

BUSHFIRE PROTECTION ASSESSMENT

FOR THE PROPOSED

**OAKDALE INDUSTRIAL ESTATE - WEST
ON**

LOT 11 in DP 1178389

KEMPS CREEK

FOR

GOODMAN PROPERTY SERVICES (AUST) PTY LTD

September 2016.



Australian Bushfire Protection Planners Pty Limited

ACN 083 085 474

32 Old Dog Trap Road

SOMERSBY 2250 NSW

Phone: (02) 43622112 Fax: (02) 43622204

Email: abpp@bigpond.net.au

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Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B152559 - 2	Final	30.2.2016	13.9.2016	<i>G.L. Swain</i>

EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited, at the request of *Goodman Property Services (Aust) Pty Ltd*, has undertaken the bushfire consultancy to inform the State Significant Development Application [SSDA] for the staged development of the Oakdale West Estate [OWE] on the bushfire protection measures required for the development of the proposed Oakdale West Estate [OWE] on Lot 11 in DP 1178389 Kemps Creek, here-in known as the 'development site'.

The proposed OWE development aims to integrate with the broader Oakdale Estate to create a high quality warehouse and logistics estate which maximises the employment generating potential of the land to create an efficient, attractive and high quality employment zone for Western Sydney.

To this end, the core objectives of the OWE proposal are to:

- Secure developable areas and high level development controls to provide certainty and minimise risk in the future development of the site;
- Resolve uncertainties in the location and alignment of key road infrastructure to allow for more timely delivery;
- Allow for the staged development of the site over time in line with infrastructure delivery and market demand;
- Facilitate earthworks and infrastructure/services development on the land concurrently with the delivery of regional road infrastructure; and
- Secure approval for the first stage of development within the site to allow for a timely response to enquiry as infrastructure issues are resolved.

The SSDA for OWE incorporates:

- ❖ A **Master Plan** to guide the staged development of the OWE including:
 - An Indicative Master Plan and Development Master Plan;
 - Development Controls;
 - Landscape Concept Plan;
 - Biodiversity Offsets.
- ❖ **Stage 1 Development** to be implemented in stages including:

Estate Works for the entire OWE comprising:

- Site preparation and mobilisation including clearing of land and importation of fill material;
- Earthworks and support structures (batters and retaining walls);
- Estate stormwater management including construction of detention basins;
- Realignment and rehabilitation of creek and riparian land;
- Landscaping and public domain works to estate roads, estate entrance and key nodes;
- Land stabilisation and rehabilitation;
- Environmental protection and management measures; and
- Subdivision aligned with infrastructure and servicing.

Development of Stage 1 Precincts comprising:

- Construction of site access, estate roads and utility infrastructure and connection of services (Stage 1 only);
- On-lot stormwater, infrastructure and services;
- Construction and fit out of buildings;
- Construction of hardstand, loading and car parking;
- Landscaping and signage; and
- Use of buildings for generic warehousing and distribution uses.

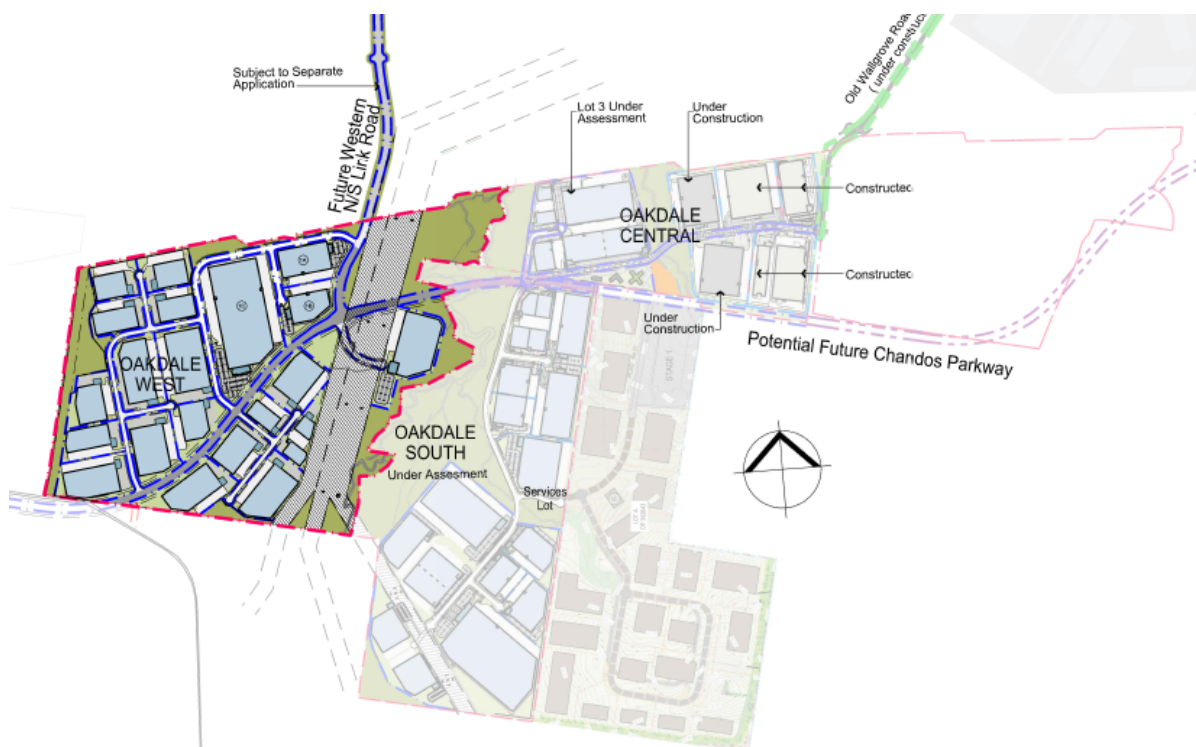
The SEARS [Secretary's Environmental Assessments Requirements] for Oakdale South were issued on the 26th November 2015 and contain a requirement that the EIS for the Master Plan and Stage 1 works must address bushfire – including consideration of bushfire measures as outlined in *Planning for Bushfire Protection 2006*, particularly asset protection zones, access and water utilities.

The site on which it is proposed to construct the new Oakdale West Estate comprises 154 hectares of land within the Western Sydney Employment Area [WSEA] and is owned by a Joint Venture (JV) between Goodman and Brickworks Limited (Brickworks, parent company of the Austral Brick Company Pty Ltd).

Goodman has entered into a JV with Brickworks to develop the Oakdale Estate into a regional warehousing and distribution hub.

The site is known as Oakdale West and comprises the third stage of four stages within the broader 'Oakdale Estate' under the management of Goodman Limited [Goodman] – refer to Figure 1 – Oakdale Estate.

Figure 1 – Oakdale Estate



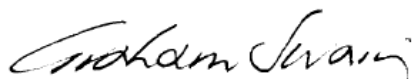
The development site is an irregular shaped parcel which is mainly located to the west of Ropes Creek. The development site is largely zoned IN1 – General Industrial under the WSEA SEPP but also includes large areas of land zoned E2 – Environmental Protection, associated with the Ropes Creek riparian corridor.

The Penrith Council Bushfire Prone Land Map indicates that the Kemps Creek corridor contains Category 1 Bushfire Prone Vegetation with Category 1 vegetation occupying the land to the south and west of the site. The vegetation within the site is mapped as Category 2 Bushfire Prone Vegetation.

Therefore, this report undertakes an assessment to examine the measures required to minimise bushfire risk on the proposed development and determines the deemed-to-satisfy bushfire protection requirements in accordance with the provisions of *Planning for Bushfire Protection 2006* and provides recommendations on the provision of Asset Protection Zones [Defendable Spaces] to the future buildings in the Oakdale West Estate.

This report also assesses the adequacy of fire-fighting access and water supplies; construction standards of the buildings, the management of the Asset Protection Zones [Defendable Spaces] and evacuation protocols necessary to address the bushfire risk to the proposed development and to address the aim and objectives of *Planning for Bushfire Protection 2006*.

The report has found that no modifications are required to the development proposal in order to address the provision of defendable spaces [Asset Protection Zone] to the buildings; the provision of access and water supplies for fire-fighting operations.



Graham Swain,
Managing Director,
Australian Bushfire Protection Planners Pty Limited

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SECTION 1

INTRODUCTION

1.1 Development Proposal.

The proposal seeks to facilitate the staged development of the Oakdale West Estate [OWE] through a staged SSDA process. The SSDA for Oakdale South comprises an overarching planning framework to guide the staged development of the OSE including:

- An Indicative Master Plan and Development Master Plan;
- Development Controls;
- Landscape Concept Plan;
- Biodiversity Offsets.

Stage 1 Development to be implemented in stages including:

Estate Works for the entire OWE comprising:

- Site preparation and mobilisation including clearing of land and importation of fill material;
- Earthworks and support structures (batters and retaining walls);
- Estate stormwater management including construction of detention basins;
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- Landscaping and signage; and
- Use of buildings for generic warehousing and distribution uses.

