



Leonards Hill Wind Operations Fire Management Plan

Version 1.0 – January 2012

Leonards Hill Wind Operations - Fire Management Plan V1.0

Version Control

Version	Responsible person	Description
0.1	Sally van Rooden	initial development
1.0	Sally van Rooden	Final - published

Stakeholder Input

Version	Stakeholder	Type and date
0.1	Operations Manager	ongoing
0.1	District 15 CFA	site audit 12/12/2011
0.1	Repower	desktop 7/12/2011

Leonards Hill Wind Operations - Fire Management Plan V1.0

Table of Contents

1. Fire Mitigation Plan objective	2
1.1 Plan aims	2
1.2 Legislative considerations.....	2
2. Facility Details	3
2.1 Location	3
2.2 Operator details	3
2.3 Mitigation task responsibility	3
2.4 Site map	3
2.5 Emergency contact details.....	4
3. Risks Identification	5
3.1 Overhead lines	5
3.2 Lighting strike.....	5
3.3 Turbine fire.....	5
3.4 Switchyard or transformer fire	5
3.5 Bushfire, grass or hay fire.....	5
4 Mitigation strategies	6
4.1 Overhead lines	6
4.2 Lighting strike.....	6
4.3 Turbine fire.....	7
4.4 Switchyard or transformer fire	7
4.5 Bushfire or grass fire	8
4.7 Other mitigation strategies	8
4.7.1 Regular maintenance and inspections	8
4.7.2 Smoking	8
4.7.3 Fire fighting Equipment	9
4.7.4 Hazard management.....	9
4.7.5 Site Access & Information.....	9
4.7.6 Water supply	9
4.7.7 Total fire ban days	10
5. Operational procedures for fire (including bushfire)	11
5.1 Incident recording.....	11
5.2 Training / fire drills.....	11
6 References.....	11

1. Fire Mitigation Plan objective

The objective of this Fire Mitigation Plan (hereafter “the plan”) is to provide policy direction on the management of fire risks at the Hepburn Community Wind Farm (“Hepburn Wind”).

1.1 Plan aims

The aim of this plan is to:

identify and assess fire hazards (including bushfire) at the wind farm including hazards to the wind turbines and ancillary systems as well as risk to people working on site or participating in tours

ensure stakeholders are identified and, where necessary, are involved in the review of risk and mitigation strategies

develop hazard mitigation strategies to reduce the risks posed by fire (including bushfire) on people and assets

ensure emergency response plans are developed.

1.2 Legislative considerations

This plan has been developed in accordance with the Electricity Safety Act 1998 and Electricity Safety (Bushfire Mitigation) Regulations 2003 (incorporating amendments of 21 October 2010).

This plan has also been developed in accordance with the CFA ‘Emergency Management Guidelines for Wind farms’, 2007.

2. Facility Details

2.1 Location

Located at Leonards Hill, 10 km south of Daylesford in Victoria, the wind farm consists of two REpower MM82 turbines and an electrical substation (see site map). Power generated from the turbines runs underground to the substation. Output from the wind farm is fed into a 22 kV distribution line owned by Powercor adjacent to the substation.

Access to the wind farm is via Ballan-Daylesford Road, Leonards Hill, approximately 100 m north of the Leonards Hill CFA shed.

2.2 Operator details

The Hepburn Community Wind Farm is owned and operated by Leonards Hill Wind Operations Pty Ltd (LHWO), a wholly-owned subsidiary of Hepburn Community Wind Park Co-operative Limited (Hepburn Wind).

Registered office: 20 Albert St, Daylesford, Victoria
Phone: (03) 5348 6760 / 0478 225 773
Email: operations@hepburnwind.com.au

