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**UPDATED  
BUSHFIRE HAZARD ASSESSMENT  
AND MITIGATION PLAN**

**ON**

**STAGE 7 OF THE PINEVUE DEVELOPMENT  
OVER LOT 4 SP146972  
GAVEN ARTERIAL ROAD  
MAUDSLAND**

**PREPARED BY**

**BUSHLAND PROTECTION SYSTEMS**

**COMMISSIONED BY**

**ORCHARD (FELLING) DEVELOPMENT P/L**

**DATE: 13<sup>th</sup> April, 2018.**

## 1. Background

A Bushfire Mitigation Plan is designed to identify and minimise the potential bushfire risk to a given property and to help property owners to minimise bushfire risk to themselves, their property and their neighbours, although it will not completely eliminate that risk. Ultimately it is a community responsibility to protect the environmental values, life and property in their area.

This plan is produced in accordance with the Gold Coast City Plan 2016 V3, Part 8, Section 8.2.3 – *Bushfire Hazard Overlay Code* and SC6.3 – *Bushfire Management Plans*, based on the State Planning Policy 7/14, under the Planning Act 2016.

This Updated Bushfire Hazard Assessment and Mitigation Plan is for Stage 7 of the PineVue Development over Lot 4 SP146972, No. 44 Gaven Arterial Road, Maudsland. This plan is based on the following material supplied by Orchard Property Group and the site inspection in April 2017.

- 1.1. A copy of the Plan of Development showing the lot and road layout, drawn by RPS, Plan Ref: 134207-PP-4f, dated 5/4/18, is included as Appendix 1 in this report.

## 2. Land Use.

The subject site is a 3.442Ha rural allotment with road frontage to Gaven Arterial Road. The property slopes down from Gaven Arterial Road to a small gully with a southwest aspect. Beyond the gully the land slopes back up to the west and then down into another gully in the southeast corner of the site. The majority of the site will be cleared for development leaving a retained area of bushland as open space in proposed Lot 905 in the southeast corner.

Lot 905 adjoins a drainage reserve (Lot 903) and more open space to the southeast (Lot 904) and west (Lot 901 SP219426). The open space area currently has grassy eucalypt vegetation and re-growth slash pine. The slash pine is to be removed. The park area provides a slope of up to 25% with a south aspect. The bushland would be assigned a Vegetation Hazard Class (VHC) of 9.2 with associated fuel loads of up to 17.2t/Ha, over a slope of up to 14 degrees with an FFDI of 53, providing for a potential fire line intensity of up to 25,542kw/m equating to a High hazard rating.

To the southeast of proposed Lots 701, 719, 729-731 & 720 is Stage 6 providing a Low hazard rating.

To the northwest is Lot 3 WD6005 which predominantly consists of managed grassland, a small area of bushland over the rear of the lot and a narrow strip running through the lot adjoining the subject site at proposed Lot 708. Lot 3 is also likely to be developed. The narrow strip would be rated a Low hazard under the corridor and patch filtering (CSIRO Report, Section 2.2.1) as well as the managed grassland which also provides a Low/No hazard rating.

The drainage Reserve (Lot 903) is to be a managed area, equivalent to an outer radiation zone, as outlined in Section 6 of this report.

The bushland over the rear of Lot 3 extends approximately 38 metres from the rear boundary and therefore adjoins the rear boundary of proposed Lot 717. The bushland would be assigned a VHC of 9.2 with associated fuel loads of up to 17.2t/Ha, upslope of the lots with an FFDI of 53, providing for a potential fire line intensity of up to 9,721kw/m equating to a Medium hazard rating.

Table 1

POTENTIAL HAZARD CLASS	POTENTIAL FIRELINE INTENSITY
Not Bushfire Prone Area (Low)	<4,000 kw/m
Medium	4,000 to 20,000 kw/m
High	20,000 to 40,000 kw/m
Very High	>40,000 kw/m

The Bushfire Hazard Mapping also incorporates a 100 metre Potential Impact Buffer meaning that any land within 100 metres of a Potential Bushfire Hazard is also assigned the same rating as that bushland and triggers the Bushfire Code if Medium, High or Very High. Whilst having the same distance for all three levels of hazard is not considered a fit for purpose application, it is unfortunately what is legislated at this current time. Therefore Lots 709-727 & 731 would be within the potential impact zone and assigned a hazard rating.

