



Bushfire Assessment

Burrah Park Concept & Stage 1

1953-2109 Elizabeth Drive,
Badgerys Creek

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(Ref: 24050)

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UniSuper Limited as Trustee for UniSuper and UniSuper Management Pty Limited
ISPT Pty Limited as trustee for The Industry Superannuation Property Trust No. 1
HB&B Property Pty Ltd

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Executive summary

This Bushfire Assessment Report has been prepared by Peterson Bushfire to accompany a State Significant Development Application (SSDA) for a Concept and Stage 1 SSDA for a Warehouse and Logistics Estate at 1953-2109 Elizaeth Drive, Badgerys Creek. The site is legally described as Lot 1 in Deposited Plan 1306448.

The applicant, the trustee for Burra Park Prop Trust 1 is a joint venture entity, with ISPT Core Fund and UniSuper each holding an equal share. HB&B and ISPT have been appointed as the development team to oversee the project's delivery. By leveraging the expertise of both organisations, the venture is well-positioned to maximise Burrah Park's value to the community.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD- 70316465).

This report concludes that with the implementation of the recommended bushfire protection measures listed below (and at Section 5), the proposal will comply with the SEARs relating to bushfire protection and the NSW Rural Fire Service document 'Planning for Bush Fire Protection 2019'.

Recommended bushfire protection measures are:

1. APZs as shown on Figure 5 are to be maintained between warehouses and bushfire hazards.
2. The design of internal public roads is to comply with the Acceptable Solutions for roads in bushfire prone areas as per Table 5.3b of PBP and repeated at Table 5 of this report. The roads impacted by an APZ from the riparian corridors are to comply with the standard of a 'perimeter road' and all remaining roads are to comply with the standard of a 'non-perimeter road'.
3. All warehouses adjoining a core vegetated riparian corridor where impacted by an APZ (refer to Figure 5) are to be separated from the corridor by a public perimeter road.
4. Future warehouses within lots adjoining the grassland hazard will require a minimum 6 m wide fire access road between the warehouse and the boundary if the grassland hazard remains.
5. The design and construction of Stage 1 warehouses is to comply with the relevant BAL in accordance with Australian Standard 'AS 3959-2018 Construction of buildings in bushfire prone areas' as mapped on Figure 6. Application of BALs to future warehouses across the Concept SSDA is to be assessed for each application.
6. Landscaping across the site is to comply with the principles listed in Section 4.3 of this report.
7. A 'Bushfire Emergency Management and Evacuation Plan' is to be prepared for each of the Stage 1 warehouses prior to occupation in accordance with the NSW Rural Fire

Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014). Consideration of plan preparation is to be made for each future warehouse application across the remainder of the site.

8. The Stage 1 warehouses are to have fire hydrants installed to comply with Australian Standard *AS 2419.1 – 2021 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419). Future warehouses across the remainder of the site will also require fire hydrants to be installed to comply with AS 2419.
9. Future warehouses are to have fire hydrants installed to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).
10. Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.
11. The storage of hazardous or combustible materials for the Stage 1 warehouses is not to occur within or adjacent an APZ. The same requirement applies to future warehouses across the remainder of the site.

1 Introduction

Street or property name:	1953-2109 Elizabeth Drive	
Suburb, town or locality:	Badgerys Creek	Postcode: 2555
Lot/DP no:	Lot 1 DP 1306448	
Local Government Area:	Penrith City Council	
Type of development:	Subdivision for industrial estate including three warehouses	

1.1 Background

Peterson Bushfire was commissioned by Richmond Bridge Burra Park 2 Pty Ltd as trustee for Burra Park Prop Trust 1, UniSuper Limited as Trustee for UniSuper and UniSuper Management Pty Limited, ISPT Pty Limited as trustee for The Industry Superannuation Property Trust No. 1, and HB&B Property Pty Ltd to prepare a Bushfire Assessment Report for a proposed industrial development on a lot identified as 'bushfire prone land'.

This report has been prepared to accompany an SSDA at 1953-2109 Elizabeth Drive, Badgerys Creek (SSD- 70316465). It presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation for development proposals on bushfire prone land.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 The subject site

Figure 1 shows the location of the site and provides regional context. The site is bordered by the M12 Motorway to the north and Elizabeth Drive to the south. Figure 2 shows an aerial of the developable area to be developed as part of this SSD. Key features of the site are summarised in Table 1 following Figure 2.



Figure 1: Location of the subject site and regional context (Source: Nearmap and Urbis)



Figure 2: Site context – Development area (Source: Nearmap and Urbis)

The key features of the site are summarised in Table 1 below.

Table 1: Key features of site and locality

Descriptor	Site detail
Land Configuration	<p>The site is legally described as Lot 1 in Deposited Plan 1306448.</p> <p>The site area is 171.84ha.</p> <p>The site generally slopes from high points adjacent to Elizabeth Drive (RL 75) to low points in the northeast corner (RL 40).</p> <p>Topography is characterised by a central ridgeline running from the central portion of the southern boundary towards the northeast.</p>
Surrounding Land Use	<p>Surrounding land uses include:</p> <ul style="list-style-type: none"> ▪ M12 Motorway and Metro (under construction) to the north and east with predominantly rural uses beyond. ▪ Western Sydney Airport is under construction opposite the site on the southern side of Elizabeth Drive. ▪ Rural residential uses on the opposite side of Cosgroves Creek to the west.
Site Access and road network	<p>The site is accessible from Elizabeth Drive, a State arterial road aligned in an east-west direction adjacent to the southern boundary.</p>
Easements and Covenants	<p>An easement for electricity purposes is located on the northern side of the site.</p>
Services	<p>The site has power and water available.</p>
Acid Sulfate Soils	<p>Not mapped.</p>
Contamination	<p>The site has the potential to be contaminated, due to the current agricultural land use. A Detailed Site Investigation has been submitted as part of the SSDA lodgement.</p> <p>As per previous Detailed Site Investigation prepared by Douglas Park, the site is appropriate for proposed development subject to remediation works undertaken.</p>
Stormwater and Flooding	<p>As indicated in the <i>Wianamatta (South) Creek Flood Study – Existing Conditions (Prepared by Advisian for Infrastructure NSW, November 2020)</i> the site is subject to 1:100 ARI (average recurrence interval) along the main creek lines of Cosgroves and Badgerys Creek.</p>

