FARM-STAY ACCOMMODATION & RURAL INDUSTRY DEVELOPMENT

LOT 7 DP228075

440 MULHOLLANDS ROAD

THIRLMERE. NSW. 2572

2. BUSH FIRE RISK & EMERGENCY MANAGEMENT PLAN

Prepared by SOWDES
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Executive Summary.

SOWDES has been commissioned by the proponents of a 'farm-stay accommodation' development located at 440 Mulhollands Road, Thirlmere within the Wollondilly Shire Council local government area to undertake a bush fire protection assessment. The assessment of the development is undertaken on two scales; the bush fire attack level (BAL) rating of any existing and proposed new buildings and the associated construction standards if applicable (refer to the previous section for details), and the risk and emergency management protocols as a type of '*Special Fire Protection Purpose'* development as defined by the pre-release edition of 'Planning for Bush Fire Protection' (2018) that caters for a population of transient visitors where the parameters of risk management and emergency and evacuation processes prevail.

The development proposal is for the formal approval and continued use of the site to provide short term farm-stay accommodation as an ancillary activity to the primary horticultural enterprises in line with current standard and best practice guidelines. The site offers visitors the opportunity to visit for day activities on the farm, and for a small number of people accommodation in one of four single bed or one double-bed short-stay cabins located within the main development precinct. Activities on the site include a hands-on participation in the day-to-day activities of a typical horticultural enterprise – including the harvesting of lavender and the processing of extracting essential oils at suitable times of the year, viewing bird and animal life, and feeding a range of small grazing and farm animals held in the outlying paddock areas. The tourism component is designed to cater for a potential small number of 'drive-by' visitors on a weekday basis, and with notice the occasional bus load of tourists on weekends. The larger bus load visitations are normally comprised of travelling groups from overseas and are catered for with meals and a range of indoor and outdoor scheduled activities.

The development property is accessed from the Mulhollands Road traffic corridor which junctions off Oaks Road approximately 4 kilometres northwest of the village of Thirlmere. Both Mulhollands Road and Oaks Road are sealed road formations. The farm-stay accommodation precinct is located approximately 90 metres from where the main entrance driveway junctions off Mulhollands Road which is located approximately 110 metres from the junction with Oaks Road to the west.

It is proposed that a separate building located in the southeast corner of the property which for the purposes of this report is identified as the 'entertainment and dining building' will be the nominated place of safe refuge as it is has a fully enclosed subfloor area supporting a concrete slab, the roof deck is continuous corrugated iron sheeting, and the underside of all eaves are lined with a non-combustible material. Internally the building is essentially designed for catering purposes and has a large open floor plan with very few partition walls, and there is ample space to safely house 50 or more people which is larger than what would be expected on the site with a bus load of visitors. The building is located approximately 20 metres from the farm-stay cabins, and the required asset protection zone of 20 metres on all aspects is already established.

The existing farm-stay cabins have not been assessed in accordance with the requirements of the Building Code of Australia (BCA) hence it is not the intention of this bush fire assessment that they be used as a place of safe refuge or be recognised as being fully compliant with the construction requirements of AS3959-2018 to the relevant BAL rating for farm-stay accommodation units. The existing main dwelling whilst also outside the specific considerations of this assessment is an approved dwelling with an assessed BAL rating of BAL-12.5 and is deemed compliant with the minimum construction standards as prescribed in Section 5 of AS3959-2018 '*Construction of Buildings in Bush Fire Prone Areas'* and therefore could be utilised as another place of safe refuge on the property in the event of a bush fire emergency.

The development proposal would ensure that the number of visitors to the site at any single time would not exceed 36 visitors which aligns with the capacity of the site to manage effluent. The numbers would be spread between 6 beds in the five farm-stay cabins, and the remainder associated with the larger bus load visitations. These numbers are in addition to the normal number of residents on the site that is generally 4 to 5 persons.

The development property is connected to the utility provider's maintained reticulated water supply with a water meter connection at the front of the property. The nearest spring hydrant outlet off the water main is located at the intersection of Mulhollands and Oaks Roads, approximately 120 metres from the front entrance which exceeds the maximum distance for firefighting purposes in accordance with the provisions of AS2419.1 -2005 – '*Fire Hydrant Installations, Part 1 System Design, Installation and Commissioning*'.

The development property does however have several rainwater tanks distributed around the development precinct varying in capacity and construction materials, in additional to access to dam water. There is four 10,000 litre and four 2,200 litre poly water tanks distributed across the development precinct and curtilage that whilst not of non-combustible materials are generally positioned against the walls of buildings constructed from non-combustible materials which act as a form of screening. A separate 20,000 litre concrete water tank is located at the northern end of the machinery shed complex which is accessible by firefighting vehicles.

To the north of the machinery shed is a shared dam with the western neighbouring property that has an estimated storage volume of at least 1 megalitre, and a larger dam is located to further to the north in the centre of the property. The two dams each have permanent pumps set-up which are used for irrigating the horticultural activities on the property that surround the development precinct and therefore provide a supplementary form of water supply for firefighting purposes.

Whilst the majority of this assessment will focus on the preparation of a Bush Fire Risk Management Plan and a Bush Fire Emergency Management Plan there are several bush fire protection measures and recommendations that are specific to the proposed development that will not necessarily be identified within either of the two aforementioned processes however are considered critical and important to the overall development. These measures may have been addressed in the previous discussions however are identified and summarised as follows:

- The requirements of Table 6.4c in the pre-release edition of PBP (2018) to provide 10,000 litres of static water supply for each of the five habitable cabins has been identified and addressed
- It is recommended that at least two firefighting pumps be available on the property at all times, and that each pump be accompanied by a durable 30 metre hose within a minimum internal diameter of 19mm. The pump and hose sets should be able to be transported around the property on standard utility or farm vehicles to provide a rapid response and coverage across the site. The outlet from each of the 10,000 litres poly tanks and the 20,000 litre concrete tank should have a tee branch that provides a connection to the pump system off one outlet, and an isolation valve with 65mm face diameter storz connection on the other outlet for access by the NSW Rural Fire Service.

- The entertainment and dining building is an approved structure that at the time of construction was deemed to meet the necessary bush fire construction requirements. The building site is assessed to have a BAL rating of BAL-12.5 and the construction standards generally meet the requirements of AS3959-2018 Section 5, however there is a requirement to check that opening portion of all windows and doors are fitted with a screen to the external side that is made entirely from non-combustible materials as prescribed in Section 5.5.2 of the standard.
- An emergency response notification board should be placed adjacent to the carparking area at the entrance which clearly articulates the present level of bush fire risk - similar to the national roadside signs along major roads and highways. The sign should also clearly show on a map of the site the location of the designated 'place of safe refuge' at which to assemble in a bush fire (or other) emergency event and which can also indicate the likelihood of an evacuation for the site. The sign needs to be dynamic and able to be updated daily, particularly during the recognised bush fire season with the level of risk to match that of the surrounding areas.

It is considered that if these general bush fire protection measures are undertaken in combination with the following risk management and emergency evacuation protocols that the development proposal can satisfy the requirements of best practice management principles for developments undertaken in bush fire prone areas.

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1.00 Introduction.

A Bush Fire Risk Management Plan (BRMP) is a documented protocol for identifying, assessing, treating, and monitoring the potential risks from bush fire attack for a specific property, development or community. The principle objective of a documented BRMP is to identify the nature of the community or development at risk, the assets and heritage of that community (including built and environmental items), and to prepare clearly defined treatment and emergency evacuation options in the event of such a risk occurring. This BRMP is specifically focused on privately owned land upon which it is proposed to continue operations of a farm-stay facility. The nature of the property and its proposed uses is not directly covered by the actions or scope of any known Bush Fire Management Committee undertaking as defined by the NSW Rural Fire Service, however it is subject to a raft of national, state and local government planning laws and regulations pertaining to bush fire protection and management. This BRMP should be read in conjunction with the previous Bush Fire Hazard Assessment and the Bush Fire Emergency Management Plan (BEMP) that directly follows this report.

