

---

# Woolnorth Wind Farm Holding

---

## Musselroe Wind Farm Fire Management Plan

October 2013



This document contains information that is proprietary and confidential to the Woolnorth Wind Farm Pty Ltd. The document and/or its contents, or any part thereof, are not to be used, exploited, reproduced or duplicated in any form or disclosed to any third party in any form or manner without the express written consent of Woolnorth Wind Farm Pty Ltd.

## Contents

|   |           |
|---|-----------|
| <b>1. Fire Management Plan Objectives</b>                                 | <b>1</b>  |
| 1.1 Legislative requirements  | 1         |
| 1.2 Review of the management plan   | 1         |
| <b>2. Facility Details</b>  | <b>2</b>  |
| 2.1 Overview  | 2         |
| 2.2 Contact details   | 5         |
| 2.3 Water supplies  | 6         |
| <b>3. Fire Risk Assessment</b>  | <b>7</b>  |
| 3.1 Assessment of consequence   | 9         |
| 3.2 Assessment of likelihood  | 10        |
| 3.2.1 Fire in the substation or control building                          | 10        |
| 3.2.2 Turbine fire  | 10        |
| 3.2.3 Fire from operational activities                                    | 10        |
| 3.2.4 Fire from farming activities and other electrical infrastructure    | 10        |
| 3.2.5 Fire from camp fires  | 11        |
| 3.2.6 Fire from lightning strike  | 11        |
| 3.2.7 Fire caused by the transmission line                                | 11        |
| 3.2.8 Fire caused by maintenance of the transmission line                 | 11        |
| 3.2.9 Fire impacting the transmission line                                | 11        |
| <b>4. Mitigation Strategies</b>   | <b>12</b> |
| 4.1 General measures  | 12        |
| 4.2 Periods of very high fire danger rating                               | 12        |
| 4.3 Fire detection systems  | 12        |
| 4.4 Preparation around site buildings                                     | 13        |
| 4.5 Preparation around towers and wind farm roads                         | 13        |
| 4.6 Maintenance of fire fighting equipment                                | 13        |
| 4.7 Transmission line inspections   | 15        |
| 4.8 Maintenance work on the transmission line                             | 15        |
| 4.9 Maintenance of turbines   | 16        |
| 4.10 General activities on the wind farm site (including farm activities) | 16        |
| 4.11 Training and fire drills   | 16        |
| <b>5. Emergency Response Procedures</b>                                   | <b>17</b> |
| <b>6. Appendices</b>  | <b>18</b> |

# **1. Fire Management Plan Objectives**

The objectives of the Musselroe Wind Farm Fire Management Plan (hereafter “the plan”) are as follows.

- To identify and assess fire hazards to people and infrastructure at the wind farm and transmission line.
- To identify and document mitigation measures that will reduce the fire risk.
- To document relevant fire emergency response information, forming part of the broader sites Emergency Response Plan

## **1.1 Legislative requirements**

A commitment to develop a “Fire Action Plan” was included in the Development Proposal and Environmental Management Plan for the Musselroe Wind Farm. This plan serves to fulfil that commitment.

Under the Tasmanian Work Health and Safety Regulations (2012), the owner of the wind farm is also required to prepare, maintain and implement an Emergency Plan. This plan does not constitute the Emergency Plan for the wind farm, but does serve to inform the fire section of the Emergency Plan.

## **1.2 Review of the management plan**

Woolnorth Wind Farm Holding will review this document on an annual basis to ensure the information is current.

## **2. Facility Details**

### **2.1 Overview**

The Musselroe Wind Farm is situated on the Cape Portland property in the far north east of Tasmania approximately 20km north of Gladstone (refer to Figure 1). The wind farm has 56 Vestas 3MW turbines, which are connected to the control building by a network of underground cables. There are also a number of farm buildings and houses on site (refer to Figure 2).

The wind farm is connected to the Tasmanian electricity grid by a 48 km 110 kV transmission line, which runs from the wind farm substation to the Derby substation. Maps of the transmission line are provided in Appendix 2.

The wind farm is owned and operated by Woolnorth Wind Farm Holding Pty Ltd. Head office is located at Level 1, 59 Cameron Street, Launceston, 7250. Woolnorth Wind Farm Holding employs a site supervisor who is normally on site during office hours. Vestas Pty Ltd also employs a number of staff on site who are responsible for maintenance of the turbines.

In addition to the wind farm activities, the grazing land on the Cape Portland property is leased by Musselroe Beef Pty Ltd. Musselroe Beef employs a farm manager who currently lives on site from Monday to Friday.