Descriptor	Site detail
Bushfire Prone Land	The site is classified as bushfire prone land. This bushfire report has been prepared to respond the land classification.
Flora and Fauna	The site currently consists of cleared rural land with the occasional scattered Cumberland Plain Woodland, trees, weeds, and shrubs. Most of the site is certified under the Cumberland Plain Conservation Plan (CPCP).
Riparian Corridor	Cosgroves Creek and Oaky Creek run along the western part of the site, while Badgerys Creek runs along the eastern side. The proposed development is designed to generally avoid land zoned ENZ. The site contains multiple hydrolines and dams.
Aboriginal Heritage	Aboriginal objects have been identified along the Oakey Creek – Cosgroves Creek corridor along the entirety of the western study area boundary.
European Heritage	<p>The site does not contain any State or locally significant heritage items.</p> <p>The site does form part of the former CSIRO McMaster Field Station which is identified as a potential heritage item under the Precinct Plan.</p> <p>The site is adjacent to the McGarvie Smith Farm which is identified as a local Heritage Item under the <i>State Environmental Planning Policy (Precincts—Western Parkland City) 2021</i>.</p>

1.3 Development proposal

The application seeks consent for a concept plan including future development lots and building footprints. The development also seeks consent for the Stage 1 works which will include bulk earthworks across the site, infrastructure delivery, road access/intersections, internal road construction, civil infrastructure and utilities, stormwater infrastructure works and the construction of three (3) warehouse buildings. A development site plan showing the proposed development is included as Figure 3.

Specifically, development consent is sought for:

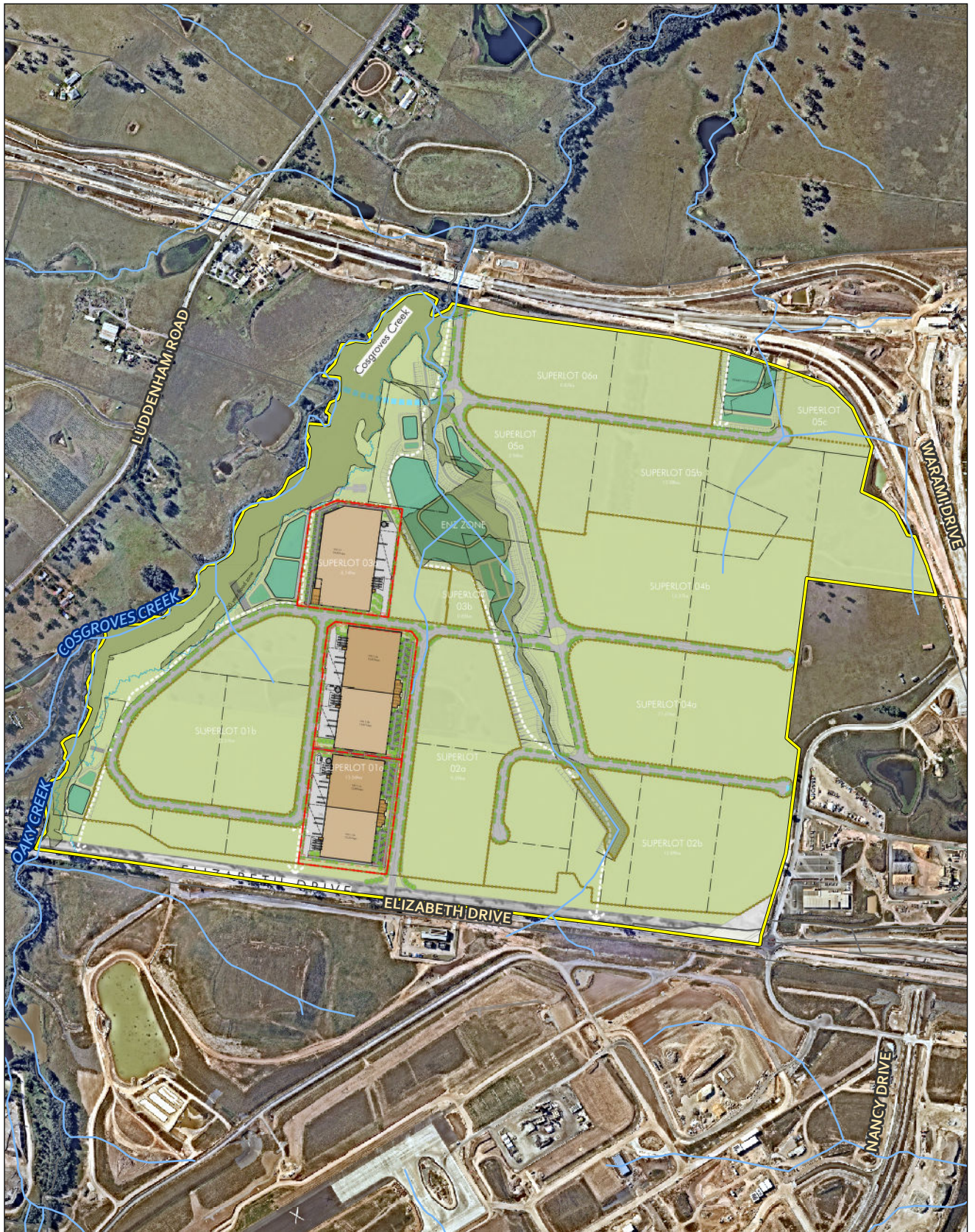
- Concept Plan:
 - Concept Masterplan for the Burrah Park comprising warehouse buildings, internal road network layout, building locations, GFA, car parking, concept landscaping, building heights, setbacks, signage strategy, public art strategy, design excellence strategy and Connection with Country framework.
 - Developable area 131.45 ha.
 - Total approximate GFA 63.00 ha.
- Stage 1 – site preparation works:
 - Demolition and removal of existing structures and vegetation.
 - Heritage salvage works (if applicable).
 - Construction of roads, access infrastructure, including a signalised intersection with Elizabeth Drive.
 - Dam de-watering and de-commissioning.
 - Bulk earthworks, cut and fill, benching, battering and retaining walls.
 - Lead in infrastructure, utilities and servicing.
 - Stormwater infrastructure including construction of Sydney Water basins and Water Sensitive Urban Design (WSUD) elements.
- Stage 1 – Development:
 - Construction and fit out of three warehouse buildings and ancillary office space.
 - Stormwater management, fencing and landscaping.
 - Internal road network, active transport network, public domain and open space.
 - Subdivision.
 - Estate and on lot signage.