Refer to Figure 2 – Estate Master Plan Oakdale West Estate on Page 10.

Refer to Figure 3 – SSDA Building Staging Plan on Page 11 and Figure 4 – Ultimate Lot Layout Plan on Page 12.

Refer to Figure 5 – SSDA Stage 1 Development Plan – Precinct 1 on Page 13 and Figure 6 – Precinct 1 Plan on Page 14.

Site Area Schedule

Total Site Area	154.08 ha
Less:	
Non Developable Land	25.93 ha
Easements	22.43 ha
Regional Roads	6.43 ha
Services Lot	1.50 ha
Estate Roads	8.81 ha
	65.10 ha
Development Areas	
Precinct 1	21.73 ha
Precinct 2	21.61 ha
Precinct 3	18.51 ha
Precinct 4	21.06 ha
Precinct 5	6.03 ha
Total Developable	88.94 ha
Total Warehouse	450,340 sqm
Total Office	22,608 sqm
Total Facility	472,948 sqm

Figure 3 – SSDA Building Staging Plan



Figure 4 – Indicative Ultimate Lot Layout.

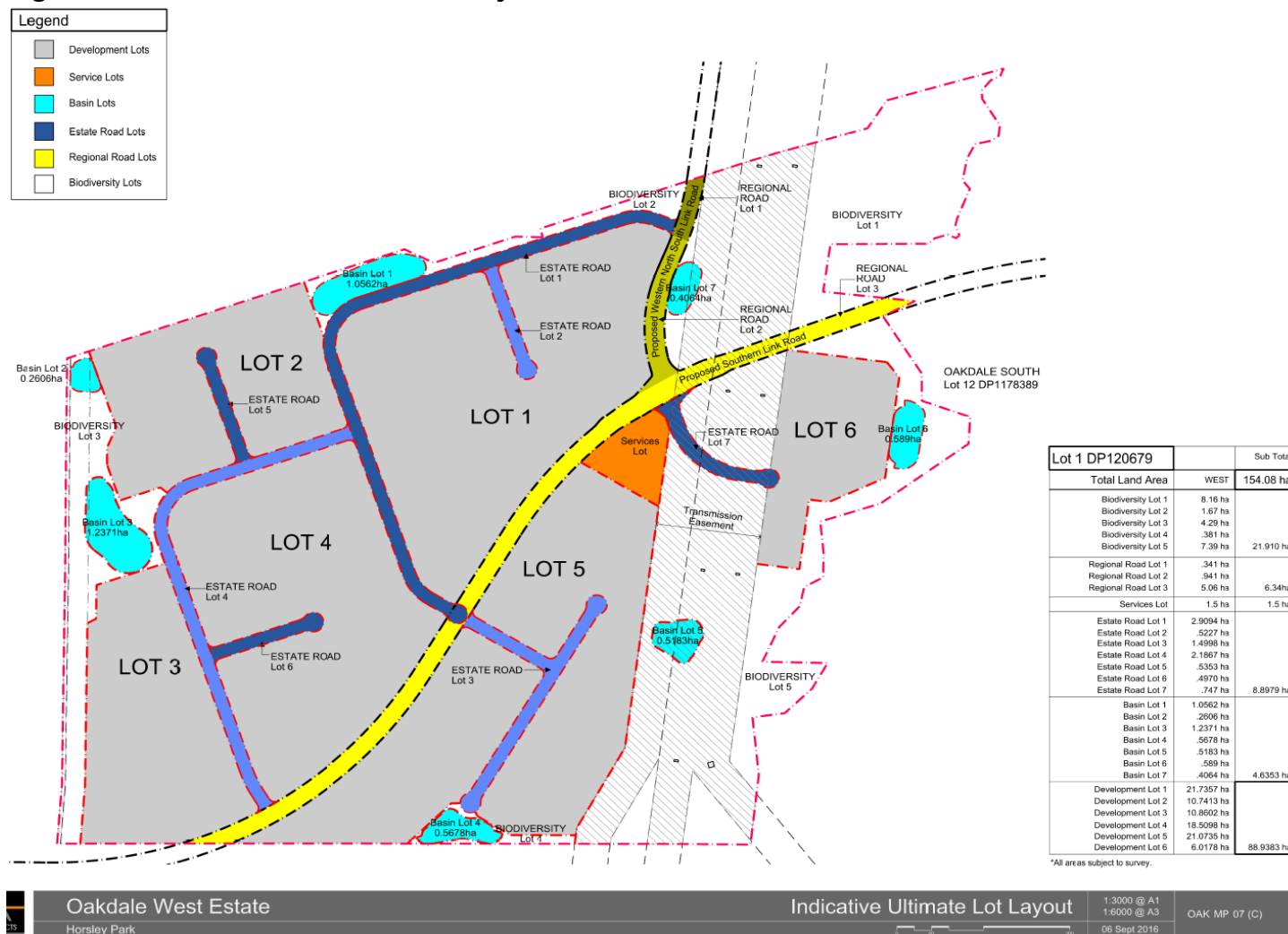


Figure 5 – SSDA Stage 1 Development – Precinct 1.

