STRATEGIC BUSHFIRE STUDY

Tomago Industrial Planning Proposal

Northbank Enterprise Hub Pty Ltd

March 2025

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

COOL BURN FIRE + ECOLOGY

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EXECUTIVE SUMMARY

Northbank Enterprise Hub Pty Ltd (NEH), c/- Urbis Ltd, has engaged Cool Burn Fire and Ecology (Cool Burn) to prepare a Strategic Bushfire Study for the Tomago Industrial Planning Proposal Project, located in Tomago, in the Port Stephens Council Local Government Area (LGA).

The Planning Proposal intends to amend the zoning classification identified as IN1 to E4 General Industrial and include further permissible land use activities to remain generally consistent with the land uses permissible in other E4 zones across other jurisdictions.

The planning proposal requires consideration in relation to Ministerial Direction 4.3 Planning for Bushfire Protection, issued under section 9.1(2) of the *Environmental Planning and Assessment Act 1979*. Port Stephens Council and the Rural Fire Service have requested a bushfire report to consider the proposed additional land uses, in alignment with Chapter 4 of *Planning for Bushfire Protection* 2019 (PBP 2019).

This Strategic Bushfire Study has been prepared to identify the extent to which the proposal conforms with or deviates from the relevant provisions of PBP 2019.

Industrial and commercial development is assessed under Chapter 8 (Other Development) of PBP 2019, and this study demonstrates how planned bushfire protection measures (BPMs) would perform and satisfy the aims and objectives of PBP 2019.

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1. INTRODUCTION

Urbis Ltd on behalf of Northbank Enterprise Hub Pty Ltd (NEH) has engaged Cool Burn Fire and Ecology (Cool Burn) to prepare a Strategic Bushfire Study for the Tomago Industrial Planning Proposal in the Port Stephens Council Local Government Area (LGA) (Figure 1).

The subject site for this study is the IN1 zoned lands south of Tomago Road, and includes three NEH landholdings (Figure 2):

- 2 WesTrac Drive (Lot 210 in DP 1174939), which is approximately 50ha in area.
- 365-403 Tomago Road (Lot 1001 in DP 1127780), which is approximately 241ha in area.
- 313 Tomago Road (Lot 1 in DP 1155307), which is approximately 0.62ha in area.

Cool Burn is recognised by the Fire Protection Association Australia (FPAA) as a suitably qualified consultant in bushfire risk assessment.

1.1 PLANNING PROPOSAL OVERVIEW

This Planning Proposal seeks to amend the Regional Precincts SEPP by:

- Reclassification of the current IN1 General Industrial zone to the E4 General Industrial zone, thereby aligning with the intent of the NSW Employment Zones Reforms (April, 2023).
- The introduction of the additional land uses at Clause 7 of Appendix 2 of the Regional Precincts SEPP to broaden the available land uses within the Tomago Industrial Site.
- Note: the land uses proposed are generally consistent with E4 General Industrial zones in the locality and throughout NSW.
- A separate new clause to permit Specialised Retail Premises as an additional permitted land use within the Tomago Industrial Site.

Urbis have submitted a subject scoping proposal for initial consideration and referral. A review of agency comments and an initial assessment by Port Stephens Council (PSC) has been undertaken, highlighting site and strategic planning matters that require consideration when lodging a planning proposal.

This Strategic Bushfire Study has been prepared as supporting information to address the planning proposal requirements, as it applies to bushfire planning matters:

- NSW RFS comments: *The Planning Proposal needs to include a bushfire report that addresses Chapter 4 of Planning for Bushfire Protection 2019*; and
- PSC comments: *The planning proposal needs to be considered against Ministerial Direction 4.3 Planning for Bushfire Protection*.

1.2 OBJECTIVE

The objectives of the Ministerial Direction 4.3 Planning for Bushfire Protection are to:

- Protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and
- Encourage sound management of bushfire prone areas.