The scope of the recommendations and actions undertaken within a BRMP are normally not limited to just the inhabitants or user groups within the property, it should also seek a coordinated effort from within the community at risk (as applicable) and across several of the key emergency organisations such the Rural Fire Service, Police, Ambulance, Local Government and recovery agencies.

Within any BRMP possible treatment options for reducing or treating the potential risk including 'off-season' measures such as hazard reduction burning, land clearing to maintain asset protection zones and access and egress routes, improvements to fire suppression provisions (water supply), development of awareness programs, and maintenance of buildings and structures should be identified and undertaken as appropriate. The extent to which the individual treatment options listed may be undertaken will be based on the specific and identified needs of the proponents and the various types of user groups likely to utilise the facility and their ability to meet these requirements.

Where such requirements are beyond the means of the property owners then other considerations such as avoiding the risks, and having clearly defined triggers for emergency evacuation processes should be enacted as an alternative.

The documented Bush Fire Risk Management Plan should be subject to review on a regular basis and should be considered as a 'living document' that is subject to change, update and revision. Reviews of the Bush Fire Risk Management Plan should also recognise that the environment is a constantly changing element within the risk assessment – including influences such as climate change.

1.10 Aim and objectives

The aims of this BRMP is to identify and prioritise the potential risks associated with bush fires for the proposed use of the site and to minimise the impacts of these risks on human life, built assets and the environment.

Once the potential risks have been identified and prioritised, then the objectives of the BRMP for the property owners are to:

- Reduce the potential for a bush fire that could result in the loss of human lives, built assets and the environment to start from the activities associated with the proposed development
- Reduce the potential for a bush fire that could result in the loss of human lives, built assets and the environment to start from sources external to the activities of the proposed development
- Raise the awareness of the various user groups and visitors of the site to the threats of bush fires and reduce their vulnerability through the delivery of preparedness campaigns and/or appropriate signage
- Facilitate a gathering of the property owners, local firefighting authorities and other emergency agencies to discuss and seek agreement on the most suitable bush fire fighting measures and emergency evacuation procedures.

1.20 Description, Access and Use of the Subject Bush Fire Risk Management Property

The property owner has undertaken a program of horticultural developments and building improvements on the site to establish a viable horticultural enterprise as the principle use of the land, and a tourism facility as an ancillary land use. The primary focus of the operations is the large-scale propagation of lavender for the extraction of the essential oils that complements other business interest in the cosmetic and aroma-therapy industries in which the property owner operates.

Lavender (*Lavandula angustifolia*) is harvested manually from the plot of approximately 5,000 plants and then steam distilled in rooms on the northern end of a machinery shed to extract the oil component, with the current plant numbers anticipated to yield approximately 4 to 5 litres of oil per harvest. The harvested oil is then used in the production and value-adding of cosmetic and aroma-therapy products, with some of the product on display in the entertainment and dining building and available for purchase by visitors to the site.

The outlying areas of the site are set to a range of animal and bird holdings that provide additional attractions and inter-actions for visitors, with the tourism concept essentially being targeted to visitors from China that don't necessarily get to experience the hands-on experience of a working property in their normal day-to-day lives.

The tourism aspect of the development is supported by an established entertainment and dining building located to the east of the main dwelling, and five separate cabins (four 1-bedroom units and a single 2-bedroom unit) located to the northeast of the dwelling that can be hired for short-term accommodation, each being self-contained with bathrooms and kitchenettes. It is understood that the entertainment and dining building has been approved by Council, however the short-term accommodation buildings, and certain parts of the machinery shed that have sinks and cleaning facilities associated with the harvesting and lavender oil extraction operations have not been formally approved.

The site offers visitors the opportunity to visit for day activities on the farm and for a small number of people accommodation in one of four single bed or one double-bed short-stay cabins located within the main development precinct. Activities on the site include a hands-on participation in the day-to-day activities of a typical horticultural enterprise – including the harvesting of lavender and the processing of extracting essential oils at suitable times of the year, viewing bird and animal life, and feeding a range of small grazing and farm animals held in the outlying paddock areas.

The tourism component is designed to cater for a potential small number of 'drive-by' visitors on a weekday basis, and with notice the occasional bus load of tourists on weekends. The larger bus load visitations are normally comprised of travelling groups from overseas and are catered for with meals and a range of indoor and outdoor scheduled activities.

The development proposal would ensure that the number of visitors to the site at any single time would not exceed 36 visitors which aligns with the capacity of the site to manage effluent. The numbers would be spread between 6 beds in the five farm-stay cabins, and the remainder associated with the larger bus load visitations. These numbers are in addition to the normal number of residents on the site that is generally 4 to 5 persons.

The development property is accessed from the Mulhollands Road traffic corridor which junctions off Oaks Road approximately 4 kilometres northwest of the village of Thirlmere. Both Mulhollands Road and Oaks Road are sealed road formations. In the event of a bush fire emergency that required evacuation from the site the route along Oaks Road southeast to the village of Thirlmere where there is two recognised 'places of safe haven' would be the best option.

The farm-stay accommodation precinct is located approximately 90 metres from where the main entrance driveway junctions off Mulhollands Road which is located approximately 110 metres from the junction with Oaks Road to the west. The entertainment and dining building which is the nominated place of safe refuge is located closer to the front entrance – approximately 60 metres.

The internal carriageway leading to the carpark area for the cabin and entertainment building precinct traverses through open and managed lands comprised of well-established and maintained gardens and lawns. The internal carriageway leading to the cabin precinct is an unsealed gravel formation that satisfies the construction standards as specified in Table 7.4a of the pre-release edition of PBP (2018) however there is an ongoing requirement for the property owners that the carriageway be regularly inspected, and any clearing undertaken 'as necessary' to maintain the required clearances in both the horizontal vertical planes as stipulated in the guidelines.

The vegetation formations surrounding development precinct are dominated by mixed horticultural activities including a large lavender plot, ornamental and market gardens, and vegetable beds to the north, and a large fruit orchard to the west. Within the horticultural plots and surrounding the main structures and habitable buildings are well-established and maintained lawns and gardens amongst pathways and carriageways. Outside the horticultural plots the remainder of the property is set to open grazing paddocks with scattered eucalyptus trees along defined drainage lines and as discontinuous formations along the outer boundaries. The southern, southwestern and southeastern boundaries are also lined with a continuous row of conifers to provide an element of screening for privacy purposes from the neighbouring properties and passing traffic, as well as a form of windbreak.

The terrain under the vegetation on the northern aspect is downslope and slightly variable at an average grade of 7%, whilst the eastern aspect has a lesser fall away at approximately 5% and the southern and western aspects are flat or upslope in relation to the main buildings. The entertainment and dining building as the place of safe refuge is located approximately 33 metres from the eastern boundary, 38 metres from the roadside front southern boundary, and greater than 100 metres to the northern and western boundaries. These measurements have been used to determine the appropriate vegetation formations within the property, however where the boundary distance is less than 100 metres the vegetation in its current form outside these boundaries has been used as the worst case formations – grassland in the neighbouring property to the east and managed lands within the road reserve to the south, and beyond.

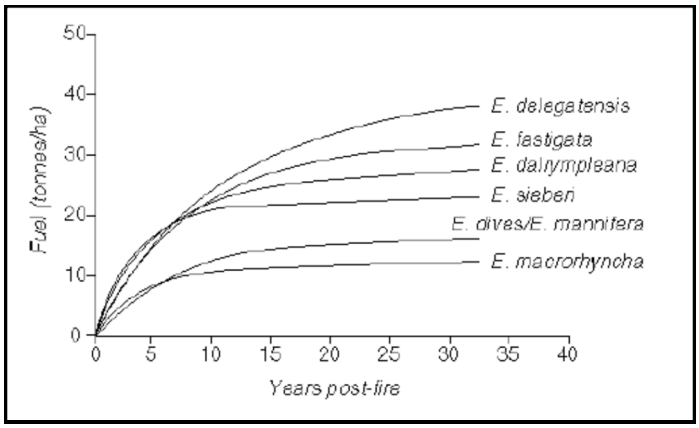
The existing farm-stay cabins have not been assessed in accordance with the requirements of the Building Code of Australia (BCA) hence it is not the intention of this bush fire assessment that they be used as a place of safe refuge or be recognised as being fully compliant with the construction requirements of AS3959-2018 to the relevant BAL rating for farm-stay accommodation units. The existing main dwelling whilst also outside the specific considerations of this assessment is an approved dwelling with an assessed BAL rating of BAL-12.5 and is deemed compliant with the minimum construction standards as prescribed in Section 5 of AS3959-2018 and therefore could be utilised as another place of safer refuge on the property in the event of a bush fire emergency.