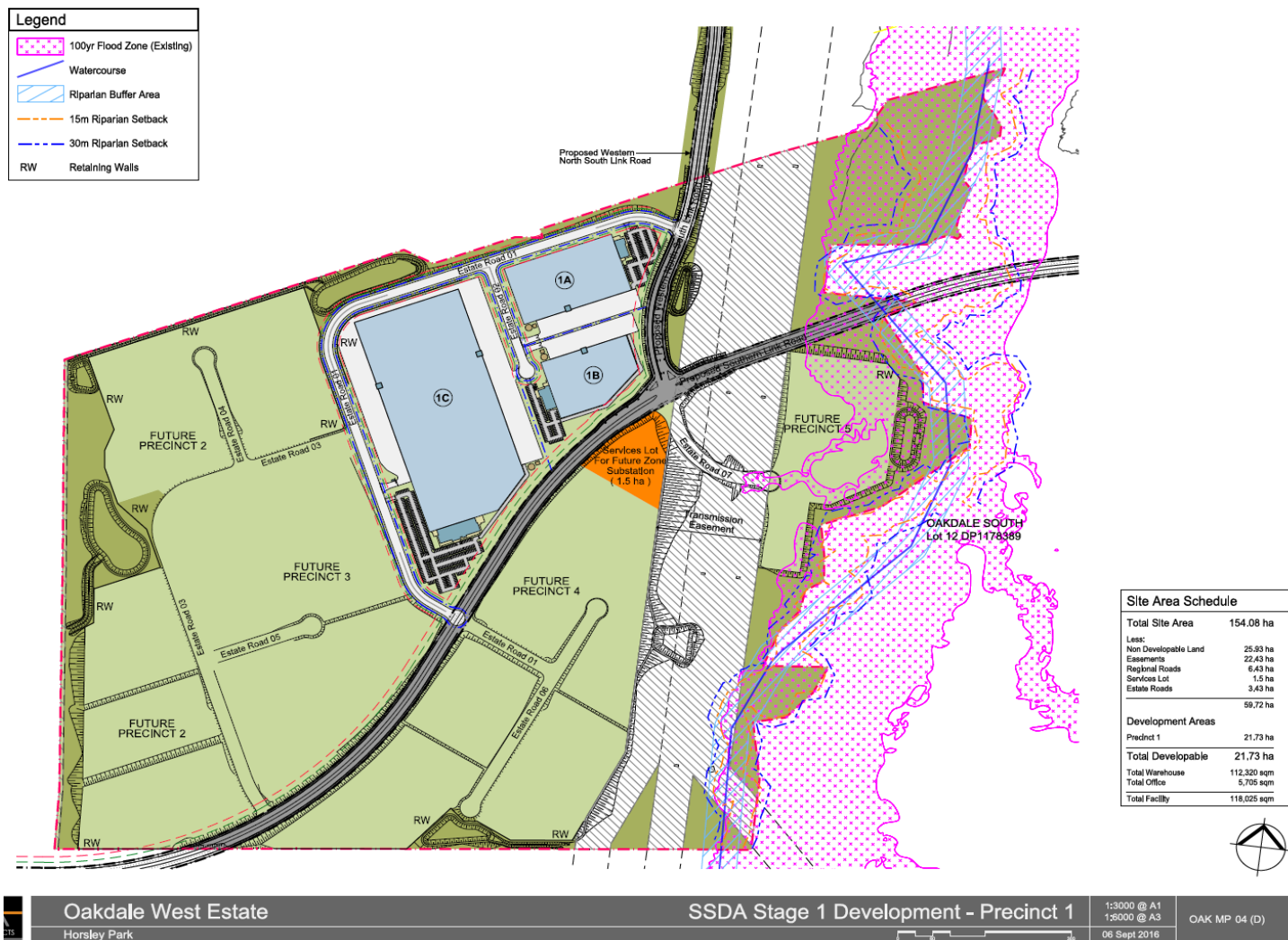
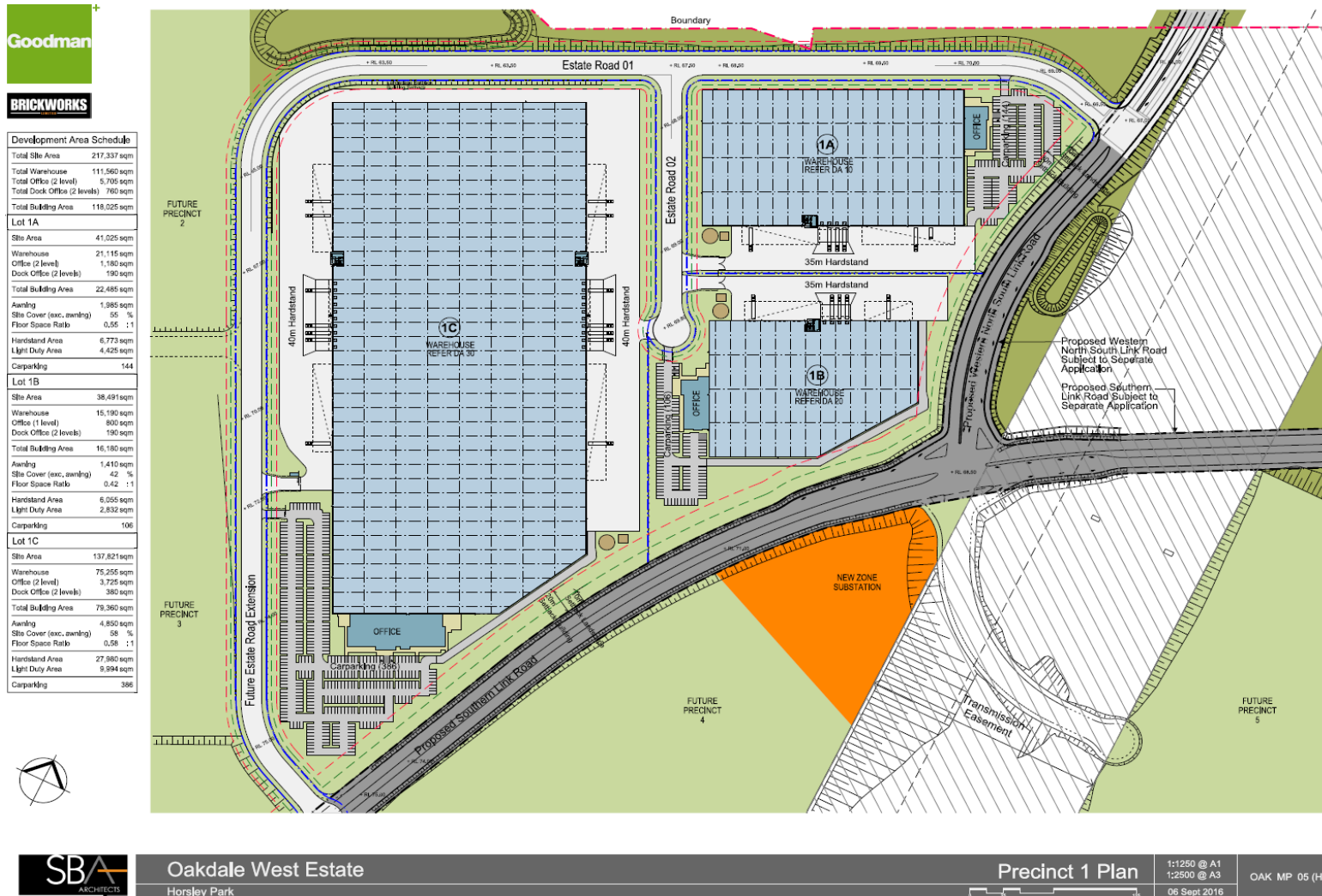


Figure 6 – Precinct 1 Plan



1.2 Aim of this Report.

The aim of this Bushfire Protection Assessment is to address the requirements of the Secretary's Environment Assessment Requirements [SEARS] issued on the 26th November 2015, including consideration of bushfire measures as outlined in *Planning for Bushfire Protection 2006*, particularly asset protection zones, access and water utilities.

To achieve the specific bushfire requirement of the SEARS the following will be examined:

- Determine the classification of the vegetation on and surrounding the site in accordance with the vegetation classification system contained in *Planning for Bushfire Protection 2006*;
- Undertake an assessment to determine the slope of the land on and surrounding the development site;
- Undertake a Bushfire Protection Assessment to determine bushfire protection strategies for the proposed development that address the following matters:
 - (i) The provision of building setbacks (Defendable Space) 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) Access requirements for emergency service vehicles;
 - (iv) 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;
 - (v) Land management responsibilities; and
 - (vi) Evacuation management.

1.3 Statutory Requirements.

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

1.3.1 Legislation.

(a) *Environmental Planning and Assessment Act - 1979 (EPA Act)*

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1997* (EPA Act). In relation to bushfire planning for new developments (including Industrial Development) in bushfire prone areas in NSW, the following sections of the EPA Act apply:

- (i) Section 79BA requires a consent authority to determine if a proposed development that is located within a designated Bushfire Prone Area or the buffer zone to the Bushfire Prone Land complies with *Planning for Bushfire Protection 2006*;
- (ii) Section 79C(1) states “*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:*
 - *The likely impacts of the development (e.g. natural hazards such as bushfire threat);*

The suitability of a site for development (e.g. bushfires

1.3.2 Planning Policies.

Planning for Bushfire Protection – 2006. [Rural Fire Service]

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for rural residential and residential subdivision, “*Special Fire Protection*” and Class 5 – 8 and 10 buildings in bushfire prone areas [Industrial buildings are Class 7 as defined by the Building Code of Australia].

These measures include the provision of defensible space requirements and access/water supply provisions to Class 5 – 8 & 10 developments in bushfire prone areas.

Provision for the assessment of construction standards to buildings and management / maintenance of the Asset Protection Zones/defensible space to buildings is also provided.

1.4 Documentation reviewed in this Assessment.

To achieve the aim of this report, a review of information relevant to the property and proposed development was undertaken. Information sources reviewed included the following documents:

- Secretary’s Environmental Assessment Requirements – 26 November 2015;
- State Significant Development Application for Oakdale West Industrial Estate prepared by Urban Advisory Services;
- Master Plan; Precinct 1 Plan and Building Plans for Building 1A; 1B & 1C Oakdale West prepared by SBA Architects – September 2016;
- Site Constraints Plan prepared by AT&L – Project No. 15 – 272 dated 7.10.2015;
- Ecological Assessment undertaken by Cumberland Ecology;

- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service/Planning N.S.W;
- Australian Standard AS3959 - 2009 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2013*;
- Penrith City Council *Certified Bushfire Prone Land Map*.

1.5 Site Inspection.

Graham Swain of ***Australian Bushfire Protection Planners Pty Limited*** inspected the development site on the 15th of July 2015 to assess the topography, gradients of the land within and external to the site and vegetation classification within and adjoining the development property, existing bushfire mitigation measures and a visual assessment of bushfire threat.

The land adjoining the development site was also inspected to determine the surrounding land use / land management practices and extent of bushfire prone vegetation.

