

BUSHFIRE MANAGEMENT REPORT

FOR THE

EMIRATES LUXURY RESORT,
WOLGAN VALLEY

PREPARED FOR

EMIRATES RESORTS AND HOTELS.



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EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited has prepared a Bushfire Management Report to support the Master Plan for the proposed Emirates Luxury Resort, Wolgan Valley, N.S.W. The site comprises 1,457ha of land in the Upper Wolgan Valley and is legally described as:

- Lots 4, 5, 6A, 7A, 8A, 8B, 9A, 9B 10, 10A, 11, 11B, 12B, 12C, 18, 19, 26, 43 and 46 in DP 751666,
- Lot 1 in DP 726429,
- Lots 4, 5, 13, 14, 15, 16, 17 and 26 in DP 751624,
- Lots 1, 2, and 3 in DP 751634.
- Lot 2 in DP 1007831.

The site is located on Wolgan Road, 35 kilometres north of Lithgow, and 3 kilometres south of Newnes and is located between the Gardens of Stone National Park to the north and south and Wollemi National Park to the east. Wolgan State Forest is located further to the west and Newnes State Forest further to the south.

The site occupies the floor of the Wolgan River Valley, extending to the north, south and west of the confluence of the Wolgan River and Carnes Creek and extends to the east and west of the Wolgan River and Carnes Creek and to the north and south of the western branch of the Wolgan River to the lower slopes of the sandstone escarpments adjoining these aspects. The Wolgan River extends beyond the western and northern boundaries of the site while Carnes Creek extends to the south of the site, forming into a steep sided, narrow valley.

The majority of the site has been cleared and supports a current agricultural land use consisting predominantly of cattle grazing with small areas of cropping. The lower slopes of the surrounding escarpments form the steep foot slopes to the vertical cliff lines that enclose the eastern, southern and north western side of the valley. These slopes, and the higher slopes within the adjoining National Parks, remain vegetated in Low Open Forest vegetation which has been identified as bushfire prone land.

The proposed development is a Tourist Resort comprising forty luxurious Hotel Villas and associated facilities, including a Restaurant, Day Spa and Conference Centre, occupying the central eastern portion of the site adjacent to the Carne Creek corridor. Staff Accommodation is located to the north of Wolgan Road, within the northern portion of the site. A separate Information Centre is located on Wolgan Road at the north western boundary of the site.

Section 100 B (6) (d) of the *Rural Fires Act* defines the proposed development as a “**Special Fire Protection Purpose**”. The site has been identified as bushfire prone land in accordance with Section 146(2) of the *Environmental Planning and Assessment Act*. The mapping of the vegetation within the site as bushfire fire prone and the proposed use of the development as a “**Special Fire Protection Purpose**” triggers Section 91 (1) of the *Environmental Planning & Assessment Act*.

The proposed development is therefore **Integrated Development** under Section 91(1) of the *Environmental Planning & Assessment Act* and requires authorization under Section 100B of the *Rural Fires Act* in respect of bushfire safety for development of land for special fire protection purposes.

Section 100B of the *Rural Fires Act* states the following:

“Bushfire Safety Authorities”

- (1) **The Commissioner may issue a bushfire safety authority for:**
 - (b) **Development of bushfire prone land for a special fire protection purpose.**
- (2) **A bushfire safety authority authorizes development for a purpose referred to in subsection (1) to the extent that it complies with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from the danger that may arise from a bushfire.**

In an undated letter to the Director-General, Department of Infrastructure Planning and Natural Resources, Lew Short, Acting Manager Development Control with the NSW Rural Fire Service advises that;

“the proposed development should meet the requirements of Planning for Bushfire Protection 2001, specifically to the extent that it complies with standards regarding setbacks (for special protection development), provision of water supply, access, supply of services, fuel management on the site, relocation/evacuation planning for the occupants and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from the danger that may arise from a bushfire”.

Mr Short further advises:

“Based on the information that the RFS received in relation to the project, the following general advice in relation to the proposal as at 17th June 2005:

1. Siting of the Development

- a. During the meeting 11 potential sites were identified, no site numbers or plans were provided designating footprints. The RFS has concerns with 4 of the proposed sites and proximity to bush fire hazard.*

2. Access

- a. Access to the site has high potential to be cut during wild fires*
- b. Access to the site will need to comply with BPP Section 4.3.*
- c. The site is isolated in nature. Ground fire fighting resourced may not be able to get to the site in a timely and safe manner.*

3. Supply of Services

- a. Services (water and power) will have to traverse large tracts of bushland. It is likely during bushfire events that these services will be lost. Alternate arrangements will need to be made to ensure power and water is supplied for fire fighting purposes.*
- b. Designated water supply for fire fighting purposes.*
- c. Static water supplies that can be utilized for aerial attack of bushfire.*

4. A central refuge area should be incorporated into the design and relocation/evacuation plans should be developed. Fire wardens will need to be trained on site to control and account for guests, staff and other occupants at the site during bushfire events.

5. Asset Protection Zones shall be in accordance with setbacks required for Special Protection Developments in PBP. Setbacks will depend on proximity to vegetation type and slope.

6. Construction of assets shall be in accordance with Australian Standard 3959 Building in Bushfire Prone Areas.

7. A Plan of Management will need to include fuel management within the development and maintenance of Asset Protection Zones in accordance with PBP.

8. Due to the isolated nature of the proposal, consideration should be given to fire fighting capacity for the site. Discussion regarding this aspect shall include the RFS due to minimum personal protective and equipment standards, training requirements, competency of fire fighters etc.

9. *The property has been utilized in the past as a heli-base for fire fighting operations. Formal arrangements should be entered into with relevant agencies for pre- positioning of resources such as fuel.*

10. *The RFS has concerns that substantial revegetation of the property may increase bushfire risk to the proposed development. Revegetation should be undertaken in such a way that limits the spread and occurrence of fire.*

This Bushfire Management Report provides an assessment of the potential level of bushfire risk to the future development and provides recommendations on the implementation of Asset Protection Zones, the provision of water supplies, building construction standards, access requirements, evacuation, provision of resources and fuel management protocols necessary to mitigate the potential bushfire threat to persons, property and the environment and provides a suite of strategies designed to provide the level of protection commensurate with the future use of the development.

The characteristics of the site as discussed in this report, together with these strategies, provide that the site is suitable in terms of its intended use.