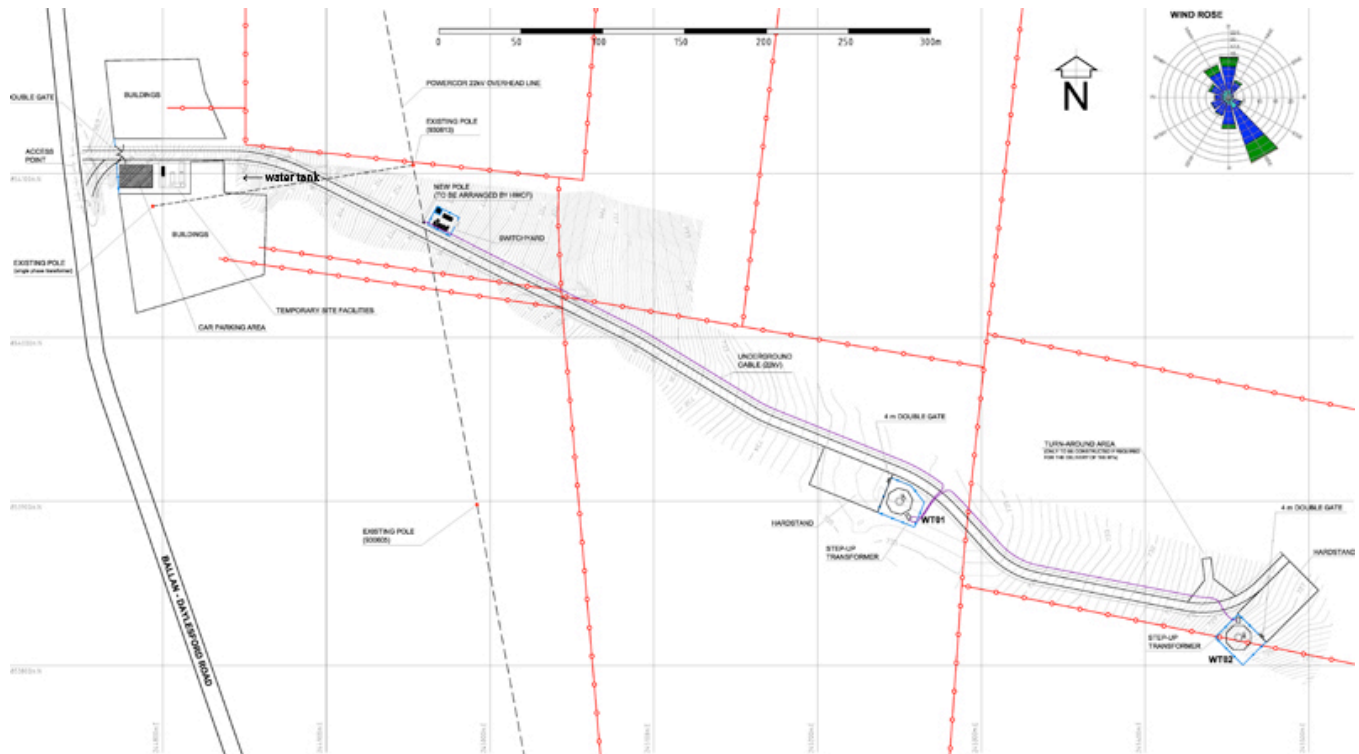
2.3 Mitigation task responsibility

The Operations Manager of LHWO is responsible for the execution of all actions and tasks associated with fulfilling the objectives of the plan. The Operations Manager (or their delegate) can be contacted on 0478 225 773.

2.4 Site map

The wind farm comprises two wind turbines (each with a transformer kiosk) and an accompanying substation as depicted on the map below. The wind farm access road runs east from Ballan-Daylesford Road, passes the substation, Turbine 1 ('Gusto') and ends at Turbine 2 ('Gale').

Leonards Hill Wind Operations - Fire Management Plan V1.0



2.5 Emergency contact details

In the case of a fire call 000 in the first instance, then notify Hepburn Wind 24/7 operations on 0478 225 773.

3. Risks Identification

The following have been identified as potential risks at the Hepburn Wind facility.

3.1 Overhead lines

Output from the wind farm is fed into a 22 kV overhead power line that cross the property near the switchyard. Pole and line fires are a potential fire risk.

3.2 Lighting strike

Lightning strike from electrical storms can hit the turbines, poles and lines, grass or other parts of the facility which could result in the development of a fire.

3.3 Turbine fire

There is a risk that a fire of electrical or mechanical origin could develop in the nacelle or hub, which could result in spot fires in the surrounding area.

3.4 Switchyard or transformer fire

There are a number of transformers and electrical systems onsite. Equipment failure has a potential to result in an electrical fire in the switchyard or at the transformer kiosks near the turbines.

3.5 Bushfire, grass or hay fire

The site is surrounded by grazing land and the Wombat State Forest. There is a risk that the wind farm is subject to bushfire or grass-fire, particularly on total fire ban days. A fire could come from any direction depending on the source of ignition and weather conditions.

4 Mitigation strategies

Turbine fires are very rare, but can occur just as they do with other activities that involve electricity, heat and machinery such as cars, tractors, harvesters, trains, mines and houses.

Only three turbine fires are thought to have occurred in more than 15 years of operation in Australia, all of which were contained. In context, there are an estimated 220 haystack fires each year in Victoria alone.