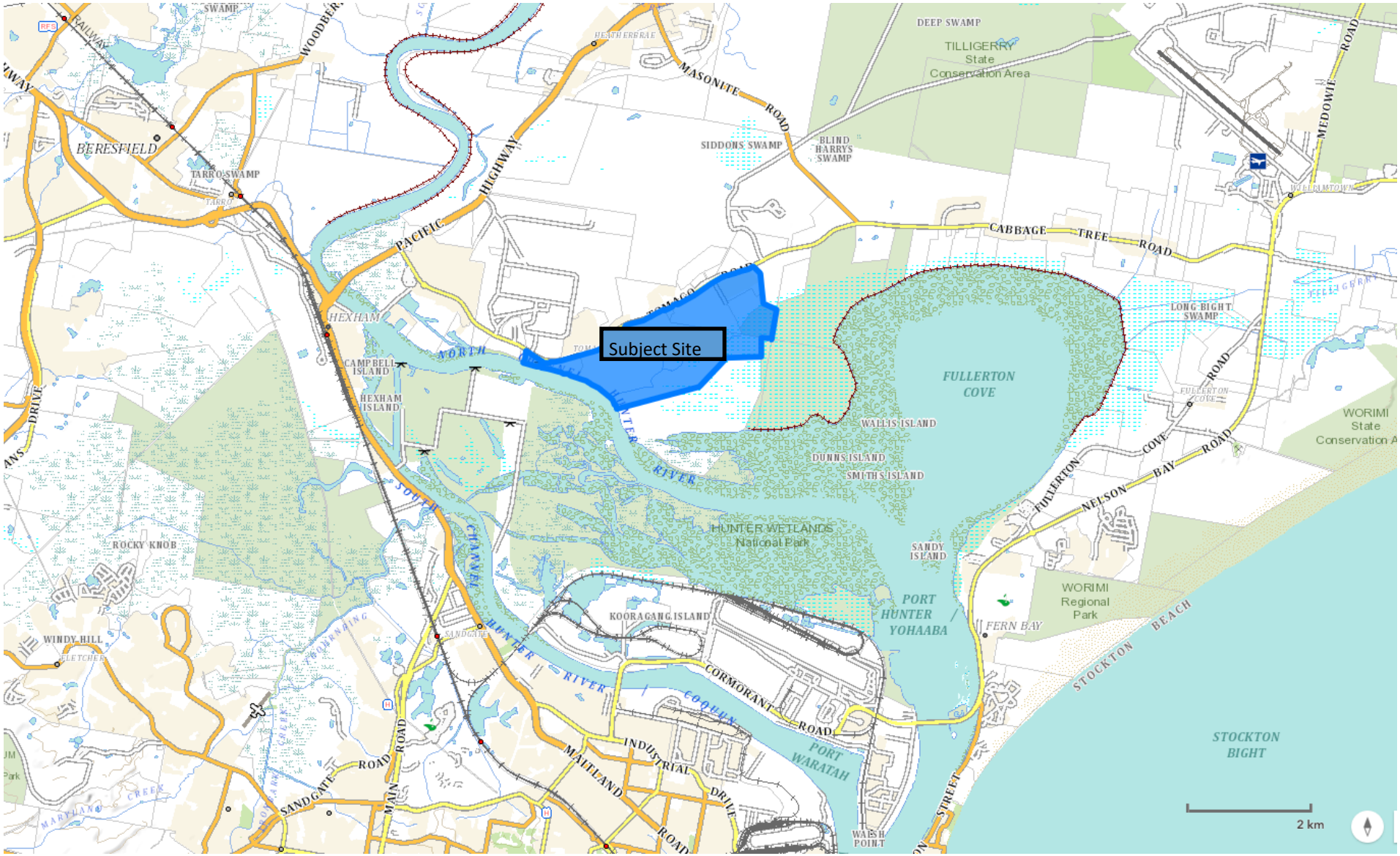

Figure 1: Location

Subject Site

Tomago Planning Proposal

Westrac Dv Tomago

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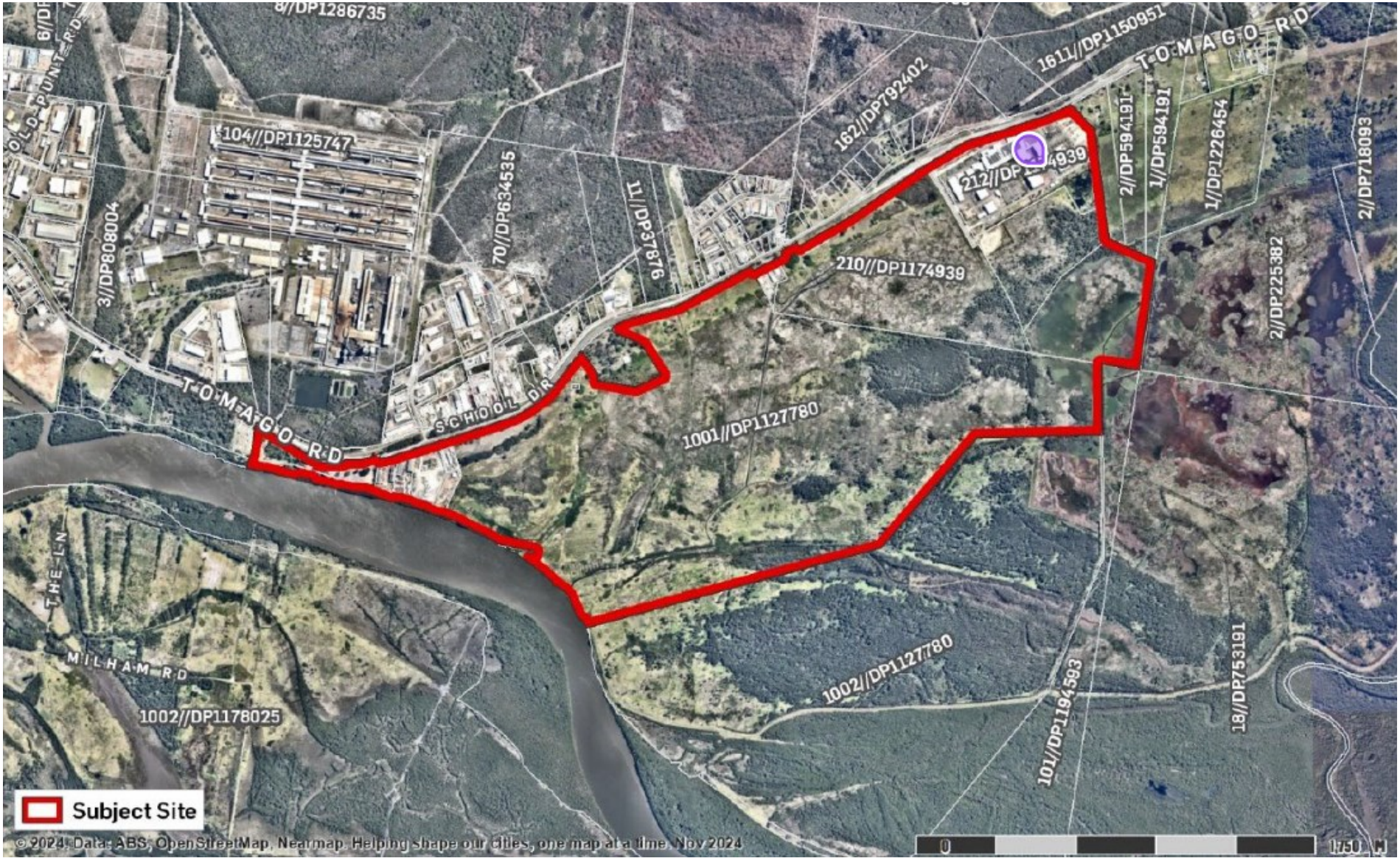

Figure 2: Subject Site

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2. ASSESSMENT METHODOLOGY

2.1 MINISTERIAL DIRECTION 4.3

This direction applies to local government areas when a relevant planning authority prepares a planning proposal that will affect, or is in proximity to, land mapped as bushfire prone land.

This applies where the relevant planning authority is required to prepare a bush fire prone land map under section 10.3 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), or, until such a map has been certified by the Commissioner of the NSW Rural Fire Service, a map referred to in Schedule 6 of that Act.

(1) In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 3.34 of the Act, and prior to undertaking community consultation in satisfaction of clause 4, Schedule 1 to the EP&A Act, and take into account any comments so made.

(2) A planning proposal must:

a. have regard to Planning for Bushfire Protection 2019,

b. introduce controls that avoid placing inappropriate developments in hazardous areas, and

c. ensure that bushfire hazard reduction is not prohibited within the Asset Protection Zone (APZ).

(3) A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:

a. provide an APZ incorporating at a minimum:

i. an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and

ii. an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,

b. for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard,

in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the *Rural Fires Act 1997*), the APZ provisions must be complied with,

c. contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,

d. contain provisions for adequate water supply for firefighting purposes,

e. minimise the perimeter of the area of land interfacing the hazard which may be developed,

f. introduce controls on the placement of combustible materials in the Inner Protection Area.

A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority (PSC) can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary) that the council has obtained written advice from the Commissioner of the NSW Rural Fire Service to the effect that, notwithstanding the non- compliance, the NSW Rural Fire Service does not object to the progression of the planning proposal.

2.2 PLANNING FOR BUSH FIRE PROTECTION 2019

Planning for Bushfire Protection 2019 (PBP 2019) is applicable to all development on bushfire prone land (BFPL) in NSW and all development on bushfire prone land must satisfy the aims and objectives of PBP 2019.

To comply with PBP 2019, the planning proposal would require the following conditions to be met:

- Satisfy the aim and objectives of PBP 2019:
    - The overall aim of PBP 2019 is to provide for the protection of life (including firefighters) and to minimise impacts on property from the threat of bush fire.
- Consider the requirements and recommendations listed within PBP 2019 for the specific purpose for the development -
    - Chapter 2.3 Strategic Planning
    - Chapter 8 Other development
- Detail appropriate Bushfire Protection Measures (BPM's) that satisfy the relevant performance criteria.

In a bush fire context, strategic planning must ensure that future land uses are in appropriate locations to minimise the risk to life and property from bushfire attack. Services and infrastructure that facilitate effective suppression of bushfires also need to be provided for at the earliest stages of planning.

