BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

PROPOSED RE-ZONING OF 77 KULGOA AVE PYMBLE

Prepared by:

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Abbreviations

Abbreviation	Meaning
AOBV	Areas of Outstanding Biodiversity Value
AWTS	Aerated Wastewater Treatment System
APZ	Asset Protection Zone (bushfire protection)
BAM	Biodiversity Assessment Methodology
BAM - C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offsets Scheme
DA	Development Application
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DPIE	NSW Department of Planning, Industry and Environment (formerly OEH)
DEE	Department of Environment and Energy
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Ha	Hectare
HTE	High Threat Exotic
LEP	Local Environmental Plan
LGA	Local Government Area
MU	Map Unit
NPWS	NSW National Parks and Wildlife Service
OEH	Office of Environment and Heritage
PCT	Native vegetation classification system approved by NSW Plant Community Type Control Panel
PFC	Projected Foliage Cover
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
TBCD	Threatened Biodiversity Data Collection

GLOSSARY

Acronym/ Term	Definition
Accredited Biodiversity Assessor	Individuals accredited by the Department of Planning, Industry and Environment (DPIE) to apply the Biodiversity Assessment Method.
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified.
Biodiversity Offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity from the impacts of secondary dwelling.
Biodiversity values	The composition, structure and function of ecosystems, including threatened species, populations and ecological communities, and their habitats.
Ecosystem credit	The class of biodiversity credit that relates to a vegetation type and the threatened species that are reliably predicted by that vegetation type (as a habitat surrogate).
Locality	A 1500m buffer area surrounding the Subject Land
Native Vegetation	Means any of the following types of plants native to New South Wales: (a) trees (including any sapling or shrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland.
Proposal	The development, secondary dwelling, activity or action proposed.
SAII entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAIIs)
Species credit	The class of biodiversity credit that relate to threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject Land	The footprint of the proposed development.
Subject Properties	77 Kulgoa Road Pymble

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CERTIFICATION

I, Alex Fraser of Fraser Ecological, hereby state that this Biodiversity Development Assessment Report (BDAR) for a proposed re-zoning of 77 Kulgoa Ave Pymble has been prepared in accordance with the Biodiversity Assessment Method (BAM) 2020 established under the NSW *Biodiversity Conservation Act 2016*.

Fieldwork for this project was undertaken by Alex Fraser. Report writing was undertaken by Alex Fraser.

My qualifications are:

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B.Sc. (Hons)
Certificate 3 Natural Area Restoration
BAM Accredited Assessor (BAAS 18156)
Member of the Ecological Consultants Association of NSW

Conflicts of Interest

The Accredited Assessors have signed an agreement to abide by the Accredited BAM Assessor Code of Conduct. The authors declare in accordance with the Assessors Code of Conduct that no actual, perceived, or potential conflicts of interest exist.

Disclaimer

This document may only be used for the purposes for which it was commissioned. Fraser Ecological accepts no liability or responsibility in respect of any use or reliance upon this report by any third party. Unauthorised use of this report in any form is prohibited.

Alex Fraser
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BAAS18156 Accredited Assessor
Principal Ecologist, Fraser Ecological

EXECUTIVE SUMMARY

Fraser Ecological has been engaged to prepare a Biodiversity Development Assessment Report (BDAR) for a residential development ('the Proposal' or 'the Project') at 77 Kulgoa Road Pymble, in the Ku-ring-gai Council local government area. The proposal is proposed re-zoning of 77 Kulgoa Ave Pymble to support a potential future subdivision into 2 lots.

This BDAR has been prepared in accordance with the Office of Environment and Heritage (OEH) (2020) Biodiversity Assessment Method (BAM). The Biodiversity Offset Scheme (BOS) applies to the Proposal, as it would require clearing of native vegetation that is mapped on the Biodiversity Values Map (BVM). Note, this is a 'streamlined assessment', in accordance with Appendix C of the BAM ('Streamlined assessment module – Small area').

The Subject Property currently contains existing dwellings, areas of cleared exotic lawn, tennis court, pools, landscaped areas, ornamental garden plantings and remnant Sydney Turpentine Ironbark Forest canopy trees (at the rear of the properties), situated within an urban residential setting.

The canopy tree species present include mixture of locally indigenous species Sydney Turpentine Ironbark Forest, planted native and exotic tree species of varying ages and stages of maturity.

The subject site has been partially modified with the removal of most of the native understorey, groundcover plants and shrubs prior to 1943. There is a high proliferation of introduced environmental weed species at the rear of the property including:

- Trad (*Tradescantia flumiensis*)
- Madeira Vine (*Anredra cordifolia*)
- Blackberry Nightshade (*Solanum nigrum*)

The subject dominant trees together with other indigenous trees in the surrounding residences are connected to the remainder of the ecological communities nearby.

Indigenous tree species occurring on-site are (tree numbering system corresponding with arborist report):

- Tree No.'s 7 & 71 *Angophora costata* (Smooth-barked Apple)
- Tree No. 1 *Eucalyptus acmenoides* (White Mahogany)
- Tree No. 70 *Eucalyptus pilularis* (Blackbutt)
- Tree No. 87 *Eucalyptus punctata* (Grey Gum) Tree No.'s 27, 65, 68, 69, 80 & 81 *Eucalyptus saligna* (Sydney Blue Gum)
- Tree No.'s 74 & 79 *Pittosporum undulatum* (Sweet Pittosporum)
- Tree No.'s 2, 3, 4, 5, 6, 8, 9, 10, 11, 14, 16, 19, 21, 24, 26, 72, 73 & 105 *Syncarpia glomulifera* (Turpentine)

- *Glochidion ferdinandi* (Cheese Tree)

The vegetation at the rear of the site has been mapped by Council and the NSW DPE (NSW Statewide PCT mapping) as Sydney Turpentine Ironbark Forest (Figure 12 and 13).

- Vegetation Formation: Wet Sclerophyll Forests (Grassy sub-formation)
- Vegetation Class: Northern Hinterland Wet Sclerophyll Forests
- PCT Name: Sydney Turpentine Ironbark Forest
- PCTID: 3262

Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion is listed as Critically Endangered under the BC Act 2016 and EPBC Act 1999.

The Arborist Impact Assessment Report prepared by Australis Tree Management dated June 2024 states that all locally native trees are proposed for retention.

A stormwater drainage easement (1.2m wide) has been proposed along the eastern (rear) boundary of all proposed lots. All trees are proposed for retention within this area which is currently subject to heavy weed invasion.

As a precautionary measure, it has been assumed 0.2ha of native vegetation may be indirectly impacted for the installation of stormwater drainage at the rear of the properties as well as edge effects. This has been taken into account into the BAM-C credit calculation. Council can provide conditions of consent to ensure the further protection (and improvement) of this vegetation.

The two indicative building envelopes will be located outside the tree protection zones of locally native trees belonging to the Sydney Turpentine Ironbark Forest Critically Endangered Ecological Community. The arborist report has provided the location of tree protection fencing to ensure all remnant native trees are protected during any essential subdivision works.

The land is not mapped as bushfire prone land, therefore, an Asset Protection Zone for potentially resulting in additional vegetation clearing will not be required for future dwellings.

Any native vegetation along the rear of proposed Lot 1-4 can be subject to a future Vegetation Management Plan provided to Council prior to the release of the Subdivision Certificate.

The following Vegetation Integrity Score (VIS) was determined for the STIF CEEC (Vegetation 1):

Vegetation Zone	PCT	Area Impacted (indirectly for water drainage easement)	Current Vegetation Integrity Score	Future Vegetation Integrity Score (factoring a Future vegetation management plan may be implemented for weed removal)	Number of Ecosystem Credits Required
1	PCT 3262	0.02	28.6	28.6	1

To assist the consent authority, the guidance document Guidance to assist a decision-maker to determine a serious and irreversible impact includes criteria that enable the application of the four principles set out in clause 6.7 of the BC Regulation to identify the species and ecological communities that are likely to be the subject of serious and irreversible impacts.

Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion is listed as Critically Endangered under the *BC Act 2016* and *EPBC Act 1999* and is listed as a threatened entity in the Threatened Biodiversity Data Collection (DPIE 2021d).

Due to the potential sensitivity of this ecological community to any impact, a determination of whether or not the proposed impacts are serious and irreversible is to be undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a) as outlined in Table 5.5.

The proposal avoids impacts to significant biodiversity values of the site.

1 INTRODUCTION

Fraser Ecological has been engaged, to provide a Biodiversity Development Assessment Report (BDAR) for the proposed development at 77 Kulgoa Road Pymble, in the Ku-ring-gai Council local government area.

See Figure 1 and 2 for the location & aerial maps showing property boundaries.

The proposed development includes proposed re-zoning of 77 Kulgoa Ave Pymble to support a potential future subdivision into 2 lots. As part of the planning proposal, it seeks to rezone 77 Kulgoa Road, Pymble from C4 Environmental Living to R2 Low Density Residential, and amend the minimum lot size and floor space ratio development standards that apply to the site.

This assessment takes into account Council's Pre-planning Proposal Application Meeting Report letter dated 1st August 2022 states that with regards to ecological impacts:

- It is required for all trees within the subject lots and any trees with tree protection zones (TPZs) intersecting subject lots to be included in the Aboricultural Impact Assessment and all trees requiring protection to be detailed in the Tree Protection Plan.
- The AIA and TPP need to be reviewed and updated against the proposed development, including demolition, construction, access, storage areas, landscaping etc.
- Include recommendations for the avoidance, mitigation, and/or offsetting of tree impacts likely to result from the proposed development.
- Vegetation communities need to be determined/verified by survey.
- If the vegetation is determined to be characteristic of a community listed as an EEC, need to determine whether it meets the legal definition including condition class criteria of that EEC(s) in the relevant listings.
- Flora species to be determined by survey with findings reported on.
- Threatened flora species recorded on site or with the potential to occur on the site, and potential impacts likely to result from the proposed development, are to be reported on.
- A fauna habitat assessment is to be completed and reported on.
- An appraisal of the likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal.
- Determination of the type(s) of impact assessment(s) required under the Biodiversity Conservation Act 2016, the Environment Protection and Biodiversity Conservation Act 1999, the Ku-ring-gai Local Environmental Plan 2015, and the Ku-ring-gai Development Control Plan 2016, and any other legislation relevant to the results of the biodiversity assessment.
- Recommendations for the avoidance, mitigation, and/or offsetting of biodiversity impacts likely to result from the proposed development.

The subject site itself is on the NSW DPE's Sensitive Biodiversity Values Map (https://www.environment.nsw.gov.au/biodiversity/biodiversity-values-map.htm) and is trigger this requirement for this assessment as BDAR (Figure 4).

This BDAR will be prepared as a site-based 'Streamlined assessment module – small area development that requires consent' as it does not exceed the area clearing threshold for small area developments as outlined in the BAM (DPIE 2020a; Table 1).

BAM plot/ quadrat for the purposes of this BDAR were undertaken on the 21 June 2023 by Fraser Ecological.

1.1 Description of the site and proposal

The Subject Property is located in the suburb of Pymble, within the Ku-ring-gai Local Government Area (LGA). The Subject Property currently contains existing dwellings, areas of cleared exotic lawn, landscaped areas and remnant Sydney Turpentine Ironbark Forest canopy trees, situated within an urban residential setting.

The Subject Site is zoned 'C4 Environmental Living' and mapped 'Biodiversity' mapped lands under the Ku-ring-gai LEP 'Natural Resource - Biodiversity Map' under the Ku-ring-gai Local Environmental Plan 2015 (KLEP).

The properties consist of an existing dwelling, garage, tennis court and swimming pool.

All areas associated with the proposed development are hereby known as the Subject Site.

Clause 13.1 of the KDCP 2020 relates to Tree and Vegetation works.

The proposed development satisfies the objectives of Part 18 Biodiversity Protection because the proposed development will:

- Conserve the natural environment of Ku-ring-gai by locating the proposed development largely within existing built and cleared areas;
- Retain and improve existing bushland by committing by not removing existing trees;
- Support the protection of threatened ecological communities by protecting and preserving existing trees indicative of the Sydney Turpentine Ironbark Forest Critically Endangered Ecological Community (CEEC);
- Capture carbon through the planting of additional vegetation within the Subject Site;
- Allow for adaption of native flora, fauna and ecological communities within the designated proposed planting areas.

The proposed development satisfies the objectives of Part 18 Biodiversity Protection because the proposed development will:

- Conserve the natural environment of Ku-ring-gai by locating the proposed development largely within existing built and cleared areas;
- Retain and improve existing bushland by committing by retaining a majority of the existing trees;
- Support the protection of threatened ecological communities by protecting and preserving existing trees indicative of the Sydney Turpentine Ironbark Forest Critically Endangered Ecological Community (CEEC);
- Capture carbon through the planting of additional vegetation within the Subject Site;
- Allow for adaption of native flora, fauna and ecological communities within the designated proposed planting areas.

1.2 Aim and Approach

This report has been prepared in accordance with the BAM (DPIE 2020a) and aims to:

- Describe the biodiversity values present within the Subject Land, including the extent of native vegetation, vegetation integrity and the presence of Threatened Ecological Communities (TECs);
- Determine the habitat suitability within the Subject Land for candidate threatened species;
- Prepare an impact assessment in regard to potential impacts of the proposed development on biodiversity values, including potential prescribed impacts and SAIIs within the Subject Land;
- Discuss and recommend efforts to avoid and minimise impacts on biodiversity values; and
- Calculate the biodiversity credits (i.e., ecosystem credits and species credits) that measure potential impacts of the rezoning proposal on biodiversity values. This calculation will inform the decision maker as to the number and class of offset credits required to be purchased and retired as a result of the proposed development.

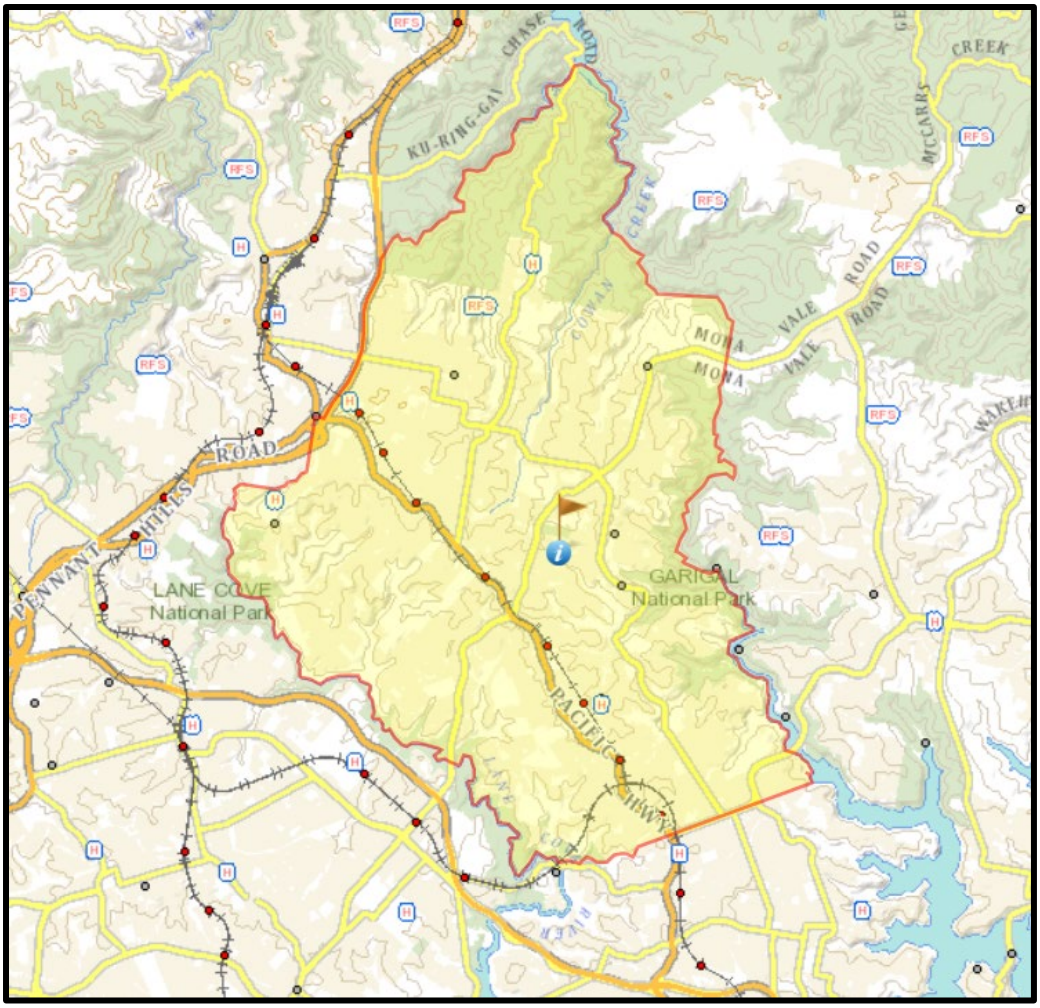


Figure 1: Locality map (Source: SIX Maps.com)

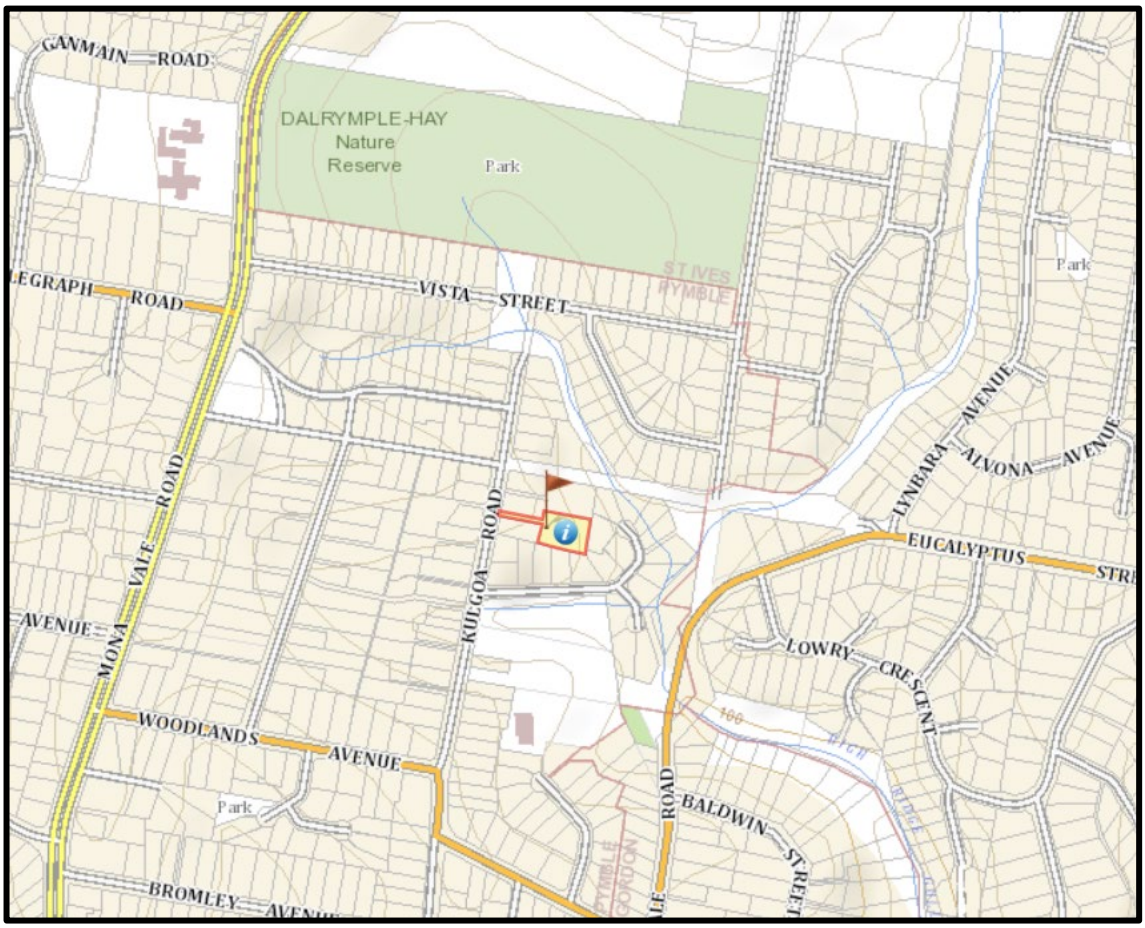


Figure 2: Locality aerial map (Source: SIX Maps.com)