Figure 1. Location of the Musselroe Wind Farm and Transmission Line

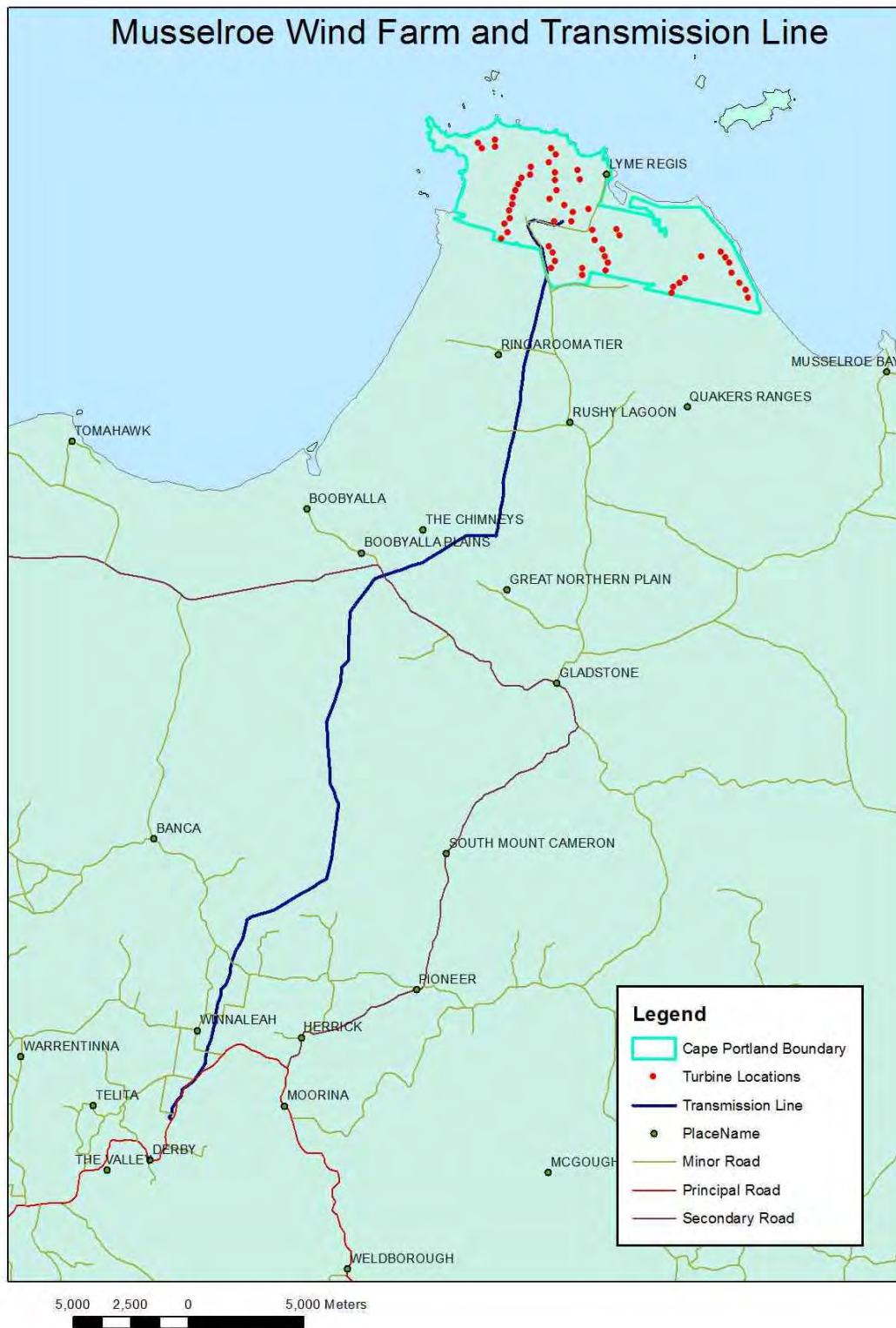
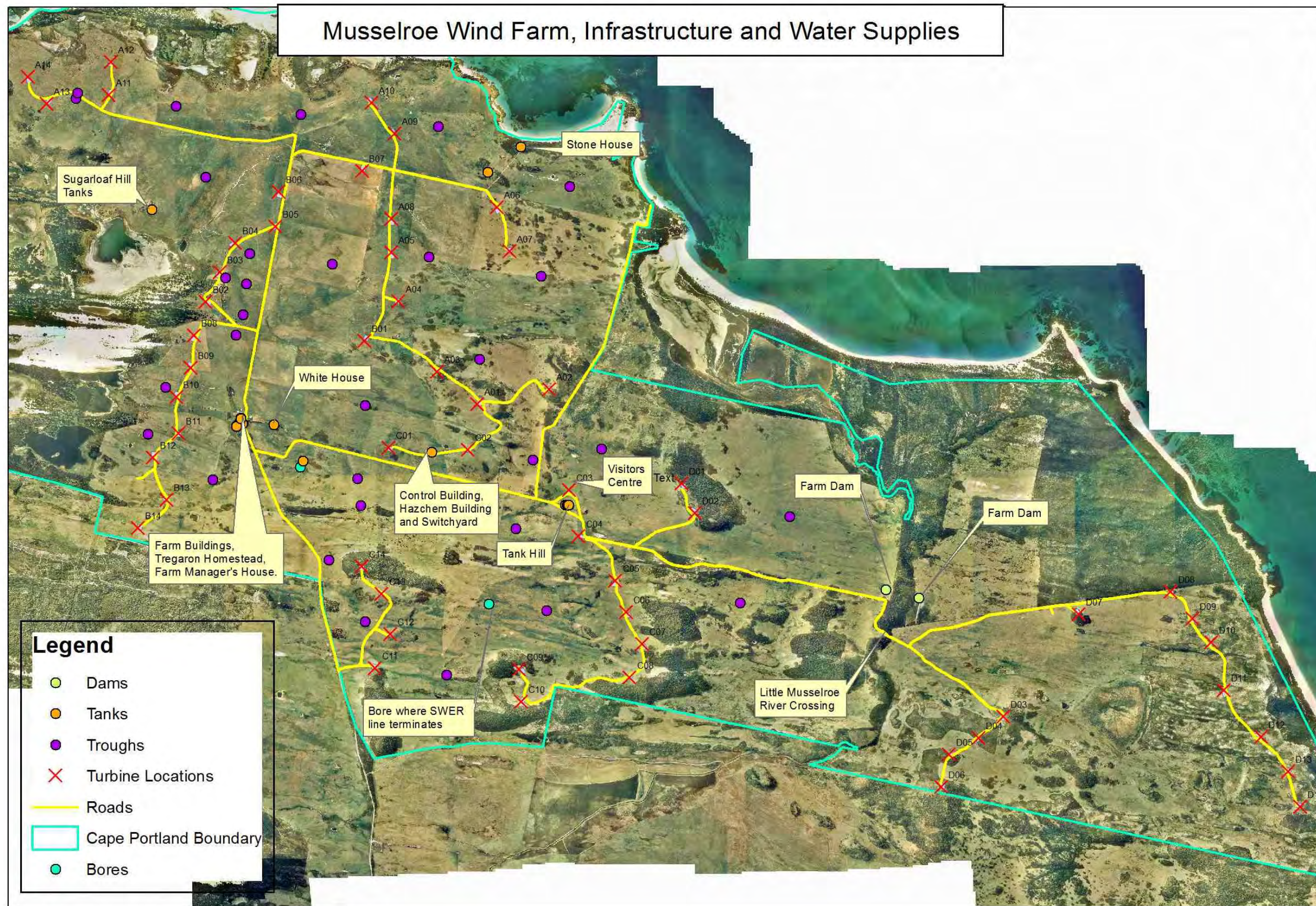


Figure 2. Site Map Showing Infrastructure and Water Supplies



## 2.2 Contact details

Relevant contact details for the wind farm, emergency services and other regional contacts are provided in Table 1.

**Table 1. Contact details relevant to Musselroe Wind Farm.**

| Company/Position                    | Name                  | Work Contact                         | Mobile       | Email/web address  |
|-------------------------------------|-----------------------|--------------------------------------|--------------|--|
| <b>Woolnorth Wind</b>               |                       |                                      |              |  |
| Site Supervisor - MRWF              | Tony Saunders         | 03 6357 4013                         | 0400 675 743 | <a href="mailto:Tony.saunders@woolnorthwind.com.au">Tony.saunders@woolnorthwind.com.au</a> |
| Production Operations Coord         | Lance Lovell          |                                      | 0439 380410  | <a href="mailto:Lance.lovell@woolnorthwind.com.au">Lance.lovell@woolnorthwind.com.au</a>   |
| Production Manager                  | Rick Haines           |                                      | 0429 320 240 | <a href="mailto:Rick.haines@woolnorthwind.com.au">Rick.haines@woolnorthwind.com.au</a>     |
| GM – Woolnorth Wind                 | Stephen Ross          | 03 6323 4102                         | 0447 518 223 | <a href="mailto:stephen.ross@woolnorthwind.com.au">stephen.ross@woolnorthwind.com.au</a>   |
| HSE Manager                         | Chris Sims            |                                      | 0428 347 942 | <a href="mailto:Chris.sims@hydro.com.au">Chris.sims@hydro.com.au</a>                       |
| HSE Advisor                         | Bob Barbour           |                                      | 0407 835 261 | <a href="mailto:Robert.Barbour@hydro.com.au">Robert.Barbour@hydro.com.au</a>               |
| Hydro Tasmania Generation Control   | Duty Officer/Operator | 03 6230 5569                         |              |  |
| <b>Vestas</b>                       |                       |                                      |              |  |
| Vestas Site Supervisor              | Tim Etchel            | 03 6357 4029                         | 0427 048 945 | <a href="mailto:tietc@vestas.com">tietc@vestas.com</a>                                     |
| Vestas Control Room                 |                       | 03 6357 4025                         |              |  |
| <b>Musselroe Beef</b>               |                       |                                      |              |  |
| Director                            | Greg Bradfield        |                                      | 0428 145 080 | <a href="mailto:gbradfield@musselroebeef.com.au">gbradfield@musselroebeef.com.au</a>       |
| Farm Manager                        | Raymond Groves        |                                      | 0427 384 101 | <a href="mailto:raymondgroves@hotmail.com">raymondgroves@hotmail.com</a>                   |
| <b>Emergency Services</b>           |                       |                                      |              |  |
| Ambulance                           |                       | 000<br>Non emergency<br>1800 008 008 | 000/112      |  |
| Fire Brigade (TFS)                  |                       | 000<br>03 6336 5633                  | 000/112      | <a href="http://www.fire.tas.gov.au">www.fire.tas.gov.au</a>                               |
| Fire Brigade - Gladstone            | Rodney Moore          | 03 6357 2233                         |              |  |
| Police – Gladstone                  |                       | 000<br>03 6357 1020                  | 000/112      | <a href="http://www.police.tas.gov.au">www.police.tas.gov.au</a>                           |
| Police – Derby                      |                       | 000<br>03 6354 1001                  | 000/112      |  |
| Police – Scottsdale                 |                       | 000<br>03 6352 4099                  | 000/112      |  |
| State Emergency Service             |                       | 0467 816 375                         | 03 6336 3790 | <a href="http://www.ses.tas.gov.au">www.ses.tas.gov.au</a>                                 |
| <b>Other</b>                        |                       |                                      |              |  |
| District Officer NE (TFS)           | Stephen Lowe          | 03 6336 5633                         |              | <a href="mailto:s.lowe@fire.tas.gov.au">s.lowe@fire.tas.gov.au</a>                         |
| Dorset Council                      |                       | 03 6352 6500                         | 1300 858 824 | <a href="http://www.dorset.tas.gov.au">www.dorset.tas.gov.au</a>                           |
| Aurora                              |                       | 13 2004                              |              |  |
| Transend                            |                       | 1300 361 811                         |              | <a href="http://www.transend.com.au">www.transend.com.au</a>                               |
| Telstra                             |                       | 1300 368 387                         |              |  |
| Dial before you dig                 |                       | 1100                                 |              | <a href="http://www.1100.com.au">www.1100.com.au</a>                                       |
| Ben Lomond Water                    |                       | 13 6992                              |              |  |
| Poisons Information                 |                       | 131126                               |              |  |
| DPIPWE                              |                       | 1300 368 550                         |              | <a href="http://www.dpipwe.tas.gov.au">www.dpipwe.tas.gov.au</a>                           |
| EPA                                 |                       | 03 6233 6518                         | 1800 005 171 | <a href="http://www.epa.tas.gov.au">www.epa.tas.gov.au</a>                                 |
| Parks and wildlife (Nth - Prospect) |                       | 03 6336 5312                         |              | <a href="http://www.parks.tas.gov.au">www.parks.tas.gov.au</a>                             |