The development property is connected to the utility provider's maintained reticulated water supply however the service is limited to a long extension of a domestic supply line from the water main with a water meter connection at the front of the property – approximately 15 metres to the west of the main entrance. The nearest spring hydrant outlet to the property off the water main is located at the intersection of Mulhollands and Oaks Roads, approximately 120 metres from the front entrance which exceeds the maximum distance for firefighting purposes in accordance with the provisions of AS2419.1 -2005 – '*Fire Hydrant Installations, Part 1 System Design, Installation and Commissioning*'.

The development property does however have several rainwater tanks distributed around the development precinct varying in capacity and construction materials, in additional to access to dam water. There is four 10,000 litre and four 2,200 litre poly water tanks distributed across the development precinct and curtilage that whilst not of non-combustible materials are generally positioned against the walls of buildings constructed from non-combustible materials which act as a form of screening. A separate 20,000 litre concrete water tank is located at the northern end of the machinery shed complex which is accessible by firefighting vehicles.

To the north of the machinery shed is a shared dam with the western neighbouring property that has an estimated storage volume of at least 1 megalitre, and a larger dam is located to further to the north in the centre of the property. The two dams each have permanent pumps set-up which are used for irrigating the horticultural activities on the property that surround the development precinct and therefore provide a supplementary form of water supply for firefighting purposes.

There have been no recorded significant bush fire events within or surrounding the property for the past 12 years with the exception of some controlled hazard reduction burns undertaken by the local brigades of the Rural Fire Service hence there are expectations that any forested vegetation around certain parts of the site are residing at or near the maximum potential fire fuel loads. (Tolhurst et.al 1992) [1].



Example of growth curves for several common eucalyptus tree species encountered within southeastern NSW and the time in years since the last fire that the maximum fuel availability would normally be expected. The available fire fuels are in the form or accumulated ground cover fallen from the trees – referred to as the 'duff layer' plus the trees themselves.

Historical weather data for the climatic area provides the best indication of the average annual weather conditions for the assessment site with average maximum daily temperatures in July of 16.86°C and average maximum daily temperatures in January of 29.3°C. Winds are predominantly from the west-southwest during the spring / summer seasons. It is considered that the potential sources of bush fire ignition that could impact on the development property might emanate from an advancing wildfire, lightning strikes, arson and accidental ignitions including sources from neighbouring properties.

[1] Tolhurst, K.G., Flinn, D.W., Loyn, R.H., Wilson, A.A.G & Foletta, I. J. 1992, 'Ecological effects of fuel reduction burning in a dry sclerophyll forest: a summary of principal research findings and their management', *Department of Conservation and Environment, Victoria, Research Report* no. 349.

Portion of the Wollondilly Shire Council Bush Fire Prone Map showing the extent of 'Category 1' (forest and woodland) bush fire prone vegetation and associated buffer zone within and surrounding the development property.

1.30 Land Ownership and Demographic Information.

The development property which is privately owned and is operating intensive horticultural activities as the main business enterprise. The site is tended by farmers and labourers that take care of the day-today horticultural activities, as well all routine yard and landscape maintenance on the property outside of specialised services.

The operation of the farm-stay tourism facility is an ancillary activity to the main horticultural enterprises and is limited to no more than 36 visitors at any single time which aligns with the capacity of the site to manage effluent. The numbers would be spread between 6 beds within the farm-stay cabins, and the remainder as day visitors on scheduled bus trips. Occupancy associated with the primary dwelling does not form part of the farm-stay and visitor numbers.

Whilst the farm-stay and tourism facility will essentially be available to operate all year round it is anticipated that the peak operating times will be principally through the warmer spring and summer months, and mostly over the weekend and holiday periods. Visitors to the site are expected to be representative of a diverse group of people ranging from families looking for an easily accessible location outside the city and metropolitan areas to relax for a day, to retirees travelling the countryside in caravans and motorhomes with no specific objectives or agendas, however the most likely group will be tourists from overseas on a scheduled trip to experience a hands-on farming experience.

It is probable that some visitors to the facility may be disabled or restricted with their respect to their mobility due to age, illness or other impairment and therefore the facility is essentially set-up to cater for ambulant persons.

A separate site plan for the development property accompanies this report as an A1 drawing.

2.00 Identifying and Assessing the Bush Fire Risk.

2.10 Process.

The process undertaken in the preparation of this BRMP has adopted the guidelines as prescribed by the NSW Rural Fire Service from the 'Bush Fire Risk Management Planning Guidelines for Bush Fire Management Committees' accessible online at the RFS website: http://www.rfs.nsw.gov.au/file_system/attachments/State08/Attachment_20130121_8D81D9F6.pdf

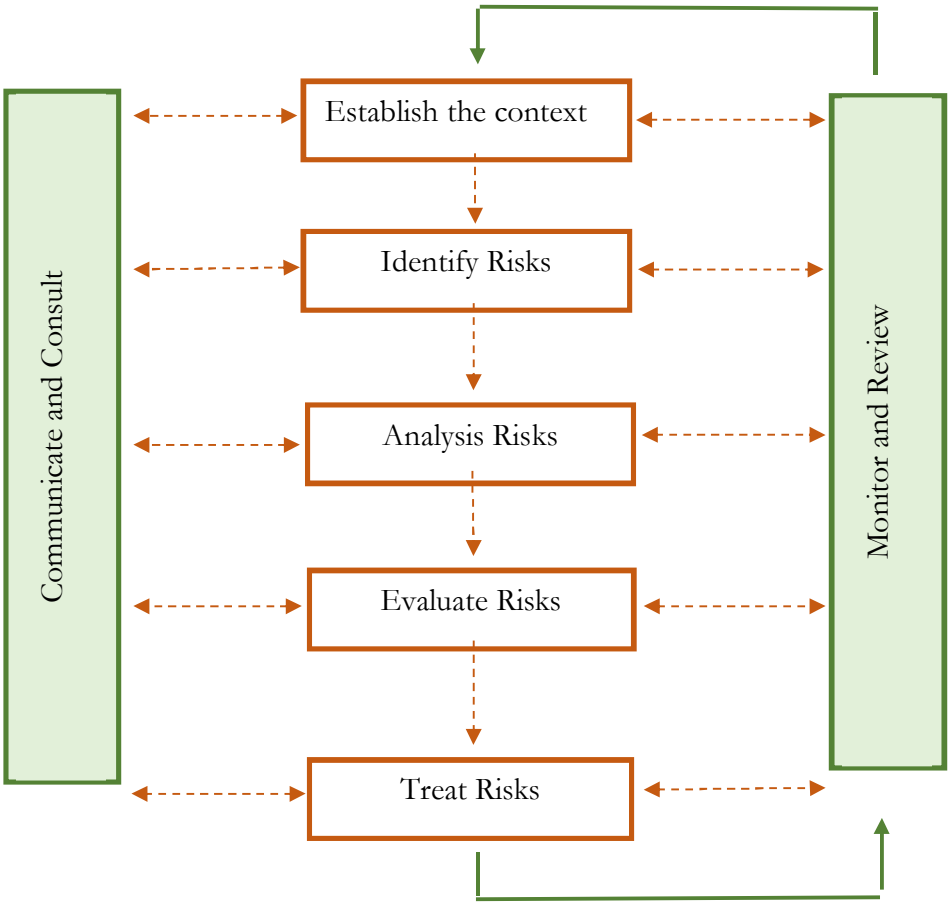


Figure 2. Framework for the risk assessment process.