To ensure a robust Fire Management Plan Hepburn Wind has consulted representatives from the CFA along with REpower, the turbine manufacturers. Additional input from our authorised HV operators regarding electrical systems has been incorporated into this plan.

The wind farm complies with the relevant Australian Standards and Building Code of Australia, which determine requirements for the structures on the site and fire protection measures for plant and machinery operating on the site.

These include:

- lightning protection devices installed on each wind turbine
- under-grounding of electrical and communications cables
- monitoring systems that detect temperature increases in the turbines and shuts them down when a threshold temperature is reached.

The LHWO Emergency and Evacuation Procedures document outlines the process to be implemented in case of a fire. In case of any fire risk, 000 must be notified immediately. This plan identifies the inbuilt fire suppression systems and activities required to mitigate fire risk identified in section 3, the following strategies have been identified and implemented.

4.1 Overhead lines

Inspections and audit details for the overhead lines will be requested from Powercor on an annual basis. Site personnel will undertake visual checks and, if necessary, provide feedback to Powercor.

4.2 Lighting strike

The wind turbine is equipped with a lightning protection system and complies with the degree of protection defined in the international standard IEC 61024-1 II. Bolts of lightning are received via receptors in the rotor blades and passed via sliding contacts and spark gaps from the rotor to the tower. The lightning current is discharged via earth grid electrodes into the ground.

Whilst the risk of a fire resulting from lightening strike to the turbines is low, appropriate Emergency and Evacuation procedures have been developed to ensure the safety of personnel

Leonards Hill Wind Operations - Fire Management Plan V1.0

who may be onsite. In general, site activity is prohibited if a storm is approaching or active near the site.

Lighting strike may also result in a bushfire or grass fire in the local area. Additional mitigation strategies are outlined in section 4.5.

Regular checks of a three meter radius area around all site facilities is undertaken by Hepburn Wind on a weekly basis during the fire season and as required during the non-fire season.

4.3 Turbine fire

The cause of an internal turbine fire is likely to be the result of an electrical fault in the nacelle, hub or base of the turbine. If fire did occur in these areas, temperature monitoring systems would initiate an automatic turbine shut down. Emergency procedures would be enacted to isolate the turbine from power and to contact emergency services to manage any spot fires. Without power and relatively little flammable material within the turbines, the fire is unlikely to spread and will eventually go out on its own accord.

Regular turbine maintenance ensuring the turbines are in good working order, along with areas of reduced fuel area around the turbines (pasture management), are the primary mitigation strategies.

In the case of a fire, ground based fire fighting equipment is unlikely to reach the fire. Brigades are to be positioned a safe distance from any falling material. Brigades are to set up a control line to contain any fire where it is safe to do so.

4.4 Switchyard or transformer fire

If there is a fire within the switchyard, sensors will activate the fire alarm. If there are appropriate qualified personnel on site at the time, and it is safe to do so, the fire will be extinguished using on-site fire extinguishers. Emergency procedures will be enacted including electrical isolation and immediate notification of emergency services.

In the event of equipment failure within the turbine area (including the transformer) causing a nearby fire, the affected turbine will automatically come to a stop. When internal temperatures exceed set limits, the turbines automatically shut down and turn their blades away from the wind.

Emergency procedures will be enacted including electrical isolation and immediate notification of emergency services. As a precautionary measure, the remaining turbine will be shut down.

A fuel-reduced area maintained around the switchyard, turbine and transformer areas will reduce the ability of the fire to spread quickly. These areas will be regularly inspected for vegetation and rubbish.

Leonards Hill Wind Operations - Fire Management Plan V1.0

4.5 Bushfire or grass fire

The wind farm is located on open grassland within a working farm. The surrounding grassland is grazed by livestock and/or cut for hay.

The farm owner is responsible for the vegetation at the wind farm in a manner agreed by the wind farm operator and the District 15 CFA.

Requirements of surrounding vegetation maintenance are, and will be managed by the farm operator are:

Grass, whether cured or green is to be kept at no more than 100 mm in height and leaf litter no more than 10 mm deep for a distance of 4 m around constructed buildings (including substation) and turbines during fire season.

A fuel reduced area of 4 m width will be maintained around the perimeter of electricity compounds and substation type facilities.

Any rubbish, oil, containers, packaging will be removed from the site.

Weekly monitoring of fuel load occurs during Fire Danger Periods. Outside this period, monitoring occurs as part of ongoing site maintenance.

Maintenance contractors will incorporate an on-site inspection and notify the wind farm operator if there are any identified hazards (e.g. oil leaks) or rubbish that have entered the wind farm area. If identified, these items will be removed from site by the wind farm operator.