Graham Swain

Director – *Australian Bushfire Protection Planners Pty Limited.*

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SECTION 1

INTRODUCTION

1.1 Development Proposal.

This Bushfire Management Report has been prepared for the Stage 1 (Master Plan) Development Application for the development of a tourist resort comprising forty (40) luxurious hotel villas and associated facilities, including a restaurant, day spa, conference centre and staff accommodation for Emirates Resorts and Hotels.

The development proposal will create four development precincts within the 1,457ha site. Precinct 1 is located on both sides of Carnes Creek, extending south from it's confluence with the Wolgan River. This precinct contains the Main Building, Villa Units, Conference Centre, Spa, the original homestead, access roads, parking areas and ancillary facilities. Precinct 2 is located to the east of the Wolgan River and the main access road, north east of Precinct 1 and contains the Managers' Residence, Fire Station and Helipad.

Precinct 3 is located on the northern side of Wolgan Road, north of the main entry to the site and contains Staff Accommodation, Deliveries and Bulk Maintenance. Precinct 4 is located to the south of Wolgan Road on the western boundary and contains an Information Centre.

Five Fire Management Precincts (FMP) are proposed on the site. Fire Management Precinct 1 includes the Development Precincts and associated Asset Protection Zones; Fire Management Precinct 2 extends to the northwest, west and south of Development Precinct 1 and provides open parkland that extends the fire protection to the buildings within Development Precinct 1. Fire Management Precinct 3 consists of the Riparian Corridors and swamp lands and Fire Management Precinct 4 consists of the Nature Conservancy Precinct within the western portion of the site.

Fire Management Precinct 5 consists of the access corridor to the Resort (Development Precinct 1) from Wolgan Road.

1.2 Aims of this Report.

- To determine the classification of the vegetation on and surrounding the development property in accordance with the vegetation classification system contained in *Planning for Bushfire Protection 2001*.

- Undertake an assessment to determine the slope of the land on and surrounding the Development Precincts.
- Undertake a bushfire risk assessment.
- Determine bushfire protection strategies for the proposed development that address the following matters:
 - (I) The provision of building setbacks (Asset Protection Zones) from vegetated areas and the siting of buildings to minimize the impact of radiant heat and direct flame contact;
 - (II) Fire fighting water supplies;
 - (III) Strategic fuel management to reduce the rate of intensity of a bushfire through the control of fuel levels;
 - (IV) Access requirements;
 - (V) Construction standards to be used for the future buildings within the proposed development to minimize the vulnerability of buildings to ignition from radiation and ember attack;
 - (VI) Provision of fire-fighting resources;
 - (VII) Land management responsibilities;
 - (VIII) Relocation/Evacuation management;
 - (IX) Biodiversity Conservation.

1.3 Statutory Requirements.

This Report has been prepared having regard to the following legislative and planning requirements:

1.3.1 Legislation.

Environmental Planning and Assessment Act (EPA Act)

- Section 91(1) defines special protection developments that are located in a Bushfire Prone Area as integrated development, which requires authorization under Section 100B of the *Rural Fires Act 1997*.

Rural Fires Act 1997 (Amended)

- Section 100B provides for the issue, by the Commissioner of the NSW Rural Fire Service, of Bushfire Safety Authorities for special fire protection developments located within a Bushfire Prone Area.
- Sections 63(1) and 63(2) require public authorities and owners / occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimize the danger of the spread of bushfires.

Rural Fires Regulation 2002.

- Section 46 of the *Rural Fires Regulation* provides details of the matters that are required to be addressed for the issue of a *Bushfire Safety Authority* under Section 100B of the *Rural Fires Act*.

1.3.2 Planning Policies.

- ***Planning for Bushfire Protection – 2001.*** (Rural Fire Service / Planning NSW).

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for residential subdivision and Special Protection Developments in bushfire prone areas.

1.4 Documentation reviewed.

- Survey Plan showing Site Cadastral Boundaries and Contours prepared by Hard & Forester, (Drawing No. 111202004 dated 22.7.2005);
- Plan showing Site Cadastral Boundaries and Photo Overlay prepared by Hard & Forester, (Drawing No. 111202004 dated 28.7.2005);
- Flora & Fauna Assessment prepared by Sydney Museum ;
- Flooding Extents plan prepared by Taylor Thomson Whitting Pty Ltd (Job No. 051349 Drawing No. SKC02 P1 dated 28.7.2005);
- Site Landscape Strategy prepared by Context dated 26.7.2005;
- Lithgow Council Bushfire Prone Land Map;
- Concept Master Plan prepared by Conybeare Morrison International Pty Ltd. dated 4.8.2005;
- *Planning for Bushfire Protection 2001* prepared by the NSW Rural Fire Service/Planning N.S.W;
- *Cullen Bullen 1:25000 Topographic Map*;
- *Ben Bullen 1:25000 Topographic Map*;
- *Lithgow 1:25000 Topographic Map*.

1.5 Site Inspection.

Graham Swain of *Australian Bushfire Protection Planners Pty. Limited* inspected the development property on the 10th July 2005 to assess the topography, slopes, vegetation classification and land use within and adjoining the development site. Visual assessment was undertaken to determine likely fire runs, influence of terrain on wind patterns within the valleys and an assessment of access and egress throughout the valley. Adjoining properties were also inspected to determine the surrounding land use / land management.

SECTION 2

DESCRIPTION OF DEVELOPMENT SITE

2.1 Location.

The development site consists of Lot 4, 5, 6A, 7A, 8A, 8B, 9A, 9B 10, 10A, 11, 11B, 12B, 12C, 18, 19, 26, 43 and 46 in DP 751666; Lot 1 in DP 726429; Lots 4, 5, 13, 14, 15, 16, 17 and 26 in DP 751624; Lots 1, 2 and 3 in DP 751634 and Lot 2 in DP 1007831 Upper Wolgan Valley. The site contains 1,457 hectares of land located on the floor of the Wolgan Valley with the major part of the site occupying the valley to the south of Wolgan Road between Donkey Mountain/Mount Wolgan to the north west, Cape Pinnacle and Wolgan Pinnacle to the south and the cliff line to the east of the Wolgan River and Carnes Creek corridor.

Lot 2 in DP 1007831, Lots 4, 5 and 10 in DP 751666 and Lot 1 in DP 726429 occupy land on the northern end of Donkey Mountain, south of Barton Creek. Wolgan Road severs Lot 2 in DP 1007831, Lots 4 & 5 in DP 751666 and Lot 1 in DP 726429.