### 3. Road, Driveway & Fire Trail layout.

The proposed road layout is a loop road with access from Stage 6 in a Low PBH rated area, with proposed connectivity to future residential areas to the west. It would be unlikely that access or egress would be denied due to bushfire.

Being a residential development, driveways will be short and direct.

A pedestrian fire trail is to be provided along the southern boundary of proposed Lot 717, within Lot 905. The trail is to have a minimum cleared width of 6 metres and a maximum cross slope of 10%. The fire trail would be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion.

### 4. Appropriate House Site Location.

A two metre wide buffer, managed in accordance with Section 6 of this report, is to be provided on the opposite side of the roadway from proposed Lots 721 & 722, within Lot 905, with a slope no greater than 1:4. This buffer combined with the 14 metre wide road reserve and minimum 4 metre front in-lot setback provides a minimum separation of 20 metres for dwellings on proposed Lots 720-722 from the unmanaged bushland in Lot 905.

The future dwelling on Lot 717 is to have a minimum setback of 10 metres from the southern boundary adjoining Lot 905, a minimum setback of 16 metres from the southwest boundary adjoining Lot 901. This will provide a minimum 16 metre separation from the bushland downslope in the open space areas.

The dwelling on proposed Lot 717 is to have a minimum setback of 10 metres from the northwest boundary adjoining Lot 3 WD6005.

With the stipulated setbacks, buffers and trail provided, dwellings would have a BAL-29 or less construction rating when assessed under AS3959-2009, which is considered to be a tolerable risk level.

## 5. Appropriate Building Construction.

The bushfire provisions of the Building Code of Australia (BCA) are applied to Class 1, 2 & 3 buildings and associated Class 10a buildings, located in designated bushfire prone areas. “Designated bushfire prone area means land which has been designated under a power in legislation as being subject, or likely to be subject, to bushfires” (BCA 1.1.1 Definitions).

The Gold Coast City Plan 2016, section 8.2.3.2(1), states “*Land shown on the bushfire hazard overlay map is designated as the bushfire hazard area (bushfire prone area) for the purposes of Section 12 of the Building Regulation 2006. The Building Act 1975 adopts the requirements of the Building Code of Australia and AS3959 and thus regulates construction standards of all premises identified in bushfire prone areas subsequent to development approval*”.

As Lots 709-727 & 731 have a PBH rating, the Gold Coast City Plan 2016, section 8.2.3.2(1), requires the Building Code of Australia (BCA) and where relevant the Australian Standard for Construction of Buildings in Bushfire-Prone Areas (AS3959) to be addressed.

P2.3.4 of the BCA requires:- “A Class 1 building or a Class 10a building or deck associated with 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.”

Section 3.7.4.0 (Qld variation) of the BCA states:-

- (a) *Subject to (b), Performance Requirement P.2.3.4 is satisfied for—*
  - (i) *a Class 1 building; or*
  - (ii) *a Class 10a building or deck associated with a Class 1 building, located in a designated bushfire prone area if it is constructed in accordance with—*
    - (iii) *AS 3959; or*
    - (iv) *NASH Standard – Steel Framed Construction in Bushfire Areas.*
- (b) *The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300 mm high.*

These levels of construction are reliant on the recommendations of this report being implemented and maintained, particularly in relation to vegetation management.

### 5.1. Lots 701-708 & 728-730

Lots 701-708 & 728-730 have a Low/No hazard rating.

Under the Gold Coast Gold City Plan 2016, section 8.2.3.2(1), a site with a Low PBH rating does not require assessment under the Building Code of Australia or under the Australian Standard (AS3959) for *Construction of Buildings in Bushfire Prone Areas* and therefore no specific level of construction would be required in relation to bushfire.

## **5.2. Lots 709-711, 718, 719, 724-727 & 731**

Dwellings on Lots 709-711, 718, 719, 724-727 & 731 will be within 100 metres of the open space area (Lot 905) with over 35 metres of separation.

In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*', the vegetation class is woodland, distance from unmanaged vegetation is between 35 and 100 metres and slope is 10-15 degrees, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwellings, requiring Sections 3 and 5 of AS3959-2009 to be applied.

## **5.3. Lots 711-714**

Dwellings on Lots 711-714 will be within 100 metres of the open space area (Lot 905) with over 35 metres of separation and within 100 metres of the bushland on Lot 3 with over 19 metres of separation.

For the bushland on Lot 902; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*', the vegetation class is woodland, distance from unmanaged vegetation is between 35 and 100 metres and slope is 10-15 degrees, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwellings.