| Medical Practitioners   |                  |             |              |
|---|------------------|-------------|--------------|
| Scottsdale Doctors Surgery Mon –Fri 8.00-6.00 Sat 9-11                                  |                  |             | 03 6352 2522 |
| Bridport Doctors Surgery Mon, and Thurs 9.00-6.00                                       |                  |             | 03 6356 1500 |
| Medical   |                  |             |              |
| Scottsdale District Hospital – (Soldiers Memorial Hospital) – X/Ray Facilities Mon-Fri  |                  |             | 03 6352 5520 |
| Launceston General Hospital – Accident/Emergency  |                  |             | 03 6348 7405 |
| Launceston General Hospital - Switch  |                  |             | 03 6348 7111 |
| Workplace Standards Tasmania  |                  |             |              |
| WST Helpline <a href="mailto:wstinfo@justice.tas.gov.au">wstinfo@justice.tas.gov.au</a> | 03 6233 8338 fax | 1300 366322 | 03 6233 7657 |

## 2.3 Water supplies

There are several water supplies on the wind farm site that can be used for fire fighting. They are marked in Figure 2. They include:

- Troughs. These are one of the best options for water if fighting a bushfire on the property. There are 31 pairs of troughs scattered throughout the property with the exception of east of the Little Musselroe River. Each pair holds 4500L and will refill at 4L per second or more. The troughs gravity fill from the tanks on Tank Hill and Sugarloaf Hill.
- Stand Pipe at Tank Hill. There is a stand pipe at Tank Hill that is connected to a 250,000 L tank. Tankers should not drive to the top of Tank Hill. **There are large diameter pipes close to the surface which if disturbed could result in the release of the water from the tank.**
- Tanks at the Control Building. There are currently two 20,000 L tanks at the Control Building. These tanks are filled by rainwater and are also used for water supply to the Control Building. They currently have British Standard Piping (BSP) fittings attached. Please note that water levels in these tanks vary with rainfall and consumption.
- Tanks near the farm buildings, farm manager’s house and Tregaron Homestead. There are currently at least seven 20,000L tanks in this area. The tank that is directly adjacent to the old shearing shed (on the northern side) is also filled by the stock water system (albeit slowly) so should always be full.
- Tanks at the Stone House. The tanks (2 x 20,000L) that supply water to the Stone House are located due east of the Stone House next to the road.
- Dams near the Little Musselroe River. East of the Little Musselroe River, there are few options for readily accessible water. The best options are the two dams located either side of the Little Musselroe River as shown on Figure 2. The dam on the western side is close to the road and has good all weather access. The Little Musselroe River itself is normally just a series of small pools in the summer months.
- Water sources along the transmission line have not been included in this plan. The Tasmanian Fire Service (TFS) is responsible for the control of fires in the State and it is anticipated that the TFS and local fire brigade members would have knowledge of water sources in the area of the transmission line.

### **3. Fire Risk Assessment**

A comprehensive fire risk assessment for the Musselroe Wind Farm has been prepared by SKM and is titled “Musselroe Wind Farm and Transmission Line Fire Risk Assessment – Final Draft – 29 March 2011”. Some of the information from the SKM fire risk assessment has been used in this plan.

Risk is the product of likelihood and consequence. The likelihood and consequence of a fire starting is described in this assessment using the descriptors in Table 2 - “Musselroe Wind Farm Risk Analysis Matrix”. The wind farm has been assumed to have a project life of 25 years and the transmission line a life of 40 years.

**Table 2. Musselroe Wind Farm Risk Analysis Matrix**

| <b>Musselroe Wind Farm Risk Analysis Matrix</b> |   |  | Type   | Determine the Consequence (C)   |  |  |   |   |
|---|---|--|--|---|--|--|---|---|
|   |   |  | Consequence  | Insignificant   | Minor  | Moderate   | Major   | Severe  |
|   |   |  | Natural Assets   | No lasting effect. Low-level impacts on biological or physical environment. Limited damage to minimal area of low significance. | Minor effects on biological or physical environment. Minor short-medium term damage to small area of limited significance. | Moderate effects on biological or physical environment but not affecting ecosystem function. Moderate short-medium term widespread impacts . | Serious environmental effects with some impairment of ecosystem function (eg. displacement of a species). Relatively widespread medium-long term impacts. | Very serious environmental effects with impairment of ecosystem function. Long term, widespread effects on significant environment (eg. unique habitat, National Park). |
|   |   |  | Health and Safety  | Local treatment with short recovery - minor short term health effects.  | Medical treatment required or short term acute health effects.   | Lost Time Injury (off work recovery required) or short / medium term health issues.  | Extensive injuries or chronic health issues.  | Single fatality or permanent disability.  |
| Built Assets                                    | Insignificant (minor impact, no lasting effect); Public concern restricted to local complaints. | Minor (minor impact, short - medium term); minor complaints. | Moderate (moderate impact, short - medium term); moderate complaints/public concern. | Significant (moderate impact, long term); significant adverse media attention, tarnished environmental credentials.             | Serious (moderate - high impact, permanent); serious public outcry; reputation severely tarnished.                         |  |   |   |
|   |   |  | Rank   | 5   | 4  | 3  | 2   | 1   |
| Determine the Likelihood (L)                    | Likelihood  | Event Frequency  | Rank   | 5   | 4  | 3  | 2   | 1   |
|   | Almost certain  | More than once during the project.                           | A  | Medium  | High   | Extreme  | Extreme   | Extreme   |
|   | Probable  | Once during the project.                                     | B  | Medium  | Medium   | High   | Extreme   | Extreme   |
|   | Possible  | Could happen during the project life.                        | C  | Low   | Medium   | Medium   | High  | Extreme   |
|   | Unlikely  | Unlikely to occur during project life.                       | D  | Low   | Low  | Medium   | Medium  | High  |
| Rare  | Very unlikely to occur during the project life.   | E  | Low  | Low   | Low  | Medium   | Medium  |   |

| Risk Level | Required Actions  |
|------------|---|
| Extreme    | Very High risks are intolerable for EH&S. Do not commence or continue at this risk level for EH&S risks. Implement control measures to ensure the risk level is reduced. Communicate and consult thoroughly on non-EH&S risks to ensure the positive benefits out-weigh the negative impacts.   |
| High       | High risk is undesirable and represents a band where the failure of any likelihood or consequence controls will place the risk into the "very high" category. Verify, and where possible quantify, the accuracy and certainty for the existing risk level. Implement control measures to ensure the risk level is reduced or is confirmed to be 'As Low As Reasonably Practicable' (ALARP). |
| Medium     | Medium risks are only tolerable if examination proves them to be ALARP. Implement management plans to prevent the occurrence and monitor for changes. Reduce to Low Risk if the benefits outweigh the cost of the additional control.   |
| Low        | Low risks are acceptable. Review at next review interval.   |

### 3.1 Assessment of consequence

The consequence of a fire event can be considered in relation to the following factors:

1. Safety. The risk to people.
2. Built Assets. These include such things as the wind farm assets, the transmission line, and the assets of surrounding properties including houses, sheds, stock, fences, pastures and crops.
3. Natural Assets. There are numerous significant natural assets surrounding the wind farm and transmission line infrastructure such as the Tregaron Lagoons, the orchids in the heathlands in the east of the Cape Portland property and the Mt Cameron Regional Reserve.