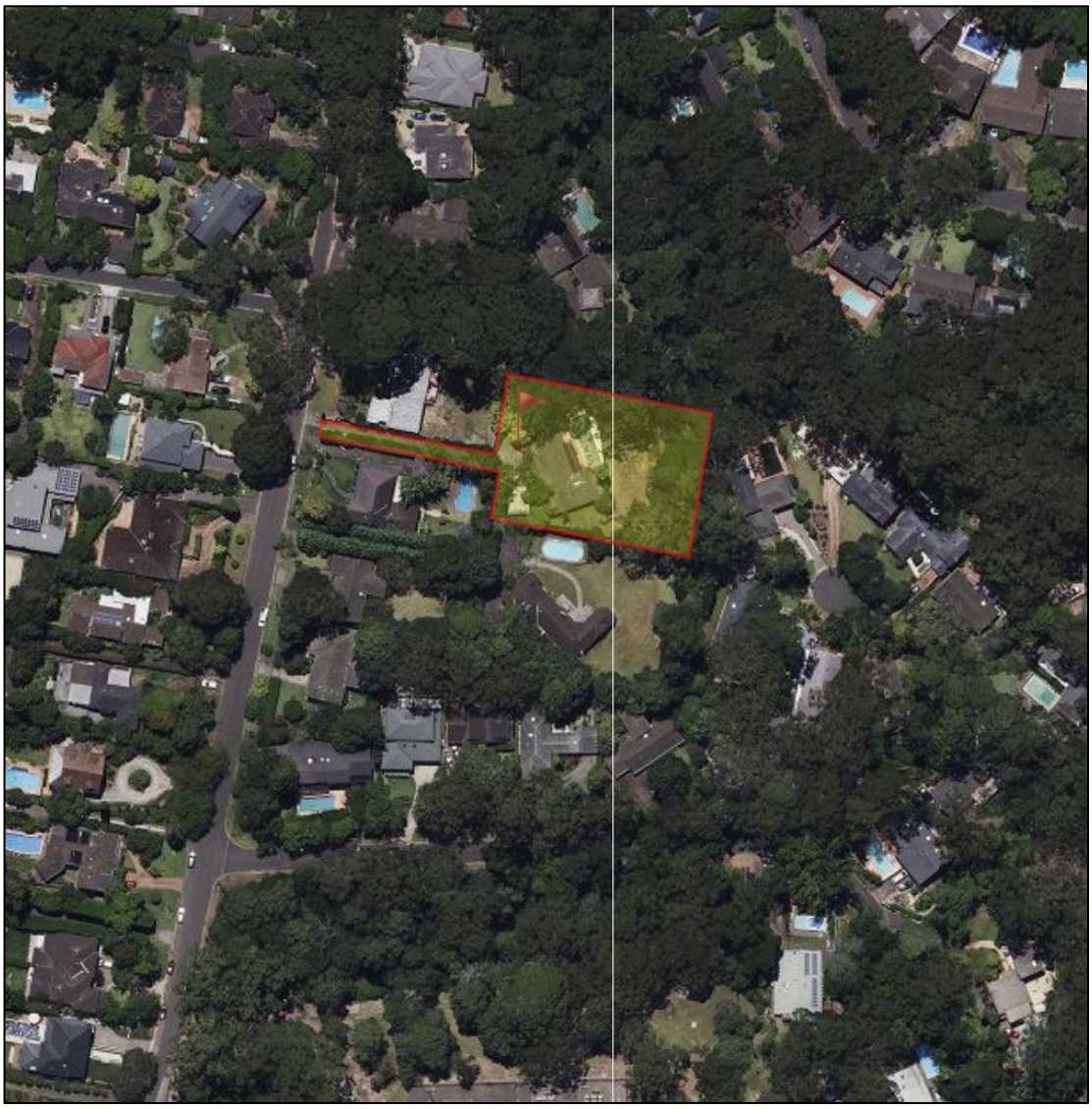


Figure 3: Aerial map showing property boundaries (Source: SIX Maps.com)

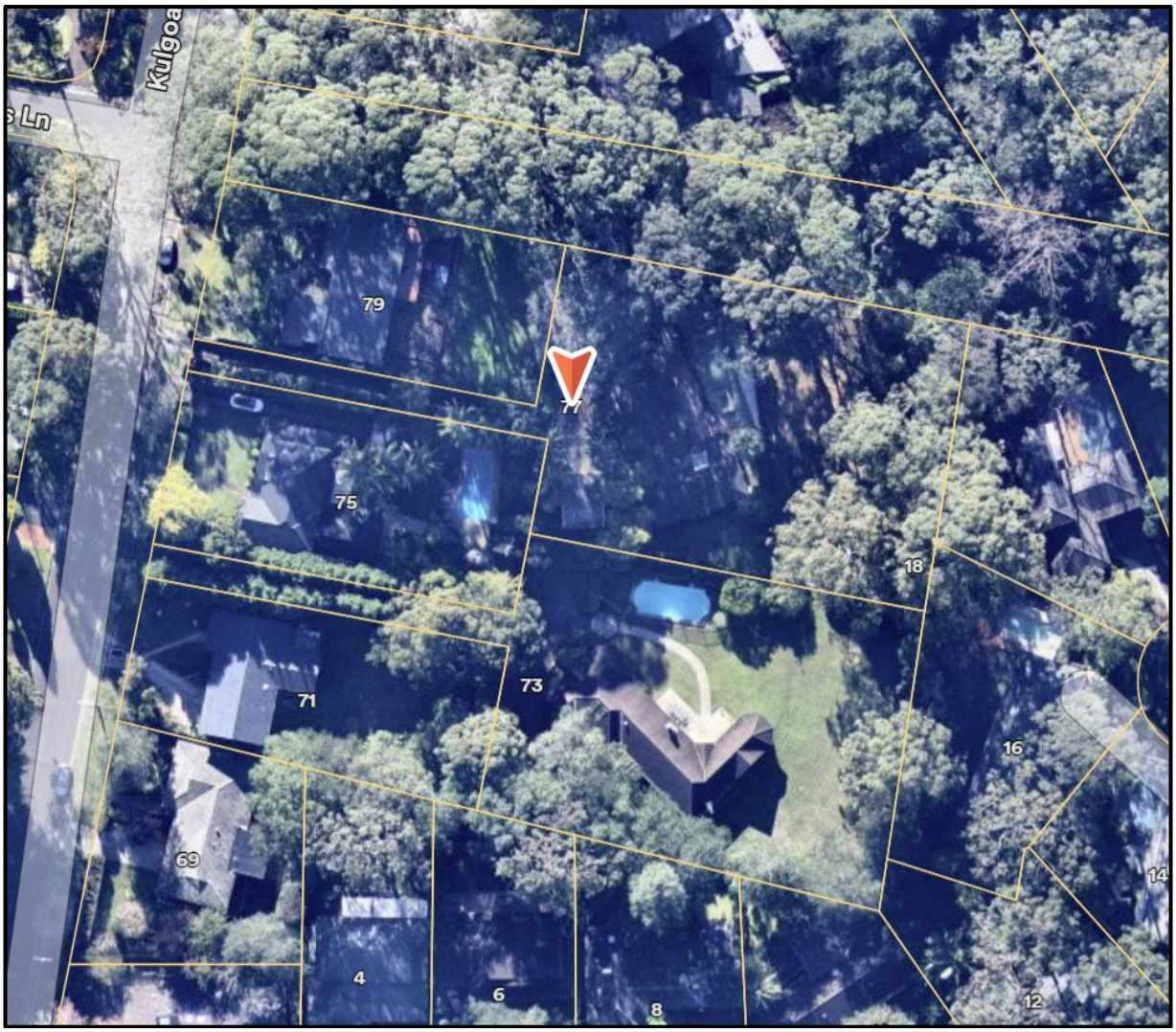


Figure 4a: Aerial map showing property boundaries (Source: Nearmap.com)

Figure X: Cadastral map (Source: Ku-ring-gai Interactive mapping viewer)

Figure 5: Sensitive biodiversity values map (Source: NSW DPIE accessed 18/12/23)

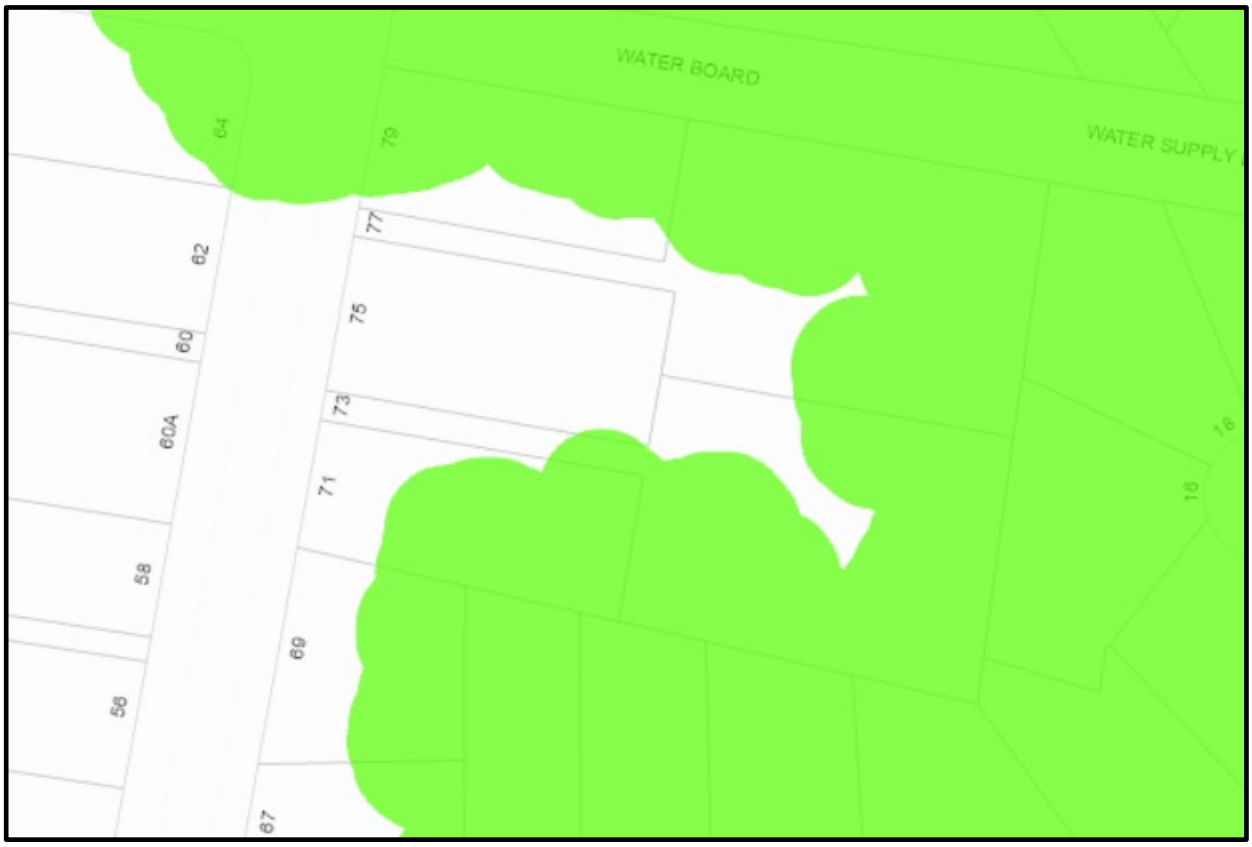


Figure 5: The Subject Site with Ku-ring-gai Environmental Mapping (Natural Resources - Biodiversity)

Figure 6: The Subject Site with Ku-ring-gai Environmental Mapping (NR riparian lands layer)

1.2.1 Database Searches

The following database searches were undertaken, in order to compile a list of threatened flora and fauna species predicted to occur in the area:

- Review of threatened fauna and flora records within a 10 km radius of the site, contained in the OEH Atlas of NSW Wildlife (NSW BioNet).
- Review of the MNES records within a 10 km radius of the site, using the Commonwealth Department of Environment and Energy (DEE), EPBC Act Protected Matters Search Tool.

1.2.2 Vegetation Mapping

Southeast NSW Native Vegetation Classification and Mapping (NSW OEH 2011 update)- SCIVI. VIS_ID 2230

Classification and descriptions of native vegetation types of southeast NSW (including the South Coast and parts of the eastern tablelands), and map of extant distribution of these veg types at 1:100 000 interpretation scale. Based on the South Coast - Illawarra Vegetation Integration (SCIVI) Project, which aimed to integrate many previous vegetation classification and mapping works to produce a single regional classification and map plus information on regional conservation status of vegetation types, to inform the South Coast and Illawarra Regional Strategies. Vegetation classification based on a compilation of ~ 8,500 full-floristic field survey sites from previous studies. Classified vegetation types referred to previous studies. Distribution of veg types was mapped by spatial interpolation (modelling) from classified sites, using a hybrid decision-tree/expert system. Final model was cut to \'extant\' boundaries using a compiled coverage of aerial photograph interpretation (API) of woody and wetland vegetation boundaries. A total of 189 vegetation types were identified, and types related to Endangered Ecological Communities are highlighted.; VIS_ID 2230.

The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 (OEH, 2016) VIS_ID 4489

This layer contains digital mapping of the native vegetation communities of the Sydney Metropolitan area. Vegetation communities have been derived from the analysis of 2200 floristic sites collated for the study area. Identified vegetation communities have been related to currently listed threatened ecological communities listed under the NSW TSC Act, 1995 and the Commonwealth EPBC Act, 1999. Native vegetation communities have been mapped using a combination of detailed image interpretation, relationships between sample sites and abiotic environmental variables. The derived digital data layer includes fields that describe the vegetation community, interpreted dominant species and understorey characteristics, interpretation confidence, disturbance type and severity,

NSW vegetation formation and classes and related NSW Plant Community Types. These are described in detail in technical reports OEH (2016) The Native Vegetation of the Sydney Metropolitan Area. Volume 1: Technical Report. Version 3.0. Office of Environment and Heritage Sydney. OEH (2016) The Native Vegetation of the Sydney Metropolitan Area. Volume 2: Vegetation Community Profiles. Version 3.0. NSW Office of Environment and Heritage, Sydney. Version 3.0 of the Native Vegetation of the Sydney Metropolitan Area updates the Plant Community Type and Biometric Vegetation Type of each map unit.

1.2.3 Literature Review

Information sources reviewed included, but were not necessarily limited to:

- Aerial Photograph Interpretation (API);
- Relevant guidelines, including:
    - OEH *Biodiversity Assessment Method*, 2017 No 469
    - *NSW Guide to Surveying Threatened Plants* (OEH, 2016)
    - *'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method* (OEH, 2018)
    - *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (Department of Environment and Conservation (DEC), 2004)
- OEH Threatened Species, Populations and Ecological Communities website
- Commonwealth DEE Species, Profile and Threats Database;
- OEH Threatened Species, Populations and Ecological Communities website
- Commonwealth DEE Species, Profile and Threats Database;
- Threatened species survey and assessment guidelines: field survey methods for fauna: Amphibians (DEC 2009);
- NSW Guideline to Surveying Threatened Plants (OEH 2016b);
- Operational Manual for BioMetric 3.1. (DECCW 2011);
- Survey guidelines for Australia's threatened birds. Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2010a);
- Survey guidelines for Australia's threatened bats. Guidelines for detecting bats listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999(Commonwealth of Australia 2010b);
- Survey guidelines for Australia's threatened frogs. Guidelines for detecting frogs listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2010c);
- Survey guidelines for Australia's threatened mammals. Guidelines for detecting

- mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2011);
- Survey guidelines for Australia's threatened orchids.
- Guidelines for detecting bats listed as 'threatened' under the Environment Protection and Biodiversity Conservation Act 1999(Commonwealth of Australia 2013).

It was not possible to determine with certainty all the fauna that utilise habitats in the subject site. This is because of the likely seasonal occurrences of some fauna species, the occasional occurrence of vagrant species, and because some species are difficult to detect because of their timid or cryptic behaviour. Therefore, in addition to targeted fauna surveys, investigations comprised an assessment of fauna habitats present on site and an indication of their potential to support native wildlife populations and, in particular, threatened species.

Section 4.2 outlines the reasoning behind why no additional targeted fauna surveys were considered necessary for the proposed development. This mainly because no candidate 'species credit' species will be affected by the proposal as potential habitat is absent.

1.2.4 Other sources and consultant reports

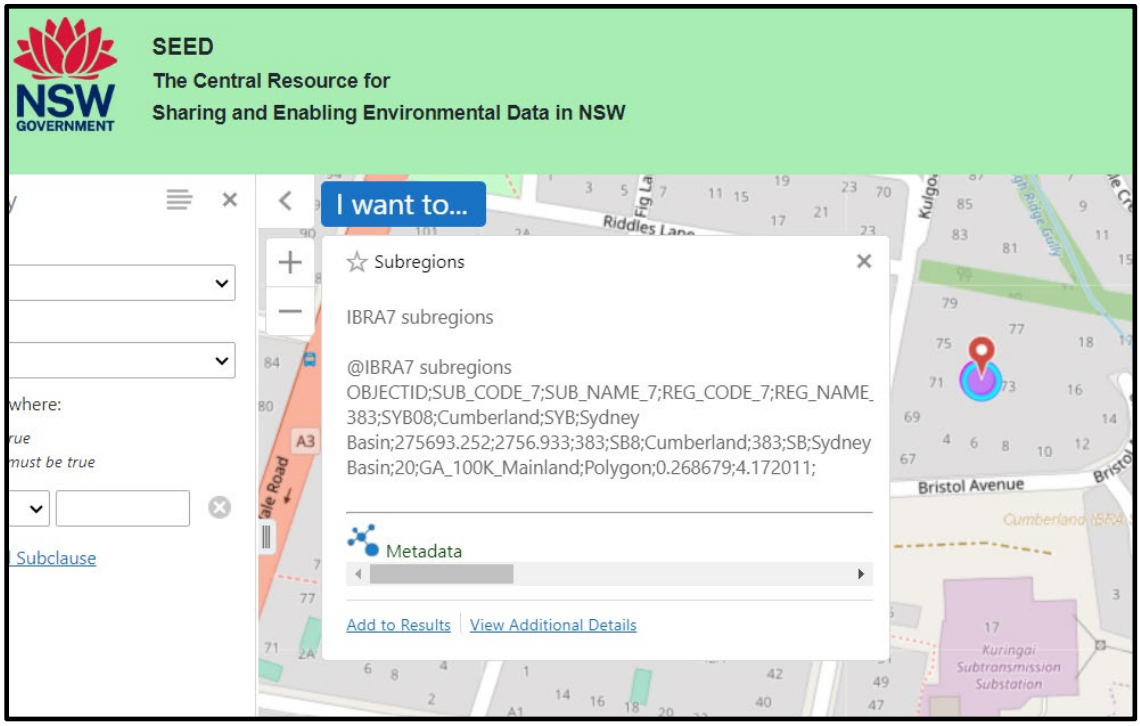
A desktop survey was performed to ensure all relevant documentation is considered when preparing the plan. Documents and other information resources utilised include:

- Aerial photographs (Google Maps, NearMaps & DPI Land Information)
- NSW Land and Property Information SIX Maps Viewer (https://maps.six.nsw.gov.au/)
- The Southeast NSW Native Vegetation Classification and Mapping (NSW OEH 2010) mapped using QGIS software overlaid with cadastral boundaries obtained from the NSW Planning Portal database collection
- Soil Landscapes of the Sydney 1:100,000 Sheet (Chapman and Murphy 1989) using the Espade Version 2.0 managed by the NSW Office of Environment and Heritage accessed 18th December 2022
- Survey plans prepared by Hammond Smealie & Co Pty Ltd dated 30/11/22
- Proposed plans prepared by ING Consulting Engineers dated June 2024
- Arborist Impact Assessment Report prepared by Australis Tree Management dated 22nd June 2024

2 LANDSCAPE FEATURES

2.1 IBRA Bioregions and Subregions

Dominant landscape forms have been used to divide Australia into bioregions. The site is within the **NSW Sydney Basin IBRA bioregion** and **Cumberland IBRA Subregion**.



2.2 NSW Landscape Regions (Mitchell Landscapes)

Mitchell Landscapes are used to describe areas in NSW in a broad sense and group together areas with relatively homogenous geomorphology, soils and broad vegetation types and are mapped at a scale of 1:250000.

The subject site is within the Pennant Hills Ridges Landscape (Figure 8). This landscape region has an estimated cleared fraction of 0.88 and has ‘over-cleared’ land status.

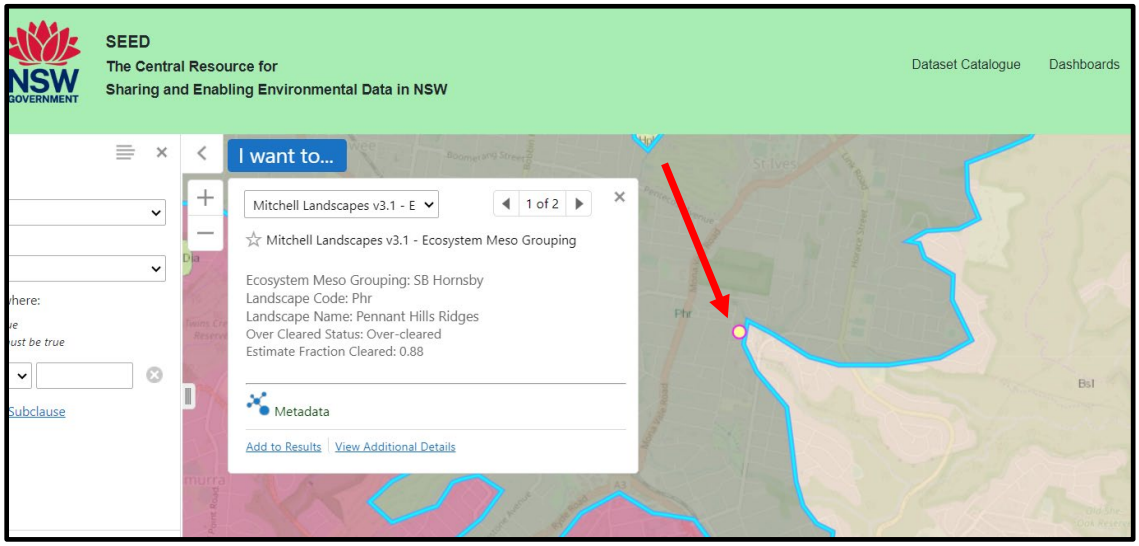


Figure 6: Location of site within the Pennant Hills Ridges Mitchell Landscape (red arrow)

2.3 Native Vegetation Extent

All areas of native vegetation cover, within the site and within a 1,500 m buffer area surrounding the site, have been mapped; see Figure 9. It is estimated, from this mapping, that the native vegetation cover would be the 30% (30-70% category) provided within the BDAR manual and this was used in the BAM Offsets calculator (Section 6).