For the bushland on Lot 3; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*', the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwellings.

Therefore the dwellings are to be constructed to a BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2009 to be applied

## **5.4. Lot 715**

The future dwelling on Lot 715 will be within 100 metres of the open space area (Lot 905) with 35 metres of separation and within 100 metres of the bushland on Lot 3 with over 16 metres of separation.

For the bushland on Lot 905; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*', the vegetation class is woodland, distance from unmanaged vegetation is between 35 and 100 metres and slope is 10-15 degrees, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling.

For the bushland on Lot 3; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland and slope is upslope. The distance between the building and the southwest corner of the lot will determine the standard of construction required.

- If the distance between the southwest corner of the lot and the building is less than 3 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19, requiring Sections 3 & 6 of AS3959-2009 to be applied.
- If the distance between the southwest corner of the lot and the building is 3 metre or more, the Bushfire Attack Level for the proposed dwelling will equate to BAL-12.5, requiring Sections 3 & 5 of AS3959-2009 to be applied.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore the northeast and southeast (front) elevation of the proposed building can be constructed to the next lower Bushfire Attack Level, unless the level is already at BAL-12.5

## 5.5. Lot 716

The future dwelling on Lot 716 will be within 100 metres of the open space area (Lot 905) with a minimum 16 metres of separation and within 100 metres of the bushland on Lot 3 with over 31 metres of separation.

For the bushland on Lot 3; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling.

For the bushland on Lot 905; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 16 and 24 metres and slope is 10-15 degrees, which equates to a BAL-29 Bushfire Attack Level for the proposed dwelling.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore the northeast elevation of the proposed building can be constructed to BAL-19 Bushfire Attack Level, requiring Sections 3 and 6 of AS3959-2009 to be applied, while the remainder of the dwelling must be constructed to a BAL-29, requiring Sections 3 and 7 of AS3959-2009 to be applied.

## 5.6. Lot 717

The future dwelling on Lot 717 will be within 100 metres of the open space areas (Lots 901 & 905) with over 16 metres of separation and within 100 metres of the bushland on Lot 3 with over 10 metres of separation.

For the bushland on Lots 901 & 905; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 16 and 24 metres and slope is 10-15 degrees, which equates to a BAL-29 Bushfire Attack Level for the proposed dwelling.

For the bushland on Lot 3; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland and slope is 10-15 degrees. The distance between the building and the rear lot boundary will determine the standard of construction required.

- If the distance between the rear lot boundary and the building is between 10 - 13 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-29.
- If the distance between the rear lot boundary and the building is between 13 - 19 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*”

Therefore if the dwelling is 10 to 13 metres from the rear boundary then the entire dwelling is to be constructed to a BAL-29 Bushfire Attack Level, requiring Sections 3 & 7 of AS3959-2009 to be applied. If the dwelling is over 13 metres from the rear boundary then the northeast elevation of the proposed building can be constructed to BAL-19 Bushfire Attack Level, requiring Sections 3 and 6 of AS3959-2009 to be applied, while the remainder of the dwelling must be constructed to a BAL-29, requiring Sections 3 and 7 of AS3959-2009 to be applied.

## **5.7. Lot 719**

The future dwelling on Lot 719 will be within 100 metres of the open space area (Lot 905) with over 42 metres of separation.

In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 35 and 100 metres and slope is 10-15 degrees, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwellings, requiring Sections 3 and 5 of AS3959-2009 to be applied.

## **5.8. Lot 720**

The future dwelling on Lot 720 will be within 100 metres of the open space area (Lot 905) with over 21 metres of separation.

In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland and slope is 10-15 degrees. The distance between the building and the southwest corner of the lot will determine the standard of construction required.

- If the distance between the southwest corner of the lot and the building is between 4 - 7 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-29.
- If the distance between the southwest corner of the lot and the building is between 7 - 18 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore the northeast and southeast elevations of the proposed building can be constructed to the next lower Bushfire Attack Level.

### 5.9. Lot 721

The future dwelling on Lot 721 will be within 100 metres of the open space area (Lot 905) with a minimum 20 metres of separation.

In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland and slope is 10-15 degrees. The distance between the building and the southern lot boundary will determine the standard of construction required.

- If the distance between the southern lot boundary and the building is between 4 - 8 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-29.
- If the distance between the southern lot boundary and the building is between 8 - 19 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore the northeast elevation of the proposed buildings can be constructed to the next lower Bushfire Attack Level.

