St Luke's Grammar School New Senior Campus - Biodiversity Development Assessment Report

Midson Group Pty Ltd

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Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd was engaged by Midson Group Pty Ltd to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed New Senior Campus at three parcels of land in Dee Why (the 'development site'). The proposed redevelopment will be assessed as a State Significant Development (SSD_1091) under NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Secretary's Environmental Assessment Requirements (SEARs) require the preparation of a Biodiversity Development Assessment Report (BDAR) under the NSW *Biodiversity Conservation Act 2016* (BC Act).

This report has been prepared to meet the requirements of the Biodiversity Assessment Method 2016 (BAM) established under Section 6.7 of the BC Act. Requirements of the Warringah Local Environment Plan 2011 (WLEP) and Development Control Plan 2011 (DCP) have also been addressed in this document.

The vegetation within the development site is highly disturbed with scattered planting of mature native species which have been incorporated into horticultural landscape gardens. The development site is contiguous with vegetation mapped as part of PCT 1776 *Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast* within the Stony Range Regional Botanic Gardens. Under the BAM all vegetation native to NSW must be assigned a Plant Community Type (PCT). Where native vegetation has been planted and does not clearly confirm to any PCT, a 'best-fit' PCT must be assigned. Based on the OEH mapping, soil profile and field validation of remnant vegetation retained within the adjacent Stony Range Regional Botanic Gardens the planted native vegetation conforms to *PCT 1776_Planted*. The remaining vegetation within the development site contains exotic or built areas.

No threatened flora or fauna species were recorded on or within the development site. There is potential that highly mobile threatened species may utilise the vegetation for foraging resources on occasion. Consideration has been given to these highly mobile species during the preparation of this BDAR.

Measures taken to avoid, minimise and mitigate impacts to the vegetation and species habitat present within the development site and methodologies to minimise impacts during construction and operation of the development have been included in this BDAR.

Following consideration of all the above aspects, the residual unavoidable impacts of the project were calculated in accordance with the BAM by utilising the Biodiversity Assessment Method Credit calculator (BAMC). For *PCT 1767_planted* the BAMC generated a vegetation integrity score of 36.3. Under the BAM, 1 ecosystem credit is required to offset the removal of 0.035 ha of *PCT 1776_planted.*

One Matter of National Environmental Significance (MNES) was identified as having potential to be adversely affected by the proposed works. *Pteropus poliocephalus* (Grey-headed Flying-fox) is listed as Vulnerable under the EPBC Act and it is considered that this species is likely to use some of the development site for foraging. An assessment of the Commonwealth Significant Impact Criteria was undertaken for the Grey-headed Flying-fox and concluded that the project would not have a significant impact on this species.

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
DCP	Development Control Plan
DotEE	Commonwealth Department of the Environment and Energy
DPIE	NSW Department of Planning, Industry and Environment (previously known as NSW Department of Planning and Environment, DPE)
DPE	NSW Department of Planning and Environment (now known as DPIE)
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FM Act	NSW Fisheries Management Act 1994
GIS	Geographic Information System
GHFF	Grey-headed Flying-fox
GPS	Global Positioning System
HBT	Hollow-bearing tree
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Service
NSW	New South Wales
OEH	NSW Office of Environment and Heritage (now part of DPIE)
PCT	Plant Community Type
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	NSW Water Management Act 2000

1. Stage 1: Biodiversity Assessment

1.1 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared in order to satisfy the Secretary's Environmental Assessment Requirements (SEARs) for a State Significant Development (SSD_1091) established under Section 7.9 of the *NSW Biodiversity Conservation Act 2016* (BC Act). This BDAR has been prepared by Belinda Failes, an accredited person (BAAS18159) under the BC Act. The report was peer reviewed by Diane Campbell (BAAS17069) who is also an accredited person under the BC Act.

1.1.1 General description of the development site

The proposed development site, defined as the area of land that is subject to the proposed development application, is approximately 3.06 ha. The development site comprises three parcels within the Northern Beaches local government area (LGA):

- 800 Pittwater Road, Dee Why (Lot 6 DP523299)
- 210 Headland Road, North Curl Curl (Lot 2112 DP752038)
- 224 Headland Road, North Curl Curl (SP45082).

The development site has been subject to considerable vegetation disturbance as a result of historical development. The development is bound by the Stony Range Regional Botanic Garden in the north, Pittwater Road in the west and residential streets to the east and south. The development site comprises a number of functioning school buildings, carparks and recreational green spaces.

