Macquarie Park Innovation Precinct: Strategic Bushfire Study

Department of Planning, Housing and Infrastructure

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Template 2.8.1

Executive Summary

This Strategic Bushfire Study has been prepared by Eco Logical Australia (ELA) on behalf of the Department of Planning, Housing and Infrastructure. The Study assesses the Master Plan for the Macquarie Park Innovation Precinct against the bushfire strategic planning requirements of *Planning for Bushfire Protection* (PBP) 2019. The Study was compiled to comply with the requirements set out in Chapter 4 (*Strategic Planning*) of PBP.

The technical assessment considered the broader bushfire landscape and risk profile for the study area, along with the feasibility of the provision of bushfire protection measures within the Master Plan, or where appropriate, the feasibility of relevant aspects for future planning stages. In consideration of the Master Plan with regard to the strategic planning principles of PBP, a bushfire risk assessment was undertaken, which included an assessment of the broader bushfire landscape, bushfire weather, potential fire behaviour and relevant scenarios of fire attack on the subject site. A land use evaluation was also conducted to consider the appropriateness of future land uses given the bushfire risk context, and the ability for future development to comply with requirements set out in PBP, with bushfire protection measures provisioned in the Master Plan.

The key finding of the study is that the residual risk influencing the site after the application of bushfire protection measures, is not considered inappropriate for the type and level of future development contemplated. However, some constraints have been identified and opportunity for further resilience should be considered, particularly in relation to Neighbourhood 7 and legacy development.

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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BFSA	Bush Fire Safety Authority
BFPL	Bush Fire Prone Land
BPM	Bushfire Protection Measures
DPHI	Department of Planning, Housing and Infrastructure
EP&A Act	*Environmental Planning and Assessment Act 1979*
FFDI	*Forest Fire Danger Index*
LEP	Local Environment Plan
PBP	Planning for Bush fire Protection 2019 and Addendum to Planning for Bush Fire Protection 2022
RF Act	*Rural Fires Act 1997*
RF Reg	*Rural Fires Regulation 2022*
RFS	NSW Rural Fire Service
SBS	Strategic Bushfire Study

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1. Overview

The Department of Planning, Housing and Infrastructure (DPHI) is leading the State-led rezoning process to implement the recommendations of the Macquarie Park Innovation Precinct Place Strategy (Place Strategy) which seeks to guide the future development within the Precinct. An urban design and planning package is being prepared and this Strategic Bushfire Study (SBS) has informed the design and package and is required to accompany the Planning Proposal. The SBS is necessary to identify, assess and document the bushfire risk associated with future rezoning and development of land within the Macquarie Park Innovation Precinct, and to ensure the statutory requirements for bushfire protection are met.

This report evaluates whether the Master Plan facilitates future development that can comply with the bushfire protection requirements prescribed by *Planning for Bushfire Protection* (PBP) (RFS 2019 and RFS 2022) and aligns with the bushfire strategic planning principles. Furthermore, it provides recommendations to guide the incorporation of bushfire protection in subsequent stages of planning.

1.1. Subject Site

The Macquarie Park Innovation Precinct is located within the City of Ryde Local Government Area, near the M2 motorway, Lane Cove National Park, and Macquarie University (Figure 1). The land is currently zoned predominantly as E2 Commercial Centre and E3 Productivity Support, with small areas of RE1 Public Recreation and SP2 Infrastructure under the Ryde Local Environmental Plan (LEP) 2014. The subject land contains a range of existing landuses and developments already in place. The development surrounding the site consists primarily of established low density residential, business, and industrial land uses, with small areas of established high density residential and Lane Cove National Park to the north and east.

1.2. Planning Context

It is envisaged that the rezoning proposal would result in an amendment to the existing Ryde LEP (2014) to enable the transition to an innovation precinct. As shown in Figures 2 and 4, it is contemplated that areas of E2 (Commercial Centre) within Neighbourhood 7 would be rezoned to E3 (Productivity Support), with smaller sections of E3 (Productivity Support) to be rezoned into MU1 (Mixed Use) and RE1 (Public Recreation). Within Neighbourhoods 3, 4, 5, and 6, some areas of E3 (Productivity Support) would be rezoned to MU1 (Mixed Use). Additional smaller areas of SP2 (Infrastructure) and RE1 (Public Recreation) are also proposed within the Subject Site.

Within the precinct, not all areas are proposed to be rezoned or are subject to proposed land use changes as shown in Figure 4. Therefore a hazard assessment for these areas has not been undertaken or bush fire protection measures considered.

1.3. Bushfire Prone Land Status

Small parts of the Subject Land and some adjoining land is currently mapped as bush fire prone land (BFPL) (Figure 3) as per The City of Ryde and neighbouring Ku-ring-gai Council Bush Fire Prone Land (BFPL) maps as published by DPHI on the NSW planning portal (DPHI, 2024).

Figure 1: Subject Site

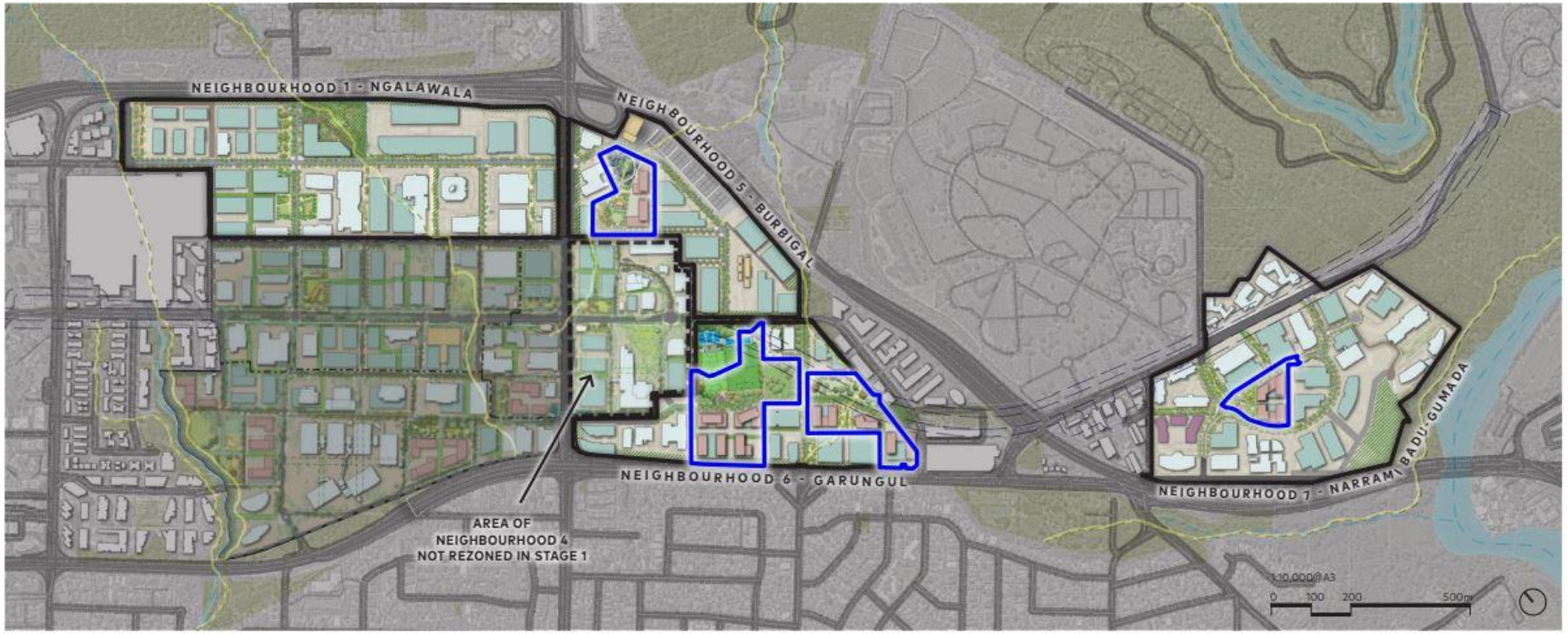

Figure 2: Indicative Master Plan (AJC Architects; Tract Consultants; NSW Department of Planning 2024)

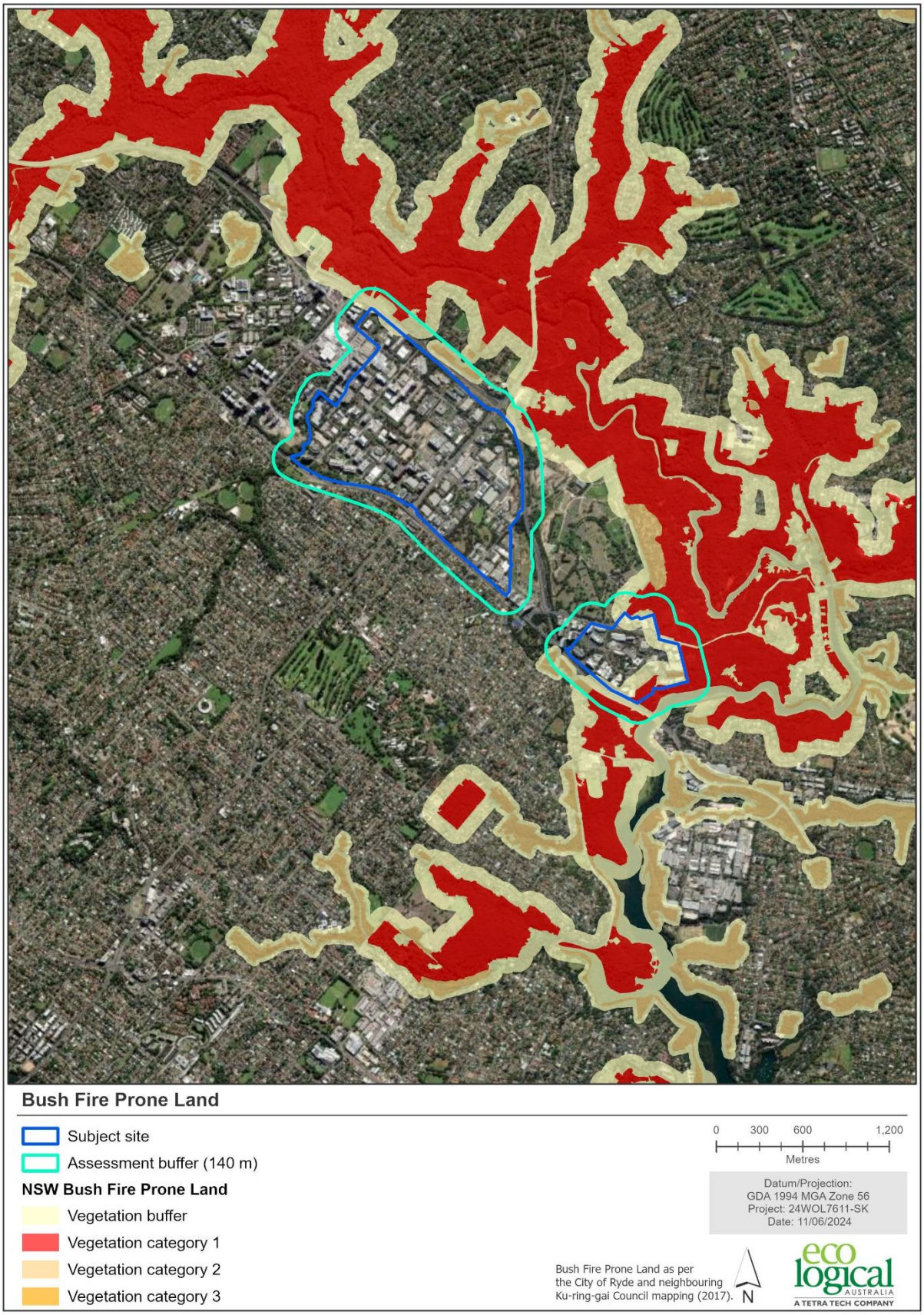

Figure 3: Current Bush Fire Prone Land (DPHI, 2024)

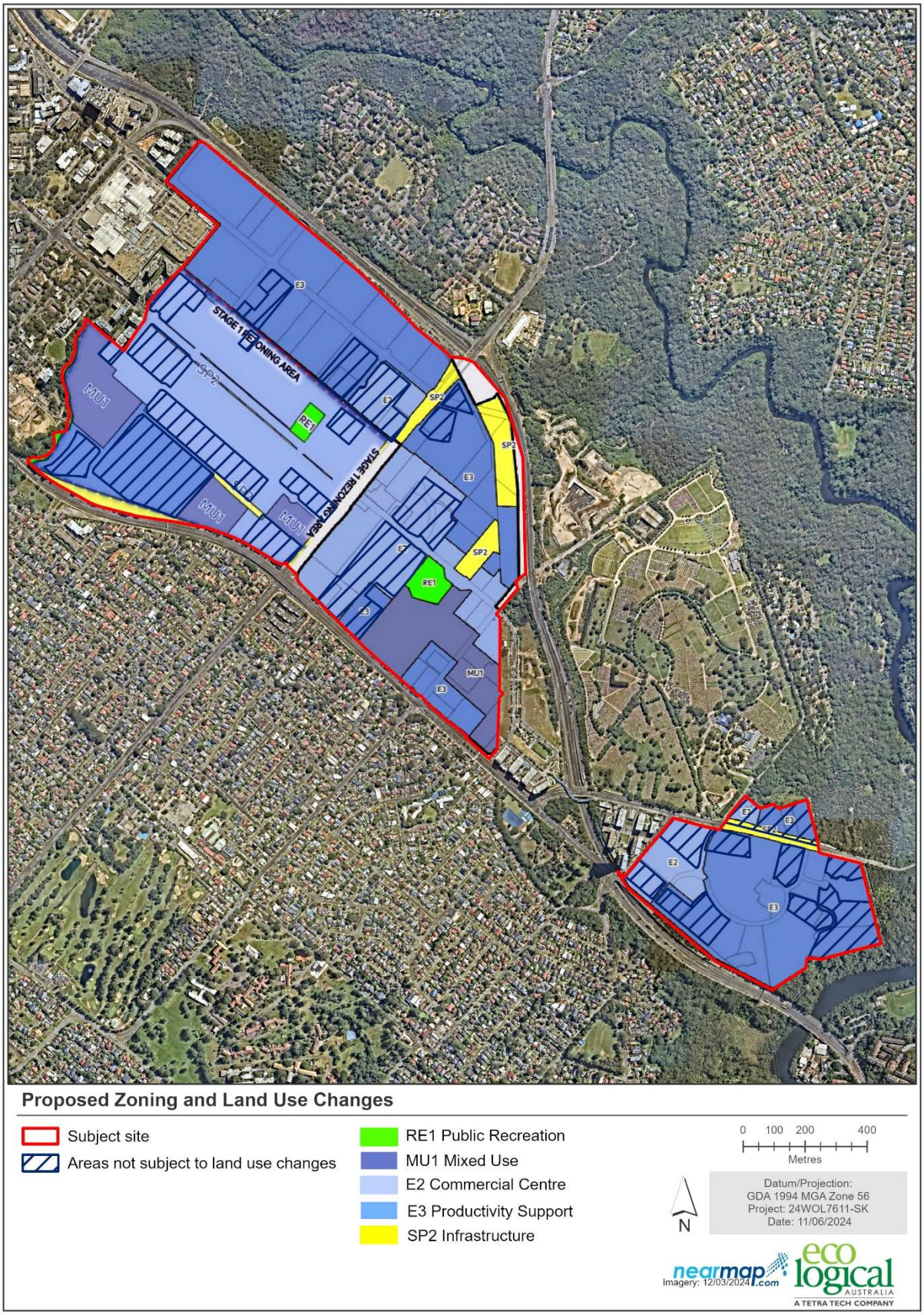

Figure 4: Proposed Zoning and Land Use Changes

2. Legislative Requirements

Under the Ministerial Direction 4.3 (Planning for Bushfire Protection) issued under Section 9.1 (2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), where a proposal includes or is in close proximity to Bushfire Prone Land (BFPL), the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service (RFS). Therefore, the assessment detailed in this study seeks to outline how the proposal can comply with the requirements of PBP.

The legislative framework guiding the assessment of bushfire risk and the application of bushfire protection measures at the strategic level, includes the NSW *EP&A Act* and the *Rural Fires Act 1997* (RF Act). Key aspects of these instruments are outlined below.

2.1.1. NSW Environmental Planning and Assessment Act (1979)

The NSW *EP&A* Act is the principal planning legislation for the state, providing a framework for the overall environmental planning and assessment of development proposals. Various legislation and instruments are integrated with the *EP&A Act*, including the *RF Act*. Section 10.3 of the *EP&A Act* requires the identification of BFPL and development of BFPL maps, which act as a trigger for bushfire assessment provisions for strategic planning and development. When investigating the capability of BFPL in relation to Macquarie Park Innovation Precinct, consent authorities must have regard to 9.1 (2) Direction 4.3 – 'Planning for Bushfire Protection' of the *EP&A Act*.

2.1.2. Rural Fires Act 1997 (RF Act)

The *RF Act* is integrated into the *EP&A Act* and triggered by Section 4.46 as outlined above. The key objectives of the RF Act are to provide for the:

- *Prevention, mitigation and suppression of bush and other fires;*
- *Co-ordination of bushfire fighting and bush fire prevention;*
- *Protection of persons from injury or death, and property from damage, arising from fires;*
- *Protection of infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires; and*
- *Protection of the environment by requiring certain activities to be carried out having regard to the principles of ecologically sustainable development.*

2.2. Assessment Framework

The proposed Master Plan and rezoning is required to be considered under the strategic planning principles of PBP to accompany a formal rezoning submission. A strategic bushfire study will need to be undertaken with consideration to the following principles:

- *Ensuring land is suitable for development in the context of bushfire risk;*
- *Ensuring new development on BFPL will comply with PBP;*
- *Minimising reliance on performance-based solutions;*
- *Providing adequate infrastructure associated with emergency evacuation and firefighting operations; and*
- *Facilitating appropriate ongoing land management practices.*

These principles trigger the consideration of bushfire protection measures at the strategic planning stage, to provide an opportunity to consider the suitability of future land uses within the broader bushfire risk setting and that future land uses can meet the aim of PBP:

> *to provide for the protection of human life and minimise impacts on property from the threat of bushfire, while having due regard to development potential, site characteristics and protection of the environment.*

A strategic bushfire study (SBS) needs to consider the assessment considerations documented in Chapter 4 of PBP and summarised in Table 1 below. This includes consideration to the bushfire landscape, feasibility for bushfire protection measures, capacity for evacuation, along with an evaluation of the residual risk and suitability for proposed land uses.

