meeting - Western Advance	Update on latest technologies
September 2016	Meeting with SRE	Annual grazing license review
October 2016	DoEE meeting	BUBMM Plan review
November 2016	DoEE meeting	BUBMM Plan review
December 2016	EPA site visit	Annual audit
January 2017	NRM North	On-site weed management meeting
February 2017	Threatened Species Unit	Botanical Survey
March 2017	EPA site visit	Familiarisation trip for new staff
May 2017	EPA meeting	Discussion on recent WTE collision
May 2017	Wombat Rescue Tasmania	Introductory meeting onsite
2017/18		
August 2017	Meeting - Western Advance	Update on latest technologies
September 2017	Meeting with Southern Rural Enterprises	Annual grazing license review

Date	Activity or meeting	Comment
October 2017	DoEE meeting	BUBMMP review
October 2017	Workshop with EPA	Meeting with EPA about eagle management, mitigation (Musselroe Wind Farm focus)
November 2017	Green Army and Dorset Council	Site Tour with emphasis on environmental management
December 2017	ISO14001 audit	External ISO 14001 audit
December 2017	University of Tasmania	Site visit and eagle nest checking for satellite tracking project
December 2017	EPA site visit to Woolnorth	General wind farm visit to discuss issues
January 2018	NRM North	On-site weed management meeting
February 2018	Threatened Species Unit	Botanical Survey
February 2018	Meeting with DPIPWE	To discuss offset projects
March 2018	EPA site visit	Familiarisation trip for new staff
May 2018	EPA meeting	Discussion on recent WTE collision
May 2018	Where, where, wedgie?	Workshop and participation in surveys
2018/19		
August	EPA meeting	Meeting with EPA about eagle management, mitigation (Musselroe Wind Farm focus)
August-October	Technology discussions/meetings	Various meetings with Identiflight and Robin Radar
October	SRE	Grazing Licence meeting
November	Noise deterrent testing	Testing of Hyper-Spike as a potential noise deterrent (MRWF)
November	ESA Conference	Presentation at Woolnorth bird impact data
December	External Audit	External audit by BSI for ISO 14001 certification

Date	Activity or meeting	Comment
March	Robin Radar	Visit to Robin Radar HQ in the Netherlands
February	Western Advance	Discussions with Western Advance re Robin Radar
February	EPA	Eagle management discussions and update on activities
March	Dorset Coastal working Group	Site meeting
April	SRE meeting	Discuss annual plan
May	Where, Where, Wedgie	Workshop and participation in surveys

7.9 Specific actions under EMPCA

There were no specific actions under EMPCA in relation to the activity.

7.10 Any proceedings under Tasmanian or Commonwealth environmental legislation

There were no proceedings under Tasmanian or Commonwealth environmental legislation during the reporting period.

7.11 Any other enforcement actions

There were no other enforcement actions during the reporting period.

7.12 Breaches of permit conditions or relevant limits in legislation and results that vary significantly from predictions contained in any relevant EMP

There were no breaches of the permit conditions or other relevant limits during the reporting period.

7.13 Report of staff and contractor environmental training

WNH maintains a training plan for the employees and contractors working at BPWF and SBWF. The training plan is an output of the Health, Safety and Environmental system that governs the BPWF and SBWF operations. The training plan documents all employees and lists the mandatory and recommended training requirements for each person. Training packages have been developed in line with the training plan and are delivered both internally and externally by suitably qualified personnel. In addition to training sessions, emergency preparedness exercises have been undertaken to prepare and train site personnel for site emergency events. Table 9 documents the training sessions and emergency preparedness exercises undertaken during the reporting period.

Table 9. Training sessions and emergency preparedness exercises

Year	Training or exercise	Activity type
2016	Bushfire incident covering prep, during, clean-up	Desktop
2016	Up tower trauma	Field, practical
2016	Site TFS tours	Site tour, field
2016	Emergency risk assessment 2 (incl. Tasmanian Fire Service, Police and State Emergency Service)	Desktop
2017	Field worker doesn't return home	Desktop
2017	Worker in hub become unconscious	Desktop
2017	Injured eagle	Desktop
2017	Quad bike rollover	Desktop
2018	Zero Harm Training	Practical, theory
2018	Nacelle evac rigging	Field, practical
2018	Unconscious patient in nacelle	Desktop
2018	Emergency response (crushed worker)	Desktop
2018	TFS Emergency response – breathing apparatus basement extraction	Field, practical

7.14 Community and stakeholder engagement

Direct community support

A number of initiatives have been maintained and/or initiated during the reporting period that have involve directly supporting a local community group or project. These have included supporting the annual Winnaleah High School Fishing competition, the Northeast River Festival, Scottsdale Show, activities and exercises of the Gladstone Volunteer Fire Brigade, the Bridport Scallop Fiesta, Bridport 10 plus Run, Rail Trail Run (Scottsdale Rotary Club) and the 2019 Veteran Car Club Rally.

Interest groups

WNH engages and supports numerous interest groups, with a working interest in the wind farm and/or property.

A close working relationship continues with Melythina Tiakana Warrana (Heart of Country) Aboriginal Corporation (MTWAC), who were closely involved with the construction of the Tebrakunna Visitor Centre built during the construction phase. MTWAC also organise Mannalargenna Day (December each year) to celebrate the life of Mannalargenna, a passed leader of the Coastal Plains Nation. The day is held at the Tebrakunna Visitors Centre and offers opportunities for the community to learn more about the local Aboriginal history and cultures. Woolnorth also open the wind farm for site tours.

NRM North and Woolnorth have previously collaborated on a strategic vegetation management program (2009-2018). The relationship proved highly constructive with significant areas of high value native vegetation being enhanced through stock exclusion fencing and gorse, box thorn and other weeds being targeted for eradication.

Woolnorth have also supported the Tasmania Museum and Art Gallery Discovery Expedition program and the DPIPWE Wombat Manage survey program.

WNH continues to foster relationships with a Birds Tasmania representatives who continue access the property. Multi-decade surveys continue to be conducted numerous times a year, to document wader bird numbers.

In addition to these mentioned, productive working relationships are also maintained with other groups in the local or regional area. These include the Tasmanian Police, local Tasmanian Fire Service brigades, property neighbours, Parks and Wildlife and the Dorset Coastal Working Group.

Schools and education

Educational support continued during the reporting period with classes from various schools conducting excursions to the wind farm to learn about the MRWF operation, large scale wind farm operations, renewable energy and other aspects of electricity generation.



Figure 4. Students from Grammar constructing and operating a model wind turbine at MRWF.

7.15 Commitments to improve future environmental performance

Adaptive Management

The commitment to continual improvement is supported using an adaptive management process. This approach provides a structured evaluation of complex environmental issues at the wind farms. It was initially formally applied to evaluate the effectiveness of management actions (including surveys) relating to WTE collisions at BPWF and SBWF. The process is now being applied to any environmental management strategy where appropriate, some of which are not complex in their nature. The approach is predicated on evidence-based management, which leads to robust and defensible decision making in environmental management. The approach has been described in previous Annual and Public Environmental Reports.

Other methods of ensuring continuous improvement

WNH is committed to the continuous improvement principles that underpin both the ISO 14001 standard and the HSE system applied to the operations and maintenance of MRWF. Opportunities to improve environmental performance are identified and evaluated through systematic processes such as management reviews, corporate level planning, internal and external auditing, site inspections, monthly site HSE meetings and weekly toolbox meetings. The commitment to continuous improvement is outlined in the WNH Environmental Policy included in section 4.

Other evidence of WNH's commitment to continual improvement is the attendance at relevant national and international conferences and forums (to keep abreast of the latest research and management strategies), the continual tracking of scientific literature on various topics, and the publication and presentation of data from these sites.

7.16 Other Environmental Management Activities

Eagle management

Wedge-tailed eagle mortalities at MRWF are recognised by WNH as a significant issue and concern. WNH, as an experienced wind farm operator, understands the complexity of the issue, the difficulties in understanding it and the various aspects and pitfalls of trying to establish mitigation solutions that have, or are likely to have, tangible and successful outcomes. Various technologies and mitigation options have been tested or implemented by WNH and the previous owners of Bluff Point and Studland Bay Wind Farms. Several workshops were held with Department of Primary Industries, Parks, Water and Environment (DPIPWE - EPA and Policy, Conservation and Assessment Branch) to evaluate all possible options. The joint and collaborative evaluation didn't establish any new concepts to pursue or significant gaps where further information is required or can be readily obtained.

Several measures remained in place throughout the reporting period such as promptly removing animal carcasses from the landscape and monitoring of stock including increased monitoring during periods of calving.

Several other measures have been developed or implemented during this reporting period as summarised below (7.16.2-7.16.10).

Eagle Impact Review (EIR)

The EPA and Woolnorth agreed on conducting an EIR to assist in determining whether the wind farm mortalities are impacting on the local wedge-tailed eagle populations in the Musselroe/Cape Portland region. Woolnorth proposed five projects to provide streams of information to assist and the EPA endorsed these projects. See Table 10 for a summary of the EIR projects.

We highlight that some of the projects are collecting data/metrics that could, however, be considerably impacted by other landscape influences for which we cannot measure or fully understand. Therefore, our ability to clearly and unequivocally determine the impact of wind farm eagle mortalities will be difficult.

Table 10. Eagle impact review projects and status

Project title and description	Status at the end of the reporting period
<p>Eagle observation study – single study A repeat of the two eagle movement studies conducted at the site. See Section 7.1.3 for summary of previous study.</p> <p>The study will contribute to the EIR by determining a current rate of utilisation for comparison with previous periods of observation (and corresponding rates of utilisation).</p>	<p>This study is described in section 7.16.4</p>
<p>Where, where, wedgie (http://naturetrackers.com.au/) – multi-year study <i>Where, where, wedgie</i> is a state-wide eagle observation study. WNH participated in the study by placing observers in the Musselroe/Gladstone regions to collect eagle data.</p> <p>This study will contribute to the EIR by providing data for a regional level comparison of eagle data (e.g. count of observations, count of individuals) collected in the Musselroe/Gladstone Region with other regions in Tasmania.</p>	<p>Observations were completed in May 2018 and May 2019.</p> <p>There has been no comparison undertaken to date. Further discussions are required with the project statistician on the possible approaches that could be used to undertake a comparison. A discussion occurred following the collection of the data in 2018 and it was considered that further years of data collection would be required.</p>
<p>Wedge-tailed eagle nest checks – multi-year study This study will assess the nest activity and breeding success of up to 15 known eagle nest sites in an approximate 30km radius from the wind farm site.</p> <p>This study will contribute to the EIR by providing regional level nest activity and breeding success data for comparison with state-wide data.</p>	<p>In 17/18 all known nest sites in the study area were checked to validate whether they still existed. In 18/19 the nest sites were included in the aerial survey undertaken by the FPA and data collected on nest activity. Post breeding season checks were also undertaken in February to April 2019. No assessment has been undertaken to date. Further years of data will be collected prior to any comparative assessment being commissioned.</p>
<p>Genetic assessment of collision victims and nest ‘cast-off’ material. – multi-year study All collision victims have been sampled for DNA. Off-cast material collected from nest sites such as excreta, feathers, egg shell, pellets can sometimes yield DNA. Using DNA finger printing the collision victims will be compared with DNA extracted from ‘off-cast’ material.</p> <p>This study will contribute to the EIR by providing details on the origin of the collision victims (e.g. local vs itinerant).</p>	<p>As a part of the study outlined about, nest off cast material is being collected in the post breeding season period. Genetic samples continue to be collected from collision victims.</p> <p>A genetic assessment was conducted during the period by UTAS. There are no finding to report and the program is ongoing.</p>
<p>Assessment of individuals through remote stations on the wind farm. Following the techniques of Driscoll and Koronkiewicz (2016), cameras located at fixed stations will be used to collect basic eagle characteristics (count, species, age, time of day) and possibly identify individuals based on plumage or other unique features.</p> <p>This study will contribute to the EIR by providing site level data on the age and number of individuals using the wind farm site. If successful, off site installations may provide a comparative data set.</p>	<p>Five camera systems were deployed. Four across the wind farm and one on a neighbouring property. The project is discussed in further detail below. See section 7.16.3</p>

Assessment of individuals through remote stations on the wind farm.