While it is unlikely there will be excess vegetation (due to weekly inspections in the fire season) the landowner will be notified and action taken to reduce the vegetation fuel load in the subject area.

4.7 Other mitigation strategies

4.7.1 Regular maintenance and inspections

A regular maintenance program will minimise the incidence of any leaks or faults. On-site maintenance will also include an inspection of the area for vegetation, oil leaks or the possibility of any rubbish that may have blown in. Any oil found will be cleaned up using a spill kit and removed.

Maintenance will be scheduled outside the fire season where possible to minimise activity on days of total fire ban.

4.7.2 Smoking

In all circumstances, smoking is prohibited on site.

Leonards Hill Wind Operations - Fire Management Plan V1.0

4.7.3 Fire fighting Equipment

The switchyard and turbines have adequate fire fighting equipment to enable small spot-fires to be extinguished. Procedures for extinguisher use are covered within the [LHWO Emergency and Evacuation Plan](#).

There are 11 fire extinguishers located on site. They are tested every six months to ensure they are in good working order and the tags updated accordingly.

Four fire extinguishers are located in each turbine, two in the base and two in the nacelle. The turbines have 2 x 3.5 kg CO₂ and 2 x 9 kg ABE DCP fire extinguishers. Turbine maintenance personnel are trained in the appropriate use of the fire extinguishers.

The switchyard area has 2 x 3.5 kg CO₂ fire extinguishers installed. One is installed next to the switch room entry and one in the high voltage switch room.

4.7.4 Hazard management

Any hazardous items have appropriate identifying signage and are catalogued in the HAZCHEM register.

Appropriate safe work methodologies are followed when handling any flammable liquids or oils. After maintenance is complete, any combustible materials used are removed from the vicinity of the turbine. No combustible materials are stored within the turbine.

All contractors on site are trained in identification and mitigation of hazards they come in contact with. There are no exposed areas where oil can catch fire.

4.7.5 Site Access & Information

Access to the wind farm has been developed in accordance with state and local regulations as well as direct input from the District 15 CFA. Access roads will be maintained in good order with regular inspections.

Site information and maps are available for CFA personnel on-site to support their activities.

4.7.6 Water supply

A bulk static water storage tank (22,500 litres) is provided adjacent to the main access point. The tank is provided with a single CFA specification fitting to allow tankers to draw water. The tank is specifically for use by CFA for fire fighting activities and may not be used for any other activity. In the case of the tank water being used it will be refilled within a maximum of two business days. Operations personnel will check the water levels fortnightly during the fire season and periodically outside of the fire season.

The area surrounding the water tank has been designed and constructed for a load limit suitable for CFA fire fighting vehicles. The location of the tank allows for fire fighting vehicles to park within 4 m of the water supply outlet.

Leonards Hill Wind Operations - Fire Management Plan V1.0

4.7.7 Total fire ban days

The turbines operate as normal on total fire ban days unless internal temperature sensors exceed thresholds, in which case the turbines will be automatically turned off. Maintenance, servicing and site visits are restricted on total fire ban /code red days with only essential site activities permitted.

5. Operational procedures for fire (including bushfire)

The Hepburn Community Wind Farm will operate normally during days of Total Fire Ban (Country Fire Authority Act, 1958) and during declared Fire Danger Periods.

On days of code red and total fire ban days, site access is restricted to authorised operations and high voltage electrical personnel.

In the event of a bushfire, emergency procedures will be enacted including evacuation of personnel from the site if necessary. The evacuation procedure is covered in LHWO's Emergency and Evacuation Plan.

5.1 Incident recording

To ensure processes and procedures have been carried out effectively and to plan, any incidents will be recorded. LHWO will assist the CFA and other authorities to investigate the cause of any fire incidents occurring on site and/or in the surrounding area,

5.2 Training / fire drills

Appropriate training of all LHWO staff and regular site contractors will be implemented to ensure all personnel are adequately prepared in the event of an emergency.

6 References

Emergency Management Guidelines for Wind Farms, CFA, 2007.
http://www.cfa.vic.gov.au/documents/CFA_Guidelines_For_Wind_Farms.pdf
Australian Standard 1851 – Portable Fire Extinguishers, 1997
Hepburn Community Wind Farm – Environmental Management Plan Revision No: Final
Wind farm safety in Australia 2001 – (referenced by CFA Guidelines for Wind Farms)
http://www.synergy-wind.com/documents/BP11_Safety.pdf