Vegetation within the development site consists of planted native species, horticultural plantings and opportunistic weeds. Open space and landscaped areas of the development site are subject to regular mowing and garden maintenance activities.

The general description of the development site is displayed on the following maps:

- Site Map (Figure 1)
- Location Map (Figure 2)
- Construction footprint Map (Figure 3).

1.1.2 Development footprint

The proposed development site footprint is located within the western extent of the development site (i.e. Lot 6 DP523299 and SP45082) and is provided in Figure 3.

The proposed works will include redevelopment of the existing buildings and facilities to upgrade the current educational facilities and increase student capacity to accommodate for future growth in the area. It is understood that the operational and construction footprint will be contained wholly within the development footprint.

A concept Masterplan of the redevelopment has been provided and indicates that a portion of vegetation within the development footprint will be retained. A small amount of planted native vegetation and exotic vegetation within the development site will be removed and the existing buildings will be demolished or modified as part of the proposed redevelopment.

1.1.3 Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification
- BioNet Atlas of NSW Wildlife 5 km database search (EES 2019)
- Biodiversity Assessment Methodology Calculator
- *Environment Protection and Biodiversity Conservation Act 1999* EPBC Act Protected Matters Search Tool 5 km database search (DotEE 2019a)
- NSW Government Biodiversity Values Map (accessed on 17 September 2019)
- The Native Vegetation of the Sydney Metropolitan Area (OEH 2016)
- Threatened species profiles and recovery plans (DotEE 2019b)
- National Flying-Fox Monitoring data (DotEE 2019c)
- St Luke's Grammar School – New Senior Campus: Sears Application – Final. Prepared by Tonkin Zulaikha Greer Architects for St Luke's Grammar School (April 2019)
- Planning Secretary's Environmental Assessment Requirements for Application Number SSD-10291
- Ecological Assessment – St Luke's Grammar School, Senior School Campus, Dee Why. Prepared by Eco Logical Australia Pty Ltd (September 2019).