As summarised above, this project commenced in the 2017/18 reporting period. Five cameras sites were set up using high-quality wildlife style trail cameras linked to a central network point (see Figure 5). The network point receives pictures from all devices on the landscape via a closed radio network and transmits them to a central viewing point over the mobile phone network. Photos can be manually taken from a remote location, the system can be programmed to take images at set times or they can be triggered via motion detection sensors. The photos have been securely held, unwanted images removed and catalogued over time.

The camera sites were positioned away from turbines and in locations we considered to be low risk from a collision point of view. The locations were also chosen to collect imagery of as many individuals as possible (separate territories based on our understanding of these). There are four stations on the wind farm site and one on an adjacent property. Once weekly, the sites are attended to by a technician and carcasses placed as an attractant. All old material is removed, and the sites kept in a hygienic condition.

The camera system produces a lot of data. Using camera 1 as an example, it produced 11600 images over a 406-day period. These images were imported into specialised image sorting software for processing. Initially all images are viewed manually to remove any species other than eagles. Other species included forest raven, marsh harrier, brown falcon, brown goshawk, feral cat, spotted-tailed quoll, Tasmanian devil. Once non-target species were removed from the images, 2506 images of eagles remained. Further processing is then conducted to assist in the cataloguing of the images. From this further processing the following data (Table 11-13) summarises the analysis and what could be determined from the data captured.

Tables 11-13. Summary of imagery collected at Camera 1

	WBSE (adult)	WBSE (non adult)	WTE (adult)	WTE (Non adult)	All eagles
Total events#	31	203	60	167	461
Average event length	17.48 mins	20.07 mins	21:12 mins	16:00 mins	17:13 mins

An event is defined as the amount of time an individual bird spends feeding at the site. An event can comprise, anything from 1 image up to many images

Individual WTE

	First recorded	Last recorded	Age
WTE B	23.07.18	25.08.19	Adult
WTE A	22.07.18	20.09.18	Adult
WTE C	17.09.18	09.08.19	Immature
WTE D	22.09.18	19.08.19	Juvenile

Individual WBSE

	First recorded	Last recorded	Age
WBSE A	07.08.18	31.08.19	Immature
WBSE B	11.10.18	31.08.19	Adult
WBSE C	11.10.18	31.08.19	Adult
WBSE D	27.12.18	31.08.19	Juvenile

The analysis of the data is an ongoing task and a detailed analysis is yet to be completed for all camera stations. From the analysis to date the following table (Table 14) summarises the most likely number

of unique individuals (i.e. not double counted through time or across different feed stations) that have been identified.

Table 14 – Numbers of unique individuals recorded at each of the camera stations.

	Wedge-tailed eagle	White-bellied sea-eagle
Feed station 1	4	4
Rushy Boundary	2	2
Bowens	2	1
Rushy Dunes	3	0
Peters	2	0
Total	13	7



Figure 5 – Top left shows a typical camera station set up with top right and the bottom image showing examples of images collected.

This camera system approach does have inherent limitations that produce identification errors. These errors are typically caused by plumage changes over time, variations in light levels and the position of the bird when the image was captured. The system does however provide an evidence-based estimate of the minimum number of birds present in the landscape. The system has also been useful in showing

the extent to which individuals use one or more of the feed stations, giving an overall indication of territorial behaviours. There has also been an interesting pattern of attendance between WTEs and WBSEs with some months more dominated by one species followed by months dominated by the other species. Overall, the camera system has been very useful in complementing our understanding the populations of both eagle species on or near the wind farm site. Our understanding of risk and impact is also enhanced. The camera data provides an indication of the rate of change in the local population and provides good evidence that eagles do persist around the wind farm for extended periods of time. The theory that eagles are repetitively being killed and replaced by new eagles is not supported by the study to date.

The project will continue in its current form until such time that it is no longer providing valuable information.

Eagle observation study summary

An Eagle Observation Study was conducted in April/May 2018. This was largely a repeated on the *Avoidance Study Around Turbines* study described in section 8 of this report (but in a compressed time period). A short summary of the study results is included below:

Objectives

The eagle avoidance study has the following core objectives:

1. Determine if the current site utilisation areas are similar or the same as that documented in previous eagle flight path studies.
2. Determine if eagle flight metrics measured are similar to previous observational studies.
3. Determine how many at-risk flights occur and their frequency (to warrant an immediate or future deployment of a method of shutdown).
4. Determine if there are any new or current turbine operational or environmental factors that affect the eagle avoidance rate.
5. To evaluate the effectiveness and practicality of a 4 observer approach (the previous study used 2 observers at paired locations).

Methods

There have been two eagle flight observation studies conducted at the MRWF (described in Hull and Muir 2013, one unpublished). Both studies used 8 observation locations across the wind farm site. The last survey conducted in 2016/17 used two observers at paired locations. This study used 4 observer locations with all observers observing simultaneously. The 4 locations were chosen to represent the best spatial separation possible as well as the most optimum observation locations. Each location was surveyed evenly, and observers were randomly distributed to an observation location for each observation session. An observation session lasted 100 minutes with up to 4 sessions per day. All observers were in radio communication and a lead observer defined to start and end of an observation session. A dedicated observation sheet and maps were used to document WTE and WBSE flights and associated data. The length of study was fixed at 20 observation days to ensure a similar survey effort to the previous two studies. The study was conducted over a four-week period, commencing in late April 2018 and running until mid-May 2018.

Summary of results

- 67 (approximately 100-minute surveys) were conducted, a total of 449 observer hours.
- 357 WTE and 54 WBSE flights were observed. This compares with 287 WTE and 29 WBSE flights recorded in the 2016/17 study.
- No significant changes detected in flight distribution across the day or in flight duration.

- The detection rate of the 4 observer method is considered better.
- There is no evidence that the activity rate on site has altered significantly.
- There is no evidence that the rate of risk flights has altered.

Workshops to assess opportunities

In late 2017 and early 2018, eagle collision mitigation workshops (Musselroe Wind Farm focus) were conducted by WNH in conjunction with DPIPWE staff. The workshops explored the technological options available but also other novel ideas. The workshop output provided some guidance on areas where continued development or monitoring of certain technologies remains valid whilst also provided direction on those approaches that have little to no merit (for one or many reasons).

In addition, an internal site-based workshop was undertaken by Woolnorth in June 2018 to evaluate potential options that could be implemented to reduce eagle collisions at a site level. The workshop focussed on identifying opportunities for modifying eagle behaviours on the wind farm site. Four possible opportunities were identified for further consideration. Following discussions with the EPA, DPIPWE and experts it was determined that only one of the options was worth progressing. This related to the strategic installation of high perching poles and is discussed below (7.16.8).

Noise deterrent trials

Noise deterrents have been trialled ineffectively at Bluff Point and Studland Bay Wind Farms on a number of occasions. This initially included a vineyard type PA (personal announcement) scaring system and later a military grade device (Long Range Acoustic Device or LRAD, see www.lradx.com/). Despite these findings, however, a trial of currently available technologies was considered of value based on improvements in the technology. During the reporting period a HyperSpike HS-10 (<https://www.ultra-hyperspike.com/HS-10>) and a HyperSpike HS-18 (<https://www.ultra-hyperspike.com/HS-18-Acoustic-Hailing-Device>) were trialled on site (See Figure 6). The site trials determined that both devices would not be an effective or reliable deterrent device. In most cases eagles within the target range did not show visual behavioural changes when the device was operated. This is the same as the findings of the original trial at the Woolnorth wind farms and therefore it can be reasonably determined that noise deterrents are unlikely to be an effective mitigation option.



Figure 6 – Trial of the HS-18 at Musselroe Wind Farm in 2018

Perch installations

The concept of strategic perch points was formed out of various discussions about strategies to reduce the risk of eagle collisions with wind turbines, and, based on site evidence of eagles using wind monitoring tower as perching points (all now removed). The concept is simple and predicated on there being an overall reduction in the risk of eagle collisions because birds can strategically perch and observe, rather than flying to observe. During October 2018, 5 perches went in across the MRWF. The perches are not actively monitored but eagles have been observed on the installed perches. The install is obviously a novel concept and the likely reduction in collision risk is probably small. The figure (Figure 7) below is provided as an example of the perches.



Figure 7 – An eagle perching pole installed during late 2018.

Eagle nests at MRWF site

Monitoring of known nest sites across the wind farm was undertaken across the PER reporting period. One new WBSE nest (# 2535) was identified within 150m of the known WBSE nest site (#2323). Nest #2322 fell in December 2018 following a period of heavy rain and wind (the nest was not active at the time).

Prior to the 2018/19 breeding season nest access restrictions commencing, a trial of small (mobile network enabled) wildlife cameras were installed to monitor nest activity at selected nests onsite. The systems were also installed prior to the 2019/20 breeding season.

Over the PER reporting period, our observations of most nests have concluded either no or a limited/intermittent use of the sites throughout the breeding season. The WBSE nest sites (either #2323 or #2535), have been active and successful across all years.

Technological investigations

WNH continued to monitor technological advances and strategies being used at wind farms around the world to monitor effects on birds and bats, and mitigation strategies to reduce impacts. A clear focal area for WNH are strategies to understand and mitigate eagle collisions.

Of the literature reviewed throughout the reporting period, the most useful summary of current research and relevant information was published by the National Wind Coordinating Collaborative (NWCC) and the American Wind Wildlife Institute (AWWI). The publication was the Proceedings of the XI Wind and Wildlife Research Meeting held in November 2016. Meeting information is available at [All meeting details](#), and the proceedings were published mid-2017 and are available at [meeting proceedings](#).

The Proceedings summarise several developing advanced technologies to minimising impacts however the two discussed of relevance to minimising eagle impacts were papers on Identiflight and DT Bird. Websites for these technologies are included below that contain considerably more information than

that within the proceedings. There were also a number of papers on innovative approaches to obtaining data on eagle impacts such as novel population sampling methods and techniques for identifying individuals and quantifying population size.

Another general publication of interest published in 2017 (also published by NCC/AWWI) was '*Wind Turbine Interactions with Wildlife and Their Habitats*'. The publication is not specific to technologies or eagles. It is available at the following link [Wind turbine interactions with wildlife and their habitats June 2017](#).

During the reporting period various meetings were held with technology providers to gain an update on developing and available technologies. In April 2018, Woolnorth commenced detailed evaluations of the available technologies. Woolnorth concluded that three technology providers - Robin Radar, DT Bird and IdentiFlight were the only technologies currently on the market with any potential to mitigate or reduce eagle mortalities at MRWF (see web links below).