2.20 Communication and Consultation

The owners of the development site are the link between the various user groups and bush fire emergency operations. In collaboration with personnel from the local brigade operations of the Rural Fire Service the owners of the site should devise appropriate evacuation procedures that has specific triggers for both 'planned' and 'emergency' incidents with readily accessible and identifiable assembly points and protocols for accounting for all the visitors to the facility.

There should be a reasonable assumption that the majority of the visitors to the site have little or no awareness of bush fire emergencies, the associated risks or the expectations during and following a bush fire event. It is therefore paramount that the owners establish and convey a clearly defined protocol for the appropriate procedures to follow that is neither ambiguous nor negotiable during a bush fire event that requires either a planned or emergency evacuation.

The emergency procedures should be clear and concise and able to be enacted by the individual visitors to the site without the intervention of the owners as they themselves may not be in a position to participate and guide people during these emergency periods.

2.30 Identifying the Bush Fire Risk

The first order of priority is to identify the major assets at risk in a major bush fire event including human life, the built assets, economic losses, environmental impacts and cultural considerations. A summary of the identified major assets within the property are listed in Appendix A.

2.31 Human occupancy.

The dynamics of the various user group types to the site could potentially comprise a diverse blend of ethnicity, ages, perceptions, physical fitness, personal priorities and individual attributes. Whilst the development precinct is located centrally within the context of the site, the large spread of the attractions over the property away from the development precinct and main entertainment and dining building means that visitors may be difficult to locate and account for in an emergency situation.

The greatest risk from a bush fire event is to account for all persons within an emergency situation as the transient nature of the visitors and their physical movements during their visits to the site may not be closely monitored or recorded.

2.32 Built Assets.

There are several existing buildings located within the development precinct which includes the five habitable short term farm-stay cabins, the main dwelling, the entertainment and dining building, a BBQ structure, several shade shelters, and animal enclosures.

Additional infrastructure on the site includes water tanks, machinery and storage sheds, surface water dams with fixed permanent pump systems, and internal fencing systems.

2.33 Economic.

There is a potential for significant financial losses to be experienced by the owners of the property as the result of a bush fire event that completely burns the horticultural plots or harvested produce, destroys or severely damages the built infrastructure, or necessitates the early departure or cancellation of functions and visitors due to invoked risk mitigation and emergency evacuation procedures. Any loss of buildings associated with the development precinct or farming operations will also significantly delay the return to normal operations during the period that buildings are assessed and replaced.

In the situation of potentially heightened bush fire risks where prevailing weather and fire conditions such as 'Extreme' or 'Catastrophic' risk ratings trigger an automatic closure of the site and therefore scheduled bookings have to be cancelled there may need to be a refund paid back to the visitors, or an offer for a re-booking for a later date – all of which can add to the financial losses incurred by the owners.

2.34 Environment.

The horticultural, farm-stay accommodation and tourism activities are undertaken on land that has already been disturbed therefore it is anticipated that there would be a low likelihood of any significant environmental impacts associated with a bush fire through the property that would not occur otherwise had the proposed development not continued.

2.35 Cultural.

There are no perceived cultural considerations associated with the continued operation of the eco-tourism facility that would be adversely impacted by a bush fire event.

2.40 Assessing the Bush Fire Risk.

Once the risks from bush fires has been identified, the consequences of a bush fire impacting on human life, the built assets, economic losses, environmental impacts and cultural considerations are assessed in line with the parameters in Table 1.

2.41 Human occupancy.

The expected consequence from a bush fire event on human life associated with use of the site has considered the mobility, spatial distribution, perception and preparedness of the general visitor population which determines a level of vulnerability. It is anticipated that in a 'worst case' scenario that there could be some minor injuries that might require first aid treatment associated with the potential for bush fire events to occur on very short notice which would limit the capacity and ability of visitors to evacuate the property.

The entrapment of individuals within the property is not expected to result in fatalities as there is a designated place of safe refuge in a low risk environment in the southeast corner of the property, however medical problems associated with burns and smoke inhalation may be possible. On this basis the consequence of the risk as classified as 'Low'.

2.42 Built Assets.

It has been assessed that there is a distinct possibility for both minor and major losses associated with the range and use of existing buildings and structures on the property in a bush fire event that will impose significant inconveniences and disruption to the operations of the site. Most significant of all would be the loss of the residential building and therefore the occupancy of the property by the owners, along with the loss of the machinery shed and internal infrastructure.

Water supply would be one particular service that could be greatly affected via contamination of on-site rainwater tanks and farm dams and loss of pumping equipment, whilst other basic provisions such as wastewater management systems could also be lost. The time required to repair or replace lost assets from a bush fire event could take several weeks to properly effect and therefore the consequence of the risk in this case is deemed to be 'High'.

Table 1. Consequences rating from bush fire events.

Consequence Rating	
Descriptor	**Comment**
Very Low	• No injuries or fatalities, little or no personal support required. • Inconsequential or no physical damage, short duration • Little or no disruption to the community • No measurable impact on the environment • Little or no financial loss • Negligible impact on image
Low	• Minor injuries, no fatalities, first aid treatment required • Some physical damage • Some community disruption for duration less than 24 hours • Small impact on the environment, on-site release contained immediately • Some financial loss • Marginal decrease in support by stakeholders
Medium	• Medical treatment but no fatalities • Localised physical damage which is rectified in a routine fashion • Normal community functioning with some inconvenience for 24 to 48 hours • Some environmental impact, short term, requires outside help on-site • Major financial loss – assistance required • Attracts media attention
High	• Extensive injuries, hospitalisation, possible fatalities, long term disabilities • Significant physical damage requiring external assistance • General and widespread community impact on functioning • Some environmental impact / permanent damage • Major financial loss – can only continue with substantial and ongoing financial assistance • Media concern
Catastrophic	• Many injuries, fatalities and widespread medical attention required • Extensive physical damage requiring extended external assistance • Community impact severe and long lasting, not functioning without support • Heavy environmental impact / permanent damage, extinction of species • Huge financial loss – can only continue with significant and ongoing financial assistance • Media outrage

2.43 Economic.

Any disruption to the horticultural operations of the property as the primary activity, or to the loss of buildings, infrastructure, and/or contents that make up the core function or attractions within the site as a result of a bush fire event would impose significant financial and economic burden on the owners. The loss of such assets would create several immediate problems; namely the physical costs to replace them, and secondly, the cost of servicing existing financial obligations in the absence of normal income streams. The consequence of the risk in this case is deemed to be 'High'.

A potential loss of income from cancellation of bookings due to precautionary measures to limit the exposure of visitors to bush fire risk in heightened fire weather days is also considered a realistic but low-importance economic outcome.

2.44 Environment.

There are no recognised environmental assets that would be lost or significantly endangered if a bush fire was to occur that are directly attributable to the operation of the farm-stay or tourism activities of the site, however the time for the land to recover from a bush fire event to the point that it could be used as a viable horticultural enterprise again could take several months or even years depending upon the nature of the damage and therefore the consequence is deemed to be 'Medium'.

2.45 Cultural.

There are no recognised cultural assets that would be lost or significantly endangered if a bush fire was to occur that are directly attributable to the continued operation of the farm-stay or tourism activities of the site and therefore the consequence is deemed to be 'Low'.

In assessing the potential consequences of a bush fire event impacting human life, built assets, economic losses, environmental impacts and cultural considerations it is determined that the overall rating for the development property would generally be 'HIGH' with reference to the parameters outlined in Table 1.

2.50 Assessing the Bush Fire Risk Likelihood.

The likelihood of a bush fire occurring that would impact on the recognised assets (listed in Appendix A) and on other matters of importance considered the following site specific elements:

- vegetation formations within and surrounding the cabins and dwelling precincts
- site topography
- proximity of the occupied and general open areas to the recognised vegetation threats
- time since last known bush fire event
- demographics and physical attributes of the visiting population
- access to firefighting services and support agencies
- access and egress facilities to remove large numbers of people on short notice
- exposure to accidental fire ignition, and
- overall awareness and preparedness of the visiting community

All recognised 'at risk' assets have been assessed with a likelihood rating based on the parameters within Table 2 and are summarised in Appendix A.