- Total approximate GFA 85,864 sqm.
 - Warehouse 1.1 – 26,860 sqm GFA.
 - Warehouse 1.2 – 31,443 sqm GFA.
 - Warehouse 3.1 – 27,561 sqm GFA.




This report has been prepared in response to the requirements contained within the SEARs dated 22 May 2024 and issued for the SSDA (SSD-70316465). Specifically, this report has been prepared to respond to the SEARs requirement listed in Table 2 below.

Table 2: SEARs compliance table

SEARs Key Issue	Description of requirement	Section of this report
Bush Fire	<p><i>A bush fire assessment report that addresses the aims and objectives of Planning for Bushfire Protection 2019 and includes:</i></p> <ul style="list-style-type: none"> <i>- Details of proposed operational access for emergency services personnel</i> <i>- Details of emergency and evacuation arrangements for occupants/visitors</i> <i>- A Bush Fire Emergency Management and Evacuation Plan prepared in accordance with relevant RFS guidance.</i> 	<p>Section 3 outlines the assessment of bushfire protection measures.</p> <p>Section 4 summarises how the proposal complies including recommendations to ensure compliance.</p>



Legend

-  Watercourse
-  Subject Land
-  Cadastre



Date: 15/08/2024



Figure 3: The Proposal

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap

1.4 Assessment requirements

The subject site is identified as bushfire prone land as shown by the bushfire prone land mapping on Figure 4. The development does not involve habitable uses (Class 1, 2 or 3) or Special Fire Protection Purpose (SFPP) development as defined by 'Planning for Bush Fire Protection 2019' (PBP). Section 8.3 of PBP prescribes the assessment methodology and bushfire protection measures for other uses that do not involve a habitable dwelling or SFPP development.

In order to comply with PBP, the following conditions must be met:

- *satisfy the aim and objectives of PBP outlined in Chapter 1;*
- *consider any issues listed for the specific purpose for the development set out in this chapter; and*
- *propose an appropriate combination of bushfire protection measures.*

It is also important to ensure that a 'defendable space' is provided for the size and scale of the development.

The aim and objectives of PBP are listed below:

1. *The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.*
2. The objectives are to:
 - a) *afford buildings and their occupants protection from exposure to a bush fire;*
 - b) *provide for a defendable space to be located around buildings;*
 - c) *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;*
 - d) *ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*
 - e) *provide for ongoing management and maintenance of BPMs; and*
 - f) *ensure that utility services are adequate to meet the needs of firefighters.*

Section 8.3.1 of PBP lists the issues specific to Buildings Class 5-8. As stated in PBP, the NCC does not provide for any bushfire specific performance requirements for these building classes. As such the Asset Protection Zones (APZ) and Bushfire Attack Levels (BAL) do not apply as deemed-to-satisfy provisions for bushfire protection. The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bushfire protection (i.e. BALs) are to be considered on a case-by-case basis in order to satisfy the aim and objectives of PBP.

The specific issues to be assessed for Buildings Class 5-8 are in relation to access, water supply and services, and emergency and evacuation planning as follows:

1. *Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;*
2. *Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;*
3. *Provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and*
4. *Provide for the storage of hazardous materials away from the hazard wherever possible.*