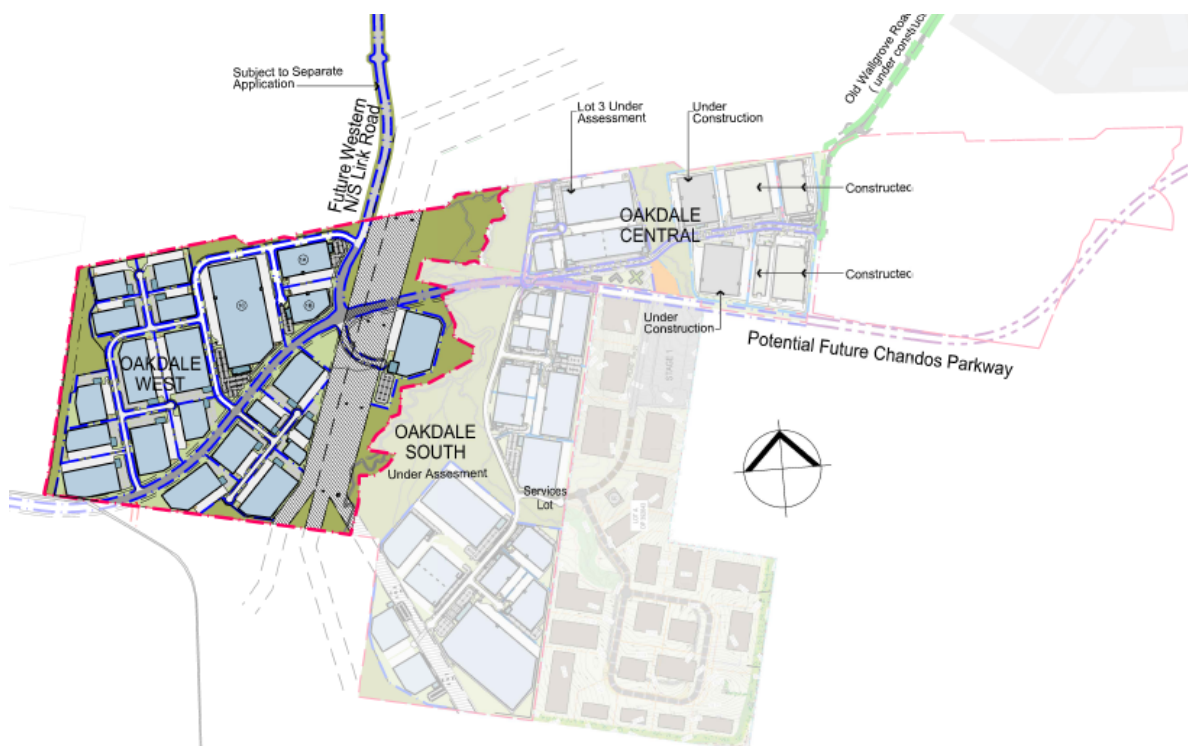
SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The development site occupies Lot 11 in DP 1178389 Kemps Creek and is located in the Local Government Area [LGA] of Penrith City Council.

Figure 7 – Location of Development Site.



2.2 Existing Land Use.

The development site contains vacant grazing land used for agricultural purposes. High voltage transmission line easements traverse the eastern portion of the site.

2.3 Surrounding Land Use.

The landuse adjoining the boundaries of the development site is as follows:

(a) North

The land to the north of the development site contains the Sydney Catchment Authority water pipeline easement.

Beyond the pipeline easement the land contains existing industrial development and vacant grazing land used for agricultural purposes. This land is zoned IN1 General Industrial under the WSEA SEPP.

(b) East

The land adjoining the eastern boundary of the development site forms the Oakdale Central and Oakdale South Estates and is zoned IN1 General Industrial under the WSEA SEPP.

(c) South

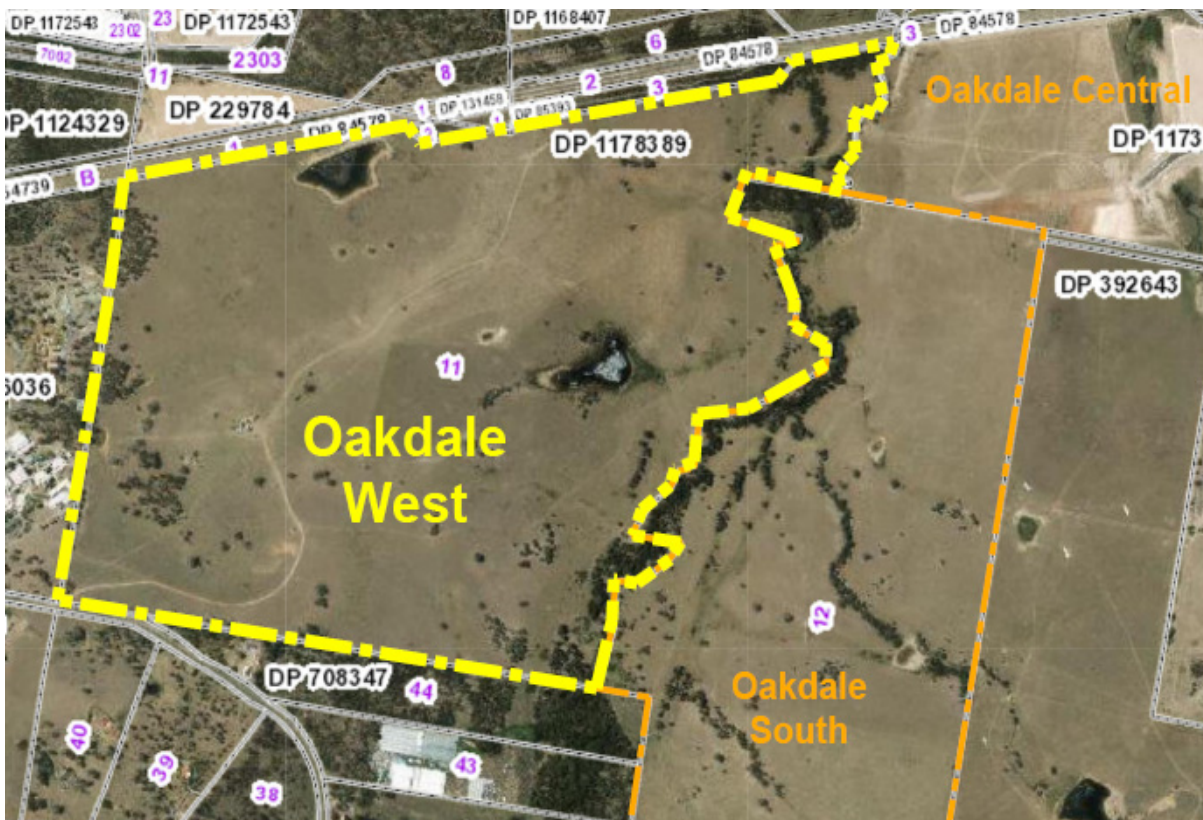
The land adjoining the southern boundary of the development site consists of rural residential development. This land is zoned IN1 General Industrial under the expansion to the WSEA.

(d) West

The land to the west of the Oakdale West development site contains the Emmaus Catholic College, Trinity Catholic Primary School and Emmaus Village [Retirement Village and Community Home].

Refer to Figure 8 – Aerial Photograph below.

Figure 8 – Aerial Photograph of the Oakdale West Development Site showing adjoining landuse



2.4 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour on the site.

➤ ***Within the Development Site.***

The topography within the eastern portion of the development site is undulating, falling to the east/northeast at less than 5 degrees towards Ropes Creek.

The topography within the western portion of the development site is undulating, falling to the west/northwest towards the head of a tributary to South/Wianamatta Creek.

➤ ***Beyond the Development Site.***

(a) North.

The topography of the land to the north of the development site falls to the east, towards Ropes Creek and to the west into a tributary of South/Wianamatta Creek

(b) East.

The topography of the land to the east, within Oakdale East and Oakdale South is undulating, rising to the east at less than 5 degrees.

(c) South.

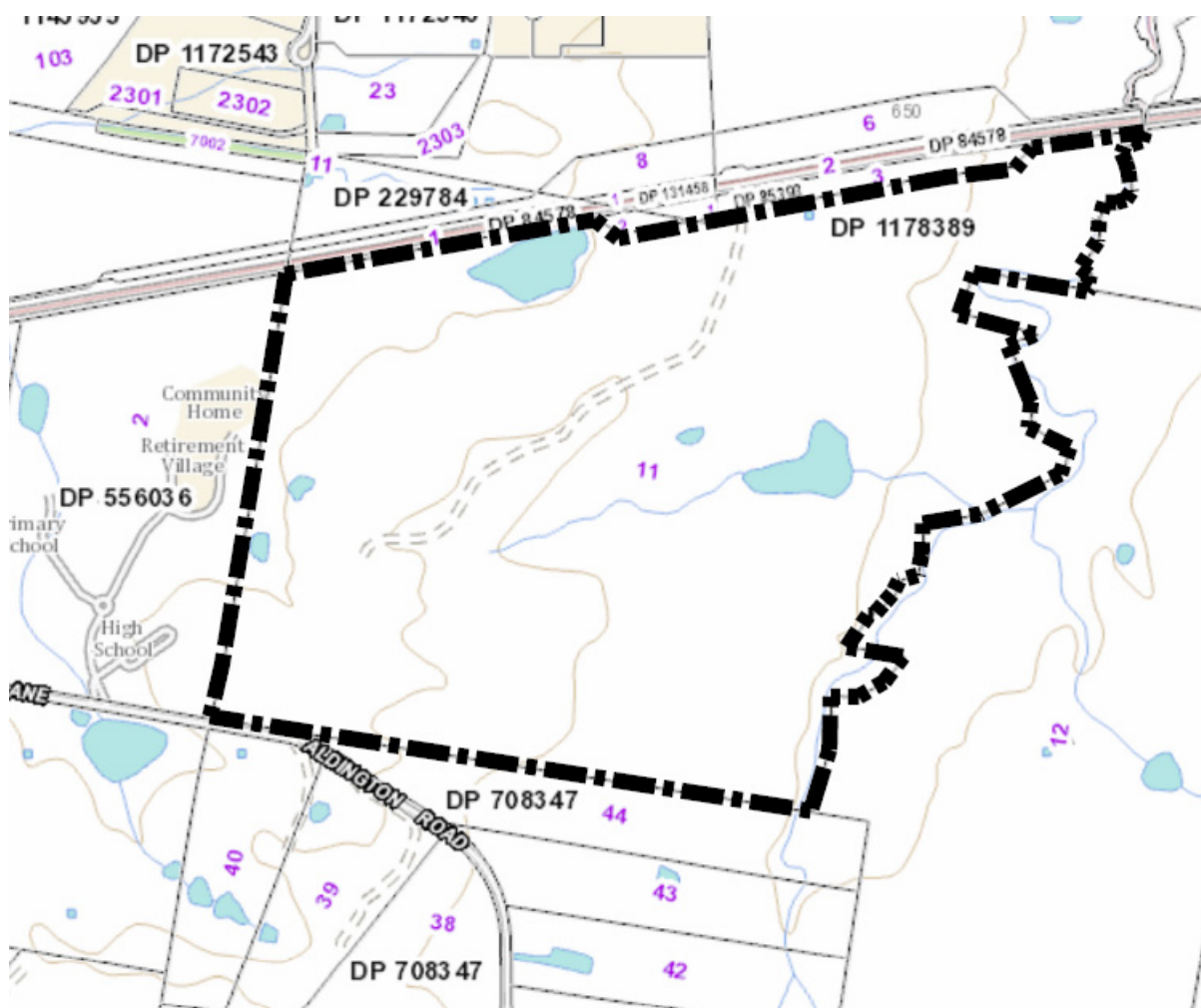
The topography of the land to the south of the development site continues the ridgeline within the site to the southwest, falling to the northwest across Bakers Lane and to the east towards Ropes Creek.