Table 1: Summary of PBP assessment considerations for a Strategic Bushfire Study (RFS 2019)

Issue	Summary of Assessment Considerations
Bushfire landscape assessment	A bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.
Land use assessment	The land use assessment will identify the most appropriate locations within the Master Plan area or site layout for the proposed uses.
Access and egress	A study of the existing and proposed road networks both within and external to the Master Plan area and site layout.
Emergency services	An assessment of the future impact of the new development on emergency services provision.
Infrastructure	An assessment of the issues associated with infrastructure provision.
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bushfire management.

2.2.1. Risk Assessment

The bushfire assessment framework detailed in Table 2 will guide this study. Any development on BFPL always has a residual bushfire risk regardless of the initial risk level and risk treatments. This study acknowledges that the outcome of any development on BFPL includes a level of residual risk and explores the acceptability of that level of residual risk.

Table 2: Risk Assessment Framework

Risk Consideration	Context	Required Outcome
Residual Risk	Complete removal of bushfire risk is not appropriate or possible in many instances, nor is it a policy setting under PBP. Determining whether the level of residual risk (i.e., the level of risk after application of bushfire protection measures) is a key factor in the strategic assessment of whether a development proposal is appropriate	Assessed risk exposure is appropriately reduced, development can occur with an appropriate level of safety on BFPL
Risk to life versus risk to property	A lower residual risk is required for the protection of life than that required for the protection of built assets, due to the vulnerability of people exposed to bushfire attack and the pre-eminent value assigned to human life	Assessment of the residual risk has therefore considered life and property risks separately

Risk Consideration	Context	Required Outcome
Life Protection and Evacuation	An appropriately low residual risk to human life is fundamentally important in bushfire protection. Early offsite evacuation is the nationally accepted safest means for protection of life. However, logistical challenges of offsite evacuation can be high, and need to be overcome without any additional demand on emergency services. Therefore, multiple life protection options provide the lowest residual risk.	Effective early offsite evacuation that is not reliant on the assistance of emergency services should be provided. Additional refuge options such access to a safer place or refuge should be considered for increased resilience
Emergency Service Response	The acceptability of proposed development should not be reliant on emergency service response / intervention. However, an emergency service response is a legitimate risk lowering consideration, that can be viewed as a bushfire protection 'redundancy' in a strategic planning context.	Future development or uplift should contribute to the emergency management response rather than provide additional demand on resources.
Adjoining Lands	Whilst fuel management (e.g., hazard reduction burning) lowers bushfire risk under most circumstances, during extreme bushfire attack and with increasing time after a burn, the life and property protection benefit is likely to be minimal and therefore should not be relied on for the protection of life and property in a strategic planning context.	There should be no reliance on fuel management of adjoining lands. Capacity for perimeter roads and asset protection zones should be provisioned during strategic planning.

2.3. Future Compliance with PBP

Future development on BFPL will need to satisfy the performance criteria identified in PBP for various land uses. At Precinct planning stage, it is expected that future land uses enabled by the proposal can accommodate the acceptable solutions identified in PBP to minimise reliance on performance solutions at the DA stage. A summary of requirements for different land uses is outlined in the sections below.

Under the planning pathway identified in PBP and as legislated, the CDC pathway is not possible for subdivision, SFPP development and where the acceptable solutions of PBP cannot be met. Therefore, it is expected that a majority of future land uses contemplated for the subject land will be assessed in more detail against the requirements of PBP during the DA stage.

2.3.1. Residential Subdivision

Following rezoning, it is anticipated that some future high density mixed use development would be activated via subdivision, and as part of the DA process, development will need to demonstrate compliance of proposed subdivision with PBP requirements. The following provisions will need to be considered:

- Provision of compliant APZs;
- Access and egress within the developable land and along the adjoining public road system shall include safety provisions for attending emergency service vehicles and evacuating residents;
- Future subdivision design shall include perimeter roads separating developable lots from bushfire hazards;
- Access is to be ensured for maintenance of APZ and other fire mitigation activities;
- Firefighting water supply; and
- Provision of access and infrastructure requirements according to Table 5.3b of PBP.

2.3.2. SFPP Development

Special fire protection purpose (SFPP) provisions will be applicable to future uses such as childcare centres, tourist accommodation, education facilities, seniors living, and any other development specified as SFPP under s.100B (6) of the RF Act or Section 46 of the RF Reg. These developments would need to meet the criteria outlined in Chapter 6 of PBP including:

- Increased APZ setbacks as per A1.12.1 of PBP
- Provision of a Bush Fire Emergency Management and Evacuation Plan; and
- Provision of suitable access and utilities according to Tables 6.8a-c of PBP.

Future development may also need to consider the 2022 Addendum to PBP (RFS, 2022), which prescribes additional bushfire protection measures for specific Class 9 SFPP buildings located on BFPL (i.e. 9a healthcare, 9b early childhood centres and schools, 9c residential care). This aligns with National Construction Code 2022 (NCC; ABCB 2022) provisions (Part G5 and Specification 43) enacted 1 May 2023. Part G5 in Volume 1 of the NCC (ABCB 2022) prescribes additional bushfire protection provisions for certain Class 9 buildings located on BFPL however, the NSW variation specifically identifies Class 9 buildings that are SFPP. In a designated bushfire prone area Class 9a health-care, Class 9b early childhood centre, primary, and secondary schools, and Class 9c residential care buildings must comply with Specification 43 requirements.

The NSW variation to the Deemed-to-Satisfy provisions apply to Class 9 buildings classified SFPP or a Class 10a building or deck immediately adjacent or connected to such a building and not exposed to a Bushfire Attack Level (BAL) greater than BAL-12.5. They must comply with:

1. Class 9 SFPP buildings – Part G5 and Specification 43 except as amended by PBP or as modified by development consent with a Bush Fire Safety Authority (BFSA) issued under Section 100B of the Rural Fires Act 1979 (RF Act).
2. Class 10a building of deck connected to Class 9 or SFPP building – AS 3959:2018 Construction of buildings in bushfire-prone areas (SA 2018) except as amended by PBP and Specification 43 or as modified by development consent with a BFSA issued under Section 100B of the RF Act.

2.3.3. Multi-storey Residential Development

Residential buildings exceeding three storeys in height are considered to be multi-storey buildings by PBP and are required to comply with the performance criteria within Chapter 5, including the requirement for an APZ which meets a threshold of 29 kW/m². In addition, the following issues need to be considered as per Table 8.2.2 of PBP.

- Higher residential densities for evacuation
- Avoiding locating high rise buildings in higher elevations or on ridge tops;
- Increased demand on road infrastructure during evacuation;
- Higher external façade exposed to bushfire attack;
- Additional fuel loading from car and storage facilities;
- Potential for balconies and external features to trap embers and ignite combustible materials;
- Increased exposure to convective heat due to height.

Where development of this type is proposed to adjoin areas of bushfire hazard, further assessment will be required along with consultation with the RFS.

2.3.4. Residential Infill Development

It is anticipated that within the Precinct, a portion of future residential development may be activated, via the infill development provisions in Chapter 7 of PBP will apply. Provision of access and infrastructure requirements according to Table 7.3b of PBP is required for all future residential infill development on BFPL, along with building construction in response to the bushfire attack level. It is anticipated that these requirements would apply for individual lots on BFPL.

2.3.5. Commercial and Industrial Development

As per the National Construction Code (NCC) building classification system (Buildings of Class 5 to 8 under the NCC) such as offices, shops, factories, warehouses, and other commercial or industrial facilities on BFPL have no specific bushfire requirements, and as such *Australian Standard AS 3959-2018* and the *National Association of Steel-framed Housing* (NASH) Standard '*Steel Framed Construction in Bushfire Areas 2014*' (NASH, 2014) are not deemed to satisfy (DTS) provisions. However, such developments on BFPL still need to meet the aim and objectives of PBP and consider the following:

- Provision of appropriate APZ / defendable space;
- Provision of safe access to/from the public road system for egress and evacuation;
- Provision of suitable emergency and evacuation arrangements for occupants;
- Provision of adequate water supply to protect the building, and the location of gas and electricity supplies so they do not contribute to the bushfire risk; and
- Provision for the storage of hazardous materials away from any hazards.

In meeting the objectives of PBP, these developments can apply the APZ requirements for residential. General access and infrastructure requirements listed in Table 7.4a of PBP should also be considered. Where future mixed-use development includes residential development, the bushfire protection measures outlined in Chapter 5 of PBP (for subdivision) will apply. Where future mixed-use development includes SFPP uses, bushfire protection measures should be consistent with the provisions outlined in Chapter 6 of PBP.

2.3.6. Section 8.3.11 – Public Assembly Buildings

Where a public building has a floor space greater than 500 m^2 it may be considered an assembly building, and due to the evacuation of a large number of people, this type of development is generally treated as SFPP. This could include future community and recreation facilities. To meet SFPP requirements, future developments of this nature on BFPL would need provisions for APZs that meet a maximum Radiant Heat Flux (RHF) of 10 kW/m^2 and a construction standard of BAL-12.5, along with other requirements identified in section 8.3.11 of PBP.

3. Bushfire Risk

In consideration of the bushfire risk for the Macquarie Park Innovation Precinct, analysis of bushfire weather and potential fire behaviour has been undertaken, along with consideration of bushfire catchments, potential fire pathways and bushfire history.

It is important to understand that all BFPL poses a bushfire risk. Complete removal of bushfire risk is not appropriate or possible in many instances, nor is it a policy setting under PBP. Determining whether the level of residual risk (i.e. the level of risk after application of bushfire protection measures) is a key factor in the strategic assessment of whether a development proposal is appropriate. In NSW, PBP outlines the measures to achieve bushfire risk reduction generally and establishes the NSW policy setting for appropriate bushfire protection and provided the risk exposure is appropriately reduced, development can occur with an appropriate level of safety on BFPL.

The subject land falls under the Hunters Hill Lane Cove Parramatta Ryde Bush Fire Risk Management Committee (BFRMC) area and bush fire risk management activities are identified in the respective Bush Fire Risk Management Plan (BFRMP) (Hunters Hill Lane Cove Parramatta Ryde BFRMC, 2019). Within this plan, the area of Neighbourhood 7 is classified as “Very High” risk, and the adjacent vegetation north of the neighbourhood is classified as a Strategic Fire Advantage Zone.

3.1. Bushfire Landscape

The landscape to the south and west of the subject land is largely residential with commercial and other urban developments present. The landscape to the north and east consists primarily of Lane Cove National Park with urban and other developed areas beyond.

The extent of Bushfire Prone Land (BFPL), as currently mapped in the City of Ryde and Ku-ring-gai Council BFPL maps, is shown in Figure 3. The primary vegetation hazard within and proximal to the subject land is located in Lane Cove National Park, to the north and east.

Within the subject land, the landscape is heavily urbanised with high density commercial and business land uses. There is limited smaller patches of vegetation present within the site which could potentially provide opportunities for fire pathways, however none of the existing vegetation is currently mapped as BFPL, indicating the lower risk context of the subject land.

3.1.1. Vegetation

Within the broader landscape (5 km buffer) there are fragmented areas of bushfire hazard present. This is predominately forest vegetation located within Lane Cove National Park and other narrow vegetation strips usually along drainage lines seen in Figure 5. This vegetation is well separated from much of the subject site, with the exception of Neighbourhood 7, which is located adjacent to the vegetation north and east of the subject site. Much of the mapped vegetation is not currently classified as BFPL seen in Figure 6, with the exception being the forest vegetation within Lane Cove National Park. This forest vegetation represents the largest and most significant bushfire hazard of relevance to the subject land.

There is an additional area of isolated forest vegetation present adjacent to the northwest of the subject site within the Shrimpton’s Creek corridor however, it is not mapped as BFPL and presents a low risk of fire development and spread. There are also multiple smaller patches of vegetation present within or

adjacent to the subject site, however these patches are not mapped as BFPL indicating their low risk, being fragmented, disconnected, small, often mesic, managed or can be otherwise considered 'low threat vegetation exclusions' under A1.10 of PBP. Thus they do not present a significant bushfire hazard to future development.

3.1.2. Slope

Within the landscape, the subject site is predominantly flat to undulating with limited lands of high slope. The steeper sloped lands are situated to the north and east of the site, corresponding to areas of forest vegetation and the Lane Cove River valley which can be seen in Figure 7.

3.1.3. Bushfire Weather

The area experiences a warm temperate climate with higher rainfall during summer and into autumn, as supported by historic weather data (1967 to 2024) (BOM, 2024) for Parramatta North (066124), located approximately 10km from the site (Figure 8). Historic weather data for this station indicates the driest part of the year on average is July, August, September (8). When also considering lowest rainfall, this also extends to October. Based on the weather analysis, while the gazetted bushfire season is October to March, when warmer temperatures overlap with usually drier months, it can promote an earlier onset or extension of the bushfire season.

Examining wind trends from the Parramatta North weather station, there is a tendency for increased afternoon winds, and during Spring and Summer months, the predominant wind direction is from the south-east and east (Figure 11). This means a potential fire initiating in Lane Cove National Park could burn towards Neighbourhood 7 within the site under favourable conditions. The weather data also indicates that there is a lower frequency of winds from the west in spring and summer. On days where the highest level of fire danger risk is present, the predominant wind direction is generally westerly through north. In the instance of a potential fire ignition within Lane Cove National Park to the northwest of the site, the fire may burn towards Neighbourhoods 1, 5, and 7. Therefore, opportunities to increase the resilience of Neighbourhoods 1, 5, and 7 have been recommended for consideration.

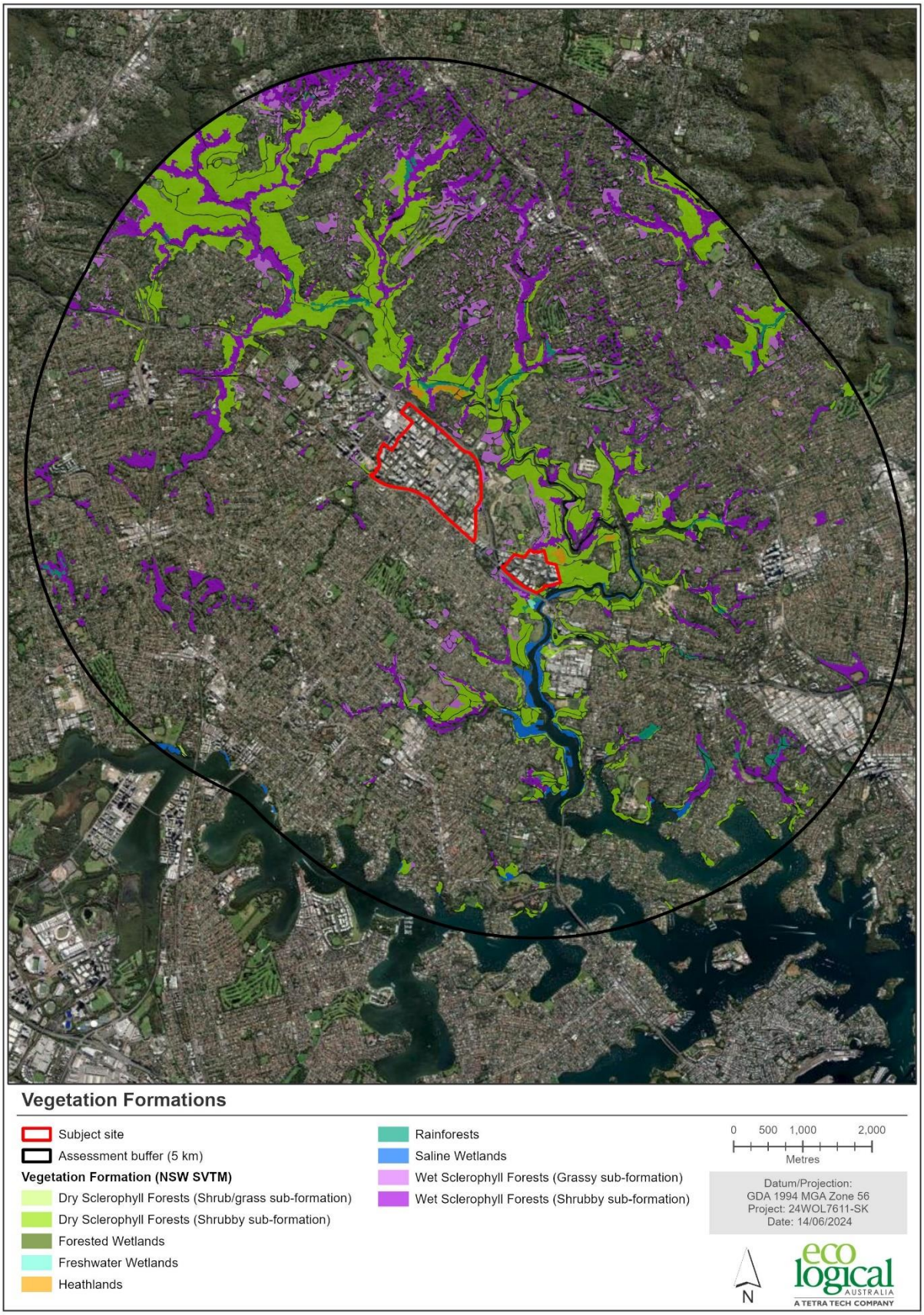

Figure 5: Mapped vegetation formation (SVTM 2023)