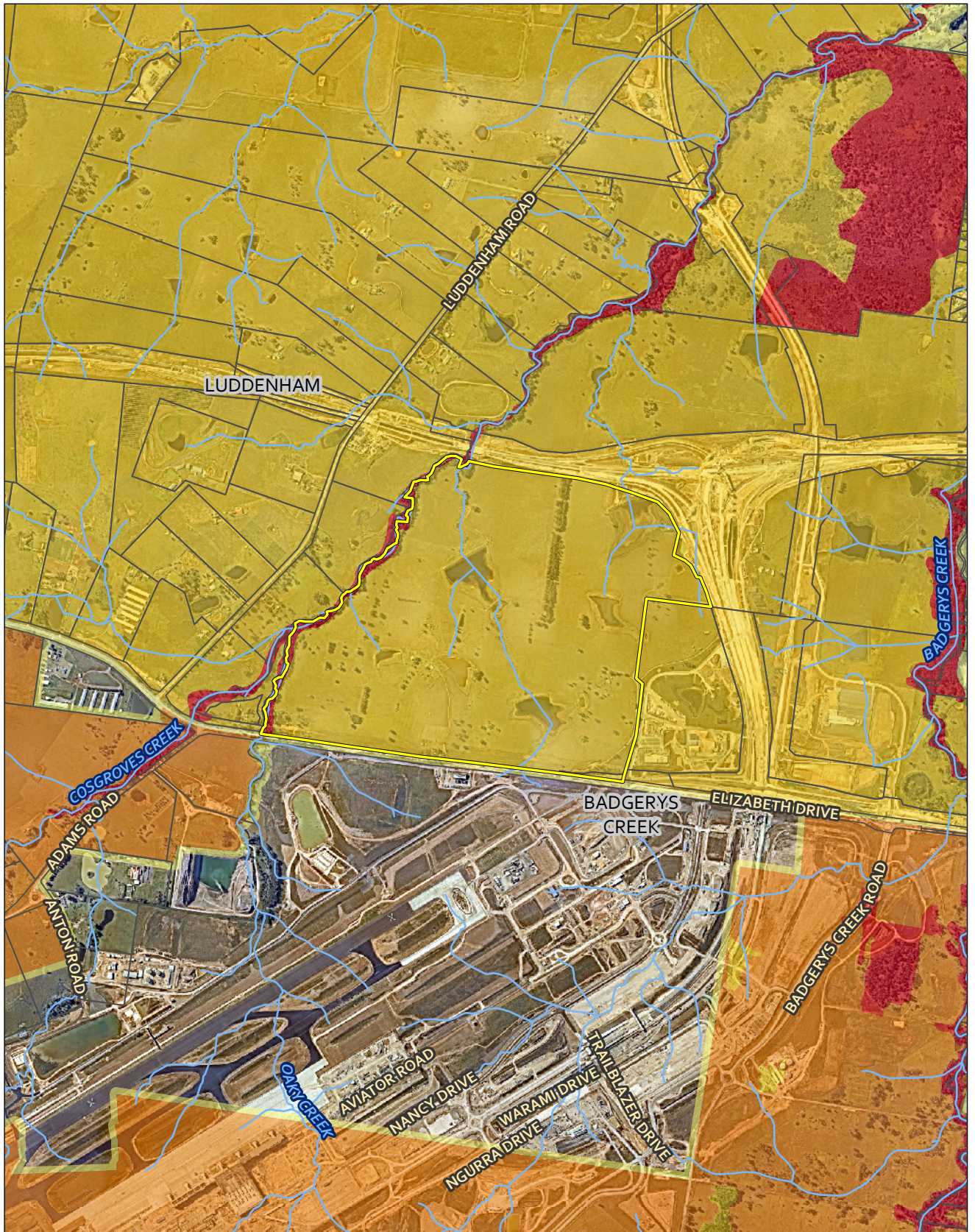
2 Bushfire prone land

The purpose of bushfire prone land mapping is to identify lands that may be subject to bushfire risk based simply of the presence of vegetation that could act as a hazard. The maps are a planning tool used to trigger further detailed assessment. They do not present a scalable measure of hazard, threat or risk. These parameters are to be determined under further assessment in accordance with PBP (i.e. this Bushfire Assessment Report).








The bushfire prone land mapping presented in Figure 4 identifies the presence of bushfire prone vegetation throughout the site and surrounding lands. Any development proposal within a lot containing mapped bushfire prone land (i.e. bushfire prone property) is to comply with the requirements of PBP.

The maps are produced at a broad scale by desk-top Geographic Information Systems (GIS) covering an entire Local Government Area (LGA). They are often conservative and are designed to identify any potential bushfire threat of all levels. The identification of hazards is discussed in the following Section 3.

Most importantly, the identification of bushfire prone land does not preclude development. The maps are not prescriptive and simply trigger further detailed assessment.



Legend

-  Watercourse
-  Subject Site
-  Cadastre
- Bushfire Prone Land**
-  Vegetation Buffer
-  Vegetation Category 1
-  Vegetation Category 2
-  Vegetation Category 3



Date: 19/06/2024



Figure 4: Bushfire Prone Land

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap

3 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures. This section provides a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

The hazard assessment was undertaken in accordance with PBP site assessment methodology using desk-top assessment methods assisted by Nearmap aerial imagery (29 May 2024), contour layer with 2 m intervals, and vegetation mapping layers available on NSW Government online spatial viewers.

3.1 Predominant vegetation

In accordance with PBP the predominant vegetation class has been determined for a distance of at least 140 m out from the proposed lots. There are three vegetation structural formations that may present a bushfire hazard to the proposed development as listed below and mapped on Figure 5.

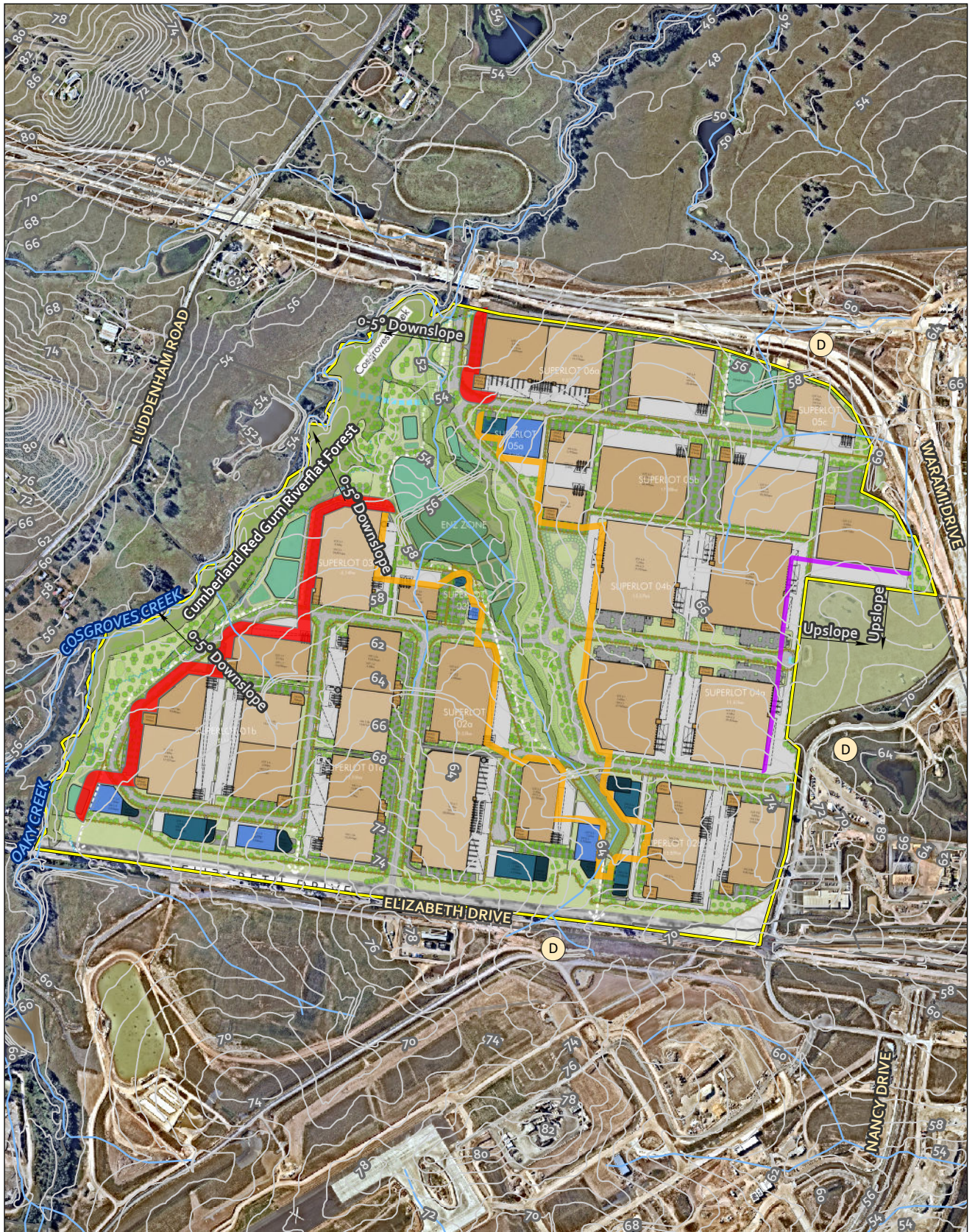
- Forest: Riparian vegetation along Oakey Creek and Cosgroves Creek forming the western edge of the site consists of the Cumberland Red Gum Riverflat Forest community and is classified as 'forest' in accordance with PBP. The riparian vegetation will be eventually embellished along the corridor within the site.
- Low hazard: A tributary of Cosgroves Creek flows through the centre of the site and any future embellishment with core vegetated vegetation would be done so in line with the Cumberland Red Gum Riverflat Forest community. However, the core vegetated riparian corridor would not be wider than 50 m and can therefore be classified as 'low hazard' vegetation in accordance with Appendix A1.11.1 of PBP.
- Grassland: A small triangular area of unmanaged land adjoins the eastern side of the site which is classified as 'grassland'.