The bushfire risk is considered at the macro-scale, looking at fire runs, steep slopes and any areas of isolation. The amount of development interfacing vegetation will also be considered.

The broad principles which apply to this analysis are:

- Ensuring land is suitable for development in the context of bush fire risk;
- Ensuring new development on BFPL will comply with PBP 2019;
- Minimising reliance on performance-based solutions;
- Providing adequate infrastructure associated with emergency evacuation and firefighting operations; and
- Facilitating appropriate ongoing land management practices.

2.3 STRATEGIC BUSHFIRE PLANNING

The Strategic Bushfire Study has been prepared for the long-term and ongoing planning for the planning proposal, supporting future development and land use.

Strategic planning should provide for the exclusion of inappropriate development in bush fire prone areas as follows:

- The development area is exposed to a high bushfire risk and should be avoided;
- 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;
- The development will adversely effect other bushfire protection strategies or place existing development at increased risk;
- The development is within an area of high bushfire risk where density of existing development may cause evacuation issues for both existing and new occupants; and
- The development has environmental constraints to the area which cannot be overcome.

The bushfire protection planning includes a review of the proposal against the following guidelines, legislation, and regional information:

- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *NSW Rural Fires Act 1997* (RF Act);
- *NSW RFS Planning for Bushfire Protection 2019* (PBP 2019);
- Australian Standard (AS) 3959-2018 *Construction of buildings in bushfire-prone areas;*

- Bushfire Risk Management Plans (BFRMP) for the Local Government Area (LGA);
- Bushfire history (SEED geo-mapping).

3. STRATEGIC BUSHFIRE STUDY

A Strategic Bush Fire Study must include, as a minimum, the components detailed in PBP 2019 Table 4.2.1, as provided in the following Section.

3.1 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 (macro) surrounding landscape.

3.1.1 Bushfire Prone Land

Bushfire Prone Land (BFPL) is land identified and mapped by Council, and certified by the Commissioner of the RFS, that can support a bushfire or is subject to bushfire attack. Bushfire prone land maps provide a trigger for development assessment provisions. Any land parcels affected must apply the legislative requirements for developing and building on bushfire prone lands.

The entire subject site is mapped as Category 3 BFPL (grasslands and freshwater wetlands), with Category 1 BFPL (Forest) predominantly occurring to the north and opposite Tomago Road (Figure 3).

3.1.2 Vegetation

The bushfire behaviour assessment methodology assesses the vegetation classification on and surrounding the investigation area (out to at least 140m from subject site) in accordance with the methodology for classification of vegetation in PBP 2019.

Predominant Vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general descriptions of PBP 2019. The *NSW Rural Fire Service – Comprehensive Vegetation Fuel Loads* (March 2019) can also be used to confirm most appropriate vegetation types and associate fuel loads. The vegetation map (Figure 4) details broad vegetation classifications and are listed as:

Vegetation classified as hazard (bushfire prone vegetation) surrounds the site:

- Exotic grasslands: former agricultural lands to the east and west are classified as Grassland;
- Freshwater wetlands: Typha and phragmites reed swamps (Reedlands) are the predominant vegetation types adjacent to the southern, eastern and western boundaries. They will be classified as Short Heath (*NSW Rural Fire Service – Comprehensive Vegetation Fuel Loads);*
- Swamp Oak: Forested wetland remnants to the south will be classified as Coastal Swamp Forests, a Forest formation;

- Forest vegetation to the north:
    - MU133 Swamp woodland of the Tomaree Peninsula: classified as Coastal Swamp Forests, a Forest formation
    - MU123 Sand Apple Blackbutt Forest; classified as Forest formation

Future development including stormwater management is likely to remove and/or manage all vegetation within the development footprint for the benefit of the proposal (i.e. managed for hazard reduction).

3.1.3 Topography

The Proposal is sited on the Tomago Swamp flats, which has a flat topography. No part of the proposal would be subject to meaningful 'downslope' fire behaviour. The slope category out to 100m surrounding this development site is classified as flat land (0 degrees).

3.1.4 Weather

The climate of the Lower Hunter region is sub tropical to temperate, with annual rainfall averages of approximately 1100 mm per year in coastal districts. Port Stephens has a mild to warm summer, and mild winter conditions. The bushfire season is generally declared in September/October and extends through the summer months to April, coinciding with increased daytime temperatures.

Fires have been known to occur at any time due to temporal micro-climate conditions, however the most significant fires recorded are generally in the months September-January, after cool and dry winter and spring seasons.

Prevailing winds associated to the bushfire peak periods are north to north westerly winds with high temperatures and low humidity.

The Fire Danger Index (FDI) is calculated using weather and fuel components, which include temperature, humidity, wind speed, dryness of the fuel, and recent rainfall. The system assigns value on a scale of 1 to 100+, with higher values indicating greater danger. Port Stephens currently has an accepted rating of FDI100. Over the expected lifespan of the Proposal, the climate is projected to change, potentially resulting in more days of higher fire danger than previously experienced, and projected Fire Danger Rating (FDR) exceeding current levels (Douglas, G. 2017). Planning for long term infrastructure should include consideration of the potential for increased fire danger and potentially higher fire frequencies.