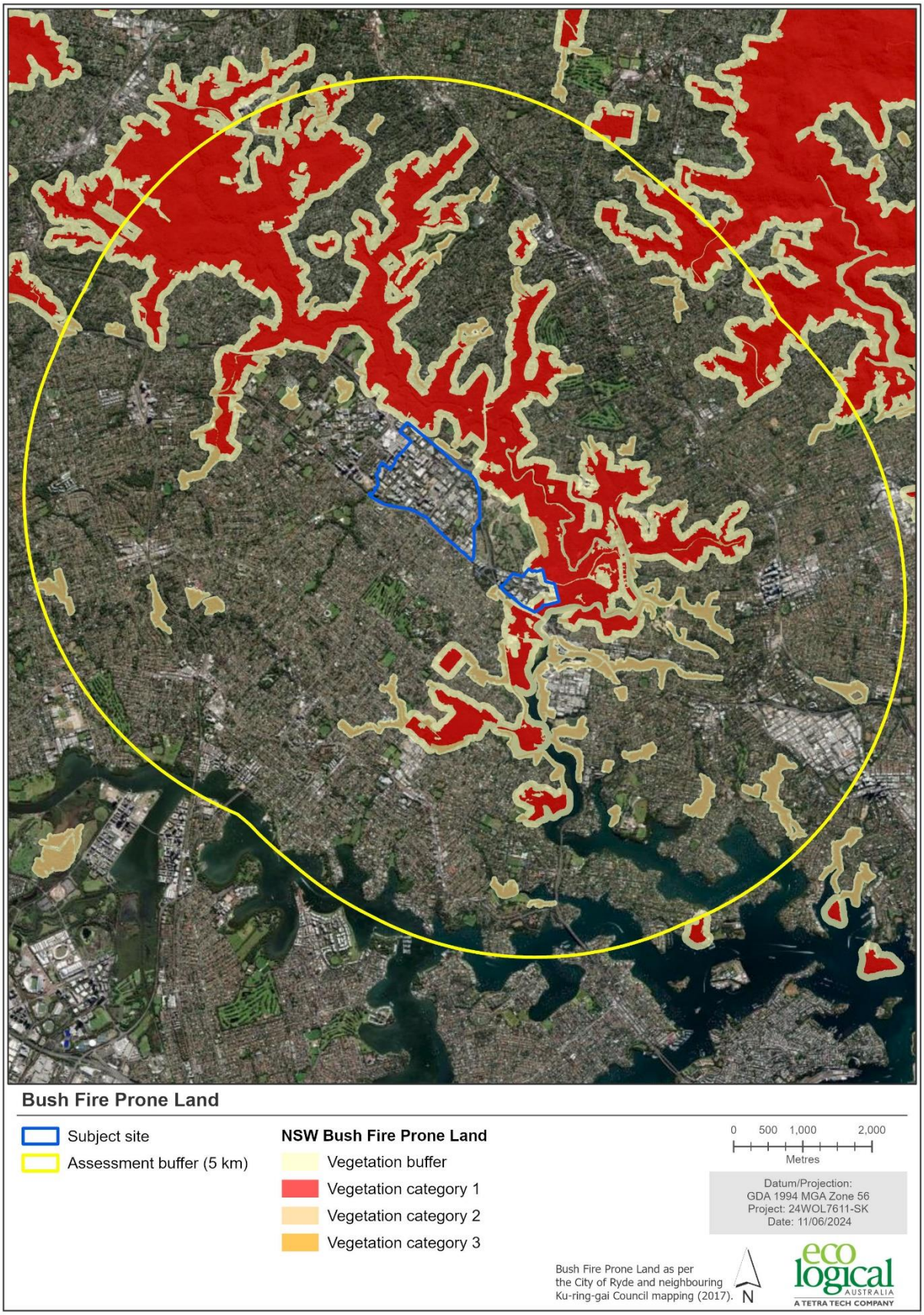

Figure 6: Current Bush Fire Prone Land Within 5km (DPHI, 2024)

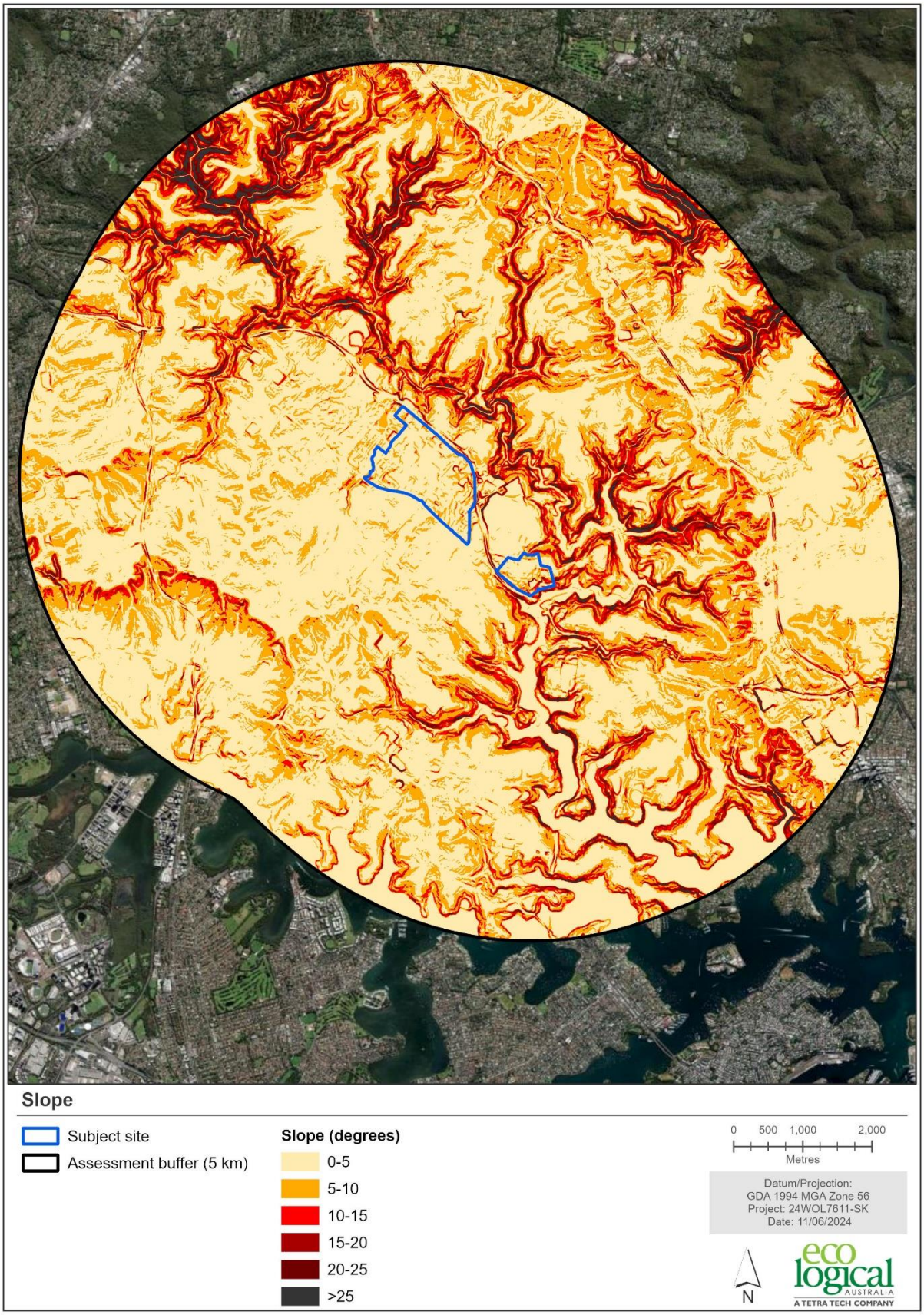

Figure 7: Slope within the study area

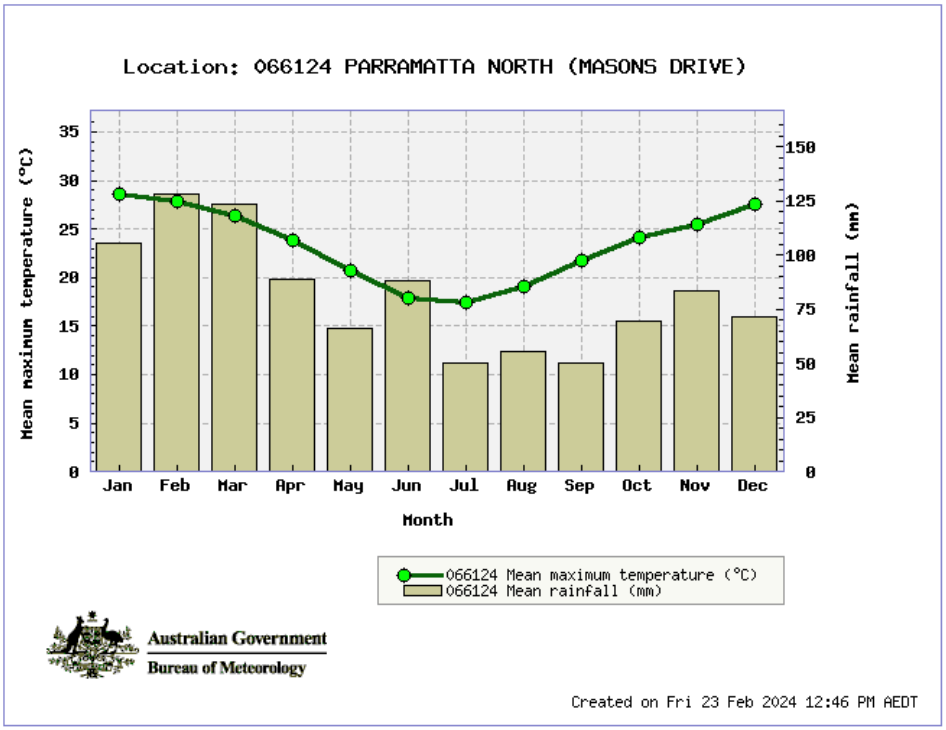

Figure 8: Mean annual rainfall and mean maximum temperature, 1967-2024, Parramatta North (BOM, 2024)

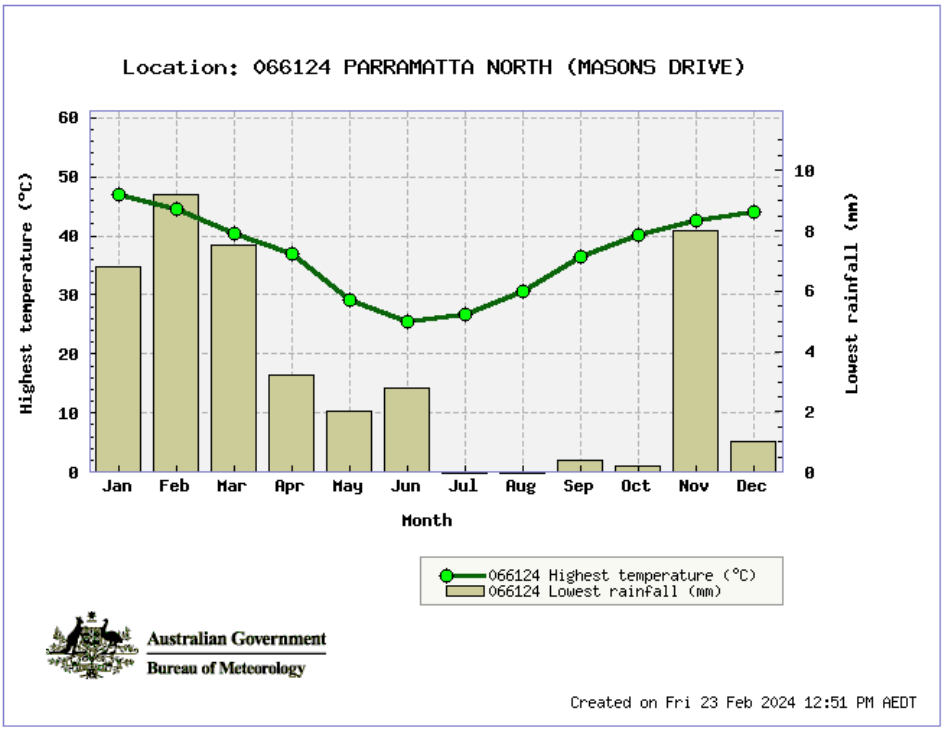

Figure 9: Highest temperature and lowest rainfall, 1967-2024, Parramatta North (BOM, 2024)

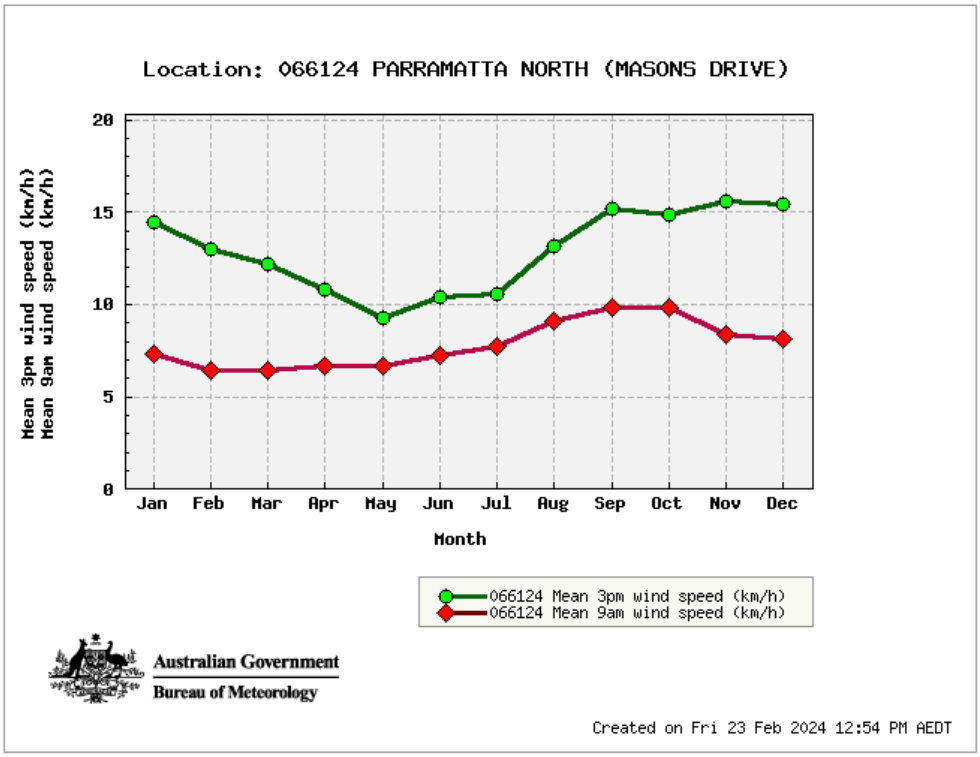

Figure 10: Mean 9am and 3pm wind speed, 1965-2024, Parramatta North (BOM, 2024)

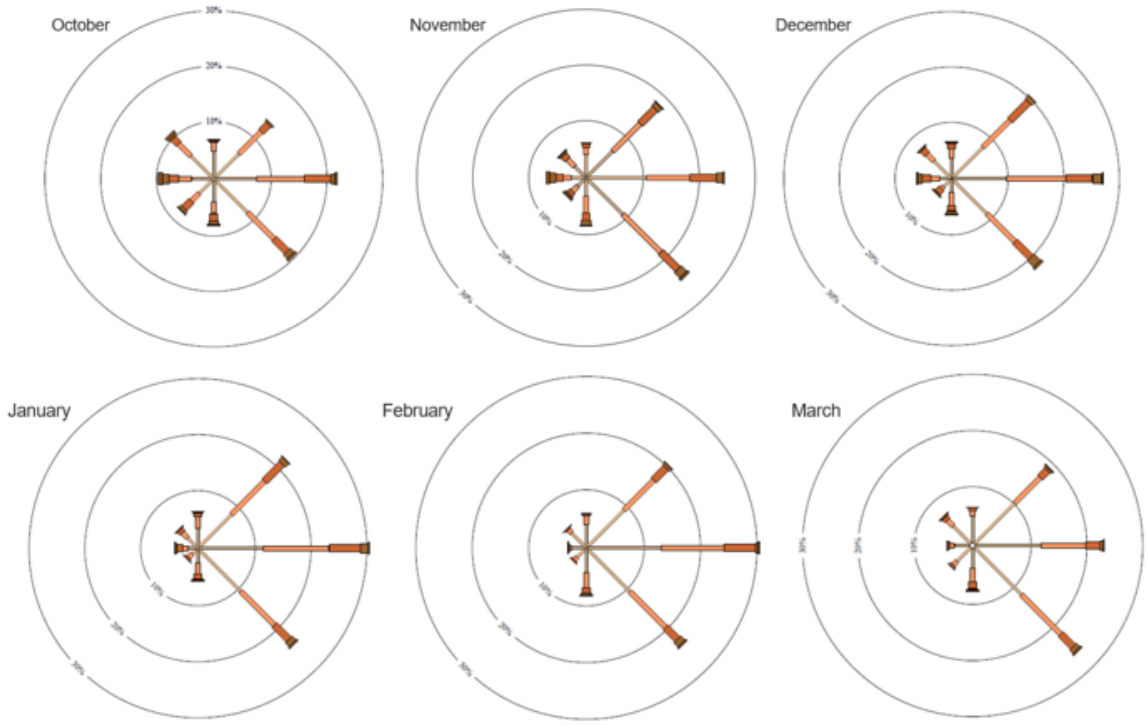

Figure 11: 3pm Wind Roses, 1965-2010, Parramatta North (BOM, 2024)

3.1.4. Potential Bushfire Behaviour and Potential Fire Pathways

Delineation of fire catchments helps to identify the location and size of potential fire runs and therefore bushfire attack scenarios for different locations within the subject site. This informs assessment of the risk profile across the site, with exposure to larger fire catchments generally increasing the bushfire risk.

The primary fire pathways which are influential to the site originate within Lane Cove National Park and are primarily from the northwest, north and northeast of the site. While there are potential fire pathways in proximity to Neighbourhood 1, there is direct separation between the hazard and Neighbourhood 1 provided by the M2. Fire pathways have the potential to impact Neighbourhood 7, with these pathways transecting through contiguous forest vegetation within Lane Cove National Park which can be seen in Figure 12. Separation to neighbourhood 7 is provided by an APZ on the boundary of the National Park. To the north of Neighbourhood 7, vegetation has been classified as part of a Strategic Fire Advantage Zone within the Hunters Hill Lane Cove Parramatta Ryde BFMC Bush Fire Risk Management Plan 2019-2024.