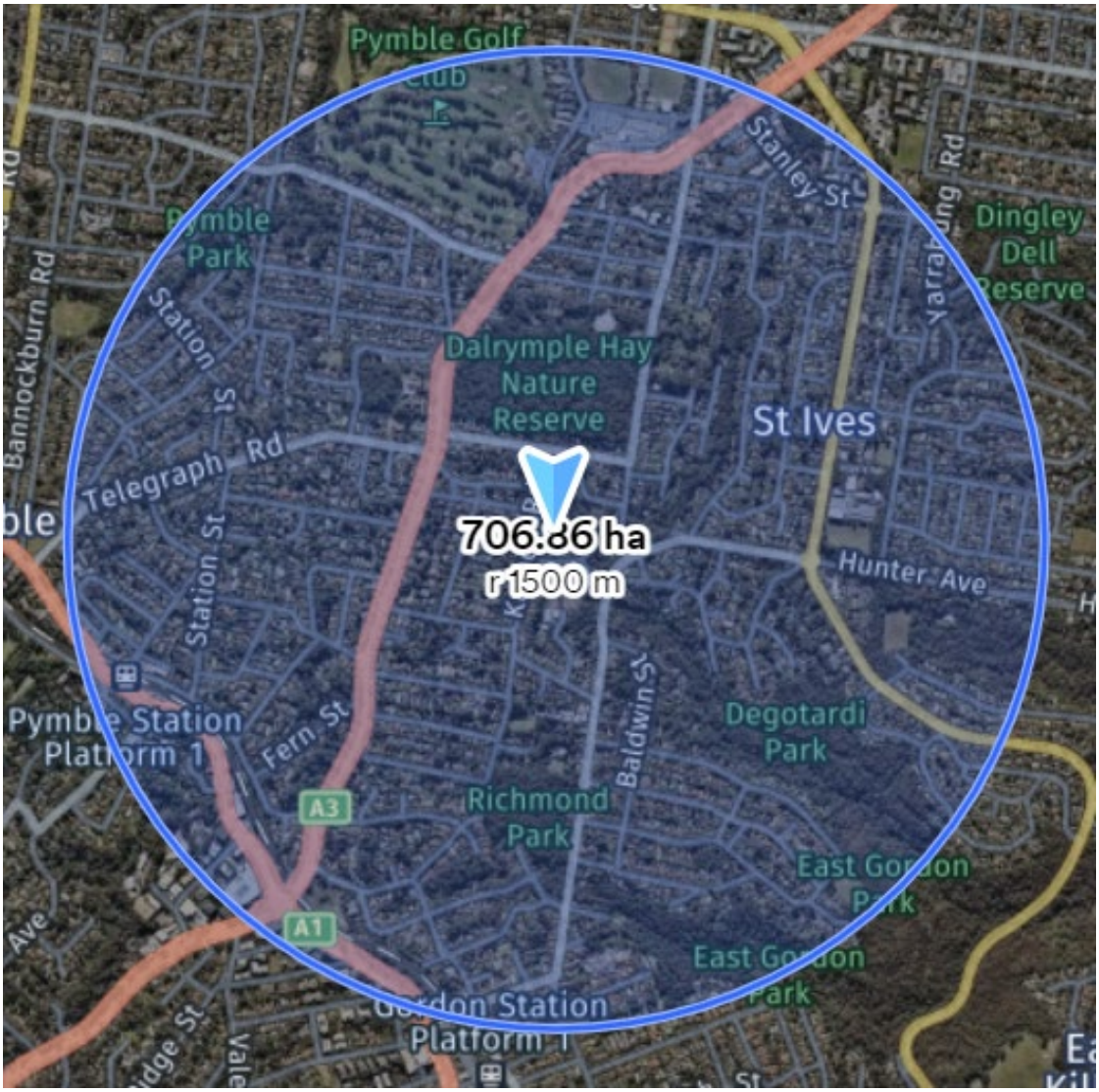


Figure 7:1500m buffer area of the site

2.4 Wetland, Rivers, Streams and Estuaries

No significant wetlands, rivers, streams and estuaries are present within the subject land.

No water courses are mapped as occurring within the Subject Property under the Ku-ring-gai LEP 'Natural Resource – Riparian Land Map'. As such, the objectives of the clause will be addressed within this report.

The objectives of this clause are to:

Protect and improve:

- water quality within waterways;
- the stability of the bed and banks of waterways;
- aquatic and riparian habitats;
- ecological processes within waterways and riparian lands;
- threatened species, communities, populations and their habitats; and
- scenic and cultural heritage values of waterways and riparian lands.

In deciding whether to grant development consent for development on land to which this clause applies, the consent authority must consider:

whether the development is likely to have an adverse impact on the following;

- water quality in the waterway;
- the natural flow regime, including groundwater flows to a waterway;
- aquatic and riparian habitats and ecosystems;
- the stability of the bed, shore and banks of the waterway;
- the free passage of native aquatic and terrestrial organisms within or along the waterway and riparian land; and
- public access to, and use of, any public waterway and its foreshores.

any opportunities for rehabilitation or re-creation of any waterway and its riparian areas;

and

any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

Development consent must not be granted to any development on land to which his clause applies unless the consent authority is satisfied that the development;

- is consistent with the objectives of this clause;
- integrates riparian, stormwater and flooding measures;
- is designed, sited and will be managed to avoid any potential adverse environmental impacts; and
- if a potential adverse environmental impact cannot be avoided by adopting feasible alternatives-the development minimises or mitigates any such impact to a satisfactory extent.

2.5 Connectivity Features

The biodiversity value of corridor networks is well known. Landscapes that retain more connections between patches of otherwise isolated areas of vegetation are more likely to maintain more numerous and more diverse populations of various plant and animal species (Lindenmayer and Fischer, 2006). Conversely, a lack of landscape connectivity can have a range of negative impacts on species populations (Lindenmayer and Fischer, 2006). It is thought that if existing remnants are left to persist without sufficient immigration to maintain genetic diversity, continued losses of biodiversity are certain (Parker *et al.* 2008).

The proposed development will not fragment bushland or significantly impact upon the corridor function of bushland on site as trees will be retained around the development site.

The central and south-eastern extents of the proposed development have been mapped as 'Biodiversity Corridors and Buffer Areas' within the Ku-ring-gai Council Greenweb Mapping (Figure 7).

The objectives of this category include:

- To manage areas providing a buffer to Core and Support for Core Biodiversity Lands;
- To reduce edge effects and to improve the health, connectivity and function of local ecosystems; and
- To revegetate and restore Biodiversity Corridors, significant vegetation and habitat across the landscape.

The following controls apply to lands mapped as 'Biodiversity Corridors and Buffer Areas':

- The siting and design of development must minimise edge effects on Greenweb.
- Planting is to consist of:
  - not less than 50% locally native species;
  - species that reflect the relevant vegetation communities within the area; and
  - a mix of groundcover, shrubs and trees.

Within Biodiversity Corridors (refer to maps in 18R.1 of the DCP):

- landscaping and revegetation must be designed to consolidate fragmented and linear vegetation and habitat areas within the site and adjacent sites; and
- the width of Biodiversity Corridors should be enhanced and gaps and barriers reduced or minimised.

Future landscape planting should be undertaken in line with relevant requirements including:

- not less than 50% locally native species;
- species that reflect the relevant vegetation communities within the area; and
- a mix of groundcover, shrubs and trees, and is to exclude monocultures.

2.6 Areas of Geological Significance and Soil Hazard Features

Not present.

The Subject Site is situated on a slight slope, with elevation ranging between 160 m Australian Height Datum (AHD) in the south and 166 m in the north AHD.

The Subject Site occurs predominately on the Glenorie soil landscape. The Glenorie soil landscape comprises undulating to rolling low hills on Wianamatta Group shales. Local relief 50-80 m, slopes 5-20%. Narrow ridges, hillcrests and valleys. Extensively cleared tall open-forest (wet sclerophyll forests). Soils are shallow to moderately deep (<100 cm) red podzolic soils crests; moderately deep (70–150 cm) red and brown podzolic soils on upper slopes (Chapman et al. 2009).

A small section in the south-eastern extent is mapped as the Lucas Heights soil landscape. This soil landscape is characterised by gently undulating crests and ridges on plateau surfaces of the Mittagong formation (alternating bands of shale and fine-grained sandstones). Local relief to 30 m, slopes <10%. Rock outcrop is absent. Extensively or completely cleared, dry sclerophyll low forest and woodland. Soils moderately deep (50–150 cm), hardsetting yellow podzolic soils and yellow soloths.

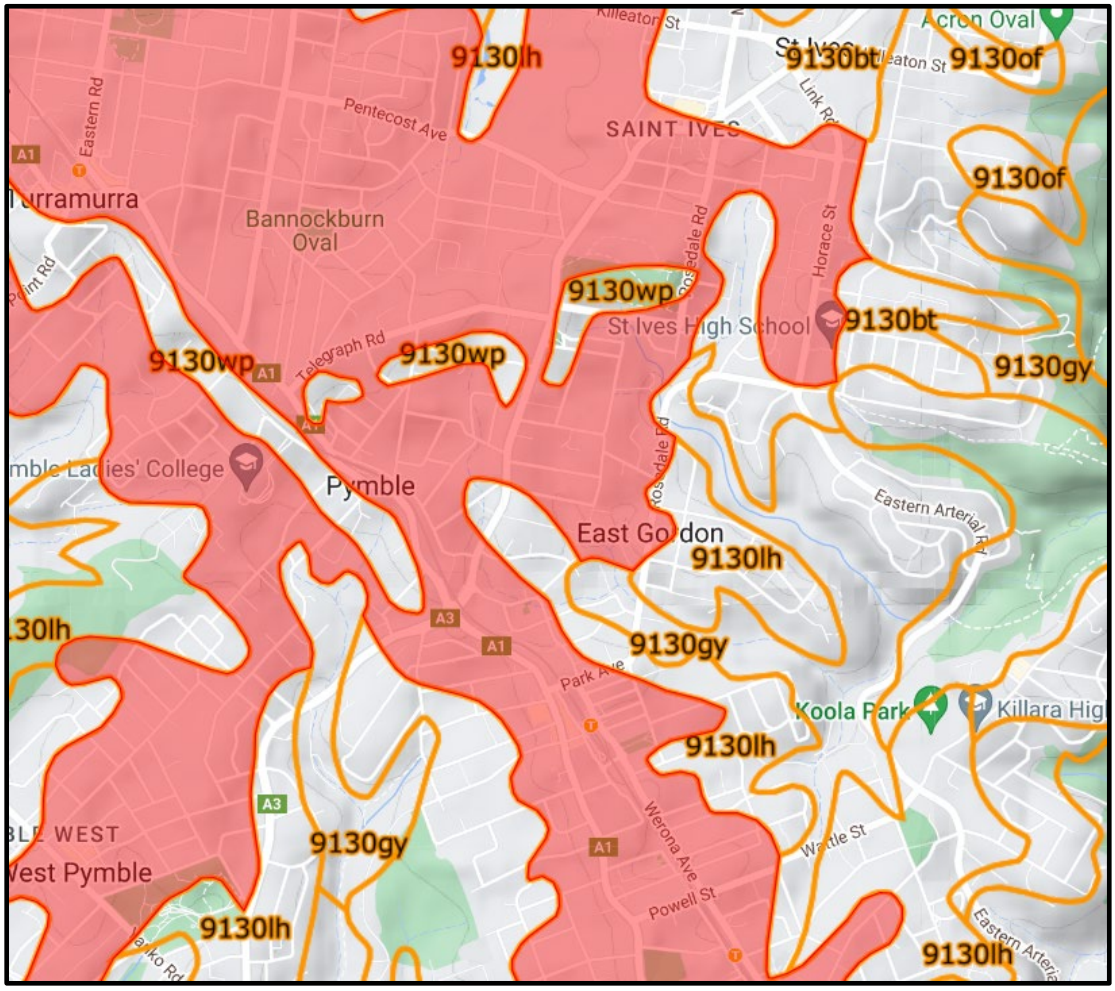


Figure 8: The site is located within the Glenorie Soil Landscape
(Source: E-Spade Version 2.0 managed by the NSW Office of Environment and Heritage)

2.7 Areas of Outstanding Biodiversity Value

Under the BC Act, the Minister for the Environment may declare Areas of Outstanding Biodiversity Value (AOBV). These are special areas that contain irreplaceable biodiversity values that are considered important to NSW, Australia or globally.

No listed AOBV occur within the site or within a 1,500 m buffer around the site.

2.8 Site Context

2.8.1 Native Vegetation Cover

Native vegetation cover is calculated as a percentage cover on the subject land and the surrounding 1,500 m buffer area. Cover estimates are based on the cover of native woody and non-woody vegetation relative to the approximate benchmarks for the PCT, considering vegetation condition and extent.

The native vegetation cover is estimated at approximately 45%.

2.8.2 Patch Size

Patch size is used to describe an area of intact native vegetation, that includes native vegetation with a gap of less than 100 m from the next area of moderate to good condition native vegetation. This gap is less than or equal to 30 m for non-woody ecosystems.

The patch size for the vegetation on-site is two (2) hectares amongst a heavily urbanised landscape.

3 NATIVE VEGETATION

3.1 Native Vegetation Extent Within the Site

The total area of native vegetation (Vegetation Zone 1) occurring within the subject site has an overly conservative of 0.2 ha for the BAM calculator.

A stormwater drainage easement (1.2m wide) has been proposed along the eastern (rear) boundary of all proposed lots. All trees are proposed for retention within this area which is currently subject to heavy weed invasion.

As a precautionary measure, it has been assumed 0.2ha of native vegetation may be indirectly impacted for the installation of stormwater drainage at the rear of the proposed lots as well as edge effects. This has been taken into account into the BAM-C credit calculation.

3.2 Plant Community Types (PCTs)

3.2.1 Vegetation zones and plant species recorded on site

The Subject Property currently contains existing dwellings, areas of cleared exotic lawn, tennis court, pools, landscaped areas, ornamental garden plantings and remnant Sydney Turpentine Ironbark Forest canopy trees (at the rear of the properties), situated within an urban residential setting.

The canopy tree species present include mixture of locally indigenous species Sydney Turpentine Ironbark Forest, planted native and exotic tree species of varying ages and stages of maturity.

The subject site has been partially modified with the removal of most of the native under storey, ground cover plants and shrubs prior to 1943. There is a high proliferation of introduced environmental weed species at the rear of the property including:

- Trad (*Tradescantia flumiensis*)
- Blackberry Nightshade (*Solanum nigrum*)
- Madeira Vine (*Anredra cordifolia*)

The subject dominant trees together with other indigenous trees in the surrounding residences are connected to the remainder of the ecological communities nearby.

Indigenous tree species occurring on-site are (tree numbering system corresponding with arborist report):

- Tree No.'s 7 & 71 *Angophora costata* (Smooth-barked Apple)
- Tree No. 1 *Eucalyptus acmenoides* (White Mahogany)
- Tree No. 70 *Eucalyptus pilularis* (Blackbutt)

- Tree No. 87 *Eucalyptus punctata* (Grey Gum) Tree No.'s 27, 65, 68, 69, 80 & 81 *Eucalyptus saligna* (Sydney Blue Gum)
- Tree No.'s 74 & 79 *Pittosporum undulatum* (Sweet Pittosporum)
- Tree No.'s 2, 3, 4, 5, 6, 8, 9, 10, 11, 14, 16, 19, 21, 24, 26, 72, 73 & 105 *Syncarpia glomulifera* (Turpentine)
- *Glochidion ferdinandi* (Cheese Tree)

The following exotic introduced tree species are listed in the Biosecurity Act (2015):

- Tree No.'s *40, 77 & 104 Celtis sinensis (Chinese Nettle)*
- Tree No.'s *82 Ligustrum lucidum (Broad Leaf Privet)*

Other introduced planted tree species recorded on-site included:

- *Archontophoenix cunninghamiana (Bangalow Palm)*
- *Cedrus deodara (Deodar Cedar)*
- *Fraxinus griffithii (Evergreen Ash)*
- *Melaleuca incana (Grey Honey Myrtle)*
- *Citharexylum spinosum (Fiddlewood)*
- *Melaleuca bracteata (Revolution Green)*
- *Laurus nobilis (Bay Tree)*
- *Leptospermum petersonii (Lemon Scented Tea Tree)*
- *Juniperus communis (Juniper)*
- *Camellia reticulata (Reticulata Camellia)*
- *Cupressus sempervirens var. stricta (Pencil Pine)*
- *Podocarpus elatus (Brown Pine)*
- *Eucalyptus microcorys (Tallowwood)*
- *Grevillea robusta (Silky Oak)*
- *Callistemon salignus (Willow Bottlebrush)*
- *Thuja plicata (Western Red Cedar)*
- *Glochidion ferdinandi (Cheese Tree)*
- *Jacaranda mimosifolia (Jacaranda)*
- *Livistona chinensis (Chinese Fan Palm)*
- *Stenocarpus sinuatus (Fire Wheel Tree)*
- *Brachychiton acerifolius (Illawarra Flame Tree)*
- *Grevillea robusta (Silky Oak)*
- *Callistemon salignus (Willow Bottlebrush)*
- *Livistona chinensis (Chinese Fan Palm)*

- *Ulmus glabra (Scotch Elm)*
- *Howea forsteriana (Kentia Palm)*

PCT classification

The vegetation at the rear of the site has been mapped by Council and the NSW DPE (NSW Statewide PCT mapping) as Sydney Turpentine Ironbark Forest (Figure 12 and 13).

Vegetation Formation: Wet Sclerophyll Forests (Grassy sub-formation)

Vegetation Class: Northern Hinterland Wet Sclerophyll Forests

PCT Name: Sydney Turpentine Ironbark Forest

PCTID: 3262

Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion is listed as Critically Endangered under the BC Act 2016 and EPBC Act 1999.

Sydney Turpentine Ironbark Forest (Benson and Howell 1990) is a tall wet sclerophyll forest found on fertile shale soils in the high rainfall districts of Sydney's north shore. It is dominated by Sydney blue gum (Eucalyptus saligna), blackbutt (Eucalyptus pilularis) and turpentine (Syncarpia glomulifera) with a number of other eucalypts occurring patchily. A sparse to open cover of small trees is found at most sites and includes a variety of sclerophyllous and mesophyllous species. The ground layer is variable in both composition and cover. It may be ferny, grassy or herbaceous depending on topographic situation and disturbance history.

At some sites vines and climbers are prolific. Sydney Turpentine Ironbark Forest is found on a range of shale or shale-influenced substrates in areas receiving between 900 and 1300 millimetres of mean annual rainfall. This includes elevated gullies, ridgelines, crests and slopes underlain by Wianamatta shales as well as small gully heads where downslope movement of shale soil lies above sandstone bedrock. In these latter situations sandstone outcrops may be present, although occupying only a minor component of the site.

Typically the community occurs at altitudes above 117 metres above sea level although it is known to occur as low as 30 metres and as high as 185 metres. It is most common across the ridgelines between Castle Hill and St Ives with small areas occurring in Ryde, Lane Cove and Willoughby where it is found at lower elevations.

Like most STIF remnants it is considered to be in poor condition. Due the lack of any groundcover or shrub species, the site is considered to contain low native resilience (ability of the soil seedbank to regenerate to a fully structured vegetation community).