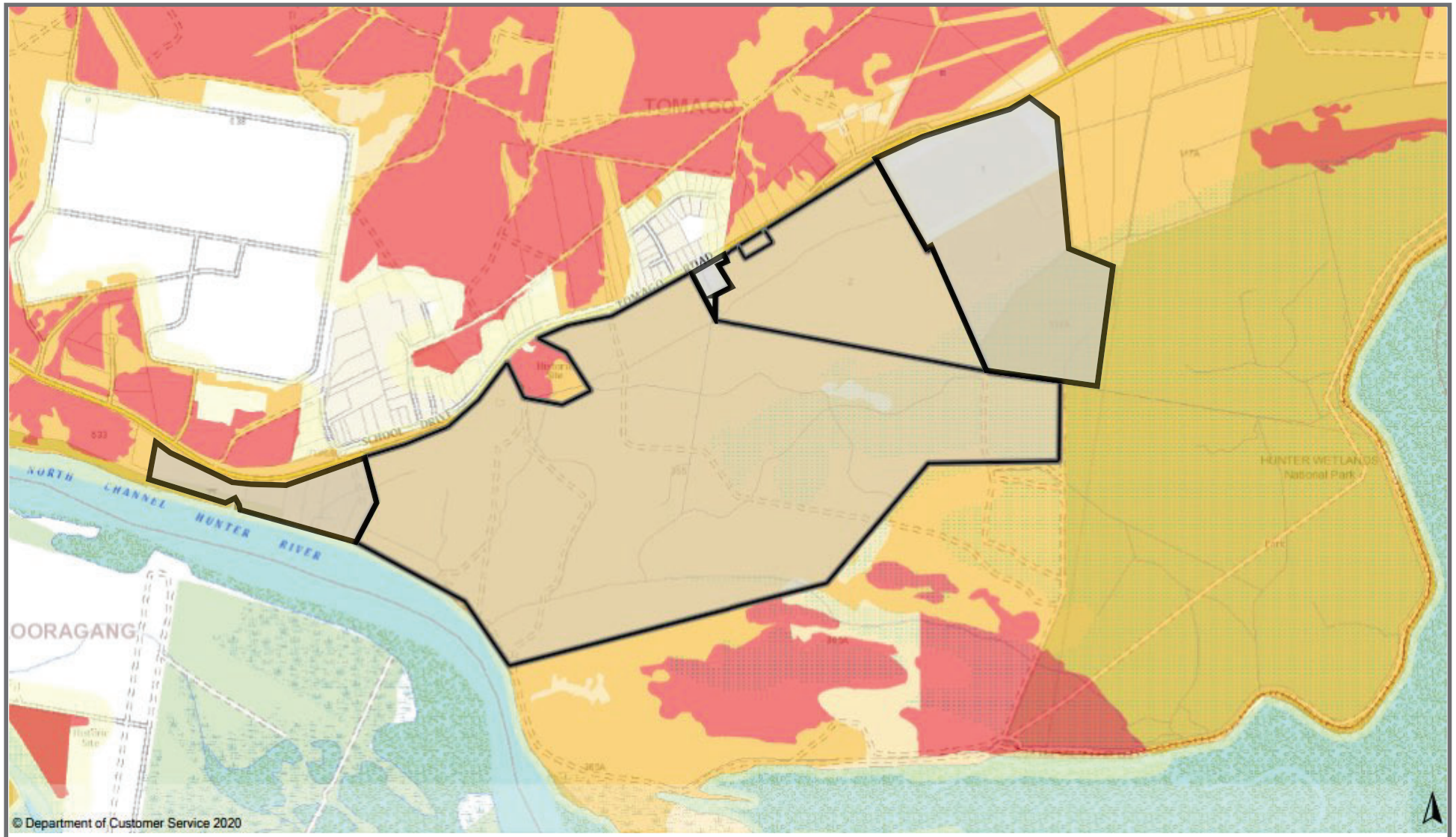

Figure 3: Bushfire Prone Land

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Category 1
Category 2
Category 3

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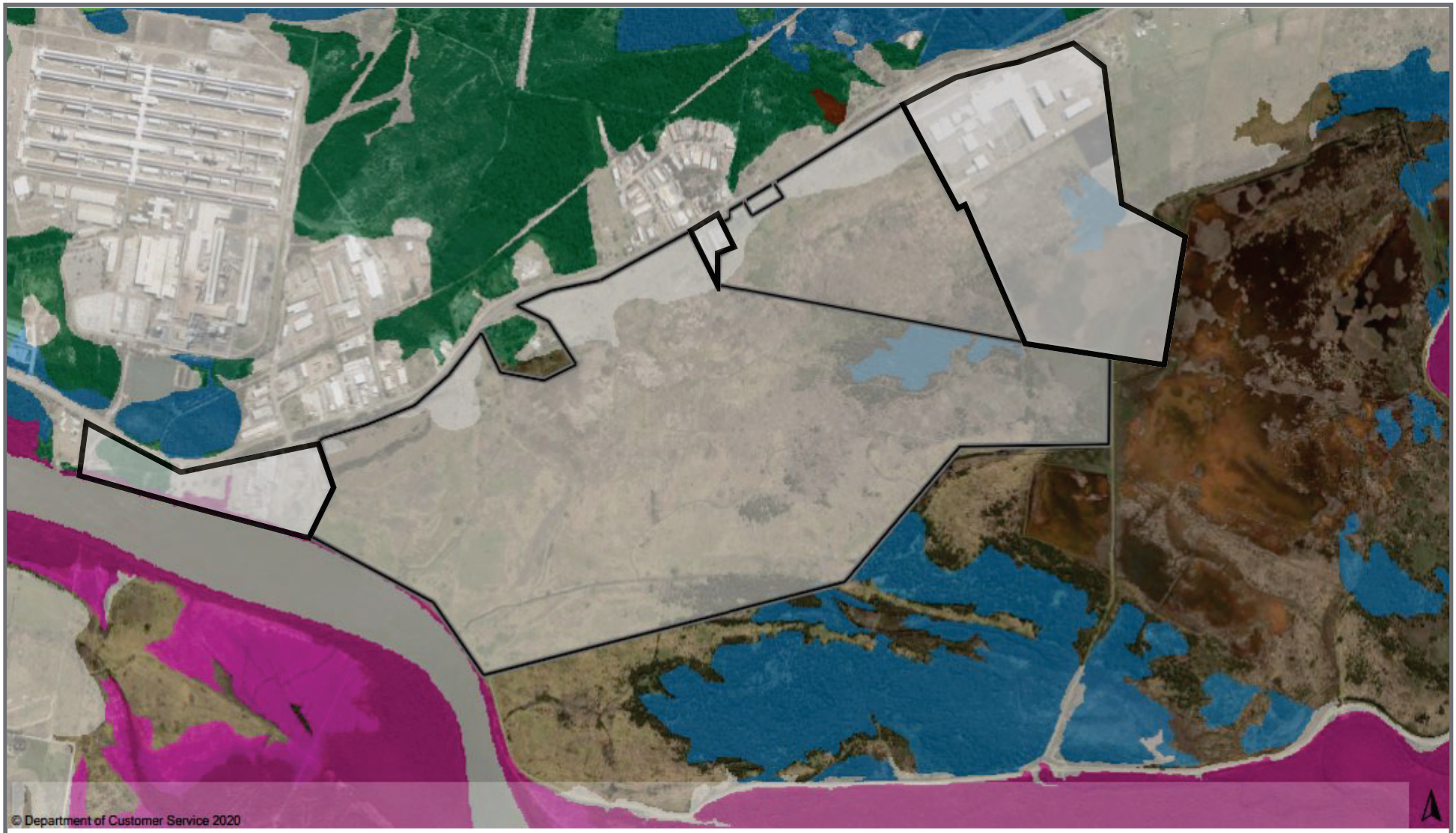

Figure 4: Vegetation Map

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Coastal Dune Dry Sclerophyll Forests

Coastal Floodplain Wetlands

Undetermined/non native vegetation

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3.1.5 Fire History and Ignition

Tomago has experienced frequent fire activity that has affected the subject site. Three major fires have been recorded in the past decade (Figure 5):

1. October 2013 – Hank Street Fire, ignition Arson, burnt 6000ha over 20 days, some at high intensity;

2. January 2018 – Masonite Road Fire, ignition Lightning, burnt 2500ha over 20 days, some at high intensity;

3. September 2024 – Old Punt Road Fire, ignition Arson/accidental (motorbike) near the AGL Newcastle Gas Storage Facility, and under strong north-westerly winds burned southeast directly toward Westrac, which was evacuated. The fire burned 88ha over 2 days, some at high intensity.

The main sources of ignition in the area are fire escape from arson and lightning strikes.