(d) West.

The topography of the land to the west of the development site, within the College and Retirement Village, falls to the northwest at less than 5 degrees.

Refer to Figure 9 – Topographic Map on Page 21.

Figure 9 – Topographic Map of development site and adjoining lands.



2.5 Vegetation within the Development Site.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the buildings. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) Forests [wet & dry sclerophyll forests];
- (b) Woodlands;
- (c) Plantations – being pine plantations not native plantations;
- (d) Forested Wetlands;
- (e) Tall Heaths;
- (f) Freshwater Heaths;
- (g) Short Heaths;
- (h) Alpine Complex;
- (i) Semi – arid Woodlands;
- (j) Arid Woodlands; and
- (k) Rainforests.

The ecological study undertaken by Cumberland Ecology states:

‘Native vegetation comprises approximately 4% of the vegetated cover of the development site.

The majority of the development site is cleared for agriculture and is dominated by exotic pasture grasses. Native vegetation within the development site is primarily limited to small remnant patches and sparsely scattered trees through the paddocks. There are also areas of regenerating woodland that connect to larger patches of woodland to the west and south of the development site. These regenerating areas largely comprise of juvenile, regenerating E. tereticornis but the understorey in these patches is largely absent due to heavy grazing by cattle and Eastern Grey Kangaroo.

The condition of vegetation across the whole development site is degraded due to persistent impacts from grazing even within areas of native vegetation, the ground layer is frequently dominated by exotic species, and the shrub layer is almost absent’.

In addition to exotic and native grasses, the three main plant communities that occur on the Oakdale West development site are Swamp Oak Floodplain Forest [TSC Act Listed], Cumberland Plain Woodland [EPBC & TSC Act listed] and Wetland vegetation associated with farm dams.

The Estate Master Plan identifies the retention of a narrow corridor of woodland vegetation along the western boundary of the site.

Refer to Figure 10 – Plan of Vegetation Communities on Page 24.

2.6 Vegetation within 140 metres of the Development Site.

(a) North.

The land to the north contains pasture grass with scattered shade trees.

(b) East.

The adjoining Oakdale South Estate Swamp Oak in the Ropes Creek riparian corridor and pasture grass with scattered shade trees. The latter vegetation will be removed as part of the development of the Oakdale South development.

The gazetted E2 zoned land in the creek corridor will regenerate to form a forest community having a width of approximately 250 – 300 metres.

(c) **South.**

The adjoining rural residential land contains pasture grass with scattered shade trees.

(d) **West.**

The College and Retirement complexes to the west of the development site contain managed landscaped gardens with remnant Cumberland Plain shade trees.

The vegetation on the land to the west of the north-western corner of the development site consists of Cumberland Plain Woodland. This vegetation connects to the proposed corridor of Cumberland Plain Woodland running along the western boundary of the development site.

Figure 10 – Plan of Vegetation Communities within the development footprint



Source: Cumberland Ecology

2.7 Significant Environmental Features within the Development Site.

The development site does not contain significant environmental features such as SEPP 44 Koala Habitat; SEPP 14 Wetlands; SEPP 26 Littoral Rainforests; land slip areas or National Parks Estate or areas of geological interest.

E2 Environmental Protection zone is designated in the SEPP for Ropes Creek.

2.8 Known Threatened Species, Population or Ecological Community on the Development Site.

Swamp Oak Floodplain Forest [TSC Act Listed] and Cumberland Plain Woodland [EPBC & TSC Act listed] were found within the development site and retained in the E2 zoned land along Ropes Creek.

2.9 Details and location of Aboriginal Relics or Aboriginal Place.

There are no known Aboriginal relics or Aboriginal places on the development site.

SECTION 3

FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

3.1 Penrith City Council.

Penrith Council has responsibility, under Section 63(1) of the *Rural Fires Act*, to take notified steps and any other practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of fire on or from:

- (a) Any land vested in or under its control or management, or
- (b) Any highway, road, street, land or thoroughfare, the maintenance of which is charged on the authority.

Section 63(3) identifies that the public authority is liable for the costs incurred by it in performing the duty imposed by Section 63(1).

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.

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.

3.3 Fire & Rescue New South Wales.

Fire & Rescue NSW 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 Fire & Rescue NSW.

3.4 Penrith Bush Fire Management Committee.

The Penrith 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 organization, a fire fighting organization or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act 1997:

- **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.
- **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 Public Authorities & owners/occupiers of land.

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

These are listed below:

63 Duties of public authorities and owners and occupiers of land to prevent bush fires

- (2) 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 bush fires on, and to minimise the danger of the spread of bush fires on or from, that land.
- (3) A public authority or owner or occupier is liable for the costs incurred by it in performing the duty imposed by this section.
- (4) The Bush Fire Co-ordinating Committee may advise a person on whom a duty is imposed by this section of any steps (whether or not included in a bush fire risk management plan) that are necessary for the proper performance of the duty.

In this section **notified steps** means:

- (a) any steps that the Bush Fire Co-ordinating Committee advises a person to take under subsection (4), or
- (b) any steps that are included in a bush fire risk management plan applying to the land.

66 Bush Fire Hazard Reduction Notice

- (1) A hazard management officer may, by notice in writing, require the owner or occupier [not being a public authority] of any land to carry out bushfire hazard reduction work specified in the notice on the land.
- (2) A hazard management officer must serve a notice under this section if required to do so by a bushfire risk management plan applicable to the land that is in force.
- (3) A hazard management officer must issue a bushfire hazard reduction certificate in respect of any bushfire hazard reduction work required by a notice issued in accordance within section (2) unless the work required by the notice:
 - Is otherwise authorised to be carried out, or
 - Is not required to be authorised to be carried out under this or any other Act.
- (6) The requirements and conditions so specified must include any requirements in a bushfire risk management plan that is applicable to the land and is in force and may include a requirement or condition that the burning of fire breaks or of combustible material:
 - (a) must in fire district constituted under the Fire Brigades Act 1989 be carried out by or under the supervision of the fire brigade or an officer in charge of the fire brigade;
 - (b) must outside a fire district, be carried out by or under the supervision of the rural fire brigade specified in the notice or an appropriate officer of the rural fire brigade or any hazard management officer.
- (7) *A notice requiring the establishment of a firebreak cannot require an occupier or owner to kill or remove any trees that are reasonably necessary for shade, shelter, windbreak or fodder purposes or the protection of threatened species, populations, ecological communities or critical habitats within the meaning of the 'Threatened Species Conservation Act 1995.*
- (8) An occupier or owner to whom a bushfire hazard reduction notice is given must, despite the fact that a fire permit has not been granted under Division 5, comply with the requirements specified in the notice.

Section 70(2) states that *'if within the time specified in the relevant notice the owner or occupier to whom it is given fails to comply with any requirement of the notice, the Commissioner may, without prejudice to liability of the owner or occupier, enter on the land and carry out the bushfire hazard reduction work the owner or occupier was required to do under the notice'*.

Section 70(3) states that *'any costs incurred by the Commissioner in carrying out such work may be recovered from the owner or occupier of the land as a debt due to the Crown in a court of competent jurisdiction'*.