Table 2. Likelihood rating for risk analysis.

Likelihood Rating	
Descriptor	**Comment**
Almost certain	• The event is expected to occur in most circumstances (every year) • High level of known incidents (records / experience) • Strong likelihood of reoccurring with high opportunities / means to occur
Likely	• The event will probably occur in most circumstances (2 to 5 years) • Regular incidents known (records / experience) • Considerable opportunity and means to occur
Possible	• The event should occur at some time (5 to 10 years) • Few infrequent, random occurrences (records / experience) • Some opportunity and means to occur
Unlikely	• The event could occur at some time (> 10 years) • No known incidents (recorded or experienced) • Little opportunity and means or reason to occur
Rare	• The event may occur in exceptional circumstances (>30 years) • Unheard of • Almost no opportunity to occur

2.60 Identifying and Evaluate the Level of Risk

The combination of identified consequences (Table 1) and likelihood (Table 2) forge to produce an overall 'Risk Rating' for the development which can be used to formulate subsequent courses of action by the operators to combat the potential effects of a bush fire event. The 'Risk Rating' for the site may then be used to prioritise the course of actions and likely treatments based on the assets at greatest risk of loss or use in the event of a bush fire. The 'Risk Rating' for the individual assets are summarised in Appendix A based on the details and parameters in Table 3 'Risk Rating Matrix' and Table 4 'Identifying Possible Courses of Action'.

Table 3. Risk Rating Matrix

RISK RATING MATRIX					
	Consequence				
LIKELIHOOD	**Catastrophic**	**High**	**Medium**	**Low**	**Very Low**
Almost certain	EXTREME	EXTREME	MAJOR	MODERATE	MINOR
Likely	EXTREME	MAJOR	MODERATE	MODERATE	MINOR
Possible	EXTREME	MAJOR	MODERATE	MINOR	INSIGNIFICANT
Unlikely	MAJOR	MODERATE	MODERATE	MINOR	INSIGNIFICANT
Rare	MAJOR	MODERATE	MINOR	INSIGNIFICANT	INSIGNIFICANT

Table 4. Identifying Possible Courses of Action

IDENTIFYING POSSIBLE COURSES OF ACTION	
RISK RATING	**POSSIBLE COURSES OF ACTION**
EXTREME	• Immediate action required • Senior management attention required • Further research recommended on scenario or vulnerability analysis
MAJOR	• Planned action will be required during period • Management attention required • Further research recommended on scenario or vulnerability analysis
MODERATE	• Some action may be required • Management responsibilities must be specified • Risk likely to be unacceptable, even if not core business of the organisation
MINOR	• Action may not be required • Risk managed by routine procedures • Risk may be acceptable (providing it is not part of organisation's core business
INSIGNIFICANT	• Need for action is unlikely • Risk may be acceptable (providing it is not part of the organisation's statutory obligations)

In addition to assessing the likelihood of the effects of a bush fire event on the recognised assets, the risk to human life can be assessed using a 'Hazard Rating' based on the separation distance between the building assets and the assessable vegetation formations (Table 5) and the 'Threat' (Table 6) which is an overall assessment of the Hazard Rating and the preparedness of the visitors to the site. The Hazard Rating has been assessed as "LOW" whilst the preparedness rating has been assessed as "UNAWARE" which results in an overall Threat rating of "MODERATE". The risk rating of "MODERATE" can be referenced back to the 'Risk Rating Matrix' for appropriate action and treatment options.

Table 5. Hazard Rating Based on Distance of Separation Between the Buildings and the Vegetation Formations.

DISTANCE			
HAZARD RATING	**<30 metres**	**30 to 100 metres**	**0.1 to 1 kilometre**
Very high	VERY HIGH	HIGH	MEDIUM
High	HIGH	MEDIUM	MEDIUM
Medium	MEDIUM	MEDIUM	LOW
Low	MEDIUM	LOW	LOW

Table 6. Threat and Preparedness

PREPAREDNESS			
THREAT	**Unaware**	**Aware**	**Proactive**
Very high	CATASTROPHIC	CATASTROPHIC	MAJOR
High	CATASTROPHIC	MAJOR	MODERATE
Medium	MAJOR	MODERATE	MINOR
Low	MODERATE	MINOR	MINOR

2.70 Priority Treatments

Following on from the identification of the assets at risk and the rating of the potential risks, hierarchal priorities are issued against the individual assets to implement the necessary course of action and treatments in order to reduce the effect of bush fire on the asset. These priorities are based on the premise that the property owner has evaluated the identified risks and determined that with appropriate planning, training and awareness education they can generally handle the majority of possible bush fire events and therefore they accept the risk. Where a bush fire event becomes too large for the operators to cope with (possibly in combination with assistance from some of the visitors), the awareness education campaign will have established pre-determined triggers that over-ride the extent of the firefighting effort and revert to the safe option of evacuation.

The recognised assets for the development site are listed in Appendix A and have been allocated a priority action index based on the perceived need to protect the asset from the effects of bush fire. It is recognised that the main area for concern that is afforded a high level of priority is the potential risk for physical harm to visitors that become entrapped at the site or to be restricted from evacuating the property. Ensuring adequate cleared vegetation around the publicly assessable sites with clear and unrestricted egress paths is paramount, particularly from the furthest most visitor attraction sites of the property where egress must cover the longest possible route.

In the event that visitors cannot safely evacuate from the property the entertainment and dining building located in the southeast corner of the property has been identified as a suitable place for safe refuge as it is has a fully enclosed subfloor area supporting a concrete slab, the roof deck is continuous corrugated iron sheeting, and the underside of all eaves are lined with a non-combustible material. Internally the building has a large open floor plan with very few partition walls, and there is ample space to safely house 50 or more people. The entertainment and dining building is an approved structure that at the time of construction was deemed to meet the necessary bush fire construction requirements. The building site is assessed to have a BAL rating of BAL-12.5 and the construction standards generally meet the requirements of AS3959-2018, '*Construction of Building in Bush Fire Prone Areas*' - Section 5.

The entertainment and dining building is surrounded by established lawns and gardens on all aspects for a distance of at least 30 metres which satisfies the minimum distance requirements set out in Table 1.12.2 of the pre-release edition of PBP (2018). The building is located approximately 20 metres from the farm-stay cabins, and the required asset protection zone of 20 metres on all aspects is already established. The terrain under the vegetation for a distance of at least 100 metres to in each direction is less than 10% and the site and surrounds are established on natural surface levels without any modifications. The gentle sloping nature of the development precinct ensures that the asset protection zones can be easily maintained.

The separation distance between adjoining buildings and the managed nature of the vegetation surrounding the entertainment and dining building on all aspects ensures that the radiant heat levels will not exceed 29kW/m². The established rows of conifers on the southern, southwestern and southeastern aspects of the development precinct help to block prevailing winds and provide an element of screening from the neighbouring properties and passing traffic, they also provide a mechanism to filter out ember attack from those respective aspects.

3.00 Treating the Risk

It is recognised that there is capacity and scope with appropriate training and planning of the property owners that the risks of bush fire threat to the major assets can be alleviated within controllable measures. The risk treatment options include:

- Reduce and maintain the vegetation hazards around the development precinct and the designated access and egress routes in accordance with the requirements of the pre-release edition of PBP (2018)
- Administrative and management procedures which recognise a hierarchy of responsibility for the undertaking of the treatment measures and the allocation of control and decision-making responsibilities during bush fire events
- The development of emergency procedures including evacuation triggers, the designation of assembly points and safe places, and the coordination with external firefighting and emergency support agencies for sudden evacuations.

3.10 Implementation

The BRMP will be subject to a series of draft reviews and corrections prior to its implementation which will ratify the contents and context of the plan and produce a clear understanding of the requirements and limitations of the scope of the plan. The property owners will need to convert the plan into a relevant and productive protocol that identifies a need whilst also offering viable outcomes and options. Once ratification of this BRMP has been completed then it is proposed that the owners will meet with local firefighting agencies to discuss the plan, its context and its implementation. It is anticipated that the BRMP will be completed and adopted prior to the next bush fire season with the simpler recommended treatment measures that can be undertaken within the labour resources and capabilities of the owners programmed within a short time frame.