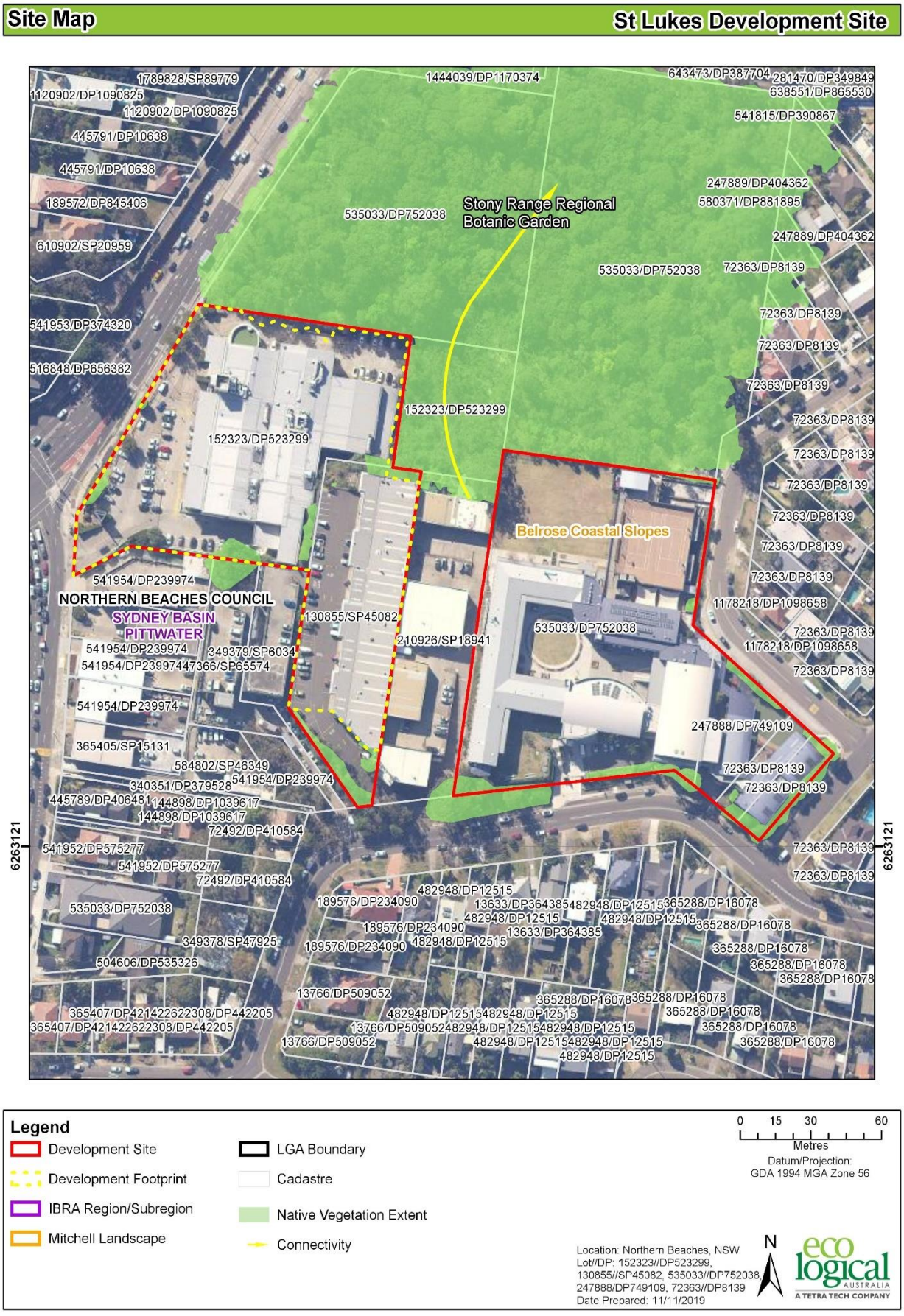

Figure 1: Site Map

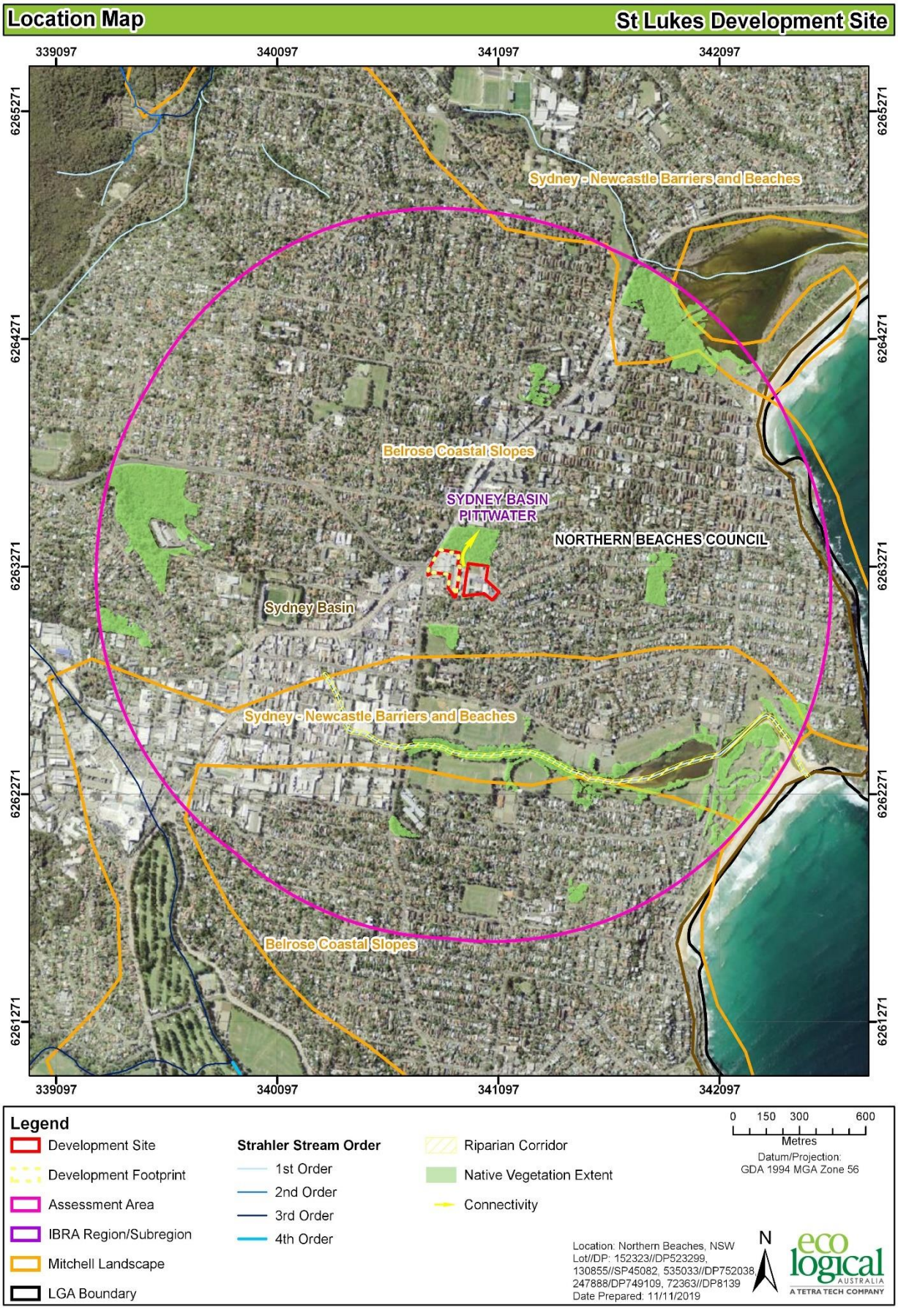

Figure 2: Location Map

Figure 3: Construction footprint

1.2 Legislative Context

Table 1: Legislative context

Name	Relevance to the project
	Commonwealth
Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of national environmental significance have been identified on or near the development site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.
	State
Environmental Planning and Assessment Act 1979 (EP&A Act)	The proposed development is State Significant Development (SSD-10291) and is to be assessed under Part 4.1 (or 5.1) of the EP&A Act. Secretary's Environmental Assessment Requirements have been issued and require a Biodiversity Assessment as follows: • Biodiversity impacts related to the proposed development (SSD 10291) are to be assessed in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and Biodiversity Assessment Method. • The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method. • The BDAR must include details of the measures proposed to address the offset obligation as follows: o The total number and classes of biodiversity credits required to be retired for the development/project o The number and classes of like-for-like biodiversity credits proposed to be retired o The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules o Any proposal to fund a biodiversity conservation action o Any proposal to make a payment to the Biodiversity Conservation Fund. • If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits. • The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the Biodiversity Conservation Act 2016. • Where a Biodiversity Assessment Report is not required, engage a suitably qualified person to assess and document the flora and fauna impacts related to the proposal. *Note: Notwithstanding these requirements, the Biodiversity Conservation Act 2016 requires that State Significant Development Applications be accompanied by a Biodiversity Development Assessment Report unless otherwise specified under the Act.*
Biodiversity Conservation Act 2016 (BC Act)	As a State Significant Development, the proposed development requires submission of a Biodiversity Development Assessment Report in accordance with the BC Act.
Fisheries Management Act 1994 (FM Act)	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.
Local Land Services Amendment Act 2016 (LLS Act)	The LLS Act does not apply to areas of the state to which the SEPP Vegetation applies. The Vegetation SEPP applies to the Northern Beaches local government area (LGA).

Name	Relevance to the project
Water Management Act 2000 (WM Act)	The proposed development does not involve works on waterfront land. A Controlled Activity Approval under s91 of the WM Act is not required.
	Planning Instruments