2.2 Existing Land Use.

The land is used for agricultural grazing. A farm house and ancillary buildings occupy the eastern portion of Lot 26 in DP 751666, on the south western side of the confluence of the Wolgan River and Carnes Creek. The site contains existing access tracks and dams scattered throughout the grazing paddocks.

2.3 Surrounding Land Use.

Wollemi National Park adjoins the eastern boundary of the site; the Gardens of Stone National Park adjoins the southern boundary of the site, the north western and part of the northern boundary of the site.

Land in private ownership adjoins the western boundary of Lots 6A, 8A, 9A, 10A and 11B and consists of agricultural land use/existing vacant forested areas. Land in private ownership adjoins the northern boundary of Lot 2 in DP 1007831, Lot 1 in DP 726429 and Lot 26 in DP 751624; the western boundary of Lot 2 in DP 1007831 and Lot 5 in DP 751666. This land contains agricultural grazing land.

2.4 Topography.

a) *Within Development Site.*

The majority of the development site is characterized by gently undulating land forming the valley floor to the Wolgan River, Carnes Creek to the south of Wolgan Road and Barton Creek, to the north of Wolgan Road.

Typically, slopes rise above the river/creek corridors at < 5 degrees increasing to form the foot slopes of the surrounding cliff lines.

b) *Beyond the Development Site.*

The topography of the valley consists of the valley floor surrounded by steep foot slopes formed below the cliff lines to the east, south, northwest and north. The slopes on the foot slopes increase to >18 degrees and terminate at the bottom of the vertical cliff lines. The land to the west of the site, within the Wolgan River and Barton Creek corridors, continues to rise gently with the slope of the river/creek to the west.

2.5 Vegetation Communities within the Development Site.

The vegetation within the floor of the valley consists of pasture grasses with scattered shade trees. The vegetation within the un-cleared higher slopes of the site consists of Low Open Forest, some of which has been grazed.

2.6 Vegetation Communities adjoining the Development Site.

Except for the pasture grasses within the adjoining agricultural land, the site is adjoined by Low Open Forest vegetation within the adjacent National Parks or un-cleared private land holdings.

2.7 Significant Environmental Features on the property.

There are no known significant environmental features on the property.

2.8 Known Threatened Species, population or ecological community within the property.

Refer to the Sydney Museum Ecological Study.

2.9 Details and location of Aboriginal relics or Aboriginal place.

An Archaeological Assessment of the property is being undertaken however at the time of compilation of this report the study has not been completed.

SECTION 3

FIRE MANAGEMENT RESPONSIBILITIES

Fire management responsibilities within the proposed Resort are the responsibility of:

3.1 Lithgow Council.

The Lithgow Council has responsibility, under Section 66 of the Rural Fires Act, to issue a notice in writing requiring an owner / occupier of any land within the City to carry out bushfire hazard reduction works on that land. Section 100E of the Rural Fires Act requires Council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

3.2 New South Wales Rural Fire Service (Lithgow District).

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation.

Section 73 of the Rural Fires Act (1997) enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

The proposed development falls under the NSW Rural Fire Service jurisdiction for fire fighting operations.

3.3 New South Wales Fire Brigade.

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of the NSW Fire Brigade.

3.4 Lithgow Bush Fire Management Committee.

The Lithgow Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level.

It is not an operational organisation or a fire fighting organisation. The committee is also not a funding source for fire management activities.

The Bush Fire Management Committee is supported by the Rural Fires Act 1997.

Section 50 of the Act requires the Bush Fire Co-ordinating Committee to constitute a Bush Fire Management Committee for the whole of the area of any local Council area for which a rural fire district is constituted.

Section 51 (1A) requires a Bush Fire Management Committee to report to the Bush Fire Co-ordinating Committee on the implementation of the requirements of the Bushfire Risk Management Plan.

Section 52 requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan. (*Refer to Section 4 of this Report*).

Section 54 of the Act specifies that a draft bush fire risk management plan is to '*set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State*'. A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

3.5 NSW National Parks & Wildlife Service.

The NSW National Parks & Wildlife Service has the responsibility for managing bushfire on its own land. These lands directly adjoin much of the site boundaries; hence it will be important to continue a complementary approach to fuel management and the management of fires within the site, especially along the interface areas.

3.6 Private Land Owners / Occupiers.

The Rural Fires Act, 1997 provides several legislative opportunities to require land owners and occupiers to manage hazardous fuels.

Section 63(2) states that '*it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land*'.

In this section; '*notified steps*' means:

- (a) any steps that a bush fire risk management plan (or the Co-ordinating Committee) advises a person to take
- (b) that are included in a bush fire risk management plan applying to the land.

Section 87 allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding TOBAN days. Section 10 permits are not required to adhere to the *Part V* provisions of the EPA Act 1979 in the assessment of impact, except for public authorities.

An owner / occupier of private land must obtain from the local authority (City of Lithgow Council) a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (Section 100E of the Rural Fires Act 1997).

3.7 Resort Manager.

The Resort Manager is responsible for coordinating/implementation of the following fire management activities within the site:

- Asset Protection Zones within the development precincts;
- Management of Fire Management Precinct 2 to reduce the fuel loads adjacent to the Asset Protection Zones.
- Management of Fire Management Precinct 5 to reduce the fuels loads adjoining the entry corridor to the Resort.
- Strategic fire breaks to adjoining lands;
- Strategic Fire Advantage Zones within the areas of retained vegetation/conservation zone;
- Fire Trails, strategic access roads;

SECTION 4

LITHGOW BUSH FIRE RISK MANAGEMENT PLAN

4.1 Introduction.

The Lithgow Bush Fire Management Committee is constituted under Section 50 of the *Rural Fires Act* and has the statutory responsibility to prepare a plan of operations and a bushfire risk management plan.

Bush Fire Risk Management involves identifying the level of risk posed by bush fires to assets and establishing strategies to protect these assets from the adverse effects of bush fires. The purpose of bush fire risk management is to protect the community and its values from the adverse effects of wildfire. The outcome sought is to achieve better integration of community preparedness and prevention strategies as key elements of bush fire management.

The Bush Fire Risk Management Plan for Lithgow identifies the level of bush fire risk across the City and establishes strategies, which the responsible land managers (including private land owners) will implement to manage the bush fire risks identified.