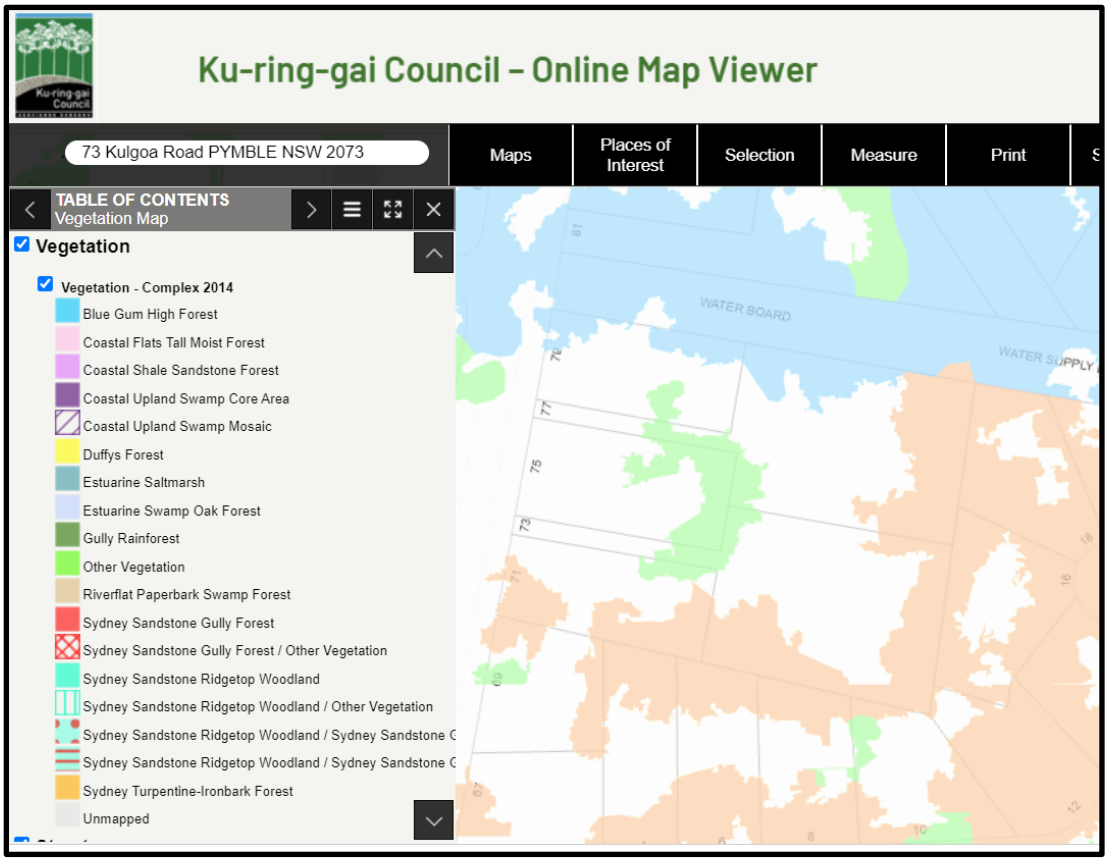


Figure 12: The subject site has been mapped by Council as Sydney Turpentine Ironbark Forest (orange polygon)

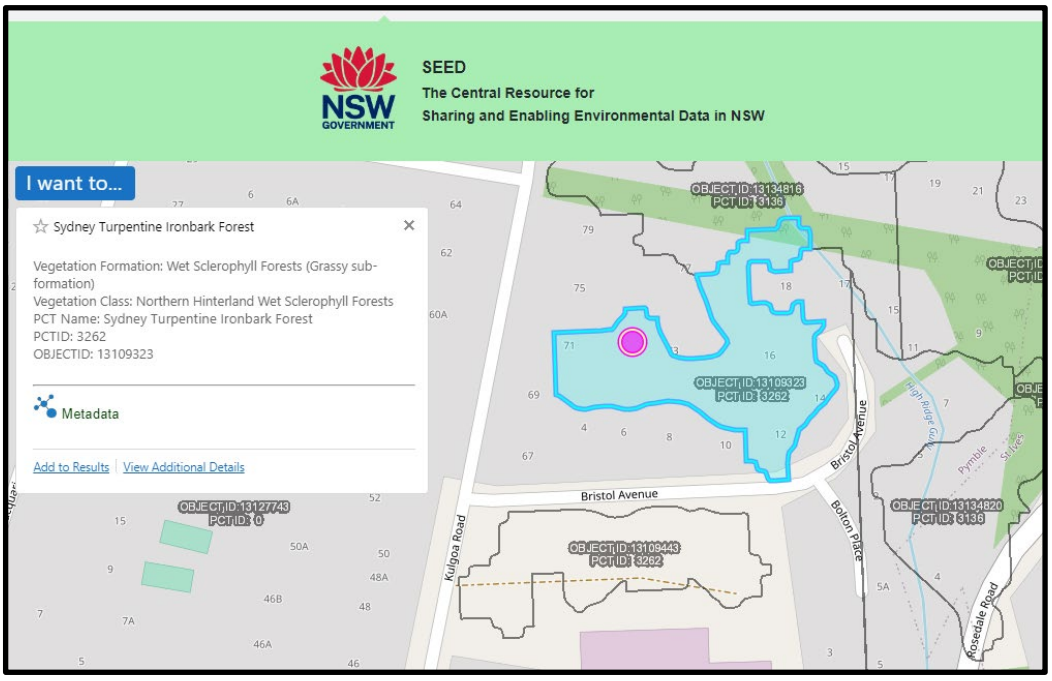


Figure 13: NSW Statewide PCT map showing the extent of STIF across the site and wider locality

3.2.2 Plot-based Floristic Vegetation Surveys

Plot-based floristic vegetation surveys were conducted, in accordance with s.5.2.1.9 of the BAM, by Alex Fraser on the 20/6/23 and their location is shown in Figure 14.

One 20 m x 20 m plot were sampled for the presence of flora species. The plot was carefully examined to identify all flora species present. Searches continued until it was confident that all flora species within a plot were detected. Data collected for each species included:

- Stratum and layers in which each species occurs
- Growth form for each species
- Scientific and common name for each species
- Percentage foliage cover (PFC) across the plot, of each species rooted in or overhanging the plot
- Abundance rating for each species

Plant Community Types (PCTs) on the site were identified according to the NSW PCT classification described in the BioNet Vegetation Classification.

One PCT (No.3262) was identified on the site and is described below.

Plot data is provided in Appendix B.

The location of the BAM plot is provided within Figure 14 (below).

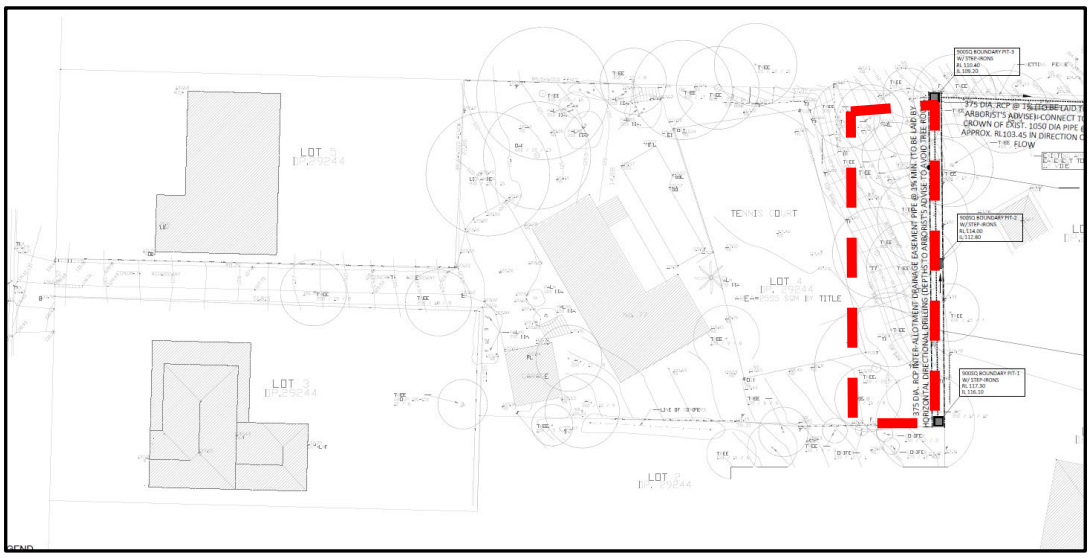


Figure 14: Location of BAM Plot (red shaped rectangle)

Photograph 1: BAM Plot midline (view south)

Photograph 2: BAM Plot midline (view north)

Photograph 3: Rear of the subject site shown presence of native and introduced species

Photograph 4: Rear of the subject site showing native species with understorey dominated by exotic species

Photograph 5: Northern boundary of the site (eastern view)

Photograph 6: Northern boundary of the site (western view)

Table 1: Plants recorded on-site

Scientific name (Common name)
Angophora costata (Smooth-barked Apple) – STIF species
Eucalyptus acmenoides (White Mahogany) – STIF species
Eucalyptus pilularis (Blackbutt) – STIF species
Eucalyptus punctata (Grey Gum) – STIF species
Eucalyptus saligna (Sydney Blue Gum) – STIF species
Pittosporum undulatum (Sweet Pittosporum) – STIF species
Syncarpia glomulifera (Turpentine) – STIF species
Glochidion ferdinandi (Cheese Tree) – STIF species
*Celtis sinensis (Chinese Nettle)**
*Ligustrum lucidum (Broad Leaf Privet)**
*Archontophoenix cunninghamiana (Bangalow Palm)***
*Cedrus deodara (Deodar Cedar)**
*Fraxinus griffithii (Evergreen Ash)**
*Melaleuca incana (Grey Honey Myrtle)***
*Citharexylum spinosum (Fiddlewood)**
*Melaleuca bracteata (Revolution Green)***
*Laurus nobilis (Bay Tree) **
*Leptospermum petersonii (Lemon Scented Tea Tree)***
*Juniperus communis (Juniper)**
*Camellia reticulata (Reticulata Camellia)**
*Cupressus sempervirens var. stricta (Pencil Pine)**
*Podocarpus elatus (Brown Pine)***
*Eucalyptus microcorys (Tallowwood)***
*Grevillea robusta (Silky Oak)***
*Callistemon salignus (Willow Bottlebrush)***
*Thuja plicata (Western Red Cedar)***
*Jacaranda mimosifolia (Jacaranda)**
*Livistona chinensis (Chinese Fan Palm)**
*Stenocarpus sinuatus (Fire Wheel Tree)***
*Brachychiton acerifolius (Illawarra Flame Tree)***
*Ulmus glabra (Scotch Elm)**
*Howea forsteriana (Kentia Palm)***
*Erhrarta erecta (Panic Veldt Grass)**
*Tradescantia flumiensis (Trad)**
*Solanum nigrum (Blackberry Night Shade)**
Oplismenus imbecillis (Basket grass) – STIF species
Dichondra repens (Kidney Weed) – STIF species
*Hedychium gardnerianum (Introduced Ginger)**
*Anredera cordifolia (Madeira vine)**
*Lonicera japonica (Japanese Honeysuckle)**
*Agapanthus praecox (Agapanthus)**
*Thirsium vulgare (Spear Thistle)**
*Ochna serrulata (Mickey Mouse Plant)**

**Denotes introduced species*
*** Denotes planted native species not locally indigenous to the STIF vegetation community*

3.2.3 Fauna habitat and species

No threatened fauna species were observed on the Subject Site during the site assessment. Fauna habitat within the Subject Site is further detailed in (Table 7).

Desktop analysis revealed a number of threatened fauna species have the potential to utilise habitat on the Subject Site during part of their lifecycles (Table 8). There was no potential for significant impact upon all potentially occurring BC Act listed threatened species therefore no assessment under the '5-Part Test Assessment of Significance' was required. There was no potential for significant impact upon all potentially occurring EPBC Act listed threatened species therefore no assessment under the Significant Impact Guidelines for Matters of National Environmental Significance (MNES) was required.

It was deemed that the proposed works are unlikely to result in a significant impact such that a local viable population or occurrence of any of the threatened species aforementioned will be placed at risk of extinction.

Table 2: Fauna habitat values of the site

Habitat component	Site values
Coarse woody debris	Absent.
Rock outcrops, bush rock, caves, crevices and overhangs	Absent.
Culverts, bridges, mine shafts, or abandoned structures	Absent.
Nectar/lerp-bearing Trees	*Syncarpia glomulifera, Eucalyptus pilularus* and *Angophora costata* were recorded within the Subject Site. These trees may provide intermittent nectar and/or lerp sources for nomadic nectivores.
Nectar-bearing shrubs	Absent.
Koala and Greater Glider feed trees.	*Syncarpia glomulifera, Eucalyptus pilularus* and *Angophora costata* are considered Koala feed treed and occur within the Subject Site. Koalas are unlikely to be present.
Large stick nests	Absent.
Sap and gum sources	Present. *Syncarpia glomulifera, Eucalyptus pilularus* and *Angophora costata* occur within the Subject Site.
She-oak fruit (Glossy Black Cockatoo feed)	Absent.
Soft-fruit-bearing trees	Present – exotic planted species such as Camelia
Dense shrubbery and leaf litter	Absent.
Tree hollows	Absent.
Decorticating bark	Absent.
Wetlands, soaks and streams	Absent.
Open water bodies	Absent.
Estuarine, beach, mudflats, and rocky foreshores	Absent.

3.3 Vegetation Integrity Assessment (BAM -C)

3.3.1 Vegetation Zones

For the purposes of the BAM, a vegetation zone is an area of native vegetation on the site that is the same PCT and has a similar broad condition state. The assigned vegetation zone for the PCT occurring on the site are described below.

3.3.2 Patch Sizes

A patch size area has been assigned to each vegetation zone, as a class. Patch size classes are provided in Table 3.

Table 3: Patch Size Classes

PCT	Vegetation Zone	Patch Size Class
Plant Community Type (PCT) PCT 3262 – Sydney Turpentine Ironbark Forest	Vegetation Zone 1	2ha

3.3.3 Vegetation Integrity Scores

Each vegetation zone identified on the site has been surveyed to obtain a quantitative measure for each zone, of the composition, structure and function attributes listed in Table 3 of the BAM. These attributes are listed below:

- Growth form groups used to assess composition and structure:
    - Tree
    - Shrub
    - Grass and grass like
    - Forb
    - Fern
    - Other
- Attributes used to assess function:
    - Number of large trees
    - Tree regeneration
    - Tree stem size class
    - Total length of fallen logs
    - Litter cover
    - High threat exotic vegetation cover
    - Hollow-bearing trees

Plot-base surveys were conducted, in accordance with s.5.3.4 of the BAM, by an ecologist (Alex Fraser). Survey plots were established around a central 50 m transect and included:

- One 400 m² (20 m x 20 m) plot to assess the composition and structure attributes listed above.
- One 1000 m² (20 m x 50 m) plot to assess the function attributes: number of large trees, stem size class, tree regeneration and length of logs.
- Five 1 m² sub-plots to assess average litter cover (and other optional groundcover components).

See previous Figure 14 for plot location. Plot data is provided in Appendix B. Table 4 details the vegetation integrity scores for each vegetation zone.

Table 4: Vegetation Integrity Scores

PCT	Vegetation Zone	Composition Condition Score	Structure Condition Score	Function Condition Score	Vegetation Integrity Score
PCT 3262	Vegetation Zone 1	13.6	28.1	61.4	28.6

3.4 Sydney Turpentine Ironbark Forest (STIF) Listing under the EPBC Act 1999

In order to be protected as a matter of national environmental significance areas of the ecological community must meet both:

- The key diagnostic characteristics (Table 5); and
- At least the minimum condition thresholds (Table 6).

The vegetation mapped within the Subject Land as STIF does not meet the Key Diagnostic Features for the community (Table 5), nor does it meet the key condition thresholds required to meet the EPBC Act listing status (Table 6).

Therefore, areas mapped as Sydney Turpentine Ironbark Forest (STIF) within the Subject Land do not conform to the EPBC Act listed Sydney Turpentine Ironbark Forest (Threatened Species Scientific Committee 2009) and no further assessment under the EPBC Act is required for this vegetation in the Subject Land.

Table 5: Key diagnostics features required to meet the EPBC Listing Status for Sydney Turpentine Ironbark Forest (Threatened Species Scientific Committee 2009).

Thresholds	Status in the Project Area
	Sydney Turpentine Ironbark Forest PCT 3262 (Canopy)
The distribution of PCT 3262 is between Sutherland and the Hornsby plateau. The Hornsby Plateau is the adjoining Mitchell landscape immediately to the northeast of the subject land and the suburb of Sutherland is approximately 50 km to the south. Therefore, the subject land is within the distribution of PCT 3262.	Yes
· Mean annual rainfall of PCT 3262 is 900 to 1250 mm and BOM (2021) rainfall data suggest the site would receive rainfall within that range (mean annual rainfall for Parramatta station 066124 since 1965 is 966mm). · Elevations of PCT 3262 are between 10 and 180 m asl and site contour data indicates the subject land is mostly within this range at 152-188 m. · Soils are described as shale and shale-enriched sandstone soils. The soil landscape of the subject land is Glenorie (OEH 2020) which is typically underlain by Wianamatta shale with topsoils of friable dark brown loam. The topsoils on the subject land generally appeared to be brown sandy	Yes
The dominant tree species of the CEEC are described as including Syncarpia glomulifera and Eucalyptus paniculata, but the Final Determination also explains that a range of other tree species (including E. globoidea, E. punctata, E. resinifera, E. pilularis, E. acmenoides, E saligna and Angophora floribunda) may co-occur or even dominate. The subject land contains a mixed canopy of Syncarpia glomulifera, Eucalyptus paniculata, E. punctata, E. pilularis, E. acmenoides, E. pilularis and Angophora floribunda and meets the CEEC canopy description. Other canopy species may occur in association with the typical dominants and may be locally dominant at some sites. The descriptions of several STIF ecotonal vegetation communities (Cumberland Plain Woodland, Blue Gum High Forest, Shale Sandstone Transition Forest, Sydney Sandstone Ridgetop Woodland and Sandstone Gully Forest) provided in the Final Determination (4.4-4.7) also support the definition of the vegetation at the rear of the subject land toward STIF.	Yes – The minimum projected foliage cover of canopy trees is 10% or more; and □ The tree canopy is typically dominated by Angophora costata (Smooth-barked Apple), Tree No. 1 Eucalyptus acmenoides (White Mahogany) □ Tree No. 70 Eucalyptus pilularis (Blackbutt) Tree No. 87 Eucalyptus punctata (Grey Gum) Tree No.'s 27, 65, 68, 69, 80 & 81 Eucalyptus saligna (Sydney Blue Gum) □ Tree No.'s 74 & 79 Pittosporum undulatum (Sweet Pittosporum) □ Tree No.'s 2, 3, 4, 5, 6, 8, 9, 10, 11, 14, 16, 19, 21, 24, 26, 72, 73 & 105 Syncarpia glomulifera (Turpentine) □ Glochidion ferdinandi (Cheese Tree)
A stratum of small trees may occur, including Pittosporum undulatum (sweet pittosporum), Trema aspera (native peach) and Acacia parramattensis (Parramatta wattle). Where present, a shrub layer may include Polyscias sambucifolia (elderberry panax), Notelaea longifolia (mock olive), Leucopogon juniperinus (prickly beard-heath), Pittosporum revolutum (rough fruit pittosporum), Breynia oblongifolia (breynia), Maytenus silvestris (narrow-leaved orangebark) and Ozothamnus diosmifolius (white dogwood). Where present in its natural state, the ground layer may include Oplismenus aemulus (basket grass), Pseuderanthemum variabile (pastel flower), Echinopogon ovatus (forest hedgehog grass) Microlaena stipoides (weeping grass) and Themeda triandra (kangaroo grass).	Yes - Pittosporum undulatum (Sweet Pittosporum) present

Table 6 Key diagnostics features required to meet the EPBC Listing Status for Sydney Turpentine Ironbark Forest (Threatened Species Scientific Committee 2009).

Category and Rationale	Thresholds	Thresholds Present within the Project Area
A. Core thresholds that apply under most circumstances: patches with an understorey dominated by natives and a minimum size that is functional and consistent within mapping unit size applied in NSW.	Minimum patch size is >0.5ha. AND >50% of the perennial understorey vegetation cover is made up of native species.	No. The patch size is <0.5ha and <50% of the perennial understorey vegetation cover is made up of native species.
OR		
B. Larger patches which are inherently variable due to their rarity.	The patch size is >5ha; AND >30% of the perennial understorey vegetation cover is made up of native species.	No. The patch size is <5ha and <30% of the perennial understorey vegetation cover is made up of native species.
OR		
C. Patches with connectivity to large native vegetation remnants in the landscape.	The path size is >0.5ha; AND ≥30% of the perennial understorey vegetation cover is made up of native species; AND The patch is contiguous with a native vegetation remnant (any native vegetation where cover in each layer present is dominated by native species) that is ≥5ha in area.	No. The patch size is <0.5ha and <30% of the perennial understorey vegetation cover is made up of native species and the patch is not contiguous with another native vegetation remnant that is ≥5ha.
OR		
D. Patches that have large mature trees or trees with hollows (habitat) that are very scarce on the Cumberland Plain.	The patch size is >0.5ha in size; AND ≥30% of the perennial understorey vegetation cover is made up of native species; AND The patch has at least one tree with hollows per hectare or at least one large tree (≥80 cm dbh) per hectare from the upper tree layer species outlined in the Description and Appendix A.	No. The patch size is <0.5ha and <30% of the perennial understorey vegetation cover is made up of native species and the patch does not have at least one tree with hollows per hectare or at least one large tree >80cm dbh per hectare.
Sydney Turpentine Ironbark Forest (STIF) within the Project Area DOES NOT meet the minimum condition thresholds for Sydney Turpentine Ironbark Forest (STIF); therefore, it is NOT considered to be part of the CEEC under the EPBC listing.		

4 THREATENED SPECIES

4.1 Ecosystem Credit Species

Ecosystem credit species are those where the likelihood of occurrence of the species or elements of the species' habitat, can be predicted by vegetation surrogates and landscape features, or for which targeted survey has a low probability of detection. The Threatened Biodiversity Data Collection (TBCD) has identified several ecosystem credit species as requiring assessment as shown on the following page.

4.2 Species Credit Species (Candidate Species)

Species credit species (or candidate species) are those where the likelihood of occurrence of the species or elements of suitable habitat for the species, cannot be confidently predicted by vegetation surrogates and landscape features and can be reliably detected by survey. The TBDC has identified several candidate species as requiring assessment as provided on the following page (Table 7).

In accordance with S.6.5.1.1. a species survey must be undertaken for all species credit species identified as likely to occur on the site based upon the application of Steps 1-3 in Section 6.4.

Based upon the low quality of fauna habitat proposed for removal, no species credit species are likely to occur on-site. Therefore, no targeted fauna surveys were considered necessary.