### 5.10. Lot 722

The future dwelling on Lot 722 will be within 100 metres of the open space area (Lot 905) with over 20 metres of separation and within 100 metres of the bushland on Lot 3 with over 19 metres of separation.

For the bushland on Lot 3; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling.



For the bushland on Lot 905; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland and slope is 10-15 degrees. The distance between the building and the southern lot boundary will determine the standard of construction required.

- If the distance between the southern lot boundary and the building is between 4 - 8 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-29.
- If the distance between the southern lot boundary and the building is between 8 - 19 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore:

- If the dwelling is 4 to 8 metres from the southern boundary then the northeast elevation can be constructed to a BAL-19 Bushfire Attack Level, requiring Sections 3 & 6 of AS3959-2009 to be applied, while the remainder of the dwelling must be constructed to a BAL-29, requiring Sections 3 and 7 of AS3959-2009 to be applied.
- If the dwelling is 8-19 metres from the southern boundary then the northeast elevation of the proposed building can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2009 to be applied, while the remainder of the dwelling must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2009 to be applied.

#### **5.11. Lot 723**

The future dwelling on Lot 723 will be within 100 metres of the open space area (Lot 905) with over 28 metres of separation and within 100 metres of the bushland on Lot 3 with over 19 metres of separation.

For the bushland on Lot 905; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 24 and 35 metres and slope is 10-15 degrees, which equates to a BAL-19 Bushfire Attack Level for the proposed dwelling.

For the bushland on Lot 3; In accordance with AS3959-2009 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling.

Section 3.5 of AS3959-2009 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore the east and northwest (front) elevations of the proposed building can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2009 to be applied, while the remainder of the dwelling must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2009 to be applied.

## 6. Appropriate Clearing and Landscaping.

The residential allotments are to be maintained with low ground fuel levels at all times and may include domestic gardens, lawns with grass kept under 100mm in height and scattered trees with discontinuous canopy.

The 2 metre wide buffer area south of Lots 721-722 and the 6 metre wide trail south of Lot 717 is to be managed as predominantly mowed/brush cut grass (kept below 300mm high). Tall Canopy tree species with discontinuous canopy cover may also be permitted in this area.

The drainage reserve (Lot 903) is to be managed so as not to provide a bushfire hazard. This can be achieved by:

- Retention of mature tall canopy trees
- Selective retention of juvenile tall canopy tree species
- Removal of limbs less than 2 metres high on trees over 4 metre tall
- Removal of weed growth
- Mowing/brush cutting of grass, keeping grass under 300mm high, but allowing for reed/rush type vegetation to allow for the function of the detention area.
- Minimise mid-storey vegetation (except the juvenile trees in dot point 2) to prevent ladder fuel structure
- Occasional dis-continuous clumps of evergreen ground covers would be permissible, such as Lomandra, which should be trimmed back prior to the start of fire season (fire season generally starts in July/August).
- Removal of fallen timber
- Restricting leaf litter build-up to 5t/Ha (approx. 10mm deep), allowing for a total of 8t/ha overall fuel load.

All previous or future cleared timber and foliage or accumulated rubbish would need to be removed from the site or mulched and not simply moved aside as this would result in a concentrated area of fuel loading which would increase the PBH from that direction.

Fibrous bark trees, such as melaleuca, swamp mahogany and stringy bark, have a tendency to increase ember attack during a bushfire, due to the fire running up the tree trunk and burning bark breaking off, creating large quantities of airborne burning embers. Ribbon bark tree species (trees that shed their bark in long strips) are also an issue, significantly increasing the potential for spot fires. For this reason tree species with these bark types should not be used as revegetation/rehabilitation/regeneration plantings in Urban interface areas. It is recommended that ground fuels be kept to a minimum around the base of existing trees of this type, to minimise the risk of bushfire running up the tree trunk.

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of rainforest species. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised.

For optimal bushfire safety and best practise, the allotments must have the required vegetation management practices established during operational works and be maintained by the developer with low ground fuel levels until sold. Once sold the purchaser must maintain the allotment at all times, before, during and after construction of the dwelling.

## **7. Provision of Adequate Water Supplies.**

The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres per second at 200kPa.

## **8. Provision of Fire Fighting Infrastructure.**

Dwellings are to have external taps and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil or be of metal above ground. Residents should maintain good access around their homes for fire suppression activities by fire authorities.