Given that the Musselroe Wind Farm is in a rural setting with some bushland, a fire that starts has the potential to spread to the surrounding vegetation and start a bushfire. The likely consequence of a fire will therefore be highly dependent on the conditions and other factors that may exist at the time of ignition. These variables include:

- Relative humidity,
- Wind speed,
- Temperature,
- Wind direction,
- Location of the fire,
- Time take for the fire to be detected,
- Time taken for first respondents or fire crews to attend the fire,
- Accessibility of the fire,
- Fuel moisture content (condition of the surrounding pasture/native vegetation), and
- Fuel load

Condition of the surrounding pasture refers to whether the pastures are green or whether they have hayed off. After the autumn break (the first good rains in autumn), the pastures on the wind farm and on grazing properties along the transmission line will quickly green up and will not support a fire until they have hayed off towards the end of spring.

If for example, a turbine fire started in October during a good season where the grass is relatively long but still green and lush, the fire may destroy the turbine, but it is very unlikely to develop into a bushfire. If the same fire was to occur a month or two later when the pasture was still long, but had dried off completely and a hot northerly wind was blowing, a potentially devastating bushfire could result.

In this context, the consequence of any fire is very dependent on the variables previously referred to and can range from insignificant to severe.

### **3.2 Assessment of likelihood**

The likelihood of a fire starting on site was assessed after utilising the following sources of information:

- The Musselroe Wind Farm and Transmission Line Fire Risk Assessment – Final Draft – 29 March 2011
- Consultation with the Tasmanian Fire Service’s officer responsible for the region.
- Consultation with operators for Woolnorth Wind Farm Holdings
- Consultation with engineers from the Engineer Procure Construct team for the Musselroe Wind Farm.

Potential sources of fire and their likelihood are discussed below.

#### **3.2.1 Fire in the substation or control building**

The likelihood of a fire in the control building or substation during the project life has been assessed as Rare.

#### **3.2.2 Turbine fire**

Turbine fires are unlikely, but can occur. Only three turbine fires have occurred in Australia, all of which have been contained. The likelihood of a turbine fire at the Musselroe Wind Farm has been estimated as Unlikely.

#### **3.2.3 Fire from operational activities**

Most operational activities occur within the turbines, control building and substation. Most other activities will be on roads and hard stands. The likelihood of a fire from operational activities is considered to be Rare.

#### **3.2.4 Fire from farming activities and other electrical infrastructure**

Farming activities are diverse and include a number of activities that may start fires. These include:

- Burning off (historically the largest cause of bushfires in the region),
- Welding,
- The use of small petrol engines (pumps and generators),
- Electric fencing,
- Slashing or mowing, and

- Vehicles and other equipment.

In addition to these activities there is also electrical infrastructure and equipment that have the potential to start fires. A good example is the Single Wire Earth Return (SWER) line that supplies the bore in the 'pump paddock' (refer to Figure 2). These types of lines are known to have a greater fire risk at the point where they terminate (i.e. where they are earthed). A fire did occur during the wind farm construction as a result of a fault in the earthing of a SWER line near the old shearing shed.

The likelihood of a fire as a result of farming activities and other electrical infrastructure has been assessed as Possible.

### **3.2.5 Fire from camp fires**

There are two public camp grounds close to the wind farm site, one at Petal Point and the other at Little Musselroe Bay. The sites are predominantly used over the summer months. Both sites are surrounded by native vegetation.

The likelihood of a fire as a result of campfires has been assessed as possible.

### **3.2.6 Fire from lightning strike**

The transmission line, turbines and substation have been designed with a lightning protection system to discharge a lightning strike to the ground. Lightning strikes directly to the ground are more likely to start fires. Bushfires ignited by lightning and impacting either the transmission line or the wind farm are considered possible over the life of the project.

### **3.2.7 Fire caused by the transmission line**

It is very rare for fires to be caused by modern transmission lines. The high standard of design and maintenance required to provide a reliable electricity supply greatly reduces the fire risk. The likelihood of the transmission line starting a fire has been rated as unlikely.

### **3.2.8 Fire caused by maintenance of the transmission line**

Maintenance activities on the transmission line will occur from time to time. In particular, clearing of vegetation could pose a fire risk depending on what time of year the work is conducted. The likelihood of a fire starting as a result of maintenance work on the transmission line has been rated as possible.

### **3.2.9 Fire impacting the transmission line**

The transmission line is approximately 50 km long. Due to its length it is almost certain that it will be subject to a bushfire during its life span. Grass fires are unlikely to have a significant impact on the line, but a fire in a forested area could adversely impact the line and its ability to operate.

## 4. Mitigation Strategies

### 4.1 General measures

- Combustible and hazardous materials will only be stored in designated storage areas. Hazardous materials storages will comply with Australian Standards.
- Petrol cars are not to be taken off roads and hard standing areas.
- Burning off will only be conducted outside the Fire Permit Period as defined by the Tasmanian Fire Service (<http://www.fire.tas.gov.au/Show?pageId=colPermit>) or with a valid Fire Permit from the Tasmanian Fire Service. Planned burns will be communicated across all site activities.
- During the Fire Permit Period, which is normally from November to March, a person will be nominated to check the predicted fire danger rating on the Tasmanian Fire Service website on a basis that is sufficiently regular to ensure the site is aware of the fire danger rating.

### 4.2 Periods of very high fire danger rating



- During periods with a fire danger rating of very high or above, there will be no high risk activities near vegetation such as hot work, slashing, and use of petrol motors.
- During periods of very high fire danger or above, a staff member at the wind farm will monitor the Tasmanian Fire Service website ([www.fire.tas.gov.au](http://www.fire.tas.gov.au)) to determine if there are any fires that have the potential to threaten the transmission line or the wind farm.
- Maintenance is restricted on total fire ban days with only essential site activities permitted.
- When a total fire ban day is declared, it is recommended that a staff member check the Little Musselroe and Petal Point camp sites to make sure there are no active or smouldering camp fires.

### 4.3 Fire detection systems

An aspirating smoke detection system is fitted in the control building which will be configured to send a call to the security company.

Fire alarms are installed in the residences. The batteries should be replaced every 12 months.

#### **4.4 Preparation around site buildings**

Prior to the bush fire season (i.e. in October) the following activities will be conducted:

- As per the “Guidelines for Development in Bushfire Prone Areas of Tasmania” ([http://www.fire.tas.gov.au/publications/Bush\\_Guide.pdf](http://www.fire.tas.gov.au/publications/Bush_Guide.pdf)), a Building Protection Zone (BPZ) and a Fuel Modified Buffer Zone (FMBZ) will be established around all buildings at the wind farm including the Stone House, the White House, the Farm Manager’s House, the Tregaron Homestead, Farm Buildings, Visitors’ Centre and the Control Building/Substation. Information on Building Protection Zones and Fuel Modified Buffer Zones is provided in Appendix 1.
- Grass growing around buildings will be mown short.
- Grass growing against buildings will be either cut very short with a brush-cutter or sprayed.
- Grass and other vegetation around the tanks on Tank Hill and Sugarloaf should also be kept low. If these tanks were to melt in a grass fire, the main water source for fighting fires would be lost.
- The small paddocks and laneways around the shearing shed and other farm buildings should be grazed short and weeds should be controlled.
- Any rubbish lying around sheds will be cleaned up.
- Roof and gutters will be cleared of leaf debris.
- Vents into roof spaces will be screened with fine wire mesh.
- Gaps in external roof and wall cladding will be sealed.

#### **4.5 Preparation around towers and wind farm roads**

- Prior to the bush fire season (i.e. in September or October) any long grass along roads and hardstands will be managed. For example, cattle may be grazed along the road and hardstand verges. Stairwells to towers will need to be temporarily protected. Roads and hardstands can be done a section at a time.
- Weeds along road verges and hardstands (such as thistles) are best controlled in the autumn and winter prior to stem elongation.

#### **4.6 Maintenance of fire fighting equipment**

Table 3 provides a list of fire fighting equipment on site at Musselroe. All fire extinguishers will be inspected (and tags updated where necessary) by a qualified person every six months.