The strategies established in the Bush Fire Risk Management Plan address the bush fire hazard, the vulnerability of assets to fire, the safety of the community and fire fighters, the protection of the land and environment from fire, and recognise that biodiversity management includes the application of appropriate fire regimes upon the landscape.

4.1.1 Aims and Objectives of the Plan.

The aim of the Lithgow Bush Fire Risk Management Plan is to provide for the co-ordinated prevention and mitigation of bush fires for:

- a) The protection of life, property and the environment within the community; and
- b) The protection, maintenance and wherever possible, the enhancement of the natural and cultural values of the area through the management of appropriate fire regimes.

To give effect to this aim, the committee has developed appropriate risk management objectives and strategies.

The objectives of the Lithgow Bush Fire Risk Management Plan are to:

- reduce the risk of bush fire damage to life, property and the environment;
- ensure that the community is well informed on bush fire protection measures and prepared for bush fire events;
- minimise the risk to the safety of fire fighters and the public by reducing the potential for severe bush fires;
- encourage community participation in managing the bush fire risk;
- reduce the impact of bush fire smoke on the community;
- effectively manage bush fires for the protection and conservation of the natural, cultural, scenic and recreational features of the area.

4.1.2 Bushfire Hazard Management.

Hazard reduction programs aim to reduce the severity of a bush fire, by reducing the amount of fuel (vegetation) available to burn during a bush fire. This makes the bush fire easier to control and reduces the level of bush fire damage to community and environmental / ecological assets. Hazard reduction burning is the most common way to reduce the bush fire hazard, as it is the most cost-effective method available. However, other methods of hazard reduction such as slashing or mowing, ploughing, grazing or hand clearing are used when appropriate.

Hazard reduction must be conducted with due regard to the principles of Ecologically Sustainable Development (ESD). It is important to recognise that situations may arise where the necessary objectives for life and property protection are in conflict with ESD objectives. Wherever possible, solutions which achieve both life/property protection and ESD principles will be sought. However, where both cannot be achieved, protection of life and property shall take priority.

4.1.3 Implementation of the Plan.

Implementation of the BFRMP is the responsibility of the owners or occupiers (land managers) of the land on which the bush fire risk is situated. The Rural Fires Act imposes this responsibility on both public and private land managers (Section 63 (i) & (ii) of the *Rural Fires Act*).

Land management agencies such as the Council/NPWS will need to develop specific programs for implementing the BFRMP strategies applicable to their land. In the case of private property, it is the responsibility of Council to develop a program for communicating the BFRMP strategies to private land managers and ensuring that the land managers implement the strategies.

The success of the plan will be monitored through the Bush Fire Management Committee annual reporting procedures to the Bush Fire Coordinating Committee (Section 51(2A) of the *Rural Fires Act*).

The Resort Management should work with the Lithgow Bushfire Management Committee/NSW Rural Fire Service/NPWS to implement sound and responsible bush fire management over their area of ownership. There shall be a Bushfire Fuel Management Plan prepared for the site which is endorsed by the Lithgow Bushfire Management Committee.

SECTION 5

BUSHFIRE RISK

Risk has two elements: Likelihood, the chances of a bushfire occurring and consequence, the impact of a bushfire when it occurs. Risk reduction can be achieved by reducing the likelihood of a bushfire, the opportunity for a bushfire to spread or the consequence of a bushfire (on natural and built assets). Bushfires will always occur. Bushfire Management should have a clear objective to reduce both the likelihood of bushfires and reduce the negative impacts of bushfires. It should also consider the costs, inconvenience and dangers of measures taken to reduce the risk of bushfires.

Many options are available to reduce the risk of bushfires starting, spreading and causing damage; reducing the unintended negative consequences of options taken to control risk; and the failure to achieve bushfire management programs.

The Australian Standard AS/NZS 4360:2004, and the Emergency Management Australia (EMA) emergency risk management process provide the framework for establishing the context, analysis, evaluation, treatment, monitoring and communication of risk.

Bushfire risk is defined as the chance of a bushfire occurring that will have harmful consequences to human communities and the environment. Bushfire risk is usually assessed through consideration of the likelihood of ignition and consequences of a bushfire occurring. The consequences of bushfire management activities alone and the failure to implement programs also need to be considered. A range of factors influence bushfire risk – these include:

- The likelihood of human and natural fire ignitions, as influenced by time, space and demographics;
- The potential spread and severity of a bushfire, as determined by fuel, topography and weather conditions;
- The proximity of assets vulnerable to bushfire fuels, and likely bushfire paths; and,
- The vulnerability of assets including natural assets, or their capacity to cope with, and recover from bushfire.

SECTION 6

BUSHFIRE RISK ASSESSMENT

The level of Bushfire Risk on a development is determined by undertaking an assessment of Fire History, Ignition/Fire Sources, Weather and the availability of Bushfire Fuels.

6.1 Fire History.

Natural fires have long been part of the landscape within the valley and adjoining areas of National Park. A combination of inherently flammable vegetation, dry summers, periodic drought and lightning and other ignitions have resulted in fires of small and large size, of high and low intensity impacting the native and introduced vegetation within the Wolgan Valley and within the native vegetation on the higher landforms above the valley. Many of the native species are fire-adapted ecosystems with recurrent bushfires having shaped the condition of the existing plant communities.

The Wolgan Valley and surrounding areas of National Parks have a history of severe, damaging bushfires with the whole of the valley being impacted during the 1956 fire season and the northern portion of the valley experiencing bushfires in 2003. The major bushfires that burnt through much of the state during the 1968 and 1994 bushfire seasons impacted the Wollemi, Yengo and Blue Mountains National Parks

Severe fires within the surrounding landscape will burn out large areas of land, travel long distances, threaten buildings, lives and other assets (including Flora & Fauna) and be uncontrollable until the weather moderates. The majority of the area burnt and most damage (including loss of life) occur over a relatively short time. These relatively rare but severe events cause more than 95% of the damage and loss to people, property and assets. Bad or severe fires are not necessarily large scale fires.

Planning to reduce the likelihood and consequence of bushfires in the Resort must take into account the full range from small grass fires to landscape-wide severe fires. It must acknowledge that in severe fire events emergency services are extended beyond their capacity to either suppress the fire or protect all life and property, such as in Sydney in 1994 and Canberra in 2003.