- Robin Radar
www.robinradar.com/
- IdentiFlight camera systems
www.res-group.com/en/services-products/identiflight/
- DT Bird
www.dtbird.com/

Discussions and further evaluation of these technologies continued during the reporting period. The evaluation process has been focussed on establishing whether these technologies would provide a reliable and effective mitigation solution based on the available performance characteristics of each system. Also key to the evaluation is whether the technologies can be feasibly and practically installed at MRWF or whether there are significant gaps or technical issues to overcome or resolve. By the end of the reporting period Woolnorth had reduced the list of technologies to two and detailed discussion with these technology providers was undertaken. This included field inspections of the equipment and initial commercial discussions. In parallel with these discussions, the issues of interfacing a technology with the wind farm operating system commenced. Woolnorth are committed to continuing our evaluation and resolving the current practical and technical considerations identified.

Roadkill removal project and other projects

The road kill removal program along the Cape Portland Road was maintained throughout the reporting period. The project was initiated due to a number of WTE being killed in the area as a result of vehicle collisions and numerous observations of WTE feeding on road kill. Woolnorth are not aware of any WTE mortalities on Cape Portland Rd since the program commenced. The program involves a dedicated technician (whilst travelling to and from MRWF) relocating road kill to safer area such as the non-road side of an adjacent farm fence or to the edge of the bush line. Fifty to 70 carcasses are typically removed each month, some of which are observed to have eagles feeding on them at the time they are identified.

In addition to the focus being placed on local eagle population management, a number of collaborative relationships have been developed with organisations such as the Save the Tasmanian Devil Program, Wombats Rescue Tasmania, Threatened Species Unit (Flora), Tasmanian Museum and Art Gallery and DPIPWE officers studying feral cats, forester kangaroos and wombats. In all cases WNH supports these agencies and organisations by facilitating land access, through to in-kind and financial support. In the case of the devil program, WNH donated \$10,000 towards the purchase of numerous virtual fencing units for the protection of released tumour free devils against road collisions. The units were initially

deployed for the Mt William/Wukalina release near MRWF but the devil program relocated the units to the Circular Head area to assist with collision management around Woolnorth.

8. State Environmental Management Plans

8.1 Wader Monitoring Plan

Bird Utilisation studies

Study Objectives

The bird utilisation surveys were undertaken at MRWF in two periods, that being prior to construction of the wind farm and after it was built and commissioned. The surveys were conducted in winter and spring 2005 and summer 2006 (pre-construction), while the post-commissioning studies commenced in 2014 focussing on Summer, Winter and Spring for the proceeding three years. This collection of studies was completed and the final report submitted to the EPA and DoEE (available upon request from WNH) in 2016. The objectives of the utilisation studies were to determine if:

1. There is a change in the activity level (using the metric average number of movements per day) or species mix (i.e. species richness and diversity) for key species groups (raptors, waders, seabirds) at MRWF.
2. There is a difference in utilisation between reference and treatment sites. If so, can the changes be related to the establishment of the wind farm (i.e. was the difference only evidence after the construction and commissioning of the wind farm)?

Study design and Data Collection

Nineteen survey points were used, with approximately half of these treatment (close to turbines) and half control sites (minimum of 800m from a turbine). Bird observations were conducted by technicians from Biosis in pairs for week-long site visits. Each observer worked individually. Once an observer reached an observation point, a five minute period was used to allow birds to settle. Observations were then conducted for 20 minutes at each point with the observer noting each bird observed, its species, number, direction of flight, time, height above ground, distance from observer and behaviour. The observations were conducted by scanning a 360° area, by slowly rotating on the spot. All birds observed with the naked eye were documented (with binoculars or scopes only used to identify the species). Once completed, the observer moved to the next point. The order in which observation points were visited and the person conducting the counts was rotated to reduce bias. All surveys were conducted during daylight hours, with ten replicates made at each fixed point, each season. Metadata (time, date, basic weather information) were also collected.

The observation points were chosen in 2005 to represent areas of two basic habitat types (pasture and wetland) and were also allocated as treatment sites (within 800 metres of a turbine) or reference sites (greater than 800 metres from a turbine). The allocation of the reference:treatment criteria was made with reference to the configuration of turbines as proposed in 2005. As design of the wind farm progressed the layout was altered and the constructed layout differed slightly from that conceived in 2005. In order for bird counts to remain comparable before and after construction, the same observation locations were maintained, however this meant reclassifying some treatment sites as reference (and vice-versa). Figure 8 shows the relative location of the survey sites and wind farm infrastructure. Each site is shown with an 800m buffer to indicate the reference/treatment definition.

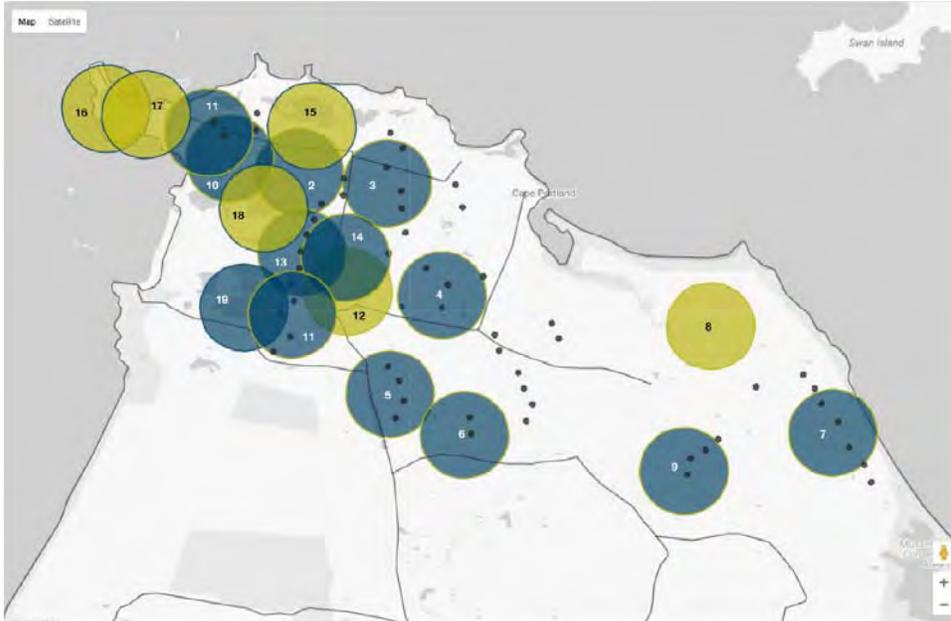


Figure 8. Locations of survey sites for the bird utilisation studies and the final wind turbine layout. Blue circles represent treatment sites and yellow circles represent reference sites. The colour of the circle border indicates whether the site is a wetland or pasture site (yellow is pasture and blue is wetland).

Results and Discussion

In total 2280 observation periods were conducted over the four years of the study (one in the pre-construction period and three in the post-construction period). The study period encompassed seasonality and a range of between-year environmental variables. The analysis of pre- and post-construction bird utilisation was conducted for a number of indices for nominated priority shorebirds, raptors, all bird species, and for bird guilds at treatment and reference sites. These included overall activity, activity by species, species diversity, individual species abundance, and spatial distribution within the site.

Variations in many of the indices were detected but in almost all cases, variance within the post-construction period was as great, or greater, than any difference between the pre- and post-construction periods. Expected variation associated with seasonality, migration and environmental variables, such as wetting and drying of wetlands were also apparent for relevant species. Changes for a couple of non-priority species were likely to have been responses to altered farm management associated with the wind farm (removal of sheep from the property, altered configuration of some paddocks for cattle and weed reduction), but no priority species appear to have been influenced by those management activities.

No patterns for any of the indices measured indicate significant change in bird utilisation for any species (including nominated priority shorebirds and raptors) that can be attributed to the changes that have occurred at the site due to the construction and operation of the wind farm. As an example of this, Figure 9 shows the lack of any clear pattern from the observation periods prior to construction (2005 & 2006) compared to those after construction (2014-2016) for the nominated priority wader species on the site.

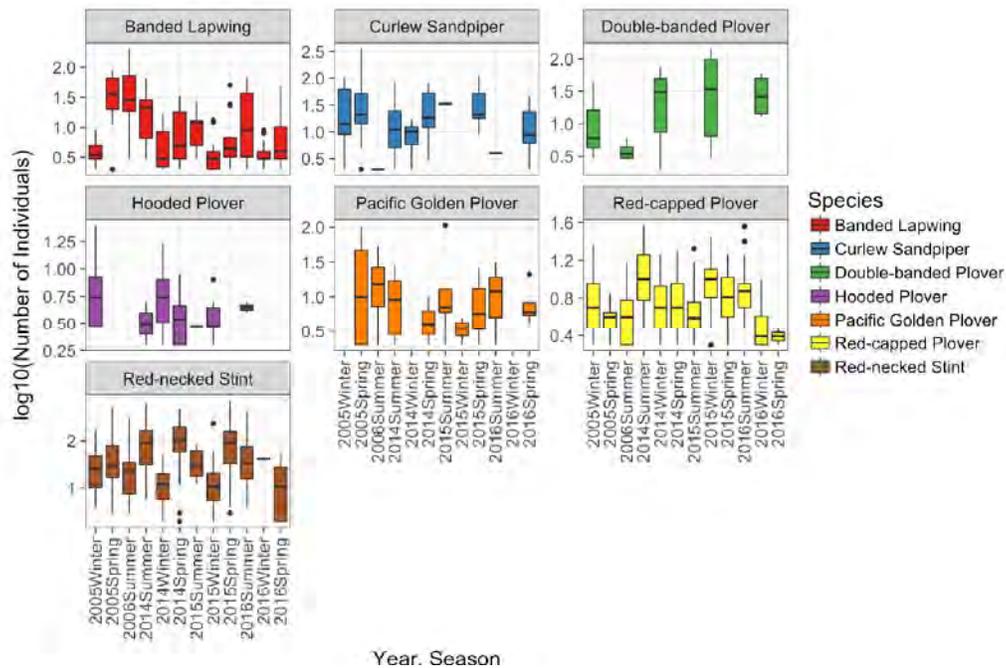


Figure 9. Mean number and distribution (log¹⁰ scale) of priority wader species across all the observation years and seasons.

Conclusions

Results of the study and the question of whether the wind farm has altered utilisation of the wind farm site by birds has been addressed in detail in the final report for this study (available on request) but can be summarised as follows:

- There was no apparent or sustained change in species mix, the number of birds or the number of species between the pre- and post-construction periods.
- There may have been some slight local changes in the use of pasture sites but all areas of the site are utilised in the same broad patterns in the pre- and post-construction periods.
- With the exception of Eastern Curlew, which has not been recorded at any time during the study, all of the nominated priority species still utilise the site. Their numbers fluctuated slightly over the course of the study but there is no evidence of any substantial difference for these species between the pre- and post-construction periods.

Finally, as the study spanned the required three complete years of operations and it was considered unlikely that further investigation would elucidate any effects of the wind farm, no further utilisation and behaviour monitoring have been conducted.

Crepuscular and nocturnal movements

Monitoring of bird and bat collisions (see Section 8.4) has not detected a significant impact to priority species known to be crepuscular or nocturnal in behaviour, hence no action has been required.