**Table 3. Fire fighting equipment at Musselroe Wind Farm**

| <b>Location</b>             | <b>Description</b> | <b>Type*</b>    | <b>Size</b> |
|-----------------------------|--------------------|-----------------|-------------|
| <b>Control Building</b>     |                    |                 |             |
| Front Door - Sliding        | Fire Extinguisher  | ABE DCP         | 4.5kg       |
| Eastern Man Door            | Fire Extinguisher  | ABE DCP         | 4.5kg       |
| Comms Room                  | Fire Extinguisher  | CO <sub>2</sub> | 5.0kg       |
| Workshop Nth Wall           | Fire Extinguisher  | ABE DCP         | 9.0kg       |
| Workshop Sth Wall           | Fire Extinguisher  | ABE DCP         | 9.0kg       |
| HV Room Nth Wall            | Fire Extinguisher  | CO <sub>2</sub> | 5.0kg       |
| HV Room Sth Wall            | Fire Extinguisher  | CO <sub>2</sub> | 5.0kg       |
| Kitchen                     | Fire Blanket       |                 |             |
|                             |                    |                 |             |
| <b>Hazchem Building</b>     |                    |                 |             |
| West End                    | Fire Extinguisher  | ABE DCP         | 9.0kg       |
| East End                    | Fire Extinguisher  | ABE DCP         | 4.5kg       |
|                             |                    |                 |             |
| <b>Switchyard</b>           |                    |                 |             |
| None                        |                    |                 |             |
|                             |                    |                 |             |
| <b>Turbines</b>             |                    |                 |             |
| Nacelle                     | Fire Extinguisher  | ABE DCP         |             |
| Base                        | Fire Extinguisher  | ABE DCP         |             |
|                             |                    |                 |             |
| <b>Stone House</b>          |                    |                 |             |
| Under stairs                | Fire Blanket       |                 |             |
| Under stairs                | Fire Extinguisher  | ABE DCP         | 2.5kg       |
| Outside back door           | Fire Extinguisher  | ABE DCP         | 9.0kg       |
|                             |                    |                 |             |
| <b>White House</b>          |                    |                 |             |
| Kitchen                     | Fire Blanket       |                 |             |
|                             |                    |                 |             |
| <b>Farm Manager's House</b> |                    |                 |             |
| Near Kitchen                | Fire Blanket       |                 |             |
| Near Kitchen                | Fire Extinguisher  | ABE DCP         |             |
| Near Garage                 | Fire Extinguisher  | ABE DCP         |             |
|                             |                    |                 |             |
| <b>Tregaron Homestead</b>   |                    |                 |             |

|      |  |  |  |
|------|--|--|--|
| None |  |  |  |
|------|--|--|--|

In Table 3, ABE refers to the fire class that the extinguisher is designed to control. These fire classes are provided in Table 4. DCP stands for Dry Chemical Powder which is a popular general purpose fire extinguisher. CO2 fire extinguishers are suitable for electrical fires.

**Table 4. Fire classes.**

| Fire Class | Description           | Typical examples  |
|------------|-----------------------|---|
| A          | Wood, paper, plastics | Wood, textiles, rubber, plastics and paper.                               |
| B          | Flammable liquids     | Petrol, oil, paint, petrol stations, cars                                 |
| E          | Energised electrical  | Switchboards, computers, toasters, fuse boxes, live electrical appliances |
| F          | Cooking oils & fats   | Butter, deep fryers, kitchens, take-aways, and restaurants                |

In addition to checking the equipment Listed in Table 3:

- The stand pipe at Tank Hill will be checked to ensure it is in good working order.
- During the fire season, at least 20,000 litres will be kept in the tanks at the Control Building.
- Ensure that there is a torch and battery operated radio at the Control Building.

#### **4.7 Transmission line inspections**

The transmission line will be subject to a routine maintenance inspection at least every 12 months.

The transmission line will be inspected every second year to ensure that:

- clearance distances to vegetation are adequate,
- there are no trees that could threaten the line if they fell, and
- that fuel loads in the easement are acceptable.

#### **4.8 Maintenance work on the transmission line**

Maintenance activities on the transmission line have the potential to start fires. One of the highest risk activities is clearing vegetation in the easement as equipment will be in close contact with vegetation. The likelihood of a fire starting as a result of vegetation clearing can be greatly reduced by conducting work outside the Fire Permit Period which is normally from November to March.

All vegetation clearing works will be conducted under Environmental Works Plans which specify strategies and requirements for ensuring fire suppression equipment is on site and that fire weather monitoring is conducted and works ceased when conditions become unsuitable (the Fire Prevention at Forest Operations – Operation Shutdown Requirements is followed). There will be no maintenance activities, except visual inspections, conducted on total fire ban days.

#### **4.9 Maintenance of turbines**

Turbines will be maintained in good working order so as to minimize the risk of fire. Oil leaks and oil spills will be cleaned up as soon as possible. No flammable materials will be stored within the turbine.

There will be no maintenance activities involving hot work conducted on total fire ban days.

#### **4.10 General activities on the wind farm site (including farm activities)**

General activities across the farm including those directly related to farming will be carefully managed during periods of high fire danger and total fire ban days. This includes:

- Ensuring vehicle and quad bike access off formed roads is minimised to the greatest extent possible and parking of 'hot' vehicle is on areas of low pasture or areas of mineral earth (or similar). All passage vehicles must have a fire extinguisher (power or water charged).
- Use of machinery and heavy plant will be carefully managed and prescriptions followed to prevent a fire from starting. All machinery and heavy plant must have a suitably sized fire extinguisher (power or water charged). There will be no operation of any machinery or heavy plant off formed roads on total fire ban days.
- Other engine powered equipment, if operated in vegetated or pasture areas, where possible, will be fitted with spark arresters and will not be operated without a suitably sized fire extinguisher (power or water charged) present. Care will be taken not to leave hot equipment unattended. There will be no operation of this type of equipment on total fire ban days.
- No other hot work will be undertaken without a suitably sized fire extinguisher (power or water charged) present (and where possible a 'spotter') and strictly none of total fire ban days.
- Fires or controlled burns will not be started during the fire permit period unless a permit has been issued by the Tasmanian Fire Service, fire suppression equipment is available and a fire or burn plan has been prepared.

#### **4.11 Training and fire drills**

- All staff on site will have basic training in how to extinguish a fire using a fire extinguisher and will have refresher training every two years.
- Evacuation drills will be conducted every 6 months.

## 5. Emergency Response Procedures

Woolnorth Wind Farm Holding has determined that if a fire starts on site, staff trained to extinguish fires can attempt to do so with a fire extinguisher or fire blanket if they assess that it is safe to do so at the time. If the fire cannot be safely extinguished with a fire extinguisher, the following procedure will be followed:

- Evacuate all persons from the area of the fire.
- Contact the incident controller (See Emergency Response Plan)
- **Phone 000** and provide the following details:
  - Your name
  - Where you are calling from
  - What the incident is
  - Where the incident is
  - Is the situation controlled or uncontrolled
  - Type of assistance required
  - Are any persons hurt
- Incident Controller will then:
  - Arrange muster of site personnel (including farm staff) if required
  - Check that all persons are accounted for
  - Consider wind direction, egress and access
  - Make an assessment on whether the site should be evacuated and whether it is safe to do so
  - Consider what needs to be done if site access has been compromised
  - Notify management of Woolnorth Wind Farm Holding
  - Notify Workplace Standards

Other factors that need to be considered:

- Should part or the entire wind farm be electrically isolated?
- Should the transmission line be isolated?
- Do Aurora or Transend need to be notified?
- Has an emergency egress offsite been arranged in case of fire escalation?
- In the case that site access has been compromised, has a safe refuge area (i.e. beach near the Stone House) been identified if the fire escalates?

The same procedure will be followed if a fire starts off-site, but has the potential to threaten the site or is threatening the site.

There are two muster points on the wind farm:

1. In front of the control building
2. Just to the east of the LittleMusselroe River bridge.

## **6. Appendices**

### **Appendix 1. Building Protection Zone and Fuel Modified Buffer Zone**

## Appendix 2. Transmission Line Route Maps

## BOX 2. BUILDING PROTECTION ZONE

A **Building Protection Zone** (BPZ) is required to ensure that potential fuel surrounding a dwelling is minimised (Figure 1).

This zone is directly adjacent to the building and has a significant amount of fuel reduction so that there is little or no material available to burn around the dwelling when bushfires approach.

The Building Protection Zone is achieved by:

- » including non-flammable areas such as paths, driveways, and short cropped lawns;
- » locating dams, orchards, vegetable gardens and effluent disposal areas (septic tank trenches, drains, etc) on the fire prone side of the building;

- » using radiation shields and windbreaks such as stone fences and hedgerows, avoiding highly flammable plants (see Further Information, page 23);
- » removing fire hazards such as wood piles, rubbish heaps and stored fuels;
- » replacing highly flammable plants with low flammability species such as dogwood, white flag iris, native frangipani etc (see Further Information, page 23);
- » ensuring there is horizontal separation between tree crowns as well as vertical separation between ground litter and the canopy by pruning low branches; and

- » maintaining the area in a minimum fuel condition.