With the exception of the small grassland area to the east, the site boundaries to the north, east and south adjoin developed lands that do not present a hazard for at least 50 m for grassland hazards and 100 m for other bushfire hazards such as forest and woodland.

3.2 Effective slope

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most significantly influence fire behaviour where the hazard has been identified within 100 m of the site. The effective slope was measured from a 2 m contour layer as shown on Figure 5.

Both riparian corridors are situated on a slope in the PBP slope class of 'downslope 0-5 degrees' and the grassland to the east is on a slope within the slope class of 'upslope/flat'. The slope classes are mapped on Figure 5.



Legend

- Contour - 2m
- Watercourse
- Subject Land
- Cadastre

Vegetation Formation

- Grassland
- Developed Land

Asset Protection Zone

- Asset Protection Zone - 10m
- Asset Protection Zone - 14m
- Asset Protection Zone - 29m



Date: 2/10/2024



Figure 5: Bushfire Hazard Analysis and Asset Protection Zone (APZ) Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap

4 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for development proposals on bush fire prone land. The measures required to be assessed for the development type proposed are listed in Tables 3 and 4 below and are discussed in detail in the remainder of this section.

Table 3: Generic PBP bushfire protection measures

Aim & Objectives (PBP Section 1.1)	Measures
Aim	
<i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i>	Achieving the objectives below will satisfy the aim.
Objectives	
1. <i>afford buildings and their occupants protection from exposure to a bush fire;</i>	<ul style="list-style-type: none"> • Building setbacks from bushfire hazards. • Building construction specifications or standards. • Defendable space (APZ) - Providing fire-fighter access between buildings and the bushfire hazard.
2. <i>provide for a defendable space to be located around buildings;</i>	
3. <i>provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>	
4. <i>ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>	<ul style="list-style-type: none"> • Access to public road • Adequacy of internal property roads • Assessment of perimeter access
5. <i>provide for ongoing management and maintenance of BPMs; and</i>	<ul style="list-style-type: none"> • Design and layout to ensure maintenance can occur by occupants without reliance on other parties

Aim & Objectives (PBP Section 1.1)	Measures
6. <i>ensure that utility services are adequate to meet the needs of firefighters.</i>	<ul style="list-style-type: none"> • Water supply for fire-fighting including provisions for hydrants or static water supplies. • Ensuring installation of electricity and gas supplies do not contribute to the risk of fire to a building.

Table 4: Specific PBP bushfire protection measures for buildings Class 5-8

Objectives (PBP Section 8.3.1)	Measures
1. <i>Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.</i>	<ul style="list-style-type: none"> • Access to public road • Adequacy of internal property roads including assessment of perimeter access • Defendable space - Providing fire-fighter access between buildings and the hazard
2. <i>Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.</i>	<ul style="list-style-type: none"> • Preparation of Bushfire Emergency Management and Evacuation Plan prior to occupation if required • Adequacy of internal property roads
3. <i>Provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.</i>	<ul style="list-style-type: none"> • Water supply for fire-fighting including provisions for hydrants or static water supplies. • Ensuring installation of electricity and gas supplies do not contribute to the risk of fire to a building.
4. <i>Provide for the storage of hazardous materials away from the hazard wherever possible.</i>	<ul style="list-style-type: none"> • Appropriate storage of hazardous materials away from bushfire hazards.

4.1 Access including defensible space and Asset Protection Zones (APZ)

4.1.1 Alternate access to the surrounding public road network

The site will initially be accessed from Elizabeth Drive to the south. Additional access points will eventually be realised to the north and east as development of adjoining lands occur. Reliance on a single access point for the early stages of the development, including Stage 1, is acceptable in this case due to the predominance of developed lands surrounding and lack of bushfire hazards other than undeveloped paddocks. The access road to Elizabeth Drive to the south will be hundreds of metres from any bushfire hazards therefore making it a safe thoroughfare to Elizabeth Drive and one that should not be disrupted by the impacts of bushfire.