State Environmental Planning Policy (SEPP) (Vegetation in Non-Rural Areas) 2017	The Vegetation SEPP applies to development that does not require consent. As this project requires consent under the EP&A Act the Vegetation SEPP is not relevant.
SEPP (Coastal Management) 2018	The proposed development is not located on land subject to this SEPP.
SEPP 44 – Koala Habitat Protection	The proposed development is located within the Northern Beaches LGA listed (as Pittwater and Warringah) in Schedule 1 of the SEPP. However, the proposed development does not impact on core koala habitat as defined by SEPP 44.
Warringah Local Environment Plan (LEP) 2011	The proposed development site is zoned as the following under the Warringah LEP: • 800 Pittwater Road zoned - B5 Business development • 224 Headland Road zoned - IN1 General industrial • 210 Headland Road zoned – R2 Low density residential. The site is not subject to the Biodiversity or Riparian overlay under the LEP. The development site contains land shown as Area A and Area B under the Landslide Risk Land map.
Warringah Development Control Plan (DCP) 2011	Small portions of the proposed development site located on the edges between the site and Stony Range Regional Botanic Garden comprise land mapped as Native Vegetation under the Warringah DCP. The DCP states the following objectives for land identified on this map: • To preserve and enhance the area's amenity, whilst protecting human life and property. • To improve air quality, prevent soil erosion, assist in improving water quality, carbon sequestration, storm water retention, energy conservation and noise reduction. • To provide natural habitat for local wildlife, maintain natural shade profiles and provide psychological & social benefits. • Promote the retention of native vegetation in parcels of a size, condition and configuration which will as far as possible enable plant and animal communities to survive in the long term. The DCP states the following requirements for land identified on this map: 1. For modification of native vegetation where the area of land supporting the vegetation to be modified is greater than 100m^2 or the land supporting the vegetation to be modified forms part of an allotment where vegetation has been modified in the last five years: a. The applicant must demonstrate that the objectives have been achieved through a Flora and Fauna Assessment prepared in accordance with Council guidelines; and b. The applicant must demonstrate that the objectives have been achieved through a Biodiversity Management Plan prepared in accordance with Council guidelines that will protect native vegetation on the subject property. 2. For modification of native vegetation in all other cases, the applicant must demonstrate that the objectives have been achieved.