3.6 Bushfire Hazard Management within the Development Site.

The management of the landscaped gardens and the vegetation within the development site will remain the responsibility of the property owner.

A Positive Covenant, created under the provisions of the *Conveyancing Act of 1919*, shall be placed on the title of the land to ensure compliance with the management prescriptions for the Defendable Spaces detailed in this report [Refer to Section 5.2].

The management of the road verges that form part of a defendable space will remain the responsibility of Penrith City Council.

SECTION 4

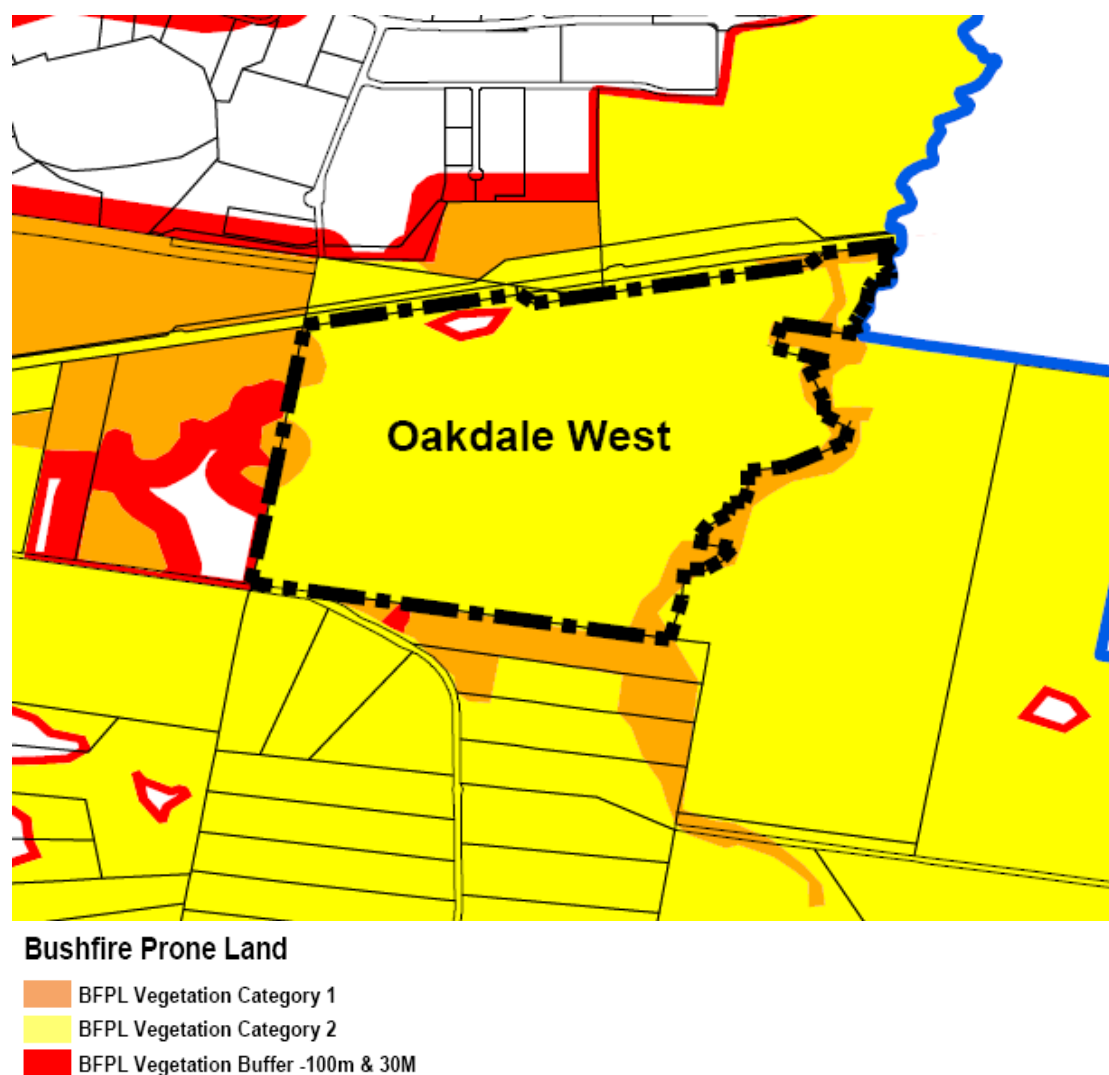
PRECINCT LEVEL ASSESSMENT

4.1 Certified Bushfire Prone Land Map.

Section 146 of the *Environmental Planning & Assessment Act 1979* requires councils, where a Bushfire Risk Management Plan applies, to prepare a Bushfire Prone Land Map in consultation with the Commissioner of the NSW Rural Fire Service.

The Commissioner will designate lands to be Bushfire Prone within an area and, when satisfied that the lands have been recorded on a map, will certify the map as a Bushfire Prone Land Map for the purposes of this or any other Act. Figure 11 below provides an extract from the Penrith Bushfire Prone Land Map.

Figure 11 – Extract from the Penrith Bushfire Prone Land Map



The Penrith Bushfire Prone Land Map shows that the site is impacted by Category 1 Bushfire Prone Vegetation generally occupying the riparian zone to Ropes Creek, the vegetation within the rural residential development to the south and within the College and Retirement Village complex to the west.

The natural revegetation of the Ropes Creek E2 zoned corridor will introduce additional forest vegetation which will become, over the life of the development, bushfire prone.

The Ropes Creek corridor will be increased in width as part of the E2 Environmental Protection Zone and will contain bushfire prone vegetation to a width of approximately 240 – 300 metres wide.

The remainder of the site and adjoining land to the north, east and south is recorded as containing Category 2 Bushfire Prone Vegetation.

The site inspection confirmed the potential fire hazard recorded on the Penrith Bushfire Prone Land Map.

SECTION 5

BUSHFIRE PROTECTION ASSESSMENT

5.1 Introduction.

Chapter 1 of *Planning for Bushfire Protection 2006* states that the aim of the document is to use the NSW development assessment system to provide for protection of human life [including firefighters] and to minimize impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and protection of the environment.

The objectives of the document are:

- Afford occupants of any building adequate protection from exposure to the impacts of a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- Ensure that safe operational access/egress for emergency service personnel and occupants relocating is provided and/or available;
- Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads within the Asset Protection Zone/s; and
- Ensure that utility services are adequate to meet the needs of firefighters [and others assisting in bushfire fighting operations].

In reference to the construction of the proposed Oakdale Industrial Estate - South the future warehouse buildings are classified as Class 7 buildings as defined by the Building Code of Australia [BCA].

Chapter 1, Section 1.3 of *Planning for Bushfire Protection 2006* states that the construction of Class 5 – 10 buildings on bushfire prone land, or land impacted by bushfire prone vegetation, must meet the aim and objectives of the document.

Chapter 4, Section 4.3.6(f) discusses the bushfire protection to buildings of Class 5 to 8 and 10b of the Building Code of Australia and states:

“The Building Code of Australia does not provide for any bushfire specific performance requirements and as such AS 3959 -1999 does not apply as a set of “deemed-to-satisfy” provisions.

The general fire safety construction provisions [of the BCA] are taken as acceptable solutions, but the aim and objectives of Planning for Bushfire Protection 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management”.

“Where the aim and objectives of PfPFP [Section 1.1] are not met, then the construction requirements for bushfire protection will need to be considered on a case-by-case basis”.

“In many cases, these types of developments will require on-site parking and loading areas. In such cases, it is prudent to place these facilities in the most appropriate location in order to establish defensible space for fire-fighting purpose”.

The objectives of *Planning for Bushfire Protection 2006* are:

- (i) Afford occupants of any building adequate protection from exposure to a bushfire;
- (ii) Provide for a defensible space to be located around buildings;
- (iii) Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- (iv) Ensure that safe operational access and egress for emergency service personnel and residents is available;
- (v) Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zones;
and
- (vi) Ensure that utility services are adequate to meet the needs of fire-fighters and others assisting in bushfire fighting.

The document identifies six core bushfire protection requirements. These are:

- Provision of Asset Protection Zones / Defensible Spaces in accordance with the specific landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Access for fire fighting operations;
- Water Supplies for fire fighting operations;

- Construction standards of buildings located within 100 metres of the bushfire hazard interface, dependant on specification landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Emergency Planning;
- Landscape Management – in particular the management of the Asset Protection Zones / Defendable Spaces and residual bushfire prone vegetation.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones [defendable space] and Bushfire Attack [Construction Standards] required for **habitable buildings** in development for **residential purposes** that are designated as bushfire prone.

The document does not provide deemed to satisfy solutions for Class 5 – 8 buildings constructed in bushfire prone areas but states that where the aim and objectives of the document are not met, then the construction requirements for bushfire protection will need to be considered on a case by case basis.