The proposed access to the surrounding public road network complies with the aim and objectives of PBP.

4.1.2 Internal roads

The design of the internal public roads is to comply with the Acceptable Solutions for roads in bushfire prone areas as per Table 5.3b of PBP. The design specifications are repeated in Table 5 below.

Those roads that are impacted by an APZ from the riparian corridors are classed as 'perimeter roads'. The remaining roads are classed as 'non-perimeter roads'.

Table 5: Acceptable Solutions for public road access (as per PBP Table 5.3b)

Access (General Requirements)
a) Property access roads are two-wheel drive, all weather roads.
b) Perimeter roads are provided for residential subdivisions of three or more allotments.
c) Subdivisions of three or more allotments have more than one access in an out of the development.
d) Traffic management devices are constructed to not prohibit access by emergency service vehicles.
e) Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.
f) All roads are through roads.
g) Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end.
h) Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.
i) Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.
j) One way public access roads are no less than 3.5 m wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.

-
- k) The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); Bridges/causeways to clearly indicate load rating.
-
- l) Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.
-
- m) Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 – Fire hydrant installations: System design, installation and commissioning.
-
- n) There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.
-

Perimeter roads

-
- o) two-way sealed roads;
-
- p) minimum 8 m carriageway width kerb to kerb;
-
- q) parking is provided outside of the carriageway width;
-
- r) hydrants are located clear of parking reserves;
-
- s) through roads, and these are linked to the internal road system at an interval of no greater than 500 m;
-
- t) curves of roads have a minimum inner radius of 6 m;
-
- u) the maximum road grade is 15° and average grade of not more than 10°;
-
- v) the road crossfall does not exceed 3°;
-
- w) a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.
-

Non-perimeter roads

-
- x) minimum 5.5 m carriageway width kerb to kerb;
-
- y) parking is provided outside of the carriageway width;
-
- z) hydrants are located clear of parking reserves;
-
- aa) through roads, and these are linked to the internal road system at an interval of no greater than 500 m;
-
- bb) curves of roads have a minimum inner radius of 6 m;
-
- cc) the road crossfall does not exceed 3°;
-
- dd) a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.
-

4.1.3 Defendable space (Asset Protection Zone – APZ)

For habitable development types such as dwellings, the application of a bushfire hazard building setback (i.e. APZ) is related to the vulnerability of an asset typically in terms of combustibility of external materials or the nature of the occupants. The resulting APZ dimension would stipulate a building construction standard (i.e. BAL) under Australian Standard 'AS 3959-2018 Construction of buildings in bushfire-prone areas'.

As the land use does not include a dwelling or habitable building, PBP does not prescribe an APZ dimension. The general fire safety requirements of the NCC are accepted as adequate bushfire protection for the developments involving Class 5 to 8 buildings.

However, PBP does require the consideration of a managed hazard-separation area for fire-fighting purposes referred to as 'defendable space'. A defendable space is an area between the building and the bushfire hazard that provides an environment in which fire-fighters can undertake property protection after the passage of a bushfire with some level of safety. The defendable space dimension is defined by the ability to gain access around an asset and conduct defensive fire-fighting operations. Relying on a defendable space in lieu of an APZ is deemed acceptable whereby construction satisfies NCC structural fire requirements.

For the Burrah Park development, it is proposed to have a defendable space that equals the APZ specifications of PBP Table A1.12.2. This will facilitate construction at a maximum BAL of BAL-29 and will avoid construction in the higher BALs (i.e. BAL-40 and BAL-FZ). This will ensure adequate separation from the fire source and greater flexibility in design and construction methods for warehouses. The proposed defendable space is listed in Table 6 below and mapped on Figure 5.

A defendable space is required for all development adjoining the riparian corridors and the grassland adjoining the eastern boundary. For the riparian corridors, the defendable space will consist of the combination of the building setbacks within lots and the perimeter road. Any managed open space within the parkland beyond the perimeter road will complement the minimum defendable space. For the grassland hazard to the east, the defendable space will consist of a building setback from the site boundary adjoining the hazard and is to feature a 6m wide fire access road.

Table 6: APZ calculation

Direction	Vegetation	Slope classes	Proposed APZ (BAL-29)
Western riparian corridor	Forest	Downslope 0-5°	29 m
Internal riparian corridor	Low hazard	Downslope 0-5°	14 m
Eastern boundary	Grassland	Upslope/Flat	10 m