Historically, there are patterns and trends in which fires, especially severe fires that cause significant damage to built and/or natural assets, start and spread.

Consequently there is an identifiable set of characteristics of severe fires, which may support a focus for some fire management efforts. While weather and fuels will vary over time and space depending on climate and management intervention, it is possible to structure the response to fires to account for the major trends in severe fires.

For the purpose of analysing fire risk that might impact the resort, a dangerous and damaging fire has the potential to occur when the following conditions prevail:

- Continuous available fuel – fuel at moisture content sufficiently low to enable rapid combustion, arising from drought effects or the maturing and drying, of combustible fuels.
- Exposure of vulnerable assets. The ‘catchments’ for such fires may be within several hundred metres or many (60-70) kilometres from the asset/s.
- A combination of weather conditions that generate a forest or grass fire danger index of Very High (24) or greater. Typically in the valley, prevailing adverse fire weather will have a strong northerly through to south westerly influence.
- Fire in the landscape not effectively suppressed.

6.2 Ignition / Fire Sources.

Causes of bushfires are natural or human caused. Human causes can be categorised as:

- Malicious – including arson;
- Careless – such as escaped campfires, children and burning off without a permit; and
- Accidental – uncommon, but includes motor vehicle accidents/ignition by farm machinery.

The only natural cause of bushfires is lightning and it is a common occurrence within the valley and the surrounding ridgelines. Lightning ignition, accidental or malicious ignition of forest and grassland vegetation within the areas to the north-west, west and south west of the Wolgan Valley have the potential to ignite the vegetation within the valley by ember attack, causing local fires to ignite and extend throughout the valley as experienced in 1965.

Local fire ignitions within the valley have the potential to develop and extend, in the direction of the prevailing wind, to most areas in the valley and into the adjoining National Park Estate.

6.3 Climate and Weather.

The fire season in the area corresponds with the summer months' high temperatures and low rainfall, and can occur from September to April with a proclaimed bushfire danger period from October to March. There is significant variability from year to year. Fire seasons may be serious in three out of every 15 years, but this can vary considerably.

Bushfire risk management, planning and operations must take into account the likelihood of severe fire weather and the challenges it presents. Extreme and uncontrollable bushfires typically occur when the fire danger rating is over 50, a rating of Extreme.

Many of the major property loss events in NSW have occurred at fire danger ratings over 70, on a scale of 0 to 100. The Very High and Extreme Forest Fire Danger conditions mainly occur between November and March. Among the projected changes in climate, as a result of global warming, is that southern Australia will see greater variability in its climate with hotter and drier droughts are possible.

As the temperatures increase, the Forest Fire Danger indices will also increase, perhaps leading to a trend of larger, more intense fires in the landscape. Climate change remains a complex issue and only one of a range of factors that may be creating an environment conducive to large-scale fires.

6.3.1 Wind.

Wind is also an important factor in bushfire behaviour as it influences the rate of spread of the fire front and spreads burning embers / sparks, providing ignition sources for spot fires to distances up to 35 kilometres ahead of the main fire front.

The shape of the valley and the surrounding land form influences the direction and speed of the prevailing wind and therefore the fire runs within the valley. Strong northwest, west and southwest winds blowing over the higher cliff lines, including Mt. Wolgan and Donkey Mountain, will cause mechanical turbulence for many kilometres in the lee of the valley rim resulting in wind gusts that reach a much higher speed than the ambient wind speed.

Winds can change direction quickly, both in the vertical and horizontal planes and wind shear and turbulence can cause micro bursts of tornado speed winds.

The primary fire run will follow the axis of the valleys; either upslope or downslope, with the dominant gully lines turning the wind / fire runs upslope from the river/creeks. Wind and fire run patterns will also be influenced by the low ridgelines / saddles that are scattered throughout the valley, resulting in an unpredictable wind influence.

6.4 Slope.

Slope is a critically important factor when assessing fire risk and likely fire behaviour. The rate of fire propagation doubles up a slope of 10 degrees (18%) and increases almost fourfold up a slope of 20 degrees (40%).

The rate of progress downslope tends to slow at a corresponding rate however wind direction in the lee of the hills/ridgelines tends to be unpredictable and can cause fires to change direction unpredictably.

The average slope of the Wolgan River/Carnes Creek corridors through the Resort is 3% (<5 degrees) to the northeast, however tributaries and gully lines to the river/creek increase the slopes to each side of the corridor to in excess of 10% (> 5 degrees), with the lower (northern) section of the river exhibiting increased slopes to the gully lines.

Bushfires entering the valley from the north will rapidly spread upslope following the rivers' course, with the gully lines / ridgelines creating changes in wind direction. Fires will increase in speed (rate of spread) up the gully lines.

Bushfires entering the resort from the west/southwest will burn along the Wolgan River towards the northeast. This fire run is downslope along the river corridor however the minimum slope of the valley to the northeast will not slow the speed of the fire.

Ridgelines, such as Mount Wolgan/Donkey Mountain will influence the rate of spread of north-west, west and south westerly wind driven fire events and will "split" the fire runs to create local changes in wind / fire direction / rate of spread.

6.5 Bushfire Fuels.

Fuel is a critical element in bushfire risk management, as it is the one factor relating to fire behaviour that can be managed.

There are three 'types' of fuel that contribute to bushfire hazard. They relate to the distribution and nature of combustible material within a vegetated environment and are defined by the Overall Fuel Hazard Guide – Third Edition (NRE May 1999), as:

- Elevated fuel load
- Surface fine fuels; and
- Bark.

Elevated material is defined as shrubs, heath and suspended material greater than 0.5 metres above ground. The level of bushfire hazard depends on fuel continuity, height, amount of dead material, foliage thickness and flammability of live foliage. Flammability of vegetation is at the highest when composition is fine, it contains a lot of dead material, is dense vertically and horizontally and has low moisture content.

Surface fine fuels are defined as the litter bed and vegetation up to 0.5 metres above the ground. Grasses add to the surface fine fuels and therefore need to be taken into account when assessing the hazard. The risk is higher where greater depth and volume of litter and surface material are present. This tends to occur where management is difficult – steep slopes, rocky surfaces or complex areas.

Bark has the potential to travel significant distances in a fire situation (spotting) and act as a ladder between surface fuels and the forest crown. Bark contributes to fire hazard when it is loose and fibrous, present in large quantities and in long loose ribbon forms.