It is not necessary to remove all vegetation from within the Building Protection Zone.

Active weed management can often be a major part of implementing a Building Protection Zone. Individual trees rarely cause houses to burn in bushfires.

Trees can screen a building from windblown embers while protecting it from radiant heat.

Generally smooth barked trees are favoured for this function as their barks are less likely to catch fire.

Ideally, no vegetation should be able to fall on the building.

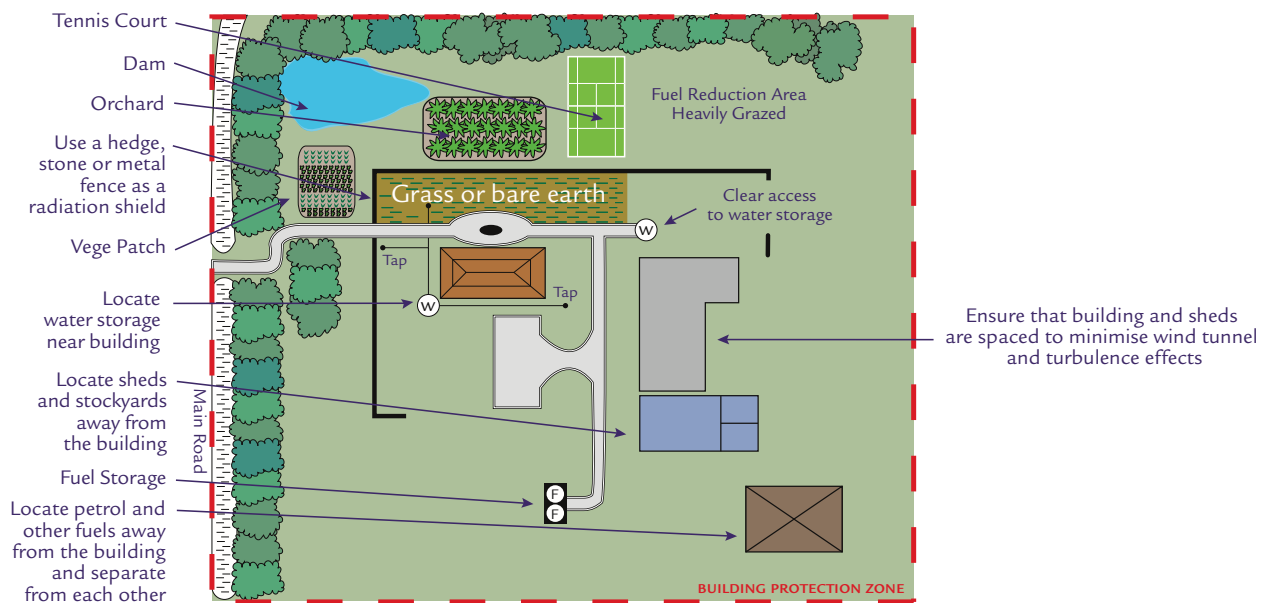


Figure 1. Lot layout showing a building, surrounded by a Building Protection Zone (see also Figure 11).

### BOX 3. FUEL MODIFIED BUFFER ZONE

A Fuel Modified Buffer Zone (FMBZ) is required to separate the Building Protection Zone from the bushfire hazard. In the Fuel Modified Buffer Zone, fine fuels are removed and larger fuels are strategically modified to reduce the intensity of an approaching bushfire (Figure 2). Fuel amount and continuity, both on the ground and between the ground and the bottom of the tree canopy, is modified by selective removal of vegetation, both horizontally and vertically, followed by on-going maintenance.

The Fuel Modified Buffer Zone is achieved by:

- » retaining established trees to trap embers and reduce wind speeds;
- » selectively removing small trees and shrubs to create clumps (rather than a continuous wall) separated by open areas;
- » removing the fuel between the ground and the bottom of the tree canopy or to a height of at least 2 metres (pruning lower branches and shrubs);
- » minimising fine fuels at ground level (mowing, slashing, raking, etc).

Active weed management can often be a major part of implementing a Fuel Modified Buffer Zone.

There is no need to remove most trees as they are beneficial in trapping embers and reducing wind speeds and will not be involved in a bushfire once the fuels below (understorey) have been modified. Good landscaping design should be able to provide for safety whilst retaining a pleasant environment.

The final impression, when up close, is of open vegetation, while from a distance it appears all the vegetation has been retained.

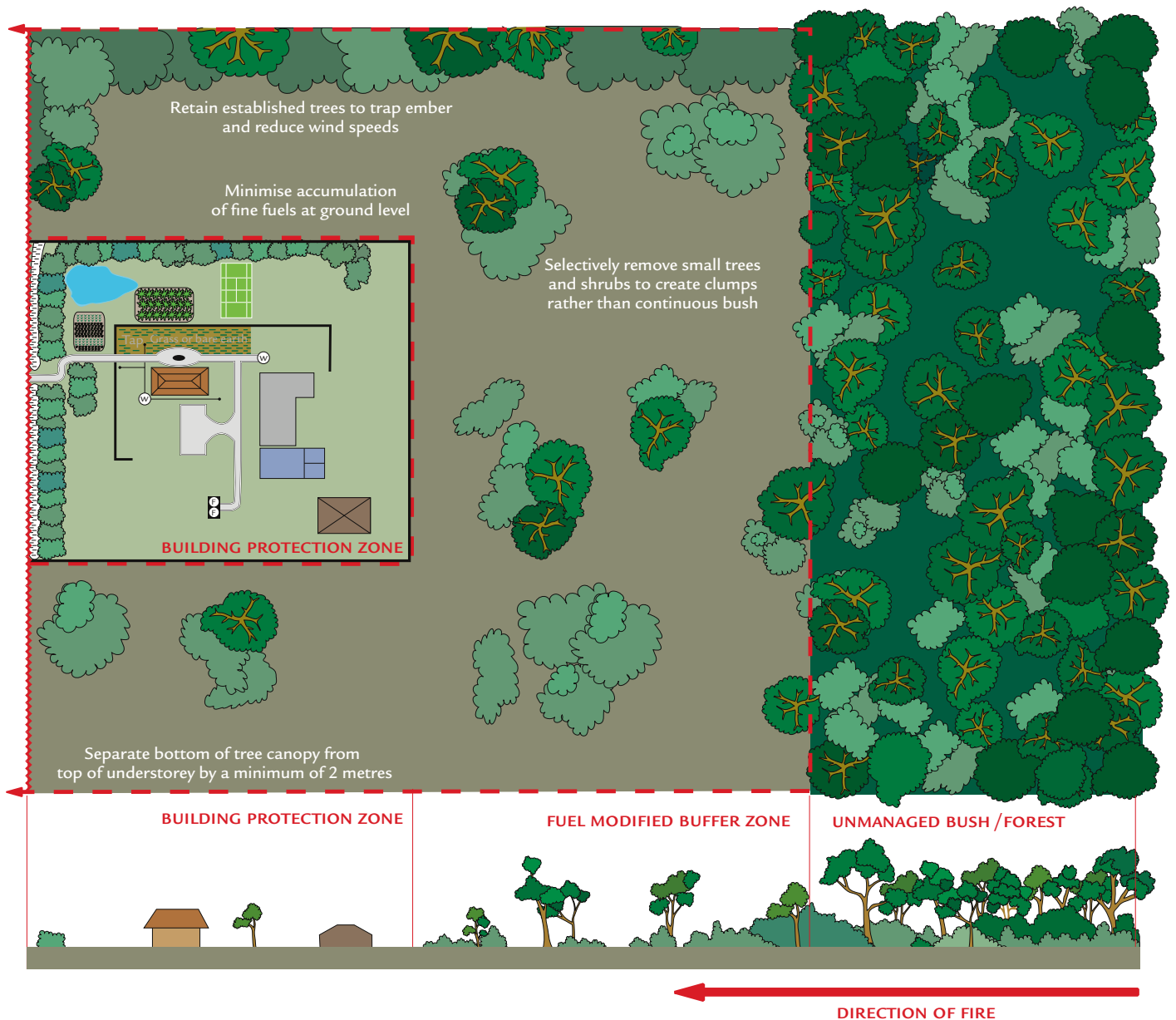
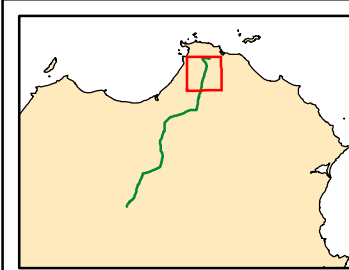
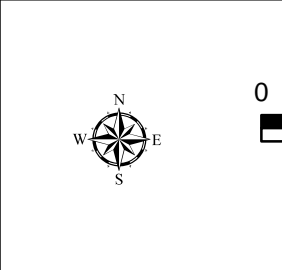


Figure 2. Lot layout showing the Building Protection Zone surrounded by the Fuel Modified buffer Zone (see also Figure 11).