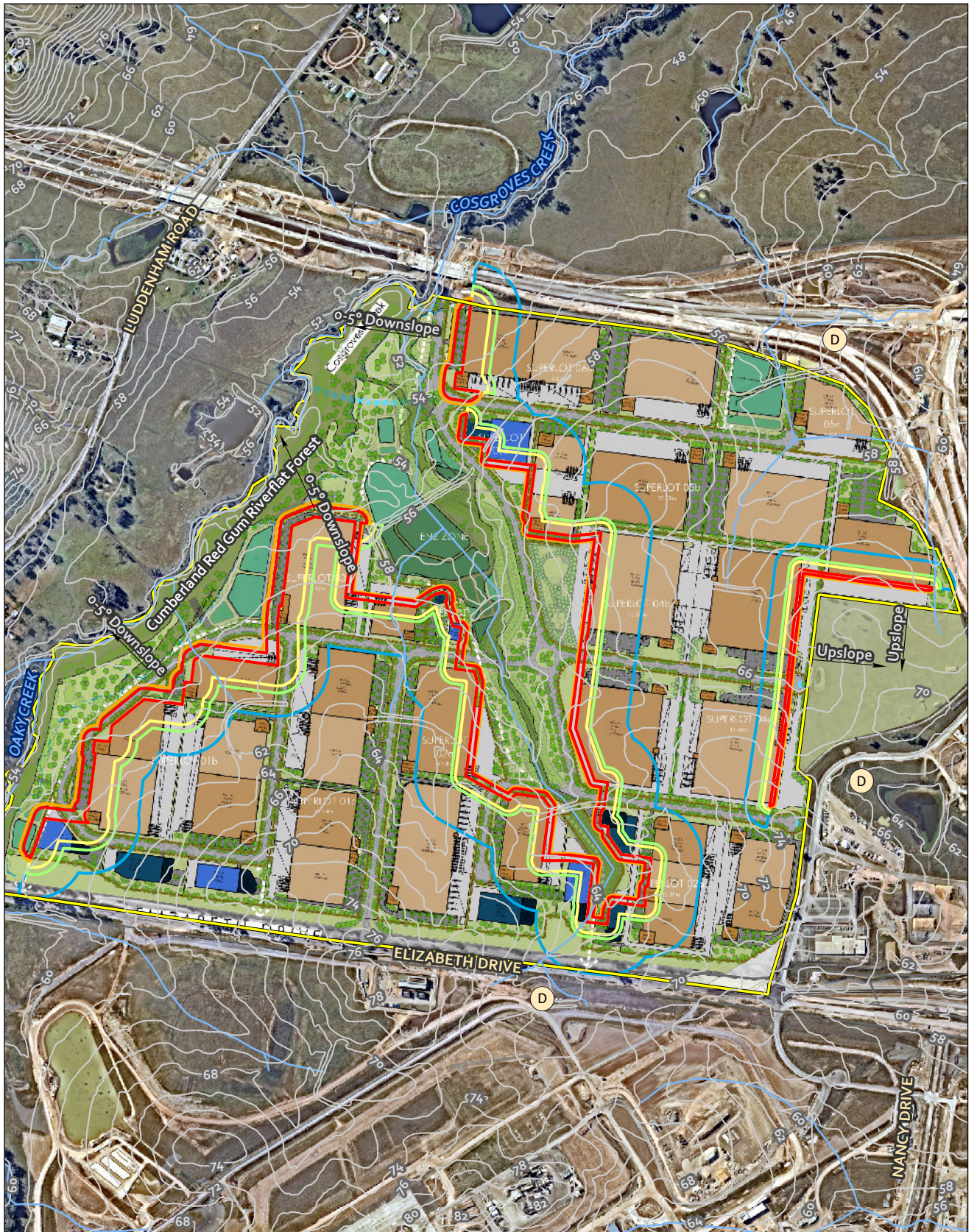
4.2 Construction standards

As introduced in Section 1.4, building construction provisions for bushfire protection within Australian Standard 'AS 3959-2018 Construction of buildings in bushfire-prone areas' (AS 3959) do not apply to developments of the type proposed as a deemed-to-satisfy requirement under the NCC. Due to the type of development and compliance with NCC requirements for building and structural fire, it is generally accepted that buildings will survive bushfire attack. In addition, staff will not reside at the site and will be familiar with evacuation routes.

However, as stated within Section 8.3.1 of PBP, consideration of building construction provisions is required to satisfy the aim and objectives of PBP and the assessment of which is to be made on a case-by-case basis.

The Bushfire Attack Levels (BAL) impacting the proposal are mapped on Figure 6.

The design and construction of Stage 1 warehouses is to comply with the relevant BAL as shown on Figure 6. Application of BALs to future warehouses across the Concept SSDA is to be assessed for each application.



Legend

- Contour - 2m
- Watercourse
- Subject Land
- Cadastre

Vegetation Formation

- Grassland
- Developed Land

Bushfire Attack Level (BAL)

- BAL - Flame Zone

- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5



Date: 2/10/2024



Figure 6: Bushfire Attack Level (BAL)

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap

4.3 Landscaping and vegetation management

Proposed landscaping estate-wide and within Stage 1 is to be designed, installed and maintained to achieve the performance of an Inner Protection Area (IPA) standard as described within Appendix 4 of PBP. To achieve this, the following landscaping principles have been designed specifically for the site based on the bushfire risk and the proposed uses:

a) Within the APZ (areas mapped as BAL-FZ and BAL-40 on Figure 6):

- i. Tree canopy cover should be less than 15% at maturity.
- ii. Trees at maturity should not touch or overhang the building.
- iii. Tree canopies should be separated by minimum 2 m.
- iv. Predominance of turf or pavement in the understory.
- v. Shrubs should not form more than 10% ground cover.
- vi. Create large discontinuities or gaps in shrubbery and planting beds to slow down or break the progress of fire towards buildings.
- vii. Shrubs should not be located under trees.
- viii. Grass should be kept mown and fallen leaves and other vegetation debris should be removed from the ground.
- ix. Park infrastructure such as play equipment, picnic facilities (e.g. seating, tables, BBQs and the like), and artistic installations are permitted.
- x. Landscape design ensures there is no specific maintenance work required in addition to what is normally expected in a park or streetscape.
- xi. Landscape design/controls (e.g. hard edges, bollards, path etc) to prevent riparian bushland regenerating into the APZ.

b) From APZ and outwards 100 m (areas mapped as BAL-29, BAL-19 and BAL-12.5 on Figure 6)

- i. Tree canopy cover should not exceed 40% at maturity.
- ii. Trees at maturity should not touch or overhang the building
- iii. Tree canopies should be separated by minimum 2 m between the building and the boundary. Canopy separation is not required parallel to the building such as along the street or boundaries where screening is required.
- iv. Garden beds are defined, narrow, separated and spread out with an avoidance of large mass-planting beds.
- v. Garden beds are separated from each other and the building by turf and/or pavement.

- vi. Garden beds are not to be within 1 m of a building.
- vii. Planting choice within garden beds to be low-lying with an allowance for taller shrubbery for corridors of visual screening parallel to the building such as along boundaries.

c) Beyond 100 m from the hazard (areas not impacted by a BAL, Figure 6):

- i. There are no specific landscaping controls for the purpose of bushfire protection for areas beyond 100 m of the bushfire hazard.

4.4 Emergency and evacuation

A 'Bushfire Emergency Management and Evacuation Plan' may be prepared for facilities within bushfire prone areas depending on the level of bushfire risk. A plan is prepared in accordance with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014).