The document also recommends that Class 5 – 8 and Class 10 buildings should be located to provide a defendable space setback which prevents flame contact with the structure.

Section 5.2 of this report examines the Oakdale West layout in relation to the provision of a suitable “defendable space” between the bushfire hazard and the industrial buildings and the protection against the potential impacts of a future fire occurrence in the bushfire prone vegetation on the E2 zoned land/riparian corridor to Ropes Creek to the east, the rural residential land to the south/southwest and within the vegetation on the land to the west and northwest of the development site.

The hazard to the northern aspect of Buildings 1A, 1C and 2A, 2C is mitigated by the existing management regime within the Sydney Catchment Authorities pipeline easement. Similarly, the hazard to the east Buildings 1A, 1B, 4D, 4E, 4F and Building 4G is mitigated by the management of the Ausgrid Power Line Easement that separates these buildings from the bushfire prone vegetation in the Ropes Creek corridor.

The bushfire construction standards to the buildings is examined in Section 5.3 and the provision of access and water supplies for fire-fighting operations’ management of the defendable space [Asset Protection Zone] and evacuation planning are examined in Sections 5.4 – 5.9 of this report.

5.2 The provision of Defendable Space/s [Asset Protection Zones].

Table 1 examines the width of defendable space requirements to the buildings located adjacent to the western boundary [Buildings 2C, 2D, 2E, 2F, 2G and Building 3B] which are exposed to the hazard in the 40 metre wide vegetated corridor, adjacent to the western, which connects to and extends across the adjoining land to the west of the north-western corner of the development site.

Table 2 examines the defendable space requirements to the south of Buildings 4A & 4E and to Building 5A.

Table 1. Determination of Defendable Space to the west of Building 2C, 2D, 2E, 2F, & 2G and Building 3B.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Flame Zone Width – Table 2.4.1 A.S. 3959 - 2009	Width of Defendable Space provided to fixed assets
West of Building 2C & 2D	Cumberland Plain Woodland	Woodland	0 – 5 degrees down slope	15 metres flame length for woodland vegetation on < 5 degrees downslope	Minimum 7.5 metres to the western aspect of Building 2C & 2D.
West of Building 2E, 2F & 2G	40 metre wide corridor of Cumberland Plain Woodland	Woodland reclassified to low hazard 'rainforest'	0 – 5 degrees down slope	10 metres flame length for rainforest vegetation on < 5 degrees downslope	Minimum 7.5 metres to Building 2E & 2F; Minimum 12 metres to building 2G.
West of Building 3B	Cumberland Plain Woodland & managed detention pond	Woodland	< 5 degrees down slope	15 metres flame length for woodland vegetation on < 5 degrees downslope	Minimum 50 metres to the building provided by width of road & building setback

Review of Defendable Space Provisions to Buildings 2C, 2D, 2E, 2F & 2G and Building 3B:

The assessment provided in Table 1 identifies the widths of Defendable Space setbacks required from unmanaged vegetation to the west of Buildings 2C, 2D, 2E, 2F & 2G and Building 3B in order to minimise flame contact and also identifies the available setbacks to the proposed buildings.

Table 1 identifies that the setback to Building 2C; 2D, 2E & 2F does not comply with the flame zone width and these buildings will be located in the flame zone level of construction.

Table 2. Determination of Defendable Space to the south of Building 4A & 4E and to Building 5A.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Flame Zone Width – Table 2.4.1 A.S. 3959 - 2009	Width of Defendable Space provided to fixed assets
South of Building 4A & 4E	Swamp Oak Forest	Forest	Level	19 metres flame length for forest vegetation on level land	Minimum 23.5 metres to the southern aspect of Building 4A & 4E [7.5m setback from lot boundary + 16m drainage swale].
North of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	0 – 5 degrees down slope	24 metres flame length for forest vegetation on < 5 degrees downslope	Minimum 7.5 metre setback to Building 5A
East of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down Slope	24 metres flame length for forest vegetation on < 5 degrees downslope	Minimum 7.5 metre setback to Building 5A
South east of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down Slope	24 metres flame length for forest vegetation on < 5 degrees downslope	Minimum 7.5 metre setback to Building 5A

Review of Defendable Space Provisions to Buildings 4A & 4E and to Building 5A:

The assessment provided in Table 2 identifies the widths of Defendable Space setbacks required from unmanaged vegetation to the south of Buildings 4A & 4E and to the north, east and southeast of Building 5A in order to minimise flame contact and also identifies the available setbacks to the proposed buildings.

Table 2 identifies that the setbacks to Building 5A do not comply with the flame zone width and this building will be located in the flame zone level of construction.

5.3 Construction Measures to Buildings.

Tables 1 & 2 identify the separation distance [Defendable Space width] to the proposed buildings exposed to the bushfire hazard. Table 3 examines the bushfire construction standards required to be implemented to comply with A.S. 3959 – 2009 – ‘Construction of Buildings in Bushfire Prone Areas’.

Table 3. Determination of Bushfire Construction Standards to Buildings 2C, 2D, 2E, 2F, & 2G; Building 3B; Buildings 4A & 4E and Building 5A.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class 2010 Addendum Planning for Bushfire Protection 2006]	Effective Slope of Land	Width of Defendable Space provided to fixed assets	Bushfire Construction Standard – A.S. 3959 - 2009
West of Building 2C & 2D	Cumberland Plain Woodland	Woodland	0 – 5 degrees down slope	Minimum 7.5 metres to the western aspect of Building 2C & 2D.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
West of Building 2E, 2F & 2G	40 metre wide corridor of Cumberland Plain Woodland	Woodland reclassified to low hazard ‘rainforest’	0 – 5 degrees down slope	Minimum 7.5 metres to Building 2E & 2F; Minimum 12 metres to building 2G.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
West of Building 3B	Cumberland Plain Woodland & managed detention pond	Woodland	< 5 degrees down Slope	Minimum 50 metres to the building provided by width of road & building setback	BAL 12.5 to building
South of Building 4A & 4E	Swamp Oak Forest	Forest	Level	Minimum 23.5 metres to the southern aspect of Building 4A & 4E.	BAL 40 exposed elevations; BAL 29 non-exposed elevations
North of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	0 – 5 degrees down slope	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
East of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down slope	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
South east of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down slope	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations

Table 3 identifies that Building 2C, 2D, 2E, 2F & 2G and Building 5A will be subject to flame contact. The type of construction of the warehouse buildings can accommodate this level of radiant heat/flame exposure with the use of non-combustible concrete wall systems.

The bushfire construction standards shall apply to the buildings exposed to the bushfire hazard to the level as specified in Table 3 with the following additional measures implemented:

- The downpipe/stormwater system to the internal box gutters shall be sized to provide a self flushing of combustible materials from the roof/gutter. This shall include increased fall in the box gutters to the sumps;
- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be given to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- External timber doors shall be fitted with a stainless steel/Colorbond kick plate of 400mm high on the outside of the door;
- External glazed doors and windows shall comply with the requirements for glazing less than 400mm above finished ground level; paths/pavement and elevated roofs;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

Should the available Defendable Space widths increase from the widths listed in Table 3, reassessment of the construction standards shall be undertaken.

5.4 Access Standards for Firefighting Operations.

Chapter 4, Section 4.2 “Access” of *Planning for Bushfire Protection 2006* provides specifications on the access provisions for fire-fighting operations within developments which are subject to bushfire attack.

Vehicular access to the proposed Oakdale West Estate will be provided with the construction of the Western North South Link Road.

This road and the proposed internal access roads will be constructed to provide heavy rigid and articulated vehicle access to each of the proposed buildings. This internal road network provides suitable access for fire-fighting appliances similar to NSW Rural Fire Service Category 1 Tankers and Fire & Rescue NSW Composite and Aerial Appliances.

The Oakdale West Estate Masterplan identifies access to the bushfire prone vegetation within the Ropes Creek corridor; the vegetation in the corridor along the western boundary and the vegetation on the land to the south is provided either by a perimeter road or by vehicular access to the future buildings or parking areas incorporated into the defensible space setback.

Fire trail access is also provided within the Ausgrid Power Line Easement to assist in fire-fighting and fire prevention operations.

5.5 Water Supplies for Firefighting Operations.

A reticulated water supply for potable water supply and fire hydrants is to be extended into the site.

To Building 2C, 2D, 2E, 2F & 2G; Building 4A & 4E and Building 5A there shall be provided a ring-main to the hazard side of the building, complete with Millcock Valves fitted with Stortz Coupling and Blanking Cap.

The fire-fighting water supply to the new buildings shall comply with the Building Code of Australia [BCA] and A.S. 2419.1 – 2005.

5.6 Emergency Management for Fire Protection / Evacuation.

The new buildings located adjacent to the bushfire hazard may be subject to a fire event that may necessitate evacuation of the buildings. Therefore, it is recommended that the evacuation planning process for these buildings shall also include protocols for bushfire emergencies.