Whilst each bushfire event is different, fire spreads by responding to changes in fuel, terrain, and weather conditions and therefore it is anticipated that a potential fire initiating in the National Park may spread more quickly and have the potential for higher intensities when:

- Burning under the influence of winds from the northwest, presenting an elevated risk primarily to Neighbourhood 1
- Burning under the influence of winds from the northeast, presenting an elevated risk primarily to Neighbourhood 1 or Neighbourhood 7
- Burning under conditions associated with the extension of drier periods of rainfall into the summer months.

The following mitigation advantages are present within the site:

- The position of the M2 Motorway provides an existing fire break for much of Neighbourhoods 1 and 5, reducing the level of bushfire attack on the subject land.
- Potential for Shrimpton's Creek to be managed / designed in a way to mitigate fire transfer.
- Opportunity to provide bushfire protection measure to areas adjoining bushfire hazards.

3.1.5. Fire History

The Hunters Hill Lane Cove Parramatta Ryde Bush Fire Risk Management Plan (BFRMP) identifies the main sources of ignition for the committee area as accidental (e.g. escaped hazard reduction burns; lightning strikes) or deliberate (e.g. arson).

Figure 13 shows the fire history within the broader study area, with mapping compiled from unplanned fire events (wildfire) since 1965 (NPWS, 2024), incorporating data from NPWS, RFS and State Forests. As shown, most fires have occurred within Lane Cove National Park situated to the northwest to east of the majority of the site.

No fires are present on record within 5 km to the southwest and south of the site.

Whilst this data may not contain all bushfires, it does indicate nearby fire history in proximity to the subject land, particularly through the Lane Cove river valley.

3.2. Summary of Bushfire Risk

The subject land is extensively surrounded by residential and other development to the south and west, with vegetation hazard to the northwest, north and east of the site, predominantly near Neighbourhoods 1 and 7. The vegetation hazard located in Lane Cove National Park and adjoining lands, proximal to the north and east of the subject land, presents the largest bushfire risk. There is previous history of a bushfire occurring adjacent to the subject site, however this is limited to Neighbourhoods 1 and 7.

Given the hazard is forest vegetation downslope of the site and located primarily to the north and east of the site, the severity of fire attack will be influenced by the bushfire weather at the time and the length of fire run. Bushfire attack from the northwest is possible and may occur during elevated weather conditions. However, fire attack from this direction is heavily mitigated by the significant setback that the M2 road corridor provides. Fire attack from the northeast to east is also possible however attack from this direction is expected to be significantly below the FFDI 100 level that is used in contemporary bushfire protection measures prescribed by PBP, and thus inherently lower risk.

Overall, the subject land is assessed as having a low residual risk from bushfire attack, subject to the provision of suitable bushfire protection measures.

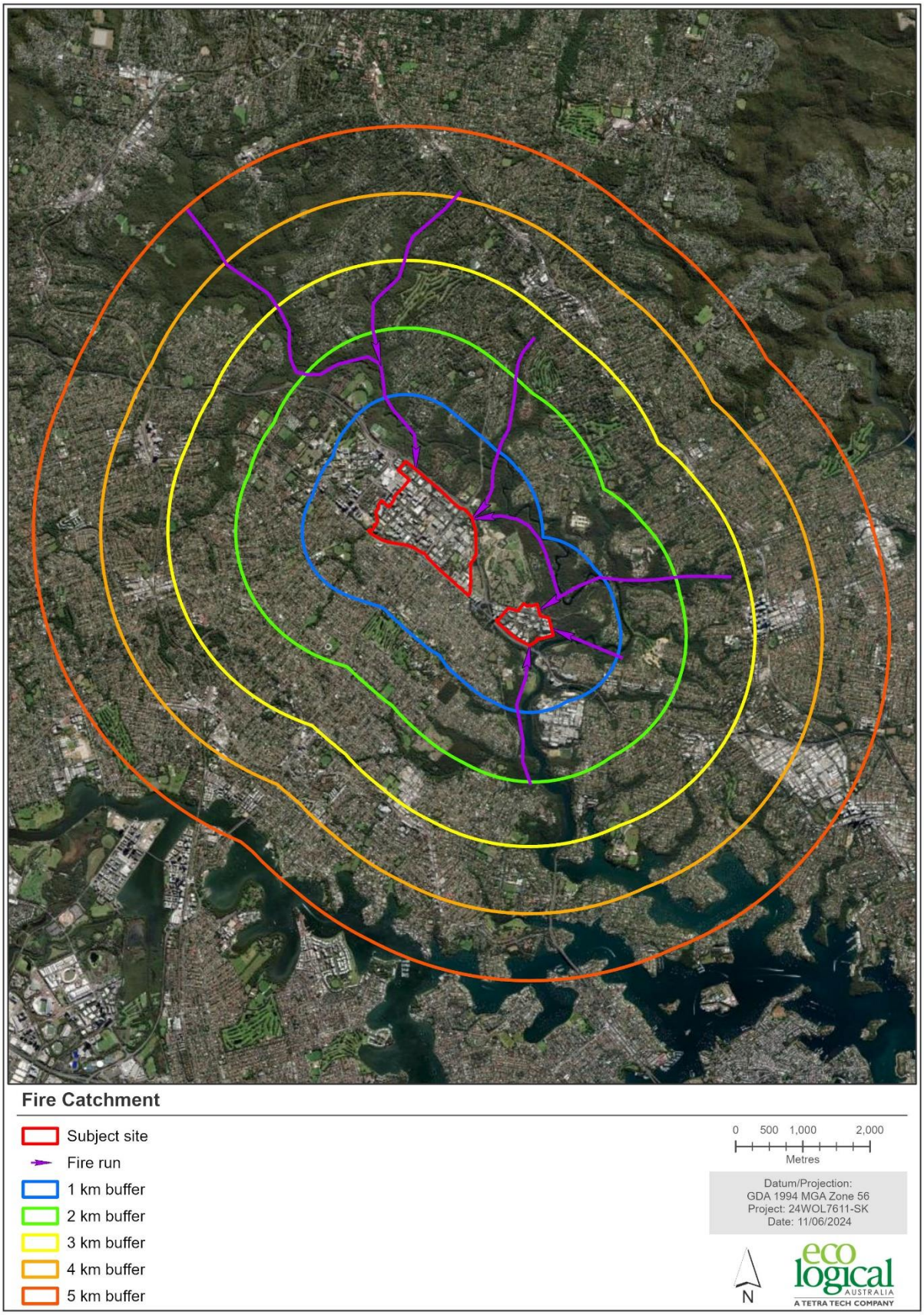

Figure 12: Fire catchments

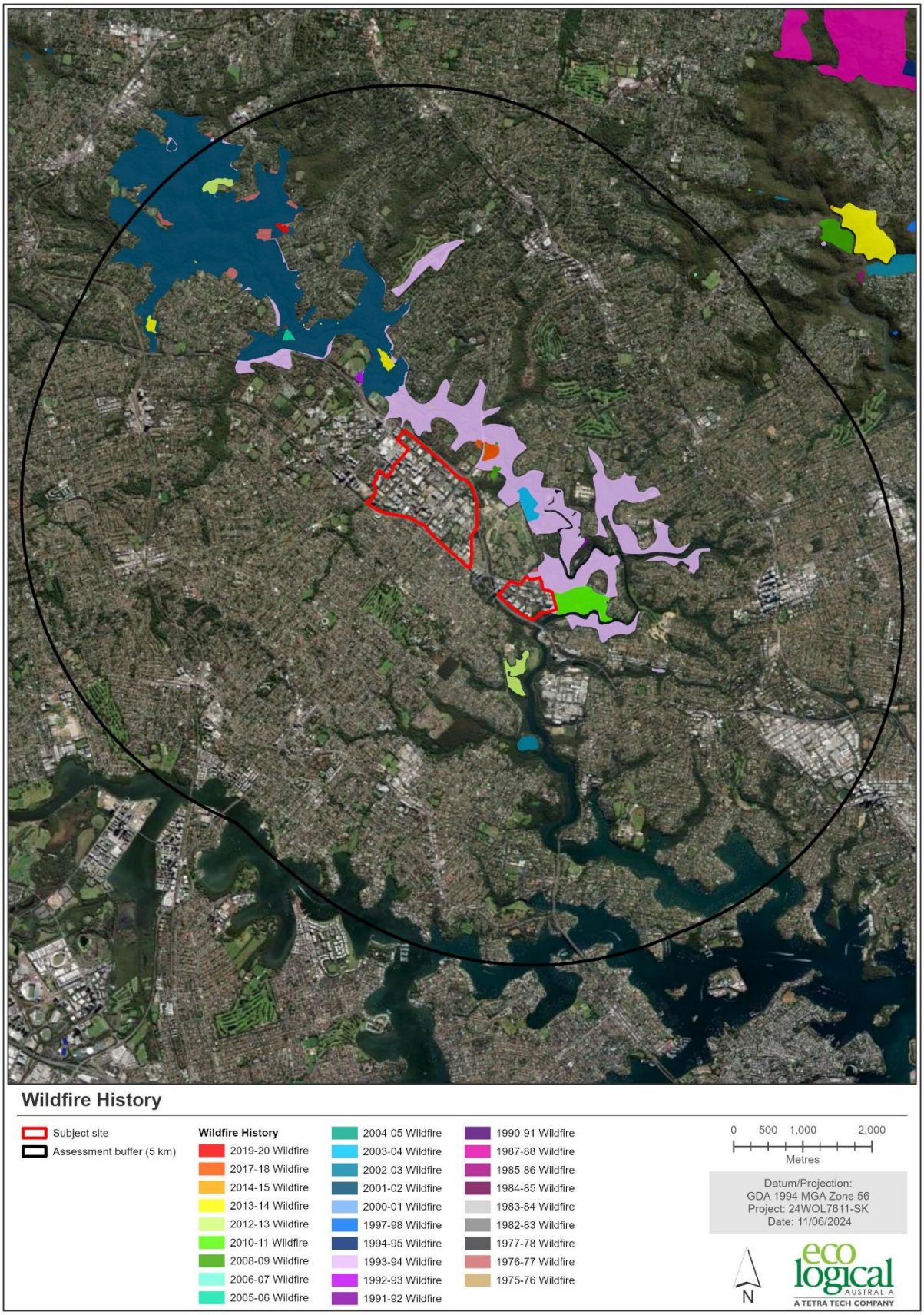

Figure 13: Wildfire History (NPWS, 2024)

4. Land Use Assessment

Future development will need to meet the requirements of PBP, including the provision of compliant asset protection zones (APZ). A preliminary hazard assessment (Table 4) has been undertaken based on the proposed land zoning, vegetation mapping, on and offsite hazards.

4.1. Hazard Assessment

In undertaking the bushfire hazard assessment, careful review of the vegetation hazard within the Subject Land and surrounds was undertaken, including consideration of the potential for current or future vegetation to be mapped as BFPL as per the current guideline. The potential inclusion of these patches is dependent on the 'vegetation management' of each patch as well as patch size being greater than 1 hectare and separated from other Category 1 or 2 vegetation by greater than 100 metres. Risk considerations have also influenced BFPL mapping in the past (i.e. exclusion of very low risk areas).

Where a bushfire hazard has been identified, bushfire protection measures will need to be provisioned for future development, including the provision of compliant asset protection zones and perimeter roads. Table 3 explores PBP requirements in more detail in relation to the future development contemplated by the Master Plan when adjoining existing or potential BFPL.

Rapid field assessment of vegetation across the subject land was undertaken to assist in identifying areas of managed land and delineating the current hazard extent. The outcomes of the bushfire hazard assessment are shown in Figure 14-18. The assessment considers the final extent of vegetation within the Precinct and within the 140m assessment buffer.

Table 3: Preliminary Assessment and Considerations for the Master Plan

Map ID	Preliminary Hazard Assessment	PBP Requirements	Comment
1	Potential to meet low threat vegetation exclusion requirements	None, subject to confirmation of management or applicability of A1.10 of PBP	Refinement of extent and management of this vegetation to be implemented to ensure the patch size is less than 0.25ha and situated more than 20m from the site or other areas of classified vegetation as per A.1.10 of PBP.
2, 3	Low threat exclusion / managed land	APZ, Perimeter Road and BAL construction requirements	There is potential for Shrimpton's Creek to be mapped in future BFPL maps as a bushfire hazard based on the current BFPL mapping guideline. BFPL mapping is reviewed every 5 years, and pending the final extent of the corridor it could potentially be mapped as BFPL in the future, subject to final extent of the corridor and management. Within this report it has been classified as low threat exclusion / managed land due to the isolated location, limited width of vegetation, and anticipated management of the outer riparian zone. The final corridor extent and revegetation plan should be review for consistency with A1.10 of PBP to ensure PBP requirements such as perimeter roads and APZs do not apply.

Map ID	Preliminary Hazard Assessment	PBP Requirements	Comment
4	Excluded vegetation	None, subject to confirmation of management or applicability of A1.10 of PBP	The vegetation present at Map ID 4 has been excluded as a single area of vegetation smaller than 1 hectare in area and greater than 100 metres separation from other areas of Category 1 or 2 vegetation as per A1.10 of PBP.
5	Forest, Potential for future hazard	APZ, Perimeter Road and BAL construction requirements	There is potential for the vegetation present at Map ID 5 to be included in future BFPL maps as a bushfire hazard based on the current BFPL mapping guideline. BFPL mapping is reviewed every 5 years, and given the area exceeds >1ha it could be potentially mapped as BFPL in the future, subject to final extent of the vegetation and management. PBP specifies the provision of perimeter roads between bushfire hazard. Indicative APZ requirements have been provided.
6, 7	Excluded vegetation	None, subject to confirmation of management or applicability of A1.10 of PBP	The vegetation present at Map ID 6 and 7 has been excluded due to being managed or developed as based on the current iteration of the Master Plan. This exclusion is subject to management as per A1.10 of PBP.

4.1.1. Climate Change Considerations

For the purposes of PBP, the Forest Fire Danger Index (FFDI) required to be used for development assessment for the site is 100, as identified for the Greater Sydney Region. The FFDI used by PBP influences certain bushfire protection measures including Asset Protection Zones (APZ) and construction standards via the assessment of the Bushfire Attack Level (BAL).

RFS policy including PBP, does not prescribe any assessment framework or bushfire protection requirements in relation to climate change. Further, there is considerable uncertainty around the degree of climate change, the implications of the changes to bushfire attack and therefore appropriate standards for bushfire protection. However, most research indicates that vegetative fuel loads may stay relatively consistent with present day levels, whereas there may be increases in bushfire weather under future climate scenarios.

The provision of an APZ is a crucial bushfire protection measure for planned development and given the importance of the FFDI in determination of APZ and the potential for increases in bushfire weather, and therefore elevated FFDIs under future climate scenarios, additional bushfire attack modelling was undertaken using an FFDI of 120. This enabled APZ criteria to be considered beyond the current policy setting of 100, in order to explore implications of potential climate change influenced increases in bushfire weather.

It is reinforced that there is no current bushfire planning policy to guide this assessment. It is also noted that the selection of FFDI 120 is for indicative purposes only and may not present what the future bushfire weather policy setting may be, and future weather of that magnitude may or may not be experienced. Nevertheless, there is opportunity to consider increased APZ setbacks to increase the resilience of potential development in Neighbourhoods 1 and 7.

The indicative width of APZ for FFDI 120 has been modelled using the Method 2 approach described in AS 3959 and using the vegetation and slope data identified in Table 4 below. This assessment provides an indication of enlarged APZ that can be considered as a resilience response to potential future bushfire attack under climate change in comparison with the current FFDI 100 APZ requirements.

Table 4: Preliminary Hazard Assessment

Transect	Slope	Vegetation	PBP Residential required APZ[1]	PBP SFPP required APZ[2]	Indicative FDI 120 Residential APZ[3]	Indicative FDI 120 SFPP APZ[3]	Comments
Neighbourhood 1							
10 (Figure 14)	0 to 5° downslope	Forest	29 m	79 m	32 m	86 m	Reducing or managing vegetation could allow for reclassification to low hazard and thus reduce APZ size.
11 (Figure 14)	Upslope/flat land	Forest	24 m	67 m	26 m	73 m	as above
12 (Figure 14)	5 to 10° downslope	Forest	36 m	93 m	41 m	102 m	It is noted that PBP does not currently prescribe APZ beyond 100m.
13 (Figure 14)	0 to 5° downslope	Low Hazard	14 m	47 m	17 m	53 m	N/A
Neighbourhoods 5 & 6							
8 (Figure 16)	Upslope/flat land	Forest	24 m	67 m	26 m	73 m	N/A
9 (Figure 16)	Upslope/flat land	Forest	24 m	67 m	26 m	73 m	N/A
Neighbourhood 7							
1 (Figure 18)	10 to 15° downslope	Forest	45 m	100 m	52 m	121 m	It is noted that PBP does not currently prescribe APZ beyond 100m.
2 (Figure 18)	5 to 10° downslope	Forest	36 m	93 m	41 m	102 m	It is noted that PBP does not currently prescribe APZ beyond 100m.
3 (Figure 18)	0 to 5° downslope	Forest	29 m	79 m	32 m	86 m	N/A

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Transect	Slope	Vegetation	PBP Residential required APZ[1]	PBP SFPP required APZ[2]	Indicative FDI 120 Residential APZ[3]	Indicative FDI 120 SFPP APZ[3]	Comments
4 (Figure 18)	0 to 5° downslope	Forest	29 m	79 m	32 m	86 m	N/A
5 (Figure 18)	5 to 10° downslope	Forest	36 m	93 m	41 m	102 m	It is noted that PBP does not currently prescribe APZ beyond 100m.
6 (Figure 18)	5 to 10° downslope	Forest	36 m	93 m	41 m	102 m	It is noted that PBP does not currently prescribe APZ beyond 100m.
7 (Figure 18)	5 to 10° downslope	Low Hazard	18 m	57 m	22 m	64 m	N/A

[1] Assessment according to A1.12.2 (residential APZ requirement) of PBP 2019.

[2] Assessment according to A1.12.1 (SFPP APZ requirement) of PBP 2019.