Although the bushfire risk at the site is low, the SEARs call for the preparation of a plan (refer to SEARs request listed in Table 1). Therefore, an individual plan is to be prepared for each of the Stage 1 warehouses prior to occupation.

Consideration of plan preparation is to be made for each future warehouse application across the remainder of the area.

4.5 Water supply and other utilities

4.5.1 Water supply

The Stage 1 warehouses are to have fire hydrants installed to comply with Australian Standard AS 2419.1 – 2021 *Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).

Future warehouses across the remainder of the site will also require fire hydrants to be installed to comply with AS 2419.

4.5.2 Electricity supply

The supply of electricity will be provided underground. Compliance is therefore achieved.

4.5.3 Gas supply

Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596-2014 *The storage and handling of LP gas*.

4.6 Hazardous materials

The storage of hazardous or combustible materials for the Stage 1 warehouses is not to occur within or adjacent an APZ. The same requirement applies to future warehouses across the remainder of the site.

5 Conclusion and recommendations

The proposal consists of a concept plan to facilitate future development lots and building footprints as well as Stage 1 works featuring three warehouses, roads, infrastructure and site works. The bushfire hazard consists of riparian corridors which will undergo future embellishment and adjoining undeveloped paddocks.

The site layout can accommodate the recommended defendable space (APZs) which will ensure warehouse construction will not exceed BAL-29, and the proposed landscaping strategy has been designed based on the bushfire risk. The proposed public road network will provide an adequate and compliant level of access including defendable space to the identified hazards.

PBP requires an assessment of the proposal against the aim and objectives of PBP and the four specific objectives for buildings Class 5-8. Tables 7 and 8 below summarise how the objectives have been satisfied. This assessment concludes that all objectives are satisfied with the adoption of the recommendations listed following Tables 7 and 8.

Table 7: Compliance with PBP aim and objectives

Aim & Objectives (PBP Section 1.1)	Compliance statement
Aim	
<i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i>	Achieving the objectives below will satisfy the aim.
<i>Afford buildings and their occupants protection from exposure to a bush fire;</i>	<u>Section 4.1.3 and 4.2 demonstrates compliance.</u> Perimeter public road to Stage 1 and 6 m wide fire access road to future warehouses as well as BAL application.
<i>Provide for a defendable space to be located around buildings;</i>	<u>Section 4.1.3 demonstrates compliance.</u> Perimeter public road to Stage 1 and 6 m wide fire access road to future warehouses.
<i>Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>	<u>Section 4.1.3 and 4.2 demonstrates compliance.</u> APZ based on BAL-29 limit as well as BAL application.

Aim & Objectives (PBP Section 1.1)	Compliance statement
<i>Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>	<u>Section 4.1.1 and 4.1.2 demonstrates compliance.</u> Access to surrounding public road network is acceptable given nature of bushfire risk. Public road design is to comply with PBP Acceptable Solutions.
<i>Provide for ongoing management and maintenance of BPMS; and</i>	<u>Section 4.3 demonstrates compliance.</u> Recommendation for compliant landscaping.
<i>Ensure that utility services are adequate to meet the needs of firefighters.</i>	<u>Section 4.5 demonstrates compliance.</u> Recommendation for compliant hydrant coverage and installation of gas supplies (if proposed).

Table 8: Compliance with PBP Section 8.3.1 objectives

Objectives (PBP Section 8.3.1)	Compliance statement
<i>Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation</i>	<u>Section 4.1.1 and 4.1.2 demonstrates compliance.</u> Access to surrounding public road network is acceptable given nature of bushfire risk. Public road design is to comply with PBP Acceptable Solutions.
<i>Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development</i>	<u>Section 4.4 demonstrates compliance.</u> Bushfire Emergency Management and Evacuation Plan to be prepared prior to occupation of warehouses.
<i>Provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building</i>	<u>Section 4.5 demonstrates compliance.</u> Recommendation for compliant hydrant coverage and installation of gas supplies (if proposed).
<i>Provide for the storage of hazardous materials away from the hazard wherever possible</i>	<u>Section 4.6 demonstrates compliance.</u> Storage of hazardous or combustible materials is not to occur within or adjacent the APZ.

The following recommendations were made within this report:

1. APZs as shown on Figure 5 are to be maintained between warehouses and bushfire hazards.
2. The design of internal public roads is to comply with the Acceptable Solutions for roads in bushfire prone areas as per Table 5.3b of PBP and repeated at Table 5 of this report. The roads impacted by an APZ from the riparian corridors are to comply with the standard of a 'perimeter road' and all remaining roads are to comply with the standard of a 'non-perimeter road'.
3. All warehouses adjoining a core vegetated riparian corridor where impacted by an APZ (refer to Figure 5) are to be separated from the corridor by a public perimeter road.
4. Future warehouses within lots adjoining the grassland hazard will require a minimum 6 m wide fire access road between the warehouse and the boundary if the grassland hazard remains.
5. The design and construction of Stage 1 warehouses is to comply with the relevant BAL in accordance with Australian Standard 'AS 3959-2018 Construction of buildings in bushfire prone areas' as mapped on Figure 6. Application of BALs to future warehouses across the Concept SSDA is to be assessed for each application.
6. Landscaping across the site is to comply with the principles listed in Section 4.3 of this report.
7. A 'Bushfire Emergency Management and Evacuation Plan' is to be prepared for each of the Stage 1 warehouses prior to occupation in accordance with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014). Consideration of plan preparation is to be made for each future warehouse application across the remainder of the site.
8. The Stage 1 warehouses are to have fire hydrants installed to comply with Australian Standard *AS 2419.1 – 2021 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419). Future warehouses across the remainder of the site will also require fire hydrants to be installed to comply with AS 2419.
9. Future warehouses are to have fire hydrants installed to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).
10. Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.
11. The storage of hazardous or combustible materials for the Stage 1 warehouses is not to occur within or adjacent an APZ. The same requirement applies to future warehouses across the remainder of the site.

In the author's professional opinion, with the adoption of the above recommendations, the proposed development will comply with *Planning for Bush Fire Protection 2019* (PBP) and the SEARs.



David Peterson
Director



References

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