**Legend**

- Poles
- Access Tracks
- Transmission Line
- Easement



1:25,000 when printed at A3

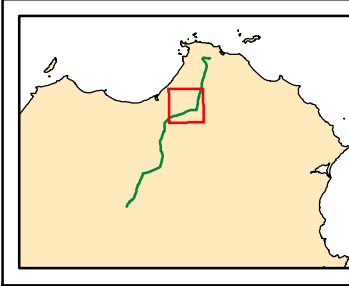
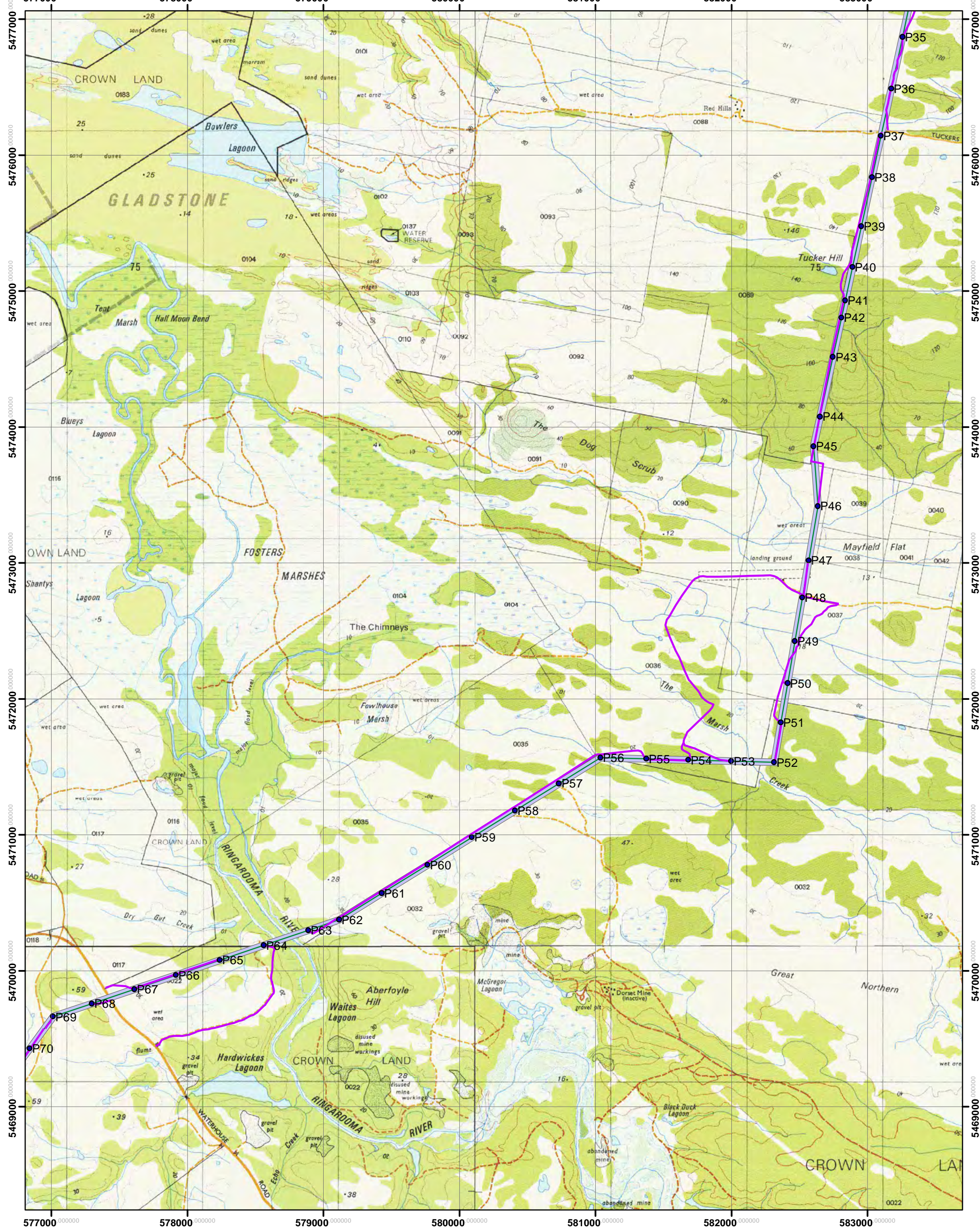
0 187.5375 750 1,125 1,500 Meters

Datum: GDA 94 Projection: MGA94 Zone 55

Data sourced from several sources including Dept of Primary Industry Water and Environment, Forestry Tasmania and Hydro Tasmania

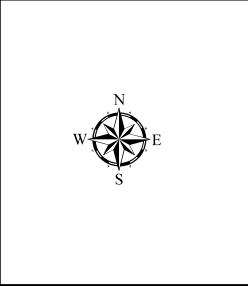
**Musselroe Wind Farm  
Transmission Line**

Map 1 of 5



**Legend**

- Poles
- Access Tracks
- Transmission Line
- Easement



1:25,000 when printed at A3

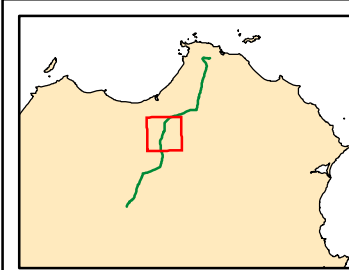
0 187.5375 750 1,125 1,500 Meters

Datum: GDA 94 Projection: MGA94 Zone 55

Data sourced from several sources including Dept of Primary Industry Water and Environment, Forestry Tasmania and Hydro Tasmania

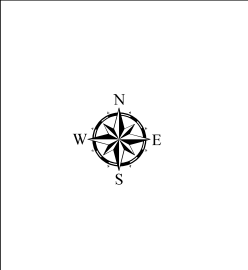
**Musselroe Wind Farm  
Transmission Line**