[3] AS 3959 method 2 assessment in accordance with PBP but using FDI 120 (Section 4.1.1).

4.2. Feasibility of Asset Protection Zones

Preliminary APZ requirements are based on an indicative hazard interface line and early interpretation of the Master Plan for the subject land. Future buildings will need to be located outside of any APZ and the Master Plan design should facilitate this.

Based on the outcomes of this assessment, the provision of required APZ is not unachievable for new development with capacity for building setback outside of the required APZs as shown in Figures 14 - 18 and based on the preliminary hazard assessment detailed in Table 4. However, given the high level of legacy development within the precinct, the prescribed APZ does encroach into existing building footprints and therefore any redevelopment where these buildings are to be retained would require a performance based solution. These areas are most prevalent within Neighbourhood 7, primarily resulting from the close proximity of this neighbourhood to vegetation hazards and unfavourable slope profiles adjacent to the site.

In relation SFPP development, while the specific location of these land uses is not yet delineated, there is generally capacity for SFPP development in all neighbourhoods except Neighbourhood 7. The future placement of SFPP land uses should be provisioned outside of the required SFPP APZ, and will require some consideration Neighbourhoods 1 and5. Within Neighbourhood 7, the provision of SFPP APZ provides significant constraints, with a large portion of the neighbourhood being unsuitable for SFPP development.

To aid in future resilience planning, Figures 19 – 23 utilise the indicative APZ widths for FDI 120 modelled using the Method 2 approach described in AS 3959 as per Section 4.1.1. The Master Plan has capacity to accommodate for the increased APZ requirements under FDI 120 modelling, however, areas of development within Neighbourhood 1, near the vegetation hazard present at Map ID 5, and within Neighbourhood 7 on Lucknow Road and Richardson Place will be further constrained and may require revision to conform with the greater APZ requirements under FDI 120 modelling.