Avoidance behaviour around turbines

The avoidance study was originally conducted focussing on all birds and initially proposed to use and follow the methods developed in the Bluff Point Wind Farm avoidance study. The study objectives and

methods were redefined as outlined in the approved 2013 version of the plan. This plan describes an eagle-focussed study using the camera technology that has been under development, trialed and used at BPWF. However, throughout the development and use of the camera technology, the systems limitations become apparent and have led us to conclude the system is not currently suitable for the eagle avoidance study at MRWF. The study methods were therefore adjusted back to an observer-based data collection strategy.

The previous 2016/17 and 2017/18 Annual Environmental Reports provided a summary of the findings of the eagle avoidance study. A summary of the final report is provided below.

The objectives of the study as described in the Wader Monitoring Plan are to:

1. Attempt to quantify the avoidance rate of eagles (or if possible other priority species) at the MRWF.
2. Compare the avoidance rates of eagles at MRWF with those obtained for the Bluff Point and Studland Bay Wind Farms.
3. Determine if there are any turbine operational or environmental factors that affect the eagle avoidance rates.
4. Determine if the current site utilisation areas are similar/or the same to that documented by the previous eagle flight path study.

The study collected data over 10 days in each of the 4 seasons, commencing in autumn 2016 and finishing in summer 2016/17. The study utilised methods and observation locations consistent with the pre-construction study however learnings from the 'observer effects' study conducted at Bluff Point (BPWF) and Studland Bay (SBWF) wind farms were incorporated to lessen observer fatigue and associated issues. The study consisted of approximately 240 hours of daylight observations (60 session/10 days/season). The study was focussed on collecting eagle movement information however other species of birds were document.

In summary the study returned the following findings:

- 287 wedge-tailed eagle (WTE) flights, 29 white-bellied sea eagle (WBSE) flights.
- By comparison slightly less WTE flights, but considerably more WBSE flights were observed in the pre-construction surveys. It is not clear why less WBSE were observed in the post construction surveys.
- Large fluctuations from month to month in numbers of WTE flights with WBSE flights being more constant (and obviously less frequent).
- Average flight time of 8 minutes.
- Digitised flight paths demonstrate clear and obvious avoidance of turbine infrastructure.
- Changes apparent in zones of higher utilisation from pre- to post-construction surveys, the reasons remain unclear however seasonal and environmental variables (e.g. nests being used, wind influences) are likely contributors.
- There were no daily patterns observed in the data (e.g. periods of higher utilisation) and because of the lack of variation in the weather data (combined with low flight counts) no assessment could be made of the influence of such factors.
- Over 400 flights were counted for other species of birds during the study however no interpretation of the data was completed beyond extracting the number of flights counted. Only flights within 200m of a turbine were counted.
- There is an apparent and discernible difference in the density of flights close to turbines (out to roughly 90m) in the post-construction data. There is also a discernible difference in the density

of flights further away from turbines. Both these findings indicate a positive avoidance behaviour.

- Following the avoidance analysis technique developed from similar data collected at BPWF, SBWF and MRWF (pre-construction control), an effective avoidance rate (EAR) was calculated for WTEs – 86.6%. This compares with the SBWF EAR of 81.3% and the BPWF EAR of 90.3%.
- A comparison between the MRWF EAR and the BPWF EAR/SBWF EAR (separately) revealed no significant differences.
- Similar to BPWF and SBWF, the MRWF post-construction data suggested a localised alienation affect with WTEs demonstrating a preference to fly in areas where no turbines were sited (between turbines). This is despite the fact that pre- and post-construction data displayed similar utilisation rates at the whole-site level.

With respect to the objectives of the study:

1. Attempt to quantify the avoidance rate of eagles (or if possible other priority species) at the MRWF.

The EAR for the WTE was quantified as 86.6%, significantly higher than the pre-construction avoidance rate of 0.9%. Avoidance rates for other species could not be determined due to the lack of data.

2. Compare the avoidance rates of eagles at MRWF with those obtained for the Bluff Point and Studland Bay Wind Farms.

The avoidance rate quantified at MRWF for WTEs is not significantly different to EARs calculated from similar studies at BPWF and SBWF. A broader confidence interval exists for the MRWF EAR (compared to BPWF and SBWF) as an artefact of the low number of flight counts.

3. Determine if there are any turbine operational or environmental factors that affect the eagle avoidance rates.

Low flight counts coupled with a lack of variability in weather over the observation periods prevented modelling to determine if any environmental factors affected the EAR.

4. Determine if the current site utilisation areas are similar/or the same to that documented by the previous eagle flight path study.

The current utilisation areas are visually different from the pre-construction utilisation areas. Key differences include:

- An obvious lower level of WBSE utilisation in the post-construction period.
- The WTE flights observed during the pre-construction surveys visually show three areas of higher utilisation. In comparison the post-construction observations visually show are areas preferential utilisation but overall the utilisation is more dispersed.
- The strong north-west utilisation area (around Charmouth Hill) that was observed during pre-construction remains evident but potentially at a lower level of utilisation.
- The area of higher utilisation observed toward the centre of the southern property boundary of the property appears to have reduced.
- The area of utilisation around the most south-eastern nest site appears to have strengthened. It is difficult to determine why this has occurred, but it could be because of the nest site (present now but previously unknown) and/or the difference in the time of year of the observations.

- A greater level of utilisation was observed in the post-construction surveys towards the central region and eastern region of the site. It is unclear why these differences are notable, but it is possible they result from the presence and activity status of the nesting sites these areas.

8.2 Weed and Disease Management Plan

Operational Phase Commitments

All areas of disturbance associated with the construction footprint are regularly surveyed for the existence of weeds. Any small outbreaks of listed weeds are targeted rapidly and removed. Routinely, roads and hardstands are inspected and maintenance is completed including herbicide treatment to remove unwanted weeds and grasses.

Sections of the transmission line corridor are managed for thistles and various other weed species through chemical application and mechanical removal. Transmission line weed populations are best described as localised with small numbers of individual plants. Monitoring of the transmission line for various issues, including weeds, is ongoing and conducted on a regular/ annual basis.

Controlling the spread of weeds

Now that the wind farm and transmission line are in an operational phase, the majority of works undertaken on either the wind farm or on the transmission line infrastructure are accessed via formed, all weather roads. Therefore, there are no significant controls required to manage the spread of weeds and soil borne diseases. The exception to this are weed management works, vegetation management works and bird mortality surveys, where off-road access is required. Standard wash-down guidelines, as per the *Tasmanian Wash-down Guidelines*, and internal environmental management procedures are applied to these tasks where required.

Additional weed management works

Weed management works across the property have continued during the reporting period (outside of the construction and operational footprint). Works have continued to focus on African boxthorn and gorse, with the long-term view to eradicate or significantly reduce the extent of both noxious weed species. A property-based weed management plan is being followed to manage the approach. Also, during the reporting period final treatment of all known stands of boxthorn and gorse within the Cape Portland Wildlife Sanctuary (CPWS - to the west of the site) took place. CPWS weed management activities were directed by Officers of NRM North (Natural Resource Management - North) in close consultation with WNH.

8.3 Eagle Impact Offset Plan

All initial actions outlined in this Plan (relating to both wedge-tailed eagles and white-bellied sea eagles) have been completed. This includes the nest protection program and the study into the effectiveness of nest protection management prescriptions. The objectives and outcomes of these actions are detailed in the MRWF Public Environment Report 2013. The plan remains active for the purpose of providing guidelines for offsetting eagle collisions (specifically nest protection projects).

Since the commissioning of the wind farm through to the end of the current reporting period, twelve wedge-tailed eagles and one white-bellied sea eagle had been identified as turbine collision victims. The 'base' offsets that were required in accordance with the initial state and commonwealth WTE Offset

Plans were designed to mitigate the impacts of 6 WTE mortalities. WBSE offsets to mitigate the impacts of 3 mortalities were also required pursuant to the State permit conditions.

The revised Eagle Impact Offset Plan (included in the revised and approved State Environmental Management Plan, 2016) committed to maintaining the offset arrangements inherent in the original approval of one offset for each mortality. The offset prescribed, either the protection of one eagle nest site (and surrounding habitat) through a conservation covenant, or an alternative project approved by the Director (EPA).

With respect to the EPBC Approval obligations for WTE mortalities over the 'base' offset of 6, these requirements are outlined in the BUBMMP as 'corrective actions'. According to the Plan, the corrective action required for mortalities over the original 'base' (or at a higher rate than anticipated) is the protection of two eagle nest sites (and surrounding habitat) through a conservation covenant, or an alternative project approved by the DoEE. This therefore means that the obligations of the EPBC Approval resulting from a WTE mortality are significantly greater than those specified in the State Environmental Management Plan, 2016.

The following projects/actions have been completed or are currently being implemented to fulfil MRWF's offset/corrective action obligations:

- Protection of 2 nest sites
- Financial contribution, equivalent value to 2 nest sites, to UTAS eagle research project
- Financial contribution, equivalent value to 2 nest sites, to Bookend Trust/Nature Trackers citizen science project 'Where, where, Wedgie?'
- Protection of 1 nest site
- Proposal currently before EPA/DPIPWE for approval, equivalent value of 3 nest sites (to determined).
- During the reporting period Woolnorth proposed funding an update to the Threatened Eagles Recovery Plan as an offset. This was supported by both the EPA and DoEE. However, discussions with DPIPWE were not finalised by the end of the reporting period. The proposal would be equivalent value to 2 nest sites

As there has only been one WBSE mortality recorded, no further offset actions have been required.

8.4 Bird and Bat Mortality Monitoring Plan

During the PER reporting period the monitoring regime for detecting bird and bat collisions with the wind turbines was modified. This change occurred in November 2017. The initial regime required more intensive surveys to detect migratory wader birds in the North-West Wader Zone (NWWZ, which comprises turbines A10-A14). All other turbines were assigned to one of four groups, and one group was surveyed fortnightly. Following a significant review of the bird mortality data in mid-2016, and 3 years of monitoring, only one (non-priority or migratory) wader bird had been detected and documented in the bird and bat collision record. On this basis, a new regime was proposed and approved, removing the obligation to undertake the intensive NWWZ surveys. The NWWZ turbines were randomly assigned to one of the four existing groups and the existing fortnightly survey schedule continued with each group being surveyed every 8 weeks (as per the previous survey methodology).

During the PER reporting period there were 1419 unique formal turbine surveys undertaken (593 in 16/17, 462 in 17/18, 364 in 18/19). Across all years, most carcasses detected were identified as part of the formal monitoring program, however, some were also identified outside the formal monitoring program by personnel working on site.

In the last period (18/19), 35 carcasses/feather spots (finds) were found in formal surveys, equalling a find at 9.6% of surveys (Table 5). 326 surveys were conducted where nothing was identified. The number of finds during the 2018/19 reporting period are generally comparable to previous years. Over the PER period 73 dead birds and 15 feather spots were identified. See table 15 below.

Table 15. Summaries of finds (formal surveys) across all survey years

Year	Dead bat	Dead bird	Feather Spot
13/14	2	26	4
14/15	1	28	4
15/16	1	33	5
16/17	0	21	4
17/18	0	23	5
18/19	0	29	6

Similar to other years in the PER period, in the 2018/19 period, 5 carcasses /feather spots and one injured bird was identified outside of the formal surveys. No bats were observed in this reporting period.