1.3 Landscape Features

1.3.1 IBRA regions and subregions

The development site falls within the IBRA region and subregions as outlined in Table 2 and Table 3.

Table 2: IBRA regions

IBRA region	Area within development site (ha)
Sydney Basin	3.06

Table 3: IBRA subregions

IBRA subregion	Area within development site (ha)
Pittwater	3.06

1.3.2 Mitchell Landscapes

The development site falls within the Belrose Coastal Slopes Mitchell Landscape (DECC 2002) as outlined in Table 4.

Table 4: Mitchell Landscapes

Mitchell landscape	Description	Area within Development Site (ha)
Belrose Coastal Slopes	Benched hill slopes and deep valleys of the coastal fall on horizontal Triassic quartz sandstone, lithic sandstone and shales. High proportion of rock outcrop with discontinuous cliffs to 5m high. General elevation 0 to 180 m, local relief 80m. Shallow uniform or gradational sands and earthy sands on ridges, deeper sands, loamy sands and organic sands on wet benches and in hanging swamps, grey or yellow texture-contrast soils on shale benches. Accumulations of deeper sand and occasional podsols in depositional sites and along streams. Low woodland of *Eucalyptus haemastoma*, *Corymbia gummifera*, *Eucalyptus luehmanniana*, and *Angophora bakeri* in deeper soils on ridges. Scrub and heath of *Allocasuarina distyle* and *Banksia ericifolia*, with other *Hakea*, *Grevillea* and *Baeckea* sp., on ridges and upper benches. Wet heath and swamps with *Gahnia* sp. and *Banksia robur* in hanging valleys. Coastal forest in sheltered areas on better quality shale soil with; *Eucalyptus saligna*, *Eucalyptus pilularis, Syncarpia glomulifera, Eucalyptus paniculata*, *Corymbia maculata, Eucalyptus botryoides, Livistona australis* and *Macrozamia* sp. Coastal headlands with scrub of *Allocasuarina distyla* and *Westringia fruticose* and grasses of *Themeda triandra.*	3.06

1.3.3 Native vegetation extent

The extent of native vegetation within the development site and buffer is outlined in Table 5.

Table 5: Native vegetation extent

Area within the development site (ha)	Native vegetation extent within the 1,500 m buffer area (ha)	Cover within the 1,500 m buffer area (%)
0.14	51.10	6

There are no differences between the mapped vegetation extent and the aerial imagery based on OEH 2016 vegetation mapping.

1.3.4 Rivers and streams

The development site does not contain any rivers or streams.

1.3.5 Wetlands

The development site does not contain any wetlands.

1.3.6 Connectivity features

The development site contains limited connectivity features outlined in Table 6. This is due to the limited native vegetation mapped within the locality of the development site.

A patch of native vegetation is located immediately north of the development site (Stony Range Regional Botanic Gardens). However, the presence of roads and urban development surrounding the development site has disconnected this vegetation patch from other areas of native vegetation. Therefore, the development site has connectivity to the vegetation within the Stony Range Regional Botanic Gardens to the north and connectivity does not extend beyond into adjacent lands.

Table 6: Connectivity features

Connectivity feature name	Feature type
Stony Range Regional Botanic Garden	Core bushland

1.3.7 Areas of geological significance and soil hazard features

The development site does not contain areas of geological significance and soil hazard features.