Map 2 of 5



**Legend**

- Poles
- Access Tracks
- Transmission Line
- Easement



1:25,000 when printed at A3

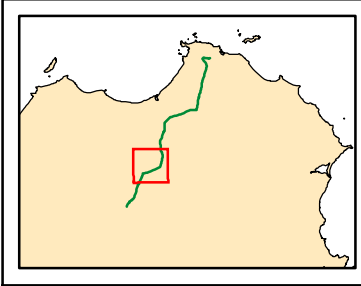
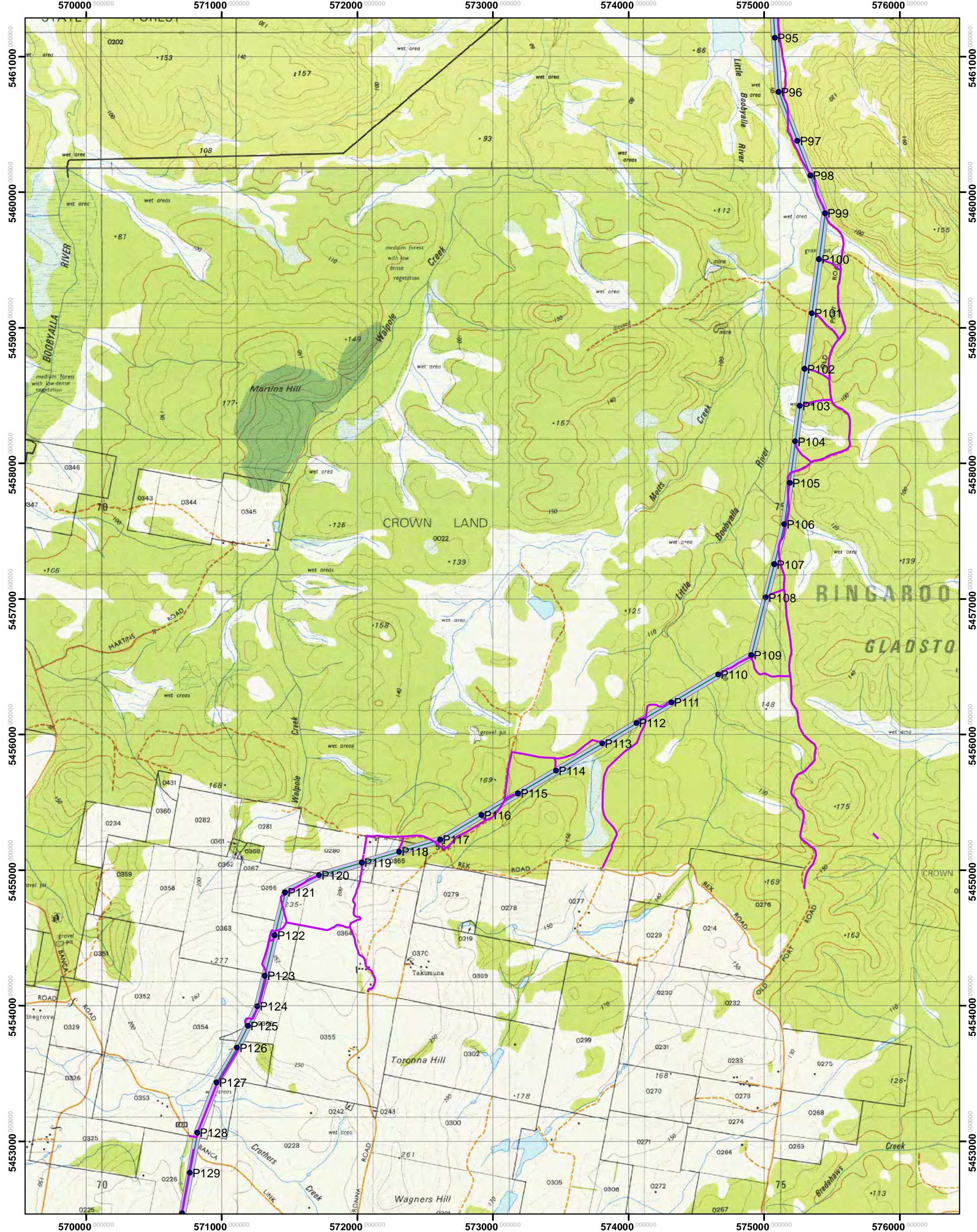
0 187.5375 750 1,125 1,500 Meters

Datum: GDA 94 Projection: MGA94 Zone 55

Data sourced from several sources including Dept of Primary Industry Water and Environment, Forestry Tasmania and Hydro Tasmania

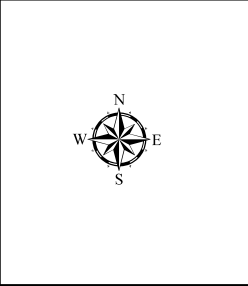
**Musselroe Wind Farm  
Transmission Line**

Map 3 of 5



**Legend**

- Poles
- Access Tracks
- Transmission Line
- Easement



1:25,000 when printed at A3

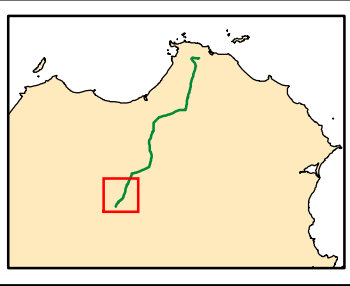
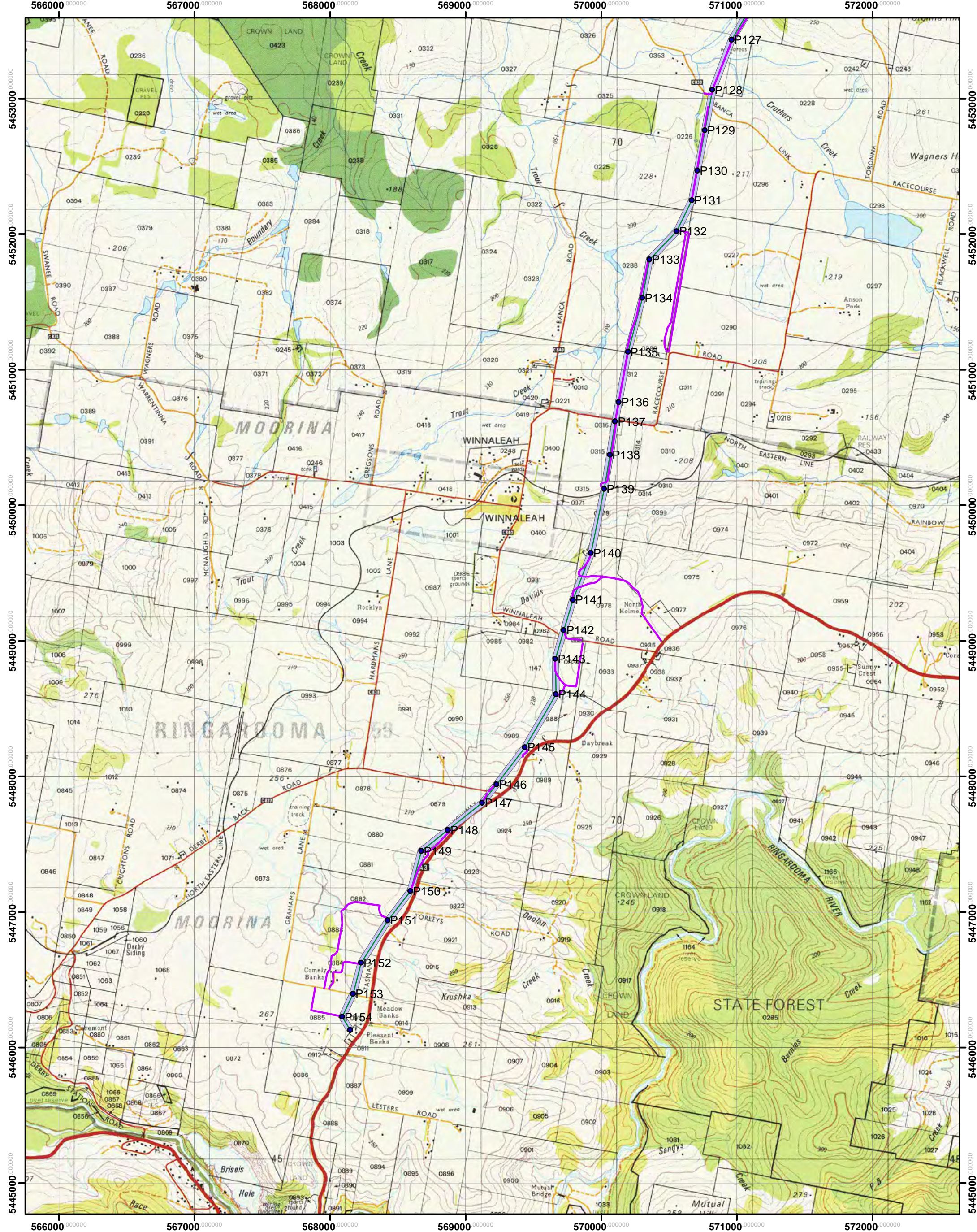
0 187.5375 750 1,125 1,500 Meters

Datum: GDA 94 Projection: MGA94 Zone 55

Data sourced from several sources including Dept of Primary Industry Water and Environment, Forestry Tasmania and Hydro Tasmania

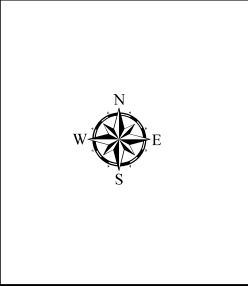
**Musselroe Wind Farm  
Transmission Line**

Map 4 of 5



**Legend**

- Poles
- Access Tracks
- Transmission Line
- Easement



1:25,000 when printed at A3

0 187.5375 750 1,125 1,500 Meters

Datum: GDA 94 Projection: MGA94 Zone 55

Data sourced from several sources including Dept of Primary Industry Water and Environment, Forestry Tasmania and Hydro Tasmania

**Musselroe Wind Farm  
Transmission Line**

Map 5 of 5