For all years in the reporting period, Table 16 (below) summarises the species identified during formal surveys and Table 17 summarises the species identified outside of formal surveys.

Table 16. Species identified during formal bird mortality surveys during the PER reporting period.

Common name	2016/17	2017/18	2018/19
Australian Pelican	4	9	3
Unknown	11	5	14
White-faced Storm Petrel	0	4	0
Wedge-tailed Eagle	0	3	1
Brown Falcon	3	3	7
Cape Barren Goose	1	2	2
Forest Raven	0	1	0
Eastern Great Egret	0	1#	0
Australian Hobby	0	0	1
Brush Bronzewing	0	0	1
Prion sp.	0	0	2
White throated needletail	0	0	1
White-faced storm petrel	0	0	1
Forest raven	0	0	1
Common skylark	2	0	1
Swamp Harrier	3	0	0
Banded lapwing	1	0	0

*A native hen (flightless bird) was also detected during formal surveys.

Found 173m from the closest WTG, next to farm fence

Table 17. Species identified outside of the formal bird mortality surveys during the PER reporting period.

Common name	2016/17	2017/18	2018/19
Australian Pelican	3	5	2
Wedge-tailed Eagle	1'	1, 1`	0
Short-tailed Shearwater	1	1	0
Silver Gull	0	1	0
White-faced Heron	0	1*	0
White-faced Storm Petrel	0	1	0
Brown falcon	1	0	1#
Lapwing sp.	0	0	1
Swamp harrier	0	0	1
Kookaburra	1	0	0
Cape barren goose	2	0	0
Unknown	1	0	0

*Found 165m from the closest WTG next to/in farm fence, #injured, ` injured and not turbine related

In addition to these records, over the PER period, nine incidents were identified within proximity to the transmission line:

- One musk duck, four cape barren geese, one pacific gull, two black swans and one Australian pelican.

Generally speaking, species identified (through formal and informal methods) from year to year across the PER period are similar, particularly for species where multiple collisions are identified. The table below (Table 18) sets out the number of years species have been observed in the collision record for this PER period. Also included is whether the species was identified in the previous 3 year period. For species where collisions have been recorded in one year only, we note these collisions are usually singular incidents ('one-offs).

Table 18. Species detected across the 2016-19 survey years and a comparison to species detected in the previous 3 years of survey (2013-16)

All years	Recorded in surveys 2013/16
Brown Falcon	Yes
Cape Barren Goose	Yes
Australian Pelican	Yes
Two years	
Wedge-tailed Eagle	Yes
White-faced storm petrel	No
Swamp Harrier	Yes
Banded lapwing	Yes
Short-tailed Shearwater	Yes
One year	
Forest Raven	No
Australian Hobby	No
Prion Sp	Yes
Brush Bronzewing	No
White throated needletail	Yes
Common skylark	Yes
Silver Gull	No
Kookaburra	No

The Figure (10) below compares the bird utilisation survey (BUS) data (2014-16) with the bird mortality data (2016-2019), highlighting that birds with a higher representation are also more commonly observed in the collision record. Previous assessment of this data indicates that species with a greater number of movements (BUS data) in the height of the rotor swept area (blade height) also feature more strongly in the collision record. Both these findings/observations are not new or novel.

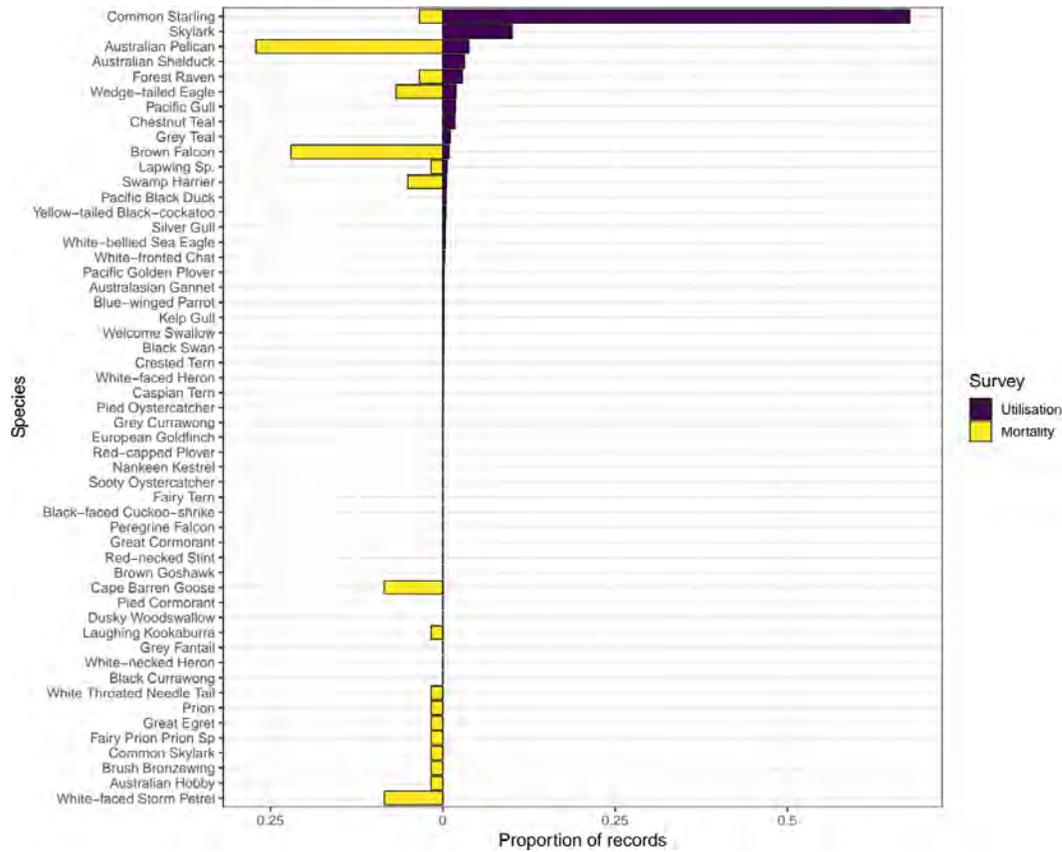


Figure 10. Comparison of the 2016-19 Collision record with the BUS data (2014-16)

An assessment of the expected number of finds per turbine circuit was also conducted for both the new and old survey methodologies. The assessment concluded (under both survey methodologies) that there is no discernible difference in the expected number of finds across the 4 turbine circuits and therefore no specific turbine circuit presents a discernibly greater collision risk. The spread of mortalities across seasons was also assessed with winter being the period when the lowest numbers of collisions are identified. Variation in the rate of finds across the other 3 seasons was noted across the PER period.

The only species listed under the TSPA or the EPBC detected during the PER period was the WTE (see Table 19 below). Five eagle collisions with wind turbines (2 non turbine related) were identified. Of these, four were found during formal turbine monitoring and the others by site personnel. An assessment of the carcasses was undertaken to try and determine age and sex (and collect other relevant data). A report for each of these collisions was submitted to both the EPA and DoEE. Genetic samples were collected from all eagle carcasses and the carcasses finally provided to the Tasmanian Museum and Art Gallery as per protocol. A summary of the finds is included below.

Table 19. Summary of the listed species identified as wind turbine collisions.

Species	Date	Found during formal survey?	Age	Sex
Wedge-tailed eagle	07-09-17	Y	Unknown	Unknown
Wedge-tailed eagle	04-10-17	N	Adult	Unknown
Wedge-tailed eagle	21-03-18	y	Adult	Unknown
Wedge-tailed eagle	04-04-18	Y	Adult	Female
Wedge-tailed eagle	23-01-19	Y	Unknown	Unknown

Reporting

All birds and bats detected in the monitoring (formal and informal finds) were reported as required in the Plan. This includes:

- Any birds and bats listed under the Threatened Species Protection Act were reported to the Director of the EPA by telephone within 24 hours of their discovery, and to the EPA Project Officer by email or telephone within 24 hours of their discovery.
- A Bird/Bat Strike Report Form¹ was submitted to the Director within three days of discovery of a dead or injured threatened species.
- Any dead or injured EPBC listed bird species listed were reported to the Commonwealth DoEE within seven days of discovery.

8.5 Wind Farm Vegetation Management Plan

Beyond the initial clearing of the site for construction of the wind farm no additional clearing has been necessary. From time to time, some vegetation slashing for the purposes of property level fire management is undertaken. The rehabilitation of disturbed areas has been successful.

8.6 Transmission Line Vegetation Management Plan

Like the wind farm, no further clearing of vegetation has been required in the transmission line easement during the PER reporting period. A 'cut and paint' program to remove individual coppicing Eucalypt saplings (<2m) was completed in various parts of the easement during 2017/18. The program was completed by a small work party using hand-based tools and equipment.

¹ Bird/bat strike forms were provided to the EPA for every bird mortality identified on the 'land'.

9. Commonwealth Environmental Management Plans

Development approval was granted from the Commonwealth for the MRWF (EPBC Approval 2002/683) with a suite of conditions. The following Plans were developed to satisfy some of these conditions. All Plans have been approved by the Commonwealth (now the Department of Environment and Energy), and they must be complied with by MRWF. The following sections summarise and report on the obligations of relevant EMPs for the post-construction and operation of the wind farm and associated transmission line. This section compliments the report provided to the Department pursuant to Condition 7 of the Approval (*“On 1 July of each year after the date of this approval, the person taking the action must provide a certificate stating that the conditions of this Approval have been complied with”*).

9.1 Wind Farm Listed Species Impact Mitigation Plan

This Plan covers requirements relating to mitigating impacts on the habitats of listed migratory birds and listed threatened species during construction and operation of the wind farm (condition CEM3). There are no specific reporting requirements for the Plan beyond the requirements of Condition 7 of the EPBC Approval. The only relevant information to report is included below:

- Bird and Bat collisions with turbines, identified during the reporting period, are summarised in Section 8.4 of this report.
- Discussion of activities relating to soil, vegetation and weed management are reported in Section 8.2, 8.5 and 8.6 above.

9.2 Bird Utilisation Behaviour and Mortality Monitoring Plan

This Plan covers requirements relating to the monitoring of utilisation, behaviour and mortality of Commonwealth listed threatened and migratory bird species at the MRWF site (condition CEM4). The sections of the Plan that require reporting (beyond the requirements of Condition 7 of the EPBC Approval), are detailed below.

Bird utilisation and behaviour surveys

The post-commissioning bird utilisation surveys were completed in 2016 and have been reported on in Section 8.1 of this report.

Mortality surveys for listed birds

A general summary of the mortality surveys conducted during the reporting period is included in Section 8.4. Five (turbine related) WTE mortalities were identified during the period of this report. These mortalities represent the only EPBC listed species found during this period and each of these incidents were reported to the DoEE in the manner required by the Plan.

Management Response and mitigation

A component of this plan is to outline the corrective action (offset) obligations associated with any wind turbine related mortality impacts on Commonwealth listed species. Since the commissioning of the wind farm, the WTE has been the only Commonwealth listed species identified through the mortality monitoring program. Two WTEs collisions were recorded in 2013 and 2014, however this number of collisions remained under the threshold for corrective actions on the basis that offsets had already been

completed for these impacts. Twelve WTE mortalities have been recorded through to the end of the current PER period, and this number represents an exceedance and activation of the 'Level 1' corrective actions (described further below and specified in the Plan). The Level 1 corrective action required, for each mortality, is the protection of two WTE nest sites or an approved alternative action.