Due to the low bushfire risk to the remaining facilities, not exposed to the bushfire hazard, there is no requirement for the preparation of a specific Bushfire Evacuation Plan or a Bushfire Management Plan for these buildings.

5.7 Bushfire Hazard Management.

The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on occupants and fire-fighters.

The management of the Defendable Spaces and the sites generally shall comply with the recommendations of Appendix A5.4 & Appendix A5.5 of *Planning for Bushfire Protection 2006* and *Standards for Asset Protection Zones*.

Management of the Defendable Spaces within the development shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings; Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps].

SECTION 6

BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the future buildings within the proposed Oakdale West Estate [OWE] - are as follows:

6.1 Strategy 1 – Defendable Space management Requirements:

Management of the defendable spaces/landscaped areas within the development site shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps].

6.2 Strategy 2 – Water Supplies/Utilities for Firefighting Operations:

The fire-fighting water supply to the proposed buildings shall comply with the Building Code of Australia [BCA] and Australian Standard A.S. 2419.1 – 2005.

To buildings erected on Lots 3A, 3C, 6A & 6B there shall be provided a ring-main to the hazard side of the building, complete with Millcock Valves fitted with Stortz Coupling and Blanking Cap.

Electricity and gas supplies will be laid underground and therefore address the performance standard of Chapter 4 of *Planning for Bushfire Protection 2006*.

6.3 Strategy 3 – Construction Standards to the buildings located adjacent to the bushfire hazard:

Table 4 identifies the bushfire construction standards required to be implemented to comply with A.S. 3959 – 2009 – '*Construction of Buildings in Bushfire Prone Areas*'.

Table 4. Determination of Bushfire Construction Standards to Buildings 2C, 2D, 2E, 2F & 2G; Building 4A & 4G and Building 5A.

Aspect	Width of Defendable Space provided to fixed assets	Bushfire Construction Standard – A.S. 3959 – 2009
<i>West of Building 2C & 2D</i>	Minimum 7.5 metres to the western aspect of Building 2C & 2D.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>West of Building 2E, 2F & 2G</i>	Minimum 7.5 metres to Building 2E & 2F; Minimum 12 metres to building 2G.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>West of Building 3B</i>	Minimum 50 metres to the building provided by width of road & building setback	BAL 12.5 to building
<i>South of Building 4A & 4E</i>	Minimum 23.5 metres to the southern aspect of Building 4A & 4E.	BAL 40 exposed elevations; BAL 29 non-exposed elevations
<i>North of Building 5A</i>	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>East of Building 5A</i>	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>South east of Building 5A</i>	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations

The bushfire construction standards shall apply to the buildings exposed to the bushfire hazard to the level as specified in Table 4 with the following additional measures implemented:

- The downpipe/stormwater system to the internal box gutters shall be sized to provide a self flushing of combustible materials from the roof/gutter. This shall include increased fall in the box gutters to the sumps;
- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be given to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;

- External timber doors shall be fitted with a stainless steel/Colorbond kick plate of 400mm high on the outside of the door;
- External glazed doors and windows shall comply with the requirements for glazing less than 400mm above finished ground level; paths / pavement and elevated roofs;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

Should the available Defendable Space widths increase from the widths listed in Table 4, reassessment of the construction standards shall be undertaken.

6.4 Strategy 4 – Emergency Management for Fire Protection / Evacuation.

The evacuation planning process for the buildings located adjacent to the bushfire hazard shall also include protocols for bushfire emergencies.

6.5 Strategy 5 – Access Standards for Firefighting Operations.

Access to the bushfire prone vegetation shall be provided either by a perimeter road or by vehicular access to the future buildings or parking areas that are incorporated into the defendable space setbacks.

The access provisions shall satisfy the NSW Rural Fire Service and Fire & Rescue NSW appliance requirements.

SECTION 7

CONCLUSION

A State Significant Development Application [SSDA] is being lodged by Goodman Property Services (Aust) Pty Ltd for the subdivision of the IN1 zoned land within the Oakdale West Estate on Lot 11 in DP 1178389 and the construction of Buildings 1A, 1B & 1C in Precinct 1 of the Estate. The proposed industrial subdivision creates a total of twenty two [22] lots and the construction and dedication of public roads.

The SEARS [Secretary's Environmental Assessments Requirements] for Oakdale South were issued on the 26th November 2015 and contain a requirement that the EIS for the Master Plan and Stage 1 works must address bushfire – including consideration of bushfire measures as outlined in *Planning for Bushfire Protection 2006*, particularly asset protection zones, access and water utilities.

The Penrith Bushfire Prone Land Map records the development site as containing Category 1 bushfire prone vegetation, located along the Ropes Creek corridor and in pockets adjacent to the western boundary and on the land to the south. The remainder of the development site is recorded as containing Category 2 Bushfire Prone Vegetation.

The Oakdale West Estate Masterplan prepared by SBA Architects identifies the establishment of a 'biodiversity lot' that contains the riparian corridor and the floodplain to Ropes Creek. This lot will contain unmanaged vegetation which will become a bushfire hazard to the proposed industrial development, increasing the area of Category 1 Bushfire Prone Vegetation along the eastern portion of the development site.

The proposed development, not being the subdivision of bushfire prone land for the purpose of rural residential or residential development or for the construction of a '*Special Fire Protection Purpose Development*' is not integrated development as defined by Section 91 of the *Environmental Planning & Assessment Act 1979*.

The subdivision of bushfire prone land for industrial purposes is assessed under the provisions of Section 79BA of the *Environmental Planning & Assessment Act 1979* and requires compliance with the aim and objectives of *Planning for Bushfire Protection 2006*.

This report has examined the objectives of *Planning for Bushfire Protection 2006*, in relation to the provision of bushfire protection measures to the future construction of industrial buildings on the lots created in the subdivision, and has provided recommendations on:

- The provision of a combination of defensible space [separation of the buildings from the bushfire hazard] and the construction standards to the buildings;
- Access and water supply provisions for fire-fighting operations;
- Management of the fire protection measures, including the defensible spaces; and
- Emergency management [evacuation] planning.

Table 5 summarises the extent to which the development conforms to the aim and objectives of *Planning for Bushfire Protection 2006* in order to address the SEARS.

Table 5. Compliance with the aim and objectives of *Planning for Bushfire Protection 2006*.

Bushfire Protection Measure	Compliance with the aim and objectives of <i>Planning for Bushfire Protection 2006</i>.
Defensible Space setbacks/construction standards to future industrial buildings	The combination of a Defensible Space and construction standards to the future industrial buildings located adjacent to the bushfire hazard addresses the requirement that the occupants are afforded adequate protection from exposure to a bushfire and that the buildings will not be exposed to material ignition.
Access for fire-fighting operations	The proposed public access roads comply with the specifications of Section 4.1.3(1) of <i>Planning for Bushfire Protection 2006</i> and provide satisfactory emergency access for fire-fighting appliances. Access for fire-fighting operations to be provided to the perimeter lots adjoining the bushfire hazard [located within the Defensible Space setback]. Positive Covenant to be recorded on title of each lot located adjacent to the bushfire hazard for access for fire-fighting operations.
Water supplies for fire fighting	Hydrant supply to be installed in accordance with AS 2419.1 - 2005 – additional fire-fighting ring main and Millcock Valves to be provided to buildings exposed to the bushfire hazard [Buildings 2C, 2D, 2E, 2F & 2G and Building 4A & 4G and Building 5A.
Management of the fire protection measures, including the defensible spaces	Each lot owner responsible for the maintenance of the recommended fire protection measures and provision of the fire access road. Positive Covenant to be recorded on title of each lot.
Emergency Management	Owners of buildings shall address protocols for the management of staff and site facilities during bushfire occurrences

The characteristics of the site, together with the recommendations contained in this assessment, identify that the site is suitable in terms of its intended use.

I therefore confirm that the proposed development complies with the aim and objectives of *Planning for Bushfire Protection 2006* and the deemed to satisfy requirements of Section 4.3.6(f) of *Planning for Bushfire Protection 2006* – Buildings of Class 5 to 8 and Class 10 of the Building Code of Australia in respect to the provision of asset protection zones [defendable spaces], access and water/utilities as required by the SEARS.



Graham Swain,
Managing Director,
Australian Bushfire Protection Planners Pty Limited.

SECTION 8 – Oakdale West Estate Masterplan showing Defendable Space widths to the future buildings.



REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- *Environmental Planning & Assessment Act – 1979*;
- *Rural Fires Act – 1997*;
- *Rural Fires Regulation 2013*;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2015*;
- *Bushfire Environmental Assessment Code 2006*;
- Building Code of Australia;
- Australian Standard A.S 3959-2009 “*Construction of Buildings in Bushfire Prone Areas*”;
- *Penrith City Council Bushfire Prone Land Map*.