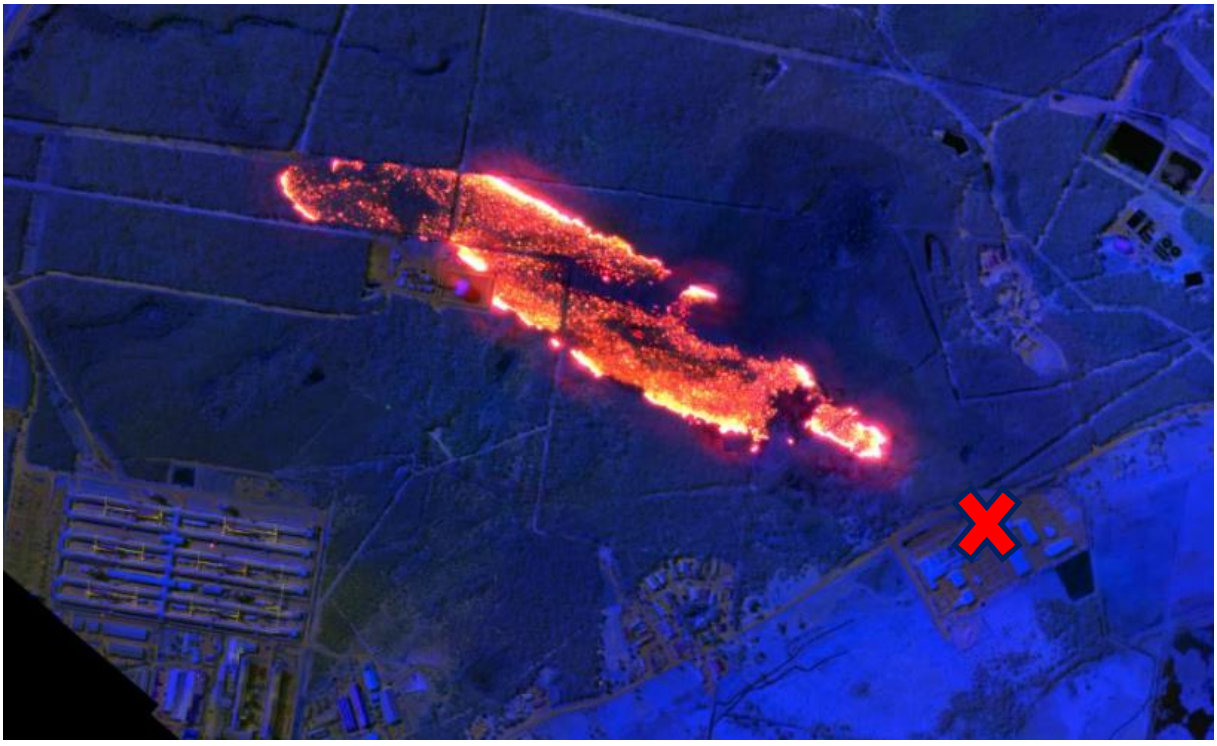

Plate 1: Old Punt Road fire affecting Westrac (X), September 2024.

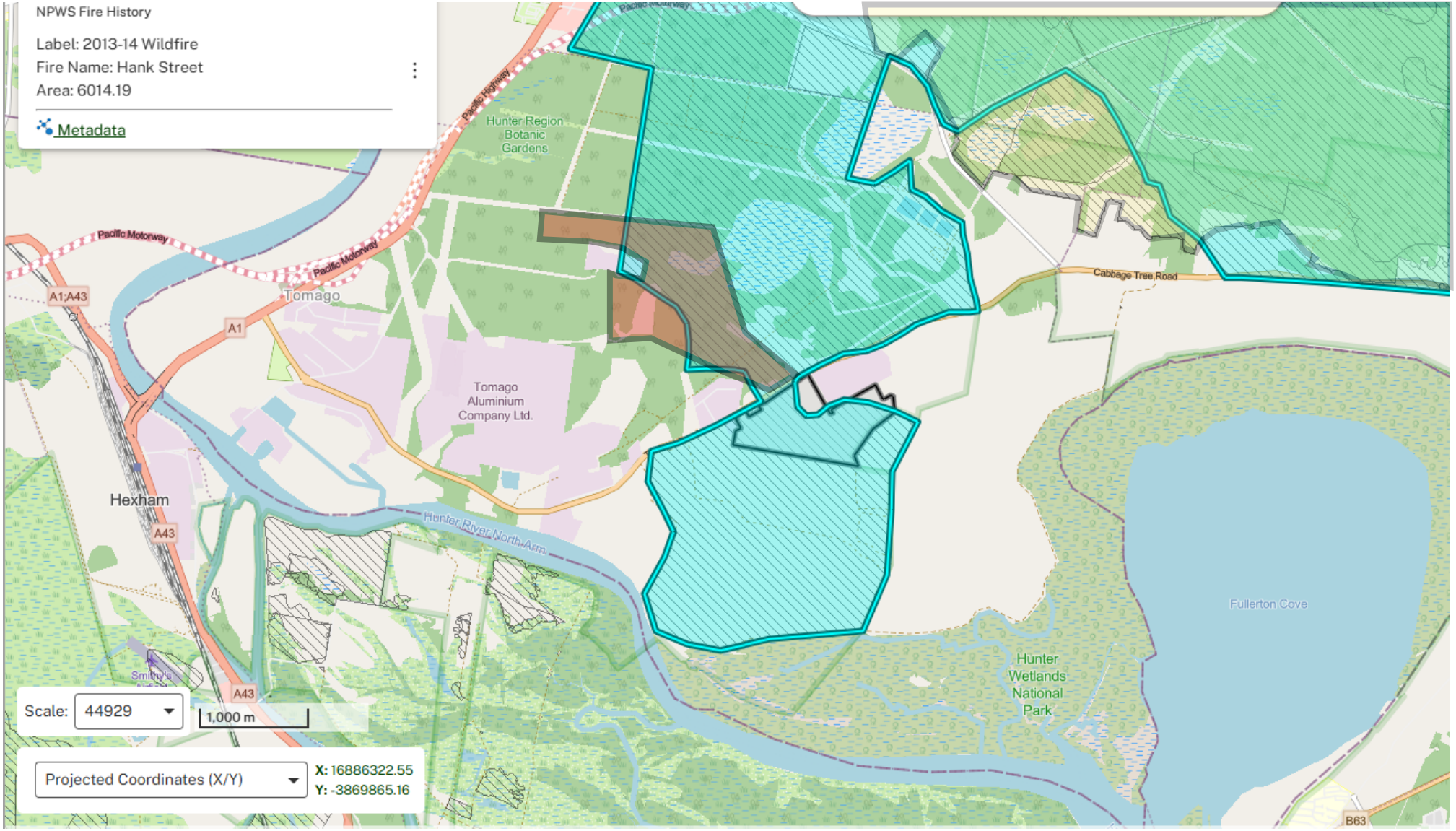

Figure 5: Fire History

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Oct 2013 Hank Street Fire

Jan 2018 Masonite Road

Sep 2024 Old Punt Road

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3.1.6 Potential Fire Behaviour

The potential for high intensity fires affecting the subject site is demonstrated through the vegetation, slope, weather and the fire history analysis.

Fire runs (the lineal extent for which a fire can consume fuels and garner intensity) are considered for determining fire behaviour, and the fire runs within all surrounding bushfire prone vegetation would allow for a fully developed fire scenario.