At the completion of the reporting period the following projects/actions have been completed or are currently being implemented to fulfil MRWF's offset/corrective action obligations:

- Protection of 2 nest sites
- Financial contribution, equivalent value to 2 nest sites, to UTAS eagle research project
- Financial contribution, equivalent value to 2 nest sites, to Bookend Trust/Nature Trackers citizen science project 'Where, where, Wedgie?'
- Protection of 1 nest site
- Proposal currently before EPA/DPIPWE for approval, equivalent value of 3 nest sites (to determined).
- During the reporting period Woolnorth proposed funding an update to the Threatened Eagles Recovery Plan as a offset. This was supported by both the EPA and DoEE. However, discussions with DPIPWE were not finalised by the end of the reporting period. The proposal would be equivalent value to 2 nest sites

Benchmarks

As stated above the number of collisions of WTEs has exceeded the base threshold described in the Plan. The threshold was exceeded on the basis that the rate of mortality exceeded the expected rate as well as the total number. The specific details in relation to benchmarks are outlined in Section 5.3.1 (see table on page 27) of the Plan.

9.3 Transmission Line Listed Species Impact Mitigation Plan

This Plan covers requirements relating to mitigating impacts on the habitats of listed migratory birds and listed threatened species during construction and maintenance of the Transmission Line (condition CEM5). There are no specific reporting requirements for the Plan beyond the requirements of Condition 7 of the EPBC Approval. The following information is provided to summarise activities and actions, relevant to the plan, undertaken during the reporting period.

Management of listed threatened fauna

The construction of the transmission line was completed in 2013 including installation of the avian collision mitigation (see the MRWF Public Environment Report 2010-13).

No spotted-tailed quoll or Tasmanian devil den sites, or new active WTE nests have been located. Therefore no action has been required.

Avian collision and electrocution mitigation

All avian collision mitigation has been installed as outlined in the MRWF Public Environment Report 2010-13.

9.4 Wedge-tailed Eagle Impact Offset Plan

This Plan satisfies the requirements of condition CEM6, which requires that a Plan be prepared to offset the impacts of the proposal on WTEs. The sections of the Plan that require reporting (beyond the requirements of Condition 7 of the EPBC approval) are detailed below.

All the actions in this Plan (nest protection, aerial searches and the study into the effectiveness of nest protection management prescriptions) have been completed. Details of these studies were reported in the MRWF 2013 Public Environment Report.

10. Review of the Activity over the next 12 months

The MRWF will continue to operate in the manner it currently is. The required monitoring actions will continue to be undertaken. There are no anticipated changes to the operation of the wind farm or transmission line in the next 12 months.

11. References and glossary

11.1 References

Driscoll, D., Koronkiewicz, T. 2016. Estimating the Minimum Number of Eagles Utilizing a Site in Northern Arizona Using Trail Cameras Deployed on Bait Stations. SWCA Environmental Consultants.

Environment Australia, 2000, Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) and Development of Version 5.1, Department of Environment, Canberra.

Hull, C.L. and Muir, S.C. 2013. Behaviour and turbine avoidance rates of eagles at two wind farms in Tasmania, Australia. *Wildlife Society Bulletin* 37(1): 49-58.

11.2 Glossary

WNH	Woolnorth Wind Farm Holding, the controlling entity and owner/operator of BPWF, person responsible for the activity
MRWF	Musselroe Wind Farm (Pty Ltd in some contexts)
DPIPWE	Tasmanian Department of Primary Industry Parks Water and Environment
DoEE	Commonwealth Department of Environment and Energy
EMP	Environmental Management Plan
EPA	Tasmanian Environment Protection Authority
TSPA	Tasmanian <i>Threatened Species Protection Act 1995</i>
EPBC	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPN	Environment Protection Notice
HSE	Health Safety and Environment (system)
WBSE	white-bellied sea-eagle (<i>Haliaeetus leucogaster</i>)
WTE	Tasmanian wedge-tailed eagle (<i>Aquila audax fleayi</i>)
BBMMP	Bird and Bat Mortality Monitoring Plan
BUBMMP	Bird Utilisation, Behaviour and Mortality Monitoring Plan
DPEMP	Development Proposal and Environmental Management Plan
BUS	Bird Utilisation Surveys
PER	Public Environmental Report
BPWF	Bluff Point Wind Farm
SBWF	Studland Bay Wind Farm

11.3 Species names referred to in the text

Plants

African boxthorn Lycium ferocissimum

Thistles Carduus tenuiflorus & Silybum marianum

Gorse Ulex europeus

She-Oak Allocasuarina verticillata

Pine trees Pinus radiata

Birds

Australasian Gannet <i>Morus serrator</i>	Grey Shrike-thrush <i>Colluricincla harmonica</i>
Australasian Pipit <i>Anthus novaeseelandiae</i>	Horsfield's Bronze-Cuckoo
Australasian Shoveler <i>Anas rhynchos</i>	House Sparrow <i>Passer domesticus</i>
Australian Pelican <i>Pelecanus conspicillatus</i>	Kelp Gull <i>Larus dominicanus</i>
Australian Shelduck <i>Tadorna tadornoides</i>	Laughing Kookaburra <i>Dacelo novaeguineae</i>
Banded Lapwing <i>Vanellus tricolor</i>	Little Wattlebird <i>Anthochaera chrysoptera</i>
Banded Stilt <i>Cladorhynchus leucocephalus</i>	Marsh Harrier <i>Circus aeruginosus</i>
Bar-tailed Godwit <i>Limosa lapponica</i>	Masked Lapwing <i>Vanellus miles</i>
Black Currawong <i>Strepera fuliginosa</i>	Nankeen Kestrel <i>Falco cenchroides</i>
Black Swan <i>Cygnus atratus</i>	New Holland Honeyeater <i>Phylidonyris novaehollandiae</i>
Black-faced Cormorant <i>Phalacrocorax fuscescens</i>	Pacific Black Duck <i>Anas superciliosa</i>
Black-faced Cuckoo-shrike <i>Coracina novaehollandiae</i>	Pacific Golden Plover <i>Pluvialis fulva</i>
Black-fronted Dotterel <i>Eseyornis melanops</i>	Pacific Gull <i>Larus pacificus</i>
Blue-winged Parrot <i>Neophema chrysostoma</i>	Peregrine Falcon <i>Falco peregrinus</i>
Brown Falcon <i>Falco berigora</i>	Pied Cormorant <i>Phalacrocorax varius</i>
Brown Quail <i>Coturnix ypsilophora</i>	Pied Oystercatcher <i>Haematopus longirostris</i>
Brown Thornbill <i>Acanthiza pusilla</i>	Red-capped Plover <i>Charadrius ruficapillus</i>
Cape Barren Goose <i>Cereopsis novaehollandiae</i>	Red-necked Stint <i>Calidris ruficollis</i>
Caspian Tern <i>Hydroprogne caspia</i>	Richard's Pipit <i>Anthus richardi</i>
Chestnut Teal <i>Anas castanea</i>	Ruddy Turnstone <i>Arenaria interpres</i>
Common Bronzewing <i>Phaps chalcoptera</i>	Sharp-tailed Sandpiper <i>Calidris acuminata</i>
Common Starling <i>Sturnus vulgaris</i>	Shining Bronze-Cuckoo <i>Chrysococcyx lucidus</i>
Crescent Honeyeater <i>Phylidonyris pyrrhopterus</i>	Short-tailed Shearwater <i>Ardenna tenuirostris</i>
Crested Tern <i>Thalasseus bergii</i>	Silver Gull <i>Larus novaehollandiae</i>
Curlew Sandpiper <i>Calidris ferruginea</i>	Silvereye <i>Zosterops lateralis</i>
Double-banded Plover <i>Charadrius bicinctus</i>	Sooty Oystercatcher <i>Haematopus fuliginosus</i>
Dusky Robin <i>Melanodryas vittata</i>	Striated Fieldwren <i>Calamanthus fuliginosus</i>
Dusky Woodswallow <i>Artamus cyanopterus</i>	Superb Fairy-wren <i>Malurus cyaneus</i>
Eastern Great Egret <i>Ardea alba modesta</i>	Swamp Harrier <i>Circus approximans</i>
European Goldfinch <i>Carduelis carduelis</i>	Tasmanian Thornbill <i>Acanthiza ewingii</i>
European Skylark <i>Alauda arvensis</i>	Tawny-crowned Honeyeater <i>Gliciphila melanops</i>
Fairy Martin <i>Petrochelidon ariel</i>	Wedge-tailed Eagle <i>Aquila audax fleayi</i>
Fairy Tern <i>Sterna nereis</i>	Welcome Swallow <i>Hirundo neoxena</i>
Fan-tailed Cuckoo <i>Cacomantis flabelliformis</i>	White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>
Flame Robin <i>Petroica phoenicea</i>	White-faced Heron <i>Egretta novaehollandiae</i>
Forest Raven <i>Corvus tasmanicus</i>	White-fronted Chat <i>Epthianura albifrons</i>
Great Cormorant <i>Phalacrocorax carbo</i>	White-necked Heron <i>Ardea pacifica</i>
Grey Butcherbird <i>Cracticus torquatus</i>	Yellow Wattlebird <i>Anthochaera paradoxa</i>
Grey Currawong <i>Strepera versicolor</i>	Yellow-rumped Thornbill <i>Acanthiza chrysorrhoa</i>
Grey Fantail <i>Rhipidura albiscapa</i>	Yellow-tailed Black Cockatoo <i>Calyptorhynchus funereus</i>

Mammals

Feral cat *Felis catus*

Forester kangaroo *Macropus giganteus*

Tasmanian devil *Sarcophilus harrisii*

Spotted tail quoll *Dasyurus maculatus*

Wombat *Vombatus ursinus tasmaniensis*

Other

Schayer's Grasshopper *Schayera baiulus*

Appendix 1 Musselroe Wind Farm (EPN 8657/2)



ENVIRONMENT PROTECTION NOTICE No. 8657/2

Issued under the *Environmental Management and Pollution Control Act 1994*

Issued to: **MUSSELROE WINDFARM PTY LTD**
ACN 113 161 247
LEVEL 1, 59 CAMERON ST
LAUNCESTON TAS 7250

Environmentally Relevant Activity: **The operation of a wind farm and transmission line (ACTIVITY TYPE: Wind Energy Facilities)**
MUSSELROE WIND FARM & TRANSMISSION LINE, 2205 CAPE PORTLAND RD
CAPE PORTLAND TAS 7264

GROUNDS

I, Wes Ford, Director, Environment Protection Authority, (the Director), being satisfied in accordance with section 44(1)(d) of the *Environmental Management and Pollution Control Act 1994* (EMPCA) that in relation to the above-mentioned environmentally relevant activity that it is desirable to vary the conditions of a permit (see table below) hereby issue this environment protection notice to the above-mentioned person as the person responsible for the activity.