## **9. Local Fire Brigades.**

The subject property is currently in the Guanaba Rural Fire Brigade district and they would be responded on a 000 emergency call. If back-up is required for vegetation fire, further units would be engaged by the Gold Coast Rural Fire Brigades Group. Urban fire appliances would be responded in the event of a structural fire or specialised structural protection being required.

## **10. Improved Community Awareness.**

Minimising ground fuel and regrowth is the easiest way of reducing bushfire hazard on rural lots. Owners can assist in the mitigation of these bushfires by the removal of ground fuels prior to the bushfire season.

The Bushland open space is a very sensitive ecosystem and could be altered drastically if not cared for properly. Residents can assist in maintaining this fragile ecosystem by preventing unwanted fires from encroaching into the parkland, ensure that dumping of rubbish does not degrade the area and that exotic plant species do not invade the bushland. Hot fires on a regular basis will degrade the bushland's biodiversity.

It would be recommended that a copy of the fire management plan be placed on display at any sales office, and a copy of the plan including Appendix 2 be given to the purchasers of lots with a direct exposure to the bushland areas to provide them with the necessary information required for the building application process.

A copy of the plan should be retained by residents and passed on to future residents including Appendix 2 on "being prepared" to assist them in minimising the risk of bushfire damage. It is recommended that regular liaison with the local fire brigade takes place as a way of being informed of danger periods.

It would be recommended that residents of Lots 709-727 & 731 prepare a 'Bushfire Survival Plan', which is available from the Rural Fire Service Queensland website at [www.ruralfire.qld.gov.au](http://www.ruralfire.qld.gov.au). The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

## 11. Summary of recommendations.

- A pedestrian fire trail is to be provided along the southeast boundary of proposed Lot 717, within Lot 905. The trail is to have a minimum cleared width of 6 metres and a maximum cross slope of 10%. The fire trail would be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion.
- A two metre wide buffer, managed in accordance with Section 6 of this report, is to be provided on the opposite side of the roadway from proposed Lots 721 & 722, within Lot 905, with a slope no greater than 1:4.
- The future dwelling on Lot 717 is to have a minimum setback of 10 metres from the southern boundary adjoining Lot 905, a minimum setback of 16 metres from the southwest boundary adjoining Lot 901.
- The dwelling on proposed Lot 717 is to have a minimum setback of 10 metres from the northwest boundary adjoining Lot 3 WD6005.
- The residential allotments are to be maintained with low ground fuel levels at all times and may include domestic gardens, lawns with grass kept under 100mm in height and scattered trees with discontinuous canopy.
- The 2 metre wide buffer area south of Lots 721-722 and the 6 metre wide trail south of Lot 717 is to be managed as predominantly mowed/brush cut grass (kept below 300mm high). Tall Canopy tree species with discontinuous canopy cover may also be permitted in this area.
- The drainage reserve (Lot 903) is to be managed so as not to provide a bushfire hazard, as outlined in Section 6 of this report.
- All previous or future cleared timber and foliage or accumulated rubbish would need to be removed from the site or mulched and not simply moved aside as this would result in a concentrated area of fuel loading which would increase the PBH from that direction.
- Fibrous bark trees, such as melaleuca, swamp mahogany and stringy bark, have a tendency to increase ember attack during a bushfire, due to the fire running up the tree trunk and burning bark breaking off, creating large quantities of airborne burning embers. Ribbon bark tree species (trees that shed their bark in long strips) are also an issue, significantly increasing the potential for spot fires. For this

reason tree species with these bark types should not be used as revegetation/rehabilitation/regeneration plantings in Urban interface areas. It is recommended that ground fuels be kept to a minimum around the base of existing trees of this type, to minimise the risk of bushfire running up the tree trunk.

- For optimal bushfire safety and best practise, the allotments must have the required vegetation management practices established during operational works and be maintained by the developer with low ground fuel levels until sold. Once sold the purchaser must maintain the allotment at all times, before, during and after construction of the dwelling.
- The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres per second at 200kPa.
- Dwellings are to have external taps and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil or be of metal above ground. Residents should maintain good access around their homes for fire suppression activities by fire authorities.
- It would be recommended that a copy of the fire management plan be placed on display at any sales office, and a copy of the plan including Appendix 2 be given to the purchasers of lots with a direct exposure to the bushland areas to provide them with the necessary information required for the building application process.
- A copy of the plan should be retained by residents and passed on to future residents including Appendix 2 on “being prepared” to assist them in minimising the risk of bushfire damage. It is recommended that regular liaison with the local fire brigade takes place as a way of being informed of danger periods.
- It would be recommended that residents of Lots 709-727 & 731 prepare a ‘Bushfire Survival Plan’, which is available from the Rural Fire Service Queensland website at [www.ruralfire.qld.gov.au](http://www.ruralfire.qld.gov.au).