The forest vegetation to the north is within several landholdings and has dry sclerophyll forest intergrading into swamp forest. The vegetation has an extensive network of cleared easements (fire trails and roads / power line / water supply / fencing), peripheral industrial infrastructure, and is separated from the subject site by Tomago Road and existing developed land (housing and industrial), all of which provide increased accessibility for fire mitigation and active suppression.

The wetlands to the south are largely inaccessible and lack any suitable fire trails. Subsequently, a fire arising from this direction would require either aerial suppression, back burning operations from the subject site boundary (perimeter roads), or progress to the development boundary to apply any ground-based suppression.

The fire modelling (Attachment 1) demonstrates the calculated fire behaviour consistent with the current accepted modelling detailed in *AS3959:2018 Appendix B – Detailed method for determining the bushfire attack level (BAL) – Method 2*.

In summary, the proposal must consider these calculations when determining the bushfire risk toward infrastructure and applying suitable and acceptable risk mitigation strategies such as defendable space and asset protection zones.

3.2 LAND USE ASSESSMENT

The land use assessment identifies the most appropriate locations for a masterplan development area or site layout for the proposed land uses.

The proposal would be consistent with land zoning and surrounding land use (for industrial and commercial activities, non-residential developments). Planning requirements for industrial and commercial development is detailed in PBP 2019 Chapter 8, and include offices, shops, factories, warehouses, public car parks and other commercial and industrial facilities and uses.

3.2.1 Risk Profile

The risk profile of different areas of the development layout based on the above bushfire landscape assessment and interaction with potential developable areas and development types. For the purpose of this study, risk profiling is broadly categorised into ‘extreme risk’, ‘very high risk’, ‘high risk’, ‘medium risk’, and ‘low risk’ consistent with NSW RFS and BFMC risk rating.

The location is within an inherently low risk landscape, with bushfire prone vegetation on flat land and fragmented by urban and industrial development. Future land use will be assessed independently with bushfire planning consideration.

This development will be ‘almost certainly’ impacted by fire in the future. The bushfire mitigation actions associated with the proposal would be community preparedness and pre-incident planning, and implementation of construction codes, asset protection zones (APZ), increased water supply and suitable access. With these mitigation actions, the proposal may have potentially ‘minor’ consequences.

3.3 ACCESS AND EGRESS

The existing road network consists of Tomago Road and Westrac Drive. Access within and external to the investigation area has been assessed for its capacity to support the following:

- The capacity to deal with evacuating occupants 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.

Tomago Road provides a significant arterial access road that links east and west. Westrac Drive links with Tomago. The existing access network provides for heavy vehicle alternate access provisions. This would be the key access routes for any development on the investigation area. This access is appropriate for heavy vehicles and could support emergency services access and community evacuation in the event of a bushfire but must consider the potential for bushfire pinch points and road

closure impacts associated with bushfire and remnant vegetation areas. It is unlikely the development would become isolated in the event of a bushfire.

Access network across the investigation area will consists of perimeter roads and sealed through roads that will support heavy vehicles. Future development will avoid the potential for bottlenecks and peninsular development areas.

3.4 EMERGENCY SERVICES

This study considers the future impact of new development on emergency services, specifically:

- Consideration of the increase in demand for emergency services responding to a bushfire emergency including the need for new stations/ brigades; and
- Impact on the ability of emergency services to carry out fire suppression in a bushfire emergency.

There are multiple fire agency brigades within 10km proximity of the subject site (Plate 2).

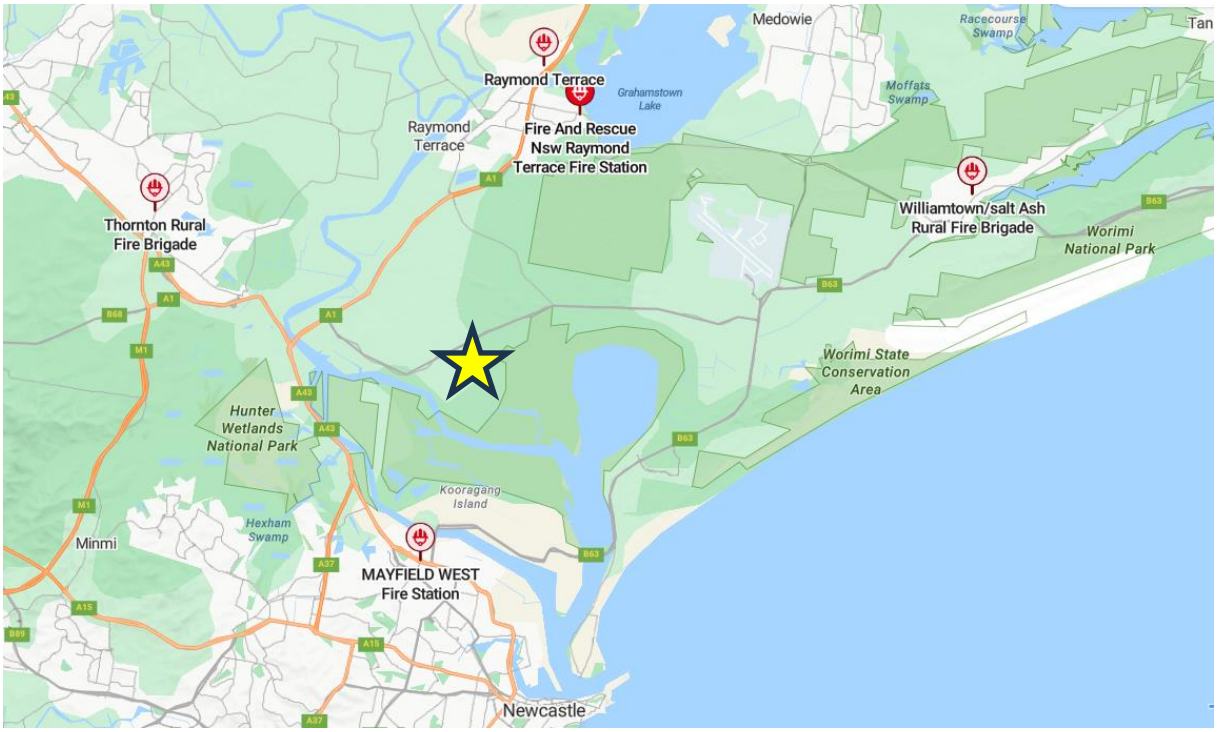

Plate 2: Fire stations in 10km radius of the subject site (highlighted yellow star).

Increasing development at this location would not increase the demand for bushfire emergency services, and development would unlikely require any new fire stations/brigades.

Further to this, new proposed industrial infrastructure would be somewhat resilient to modelled bushfire impacts and would provide for suitable setbacks, landscaping, access planning and design and water supply services for emergency operations.

3.5 SERVICES INFRASTRUCTURE

An assessment is made of the issues associated with infrastructure and utilities, including:

- 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.

A reticulated water supply is provided to the area, which would be accessible to assist bushfire suppression. To comply with PBP 2019, the reticulated water infrastructure (fire hydrant spacing, sizing and pressures) would comply with AS 2419.1 – 2021 *Fire hydrant installations*. The water services would be planned and designed, such that PBP 2019 acceptable solution requirements for water will be achievable.