Table 7: Candidate species inclusion/ exclusion justification table

Table 7: Candidate species assessment

Common name	Scientific name	Included in assessment	Targeted survey conducted?	Present within subject land?	Biodiversity risk weighting	No. of BIONET records in the locality (accessed 28/6/23)	Biodiversity Offset Credits required?
Large Bent-winged Bat (breeding)	*Miniopterus orianae oceanensis*	*This species is known to breed in caves, tunnels, mines and culverts. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment*	No	n/a	Very High -3	20	No
Large-eared Pied Bat	*Chalinolobus dwyeri*	*This species is known to occur within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels. Whilst hilly terrain was observed within the surrounding locality of the Subject Land, aerial imagery revealed no such geological features (caves, overhangs escarpment etc.) within or adjacent to the Subject Land. It is therefore unlikely such habitat features would occur within the area surrounding the Subject Land. As such, this species was excluded from the assessment.*	No	n/a	Very High -3	3	No
Little Bent-winged Bat	*Miniopterus australis*	*This species is known to breed in caves, tunnels, mines and culverts. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.*	No	n/a	Very High -3	2	No
Regent Honeyeater	*Anthochaera phrygia*	*No, the subject land is not within the important areas mapped for this species*	No	n/a	Very High -3	6	No
Swift Parrot	*Lathamus discolor*	*No, the subject land is not within the important areas mapped for this species*	No	n/a	Very High -3	17	No
Thick Lip Spider Orchid	*Caladenia tessellata*	*The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in*	No	n/a	Very High -3	0	No

Common name	Scientific name	Included in assessment	Targeted survey conducted?	Present within subject land?	Biodiversity risk weighting	No. of BIONET records in the locality (accessed 28/6/23)	Biodiversity Offset Credits required?
		NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border. *Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.* *The single leaf regrows each year. Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).* *The habitat is degraded to the point where the species will no longer be present. This is reflected in the low vegetation integrity score of 13.4 on-site.*					

THREATENED SPECIES PREVIOUSLY RECORDED WITHIN 10KM OF THE SITE

Table A: Threatened plants previously recorded within 10km of the subject site (NSW Bionet and EPBC Protected Matters Database undertaken June 2023)

Scientific Name	BC Act	EPBC Act	ROTAP	Habitat
Darwinia biflora	V		2K	Occurs in Gosford and Sydney districts where it grows in sclerophyll forest, scrub and swamps (Harden 1992). Usually found in sites with a strong shale influence (NSW National Parks and Wildlife Service, 2002).
Epacris purpurascens var. purpurascens	V		2K	Occurs in Gosford and Sydney districts where it grows in sclerophyll forest, scrub and swamps (Harden 1992). Usually found in sites with a strong shale influence (NSW National Parks and Wildlife Service, 2002).
Leucopogon fletcheri ssp. fletcheri	E1		2R	Occurs in dry eucalypt woodland or in shrubland on clayey lateritic soils, generally on flat to gently sloping terrain along ridges and spurs (Royal Botanic Gardens 2005 and Department of Environment and Conservation 2005).
Eucalyptus camfieldii	V	V	2Vi	Occurs from Tomago to the Royal National Park where it grows in coastal shrub heath in sandy soils on sandstone {Harden, 2002 #5}.
Eucalyptus nicholii	V	V	3V	Occurs from Niangala to Glenn Innes where it grows in grassy sclerophyll woodland on shallow relatively infertile soils on shales and slates (Harden, 1991; DLWC, 2001). Endemic on the NSW Northern Tablelands, of limited occurrence, particularly in the area from Walcha to Glen Innes; often on porphyry or granite (Brooker and Kleinig 1999).
Eucalyptus scoparia	E1	V	2Vi	Occurs in Queensland and reaches its southern limit in NSW. In NSW it is known from three locations all near Tenterfield in the far northern New England Tableland Bioregion where it grows on well drained granitic hilltops, slopes and outcrops, often as scattered trees in open forest and woodland (Royal Botanic Gardens 2004).
Acacia bynoeana	E1	V	3V	Occurs south of Dora Creek-Morisset area to Berrima and the Illawarra region and west to the Blue Mountains. It grows mainly in heath and dry sclerophyll forest on sandy soils {Harden, 2002 #5}. Seems to prefer open, sometimes disturbed sites such as trail margins and recently burnt areas. Typically occurs in association with Corymbia gummifera, Eucalyptus haemastoma, E. gummifera, E. parramattensis, E. sclerophylla, Banksia serrata and Angophora bakeri {NSW National Parks and Wildlife Service, 1999 #61}.
Acacia gordonii	E1	E	2K	Occurs in the lower Blue Mountains from Bilpin to Faulconbridge and also in the Glenorie district. Grows on sandstone outcrops and amongst rock platforms in dry sclerophyll forest and heath {Harden, 2002 #5; NSW Scientific Committee, 1997 #298}. Specifically this species occurs in Sydney Sandstone Ridgetop Communities {James, 1997 #69}.

Scientific Name	BC Act	EPBC Act	ROTAP	Habitat
Acacia pubescens	V	V	3Va	Restricted to the Sydney Region from Bilpin to the Georges River and also at Woodford where it usually grows in open sclerophyll forest and woodland on clay soils. Typically it occurs at the intergrade between shales and sandstones in gravely soils often with ironstones {Harden, 2002 #5;NSW National Parks and Wildlife Service, 2003 #14}.
Hibbertia superans	E			The species occurs on sandstone ridgetops often near the shale/sandstone boundary. Occurs in both open woodland and heathland, and appears to prefer open disturbed areas, such as tracksides(Royal Botanic Gardens 2005 and Department of Environment and Conservation 2005).
Galium australe	E4			Previously presumed extinct in NSW, this species is now known from a number of sites in coastal regions. In NSW, this species has been recorded in moist gullies of tall forest, Eucalyptus tereticornis forest, coastal Banksia shrubland, and Allocasuarina nana heathland. In other States the species is found in a range of near-coastal habitats, including sand dunes, sand spits, shrubland and woodland (Royal Botanic Gardens 2005 and Department of Environment and Conservation 2005).
Melaleuca deanei	V	V	3R	Occurs in coastal districts, including western Sydney (e.g. Baulkham Hills, Liverpool shires) from Berowra to Nowra where it grows in wet heath on sandstone and shallow/skeletal soils near streams or perched swamps {James, 1997 #69; Harden, 2002 #5}.
Syzygium paniculatum	V	V	3Ri	Occurs between Buladelah and St Georges Basin where it grows in subtropical and littoral rainforest on sandy soils or stabilized dunes near the sea {Harden, 2002 #5}.
Grevillea juniperina ssp. juniperina	V			Restricted to western Cumberland Plain, Marsden Park, Rooty Hill, Riverstone, Plumpton, Castlereagh NR, Blacktown, Penrith and north to Pitt Town, where it grows in open dry sclerophyll (eucalypt-dominated) forest or woodland, at altitudes of less than about 50 m, in sandy to clay-loam soils and red pseudolateritic or sandy gravels {Royal Botanic Gardens, 2005 #404; Fairley, 2004 #523}. More specifically it grows in Cumberland Plain Woodland and Castlereagh Woodland, typically in moist sites, often beside creeks on acidic soils and often recorded on road verges. Restricted to red sandy to clay soils (often lateritic) on Wianamatta Shale and Tertiary Alluvium {NSW Scientific Committee, 2000 #582}.
Persoonia hirsuta ssp. hirsuta	E1		3Ki	Occurs from Gosford to the Royal National Parkand Hill Top to Glen Davis and Putty inland where it grows in woodlands and dry sclerophyll forest on sandstone or very rarely on shale. Typically occurs as isolated individuals or very small populations {NSW Scientific Committee, 1998 #64; Royal Botanic Gardens, 2005 #404}. Habitat in Castle Hill is considered to be "critical habitat" {James, 1997 #69}.
Persoonia mollis subsp. maxima	E	E		Highly restricted, known from the Hornsby Heights-Mt Colah area north of Sydney in the Sydney Basin Bioregion. Occurs in three populations (described on a catchment basis) located over an approximate north-south range of 5.75 km and east-west distance of 7.5 km. Additional locations may exist outside the current distribution. Occurs in sheltered aspects of deep gullies or on the steep upper hillsides of narrow gullies on Hawkesbury Sandstone. These habitats support relatively moist, tall forest vegetation communities, often with warm temperate rainforest influences.

Scientific Name	BC Act	EPBC Act	ROTAP	Habitat
				Associated species: Smooth Barked Apple *Angophora costata*, Sydney Peppermint *Eucalyptus piperita*, Red Bloodwood *Corymbia gummifera*, Turpentine *Syncarpia glomulifera*, Coachwood *Ceratopetalum apetalum* and Black Wattle *Callicoma serratifolia*.
Persoonia nutans	E1	E	2Ei	Confined to the Cumberland Plain where it grows in Castlereagh Scribbly Gum Woodlands and Agnes Banks Woodlands {NSW National Parks and Wildlife Service, 2001 #77; Harden, 2002 #5; James, 1997 #69}.
Genoplesium baueri	V		3R	Grows in sparse sclerophyll forest and moss gardens over sandstone; from the Hunter Valley to Nowra district {Royal Botanic Gardens, 2004 #9}.
Pimelea curviflora var. curviflora	V	V		Confined to coastal areas around Sydney where it grows on sandstone and laterite soils. It is found between South Maroota, Cowan, Narrabeen, Allambie Heights, Northmead and Kellyville, but its former range extended south to the Parramatta River and Port Jackson region including Five Dock, Bellevue Hill and Manly. Usually occurs in woodland in the transition between shale and sandstone, often on Lucas Heights soil landscape {NSW Scientific Committee, 1998 #65; James, 1997 #69; James, 1999 #68; Harden, 2000 #2}.
Tetratheca glandulosa	V	V	2V	Occurs from Mangrove Mountain to the Blue Mountains where it grows in sandy or rocky heath or scrub {Harden, 1992 #3}.
Tetratheca juncea	V	V	3Vi	Occurs in coastal districts from Buladelah to Port Macquarie where it grows in dry sclerophyll forest and occasionally swampy heath in sandy, {Harden, 1992 #3} low nutrient soils with a dense understorey of grasses. Specifically it is known to occur within Smooth-barked Apple Woodland and Coastal Foothills Spotted Gum Woodland {NSW National Parks and Wildlife Service, 2000 #392; NSW National Parks and Wildlife Service, 2000 #393; NSW National Parks and Wildlife Service, 2000 #344}.

BC Act (*Biodiversity Conservation Act 2016*): E1 =Critically Endangered E= Endangered V= Vulnerable

EPBC Act (*Environment Protection Biodiversity Conservation Act 1999*): E1 =Critically Endangered E= Endangered V= Vulnerable

ROTAP CODES ***Source: Briggs, J.D. & Leigh J.H. (1988) Rare or threatened Australian plants.*** Plant Codes: **Distribution** 1: Known from type collection only. 2: Geographic range < 100km. 3: Geographic range > 100km. **Conservation** E: Endangered (at risk of disappearing in 1 or 2 decades) V: Vulnerable (at risk of disappearing in 20 - 50 years). R: Rare (rare in Australia but currently not endangered or vulnerable). K: Poorly known Reservation. C: Population reserved adequately reserved (>1000 plants). I: Inadequately reserved (<1000 plants) - Adequacy of reservation unknown.

Table B: Threatened fauna previously recorded within 10km of the subject site (NSW Bionet and EPBC Protected Matters Database undertaken on the 21st September 2021)

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Potential habitat
Pseudophryne australis (Red-crowned Toadlet)	V		Occurs within 160 km of Sydney where it is restricted to Hawkesbury Sandstone. It breeds in deep grass and debris adjacent to ephemeral drainage lines. When not breeding individuals are found scattered on sandstone ridges under rocks and logs {Cogger, 2000 #20}.	No
Callocephalon fimbriatum (Gang-gang Cockatoo)	V		Occurs in wetter forests and woodland from sea level to an altitude over 2000 metres, timbered foothills and valleys, coastal scrubs, farmlands and suburban gardens {Pizzey, 1997 #24}.	No
Calyptorhynchus lathami (Glossy Black-Cockatoo)	V		Occurs in eucalypt woodland and forest with Casuarina/Allocasuarina spp. Characteristically inhabits forests on sites with low soil nutrient status, reflecting the distribution of key Allocasuarina species. The drier forest types with intact and less rugged landscapes are preferred by the species. Nests in tree hollows {Garnett, 2000 #21; NSW National Parks and Wildlife Service, 1999 #55}.	No
Lathamus discolor (Swift Parrot)	E1	EM	Breeding occurs in Tasmania, majority migrates to mainland Australia in autumn, over-wintering, particularly in Victoria and central and eastern NSW, but also south-eastern Queensland as far north as Duaringa. Until recently it was believed that in New South Wales, swift parrots forage mostly in the western slopes region along the inland slopes of the Great Dividing Range but are patchily distributed along the north and south coasts including the Sydney region, but new evidence indicates that the forests on the coastal plains from southern to northern NSW are also extremely important. In mainland Australia is semi-nomadic, foraging in flowering eucalypts in eucalypt associations, particularly box-ironbark forests and woodlands. Preference for sites with highly fertile soils where large trees have high nectar production, including along drainage lines and isolated rural or urban remnants, and for sites with flowering Acacia pycnantha, is indicated. Sites used vary from year to year. {Garnett, 2000 #21},{Swift Parrot Recovery Team, 2001 #396}.	No
Lophoictinia isura (Square-tailed Kite)	V	M	This species hunts primarily over open forest, woodland and mallee communities as well as over adjacent heaths and other low scrubby habitats in wooded towns. It feeds on small birds, their eggs and nestlings as well as insects. Seems to prefer structurally diverse landscapes {Garnett, 2000 #21}.	No
Ninox strenua (Powerful Owl)	V		A sedentary species with a home range of approximately 1000 hectares it occurs within open eucalypt, casuarina or callitris pine forest and woodland. It often roosts in denser vegetation including rainforest of exotic pine plantations. Generally feeds on medium-sized mammals such as possums and gliders but will also eat birds, flying-foxes, rats and insects. Prey are generally hollow dwelling and require a shrub layer and owls are more often found in areas with more old trees and hollows than average stands {Garnett, 2000 #21}.	Yes – potential foraging habitat. Critical breeding habitat absent.
Petroica rodinogaster (Pink Robin)	V		Found in open forest and woodland including native tea-tree scrubs. Rarely found in open cleared areas. Breeds in dense gullies in temperate rainforests {Pizzey, 1997 #24}.	No
Tyto tenebricosa (Sooty Owl)	V		Occurs in wet eucalypt forest and rainforest on fertile soils with tall emergent trees. Typically found in old growth forest with a dense understorey but also occurs in younger forests if nesting trees are present nearby. It nests in large hollows within eucalypts and occasionally caves. It hunts in open and closed forest for a range of arboreal and terrestrial mammals including introduced	No

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Potential habitat
			species and sometimes birds {Garnett, 2000 #21}.	
Xanthomyza Phrygia (Regent Honeyeater)	E1	EM	Occurs mostly in box-ironbark forests and woodland and prefers the wet, fertile sites such as along creek flats, broad river valleys and foothills. Riparian forests with Casuarina cunninghamiana and Amyema cambagei are important for feeding and breeding. Important food trees include Eucalyptus sideroxylon (Mugga Ironbark), E. albens (White Box) , E. melliodora (Yellow Box) and E. leucoxylon (Yellow Gum) {Garnett, 2000 #21}.	No
Miniopterus schreibersii (Eastern Bent-wing Bat)	V	C	Usually found in well timbered valleys where it forages on small insects above the canopy. Roosts in caves, old mines, stormwater channels and sometimes buildings and often return to a particular nursery cave each year {Churchill, 1998 #26}.	Yes – potential roosting and foraging habitat. Critical breeding habitat absent.
Miniopterus australis *Little Bent-wing Bat*	V		Feeds on small insects beneath the canopy of well timbered habitats including rainforest, Melaleuca swamps and dry sclerophyll forests. Roosts in caves and tunnels and has specific requirements for nursery sites. Distribution becomes coastal towards the southern limit of its range in NSW. Nesting sites are in areas where limestone mining is preferred {Strahan, 1995 #185}.	No
Mormopterus norfolkensis (Eastern Freetail-bat)	V		Thought to live in sclerophyll forest and woodland. Small colonies have been found in tree hollows or under loose bark. It feeds on insects above the forest canopy or in clearings at the forest edge {Churchill, 1998 #26}.	Yes – potential roosting and foraging habitat. Critical breeding habitat absent.
Saccolaimus flaviventris *Yellow-bellied Sheathtail Bat*	V		Occurs in eucalypt forest where it feeds above the canopy and in mallee or open country where it feeds closer to the ground. Generally a solitary species but sometimes found in colonies of up to 10. It roosts in tree hollows. Thought to be a migratory species {Churchill, 1998 #26}.	No
Eastern False Pipistrelle	V		Usually roosts in tree hollows in higher rainfall forests. Sometimes found in caves (Jenolan area) and abandoned buildings. Forages within the canopy of dry sclerophyll forest. It prefers wet habitats where trees are more than 20 metres high {Churchill, 1998 #26}.	Yes – potential foraging habitat. Critical breeding habitat absent.
Phascolarctos cinereus	V		Found in sclerophyll forest. Throughout New South Wales, Koalas have been observed to feed on the leaves of approximately 70	No

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Potential habitat
(Koala)			species of eucalypt and 30 non-eucalypt species. However, in any one area, Koalas will feed almost exclusively on a small number of preferred species. The preferred tree species vary widely on a regional and local basis. Some preferred species in NSW include Forest Red Gum Eucalyptus tereticornis, Grey Gum E. punctata, Monkey Gum E. cypellocarpa and Ribbon Gum E. viminalis. In coastal areas, Tallowwood E. microcorys and Swamp Mahogany E. robusta are important food species, while in inland areas White Box E. albens, Bimble Box E. populnea and River Red Gum E. camaldulensis are favoured {NSW National Parks and Wildlife Service, 1999 #43; NSW National Parks and Wildlife Service, 2003 #31}.	
Pteropus poliocephalus (Grey-headed Flying-fox)	V	V	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps. Urban gardens and cultivated fruit crops also provide habitat for this species. Feeds on the flowers and nectar of eucalypts and native fruits including lilly pillies. It roosts in the branches of large trees in forests or mangroves {NSW National Parks and Wildlife Service, 2001 #56; Churchill, 1998 #26}.	Yes – potential foraging habitat. Critical breeding habitat absent.
Scoteanax rueppellii (Greater Broad-nosed Bat)	V		The preferred hunting areas of this species include tree-lined creeks and the ecotone of woodlands and cleared paddocks but it may also forage in rainforest. Typically it forages at a height of 3-6 metres but may fly as low as one metre above the surface of a creek. It feeds on beetles, other large, slow-flying insects and small vertebrates. It generally roosts in tree hollows but has also been found in the roof spaces of old buildings {Churchill, 1998 #26}.	Yes – potential roosting and foraging habitat. Critical breeding habitat absent.
Chalinolobus dwyeri *Large-eared Pied Bat*	V	V	Occurs in moderately wooded habitats and roosts in caves, mine tunnels and the abandoned, bottle-shaped mud nests of Fairy Martins. Thought to forage below the forest canopy for small flying insects {Churchill, 1998 #26}.	No
Little Lorikeet	V		Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina. Nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3-4 young per attempt. However, the survival rate of fledglings is unknown(NSW National Parks and Wildlife Service, 2003 #31}.	Yes – potential roosting and foraging habitat. Critical breeding habitat absent.
Varied Sitella	V		Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and	Yes – potential roosting and

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Potential habitat
			cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. Generation length is estimated to be 5 years(NSW National Parks and Wildlife Service, 2003 #31}.	foraging habitat. Critical breeding habitat absent.

1: BC Act (*Biodiversity Conservation Act 2016*): E1 =Critically Endangered E= Endangered V= Vulnerable

2: EPBC Act (*Environment Protection Biodiversity Conservation Act 1999*): E1 =Critically Endangered E= Endangered V= Vulnerable

4.3 Description of Impacts

4.3.1 Potential Direct Impacts

Vegetation and habitat removal

The Arborist Impact Assessment Report prepared by Australis Tree Management dated June 2024 states that all locally native trees are proposed for retention.

A stormwater drainage easement (1.2m wide) has been proposed along the eastern (rear) boundary of all proposed lots. All trees are proposed for retention within this area which is currently subject to heavy weed invasion.

As a precautionary measure, it has been assumed 0.2ha of native vegetation may be indirectly impacted for the installation of stormwater drainage at the rear of the proposed lots as well as edge effects. This has been taken into account into the BAM-C credit calculation. Council can provide conditions of consent to ensure the further protection of this vegetation.

The proposed re-zoning of 77 Kulgoa Ave Pymble will support a potential future subdivision into two indicative building envelopes will be located outside the tree protection zones of locally native trees belonging to the Sydney Turpentine Ironbark Forest Critically Endangered Ecological Community. The arborist report has provided the location of tree protection fencing to ensure all remnant native trees are protected during any essential subdivision works.

The land is not mapped as bushfire prone land, therefore, an Asset Protection Zone for potentially resulting in additional vegetation clearing will not be required.

Any native vegetation along the rear of the site can be subject to a future Vegetation Management Plan provided to Council (prior to the release of the Subdivision Certificate as part of a future subdivision application).