## 12. Conclusion.

This Bushfire Hazard Assessment and Mitigation Plan is for Stage 7 of the PineVue Development over Lot 4 SP146972, No. 44 Gaven Arterial Road, Maudsland. It is located in a developing residential area with the predominant bushfire hazard to the south and south west. As further development takes place in the area the bushfire hazard will continue to reduce.

With the appropriate maintenance of fuel levels around the development, adequate water supply, good access provisions and minimising ground fuels, the risk of bushfire damage can be managed and improve the safety of residents and fire services in attending to a bushfire threat.

This plan should remain current for a period of 5 years, until 2023, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bush fire event affecting the subject site should also trigger a review in order to determine effectiveness of protection measures and annual hazard reduction initiatives.

Ultimately, persons living in a bushfire prone area must take the precautions necessary to protect themselves, their families and their homes if Brigades are stretched and are unable to attend immediately.

If you require any further assistance please do not hesitate to contact this office.



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C. L. Bain  
Principal Consultant.



LOCALITY



Development Summary

SITE AREA : 3.442 ha [Deed]  
NUMBER OF LOTS : 31  
TOTAL LENGTH OF ROAD : 624m

IMPORTANT NOTE

This plan was prepared as a concept plan only and accuracy of all aspects of the plan have not been verified. No reliance should be placed on the plan and RPS Australia East Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person who may use or rely on this plan.

CLIENT  
ORCHARD DEVELOPMENT P/L

Level Datum	AHD	Date	5 APRIL 2018
Level Origin	LIDAR	Surveyed	RPS GC
		Drafted	BJB
Local Authority		Data Origin	CS[CCAD]
GOLD COAST CITY			134207-Bdy-2018-04-05

PLAN  
PROPOSED SUBDIVISION

Lots 701-731 and Park Lots 905 & 906  
cancelling Lot 4 on SP146972  
Felling Drive, MAUDSLAND

SCALE: 1:1000 (A3)



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Sheet  
1 of 1

## APPENDIX 2

### Being Prepared

Knowing how to prepare your property for bush fire, both pre-fire and during a fire, can assist in protecting people and property. It can also alleviate a lot of the stress and panic and the feeling of helplessness that is commonly felt by the inexperienced and by the ill-prepared.

It is generally accepted that South East Queensland does not experience the same degree of extreme fire conditions as the southern states of New South Wales, Victoria and South Australia. Having said this it is also accepted that this State's bushland experiences a relatively regular fire regime. From time to time conditions may occur that will institute a serious and potentially destructive fire. These conditions can be recognised and precautions taken. It must be remembered that during extreme fire conditions the fire services may be stretched to the limit and may not be able to respond immediately to your particular emergency. Fire trucks and fire fighters are a limited resource so it is important that they are deployed in an appropriate manner to best manage the fire. The Queensland Fire and Rescue Service do not guarantee a fire truck will be available to defend every structure during a large bushfire. So it would be desirable to be as prepared and self-reliant as possible to protect yourself, your family and your assets. It is not difficult if appropriate preparation is undertaken and the following information is provided to be of some assistance.

#### 1. Conditions that may lead to a Serious Fire:

- 1.1. Higher than average air temperatures for prolonged periods.
- 1.2. Large and very dry fuel loads.
- 1.3. Prolonged dry spell with little or no rain resulting in low soil moisture content.
- 1.4. Very low relative humidity, ie. there is very little moisture in the air.
- 1.5. Strong and gusty winds, usually from the north through to the west contribute to increased fire hazard. The longer these winds continue the drier the conditions become, and the higher the risk of serious fire.

Observation of local weather conditions past and present will give the best indication of the potential intensity of a fire at any given time or place.

Notification of potential bushfire conditions are available from the Queensland Rural Fire Service and Local Brigades, in the form of Fire Danger Ratings often seen on roadside signs, Advice Messages, Watch and Act Messages and Emergency Warnings. More information on these information sources, where to find them and what they mean, is available on the Rural Fire Service Website [www.ruralfire.qld.gov.au](http://www.ruralfire.qld.gov.au) or through the local Fire Brigade.