Permit No.	Date Granted	Granted By
PLN 03161	20 December 2004	Dorset Council

PARTICULARS

The particulars of the grounds upon which this notice is issued are:

- 1 It is necessary to remove conditions GG5, GM1, GZ1, GZ2, GC1, GP1, GE1, GE2, GE3, GE4, GE5, GA2, GK2, GX1, WQ1, WR1, WF1, WN2, WN3, TR1, TR2, and TB1 of the Permit because they detail requirements that have been fulfilled and/or are no longer required.
- 2 A regulatory limit which sets the maximum scale or throughput of the activity is needed because any increase in scale or throughput may result in additional environmental impacts or emissions that were not considered at the time of granting the permit.
- 3 The permit conditions need to be varied to reflect current regulatory practice.
- 4 It is desirable to add a condition to require the development, submission and implementation of an Environmental Management Plan to ensure best practice environmental management is applied to the activity.
- 5 It is necessary to add conditions ensuring that decommissioning and rehabilitation is undertaken, and is done in a timely, planned and approved manner to minimise environmental harm.

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- 6 The permit does not have a condition requiring the provision of spill kits. It is desirable to add a condition requiring the provision, in suitable locations, of spill kits appropriate for the environmental hazardous substances held on The Land for the use in an incident to minimise the emissions of a pollutant into the environment.
- 7 It is desirable to add conditions to allow the Director to require a noise survey to be undertaken should noise complaints be received.
- 8 It is desirable to add a condition that restricts the location of new infrastructure to ensure sensitive areas and species are protected.
- 9 It is desirable to add a condition that requires compliance with a wader monitoring plan.
- 10 It is desirable to add a condition that requires compliance with a bird and bat mortality monitoring plan.
- 11 It is desirable to add a condition that requires the submission of an avifauna assessment report to ensure the impact on avian species is not greater than predicted.
- 12 It is desirable to add a condition that requires the development, submission and implementation of mitigation measures should the Director be of the opinion that the activity is having a significant impact on an avian species.
- 13 It is desirable to add a condition that requires notification of bird and bat strikes to ensure the Director is aware of the impact of the activity upon bird and bat species.
- 14 It is desirable to add a condition that requires compliance with eagle impact offset management plans.
- 15 It is desirable to add a condition that requires compliance with a vegetation management plan.
- 16 It is desirable to add a condition that requires compliance with a transline vegetation management plan.
- 17 It is desirable to add a condition that requires compliance with a weed and disease management plan.
- 18 It is desirable to add a condition that requires compliance with a hazardous materials management plan.
- 19 The permit conditions need to be varied to reflect current or updated terminology and/or to clarify the meaning of the conditions.

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Schedule 1: Definitions

Activity means any environmentally relevant activity (as defined in Section 3 of EMPCA) to which this document relates, and includes more than one such activity.

Bird And Bat Mortality Monitoring Plan means the Bird and Bat Mortality Plan approved on 24 March 2011 and any amendment to or substitution of this document approved in writing by the Director.

Controlled Waste has the meaning described in Section 3(1) of EMPCA.

Director means the Director, Environment Protection Authority holding office under Section 18 of EMPCA and includes a person authorised in writing by the Director to exercise a power or function on the Director's behalf.

DPEMP means the document entitled "Musselroe Wind Farm Development Proposal and Environmental Management Plan - March 2003, Hydro Tasmania" received by the Board on 3 April 2003, together with the document entitled "Musselroe Wind Farm Development Proposal and Environmental Management Plan 2003 Supplementary Information" (DPEMP Supplement) received by the Board on 3 October 2003, and "Musselroe Wind Farm Development Proposal and Environmental Management Plan August 2004 Supplementary information Two" (DPEMP Second Supplement received by the Board on 31 August 2004).

DRP means Decommissioning and Rehabilitation Plan

EMPCA means the *Environmental Management and Pollution Control Act 1994*.

Environmental Harm and **Material Environmental Harm** and **Serious Environmental Harm** each have the meanings ascribed to them in Section 5 of EMPCA.

Environmental Nuisance and **Pollutant** each have the meanings ascribed to them in Section 3 of EMPCA.

Environmentally Hazardous Material means any substance or mixture of substances of a nature or held in quantities which present a reasonably foreseeable risk of causing serious or material environmental harm if released to the environment and includes fuels, oils, waste and chemicals but excludes sewage.

Final Wind Farm Design Report means the Final Wind Farm Design Report approved on 26 July 2012 and any amendment to or substitution of this document approved in writing by the Director.

Hazardous Materials Management Plan means the Hazardous Materials Management Plan approved on 29 March 2009 and any amendment to or substitution of this document approved in writing by the Director.

Heavy Disturbance Activities means any activity associated with the maintenance of the wind farm, transmission line and ancillary activities that generates local noise above background levels but excludes activities associated with the initial response to an emergency event.

Noise Sensitive Premises means residences and residential zones (whether occupied or not), schools, hospitals, caravan parks and similar land uses involving the presence of individual people for extended periods, except in the course of their employment or for recreation.

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Person Responsible is any person who is or was responsible for the environmentally relevant activity to which this document relates and includes the officers, employees, contractors, joint venture partners and agents of that person, and includes a body corporate.

Reporting Period means the 12 months ending on 30 June of each year.

Tasmanian Noise Measurement Procedures Manual means the Noise Measurement Procedures Manual referred to in regulation 4 of the *Environmental Management and Pollution Control (Miscellaneous Noise) Regulations 2014*.

The Board means the Board of the Environment Protection Authority, previously known as the Board of Environmental Management and Pollution Control.

The Land means the land on which the activity to which this document relates may be carried out, and includes: buildings and other structures permanently fixed to the land, any part of the land covered with water, and any water covering the land. The Land falls within the area defined by:

- 1 Certificates of title 102360/1, 102366/1, 102368/1, 104138/1, 107071/1, 111234/1, 111245/1, 118234/1, 133771/1, 133771/2, 196819/1, 202520/1, 237938/1, 241372/1, 243023/1, 9513/1, 9513/2, 9513/3 and Property ID: 3338170

Transmission Line means the 110 kV electricity transmission line from the electrical substation located on the wind farm site to the Derby Electricity Substation, and related infrastructure.

Transmission Line Vegetation Management Plan means the Transmission Line Vegetation Management Plan approved on 11 December 2008 and any amendment to or substitution of this document approved in writing by the Director.

Vegetation Management Plan means the Vegetation Management Plan approved on 3 December 2007 and any amendment to or substitution of this document approved in writing by the Director.

Wader Monitoring Management Plan means the Wader Monitoring Management Plan approved on 18 December 2013 and any amendment to or substitution of this document approved in writing by the Director.

Waste has the meaning ascribed to it in Section 3 of EMPCA.

Wedge-Tailed Eagle means *Aquila audax fleayi*.

Wedge-Tailed Eagle Impact Offset Management Plan means the Wedge-Tailed Eagle Impact Offset Management Plan approved on 11 December 2008 and any amendment to or substitution of this document approved in writing by the Director.

Weed And Disease Management Plan means the Weed and Disease Management Plan approved on 15 December 2008 and any amendment to or substitution of this document approved in writing by the Director.

White-Bellied Sea-Eagle means *Haliaeetus leucogaster*.

White-Bellied Sea-Eagle Impact Offset Management Plan means the White Bellied Sea Eagle Impact Offset Management Plan approved on 11 December 2008 and any amendment to or substitution of this document approved in writing by the Director.

Wind Farm means the electrical generating wind turbines and related infrastructure located on the wind farm site.

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Schedule 2: Conditions

Maximum Quantities

Q1 Regulatory limits

- 1 The activity must not exceed the following limits (annual fees are derived from these figures):
 - 1.1 168 megawatts of generating capacity

General

G1 Access to and awareness of conditions and associated documents

A copy of these conditions and any associated documents referred to in these conditions must be held in a location that is known to and accessible to the person responsible for the activity. The person responsible for the activity must ensure that all persons who are responsible for undertaking work on The Land, including contractors and sub-contractors, are familiar with these conditions to the extent relevant to their work.

G2 Incident response

If an incident causing or threatening environmental nuisance, serious environmental harm or material environmental harm from pollution occurs in the course of the activity, then the person responsible for the activity must immediately take all reasonable and practicable action to minimise any adverse environmental effects from the incident.

G3 No changes without approval

- 1 The following changes, if they may cause or increase the emission of a pollutant which may cause material or serious environmental harm or environmental nuisance, must only take place in relation to the activity if such changes have been approved in writing by the EPA Board following its assessment of an application for a permit under the *Land Use Planning and Approvals Act 1993*, or approved in writing by the Director:
 - 1.1 a change to a process used in the course of carrying out the activity; or
 - 1.2 the construction, installation, alteration or removal of any structure or equipment used in the course of carrying out the activity; or
 - 1.3 a change in the quantity or characteristics of materials used in the course of carrying out the activity.

G4 Change of ownership

If the owner of The Land upon which the activity is carried out changes or is to change, then, as soon as reasonably practicable but no later than 30 days after becoming aware of the change or intended change in the ownership of The Land, the person responsible must notify the Director in writing of the change or intended change of ownership.

G5 Annual Environmental Review

- 1 Unless otherwise specified in writing by the Director, a publicly available Annual Environmental Review for the activity must be submitted to the Director each year within three months of the end of the reporting period. Without limitation, each Annual Environmental Review must include the following information:
 - 1.1 a statement by the General Manager, Chief Executive Officer or equivalent for the activity acknowledging the contents of the Annual Environmental Review;



- 1.2 subject to the *Personal Information Protection Act 2004*, a list of all complaints received from the public during the reporting period concerning actual or potential environmental harm or environmental nuisance caused by the activity and a description of any actions taken as a result of those complaints;
- 1.3 details of environment-related procedural or process changes that have been implemented during the reporting period;
- 1.4 a summary of the amounts (tonnes or litres) of both solid and liquid wastes produced and treatment methods implemented during the reporting period. Initiatives or programs planned to avoid, minimise, re-use, or recycle such wastes over the next reporting period should be detailed;
- 1.5 details of all non-trivial environmental incidents and/or incidents of non compliance with permit or environment protection notice conditions that occurred during the reporting period, and any mitigative or preventative actions that have resulted from such incidents;
- 1.6 a summary of the monitoring data and record keeping required by these conditions. This information should be presented in graphical form where possible, including comparison with the results of at least the preceding reporting period. Special causes and system changes that have impacted on the parameters monitored must be noted. Explanation of significant deviations between actual results and any predictions made in previous reports must be provided;
- 1.7 identification of breaches of limits specified in these conditions and significant variations from predicted results contained in any relevant DPEMP or EMP, an explanation of why each identified breach of specified limits or variation from predictions occurred and details of the actions taken in response to each identified breach of limits or variance from predictions;
- 1.8 a list of any issues, not discussed elsewhere in the report, that must be addressed to improve compliance with these conditions, and the actions that are proposed to address any such issues;
- 1.9 a summary of fulfilment of environmental commitments made for the reporting period. This summary must include indication of results of the actions implemented and explanation of any failures to achieve such commitments; and
- 1.10 a summary of any community consultation and communication undertaken during the reporting period.

G6 Environmental Management Plan and review thereof

- 1 Unless otherwise approved in writing by the Director, an Environmental Management Plan (EMP) for the activity must be submitted for approval to the Director by 30 November 2016 and at five yearly intervals thereafter:
 - 1.1 The EMP must include a statement by the General Manager, Chief Executive Officer or equivalent for the activity acknowledging the contents of the EMP Operations.
 - 1.2 The EMP must detail the potential environmental impacts arising from the ongoing operation of the activity over the next 5 years, including a strategic consideration of potential changes to the activity during that period and consideration of opportunities to implement continuous improvement.
 - 1.3 The EMP must separately identify specific commitments, with actions and timeframes, to mitigate or prevent the identified potential environmental impacts. In preparing the EMP the person responsible must take into account the contents of any previous annual environmental reviews including complaints, incidents and monitoring data.