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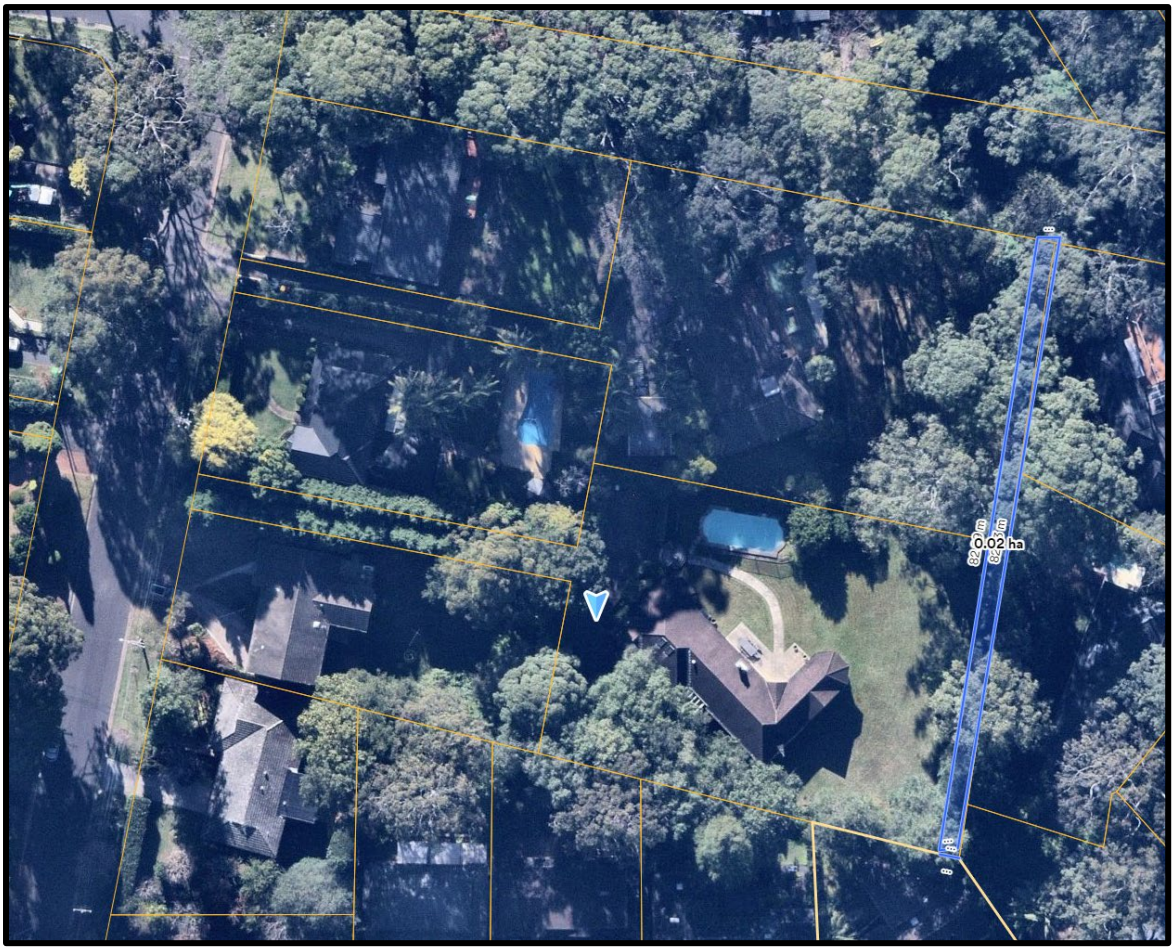


Figure 9: Precautionary area of calculated impacts for proposed 1.2 m wide easement to drain water that would be required to facilitate the proposed rezoning application

Risk of runoff, erosion and sedimentation, during construction

Surface water quality may be affected during construction activities. Construction activities could potentially encourage soil erosion and increase the sediment loads in downstream areas. Further, accidental leaks/spills of oil, fuel, cement or other substances entering watercourses could pollute surface waters.

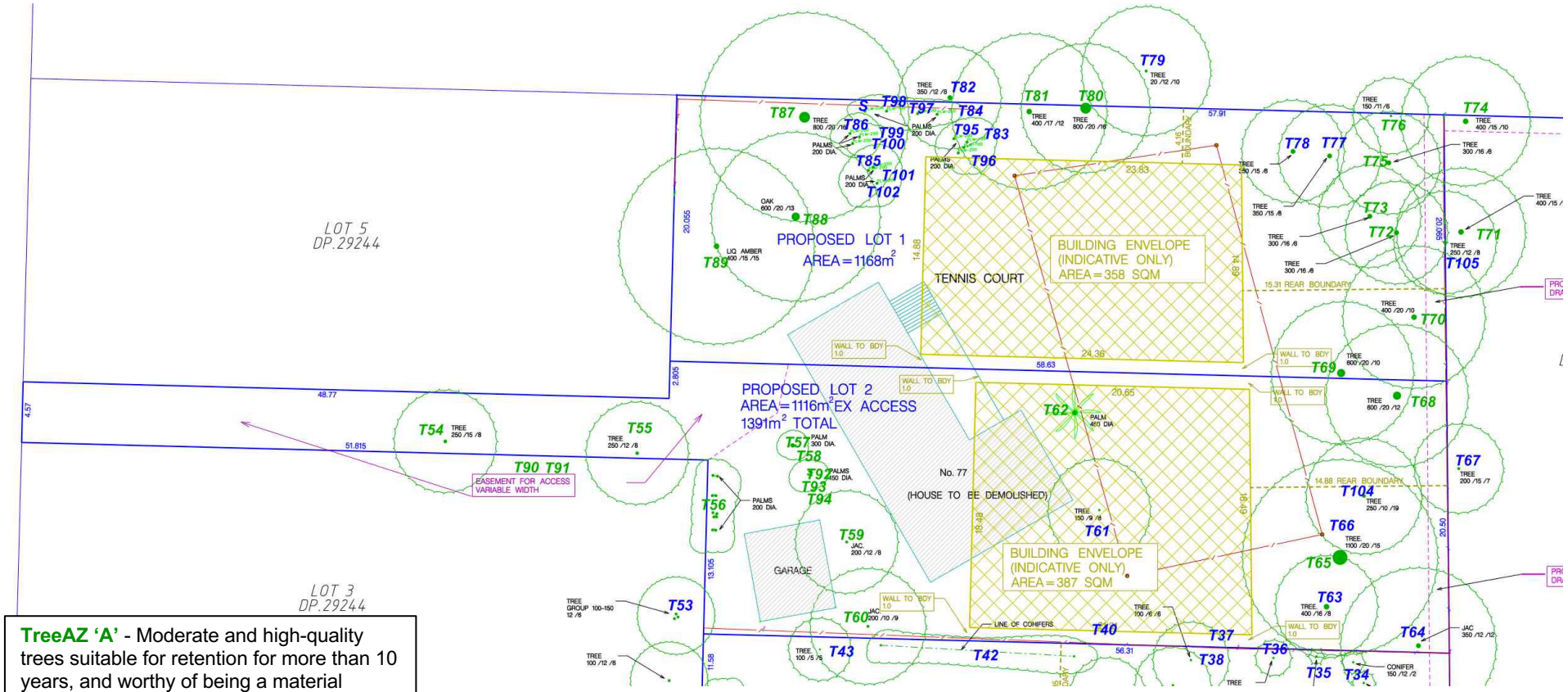
The Construction Environment Management Plan (CEMP) can be provided with the application addresses these issues es (prior to the release of the Construction Certificate).

Temporary noise, dust, light and vibration disturbance, during construction work

Impacts of noise, dust, light and vibration upon fauna are difficult to predict. Potential impacts may include effects on predator-prey interactions and changes to mating and nesting behaviour.

The Construction Environment Management Plan (CEMP) can be provided with the application addresses these issues (prior to the release of the Construction Certificate).

Appendix A - Tree Location Map



TreeAZ 'A' - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constraint

TreeAZ 'Z' - Low quality or unprotected trees not worthy of being material constraint

Figure 6. Tree Location Map

4.3.2 Potential Indirect Impacts

Potential indirect impacts to flora and fauna include:

Minor hydrological changes

Hard surfaces created as a result of construction typically cause some hydrological changes; however, in this case, hydrological changes are expected to be very minor.

4.3.3 Indirect impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal affect native vegetation, threatened ecological communities and threatened species habitat beyond the Subject Site. Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat (Table 8 below).

Table 8: Indirect impacts, extent and duration and consequences

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(a) inadvertent impacts on adjacent habitat or vegetation	The proposed development may lead to enhanced weed infiltration into adjacent habitat by enhanced edge effects. This impact is likely to be restricted the immediate area surrounding future dwellings to a couple of metres.	Nil	Edge effects will not be created and increase weed intensity and reduce vegetation integrity.
(b) reduced viability of adjacent habitat due to edge effects	The proposed development may lead to enhanced weed infiltration into adjacent habitat by enhanced edge effects. This impact is likely to be restricted the immediate area surrounding the future dwellings to a couple of metres.	Nil	Edge effects will not be created and increase weed intensity and reduce vegetation integrity.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	The proposed works are unlikely to significantly exacerbate any of these issues which are all currently in effect within surrounding lots, or otherwise unlikely to occur within the Subject Site.	Nil	Nil
(d) transport of weeds and pathogens from the site to adjacent vegetation	The proposed development may lead to enhanced weed infiltration into adjacent habitat by enhanced edge effects. This impact is likely to be restricted the	Nil	Edge effects will not be created and increase weed intensity and reduce vegetation integrity.

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
	immediate area surrounding the dwelling to a couple of metres. Active weed control efforts will be undertaken prior to and post construction.		
(e) increased risk of starvation, exposure and loss of shade or shelter	This issue is unlikely to occur on the Subject Site. It is unlikely that any threatened fauna relies on habitat within the Subject Site, such that the proposed impacts will lead to increased risks from starvation, exposure, shade and shelter. All habitat resources removed will be replaced through implementation of the recommendations outlined in this report.	Nil	Nil
(f) loss of breeding habitats	No hollow bearing trees are present on-site	Nil	The implementation of the actions prescribed in this report should see an increase in the availability of potential habitat for these threatened species within the Subject Site.
(g) trampling of threatened flora species	This issue is not likely to affect the Subject Site. No threatened flora species were identified within the Subject Site.	Nil	Nil
(h) inhibition of nitrogen fixation and increased soil salinity	This issue is not likely to affect the Subject Site.	Nil	Nil

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(i) fertiliser drift	This issue is not likely to affect the Subject Site.	Nil	Nil
(j) rubbish dumping	This issue is not likely to affect the Subject Site.	Nil	Nil
(k) wood collection	This issue is not likely to significantly affect the Subject Site.	Nil	Nil
(l) bush rock removal and disturbance	No bush rock occurs on-site.	Nil	Nil
(m) increase in predatory species populations	It is unlikely that the proposed works will influence or alter predatory species populations.	Nil	Nil
(n) increase in pest animal populations	It is unlikely that the proposed works will influence or alter pest species populations.	Nil	Nil
(o) increased risk of fire	This issue is not relevant to the Subject Site as there is little identified bushfire hazard.	Nil	Nil
(p) disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	There is no specialist breeding or foraging habitat on the Subject Site. The site contains a stand of mixed, nectar producing canopy trees which can provide intermittent nectar resources for several threatened fauna species.	Nil	Nil

4.3.4 Prescribed and Uncertain Impacts

This list of impacts includes all of those impacts on biodiversity values not caused by direct vegetation clearing or development that have been prescribed by the Biodiversity Conservation Regulation 2017 (Table 9).

Table 9: Potential Prescribed or Uncertain Impacts of the Proposed Action

Will there be impacts on any of the following	Yes/No	If Yes, must address all of the assessment questions from section 9.2.1 of the BAM
Species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance	No	n/a
Habitat of threatened species or ecological communities associated with rocks	No	n/a
Habitat of threatened species or ecological communities associated with human made structures	No	n/a
Habitat of threatened species or ecological communities associated with non-native vegetation	No	n/a
Connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Yes	Habitat connectivity continues to exist across the site. It is unlikely that the small area of impact will interrupt connectivity for any threatened fauna or flora species.
Movement of threatened species that maintains their life cycle	Yes	Habitat connectivity continues to exist across the site. It is unlikely that the small area of impact will interrupt movement of any threatened fauna or
Water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including subsidence or upsidence resulting from underground mining or other development)	No	n/a
Wind turbine strikes on protected animals	No	n/a
Vehicle strikes on threatened species of animals or on animals that are part of a TEC	No	n/a

4.4 Avoidance of Impacts

The Arborist Impact Assessment Report prepared by Australis Tree Management dated June 2024 states that all locally native trees are proposed for retention.

We were engaged during the preliminary design concept phase to ensure that all locally native trees are retained as part of the proposed development.

The proposed re-zoning of 77 Kulgoa Ave Pymble aims to support a potential future subdivision that will include two indicative building envelopes will be located outside the tree protection zones of locally native trees belonging to the Sydney Turpentine Ironbark Forest Critically Endangered Ecological Community.

The Arborist Impact Assessment Report has provided the location of tree protection fencing to ensure all remnant native trees are protected during any essential subdivision works (refer to the tree protection plan provided on the following page).

4.5 Minimisation of Impacts

Several mitigation measures are proposed to minimise potential impacts; these are summarised in Table 10. These include measures to be implemented in the pre-construction, construction and post-construction phases. It is considered that these measures would serve to minimise any potential direct or indirect impacts.

Table 10: Mitigation measures proposed to minimise potential impacts

Action	Outcome/measure	Risk/ consequence of residual impacts	Timing	Responsibility
Project location	The location of the proposed development has been positioned in order to avoid and minimise the potential resulting impacts on biodiversity values within the Subject Site, where possible.	Risk = low Consequence = Harm to native vegetation and native fauna	Pre-construction phase	Proponent
Project design	The proposed development has been designed to avoid and minimise impacts on native vegetation and habitat where possible within the Subject Site. Where this is not possible, mitigation measures have been designed and recommended to reduce potential ecological impact. While there will be some impact on native vegetation, this falls above the Biodiversity Offset Scheme threshold. The design of the proposed development includes the retention of a majority of the trees on the property plus the re-planting of locally indigenous species.	Risk = low Consequence = Harm to native vegetation and native fauna	Pre-construction phase	Proponent
Tree protection	Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ. A Minor Encroachment is less than 10% of the TPZ and is outside the SRZ. A Minor Encroachment is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. A Major Encroachment is greater than 10% of the	Risk = low Consequence = Harm to native vegetation and native fauna. Proliferation of weeds.	Pre-construction phase	

Action	Outcome/measure	Risk/ consequence of residual impacts	Timing	Responsibility
	TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods..			
Avoidance of hollow-bearing trees	No hollow-bearing trees occur within the proposed development footprint.	Risk = low Consequence = Loss of fauna habitat. Loss of native vegetation.	Construction phase	Proponent
Avoidance of woody debris	Woody debris within the development footprint should be relocated, by the proponent to the area of native vegetation in the northern extent of the Subject Site.	Risk = low Consequence = Loss of fauna habitat.	Construction phase	Proponent
Erosion and sedimentation	Appropriate erosion and sediment control must be erected and maintained at all times during construction. As minimum such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).	Risk = low Consequence = Degradation of vegetation,	Construction phase	Construction Contractor
Erosion protection fencing	Temporary fencing should be erected around the extent of native vegetation to be retained in order to minimise any disturbance resulting from the proposed construction works.	Risk = high Consequence = Permanent damage or degradation of vegetation.	Construction phase	Construction Contractor
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile and laydown sites away from any native vegetation that is planned to be retained. Avoid importing any soil from outside the site as this can introduce weeds and pathogens to the site.	Risk = moderate Consequence = Harm to native vegetation and native fauna	Construction phase	Construction Contractors
Weed eradication and suppression	All priority weeds should be eradicated across all areas of the Subject Site. Very low weed invasion was recorded on-site. Any weeds should be continually supressed and prevented from re-establishing within retained native vegetation.	Risk = moderate Consequence = Harm to native vegetation and native fauna habitat.	Construction phase and Post-construction phase	Proponent
Stormwater	The proposed development is unlikely to result in significant changes to stormwater runoff so it is expected there will be no exacerbated impact on native species of flora and fauna. Stormwater flow from future dwellings and hard surfaces will be directed to newly installed water storage tanks. Prior to any release, all stormwater is to be piped through any tanks that may be required by the regulating authorities.	Risk = low Consequence = Harm to native vegetation and native fauna habitat.	Post-construction phase	Proponent Construction Architect
Wastewater	All sewerage produced on site will be directed towards the existing urban treatment system.	Risk = low Consequence = Harm to native vegetation and native fauna habitat.	Post-construction phase	Proponent

A Construction Environment Management Plan (CEMP) can be provided with the application prior to the release of the Construction Certificate to address all issue in Table 10.

5 IMPACT SUMMARY

5.1 Impacts Which Require an Offset

Tables 11 and 12 provide a summary of the impacts that require an offset, under the BAM.

Table 11: Vegetation Zones Requiring an Offset

Vegetation Zone	PCT	Area Impacted (indirectly for water drainage easement)	Current Vegetation Integrity Score	Future Vegetation Integrity Score (factoring a Future vegetation management plan may be implemented for weed removal)	Number of Ecosystem Credits Required
1	PCT 3262	0.02	28.6	28.6	1

Table 12: Threatened Species Requiring an Offset

Species	Area of Impacted Habitat	Number of Species Credits Required
NIL	NIL	0

5.2 Impacts Not Requiring an Offset

N/A

5.3 Identification of Areas Not Requiring Assessment

N/A

5.4 Serious and Irreversible Impacts (SAII's)

An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:

- it will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline
- it will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size
- it is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution
- the impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

These principles are set out in clause 6.7 of the Biodiversity Conservation Regulation 2017.

Species and ecological communities with a 'very high' biodiversity risk weighting will be a potential serious and irreversible impact (SAII). These 'potential SAII entities' are identified within the BAM calculator (OEH 2018b).

The determination of serious and irreversible impacts on biodiversity values is to be made by the consent authority in accordance with the principles set out in the BC Regulation.

To assist the consent authority, the guidance document Guidance to assist a decision-maker to determine a serious and irreversible impact includes criteria that enable the application of the four principles set out in clause 6.7 of the BC Regulation to identify the species and ecological communities that are likely to be the subject of serious and irreversible impacts.

Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion is listed as Critically Endangered under the *BC Act 2016* and *EPBC Act 1999* and is listed as a threatened entity in the Threatened Biodiversity Data Collection (DPIE 2021d).

Due to the potential sensitivity of this ecological community to any impact, a determination of whether or not the proposed impacts are serious and irreversible is to be undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a) as outlined in Table 13.

Table 13: Sydney Turpentine Ironbark Forest SAII assessment

Table 13:- Additional Impact Assessment for STIF CEEC at Risk of an SAII

No	Assessment Criteria	SAII Assessment Information
2a	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Evidence of reduction in geographic distribution as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)*	It is difficult to ascertain the 1970 extent; however, the STIF Final determination estimates that there has been a 90% reduction in the total geographic extent of STIF since European Settlement (ie since 1788). The STIF Final Determination states the following in relation to a reduction in geographic extent: '*Only 6% of the original extent of the community remained in 1988 (Benson, D. & Howell, J. 1990 Proc. Ecol. Soc. Aust. 16, 115-127) in the form of small and fragmented stands. Although some areas occur within conservation reserves, this in itself is not sufficient to ensure the long term conservation of the Community unless the factors threatening the integrity and survival of the Community are ameliorated*.". *Based on aerial photography flown in November 1998, Tozer (2003) estimated the total extent of woody vegetation referred to as Shale Sydney Turpentine Ironbark Forestwas 11 054 (±1 564) ha (upper and lower plausible bounds, sensu Keith et al. 2009), representing 8.8 (±1.2)% of the pre-European distribution of the community. Patches of the community lacking woody vegetation are very small in extent and can be considered to be included within the plausible bounds. For that part of the community's distribution to the east of the Hawkesbury-Nepean River, earlier mapping at coarser resolution by Benson & Howell (1990b) suggests a similar level of depletion, with an estimated 6 420 ha of 'Shale Sandstone Transition Forests', representing 6% of the pre-European distribution east of the Hawkesbury-Nepean River. An update of Tozer's (2003) map, based on interpretation of imagery flown in January-March 2007 shows that the extent of Sydney Turpentine Ironbark Forest east of the Hawkesbury – Nepean River had declined by 442±46 ha, a reduction of 5.2±0.6% in 9 years (NSW Scientific Committee & Simpson 2008). These estimates indicate that the geographic distribution of the community has undergone a very large reduction over a time frame appropriate to the life cycle and habitat characteristics of its component species.*
2bi	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by: change in community structure*	The STIF Final Determination states the following in relation to the change in community structure: *"Remnants of STIF have historically been subjected to a range of anthropogenic disturbances including logging, grazing by domesticated livestock and burning at varyingintensities (Benson and Howell 1994). These disturbances have affected thestructure and potentially the composition of remnants. For example, the density and average basal diameter of trees in remnants sampled by Benson and Howell (1994) suggested that the removal of large older trees has led to higher densities of smaller trees such that remnants typically have the structure of regrowth forest."*

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

No	Assessment Criteria	SAII Assessment Information
2bii	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by: change in species composition*	
2biii	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by: disruption of ecological processes*	The STIF Final Determination states the following in relation to the disruption of ecological processes: "*The threats to STIF listed above are ongoing and likely to cause continuing declines in geographic distribution and disruption of biotic processes andinteractions.*" *The reduction in the geographic distribution of Shale Sydney Turpentine Ironbark Forest was initially due to tree-felling for timber and clearing for crops and pastures (Benson & Howell 1990a). Benson & Howell (1990b) estimated that the community had been reduced to approximately half of its pre-European extent by 1850. Following World War II, there was a marked acceleration in urban and industrial development, which continues to deplete the distribution of the community to the present day.* *These trends appear likely to continue into the future as the urban area continues to expand to accommodate Sydney's increasing population, which is projected to grow by 1.0-1.1 million people during the 20 years 2007-2026 and 2.2-3.3 million during the 50 years 2007-2056 (Australian Bureau of Statistics 2008). Recent draft plans to develop growth centres in north-west and south-west Sydney, for example, identify staged release of land for residential and employment development over the next 25 years.* *These areas contain approximately 2000 ha (one-fifth) of the estimated remaining Shale Sydney Turpentine Ironbark Forestbased on Tozer (2003), of which about two-thirds will be available for development, the loss of which is planned for offsetting through voluntary land acquisition and/or the establishment of conservation agreements on lands outside the Growth Centres (Growth Centres Commission 2007) for the primary purpose of biodiversity conservation. While important examples of Sydney Turpentine Ironbark Forest are represented within conservation reserves, much of the remaining area of the community occurs on private land or on public easements, where it is at risk from small-scale clearing associated with housing, industrial development*