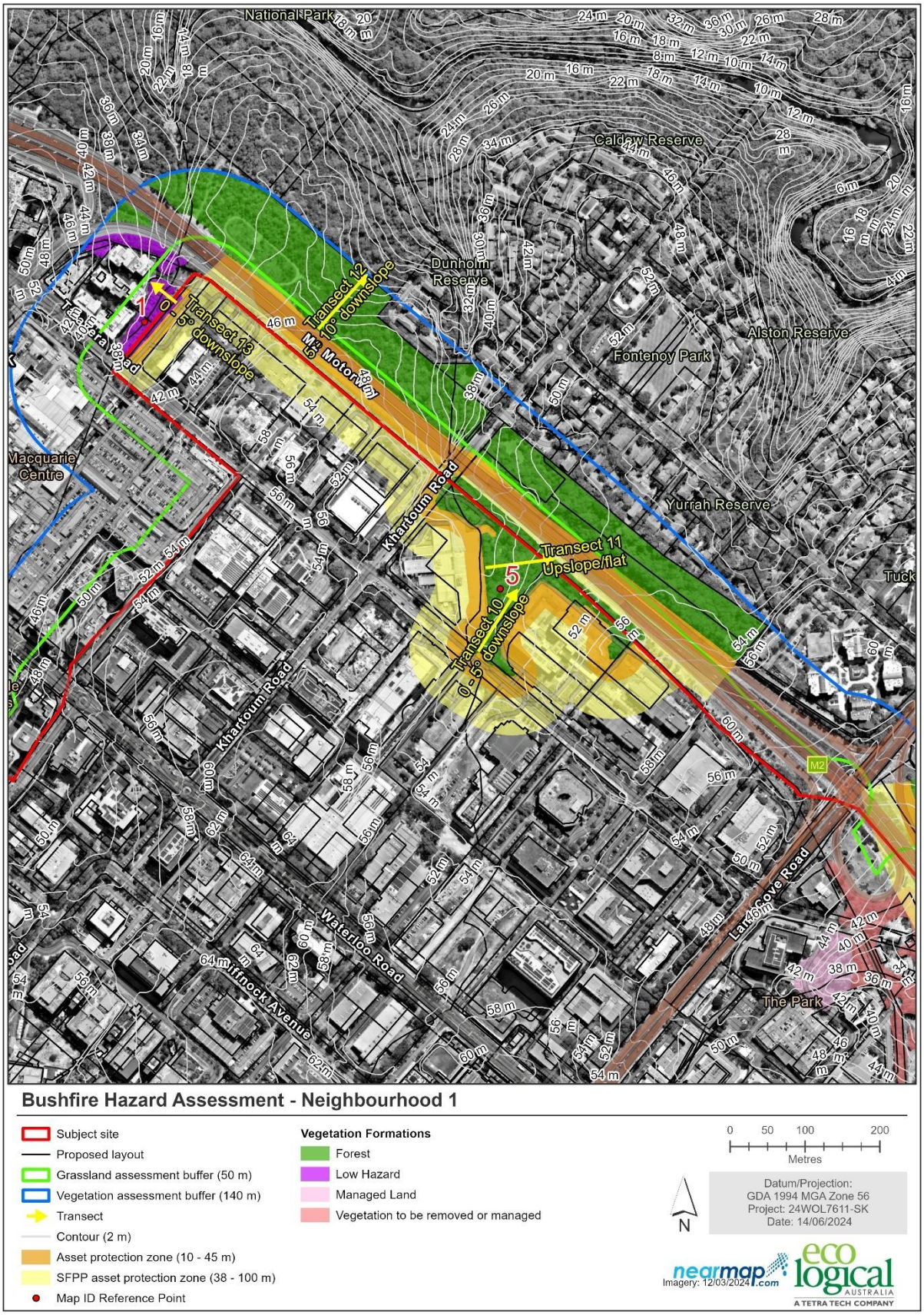

Figure 14: Bushfire Hazard Assessment – Neighbourhood 1

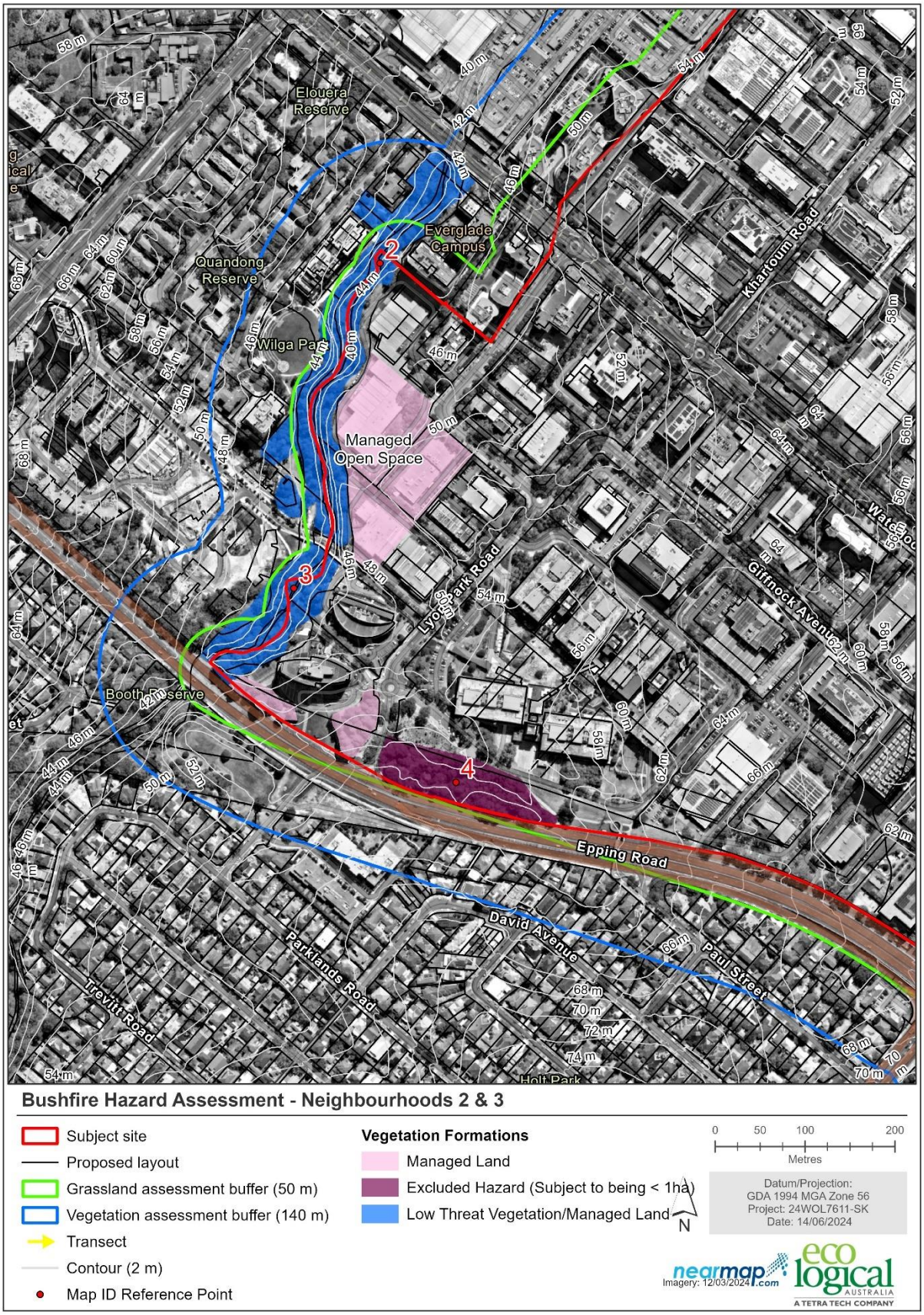

Figure 15: Bushfire Hazard Assessment – Neighbourhoods 2 & 3

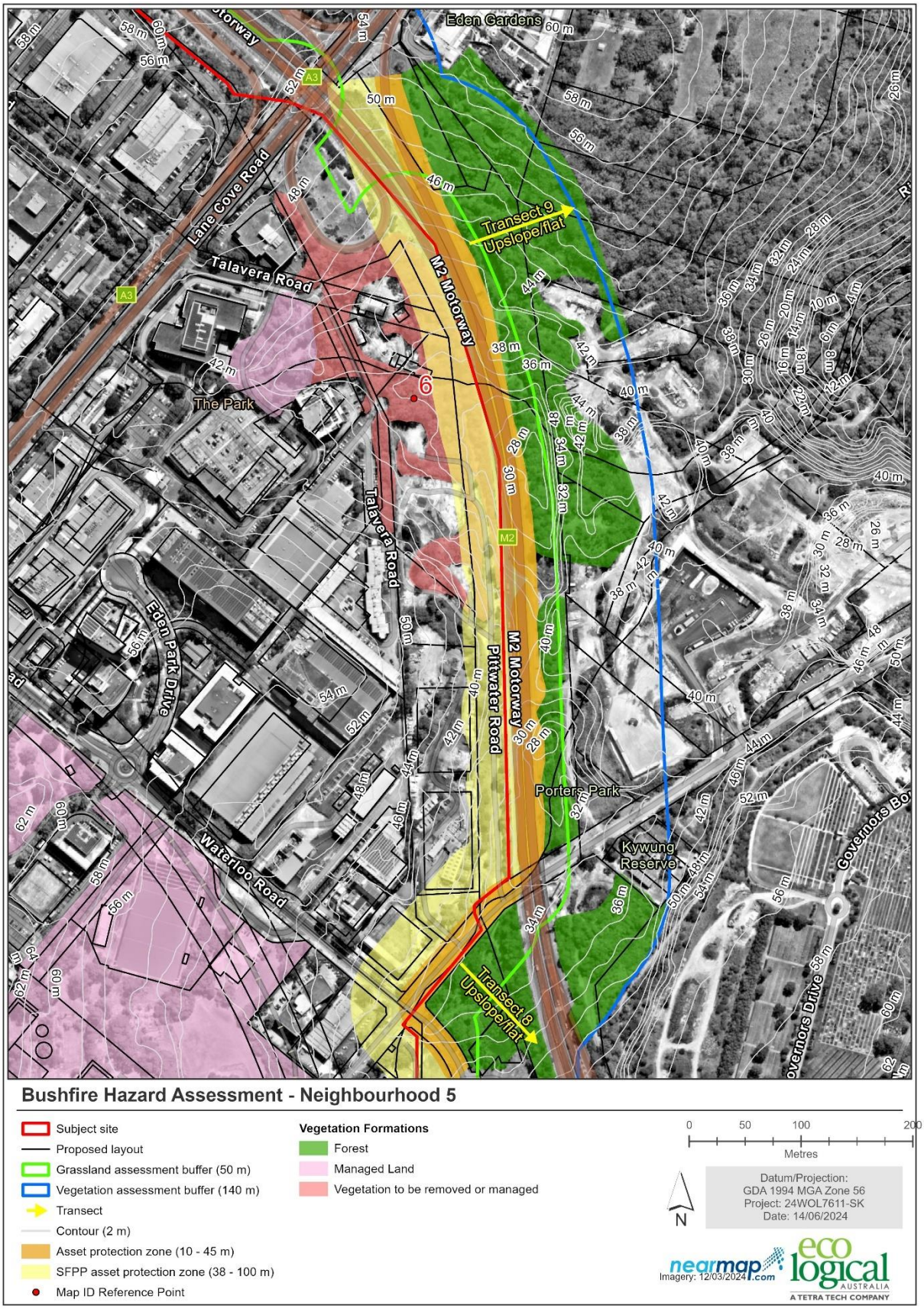

Figure 16: Bushfire Hazard Assessment – Neighbourhood 5

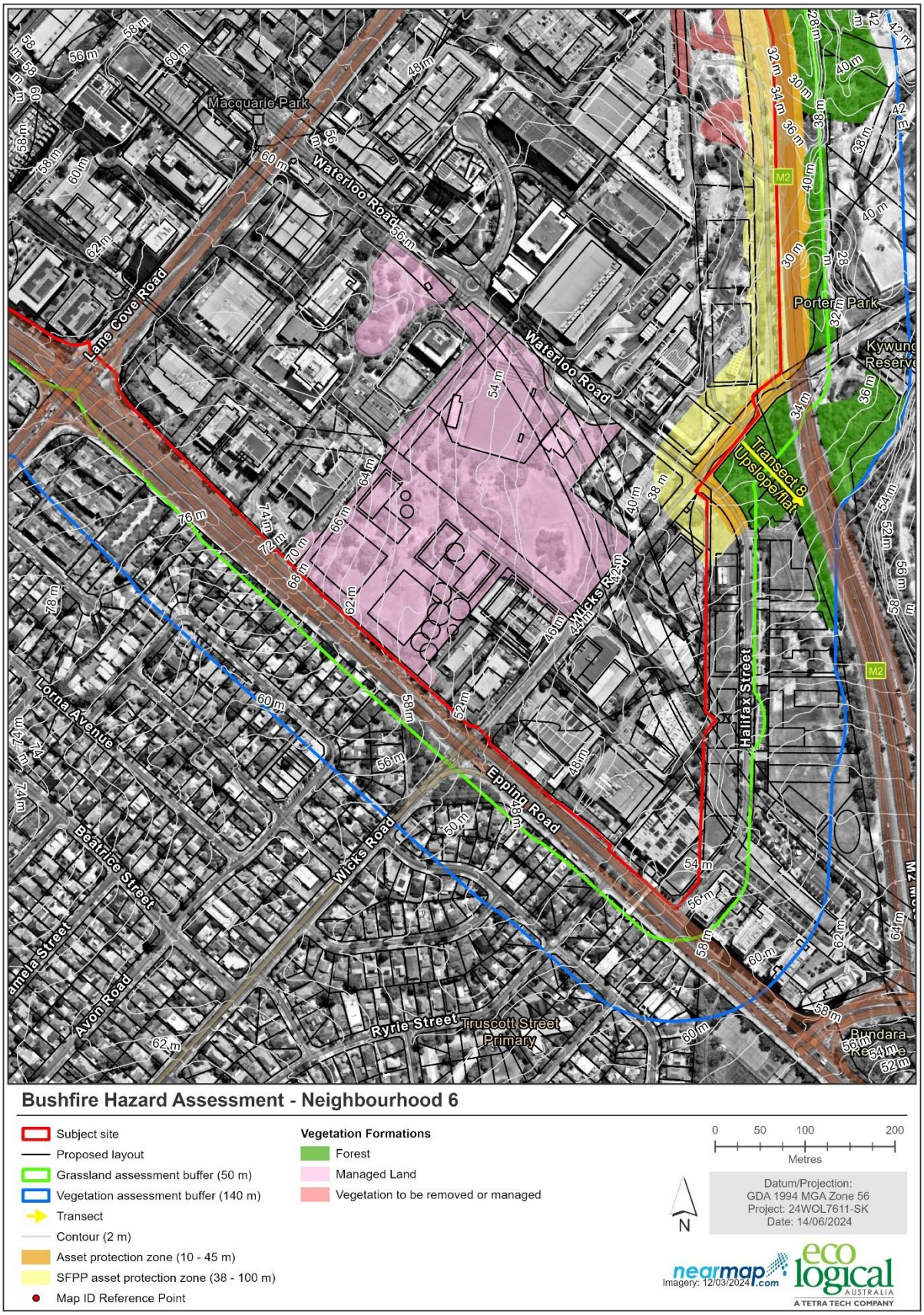

Figure 17: Bushfire Hazard Assessment – Neighbourhood 6

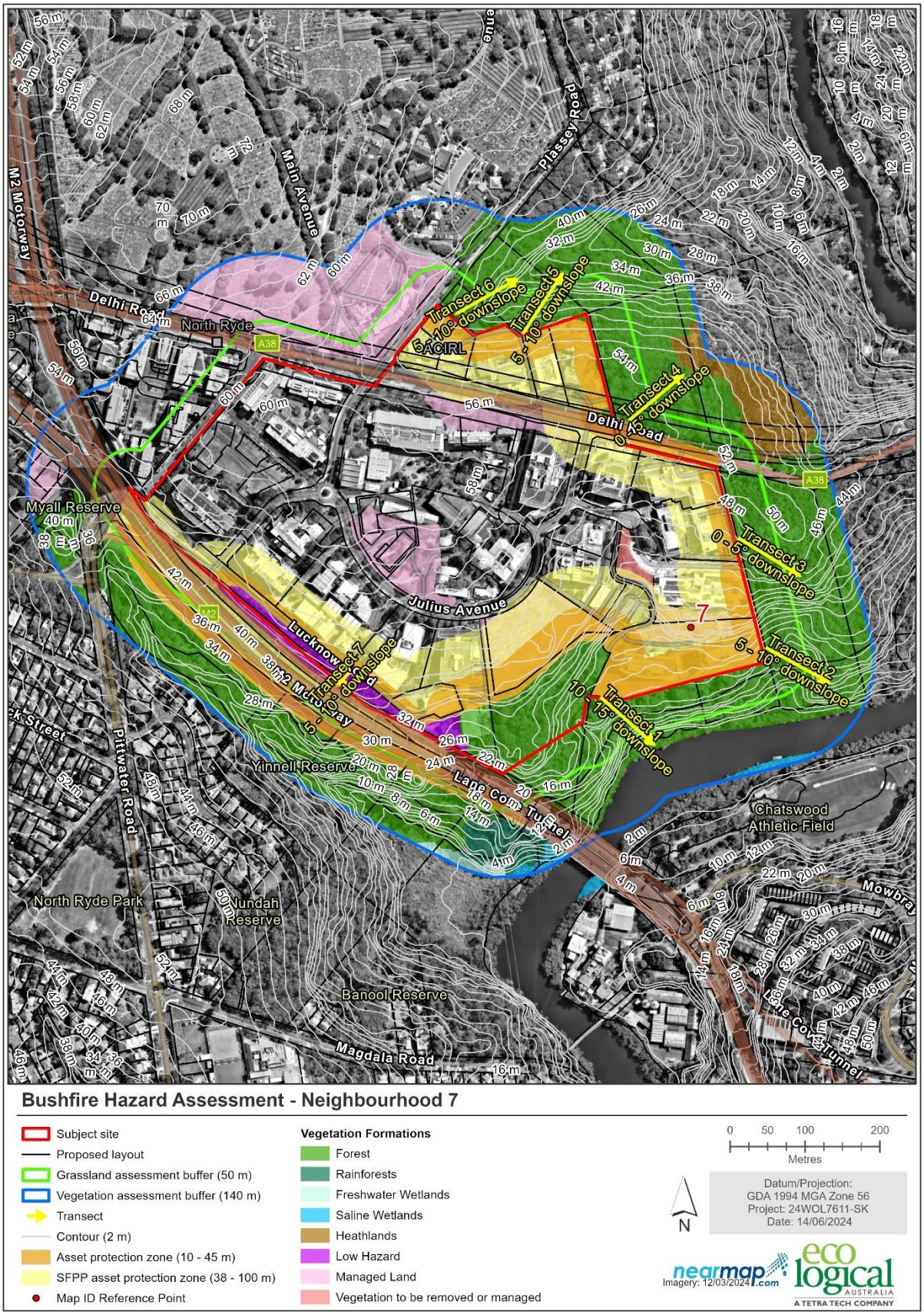

Figure 18: Bushfire Hazard Assessment – Neighbourhood 7

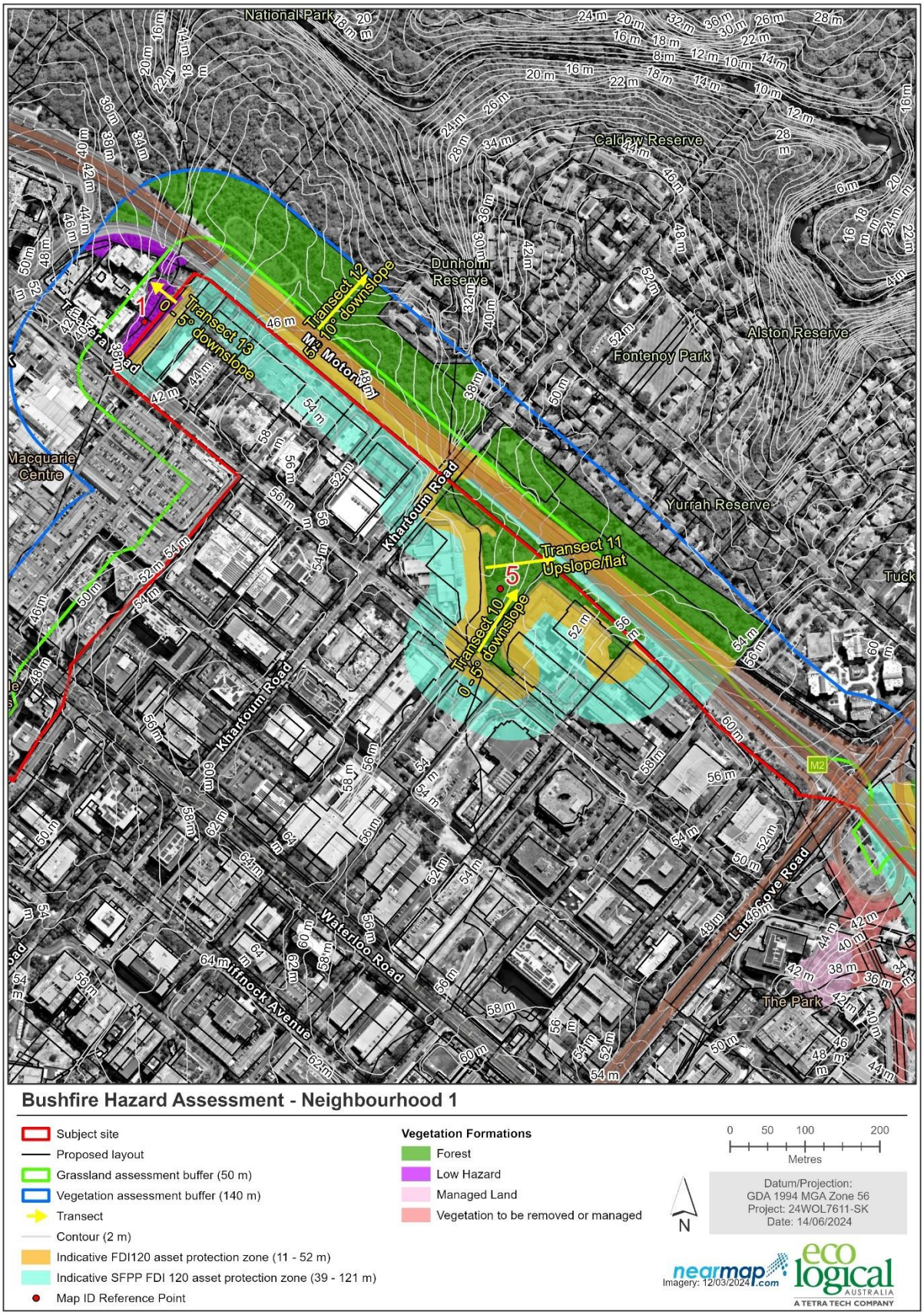

Figure 19: FDI 120 Indicative Bushfire Hazard Assessment – Neighbourhood 1

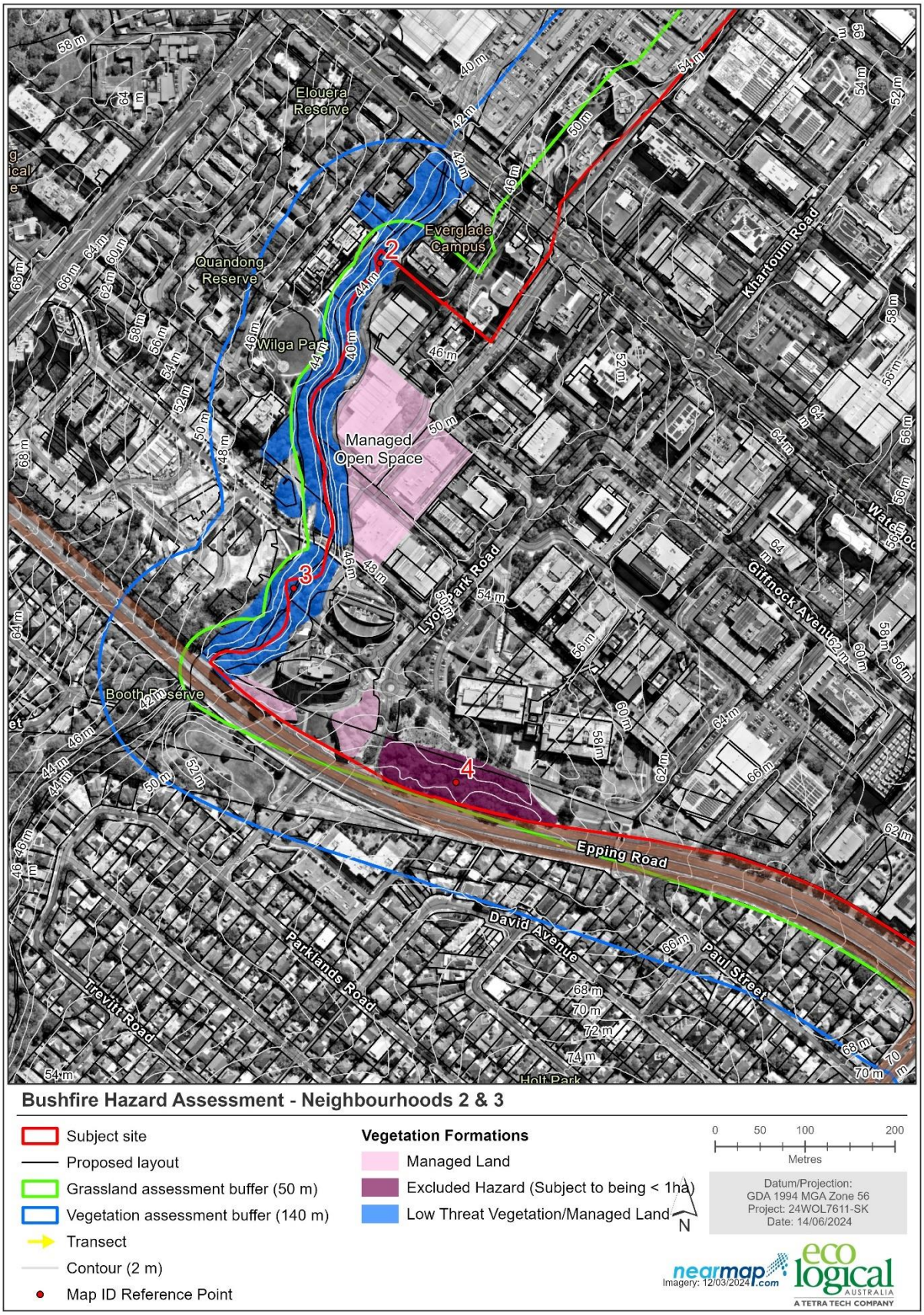

Figure 20: FDI 120 Indicative Bushfire Hazard Assessment – Neighbourhoods 2 & 3

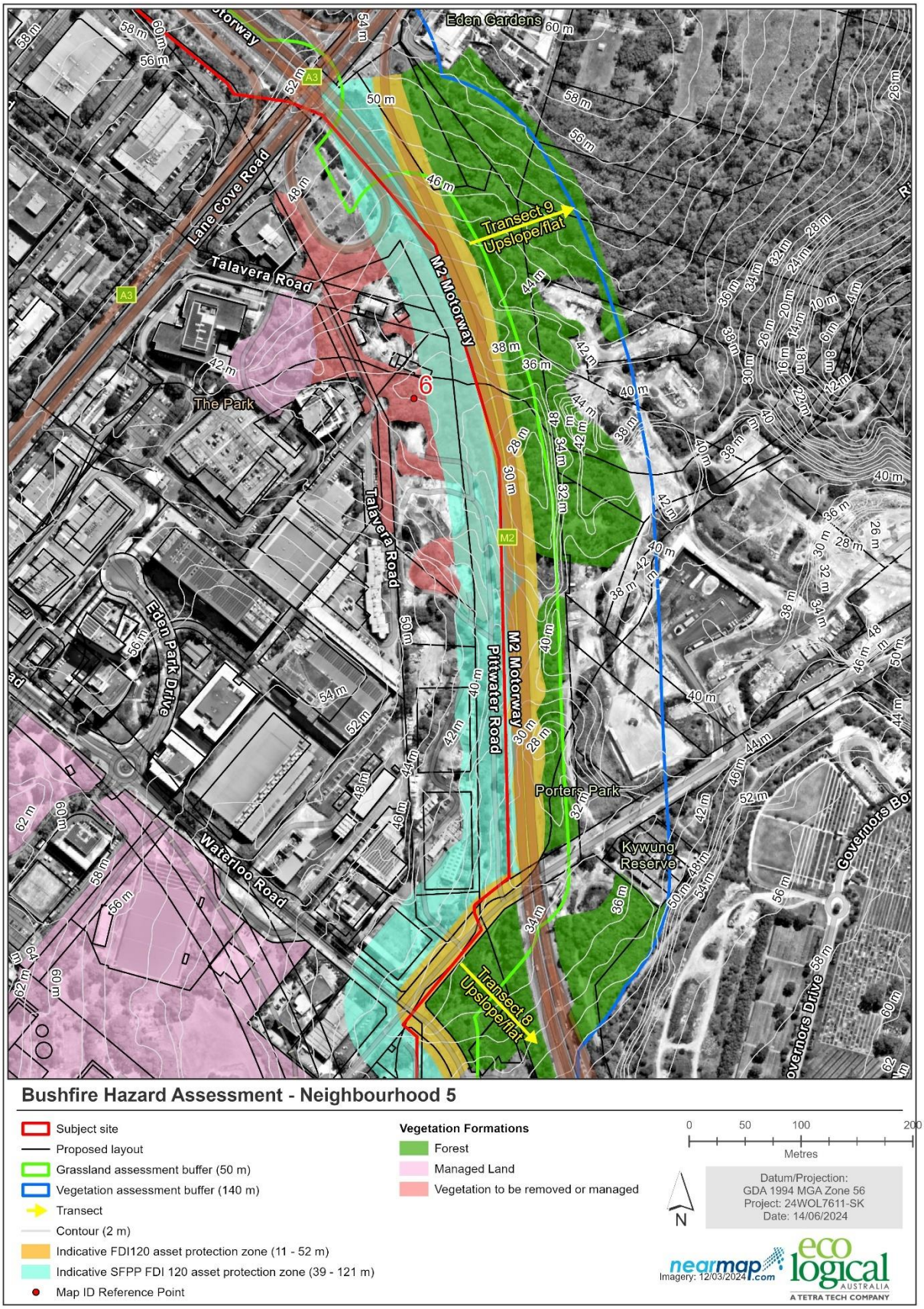

Figure 21: FDI 120 Indicative Bushfire Hazard Assessment – Neighbourhood 5

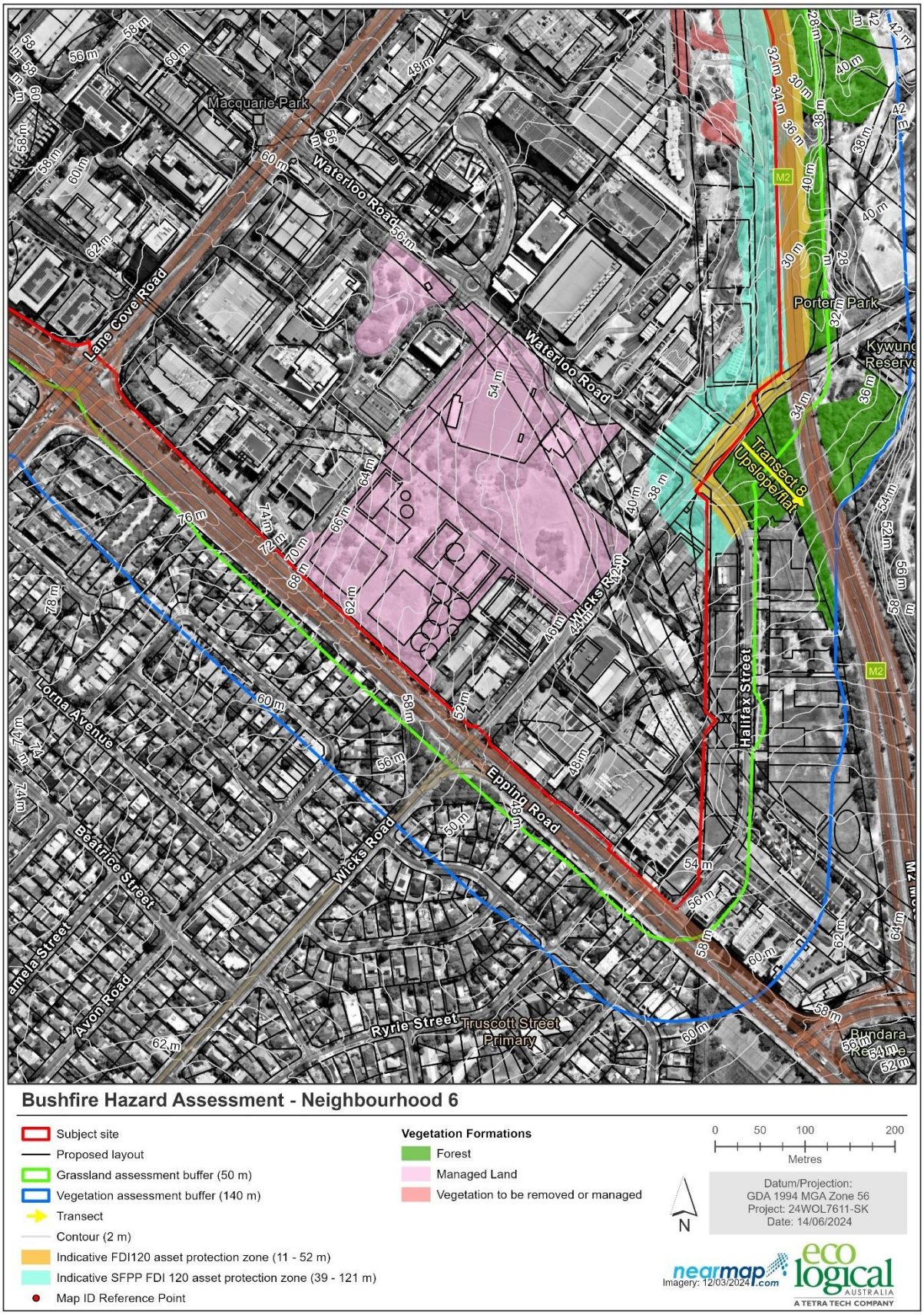

Figure 22: FDI 120 Indicative Bushfire Hazard Assessment – Neighbourhood 6

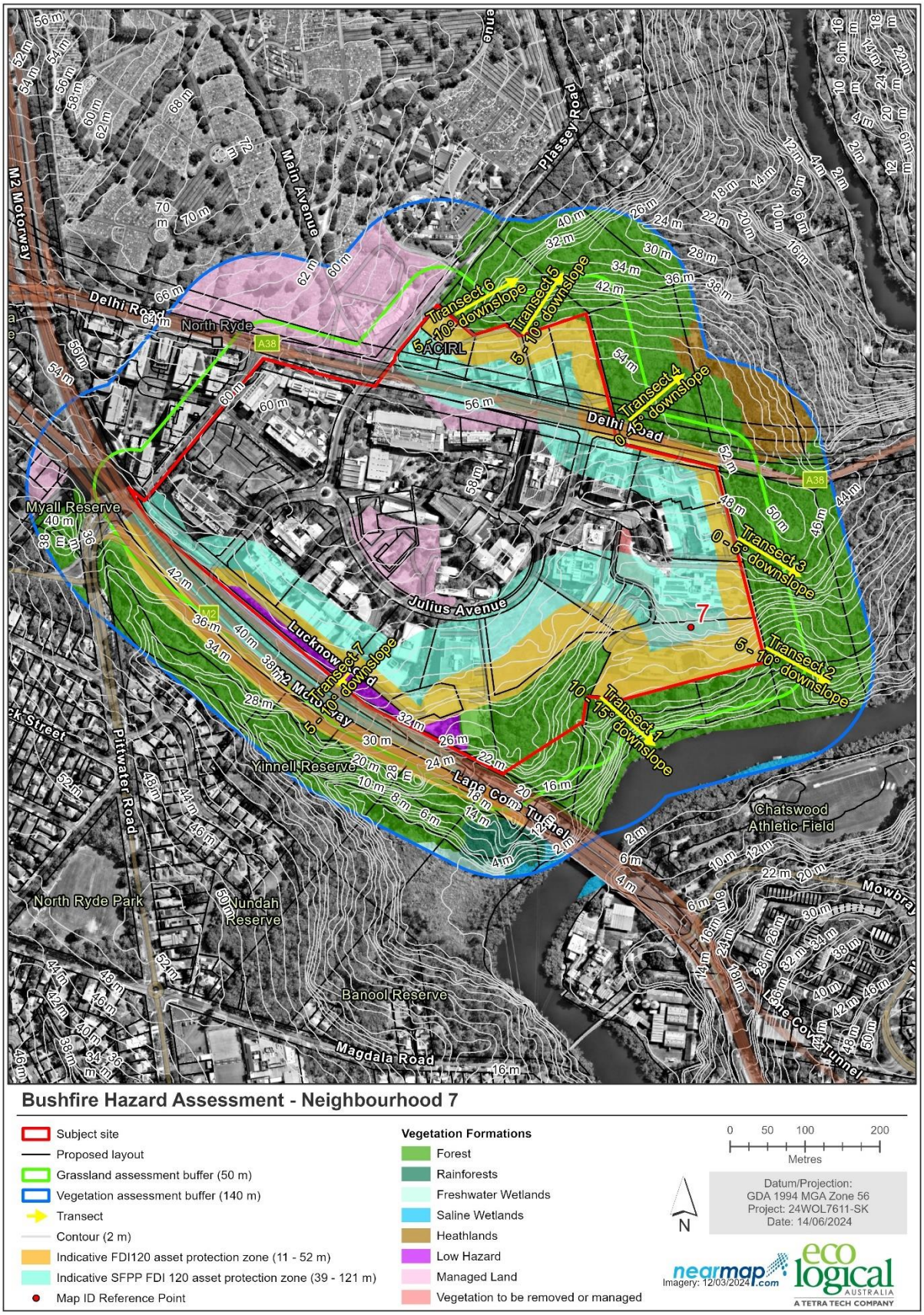

Figure 23: FDI 120 Indicative Bushfire Hazard Assessment – Neighbourhood 7

5. Access and Evacuation

In regard to access, Chapter 4 of PBP requires the following assessment considerations to be addressed for rezoning proposals:

- The capacity of the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile;
- The location of key access routes and direction of travel; and
- The potential for development to be isolated in the event of a bushfire.

5.1.1. Access Requirements

In addition to the above, Chapter 5 of PBP prescribes the access requirements for subdivisions, which amongst other matters specifies:

- Perimeter roads are provided for residential subdivisions of three or more allotments (minimum 8m carriageway width kerb to kerb, with parking provided outside of the carriageway width);
- Subdivisions of three or more allotments have more than one access in and out of the development;
- 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 (refer to A3.3 of PBP), and are clearly sign posted as a dead end;
- Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; and
- Road design should be provisioned to achieve compliance with specifications as detailed in table 5.3b of PBP, including but not limited to carriageway width, parking, vertical clearance etc.

Activation of land use outcomes via infill development may have implications for the broader road network. Therefore, at a Strategic Level the provision of a suitable road network, including perimeter roads should be demonstrated in the Master Plan, and where necessary supported by planning mechanisms.

Review of the road design and access points within the Master Plan considered the bushfire risk context and an appropriate design and protection response. A review of access options proposed in the Master Plan has been undertaken and key points (as labelled on Figure 24) for consideration are:

- It is recommended that Richardson Place is formalised as a through road, connecting into the proposed new road between Lucknow Road and Richardson Place.

Shrimpton's Creek can meet the Low Threat Vegetation exclusions as per A1.10 of PBP and a bushfire response is not required.

It is noted that the following provisions have been included in the design:

- Through access is provided in the south, connecting new proposed roads to Lane Cove Road. Future road design should meet the requirements of Table 5.3b of PBP.
- Map ID '1': Lucknow Road has been converted to a through road, avoiding a greater than 200m dead end road.
- As per Table 5.3b of PBP, where through roads are unavoidable, dead-end roads must be provided with compliant turning circles, as identified in A3.3 of PBP.

5.1.2. Evacuation

Chapter 4 of PBP specifies the exclusion of 'inappropriate development' when "*the development is likely to be difficult to evacuate during a bushfire due to its siting in the landscape, access limitations, fire history and/or size and scale*". While the risk of a significant bushfire necessitating the need for evacuation of the site either in its entirety or partial, is very low to negligible, it is nevertheless important that strategic planning affords multiple options for evacuation. Planned development should ensure provision for:

- Early offsite evacuation with multiple options;
- Safe on-site refuge capacity; and
- Low risk development outcomes.

The current Master Plan provisions at least two access points from the north of Neighbourhoods 1 and 5, linking to the M2, and two from the south onto Epping Road, as show in Figure 24. Additionally, a further access point is located along the western boundary, two along the northern boundary, and two along the southern boundary. Within Neighbourhood 7, similar access is afforded with two northern connections to Delhi Road, and one southern connection onto the M2.

It is recommended that an evacuation study is undertaken to confirm the capacity of the road network to accommodate increased vehicle movements resulting from rezoning.

5.1.3. Offsite Neighbourhood Safer Places