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- 2 If the Director issues guidelines for preparation of the EMP, the EMP must address the matters listed in those guidelines.
- 3 Unless otherwise specified in writing by the Director, the activity on The Land must be carried out and monitored in accordance with the environmental management measures set down in the EMP most recently approved by the Director and in accordance with best practice environmental management.

Atmospheric

A1 Control of dust emissions

Dust emissions from The Land must be controlled to the extent necessary to prevent environmental nuisance beyond the boundary of The Land.

Decommissioning And Rehabilitation

DC1 Notification of cessation

Within 30 days of becoming aware of any event or decision which is likely to give rise to the permanent cessation of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to cease or has ceased.

DC2 DRP requirements

Unless otherwise approved in writing by the Director, a Decommissioning and Rehabilitation Plan (DRP) for the activity must be submitted for approval to the Director within 30 days of the Director being notified of the planned cessation of the activity or by a date specified in writing by the Director. The DRP must be prepared in accordance with any guidelines provided by the Director.

DC3 Rehabilitation following cessation

- 1 Following permanent cessation of the activity, and unless otherwise approved in writing by the Director, The Land must be rehabilitated including:
 - 1.1 stabilisation of any land surfaces that may be subject to erosion;
 - 1.2 removal or mitigation of all environmental hazards or land contamination, that might pose an on-going risk of causing environmental harm; and
 - 1.3 decommissioning of any equipment that has not been removed.
- 2 Where a Decommissioning and Rehabilitation Plan (DRP) has been approved by the Director, decommissioning and rehabilitation must be carried out in accordance with that plan, as may be amended from time to time with written approval of the Director.

DC4 Temporary suspension of activity

- 1 Within 30 days of becoming aware of any event or decision which is likely to give rise to the temporary suspension of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to suspend or has suspended.
- 2 During temporary suspension of the activity:
 - 2.1 The Land must be managed and monitored by the person responsible for the activity to ensure that emissions from The Land do not cause serious environmental harm, material environmental harm or environmental nuisance; and
 - 2.2 If required by the Director a Care and Maintenance Plan for the activity must be submitted, by a date specified in writing by the Director, for approval. The person responsible must implement the approved Care and Maintenance Plan, as may be amended from time to time with written approval of the Director.

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- 3 Unless otherwise approved in writing by the Director, if the activity on The Land has substantially ceased for 2 years or more, rehabilitation of The Land must be carried out in accordance with the requirements of these conditions as if the activity has permanently ceased.

Flora And Fauna

FF1 Infrastructure location

- 1 Unless otherwise approved in writing by the Director:
- 1.1 Infrastructure must not be located within the original DPMP zones and additional environmental management zones as shown in Figure 1 of the approved Final Wind Farm Design Report.
 - 1.2 Infrastructure must not be located within 500 metres of any known Wedge-tailed eagle nest or known White-bellied Sea-eagle nest.
 - 1.3 Heavy disturbance activities which last for a continuous period of greater than 30 minutes, or maintenance activities which last for more than a total period of 60 minutes within a 24 hour period, must not occur during the period from 1 August to 1 February within:
 - 1.3.1 1,000 metres of a Wedge-tailed eagle nest or White-bellied Sea-eagle nest if the heavy disturbance activities are in line-of-sight of the nest; or
 - 1.3.2 500 metres of a Wedge-tailed eagle nest or White-bellied Sea eagle nest if the heavy disturbance activities are not in line-of-sight of the nest.

FF2 Wader Monitoring Management Plan

Unless otherwise approved in writing by the Director, the activity must be undertaken in accordance with the approved Wader Monitoring Management Plan and any amendment to the plan approved in writing by the Director.

FF3 Bird and Bat Mortality Monitoring Plan

Unless otherwise approved in writing by the Director, the activity must be undertaken in accordance with the approved Bird and Bat Mortality Monitoring Plan and any amendment to the plan approved in writing by the Director.

FF4 Avifauna Assessment Review Report

- 1 Unless otherwise approved in writing by the Director, an Avifauna Assessment Review Report must be submitted to the Director by 30 November 2016. The report must be prepared in accordance with any reasonable guidelines provided by the Director. The report must include, but is not necessarily limited to, details of the following:
- 1.1 a review of the avifauna risk assessment contained in the DPMP based on available information on collision mortality, site utilisation, species behaviour, species population and other relevant matters;
 - 1.2 details of any proposed changes to the Bird and Bat Mortality Monitoring Plan.

FF5 Notification of Bird and Bat Strikes

- 1 The Director must be notified in writing of any evidence of dead or injured native birds or bats listed under the *Threatened Species Protection Act 1995* found on the land within 24 hours of their discovery.
- 2 Within three days of notification, an incident report must be submitted to the Director. The report must include, but is not necessarily to be limited to, the following:
 - 2.1 unique identification number;
 - 2.2 general description of evidence;

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- 2.3 species identification;
- 2.4 sex and estimated age (if known);
- 2.5 discovery date and time;
- 2.6 estimated date of collision;
- 2.7 estimate of general weather conditions at time of incident;
- 2.8 position of evidence relative to infrastructure;
- 2.9 photographic evidence; and
- 2.10 any other relevant information.

FF6 Mitigation Measures

- 1 Mitigation measures must be implemented as required by the Director if the Director forms the view on the basis of available evidence that:
 - 1.1 avian mortality rates as a result of the activity are in excess of that predicted in the DPEMP; or
 - 1.2 avian mortality rates have had, or are likely to have, a significant impact on any avian species; or
 - 1.3 the activity has resulted in significant avian behavioural changes that have had, or are likely to have, a significant impact on avian species.
- 2 Within three months of receiving written notification that the Director has formed one or more of the above opinions, a report documenting proposed mitigation measures to address the identified issue(s) must be submitted to the Director for approval.
- 3 The approved mitigation measures must be implemented.

FF7 Eagle Impact Offset Management Plans

- 1 Unless otherwise specified in writing by the Director, the approved Wedge-tailed Eagle Impact Offset Management Plan, must be implemented. If requested in writing by the Director, the Wedge-tailed Eagle Impact Offset Plan must be reviewed in accordance with any reasonable guidelines to be provided by the Director, and by such date as the Director may specify. The guidelines may include the requirement for further offset measures if monitoring indicates more than six Wedge-tailed Eagle mortalities are likely to occur over the life of the activity as a result of the activity.
- 2 Unless otherwise specified in writing by the Director, the approved White-bellied Sea-eagle Impact Offset Management Plan, must be implemented. If requested in writing by the Director, the White-bellied Sea-eagle Impact Offset Plan must be reviewed in accordance with any reasonable guidelines to be provided by the Director, and by such date as the Director may specify. The guidelines may include the requirement for further offset measures if monitoring indicates more than three White-bellied Sea-eagle mortalities are likely to occur over the life of the activity as a result of the activity.

FF8 Vegetation Management Plan

Unless otherwise approved in writing by the Director, the activity must be undertaken in accordance with the approved Vegetation Management Plan, and any amendment to the plan approved in writing by the Director.

FF9 Transmission Line Vegetation Management Plan

Unless otherwise approved in writing by the Director, the activity must be undertaken in accordance with the approved Transmission Line Vegetation Management Plan, and any amendment to the plan approved in writing by the Director.

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FF10 Weed and Disease Management Plan

Unless otherwise approved in writing by the Director, the activity must be undertaken in accordance with the approved Weed and Disease Management Plan, and any amendment to the plan approved in writing by the Director.

Hazardous Substances**H1 Storage and handling of hazardous materials**

Unless otherwise approved in writing by the Director, environmentally hazardous material held on The Land, including chemicals, fuels and oils, must be located within impervious bunded areas or spill trays which are designed to contain at least 110% of the total volume of material.

H2 Hazardous Materials Management Plan

Unless otherwise approved in writing by the Director, the activity must be undertaken in accordance with the approved Hazardous Materials Management Plan, and any amendment to the plan approved in writing by the Director.

H3 Spill kits

Spill kits appropriate for the types and volumes of materials handled on The Land must be kept in appropriate locations to assist with the containment of spilt environmentally hazardous materials.

Noise Control**N1 Noise emission limits**

- 1 Noise emissions from the activity when measured at any noise sensitive premises in other ownership and expressed as the equivalent L_{A90} sound pressure level must not exceed the greater of:
 - 1.1 5 dB(A) above the L_{A90} of all other noise; or
 - 1.2 40dB(A)
- 2 L_{A90} is the A-weighted sound pressure level that is exceeded for 90% of the time.
- 3 The time interval over which noise levels are averaged must be 10 minutes or an alternative time interval specified in writing by the Director.
- 4 Measured noise levels must be adjusted for tonality, impulsiveness, modulation and low frequency in accordance with the Tasmanian Noise Measurement Procedures Manual.
- 5 All methods of measurement must be in accordance with the Tasmanian Noise Measurement Procedures Manual.

N2 Noise survey requirements

- 1 If requested in writing by the Director a noise survey must be conducted to demonstrate compliance with the noise emission limits at such times as may reasonably be specified by the Director.
- 2 Noise surveys must be undertaken in accordance with a survey method approved in writing by the Director.

Waste Management**WM1 Controlled waste transport**

Transport of controlled wastes to and from The Land must be undertaken only by persons authorised to do so under EMPCA or subordinate legislation.

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Date of issue: 22 DEC 2015

Schedule 3: Information

Legal Obligations

LO1 EMPCA

The activity must be conducted in accordance with the requirements of the *Environmental Management and Pollution Control Act 1994* and Regulations thereunder. The conditions of this document must not be construed as an exemption from any of those requirements.

LO2 Storage and handling of Dangerous Goods, Explosives and dangerous substances

1 The storage, handling and transport of dangerous goods, explosives and dangerous substances must comply with the requirements of relevant State Acts and any regulations thereunder, including:

- 1.1 *Work Health and Safety Act 2012* and subordinate regulations;
- 1.2 *Explosives Act 2012* and subordinate regulations; and
- 1.3 *Dangerous Goods (Road and Rail Transport) Act 2010* and subordinate regulations.

LO3 Change of responsibility

If the person responsible for the activity ceases to be responsible for the activity, they must notify the Director in accordance with Section 45 of the EMPCA.

Other Information

OI1 Waste management hierarchy

1 Wastes should be managed in accordance with the following hierarchy of waste management:

- 1.1 waste should be minimised, that is, the generation of waste must be reduced to the maximum extent that is reasonable and practicable, having regard to best practice environmental management;
- 1.2 waste should be re-used or recycled to the maximum extent that is practicable; and
- 1.3 waste that cannot be re-used or recycled must be disposed of at a waste depot site or treatment facility that has been approved in writing by the relevant planning authority or the Director to receive such waste, or otherwise in a manner approved in writing by the Director.

OI2 Notification of incidents under section 32 of EMPCA

Where a person is required by section 32 of EMPCA to notify the Director of the release of a pollutant, the Director can be notified by telephoning 1800 005 171 (a 24-hour emergency telephone number).

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