4.00 Performance Monitoring and Review

4.10 Review

A review of the BRMP should be performed on an annual basis around a predetermined time to ensure that all programmed works have been undertaken or are scheduled to be undertaken prior to the ensuing bush fire season. The review should also look for any changes in the management structure of the property owners, particularly at the senior management level, and this may require a documented process for allocating responsibility and decision-making roles in the event of a bush fire emergency based on the experience and proficiency of individuals within the business. Contingencies also need to be provided for times when the designated responsible person or persons may be absent from the property which in turn may unintentionally leave gaps in the organisational structure which could go unnoticed or undetected and therefore leave visitors to the facility unprepared and vulnerable at critical times.

4.20 Monitoring

A documented program for monitoring the efficiency of treatment measures should be implemented as part of the annual review process. A well-documented monitoring program will address matters such as:

- the effectiveness of previous specific treatment measures
- identification of risk mitigation and / or treatment measures outstanding to be completed
- identification of any new risks or hazards and treatment options
- any bush fire training and / or evacuation drills
- communications with the relevant firefighting, emergency and support agencies

4.30 Reporting

The process and purpose of the review and monitoring of the BRMP ensures a consistency in the approach to the risk of bush fire protection for the development owners, but it also displays that they have addressed their 'duty of care' with respect to the preservation of the lives within the visiting community.

As has been mentioned, the site may receive participants with a varied and sometimes empathetic appreciation of the risks associated with bush fires. The documented records of the recognition, treatment, monitoring and preparedness objectives of the owners with respect to risks associated with bush fires might also support a legal defence if the extreme of possible outcomes such as a fatality were to occur as a direct result of a bush fire.

4.40 Communication and Consultation

The whole process of identifying the risks associated with a potential bush fire and the resulting treatment and emergency evacuation protocols are of little value if the target audience is not aware of them. It is therefore vitally important that all visitors to the site are provided with an advanced warning (for example at booking time) and that site specific information notice boards are placed at strategic locations that clearly articulates the triggers to evacuate which would include the sound of an audible alarm across the site, the procedures to follow and the areas to retreat to – including both on and off site. To ensure that this is conveyed to all visitors it is recommended that clearly visible and legible signage be displayed at the entrance to the development precinct that is both informative and dynamic in the sense that it can amended on a daily basis to reflect the potential bush fire risk and the potential for short notice evacuations. The sign should also clearly show on a map of the site the location of the designated 'place of safe refuge' at which to assemble in a bush fire (or other) emergency event and which can also indicate the likelihood of an evacuation for the site. The sign needs to be dynamic and able to be updated daily, particularly during the recognised bush fire season with the level of risk to match that of the surrounding areas.

APPENDIX A. – ASSET REGISTER

Asset type	Asset Sub-Type	Description	Likelihood	Consequences	Risk	Priority	Treatment
Buildings	Dwelling	Primary dwelling	Possible	High	Major	1	Maintain asset protection zones & construction standards
Buildings	Entertain/ Dining building	Cooking and food preparation, dining, social, toilets	Possible	High	Major	1	Maintain asset protection zones & construction standards
Buildings	Farm-stay cabins	Five habitable accommodation cabins	Possible	High	Major	1	Maintain asset protection zones & construction standards
Buildings	Farm shed	Machinery & processing shed	Possible	High	Major	1	Maintain asset protection zones & construction standards
Buildings	Pump sheds	Pump equipment and transfer systems	Possible	High	Major	1	Maintain asset protection zones
Services	Water tanks	Water supply, firefighting, ancillary uses	Possible	High	Major	1	Maintain asset protection zones
Shelters	Sheds	Animal housings	Possible	Medium	Moderate	2	Maintain asset protection zones & construction standards

PRIORITY INDEX		
High	Medium	Low
1	2	3

Table of Contents – Emergency Management Plan

1.0 Introduction

The purpose of a Bush Fire Emergency Management Plan (BEMP) is to raise the awareness, preparedness and safe operating procedures for the owners, operators and visitors to potentially vulnerable facilities or locations to adequately manage the safe evacuation or protection of property and assets at risk from a bush fire event. The BEMP documents the evacuation protocols and recovery strategies specific to the entity and should be made known and practiced by all persons having responsibility for or participation in the operation of the facility. The nature of an evacuation is generally one of two types; planned (ample notice) or emergency (extremely short notice), and both types of evacuation have vastly different processes and responses.

Whilst the protection of life and minimisation of damage to important buildings and infrastructure is the paramount consideration of any emergency management plan, the recovery process after a major disruptive event is also a critical factor in the healing and re-establishment phases. Timely coordination of the recovery process is an important part of an emergency aftermath, empowering effected individuals and communities with the decision making tools to progress back to a life of normality as quick as practically possible.

This BEMP is prepared for the owners of a farm-stay accommodation and intensive horticulture development located at 440 Mulhollands Road, Thirlmere. A Bush Fire Risk Management Plan (BRMP) has been prepared for the development and it has been identified that the property is at risk from two probable sources of bush fire;

1) the first being a general wildfire event that would sweep across the ranges and valleys from the western and southwestern aspects and ignite surrounding forest, woodland and grassland vegetation throughout the property and surrounding areas that in turn could migrate toward the development precincts

2) the second form of bush fire event is from accidental ignition such as lightning strikes, exhaust backfire from a vehicle, or from intentional arson that would ignite the vegetation that surrounds the property and travel swiftly toward the habitable areas of the site.

In the event of a bush fire as described in the first example it is assumed that there would ample notice for a 'planned' and methodical evacuation from the property, however in the second scenario the chances of a full evacuation may be less likely and therefore localised contingencies must be available. This BEMP will seek to identify and document the internal arrangements for the owners of the development in the event of both planned and emergency evacuation situations and coordinate these arrangements with the local brigade of the NSW Rural Fire Service, the NSW Police, the State Emergency Services and localised support agencies. It is recognised that whilst these measures are specifically targeting the event of a bush fire, the same protocols can be applied equally to other forms of emergency that might arise and threaten visitors to the development site and therefore the principles and recommendations herewith can be used in conjunction with other internal management strategies and responsibilities.

The Bush Fire Emergency Management Plan actions are described in detail in the following sections and supported by a summary document in the form of 'quick reference' plan at the end of the report that follows the general procedure recommended by the NSW Rural Fire Service. The 'quick reference' summary plan has been created to be specific to the needs of the site in the event that evacuations are considered necessary due to an imminent risk. The plan is dynamic in its existence in that the demographics of the visiting community and the site can change on a regular basis and therefore it needs to be regularly upgraded.

1.1 Aims and Objectives.

The principle aim of this BEMP is to identify the potential risks to visitors of the site from bush fire events and to document the protocols and procedures to combat emergency situations from such events. There are two possible likelihoods with respect to a bush fire event; small events that are considered manageable and defendable within the capacity of owners of the site, and larger events where the risk is considered too great that evacuation is the only course of action. The owners of the development are responsible for all management actions and activities within the facility, and either directly or through delegation will determine the appropriate responses based on the nature and potential risk of a bush fire event in which case this BEMP is considered a tool to assist with the decision making process and appropriate course of action.

1.2 Background and demographics.

The property owner has undertaken a program of horticultural developments and building improvements on the site to establish a viable horticultural enterprise as the principle use of the land, and a tourism facility as an ancillary land use. The primary focus of the operations is the large-scale propagation of lavender for the extraction of the essential oils that complements other business interest in the cosmetic and aroma-therapy industries in which the property owner operates.

Lavender (*Lavandula angustifolia*) is harvested manually from the plot of approximately 5,000 plants and then steam distilled in rooms on the northern end of a machinery shed to extract the oil component, with the current plant numbers anticipated to yield approximately 4 to 5 litres of oil per harvest. The harvested oil is then used in the production and value-adding of cosmetic and aroma-therapy products, with some of the product on display in the entertainment and dining building and available for purchase by visitors to the site.