All offsite Neighbourhood Safer Places (NSPs) within a 5 km radius are shown in Figure 25, and are listed with approximate distances in Table 5. The majority of the NSPs within proximity to the site are located to the east of the subject site. Alternative emergency refuge options include the Macquarie Shopping Centre NSP and the town centres of Ryde and Eastwood located to the west and south/west. There are road connections within the Master Plan facilitating egress in these directions.

Table 5: Neighbourhood Safer Places within 5km

Name	Location	Distance (approximate)[1]	Journey time (approximate)[2]
Burt Oldfield Oval	Rosebery Road, Killara	5.4 km	9 minutes
Carpark Macquarie Shopping Centre	Talavera Road, Macquarie Park	0.2 km	1 minute
Chatswood Park	Orchard Road, Chatswood	5.7 km	8 minutes
Gore Hill Oval	Pacific Highway, St Leonards	6.7 km	9 minutes
Kingsford Smith Oval	Kenneth Street, Longueville	7.3 km	11 minutes
Linley Point Reserve	348 Burns Bay Road, Lane Cove	7.9 km	12 minutes
Marjorie York Playground	61 Tambourine Bay Road, Riverview	6.3 km	9 minutes
Monash Park	Cnr of Ryde Road and Monash Road, Gladesville	4.7 km	7 minutes
Pottery Green	Phoenix Street, Lane Cove	5.1 km	7 minutes
Regimental Park	20 Lorne Avenue, Killara	4.5 km	7 minutes

Name	Location	Distance (approximate)[1]	Journey time (approximate)[2]
Robert Pymble Park	Alma Street, Pymble	5.8 km	8 minutes
Roseville Park	60A Clanville Road, Roseville	6.2 km	10 minutes
Saint Ignatius College - Junior School Oval	College Road South, Riverview	4.8 km	9 minutes
West Epping Park	Ward Street, Epping	4.5 km	8 minutes
Woodford Bay Bicentennial Reserve	Kelly's Esplanade, Longueville	5.6 km	11 minutes

[1]Distance is measured from the nearest access point along the subject land boundary

[2]Journey time according to Google Maps at the time of assessment, subject to traffic, road works etc.

5.1.4. Capacity for Safe Onsite Refuge

Whilst early offsite evacuation will always be the safest option, research into past bushfire incidents reveals that multiple and varying evacuation and refuge options should be provided to the community (Blanchi et al. 2015, Whittaker 2019). While rapid onset bushfire attack to the level requiring relocation is unlikely for the majority of this site, the provision of onsite safe refuge locations would nevertheless reduce the demand for potential offsite evacuation, particularly if there is provision in the Precinct for community facilities. On site refuge can be formalised through the provision of NSPs. Typically, NSPs provide a temporary safer place and can be a *building or an open space that may provide for improved protection of human life* (RFS 2017) should they be needed if early off-site evacuation is not available.

There is potential for Built and Open Space NSPs within the Neighbourhoods 1-6, particularly west of Lane Cove Road, and for built NSP east of Lane Cove Road, including within neighbourhood 7. Identifying capacity for a built NSP via provision of a community facility in this area would increase resilience of existing development within Neighbourhood 7, and the resilience of proposed land use outcomes (Figure 27).

5.1.5. Low Risk Development Outcomes

In combination with the capacity for early off-site evacuation and capacity for safe on-site refuge, the risk level of the proposed development outcomes across the site warrants consideration with respect to evacuation demand. With 100 m being the statutory distance that bushfire protection measures are applied to development via PBP and AS 3959 (i.e. bushfire prone land), it provides an indication of the land that could be at higher risk from bushfire attack and the land beyond being at lower risk.

Analysis reveals that a large proportion of the subject land is greater than 100 m from the closest bushfire hazard and thus not considered bushfire prone land and as a result is not expected to be exposed to significant bushfire attack or in some cases any level of attack (Figure 26).

Much of the Master Plan area west of Lane Cove Road will occur outside of the statutory distance that bushfire protection measures are applied to development via PBP and AS 3959, indicating these areas are subject to a lower residual risk. This contrasts to Neighbourhood 7, where much of the neighbourhood is within the statutory distance (100m) that bushfire protection measures are applied to development.

5.2. Emergency Services

The following is recommended for strategic land use planning to achieve the objectives and strategic planning principles of PBP 2019 relating to emergency management. Strategic emergency management planning is undertaken in collaboration with emergency service organisations within the strategic land use planning process, to establish preferred future outcomes (i.e. emergency evacuation) that have implications for land use planning, including:

a. Emergency evacuation planning; and
b. Evacuation adequacy assessment.

The provision of adequate infrastructure for emergency management is largely to be considered as a component of broader planning, and it is recommended that any uplift to the existing provision of emergency services is discussed with relevant agencies.