## **2. Basic Fire Behaviour.**

Having some idea of what a fire is likely to do in your local area, will help you make the right decisions and give you the confidence to deal with an approaching fire if necessary. Following are some basic fire behaviours.

- 2.1. Fire will travel faster and hotter uphill. The steeper the slope the faster the rate of spread, in some cases allowing little time to react. The speed of a fire will double for every 10 degrees of upslope.
- 2.2. Fire will usually travel relatively slower down hill even with reasonably high fuel loads, which will give more time to prepare. The speed of a fire will halve for every 10 degrees of down slope.
- 2.3. A fire will generally travel faster and at higher intensities with a wind behind it. The stronger the wind, the faster the rate of spread. Likewise a fire will slow considerably when burning against the wind in some cases it may even go out.
- 2.4. The fire will usually burn at a higher intensity and spread faster during the hottest times of the day and tend to slow down considerably as the evening approaches and air temperatures drop.
- 2.5. The greater the supply of dry ground fuel available to the fire, ie. grass, dry leaf litter, hanging bark and twigs, the greater the intensity of the fire. If the ground fuel is minimised the intensity of the fire reduces considerably and so does the personal risk and the potential for damage.
- 2.6. If ground fuels are kept relatively low the chances of a fire progressing into the treetops (crown fire) would be considerably reduced within the Queensland coastal bushlands. For a fire to progress into the tree tops ground fuels and elevated fuels must be present providing a 'ladder' of fuels from ground level to tree top. Control of these fuels is the best way of minimising fire intensity and therefore limiting the destructiveness of a bushfire.

Talk to neighbours that have been present during previous bushfires or consult the local Fire Brigade to develop an understanding of usual fire behaviour for your specific location.

## **3. Preparing for the bushfire season.**

Most cases of damage to property are caused by radiated heat, direct flame contact or most commonly by burning debris or sparks landing in, on, or around buildings and starting small spot fires which if not attended to may destroy the property long after a fire front has passed. There are many steps that should be taken prior to the onset of a fire season to help protect your property.

- 3.1. Keep ground fuel cleared from around buildings such as long dry grass, branches, dead leaves, bark and thick undergrowth.
- 3.2. Remove elevated fuels, such as hanging bark and fallen debris hung up on lower branches.

- 3.3. Ensure fire breaks/trails/buffers are checked and maintained, even a well-watered lawn can be an effective firebreak.
- 3.4. Flammable material around buildings should be kept well clear, such as firewood piles, rubbish, fuels, hazardous materials, plant pots, boxes, paper, patio and garden furniture.
- 3.5. Ensure flammable materials are not stored in open areas under the building.
- 3.6. Make sure that rainwater gutters are kept clear of leaf litter build-up. Consider a method of blocking off down pipes so gutters can be filled with water during a fire to extinguish sparks landing in gutters. There are commercially made products available or you can create your own.
- 3.7. Make sure that the roofing is well secured, as winds created during a fire may lift roofing and allow the entry of burning embers into the roof space. Also clear any leaf litter or debris build-up from roof areas.
- 3.8. All windows and vents should be screened with fine wire mesh and all roof areas closed in to prevent entry by sparks.
- 3.9. Ensure gas tanks have their emergency relief valves facing away from the building (this includes barbeque bottles).
- 3.10. Make sure of reserve water supplies. Power frequently fails during a fire. If petrol or diesel pumps are available make sure they and associated hoses and fittings are in good working order.
- 3.11. Ensure your bushfire survival kit is up to date and complete.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to fire season and what to do during a bushfire event. This information can be found at [www.ruralfire.qld.gov.au](http://www.ruralfire.qld.gov.au) or obtained from your local fire brigade.

#### **4. Green Fire Breaks**

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of tropical rainforest species. Excess rainwater or tertiary treated waste water could be stored and used for this purpose during dry periods to maintain the green fire breaks. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised.

#### **5. Personal Protection**

- 5.1. If you plan to evacuate, make sure you do so early, long before the fire front arrives. Evacuating at the very last moment results in the majority of deaths at bushfires. People remaining to fight the fire need to be physically and mentally fit to do so.

5.2. Those staying to protect the property should make sure they protect themselves from radiant heat, flying embers, smoke and most importantly heat stress.