The outlying areas of the site are set to a range of animal and bird holdings that provide additional attractions and inter-actions for visitors, with the tourism concept essentially being targeted to visitors from China that don't necessarily get to experience the hands-on experience of a working property in their normal day-to-day lives.

The tourism aspect of the development is supported by an established entertainment and dining building located to the east of the main dwelling, and five separate cabins (four 1-bedroom units and a single 2-bedroom unit) located to the northeast of the dwelling that can be hired for short-term accommodation, each being self-contained with bathrooms and kitchenettes. It is understood that the entertainment and dining building has been approved by Council, however the short-term accommodation buildings, and certain parts of the machinery shed that have sinks and cleaning facilities associated with the harvesting and lavender oil extraction operations have not been formally approved.

The site offers visitors the opportunity to visit for day activities on the farm and for a small number of people accommodation in one of four single bed or one double-bed short-stay cabins located within the main development precinct. Activities on the site include a hands-on participation in the day-to-day activities of a typical horticultural enterprise – including the harvesting of lavender and the processing of extracting essential oils at suitable times of the year, viewing bird and animal life, and feeding a range of small grazing and farm animals held in the outlying paddock areas.

The tourism component is designed to cater for a potential small number of 'drive-by' visitors on a weekday basis, and with notice the occasional bus load of tourists on weekends. The larger bus load visitations are normally comprised of travelling groups from overseas and are catered for with meals and a range of indoor and outdoor scheduled activities.

The development property which is privately owned and is operating intensive horticultural activities as the main business enterprise. The site is tended by farmers and labourers that take care of the day-today horticultural activities, as well all routine yard and landscape maintenance on the property outside of specialised services.

The operation of the farm-stay tourism facility is an ancillary activity to the main horticultural enterprises and is limited to no more than 36 visitors at any single time which aligns with the capacity of the site to manage effluent. The numbers would be spread between 6 beds within the farm-stay cabins, and the remainder as day visitors on scheduled bus trips.

Whilst the farm-stay and tourism facility will essentially be available to operate all year round it is anticipated that the peak operating times will be principally through the warmer spring and summer months, and mostly over the weekend and holiday periods. Visitors to the site are expected to be representative of a diverse group of people ranging from families looking for an easily accessible location outside the city and metropolitan areas to relax for a day, to retirees travelling the countryside in caravans and motorhomes with no specific objectives or agendas, however the most likely group will be tourists from overseas on a scheduled trip to experience a hands-on farming experience

The dynamics of the various user group types to the site could potentially comprise a diverse blend of ethnicity, ages, perceptions, physical fitness, personal priorities and individual attributes. Whilst the farm-stay cabins and main development precinct are located close together within the southern portion of the site, the large spread of the attractions over the property means that visitors may be difficult to locate and account for in an emergency situation. The greatest risk from a bush fire event is to account for all persons within an emergency situation as the transient nature of the visitors and their physical movements during their visits to the site may not be closely monitored or recorded.

2.0 Bush Fire Emergency Management Procedures

2.1 Site Warnings

It is recognised that the effectiveness of any emergency management plan can only be successful if all persons that are effected by such a plan are familiar with and understand its contents. In this matter it is considered that the owners of the development will install signage around the property at strategic locations to achieve maximum impact. The signs will display the existing bush fire risk ranging from LOW to CATASTROPHIC – in the exact same style as the roadside signs that are found along the highway corridors and major road networks around the country. Within the same sign or adjacent to the risk rating sign will be the added indication of the likelihood of evacuation ranging from LOW – POSSIBLE – LIKELY and IMMINENT (or wording to similar effect). The signs will be located at the entrance to the development precinct and shall be changed on a regular basis to match the general advice provided by the NSW Rural Fire Service.

In addition to the onsite warning advices it is also proposed that any form of advertising related to stays at the farm-stay and tourism facilities will contain a general pre-warning of the possibility that evacuation from the site may be necessary on short notice in the event of a bush fire or other emergency.

2.2 Bush Fire Emergency Management Plan

It would be very difficult to implement a Bush Fire Emergency Management Plan that could be articulated to all visitors attending the site however it is possible to ensure that the owners and all key persons associated with the development site are fully conversant with the contents of the Bush Fire Emergency Management Plan. Within the Bush Fire Emergency Management Plan the following Items 2.3 to 2.4 will form the majority of emergency management protocols.

2.3 Evacuation Triggers

In the event of a bush fire event that requires a response action, one of two possible outcomes are considered most likely:

1) The bush fire event is localised and can be suppressed using internal resources (and if required - the local brigade of the NSW Rural Fire Service). Such instances may include a fire started from an activity within or external to the property as the result of a genuine accident. In such events the protocol would initially be to 'stay and defend' the fire and to protect the life and welfare of individuals, animals, and the surrounding assets. A quick assessment of the fire and the control measures being employed to control that fire will determine if it is appropriate to initiate evacuation processes on the possibility that the fire may in fact worsen and prevent effective evacuation. If any doubt lingers as to whether or not an evacuation should be commenced, then that doubt alone would be the trigger to commence evacuation as the required travel distance to the nearest recognised 'Neighbourhood Safe Place' at Thirlmere to the southeast will take some time to traverse – particularly during times of reduced visibility.

2) The bush fire event has started off property and was being pushed toward the development site by the prevailing weather conditions rendering the bush fire too large and too dangerous for internal resources to attempt to fight. For a bush fire started in the surrounding ranges there should be ample warning and a planned evacuation from the property would be affected. In the event of evacuation protocols being initiated the accompanying "Bush Fire Emergency Management Plan" chart at the conclusion of this report will become the recognised protocol and reference document.

A third trigger to evacuate or close down the facility is recognised and perhaps may be the most called upon measure of all – 'Extreme' to 'Catastrophic' fire weather conditions. It is proposed that when the Fire Danger rating for the area is listed as 'Extreme' or 'Catastrophic', or when there are general warning advices from the NSW Rural Fire Service public notification system then there will be an automatic evacuation from the property by all visitors present.

It may also be necessary to cancel any forthcoming operating days if the forecasted fire weather conditions for the next few days are expected to deteriorate to the 'Extreme' or 'Catastrophic' levels. This trigger will need to be discussed with the local brigade of the NSW Rural Fire Service as it is recognised that there can be days of 'Extreme' or 'Catastrophic' fire weather conditions where the actual conditions are relatively benign and often this judgement can only be determined by local knowledge of local conditions.

In the event of an evacuation from the development property it will be the responsibility of the owners to ensure that all visitors have left the property by performing a sweep of the surrounding buildings and visitor access areas and that a designated person is responsible for coordinating the collection of personal belongings. It may be necessary in extreme circumstances to enforce emergency evacuation from the site where some personal property is left behind because of the time required to travel the necessary distances to vacate the property.

2.4 Evacuation Procedures

With the possibility of a large number of visitors attending the development property the time required to evacuate those numbers in the worst case scenario will need to be factored into the decision to evacuate, and if so - when. It is important in any emergency evacuation process that sufficient time is allowed to safely remove persons not only from the site but also to a point of safe refuge. In this matter it is recognised that there is no simple formula that will address all possible contingencies that can be applied in all possible situations and therefore a conservative approach should be adopted.

In the absence of a specific protocol for determining safe evacuation times for bush fire events experience and methodologies adopted by the State Emergency Services that is normally used for evacuation in flood affected areas has been used as a guide for this development. In adopting the SES model there are some assumptions that easily apply across both types emergency situations and therefore the method holds some validity and practicality.

The evacuation timeline is expressed as: the Surplus Time = Time Available – Time Required (ST = TA – TR). The Time Available is the time from when it is realised that evacuation is necessary to when the evacuation route is likely to be cut off by fire. The Time Required is the total time that is necessary for a successful evacuation and includes a period of notification (DK (referred to in flood emergency applications as Door Knocking)), Warning Acceptance Factor (WAF), Warning Lag Factor (WLF), Travel Time (TT) and a Traffic Safety Factor (TSF). The Time Required is summarised in the following equation: TR = DK + WAF + WLF + TT + TSF.