Existing high voltage powerlines and gas infrastructure across the subject will be maintained within designated easements, and any future development will consider life safety and proximity issues.

At this stage of planning, the services infrastructure and utilities do not pose a significant constraint.

3.6 ADJOINING LAND

The proposal would reduce the extent of bushfire prone vegetation and connectivity in the locality, such that adjoining land uses would benefit from the reduced bushfire risk.

Any future industrial development, buildings and land uses would have an element of resilience to modelled bushfire attack, be afforded acceptable access and emergency management provisions, and no additional bushfire management actions would be required on adjoining land or land owners.

4. BUSHFIRE PROTECTION MEASURES

Commercial and industrial development on BFPL is addressed through the aim and objectives of PBP 2019.

At the design and construction stage, a suitable package of Bushfire Protection Measures (BPMs) are to be proposed commensurate with the assessed level of risk to the development. The scale of the development and numbers of people likely to be occupying the building will be directly relevant to the BPMs proposed. Each development will be assessed on its own individual merits.

PBP 2019 details BPMs (Plate 3) to mitigate bushfire risk as follows:

- Asset Protection Zone (APZ) and easement/landscape management actions (including, but not limited to slashing, mowing, landscaping & garden maintenance and fire breaks) required to protect assets and prevent the spread of fire;
- Building and construction requirements, commensurate with the purpose/use and constructions of the structures and, where applicable, the quantified bushfire attack level (BAL) ratings;
- Access provisions (e.g. public access, property access and fire trails);
- Water supply and utilities (electricity, gas) provisions;
- Emergency management arrangements, consistent with the relevant emergency services requirements.

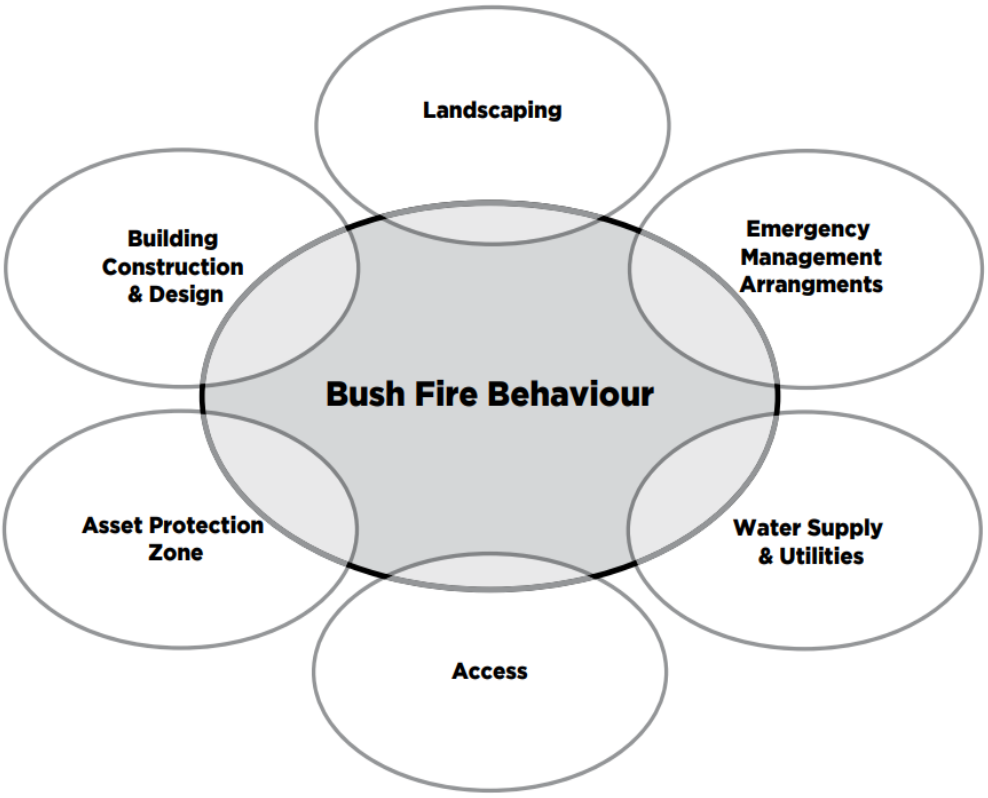

Plate 3: Bushfire Protection Measures

4.1 ASSET PROTECTION ZONES

The APZ is a fuel-reduced, physical separation between structures / assets and bushfire hazards, which would provide sufficient space to ensure radiant heat level exposure is below critical limits and prevent direct flame contact. The APZ also allow emergency services access and provides a safer area for firefighters to defend assets. Additionally, APZ intent would mitigate any fire occurring within the development to ignite and spread into the surrounding vegetation and subsequently be the origin for a bushfire.

There are no specified APZ performance criteria in PBP 2019 for industrial structures and NCC Class 5-8 structures (offices, shops, factories, warehouses, public car parks and other commercial and industrial facilities); however compliance with AS 3959 and the NASH Standard must be considered when meeting the aims and objectives of PBP 2019.

Cool Burn have calculated the minimum APZ setbacks measured in metres (*Table 1*) from perimeter bushfire prone vegetation, specifically to avoid flame contact (flame length measured as metres) and a broadly accepted maximum radiant heat yield (29kW/m^2 or BAL29 as detailed in *AS3959:2018 Construction of buildings in bushfire prone areas*). APZs will be wholly within the boundaries of the development, unless it can be assured that maintenance will meet the acceptable standards for the life of the project (i.e. public roads, power line easements, existing construction and development).

Table 1: Asset Protection Zones - Tomago Industrial Planning Proposal

Direction	Vegetation	Slope	APZ (m)	Planning Proposal Status
North	Coastal swamp forest	Flat or upslope	22m	Exceeds 22m in Tomago Road
	Coastal dune forest	Flat or upslope	22m	Exceeds 22m in Tomago Road
South Southeast	Freshwater Wetlands/Reedland Swamps	Flat or upslope	10m	Achieved in perimeter road and stormwater management landscape management
	Coastal Swamp Forest (Swamp Oak)	Flat or upslope	22m	Achieved in perimeter road and stormwater management landscape management
East West	Grassland	Flat or upslope	10m	Achieved on site

The planning proposal has capacity to satisfy the acceptable solutions for APZ in PBP 2019.

4.2 LANDSCAPING

Vegetation within the APZ will be managed to the prescribed standards for an Inner Protection Area (IPA) as detailed in PBP 2019 Appendix 4, and below:

Trees

- Tree canopy cover should be less than 15% at maturity;
- Trees at maturity should not touch or overhang the building;
- Lower limbs should be removed up to a height of 2m above the ground;
- Tree canopies should be separated by 2 to 5m;
- Preference should be given to smooth barked and evergreen trees.

Shrubs

- Large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover;
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height);
- Leaves and vegetation debris should be removed.

Landscaping requirements should be incorporated into a Landscape or Vegetation Management Plan, to ensure the activities are delivered with regularity and the above criteria can be consistently achieved.

Considering implementation of the above recommendations, the planning proposal has capacity to demonstrate the acceptable solutions for landscaping in PBP 2019.