An overall Fuel Hazard for vegetation within the Wolgan Valley can be based on the combination of these three contributing fuel hazards.

6.6 Assessment of Fuel Hazard.

6.6.1 Open Woodland / Grassland vegetation to the north-west, west and south west of the Resort precinct.

Using the methodology provided within the NRE Overall Fuel Hazard Guide, the following Fuel Hazard observation was determined for the existing vegetation. If the current management practices change with a result of increasing fuel loadings in the valley, the fuel hazard will increase.

- **Bark Hazard :**
The Woodland vegetation includes species which have a limited amount of bark to cause spotting. Therefore this vegetation has a **High Bark Hazard**.
- **Elevated Fuel Hazard :**
Elevated fuel comprises shrub, heath and suspended material. The grazing paddocks do not contain elevated fuels therefore the present Elevated Fuel Hazard is **Low**.
- **Surface Fine Fuel Hazard :**

Surface Fine Fuel Hazard is assessed by measuring litter-bed height. The Surface Fine Fuel in the Open Woodland vegetation in the valley consists predominantly of pasture grass with accumulated leaf litter beneath trees.

The estimated “good season” litter bed height is 15-25mm, however due to the extent of “near-surface fuels” – i.e. grass tussocks, low shrubs or wire grass up to 0.5m high, the Surface Fine Fuel Hazard Rating increases from **High to Very High**.

Assessment of Overall Fuel Hazard.

The Overall Fuel Hazard for the Open Woodland/Grassland vegetation within the valley, during good growing seasons, is **High**.

6.6.2 Low Open Forest Vegetation.

- **Bark Hazard :**
The Low Open Forest vegetation within the uncleared sections of the site and within the adjoining forest vegetated lands (the adjoining National Parks and private land to the west) includes species which have huge amounts of bark available to cause spotting. Therefore this vegetation has an **Extreme Bark Hazard**.
- **Elevated Fuel Hazard :**
Elevated fuel comprises shrub, heath and suspended material. The level of hazard depends on the fuel continuity (horizontal and vertical), height, and proportion of dead material, thickness of the foliage and twigs and flammability of the live foliage.

The flammability of the elevated fuel is highest when:

- The foliage, twigs and other fuel particles are very fine (e.g. maximum thickness 1-2 mm)
- The proportion of dead material is high.
- The fuels are arranged with a high level of density and horizontal and vertical continuity that promotes the spread of flame.
- The live foliage has low live fuel moisture content.

The vegetation type and time lapsed since the most recent fire substantially determines the level of elevated fuel hazard. Site investigation was undertaken to determine the structure of the elevated fuel and an estimated Elevated Fuel Hazard of **Very High** was determined for those areas of Low Open Forest vegetation that may remain unmanaged by hazard reduction burning.

- **Surface Fine Fuel Hazard :**

Surface Fine Fuel Hazard is assessed by measuring litter-bed height.

The Surface Fine Fuel in the Low Open Forest vegetation in the valley consists predominantly of native grasses, low shrubs with accumulated leaf litter. The estimated litter bed height is 35-50mm, however due to the extent of “near-surface fuels” – i.e. grass tussocks, low shrubs up to 0.5m high, the Surface Fine Fuel Hazard Rating increases from **Very High to Extreme**.

Assessment of Overall Fuel Hazard.

The Overall Fuel Hazard for the Low Open Forest vegetation within the valley is **Extreme**.

6.7 Assessment of Bushfire Risk.

Major bushfires have occurred in the Wolgan Valley and surrounding areas in 1956, 1994 and 2003.

The topography and landform of the valley predisposes the valley to impacts of fires burning under northerly, north-westerly, westerly and south-westerly wind influences.

The slope of the valley and the ridgelines/ gullies will influence the spread of fire from the northwest, west and south west and result in sporadic fire runs.

The Overall Fuel Hazard for the unmanaged Low Open Forest vegetation within the valley is **Extreme** and this, coupled with the risk factors of fire history, lightning ignition, weather conditions, terrain and the isolated nature of the valley, there is an **Extreme Risk** of damaging bushfires impacting future development in the valley, unless bushfire mitigation measures are implemented and maintained.

SECTION 7

ISSUES ARISING FROM THE BUSHFIRE RISK ASSESSMENT

The Wolgan Valley forms a “sunken valley” below a deeply eroded plateau formation which terminates in vertical cliff lines that form the eastern, southern, western and north western perimeter of the valley. Vehicular access into the valley is via a narrow, in some parts, single lane road that is cut into the south western cliff line of the valley rim.

This access road traverses extensive areas of bushfire prone Low Open Forest vegetation both on the plateau above the valley, on the cliff line and in the south western portion of the valley floor. Future bushfires occurring in the unmanaged Low Open Forest vegetation within the Wolgan Valley, and within the adjoining National Parks/private land, will generate an extreme level of risk to motorists using Wolgan Road.

The topography and vegetation of the surrounding plateau areas will continue to generate extreme fire events that will either directly impact the valley by causing localized spot fire ignition from flying embers or enveloping the valley in smoke for long periods. Local spot fire ignitions from remote fires (up to >30 kilometres from the valley rim), lightning strike ignitions, arson, or accidental ignitions within the valley, will be driven by hot, dry north, north westerly, westerly and south westerly winds to impact the vegetation/development on the valley floor.

Local topographic features such as Mount Wolgan and Donkey Mountain and the narrow valleys will introduce wind turbulence and influence the fire behaviour and rate of spread of wild fires throughout the valley.

The risk mitigation strategies provided in Section 8 of this report provide a suite of bushfire protection measures considered necessary to reduce the level of bushfire risk to the guests, staff and visitors to the Wolgan Valley Emirates Resort.

SECTION 8.

BUSHFIRE MANAGEMENT STRATEGIES

Strategies for managing the potential fire risk within the Emirates Resort are as follows:

8.1 Strategy 1 – Provision of Asset Protection Zones.

- ***Development Precinct 1 - Villas, Conference Centre, Main Building, Spa.***

These facilities are located on each side of Carnes Creek, south of the confluence of the Wolgan River and Carnes Creek and are classified as a Special Fire Protection Development under Section 100B (6) of the *Rural Fires Act*. Therefore the Asset Protection Zone widths nominated in Table A2.3 of *Planning for Bushfire Protection 2001* shall apply as a minimum. The Asset Protection Zones to the east of the Main Building and Villas 12 – 20 shall be 60 metres, measured from the edge of the unmanaged Low Open Forest vegetation.