Protection measures should include the following:

- Long trousers and long sleeve shirt made of wool, denim or cotton (no synthetics)
- Woollen socks and sturdy work boots for foot protection
- Goggles for eye protection
- A good pair of work gloves to protect hands from burns
- A smoke mask or a damp cloth (non-synthetic), to cover your nose and mouth to protect you from inhaling smoke and embers.
- Have plenty of drinking water available to protect against dehydration (not refrigerated as this can cause cramping).

5.3. During the fire

When a fire is approaching and given that you have already carried out your pre-fire precautions, established adequate buffers, implemented mitigation measures and established the degree of risk to your property, protection from the actual fire should be relatively straight forward.

5.3.1. Dress in the appropriate clothing and be sure to drink water regularly.

5.3.2. Fill up bathtubs, sinks, buckets, laundry tubs etc. in case of blackouts.

5.3.3. Close doors and windows.

5.3.4. Close gaps under doors and windows with wet towels.

5.3.5. Block up down pipes, wet down roof, walls and gardens, paying particular attention to the side the fire is approaching from.

5.3.6. Have a battery-powered radio on hand to listen for information about the fire's progress from local radio stations.

5.3.7. Patrol your property while the fire is approaching and take shelter inside as the fire front passes. Then continue patrolling the property for many hours after it has passed, to ensure that any spot fires or smouldering debris do not get a chance to develop into a major fire, paying particular attention to the roof cavity of your buildings. Smouldering embers have been known to start fires hours or even days after the initial passing of the bushfire front.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to the arrival of a bushfire and what to do during a bushfire event. This information can be found at [www.ruralfire.qld.gov.au](http://www.ruralfire.qld.gov.au) or obtained from your local fire brigade.

## 6. Further Information?

The local fire brigade is a good source of local district knowledge, they also have pamphlets and literature produced by the Queensland Fire and Rescue Service available. Most brigades will also be happy to advise local residents.

The information provided above is only a basic guide. Further and more details information is available from the Queensland Fire and Rescue Service. It would be recommended that residents in bushfire prone areas prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at [www.ruralfire.qld.gov.au](http://www.ruralfire.qld.gov.au). The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.



## **Bushland Protection Systems**

Specialising in  
**BUSHFIRE HAZARD  
PLANNING & MITIGATION**

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Fire is a part of nature. Its effects can be catastrophic and fire can never be totally eliminated, however there are steps that can be taken to reduce the chances of uncontrolled fires occurring and the risk to life, property and the environment, in the event of uncontrolled fires. This is what we concentrate on, how the threats from bushfire can be minimised. There are many methods to do so, however deciding which method/s is best to use can be a complex decision to make. There are so many factors to consider such as ecological values, biodiversity, fire history, availability of resources, cost effectiveness and public awareness just to name a few. No guarantees can ever be given when dealing with Mother Nature, with ever increasing complexities it has now become a specialist field to be able to create plans to try and minimise the risk from bushfire. Ultimately it is a community responsibility to protect the environmental values, life and property in their area

### **COMPANY PROFILE**

Bushland Protection Systems Pty Ltd (BPS) is a leading Bushfire Management Consultancy firm in Queensland, with many clients, ranging from private landowners to multi-national companies and government bodies.

BPS consultants began operating as Bushfire Management Consultants with the introduction of the Gold Coast Bushfire Management Strategy in 1998 and spread their operations across the state with the implementation in 2003 of the State Planning Policy for mitigating the adverse impacts of flood, bushfire and landslide.

During that time over 3000 projects have been successfully completed, including large residential estates such as Coomera Waters, Spring Mountain, Pacific Pines, Coomera Springs, Observatory, Highland Reserve, Delfin Woodlands & Yarrabilba as well as commercial or Government project sites such as Paradise Country, Wacol Police Academy, Numinbah Correctional Facility, Silkwood Steiner School, Canon Hill Community Links Project & Griffith University. Clyde Bain, the Principal Consultant, is also one of the two most highly sought after expert witnesses for Land and Environment Court Appeals, in Queensland, having worked as the Bushfire Expert for several Regional and City Councils throughout the state on a number of various projects before the Land and Environment Court.

With a strong background in bush fire fighting and involvement with numerous industry bodies, Bushland Protection Systems continues to deliver realistic and cost effective advice, solutions to provide higher levels of safety for the community, improve wildfire suppression and mitigation options for emergency services and land managers, while maintaining and improving environmental values for the future. All our Consultants are members of the Rural Fire Association of Queensland.