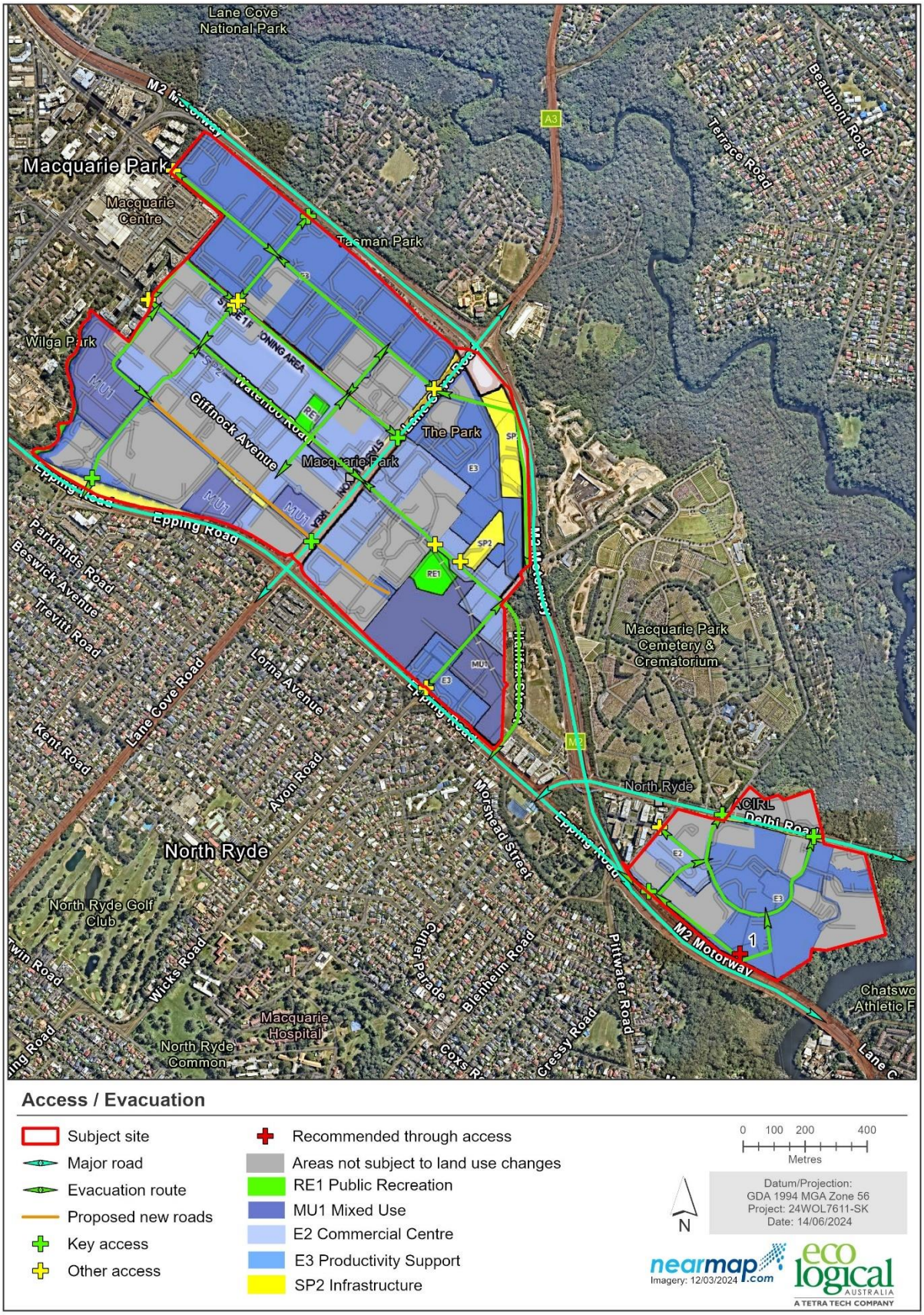

Figure 24: Indicative access routes

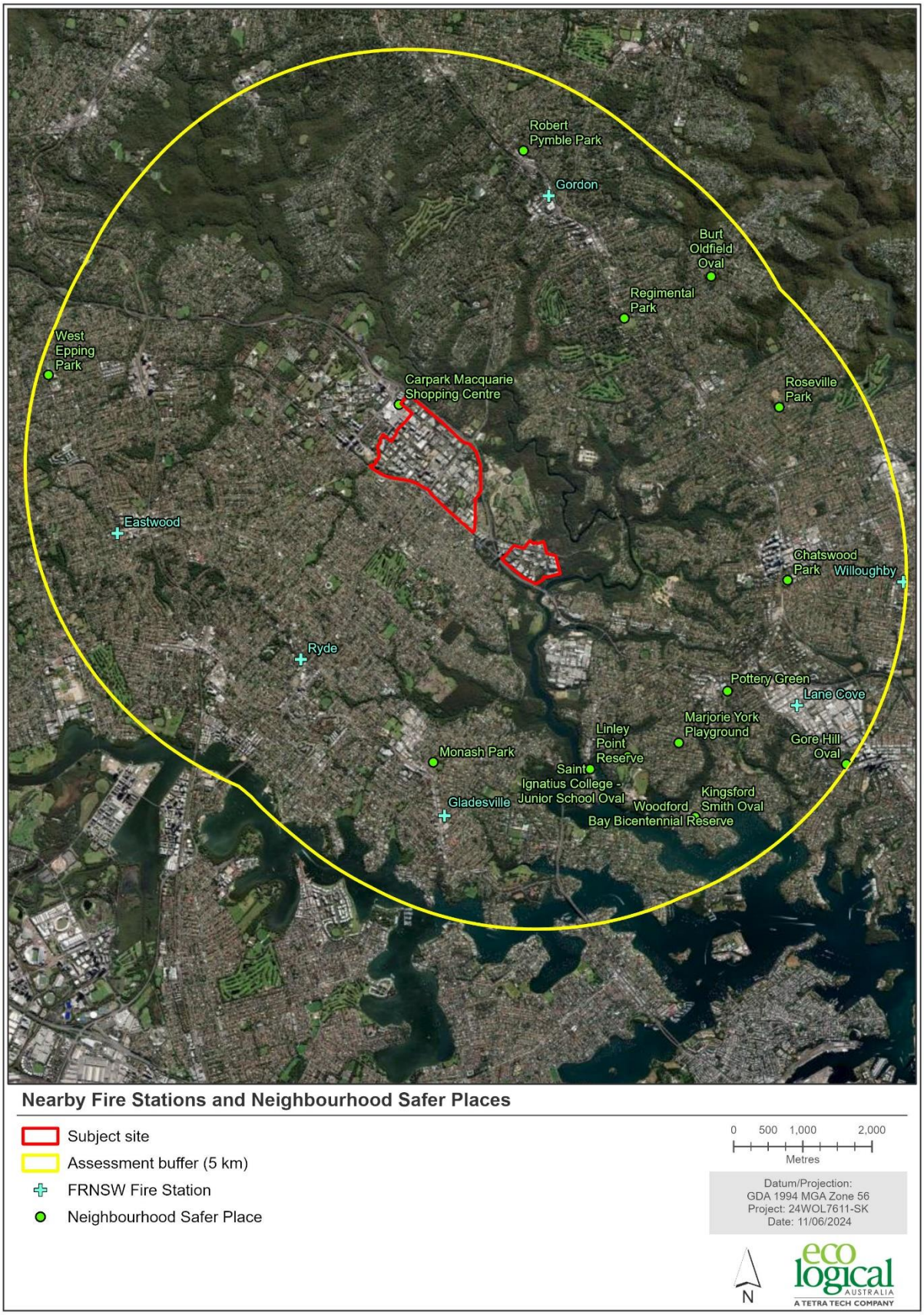

Figure 25: Nearby fire stations and existing neighbourhood safer places

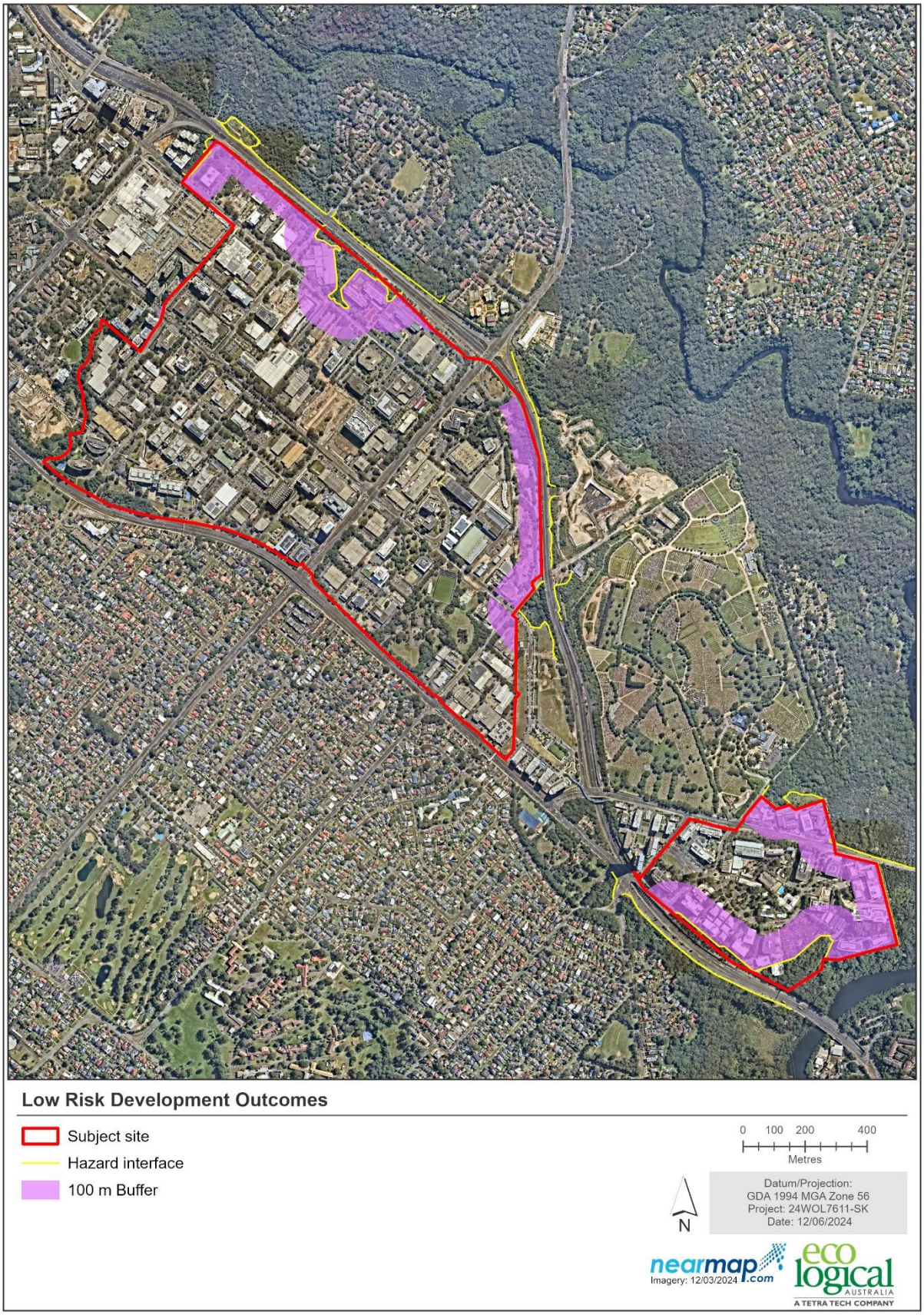

Figure 26: Low Risk Development Outcomes

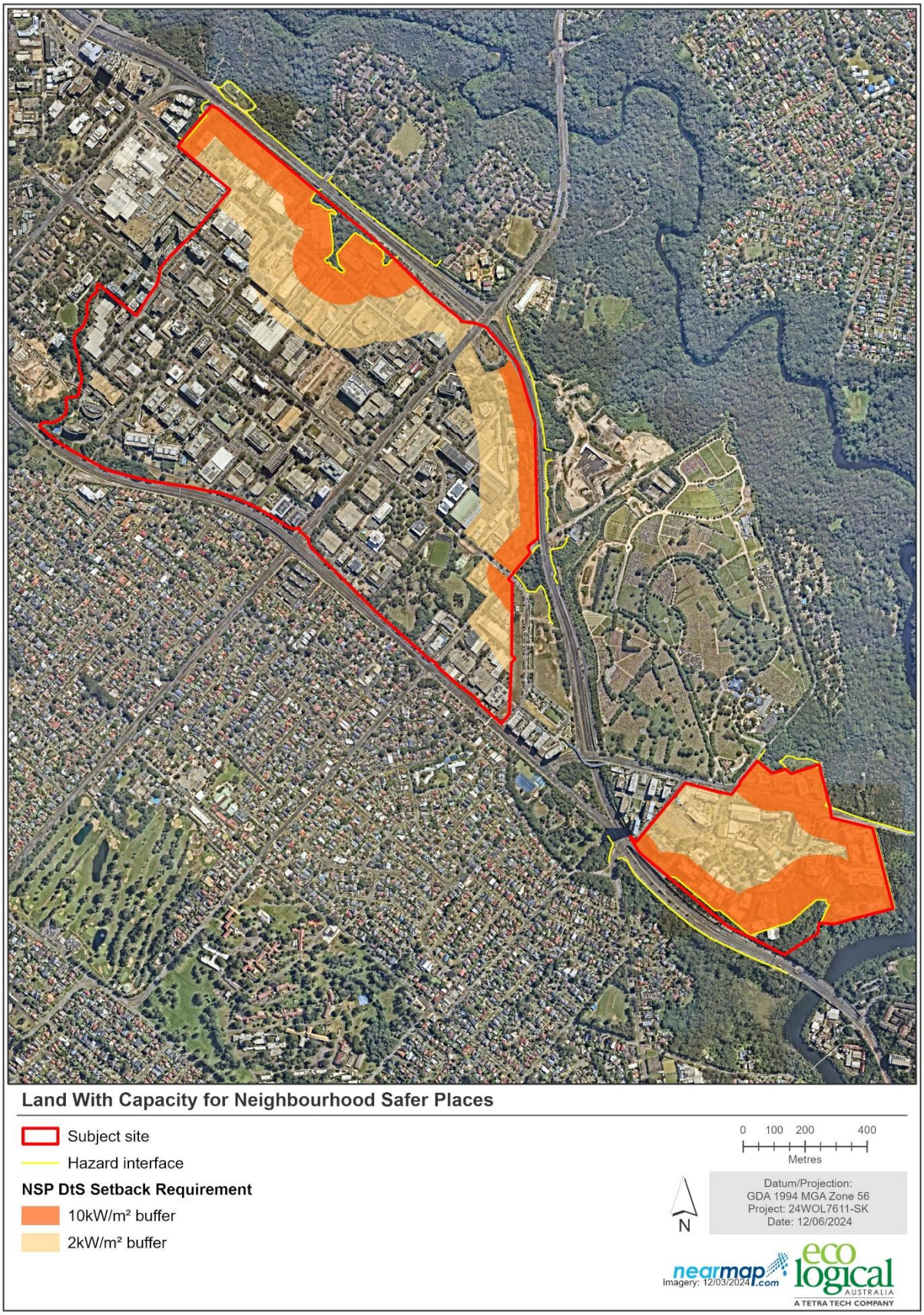

Figure 27: Land With Capacity for Neighbourhood Safer Places

6. Infrastructure and Adjoining Land

Future development on the Subject Land will need to meet the applicable requirements of PBP relating to infrastructure provision. The general requirements for development are discussed below and are considered achievable for this site. Specific requirements for SFPP developments and residential subdivision are detailed in PBP and compliance will need to be ensured as design and planning progresses.

Strategic planning requirements seek to identify any potential issues associated with infrastructure and utilities. Key considerations on suitability of infrastructure to meet the requirements of PBP include the ability of the reticulated water system to deal with a major bushfire event in terms of pressures, flows, and spacing of hydrants and life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines, etc. Table 5.3 and Table 6.8 of PBP detail the Acceptable Solution requirements in full.

6.1. Water Supply

Future development will be serviced by a reticulated water supply, which is compliant with PBP. Fire hydrant spacing, sizing and pressures should also comply with AS 2419.1 – 2021 '*Fire hydrant installations – Part 1: System design, installation and commissioning*' (SA 2021). Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. Fire hydrants should not be located within any road carriageway. All above ground water and gas service pipes external to any buildings are to be metal, including and up to any taps. Where reticulated water cannot be provided a static water supply for firefighting purposes is required on site for each occupied building in accord with the capacities outlined in PBP.

Further detail regarding water supply requirements is detailed in PBP. Acceptable Solution requirements for water supply are expected to be achievable for future development within the subject land.

6.2. Electricity and Gas

It is expected that future electricity supply to the Subject Land will be underground where possible and compliant with PBP. If existing or future electrical transmission lines to the subject land are above ground, the following requirements apply:

- Lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and
- No part of a tree is closer to a line than the distance set out in accordance with the specifications in ISSC3 'Guide for the Management of Vegetation in the Vicinity of Electricity Assets' (ISSC3 2016).

While it is understood that the development will not include provisions for reticulated gas supply, should any future development utilise bottled gas, then it is to be installed and maintained in accordance with Australian Standard AS/NZS 1596:2014 '*The storage and handling of LP Gas*' (SA 2014) and the requirements of relevant authorities (metal piping must be used).

Further detail regarding electricity and gas requirements is detailed in PBP. The Acceptable Solution requirements for these services are expected to be achievable for the future development contemplated by the Master Plan within the study area.

6.3. Adjoining Land

Future development contemplated by the Master Plan should not compromise any offsite bushfire management work and should also not require a change to the bushfire management practices for adjoining land.

7. Evaluation

Provided below in Table 6 is an evaluation of the proposal against the strategic planning principles of PBP. The evaluation is based on Shrimpton's Creek and other excluded vegetation within the study area not being assessed as a future hazard.

Table 6: Evaluation of proposal against strategic requirements of PBP

PBP Strategic Planning Principle	Key Considerations	Comment
Ensuring land is suitable for development in the context of bushfire risk	• The broader bushfire landscape • The sitting of land uses/development type within the site and broader landscape • Capacity for BPM	• The site is situated in a broader landscape with some connectivity to areas of bushfire hazard. However, there is capacity for future development to be positioned to achieve regulatory bushfire protection measures including: o land where future residential development can achieve a Bush Fire Attack Level of 29 (or lower) i.e. situated outside of the required residential APZ o land where future SFPP development can be situated outside of the required SFPP APZ. o land proposed for development outside of the statutory distance that bushfire protection measures are applied to development via PBP and AS 3959 can be considered as low risk development. o Opportunity to increase the resilience of the Precinct through consideration of additional access connections, strategic placement of public open space, and onsite evacuation potential. • It is noted that legacy development is constrained by current bushfire protection requirements, and redevelopment of these structures may require a performance based solution.
Ensuring new development on BFPL will comply with PBP	• Capacity for BPM consistent with the requirements of Chapter 5 of PBP for residential /rural residential development • Capacity for BPM consistent with Chapter 6 of PBP for SFPP development	• Review of the proposed Master Plan indicates that the BPMs incorporated into the design are appropriate for the bushfire risk context. • Compliance with Chapter 4 of PBP through the provision of BPM meeting the acceptable solutions of PBP is generally demonstrated including: o Perimeter access between the bushfire hazard and development has been provisioned in Master Plan. o Avoidance of dead ends or where unavoidable, ensuring they are less than 200m in length has been provisioned in the Master Plan design.

PBP Strategic Planning Principle	Key Considerations	Comment
		○ Secondary access points to and from the public road network have been provisioned in the design ○ Provision for future development outside of required APZ as per section 3 of this report is feasible. As design progresses, road dimensions and turning circles should be compliant with the specifications in Table 5.3b of PBP and Appendix 3 of PBP.
Minimising reliance on performance-based solutions	• Provision for BPM meeting the acceptable solutions of PBP, including APZs, access, infrastructure and water supply	• Review of the proposed Master Plan indicates that the BPMs incorporated into the design minimise reliance on performance based solutions and therefore is consistent with the strategic planning principles of PBP. • While the Master Plan generally makes provision to avoid performance solutions, given the precinct supports existing legacy development, it is expected that some performance solutions are unavoidable. This is most notable where future development will be activated by the infill development provisions. However, there is opportunity for BPM to be implemented that achieve a better outcome then present. Given the generally low to negligible bushfire risk for much of the Precinct, this is considered an appropriate strategic planning outcome. • Within Neighbourhood 7, existing development abuts Lane Cove National Park. Opportunities are present to strengthen the existing BPM by providing additional access points for fire fighting purposes, such as the provision of a perimeter road and further consideration to the placement of the open space area.
Providing adequate infrastructure associated with emergency evacuation and firefighting operations	• The proponent should liaise with relevant government agencies to understand their contribution to emergency management. • Traffic study to ensure road network can accommodate evacuation demand of both the site and broader urban area • Internal road network that meets the requirements of Chapter 5 of PBP • Capacity of water supply for firefighting as per requirements of Chapter 5 of PBP.	• It is recommended that consultation with relevant authorities is undertaken regarding the capacity of existing emergency services. • It is recommended that an evacuation study is undertaken to demonstrate the capacity of the internal road network and existing public roads for evacuation.
Facilitating appropriate ongoing land	• APZs will need to be managed in perpetuity to ensure management in perpetuity.	• It is recommended that the Shrimpton's Creek riparian corridor and any other areas of retained vegetation are managed under a vegetation

PBP Strategic Planning Principle	Key Considerations	Comment
management practices		management plan/plan of management. In particular for Shrimpton's Creek, ensuring the corridor is not considered a future bushfire hazard. • Consideration should be given to the management and future land use for the vegetation hazard between Lucknow Road and Richardson Place. Opportunity exists to reduce the constraints and increase resilience within Neighbourhood 7 via the potential management of this vegetation in accordance with A4.1.1 of PBP, subject to landowner agreeance. • Where required, mechanisms for APZ management in perpetuity should be considered: o This could be via community title, Section 88b or a plan of management where on public open space.

9. Conclusion and Recommendations

Upon review of the Master Plan, future development is considered appropriate with the bushfire risk context and consistent with the strategic planning principles of PBP. There is generally provision for bushfire protection measures in the Master Plan, including the provision of suitable access and capacity for development to occur outside of required asset protection zones.

It is noted that some areas of legacy development within the precinct have been encroached by the prescribed APZ and therefore any redevelopment where these buildings are to be retained would require a performance based solution

Overall, the subject land is assessed as having a low residual risk and suitable bushfire protection measures can be achieved for new development. Therefore, the rezoning and proposed development outcomes contemplated by the Master Plan are generally considered appropriate for the precinct. However, Neighbourhood 7 presents an elevated risk given the proximity to Lane Cove NP, existing development and Master Plan layout. Therefore, specific recommendations to increase the resilience for existing and proposed urban land uses in neighbourhood 7 include:

- A road network that meets the requirements of PBP and provided suitable offsite evacuation:
    - Perimeter access provisioned where rezoning or land use outcomes abut future or existing hazards, as consider in this assessment.
- Opportunity for onsite refuge through provision of a community facility or similar structure that can achieve the built NSP requirements.
- Consideration should be given to the management and future land use for the vegetation hazard between Lucknow Road and Richardson Place.
- Opportunity to consider enlarged (FFDI120) APZ setbacks for increased resilience to climate change.
- Placement of low level residential uplift to achieve low risk development outcomes.

To achieve the lowest risk profile feasible, the following additional recommendations are made:

- Management or refinement of vegetation identified at Map ID 1 is undertaken to meet the Low Threat Exclusion parameters of PBP (see appendix A1.10) in accordance with recommendations in Table 3.
- Management of the Shrimpton's Creek Corridor and vegetation at other locations where Low Threat Vegetation Exclusions have been applied as per A1.10 of PBP (MAP ID 2, 3, and 4).
- Consideration to planning mechanisms to guide the placement of multistorey residential development (i.e. greater than 3 storeys) away from bushfire hazards and retained/future hazards within the subject land.
- Consideration to recommendations regarding the proposed road network and implementation of road specifications that are compliant with Table 5.3b of PBP for each road.
- An evacuation study is undertaken to confirm capacity of the road network is suitable and can facilitate egress in an emergency.
- Placement of future development outside of the required APZ.

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