A minimum 200 metre wide Asset Protection Zone shall be provided to the northwest, west and southwest of the Villa precinct on the western side of Carnes Creek. The Resort Precinct shall be managed as an Inner Protection Area.

- ***Development Precinct 2 – Managers Residence, Helipad and Fire Station.***

These facilities are located to the east of the main entry road and are technically not Special Protection Developments however, due to the need to maintain security against major fire events in the valley and the necessity to provide adequate protection against this event, it is recommended that the Asset Protection Zones to these facilities be established to the widths in compliance with Table A2.3 of *Planning for Bushfire Protection 2001*.

The minimum Asset Protection Zone to the east of the buildings in this precinct shall be 60 metres, measured from the edge of the unmanaged Low Open Forest vegetation and 100 metres to the west.

- ***Development Precinct 3 – Staff Accommodation, Workshops/ Maintenance and Deliveries.***

These facilities are located to the north of Wolgan Road, north of the main entry road/Wolgan Road intersection. The northern boundary of this precinct adjoins the southern edge of the Gardens of Stone National Park with open grazing land adjoining the other aspects.

Asset Protection Zones complying with Table A2.2 (Residential Development) shall apply to all aspects of the buildings with a minimum width of 40 metres.

- ***Development Precinct 4 – Information Centre.***

This precinct is located to the south of Wolgan Road on the western boundary entry point to the site. The development within this precinct does not contain accommodation facilities however due to its isolation from the main resort complex, Asset Protection Zones in accordance with Table A2.3 (Special Protection Developments) shall be provided to the building/s.

8.2 Strategy 2 – Provision of Managed Parkland to Development Precinct 1.

A managed parkland shall be provided to the north, northwest, west, southwest and to the south of the Resort precinct. The objective of the managed parkland shall be to provide a fuel managed buffer zone to the perimeter of the designated Asset Protection Zones to Precinct 1 and therefore increase the protection provided to the Resort to ensure a safe refuge during major bushfire events in the valley.

8.3 Strategy 3 – Provision of Managed Access Corridor to Main Entry Road.

The existing grazed corridor from Wolgan Road to the Resort (Precinct 1) and the access road to Precinct 2 shall be fuel managed to provide safe access between the Resort, Precinct 2 and Precinct 3 to allow secure passage of staff/visitors to the safe refuge within the Resort Precinct.

8.4 Strategy 4 – Water Supplies For Fire Fighting Operations.

The Resort will be serviced by a new water supply drawn from the potable water supply located at Baal Bone Point, approximately 6 kilometres to the west of the site. This water supply will be used for providing potable water to the Resort and ancillary facilities; however the supply of water for fire fighting operations, particularly bushfire fighting operations, can not be guaranteed during periods of peak demand. Therefore, an 850,000 litre static water supply storage tank is being provided to supply the internal building sprinkler system and a hydrant system throughout the Development Precincts 1-3. A hydrant supply point is also being provided adjacent to the Helipad for the filling of Bambi Buckets for aerial water bombing operations.

8.5 Strategy 5 – Access Provisions.

Property access roads and fire trails shall comply with the specifications of Section 4.3.2 of *Planning for Bushfire Protection 2001*. Specifically, these roads shall be constructed to address the following:

- A minimum trafficable width of 4 metres with an additional 1 metre to each side which is kept clear of bushes and grasses with a minimum vertical separation of 6 metres to overhanging branches/obstructions;
- Passing bays shall be provided at approximately 200 metre intervals, at curves and at road junctions. Passing bays shall be 20 metres long x seven metres wide (including the width of the access road);
- The carrying capacity of the road surfaces and bridges shall be sufficient to carry a fully laden fire fighting vehicle. (Category 1 Rural Fire Service Tanker - 14 tonnes GVM , Bulk Water Tanker – 28 tonnes;
- Curves shall have a minimum inner radius of 6 metres with an outer radius of 12 metres;
- Maximum grades should not exceed 15 degrees (preferably not more than 10 degrees);
- Access roads and fire trails shall be clearly signposted indicating the location of the safe assembly area/s in the Resort Precinct;
- Bridges shall be sign posted to indicate load rating;
- Access roads and fire trails, where possible, shall be designed to provide for alternate means of egress;
- The access road network to the Resort Precinct shall provide a loop road network for fire operational access;
- Fire trails shall be located to provide fire management/operational access throughout the site and at the interface of the private land with the National Park Estate (where practicable).

8.6 Strategy Six – Building Construction Standards (Design & Materials).

Part 2.3.4 of the Building Code of Australia states that a Class 1 building that is constructed in a *designated bushfire prone area* must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes. Part GF5.1 states that a Class 2 or 3 building constructed in a *designated bushfire prone area* is to provide a resistance to bushfires in order to reduce the danger to life and minimize the risk of the loss of the building.

Australian Standard A.S. 3959 -1999 is the enabling standard that addresses the performance requirements of both Parts 2.3.4 and Part GF5.1 of the Building Code of Australia.

Therefore, the construction of the Class 1, 2 and 3 buildings within the development shall be constructed to comply with the specifications of this Standard. Whilst the Building Code of Australia does not specify performance standards for buildings other than Class 1, 2 and 3 buildings, all Class 6, 9 and 10 buildings constructed on the site shall be constructed to comply with the specifications of Level 1 of Australian Standard A.S. 3959 – 1999.

8.7 Strategy 7 – Fuel (Hazard) Management / Fuel Management Plan.

The management of bushfire fuels within the site is critical to the provision of a safe environment in which to operate the Resort. Five Fuel Management Precincts (FMP) have been provided on the site. The objectives of these precincts are listed below, however a detailed **Fuel Management Plan shall be prepared that addresses the specific management requirements of each precinct.**

- **Fire Management Precinct 1 - Development Precincts.**

Objective:

Minimise bushfire hazard, including the provision of bushfire Asset Protection Zones in accordance with Table A2.2 & A2.3 of *Planning for Bushfire Protection 2001* and management of these zones in accordance with Section 4.2.2 of *Planning for Bushfire Protection 2001*.

- **Fire Management Precinct 2 – Managed Pasture & Parkland.**

Objective:

Manage the Grassland/Woodland vegetation to create a substantial bushfire fuel reduced precinct to the northwest, west, southwest and south of the Resort Development (Precinct 1).