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

		and transport infrastructure. *There are significant logistic and technological constraints and time lags associated with efforts to restore the community (Wilkins et al. 2003; Nichols 2005; Nichols et al. 2005). 'Clearing of native vegetation' is listed as a Key Threatening Process under the Threatened Species Conservation Act 1995.*
2biv	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by: invasion and establishment of exotic species*	*The STIF Final Determination states the following in relation to weed invasion: "Remnants of Sydney Turpentine-Ironbark Forest are subject to ongoing invasion by an extensive range of naturalised plant species. Weed invasion is exacerbated by the proximity of remnants to areas of rural and urban development and the associated influx of both weed propagules from gardens and nutrients contained in stormwater runoff, dumped garden refuse and animal droppings (Leishman 1990, Benson and Howell 1994, Leishman et al. 2004, Smith and Smith 2010). Species such as Ligustrum lucidum (Large-leafed Privet) and Ligustrum sinense (Small-leafed Privet) are highly invasive under conditions of enhanced soil nutrients and have been recorded in at least half of all plots sampling STIF by Tozer (2003). Other frequently recorded species include the shrubs Ochna serrulata (Mickey Mouse Plant), Phytolacca octandra (Inkweed), Sida rhombifolia (Paddy's Lucerne) and Chrysanthemoides monilifera (Bitou Bush/Boneseed), the scandent shrubs Lantana camara (Lantana) and Asparagus aethiopicus (Asparagus Fern), the climbers Araujia sericifera (Moth Vine), Asparagus asparagoides (Bridal Creeper) and Hedera helix (English Ivy) and the grasses Paspalum dilatatum (Paspalum), Ehrhata erecta (Panic Veldtgrass) and Setaria parviflora (Tozer 2003)".*

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

No	Assessment Criteria	SAII Assessment Information
2bv	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by: degradation of habitat*	*There is no information regarding evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by degradation of habitat.*
2bvi	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes indicated by: fragmentation of habitat*	*The STIF Final Determination states the following in relation to fragmentation of STIF habitat: "Remnants of Sydney Turpentine-Ironbark Forest are typically small and fragmented and are susceptible to continuing attrition through clearing for routine land management practices due to the majority of remnants being located in close proximity to rural land or urban interfaces (Benson and Howell 1994; Tozer 2003)."*
2ci	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Evidence of restricted geographic distribution, based on the TEC's geographic range in NSW according to the: extent of occurrence*	*The STIF Final Determination states the following with respect to extent of occurrence in NSW: "The distribution of Sydney Turpentine-Ironbark Forest is highly restricted. The extent of occurrence (EOO) of STIF is 4,479 km2 based on a minimum convex polygon enclosing known occurrences of the community as interpreted in Sections 4.2 – 4.10 and using the method of assessment recommended by IUCN (Bland et al. 2017). The estimated area of occupancy (AOO) is 12 10 km x 10 km grid cells, the scale recommended for assessing AOO by IUCN and applying a minimum occupancy threshold of 1% (Bland et al. 2017)."*
2cii	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Evidence of restricted geographic distribution, based on the TEC's geographic range in NSW according to the: area of occupancy*	*The STIF Final Determination states the following with respect to extent of occurrence in NSW: "Tozer et al. (2010) estimated some 2,300 ha of STIF remains". "Additional remnants of STIF have been mapped by BMCC (2003) (a total of 190 ha) and Smith and Smith (2008) (148 ha). Combining these maps with the maps of Tozer et al. (2010) and NSW OEH (2013ab) gives an estimated 2,940 ha of STIF remaining"*

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

2ciii	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Evidence of restricted geographic distribution, based on the TEC's geographic range in NSW according to the: number of threat-defined locations*	*The Final Determination indicates that there is very little STIF CEEC within conservation reserves and "unreserved areas are subject to the threat of vegetation clearing". Reserved areas are described as follows: "An estimated 280 ha of STIF (less than 1% of the pre-European extent) is distributed among 15 reserves (with a minimum area of 0.5 ha) under the management of the NSW National Parks and Wildlife Service (Tozer et al. 2010; BMCC 2003; Smith and Smith 2008; NSW OEH 2013a). This includes 112 ha in Bargo SCA, 49 ha in Blue Mountains NP, 25 ha in Lane Cove NP and 22 ha in Newington NR. A further 254 ha occurs in Crown Reserves and 36 ha is preserved in perpetuity under Biobanking or Conservation Agreements. The total area under reservation is estimated to be 570 ha, equivalent to less than 2% of the estimated pre-1750 distribution or 20% of the remaining extent."*

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

No	Assessment Criteria	SAII Assessment Information
2d	*The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including: Evidence that the TEC is unlikely to respond to management*	There is no information regarding evidence that the TEC is unlikely to respond to management. The *Department of Environment and Conservation (NSW). (2005) Document - Recovering Bushland on the Cumberland Plain: Best practice guidelines for the management and restoration of bushland.* *Department of Environment and Conservation (NSW), Sydney* outlines theoretical and practical'best practice' guidance for the restoration of STIF, including examples of small remnant patches.
3	*Where the TBDC indicates data is 'unknown' or 'data deficient' for a TEC for a criterion listed in Subsection 9.1.1(2.), the assessor must record this in the BDAR or BCAR.*	It is difficult to ascertain the 1970 extent of the TEC when most studies have focussed on pre-European extent, therefore pre-European data is referenced in (2a). No information was able to be presented in relation to (2bv) and (2d).
4ai	*Include data and information on the impact on the geographic extent of the TEC by estimating the total area of the TEC to be impacted by the proposal: in hectares. Data and information should include direct impacts (i.e. from clearing) and indirect impacts where partial loss of the TEC is likely as a result of the proposal.*	*The Arborist Impact Assessment Report prepared by Australis Tree Management dated June 2024 states that all locally native trees are proposed for retention.* *A stormwater drainage easement (1.2m wide) has been proposed along the eastern (rear) boundary of all proposed lots. All trees are proposed for retention within this area which is currently subject to heavy weed invasion.* *As a precautionary measure, it has been assumed 0.2ha of native vegetation may be indirectly impacted for the installation of stormwater drainage at the rear of the proposed lots as well as edge effects. This has been taken into account into the BAM-C credit calculation. Council can provide conditions of consent to ensure the further protection of this vegetation.* *The proposed re-zoning to facilitate 2 future indicative building envelopes will be located outside the tree protection zones of locally native trees belonging to the Sydney Turpentine Ironbark Forest Critically Endangered Ecological Community. The arborist report has provided the location of tree protection fencing to ensure all remnant native trees are protected during any essential subdivision works.* *The land is not mapped as bushfire prone land, therefore, an Asset Protection Zone for potentially resulting in additional vegetation clearing will not be required.* *Any native vegetation along the rear of the site can be subject to a future Vegetation Management Plan provided to Council prior to the release of the Subdivision Certificate.*

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

4aii	*Include data and information on the impact on the geographic extent of the TEC by estimating the total area of the TEC to be impacted by the proposal: as a percentage of the current geographic extent of the TEC in NSW. Data and information should include direct impacts (i.e. from clearing) and indirect impacts where partial loss of the TEC is likely as a result of the proposal.*	According to the Final Determination the current estimate of STIF CEEC in NSW is 2,940 ha. The total area impacted by the proposed is less than 0.02 ha. Therefore, the impact of the proposal on the geographic extent is estimated at less than 0.01%.
4bi	*The extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes of the TEC by: estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals.*	This patch will not be fragmented by the proposal.

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

<table>
<tr><th>No</th><th>Assessment Criteria</th><th>SAII Assessment Information</th></tr>
<tr><td>4bii</td><td>The extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes of the TEC by: describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by:
• distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and
• estimated maximum dispersal distance for native flora species characteristic of the TEC, and
• other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development</td><td>The total area of the STIF CEEC patch in the east of the subject land is greater than 2 ha if all trees within surrounded backyards and road frontages are taken into consideration.

No fragmentation will occur as existing STIF trees along the eastern boundary will be retained and it is expected that the flora and fauna within the Forest will be able to readily disperse between these two areas.

This is because the EEC remains as part of a continuous area of bushland including areas off-site on adjacent properties. The removal of one tree will not fragment community and prevent it from it functioning in dispersal of seed and pollen/ genetic material from canopy trees off the subject site.</td></tr>
<tr><td>4biii</td><td>The extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes of the TEC by: describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s) (Section 4.3). The assessor must also include the relevant composition, structure and function condition scores for each vegetation zone.</td><td>The Vegetation Integrity (VI) of the STIF CEEC vegetation is 28.6 and is made up of thefollowing scores for composition, structure and function:

<table><tr><th>PCT</th><th>Vegetation Zone</th><th>Composition Condition Score</th><th>Structure Condition Score</th><th>Function Condition Score</th><th>Vegetation Integrity Score</th></tr><tr><td>PCT 3262</td><td>Vegetation Zone 1</td><td>13.6</td><td>28.1</td><td>61.4</td><td>28.6</td></tr></table></td></tr>
<tr><td>5</td><td>The assessor may also provide new information that demonstrates that the principle identifying that the TEC is at risk of an SAII is not accurate.</td><td>N/A</td></tr>
</table>

Table 5.5 Additional Impact Assessment for STIF CEEC at Risk of an SAII - 77 Kulgoa Rd PYMBLE

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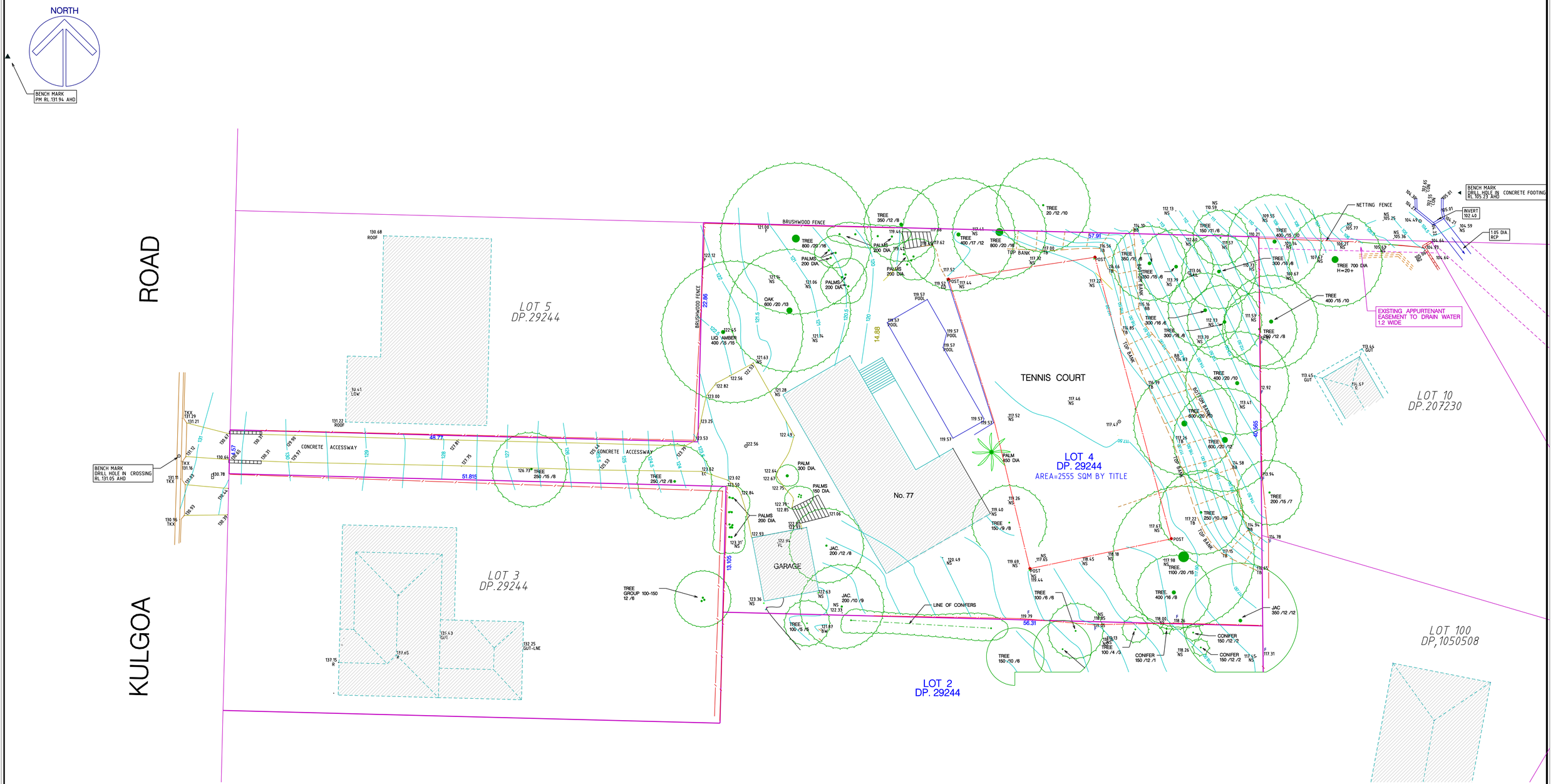
APPENDIX A SITE PLANS



I, GARY JOHN SKOW, a Surveyor registered under the Surveying and Spatial Information Act 2002, certify that:

The boundaries shown in this plan were surveyed in accordance with the Surveying and Spatial Information Regulation 2017, is accurate for the purposes of a development application and the survey was completed on the 10–11–2023.

Signature:.

Dated: 15th NOV. 2023.
Surveyor Identification No. 1985
Surveyor Registered under the Surveying and Spatial Information Act 2002.

REDUCTION RATIO (1:200 @ A1)

0 10 20 30

Hammond Smeallie & Co Pty Ltd
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LEGEND

TK	TOP OF KERB
WM	WATER METER
GM	GAS METER
CH	CHIMNEY
TF	TOP OF FENCE
TEL	TELSTRA PIT
WH	WATER HYDRANT
KIP	KERB INLET PIT
TW	TOP OF WALL

LINE TYPES

- + DENOTES POSITION OF SPOT LEVEL
- BOUNDARY LINE
- E OVERHEAD POWER LINE
- SEWER MAIN (APPROX.)
- 50.0 CONTOUR LINE
- FENCE LINE
- LIP GUTTER/RIDGE LINE

ISSUE	DATE	AMENDMENT
A	02/07/2020	ORIGINAL

PLAN OF DETAIL AND LEVELS

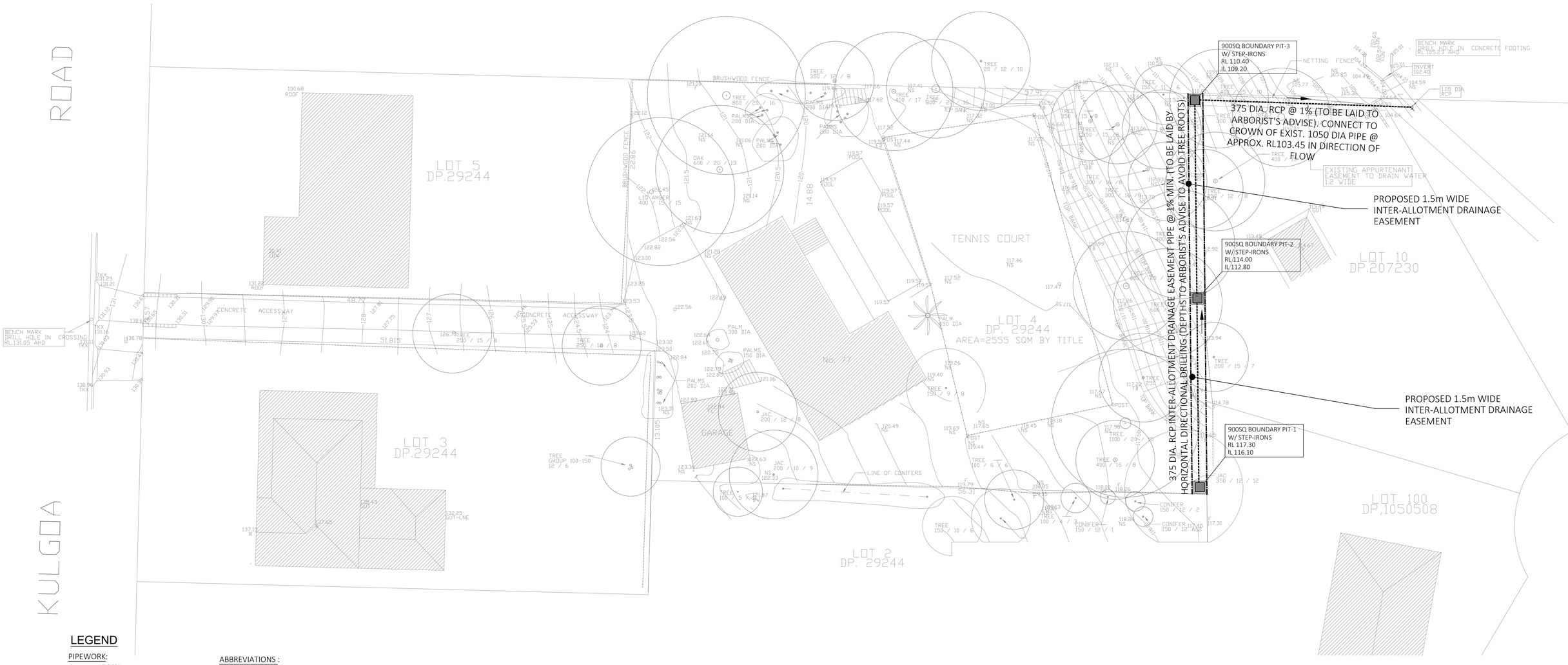
Project: LOT 4 IN DP. 29244.
77 KULGOA ROAD, PYMBLE.

Client: MR JOHN LEECE

SURVEYED: GARY SKOW	DATE: 30/11/2022	DRAWN: GARY SKOW	CHECKED: WARREN ROLFE
HEIGHT DATUM:		SCALE: 1:200@A1	ISSUE: A
CONTOUR INTERVAL:			
ORIENTATION: MAGNETIC NORTH		PROJECT No: 14989– No.77	
SHEET: 1	SHEETS: 1		

NOTES:

1. ALL BEARINGS ARE ORIENTED ON MAGNETIC NORTH. A VARIATION TO APPROXIMATE TRUE NORTH HAS BEEN SHOWN FOR PLANNING AND DESIGN PURPOSES.
2. DELETED.
3. DELETED.
4. BEARINGS AND MEASUREMENTS SHOWN ON THE PLAN ARE COMPILED FROM INFORMATION SUPPLIED BY THE DEPARTMENT OF LANDS.
5. RELATIONSHIP OF IMPROVEMENTS AND DETAIL TO BOUNDARIES IF CRITICAL SHOULD BE CONFIRMED BY A BOUNDARY SURVEY.
6. NO SERVICES SEARCH HAS BEEN UNDERTAKEN. SERVICES SHOWN ARE BASED ON SURFACE INDICATORS EVIDENT AT THE DATE OF SURVEY AND PLOTTED AS A GUIDE TO THE POSITION AND NATURE OF THE SERVICE. BEFORE ANY EXCAVATION ON THE SITE, THE "DIAL BEFORE YOU DIG" SERVICE SHOULD BE USED (PH: 1100)
7. RIDGE, ROOF, EAVE AND GUTTER HEIGHTS HAVE BEEN OBTAINED BY AN INDIRECT METHOD AND ARE ACCURATE FOR PLANNING PURPOSES ONLY.
8. GUTTER LEVELS SHOWN ARE MEASURED TO THE LIP OF THE GUTTER.
9. ADJOINING BUILDINGS AND DWELLINGS TOGETHER WITH WINDOWS HAVE BEEN PLOTTED FOR PLANNING PURPOSES ONLY.
10. THE SPREAD AND HEIGHT OF EACH TREE IS INDICATIVE ONLY AND SPECIFIC DETAILS IF CRITICAL WILL REQUIRE FURTHER SURVEY.
11. DESCRIPTION OF TREES... DIAMETER /HEIGHT /SPREAD



LEGEND

PIPEWORK:

- SUB-SOIL
- 100 DIA uPVC STORMWATER PIPE U.N.O. WITH 1% GRADE (MIN.)
- TRUNK MAIN
- SILT AND DUST FENCE
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER TO BE REMOVED
- RISE IN SERVICE
- DROP IN SERVICE

SERVICE ACCESSORIES:

- DOWNPIPE 100 DIA. U.N.O
- DOWNPIPE AND SPREADER
- PLANTER BOX DRAINAGE OUTLET 100 DIA. U.N.O.
- RAINWATER OUTLET (150 x 150 U.N.O.)
- BALCONY RAINWATER OUTLET (100 GRATE U.N.O.)
- OVERFLOW SPITTER (50Ø DIA. U.N.O.)
- GRATED INLET PIT (450SQ MIN. U.N.O.)
- CONCRETE COVERED JUNCTION PIT
- GRATED TRENCH DRAIN (150 WIDE U.N.O.)
- KERB INLET PIT
- STORMWATER PUMPWELL
- VEHICULAR CROSSING
- REVISION
- OVERLAND FLOW PATH
- CLEANING EYE