4.3 CONSTRUCTION

The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bushfire protection will need to be considered on a case-by-case basis. An objective for construction planning is to provide for the storage of hazardous materials away from the hazard wherever possible.

Bushfire Attack Level (BAL) is a means of measuring the ability of a building to withstand attack from bushfire. The BAL is defined in *Australian Standard AS 3959-2018 Construction of buildings in bushfire-prone areas* (AS 3959-2018).

There are no specific bushfire protection requirements for project-related infrastructure. The general fire safety construction provisions are taken as acceptable solutions however construction requirements for bushfire protection will need to be considered on a case-by-case basis (PBP 2019).

The planning proposal will have capacity to satisfy acceptable solutions for construction as detailed in PBP 2019.

4.4 ACCESS

The objective of access measures is to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.

The access provisions for the industrial estate will be suitable for two-lane heavy vehicle access and design should avoid dead ends/no through roads. Property access provisions will be assessed on a case-by-case basis. Tomago Road is a through road that offers alternative access / egress in the event that fire blocks off the roadway to the east or west of the development.

The planning proposal has the capacity to satisfy acceptable solutions for access of PBP 2019.

4.5 WATER AND UTILITIES

The objective for water and utilities is to provide adequate services of water for the protection of buildings during and after the passage of bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

Future development provide adequate services of water for the protection of structures and suppression of bushfire. Reticulated water supplies will need to comply the following requirements of PBP 2019:

- Any installed fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2021
- Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021
- Fire hose reel system be constructed at the temporary workers accommodation facility in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2021
- Unobstructed access to water supply points at all times
- All above-ground water service pipes are metal, including and up to any taps.

Electricity and gas provisions would be installed to relevant standards and would limit the possibility of ignition of surrounding bushland or the fabric of buildings or structures.

The planning proposal can demonstrate water and services would have capacity to meet the PBP 2019 performance criteria requirements.

4.6 EMERGENCY MANAGEMENT AND EVACUATION PLANNING

The objective is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.

Emergency management planning will be required for future development, as a part of the development approvals prior to construction operation stages.

An emergency management plan (EMP) is to be prepared for each development and will take into consideration the NSW RFS *Guide to Developing a Bushfire Emergency Management and Evacuation Plan* (2014). The EMP should detail the mitigation measures associated with the construction and operation of the project and should include:

- Detailed measures to identify, prevent, and mitigate fires igniting (ignition sources) e.g.:
    - hot works permits for works which may result in the ignition of fire
    - hot works not to be carried on Extreme or catastrophic Fire Danger Rating days or Total Fire Ban days, or when local authorities or the Site Manager deems weather conditions too dangerous
- Roles, responsibilities, and 24-hour emergency contact details including alternative telephone contact;
- Bushfire contingency plan and emergency response procedures;
- Availability of fire-suppression equipment, access, and water including site plans, site access and internal road plans;
- Location of hazards (physical, chemical, electrical) that will impact on the firefighting operations and procedures to manage any identified hazards during firefighting;
- Storage, maintenance, and appropriate signage of fuels and other flammable materials;
- Notification of the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bush-fire fire danger period to ensure weather conditions are appropriate;
- Additional matters as agreed and required by the NSW RFS District Office.

5. SUMMARY

This Bushfire Strategic Study is a preliminary study that will be used to inform bushfire constraints across the Tomago Industrial Planning Proposal.

At a regional scale, the subject site is positioned in a largely modified landscape with substantial bushfire prone vegetation within a flat topography. Although the local fire history demonstrates the Tomago locality may experience bushfire impacts on a regular basis (e.g. 3 fires in 10 years), the historical and current land use (rural and industrial) has cleared and fragmented connective bushfire prone vegetation within and surrounding the subject site, mitigating the bushfire behaviour and enhancing bushfire management capabilities.

The bushfire prone vegetation within and surrounding the subject site has potential to pose significant bushfire risk yet can be mitigated by appropriate combination of concept planning and design, development control, landscape management and construction standards.

In summary, the broad principles which apply to a bushfire strategic study have been demonstrated to find that:

- The site is suitable for development in the context of bushfire risk (subject to ongoing coordination and engagement with the NSW RFS);
- New development on bushfire prone land can comply with PBP 2019, but recognises some environmental impacts must be considered and approved;
- Development planning and design can avoid performance-based solutions;
- The planning and design will provide for adequate infrastructure associated with emergency evacuation and firefighting operations; and
- The planning and design will facilitate appropriate ongoing land management practices.

This study would suggest that the Tomago Industrial Planning Proposal is considered compatible with the surrounding environment and could satisfy EP&A Act s.9.2 Direction 4.3 – 'Planning for Bush Fire Protection' and the development performance criteria of Planning for Bush Fire Protection 2019.

6. REFERENCES

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ATTACHMENT 1. FIRE BEHAVIOUR MODELLING

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 17/01/2025 **Assessment Date:** 17/01/2025

Site Street Address: Westrac Drive, Tomago

Assessor: Dan Pedersen; Cool Burn P/L

Local Government Area: Port Stephens **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: Estuarine Reedlands

Vegetation Information

Vegetation Type: Coastal Heath Swamps

Vegetation Group: Freshwater Wetlands (PBP - Short Heath)

Vegetation Slope: 0 Degrees **Vegetation Slope Type:** Downslope

Surface Fuel Load(t/ha): 15 **Overall Fuel Load(t/ha):** 15

Vegetation Height(m): 2 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Downslope

Elevation of Receiver(m): Default **APZ/Separation(m):** 10

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1090

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25

Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308

Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 29 **Peak Elevation of Receiver(m):** 3.77

Radiant Heat(kW/m2): 27.45 **Flame Angle (degrees):** 65

Flame Length(m): 8.31 **Maximum View Factor:** 0.415

Rate Of Spread (km/h): 3.35 **Inner Protection Area(m):** 10

Transmissivity: 0.871 **Outer Protection Area(m):** 0

Fire Intensity(kW/m): 25940

Run Description: Forest (north)

Vegetation Information

Vegetation Type: Coastal Dune DSF

Vegetation Group: Dry Sclerophyll Forests (Shrubby)

Vegetation Slope: 0 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 20.5

Overall Fuel Load(t/ha): 31.1

Vegetation Height(m): 2 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 22

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 8.71

Radiant Heat(kW/m2): 28.09

Flame Angle (degrees): 62

Flame Length(m): 19.72

Maximum View Factor: 0.44

Rate Of Spread (km/h): 2.46

Inner Protection Area(m): 12

Transmissivity: 0.839

Outer Protection Area(m): 10

Fire Intensity(kW/m): 39528

Run Description: Grasslands east/west

Vegetation Information

Vegetation Type: Grassland

Vegetation Group: Grassland

Vegetation Slope: 0 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 6

Overall Fuel Load(t/ha): 6

Vegetation Height(m): 0 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 10

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 130

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 3.88

Radiant Heat(kW/m2): 28.51

Flame Angle (degrees): 64

Flame Length(m): 8.63

Maximum View Factor: 0.431

Rate Of Spread (km/h): 16.9

Inner Protection Area(m): 10

Transmissivity: 0.871

Outer Protection Area(m): 0

Fire Intensity(kW/m): 52390