- **Fire Management Precinct 3 – Riparian Corridors.**

Objective:

Minimise bushfire hazard by managing bushfire fuels in accordance with ecological best practice.

- **Fire Management Precinct 4 – Nature Conservancy.**

Objective:

Provide ecologically sustainable strategic fuel management of the conservation area in the western portion of the site to minimize the threat of escape of fire onto adjoining land and to reduce the risk to the flora and fauna asset.

- **Fire Management Precinct 5 – Access Corridor.**

Objective:

Actively fuel manages the bushfire hazard along the ingress/egress corridor to provide a secure route between the Staff Quarters/Maintenance Precinct on the northern side of Wolgan Road and the safe refuge zone at the Resort. To also provide a fuel reduced precinct to the west and northwest of the Managers Accommodation, Fire Station and Helipad.

8.8 Strategy 8 – Evacuation/Emergency Management.

Evacuation of guests, staff and visitors from the site during major fire events within the vegetation, either in the valley or within the adjoining National Parks Estates/private land holdings, will not be supported by the Emergency Services due to the risk of fire over run impacting the egress roads.

An Evacuation Plan shall be prepared to address the relocation of the guests/staff/visitors to a safe refuge zone within the Resort. The Safe Refuge Zone shall be within the Conference Centre and this building shall be air-conditioned with a positive pressure system fitted with smoke filters to the fresh air intake. The auxiliary power supply to the development shall be capable of providing electric power to this building, including the air-conditioning system.

The valley experiences prolonged periods of smoke impact during fire events within the vegetation in the valley and on the plateau above the valley. Therefore, the Evacuation Plan shall also address the need for Medical Evacuation by Helicopter, or road ambulance, during these prolonged periods of bushfire smoke impact and for other medical emergencies.

A copy of the Evacuation Plan shall be supplied to the Local Emergency Management Committee and the local Emergency Services.

8.9 Strategy 9 - Fire Fighting Resources.

The isolated location of the Resort presents difficulties in the provision of emergency fire fighting resources to rapidly handle bushfire and structural fire emergencies on the site. During major bushfire events the risk to emergency crews responding from areas outside the valley may be such that no immediate response can be provided. Therefore, a fully equipped two bay Fire Station shall be provided, within Development Precinct 2.

Equipment shall include:

- One Category 1 Rural Fire Service Tanker, fully equipped;
- One Category 7 Rural Fire Service Tanker, fully equipped;
- Personal Protective Equipment including Positive Pressure Breathing Apparatus and structural fire fighting clothing;
- Radios including hand held portable radios.

The station and vehicles should be equipped with a Rural Fire Service Radio network that broadcasts throughout the Wolgan Valley. A repeater station will be required on the 'rim' of the valley to link the station radio to the Rural Fire Service Network.

The Emirates Brigade, and its members, shall function as part of the N.S.W. Rural Fire Service brigade structure with operational command and training being provided by the Rural Fire Service. Operating costs, including wages of the Emirates employees providing the staffing of the brigade, shall be borne by the Resort Management.

Operational staffing of the vehicles will be in accordance with the Rural Fire Service protocols.

8.10 Strategy 10 – Helicopter Support Facilities.

Fire fighting operations within the valley rely heavily on the provision of aerial support using National Park & Wildlife Service and private Helicopters. To enable these operations to continue, fuel reserves should be stored in a bunded weather proof area adjacent to the Helipad.

Flight paths to the Helipad and water storage dams shall not be impeded by new tree planting.

8.11 Strategy 11 – Liaison with National Parks & Wildlife Service for Joint Fire Management/Fire Operations.

A Memorandum of Understanding (MOU) shall be established between the Resort Management and the National Parks & Wildlife Service, which establishes the protocols necessary to address joint fuel management of vegetation on the common boundaries to satisfy the requirements of Section 63 of the *Rural Fires Act*. The MOU should also address joint operational response to fire emergencies that are likely to impact either the Resort or the National Park Estate.

8.12 Strategy 12 – Fire Breaks.

The following fire breaks/fire trails shall be provided

- Strategic Fire Breaks shall be provided to the perimeters of the site (where practicable) to provide fuel management and fire operations compartments.
- Fire access trails to Rural Fire Service standards shall be established within the fire breaks.

8.13 Strategy 13 – Strategic Fire Advantage Zones (SFAZ).

- Strategic Fire Advantage Zones (SFAZ) shall be established within the Nature Conservancy Precinct to provide fuel management compartments.

8.14 Strategy 14 – Biodiversity Conservation.

- Fuel management/hazard reduction burning within Nature Conservancy Precinct and the retained vegetation corridors within the site should be planned to minimise the negative impact of fire on biodiversity and the natural ecosystems.
- Fuel management by burning should be implemented in a mosaic pattern to maximise the diversity in vegetation age and structure.
- Unplanned fires should be contained and suppressed as quickly as possible.

8.15 Strategy 15 – Liaison with Local Emergency Services.

The Resort Management shall establish a protocol with the Local Emergency Management Committee (LEMC) and the Lithgow Bushfire Fire Management Committee (LBFMC) to foster cooperative emergency management/fire management within the site.

SECTION 9

CONCLUSION

The isolated nature of the location of the Emirates Luxury Resort within the secluded Wolgan Valley generates concern for the safety of guests/staff and visitors from the risk of potentially damaging bushfires that will occur in the future.

The nature of the landscape, vegetation and the fire weather conditions that prevail for long periods during summer will promulgate severe fire events throughout the surrounding National Parks and vacant land, with the possibility for these events to impact the valley floor.

The risk to the Resort, from the impact of uncontrolled fires, is extreme, however the siting of the facilities; the provision of Asset Protection Zones; the provision of managed parklands adjacent to the Resort Precinct; management of the bushfire fuels; implementation of construction standards to the buildings; provision of fire fighting resources; training of staff and the establishment of an emergency management protocol that addresses evacuation/relocation of guests/staff and visitors mitigates this risk to an acceptable level to ensure the safety of the guests/staff/visitors and emergency service personnel.

The Bushfire Management Strategies provided in Section 8 of this report provide a suite of mitigation measures that reduce the potential risk to the development.

APPENDIX 1

FIGURE ONE

AERIAL PHOTOGRAPH OF SITE

APPENDIX 2

FIGURE 2

CONCEPT MASTER PLAN

APPENDIX 3

FIGURE 3

FIRE MANAGEMENT PRECINCTS