ABBREVIATIONS :

uPVC	UNPLASTISIZED POLYVINYL CHLORIDE
PVC	POLYVINYL CHLORIDE
HDPE	HIGH DENSITY POLYETHYLENE
FRC	FIBRE REINFORCED CONCRETE
CI	CAST IRON
CU	COPPER
DP	DOWNPIPE
RM	RISING MAIN
SYDP	SYPHONIC DOWNPIPE
RWT	RAINWATER TANK
TD	TUNDISH
TTD	TRAPPED TUNDISH
D.T.U.A.A.	DRAINAGE TURN-UP POINT
GTD	GRATED TRENCH DRAIN
RWO	RAINWATER OUTLET
BRWO	BALCONY RAINWATER OUTLET
PBO	PLANTER BOX OUTLET
SPO	SPOON DRAIN OUTLET
RL	REDUCED LEVEL
IL	INVERT LEVEL
SL	SURFACE LEVEL
FFL	FINISHED FLOOR LEVEL
HL	HIGH LEVEL
LL	LOW LEVEL
TOW	TOP OF WALL
US	UNDERSIDE
M/H	PRESSURE IN METRES/HEAD
CIS	CAST IN SLAB
CIC	CAST IN COLUMN
EX.	EXISTING
DIA.	DIAMETER
m	METRE
SQ.	SQUARE
U.N.O.	UNLESS NOTED OTHERWISE
PSD	PERMISSIBLE SITE DISCHARGE
SSR	SITE STORAGE REQUIREMENTS

NOT FOR CONSTRUCTION

VERIFY ALL DISCREPANCIES WITH PROJECT ARCHITECT/ MANAGER PRIOR TO PROCEEDING WITH ANY WORKS. **Do not scale off drawings.**

Issue	Description	Date
A	Issued for Development Application	10 July 2024

Drawn & Designed by: K Koh

Checked by: N. Evans

Approved by: Kenneth T. NG
MIEAust CPEng NER APEC Engineer
IntPE(Aus) (Reg. No. 2206352) RPEQ RPEV
Registered Certifier (Hydraulic (stormwater), Road & Drainage and Stormwater) (Reg. No. BDC0827)
Registered Design Practitioner (Drainage & Civil Engineering) (Reg. No. DEP0000692)
& Professional Engineer (Civil) (Reg. No. DEP0000630)
NSW Fair Trading

Designed By
ING CONSULTING ENGINEERS PTY LTD
P O BOX 1543
BAULKHAM HILLS NSW 1755
T: (02) 8807 5656
M: 0433 778 109
E: ken@ingengineers.com.au

Project: Concept Sub Division/Proposed Rezoning

At: 77 Kulgoa Road
Pymble NSW 2073

Client:

Drawing Title: Site Plan (Sub Division)

Date: July 2024

Scale: 1 : 200 @ A1

Project No.: 420082023FEAS

Drawing & Sheet No./ Issue: 42008-01/1 / A

APPENDIX B PLOT DATA

BAM Site – Field Survey Form

Survey Name		Date	Zone ID	Recorders	
73 &77 Kulgoa Road Pymble		20 June 2023	1	Alex Fraser	
Zone: 56	Datum: MGA	Plot ID: 1	Plot dimensions: 50x20 m		Photo #: 1 and 2
Easting: 329267	Northing: 6265026	IBRA region: Sydney Basin		Midline bearing from 0 m:	
Vegetation Formation: Wet Sclerophyll Forests (Grassy sub-formation) Vegetation Class: Northern Hinterland Wet Sclerophyll Forests					Confidence H
Sydney Turpentine Ironbark Forest PCTID: 3262				EEC: **Yes – STIF CEEC**	Confidence H

Record easting and northing at 0m on midline. Dimensions (Shape) of 0.04ha base plot.

BAM Attribute (400m^2 plot)	Sum values	
	Count of native richness	Cover
Trees	**8**	**34**
Shrubs	**0**	**0**
Grasses etc.	**1**	**1**
Forbs	**0**	**0**
Ferns	**0**	**0**
Other	**1**	**1**
High threat weed cover		**28.5**

Cover: 0.1, 0.2, 0.3….. 1,2,3,……,10, 15, 20, 25, ….. 100% (foliage cover). *Note: 0.1% cover is approx.. 63x63 cm or a circle about 71 cm diameter, 0.5% approx. 1.4 x 1.4m, 2% cover is approx. 2 x 2m, 5% = 4 x 5m, 25% 10 x 10m*

BAM Attribute (1000m^2 plot)		
DBH	**#Tree Stems Count**	**#Stems with Hollows**
80 + cm	2	-
50 – 79 cm	4	-
30 – 49 cm	4	-
20 – 29 cm	3	-
10 – 19 cm	-	-
5 – 9 cm	-	-
<5 cm	-	
Length of logs (m) (≥ 10 cm diameter, >50cm in length)	**Tally: 0**	**Total:** 0

Counts apply when the number of tree stems within a size class is ≤ 10. Estimate can be used when > 10 (eg. 10, 20, 30….100, 200). For a multi-stemmed tree, only the largest living stem is included in the count / estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)																				
	Litter cover %					**Bare ground cover %**					**Cryptogam cover %**					**Rock cover %**				
Subplot score % in each	5	15	25	35	45	5	15	25	35	45	5	15	25	35	45	5	15	25	35	45
	70	70	70	70	70															

Average of the 5 subplots	**70**			

Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter)

BAM Site – Plot Species List

400m² plot: Sheet __1_ of 1_	Survey Name	Plot ID	Recorders
Date: 20/6/23	73 &77 Kulgoa Road Pymble	2	Alex Fraser

GF Code	Top 3 native species in each growth form group: full species name mandatory. All other native and exotic species: full species name where practicable	N, E or HTE	Cover	Abund	Stratum	Voucher	Photo #
T	*Angophora costata*	N	5	1			
T	*Syncarpia glomulifera*	N	15	2			
T	*Eucalyptus saligna*	N	5	1			
T	*Eucalyptus piluarus*	N	3	1			
T	*Pittosporum undulatum*	N	1	1			
T	*Brachychiton acerifolius*	N	3	1			
T	*Grevillea robusta*	N	5	1			
T	*Celtis sinensis*	E	5	1			
T	*Cedrus deodara*	E	5				
T	*Jacaranda mimosifolia*	E	2				
T	*Camellia reticulata*	E	3				
	Tradescantia flumiensis	HTE	10				
	Solanum nigrum	E	0.1				
G	*Oplismenus imbecillis*	N	1				
OG	*Dichondra repens*	N	1				
	Hedychium gardnerianum	E	0.1				
	Anredera cordifolia	HTE	15				
	Lonicera japonica	HTE	2				
	Agapanthus praecox	E	1				
	Ehrharta erecta	HTE	1				
	Thirsium vulgare	HTE	0.5				
	Ochna serrulata	E	0.1				
T	*Stenocarpus sinuatus*	N	2	1			

N: native, **E**:exotic, **HTE**: high threat exotic, **GF** – circle code if 'top 3'

Cover: 0.1, 0.2, 0.3….. 1,2,3,……,10, 15, 20, 25, ….. 100% (foliage cover). *Note: 0.1% cover is approx.. 63x63 cm or a circle about 71 cm diameter, 0.5% approx. 1.4 x 1.4m, 2% cover is approx. 2 x 2m, 5% = 4 x 5m, 25% 10 x 10m* **Abundance**: 1, 2, 3, ….10, 20, 30, ….. 100, 200,…., 1000**Stratum**: E – emergent, C – canopy, M – mid-storey / sub canopy, S – shrub layer, G – ground layer

APPENDIX C QUALIFICATION, LICENSING AND CERTIFICATION

Alexander Fraser

alohafraser@gmail.com | 0423238193 | 665 The Scenic Rd Macmasters Beach, NSW 2251

Key skills

- 12+ years private ecological consulting (Fraser Ecological Consulting)
- 15 + years local government ecological assessment for DAs (Hornsby Shire Council – current employer)
- 10 + years Land & Environment Court expert witness experience
- 2 years state government ecological assessment (NSW OEH)
- High level botanical field identification skills, plot surveys and project management
- Fauna survey and field assistant experience
- Biodiversity Assessment Reporting (BDAR) preparation and Stewardship Site (BSAR) under the NSW BOS Credit Scheme

Qualifications

Bachelor Environmental Science (Honours) Southern Cross University

Certificate 3 Natural Area Restoration

Certificate 3 Vertebrate Animal Pest Control (NSW DPI, Orange)

NPWS Scientific Licence - S10445

Animal Ethics Authority - 11/4299

Accredited under the Biodiversity Assessment Methodology - BAM (Accreditation No. BAAS18156)

Practising member of NSW Ecological Consultants Association (ECA)

Summary

Alex Fraser (Principal Ecologist, Fraser Ecological) has extensive experience in DA related ecological assessment as both an assessor (Hornsby Shire Council) and private consultancy (Fraser Ecological) which actively and currently involve a wide array projects. Fraser Ecological is based locally on the Central Coast, however, project experience extends to South Coast, Blue Mountains, Mid-north Coast and mainly in the Sydney Basin Bioregion.

Previous work roles include ecological consulting for Parsons Brinckerhoff (large infrastructure), NPWS threatened species unit (biodiversity surveys), former NSW Department of Climate Change/ OEH (SIS DGRs and major projects assessment) and Hornsby Shire Council (DA assessment officer) have focussed primarily on ecological survey, development assessment, project management and policy development for consent authorities.

Alex offers high level botanical ID and field survey skills which includes targeted surveys and BAM plot surveys. Fraser Ecological has extensive experience in the preparation of over 15 BDARs under the new BC Act 2016 BOS credit trading scheme. Alex has experience dealing with consent authorities including Council, Crown Lands, Metropolitan Land Council, RFS, Biodiversity Conservation Trust and Department of Planning for major projects including SSDI proposals.

Fraser Ecological has established a wide network of ecological specialists including the Royal Botanic Gardens and Australian Museum as well academic institutions for expert advice when required. Alex is a current member of the North Sydney Regional Land Managers Group that includes staff from Central Coast Council, Northern Beaches, Ku-ring-gai Council, Hornsby Council (HSC), NPWS and Crown Lands) as project manager developing the Natural Area Recreation Strategy for HSC. Current main role at Council is development assessment and review of Flora and Fauna Reports and Biodiversity Assessment Reports.

Fraser Ecological has been engaged by various Councils (Central Coast, Ku-ring-gai, Liverpool City, Blacktown City Council, Hornsby Shire Council and Hawkesbury City Council) to undertake biodiversity assessments for major civil works projects. He is continuously providing biodiversity assessments for private clients for a range od development proposals across coastal and western NSW. We have also undertaken threatened flora and fauna species survey and monitoring for the NSW OEH Save our Species grants.

Key skills:

- Targeted flora and fauna surveys
- BAM plots in accordance with the BAM
- Ecological monitoring & Opportunity and Constraints mapping
- Preparation of BDARs, BAM calculator and credit reporting
- Retirement of credits for approved projects via BCT and brokers
- Establishment of stewardship sites and other offset packages
- Expert witness reporting and attendance in the LAEC
- Compliance investigations and auditing
- Preparation of Vegetation Management Plans
- Preparation of Nestbox Monitoring Plans

CERTIFICATE OF ACCREDITATION AS A BIODIVERSITY ASSESSMENT METHOD ASSESSOR under the *Biodiversity Conservation Act 2016* (NSW)

BAM Assessor		
Alexander Fraser		
Accreditation number	**Accreditation date (Date of issue)**	**Expiry Date of**
BAAS18156	17 October 2021	17 October 2024

The person named above is accredited under section 6.10 of the *Biodiversity Conservation Act 2016* (NSW) (**BC Act**) as a Biodiversity Assessment Method Assessor to apply the Biodiversity Assessment Method in connection with the preparation of biodiversity stewardship site assessment reports, biodiversity development assessment reports and biodiversity certification assessment reports pursuant to Part 6 of the BC Act.

The accreditation is in force until and including the Expiry Date. The accreditation is subject to the conditions set out in the *Accreditation Scheme for the Application of the Biodiversity Assessment Method*, under the BC Act, and the conditions specified on the reverse of this certificate.

LUCIAN MCELWAIN

Manager Ecosytem Programs
Department of Planning, Industry & Environment

NOTES

- DPIE maintains a register of Accredited Biodiversity Assessment Method (BAM) Assessors accessible from the DPIE website.
- The BAM Assessor's accreditation expires on the Expiry Date unless renewed in accordance with the *Accreditation Scheme for the Application of the Biodiversity Assessment Method*. It is the BAM Assessor's responsibility to monitor the Expiry Date of their accreditation, and apply for any renewal with sufficient time for the application to be processed prior to the Expiry Date.
- Words and expressions used in this accreditation instrument and which are also used in the Act have the same meaning.

SUMMARY OF CONDITIONS UNDER SCHEME

The following are conditions of all accreditations granted under the Scheme:

1. an accredited person must prepare Biodiversity Assessment Reports (and conduct surveys and other activities in connection with the preparation of such reports) in accordance with:
   a. the Biodiversity Assessment Method Manual,
   b. the Credit Calculator Operational Manual,
   c. Accredited Person Code of Conduct.
   d. this Scheme,
   e. any guidance materials published by the Department of Planning, Industry and Environment in connection with preparation of Biodiversity Assessment Reports or the application of the BAM
   f. any accreditation requirements notified by the Department of Planning, Industry and Environment to the accredited assessor from time to time.
2. an accredited person must maintain a detailed and up to date working knowledge of, and comply with, all relevant legislation.
3. an accredited person must maintain records of surveys and assessments, including field data sheets and targeted flora and fauna surveys, undertaken and used as part of the preparation of a Biodiversity Assessment Report, for at least ten years after certification of the relevant Biodiversity Assessment Report.
4. all records required kept by an accredited person must be in legible form, or in a form that can be readily be reduced to a legible form.
5. an accredited person must provide to the Department of Planning, Industry and Environment any information related to biodiversity assessment reports required to be provided by all accredited persons, or by a group of accredited persons, by way of a notice specified on a website maintained by it, in the form and within the time frames required in that notice.
6. an accredited person must comply with any scientific licence conditions relating to survey records.
7. an accredited person must possess, or operate under, an appropriate scientific licence as required for the type work, they are completing in the Biodiversity Offsets Scheme.

Note. Information that the Environment Agency Head (EAH) may require to be provided may include information collected during the application of the BAM such as site specific survey data.

Note. In addition to the conditions above, accredited persons must comply with obligations under the BC Act and regulations, including Part 6 Division 3 of the BC Act. Failure to comply with any of the conditions above may result in the EAH exercising the power to vary, suspend or cancel that accreditation under Part 5 of this Scheme.

ECA ECOLOGICAL CONSULTANTS ASSOCIATION of NSW Inc

2023 PRACTISING MEMBER

APPENDIX D BAM SUMMARY REPORTS

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00041481/BAAS18156/23/00041482

Proposal Name

73 Kulgoa Road Pymble

BAM data last updated *

22/06/2023

Assessor Name

Alex FRASER

Assessor Number

BAAS18156

BAM Data version *

61

Proponent Name(s)

John Leece

Report Created

11/01/2024

BAM Case Status

Finalised

Assessment Revision

2

Assessment Type

Part 4 Developments (Small Area)

Date Finalised

11/01/2024

BOS entry trigger

BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	Critically Endangered Ecological Community	3262-Sydney Turpentine Ironbark Forest

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

BAM Biodiversity Credit Report (Variations)

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3262-Sydney Turpentine Ironbark Forest	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	0.2	0	1	1.00

3262-Sydney Turpentine Ironbark Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion This includes PCT's: 3262	-	3262_Poor	No	1	Cumberland,Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like options

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00041481/BAAS18156/23/00041482

Proposal Name
73 Kulgoa Road Pymble

BAM data last updated *
22/06/2023

Assessor Name
Alex FRASER

Assessor Number
BAAS18156

BAM Data version *
61

Proponent Names
John Leece

Report Created
11/01/2024

BAM Case Status
Finalised

Assessment Revision
2

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
11/01/2024

BOS entry trigger
BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	Critically Endangered Ecological Community	3262-Sydney Turpentine Ironbark Forest

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3262-Sydney Turpentine Ironbark Forest	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	0.2	0	1	1

BAM Biodiversity Credit Report (Like for like)

3262-Sydney Turpentine Ironbark Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion This includes PCT's: 3262	-	3262_Poor	No	1	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Biodiversity Credit Report (Like for like)

BAM Candidate Species Report

Proposal Details

Assessment Id 00041481/BAAS18156/23/00041482	Proposal Name 73 Kulgoa Road Pymble	BAM data last updated * 22/06/2023
Assessor Name Alex FRASER	Report Created 11/01/2024	BAM Data version * 61
Assessor Number BAAS18156	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 2	Date Finalised 11/01/2024	BOS entry trigger BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Broad-headed Snake	Hoplocephalus bungaroides	Geographic limitations
Darwinia peduncularis	Darwinia peduncularis	Refer to BAR
Eastern Australian Underground Orchid	Rhizanthella slateri	Refer to BAR
Haloragodendron lucasii	Haloragodendron lucasii	Geographic limitations
Julian's Hibbertia	Hibbertia spanantha	Refer to BAR
Large Bent-winged Bat	Miniopterus orianae oceanensis	Refer to BAR
Large-eared Pied Bat	Chalinolobus dwyeri	Refer to BAR
Little Bent-winged Bat	Miniopterus australis	Refer to BAR

Regent Honeyeater	Anthochaera phrygia	Refer to BAR
Scrub Turpentine	Rhodamnia rubescens	Refer to BAR
Swift Parrot	Lathamus discolor	Refer to BAR

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00041481/BAAS18156/23/00041482	73 Kulgoa Road Pymble	22/06/2023
Assessor Name	Report Created	BAM Data version *
Alex FRASER	11/01/2024	61
Assessor Number	BAM Case Status	Date Finalised
BAAS18156	Finalised	11/01/2024
Assessment Revision	Assessment Type	BOS entry trigger
2	Part 4 Developments (Small Area)	BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Sydney Turpentine Ironbark Forest												
1	3262_Poor	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	28.6	0.0	0.2	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
											Subtotal	**1**
											Total	**1**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00041481/BAAS18156/23/00041482	73 Kulgoa Road Pymble	22/06/2023
Assessor Name	Report Created	BAM Data version *
Alex FRASER	11/01/2024	61
Assessor Number	Assessment Type	BAM Case Status
BAAS18156	Part 4 Developments (Small Area)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
2	BOS Threshold: Biodiversity Values Map	11/01/2024

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Barking Owl	Ninox connivens	3262-Sydney Turpentine Ironbark Forest
Black Bittern	Ixobrychus flavicollis	3262-Sydney Turpentine Ironbark Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3262-Sydney Turpentine Ironbark Forest
Black-necked Stork	Ephippiorhynchus asiaticus	3262-Sydney Turpentine Ironbark Forest
Broad-headed Snake	Hoplocephalus bungaroides	3262-Sydney Turpentine Ironbark Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3262-Sydney Turpentine Ironbark Forest
Diamond Firetail	Stagonopleura guttata	3262-Sydney Turpentine Ironbark Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3262-Sydney Turpentine Ironbark Forest
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	3262-Sydney Turpentine Ironbark Forest
Eastern False Pipistrelle	Falsistrellus tasmaniensis	3262-Sydney Turpentine Ironbark Forest

Eastern Osprey	Pandion cristatus	3262-Sydney Turpentine Ironbark Forest
Flame Robin	Petroica phoenicea	3262-Sydney Turpentine Ironbark Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3262-Sydney Turpentine Ironbark Forest
Glossy Black-Cockatoo	Calyptorhynchus lathami	3262-Sydney Turpentine Ironbark Forest
Greater Broad-nosed Bat	Scoteanax rueppellii	3262-Sydney Turpentine Ironbark Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3262-Sydney Turpentine Ironbark Forest
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	3262-Sydney Turpentine Ironbark Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	3262-Sydney Turpentine Ironbark Forest
Little Bent-winged Bat	Miniopterus australis	3262-Sydney Turpentine Ironbark Forest
Little Eagle	Hieraaetus morphnoides	3262-Sydney Turpentine Ironbark Forest
Little Lorikeet	Glossopsitta pusilla	3262-Sydney Turpentine Ironbark Forest
Masked Owl	Tyto novaehollandiae	3262-Sydney Turpentine Ironbark Forest
Painted Honeyeater	Grantiella picta	3262-Sydney Turpentine Ironbark Forest
Powerful Owl	Ninox strenua	3262-Sydney Turpentine Ironbark Forest
Regent Honeyeater	Anthochaera phrygia	3262-Sydney Turpentine Ironbark Forest
Rosenberg's Goanna	Varanus rosenbergi	3262-Sydney Turpentine Ironbark Forest
Speckled Warbler	Chthonicola sagittata	3262-Sydney Turpentine Ironbark Forest
Spotted-tailed Quoll	Dasyurus maculatus	3262-Sydney Turpentine Ironbark Forest
Square-tailed Kite	Lophoictinia isura	3262-Sydney Turpentine Ironbark Forest
Swift Parrot	Lathamus discolor	3262-Sydney Turpentine Ironbark Forest
Varied Sittella	Daphoenositta chrysoptera	3262-Sydney Turpentine Ironbark Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3262-Sydney Turpentine Ironbark Forest
White-throated Needletail	Hirundapus caudacutus	3262-Sydney Turpentine Ironbark Forest
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	3262-Sydney Turpentine Ironbark Forest

BAM Predicted Species Report

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00041481/BAAS18156/23/00041482	73 Kulgoa Road Pymble	22/06/2023
Assessor Name	**Report Created**	**BAM Data version ***
Alex FRASER	11/01/2024	61
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS18156	Part 4 Developments (Small Area)	Finalised
Assessment Revision	**Date Finalised**	**BOS entry trigger**
2	11/01/2024	BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	3262_Poor	3262-Sydney Turpentine Ironbark Forest	Poor	0.2	1	