In a theoretical assessment of an appropriate evacuation protocol the following assumptions have been made with respect to the above listed formulas and their application to the development. In this theoretical exercise it is assumed that only one group of a few persons is designated the role of notifying the order to evacuate. It has been assumed that the period for notification would be approximately 1 hour which is based on the fact that the majority of visitors will be located in centralised positions around the development precinct and therefore a large group or number of people can be advised at once – however it will still take a minimum amount of time to get around all persons. It is proposed that a siren warning alarm will also be activated which will notify people of the need to evacuate. The warning acceptance factor has been assumed as being 30 minutes which is based on the need to explain the nature of the emergency several times over to a large number of people. The warning lag factor has also been assumed to be 30 minutes which would allow visitors the opportunity to collect personal belongings before physically commencing the evacuation process.

The time to physically leave the site is a function of the route capacity plus or minus any adjustments for localised contingencies. The recommended design rate for vehicles exiting parking facilities onto a public road in Australian Standard "AS 2890.1 – 1993 – Parking Facilities –

Off Street Parking" is 600 vehicles per lane per hour which assumes uniform driving and road conditions such as an urban or rural sealed road formation and dual lanes. For this particular development where the majority of the access and egress route to the village of Thirlmere is a bitumen sealed carriageway the number of 600 vehicles could conservatively be reduced by 50 per cent to 300 vehicles per lane per hour, or 5 vehicles per minute.

The Mulhollands and Oaks Road formations that provides egress back to the village of Thirlmere is wide enough for side-by-side vehicle movements with relative ease. There will effectively be one single lane for traffic evacuating the development property and surrounding area allowing for half of the road formation to be maintained clear for the movement of emergency service personnel and vehicles.

Assuming that any given time there is a maximum of 10 vehicles to be evacuated from the site which would include all visitors and the property owners and based on the above route capacity figures it would take less than 5 minutes for all vehicles to leave the site. The general rule of thumb for the application of the traffic safety factor is that any evacuation that can be undertaken in less than 3 hours will be applied with a safety factor of 1 (hour) and thereafter the safety factor will increase by increments of 0.5 for every additional 1 to 3 hours, for example an evacuation time of 5 hours would have a safety factor of 1.5 and an evacuation time of 8 hours would have a safety factor of 2.

By now adding together the Time Required components to effect a safe evacuation from the facility we can combine the requirements for notification (DK) of 1 hour + a warning acceptance factor (WAF) of 30 minutes + the warning lag factor (WLF) of 30 minutes + a travel time (TT) of 5 minutes + a travel safety factor (TSF) of 1 hour which equates to a total evacuation time of just over 3 hours. This approach and figure is a very conservative value and would allow some scope for flexibility.

It should be noted that in the evacuation process once the evacuees had reached the junction of Mulholland and Oaks Road there is effectively only one route away which is toward the southeast to the village of Thirlmere where the nearest recognised 'Neighbourhood Safe Place' is located.

2.5 Safe Refuge (On Site)

In the event that visitors cannot safely evacuate from the property the entertainment and dining building located in the southeast corner of the property has been identified as a suitable place for safe refuge as it is has a fully enclosed subfloor area supporting a concrete slab, the roof deck is continuous corrugated iron sheeting, and the underside of all eaves are lined with a non-combustible material. Internally the building has a large open floor plan with very few partition walls, and there is ample space to safely house 50 or more people. The entertainment and dining building is an approved structure that at the time of construction was deemed to meet the necessary bush fire construction requirements. The building site is assessed to have a BAL rating of BAL-12.5 and the construction standards generally meet the requirements of AS3959-2018, '*Construction of Building in Bush Fire Prone Areas*' - Section 5.

The entertainment and dining building is surrounded by established lawns and gardens on all aspects for a distance of at least 30 metres which satisfies the minimum distance requirements set out in Table 1.12.2 of the pre-release edition of PBP (2018). The building is located approximately 20 metres from the farm-stay cabins, and the required asset protection zone of 20 metres on all aspects is already established. The terrain under the vegetation for a distance of at least 100 metres to in each direction is less than 10% and the site and surrounds are established on natural surface levels without any modifications. The gentle sloping nature of the development precinct ensures that the asset protection zones can be easily maintained.

The separation distance between adjoining buildings and the managed nature of the vegetation surrounding the entertainment and dining building on all aspects ensures that the radiant heat levels will not exceed 29kW/m². The established rows of conifers on the southern, southwestern and southeastern aspects of the development precinct help to block prevailing winds and provide an element of screening from the neighbouring properties and passing traffic, they also provide a mechanism to filter out ember attack from those respective aspects.

It is an ongoing requirement that the asset protection zones around the entertainment and dining building be maintained for the life of the development as part of the overall bush fire protection measures of the site.

3.0 Recovery arrangements

The recovery arrangements from a post-evacuation bush fire event are to be determined on a needs basis and are to reflect the nature of any damages and/or losses. As appropriate medical attention should be sought immediately for any individuals suffering injury or anxiety as a result of the incident. For all other recovery matters such as losses of personal possessions or building assets claims should be lodged through the appropriate channels and insurance agencies to seek reimbursement.

BUSH FIRE EMERGENCY MANAGEMENT PLAN

This Bush Fire Emergency Management Plan (BEMP) has been prepared for the owners of the farm-stay accommodation and intensive horticulture development located at 440 Mulhollands Road, Thirlmere to undertake emergency evacuation actions in the event of a bush fire event. It is perceived that there are two possible types of evacuation situations associated with the property; planned and emergency, and both require different modes of action and responses. The following information and data sheets are compiled in support of either decision and will assist with the emergency situation.

SITE DETAILS			
Property Identification			
Address	440 Mulhollands Road	Suburb	Thirlmere
Postcode	2572	LGA	Wollondilly Shire Council
Contact Name			
Contact Numbers			
Date of Plan	July 2019	Date of Review	September 2020
Type of Facility	Farm-stay accommodation cabins, intensive horticulture		

PROPERTY & BUILDING DETAILS			
Building Name	**Construction**	**Location**	**Number of Occupants**
Residential dwelling	Brick veneer with tiled roof	Development precinct	5
Entertainment building	Brick veneer with metal roof	Development precinct	Nil but can support up to 50 persons
Accommodation cabins x 5	Timber frame with external metal and/or fibre cement cladding	Development precinct	6 total
Machinery shed	Steel frame with external metal cladding	Farm paddocks	nil
Farm sheds - various	Steel or timber frame with external metal cladding	Farm paddocks	nil

ROLES & RESPONSIBILITIES	
Property Owners	Make the decision to stay and defend or leave (possibly in conjunction with the local brigade of the RFS)

WHEN TO STAY – SHELTER IN PLACE at RESIDENTIAL DWELLINGS
1/. When the bush fire event is localised and able to be suppressed using internal resources
2/. When instructed by the owners or other delegated responsible person
3/. When the risk to life and health is very minimal and the weather conditions are innocuous
4/. When it is too late to safely leave the property due to surrounding bush fire activity and to stay and take refuge would be the safer option
5/. When the location and activates of other visitors of the facility is unknown and no other specific instructions have been issued.

WHEN TO EVACUATE – LEAVE THE PROPERTY
1/. When given specific instructions from the owners or instructed from a member of the NSW Rural Fire Service or NSW Police Department
2/. When there is a visible bush fire event within the boundaries of the property and no one has issued any other advice
3/. Other (to be populated with a specific entry)

DESIGNATED OFF SITE EVACUATION LOCATIONS
Venue 1
Thirlmere Public School - Thirlmere (designated RFS Neighbourhood Safer Place)

EMERGENCY CONTACT NUMBERS		
Entity Name	**Contact Person**	**Phone Number**
440 Mulhollands Road	(To be Completed)	(To be Completed)
NSW Rural Fire Service		000
NSW Police		000
State Emergency Service		000
Hospital		000
Ambulance		000
Other		

SAMPLE ONLY