1.3.8 Site context

1.3.8.1 *Method applied*

The site-based method has been applied to this development.

1.3.8.2 *Percent native vegetation cover in the landscape*

The current percent native vegetation cover in the landscape was assessed in a Geographic Information System (GIS) using aerial imagery sourced from NearMap, using increments of 5%. The percent native vegetation cover within the 1,500 m buffer area is 6% (51.10 ha).

1.3.8.3 *Patch size*

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the development site. The patch size is 3.75 ha, this includes patches of Urban Exotic/Native vegetation as mapped by Office of Environment and Heritage (OEH 2016) vegetation mapping.

1.4 Native Vegetation

1.4.1 Survey effort

Vegetation survey was conducted on 9 August 2019 by Belinda Failes. A total of one full-floristic and vegetation plot was undertaken to identify plant community types (PCTs) and threatened ecological

communities (TECs) on the development site (Figure 5 and Table 7). The vegetation integrity plot was undertaken within the development site in accordance with the BAM (Table 8). A modified version of the BAM vegetation integrity plot was undertaken to account for the narrow vegetation zone. The integrity plot was modified into a 10 m x 40 m plot and 10 m x 100 m transect configuration. All field data collected at full-floristic and vegetation integrity plots is included in Appendix B.

The site visit also involved vegetation mapping of the development site, assessment of habitat and mapping of habitat features, namely hollow-bearing trees (HBTs) and human-made structures such as buildings and bridges. An assessment of potential threatened fauna species and their habitat was conducted within the adjacent Stony Range Regional Botanic Garden. In particular evidence of HBTS and presence or habitat for threatened species such as *Ninox strenua* (Powerful Owl).

Table 7: Full-floristic PCT identification plots

PCT ID	PCT Name	Number of plots surveyed
1776	Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	1

Table 8: Vegetation integrity plot

Veg Zone	PCT ID	PCT Name	Condition	Area (ha)	Plots required	Plots surveyed
1	1776	Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	Planted	0.035	1	1

1.4.2 Plant Community Types present

The field survey confirmed that the vegetation within the development site has been cleared of remnant vegetation and replaced with landscaped plantings which includes native and exotic vegetation. The native vegetation does not represent species which would be considered indigenous to the local vegetation community. However, under the BAM, planted vegetation native to NSW requires consideration as to the 'best fit' PCT. Based on the soil landscape, presence of remnant vegetation adjacent to the development site, it was determined that the planted native vegetation 'best fit' PCT was *PCT 1776 Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast*. The development site does not contain any listed TECs under the BC Act or the EPBC Act. Justification for the selection of PCTs occurring on the development site is based on a quantitative analysis of full-floristic plot data (Appendix D) and is provided in Table 10.

The desktop assessment identified one possible remnant patch of PCT 1776 located adjacent to the northern boundary of the development site (Table 9, Figure 4). It is likely that the development site would have had the same PCT prior to European settlement due to is location in the landscape, connectivity and same soil types. Due to the planted nature of the vegetation within the development site, it was mapped as a modified form of PCT 1776 (i.e. planted) (see Photo 1).

The field survey identified the native vegetation along the northern boundary consists overhanging canopy species which do not occur within the development area. Therefore, overhanging branches have been excluded from the amended vegetation map as it does not occur within the development area and will not be impacted by the proposed development (Photo 3).

The vegetation along the eastern and southern boundary was represented by clusters of planted mixed species *Eucalyptus* and *Banksia* species such as; *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus saligna* (Sydney Blue Gum), *Banksia integrifolia* (Coast Banksia) and *Banksia ericifolia* which are not considered part of local indigenous vegetation community (i.e. PCT 1776) but under the BAM have been mapped as part of the vegetation zone (PCT 1776_planted).

The vegetation along the western and south-western boundary consists of planted horticultural gardens which includes low lying hedging shrubs and isolated planted trees. Planted exotic vegetation includes hedging plants; *Murraya paniculata* (Murraya), and taller planted *Magnolia grandiflora* (Southern magnolia) and *Schinus molle* (Peppercorn Tree) (Photo 2).

For the purpose of this assessment, ELA has assumed that all vegetation within the development area will be removed.

Table 9: Plant Community Types

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area (ha)	Percent cleared
1776	Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.035	64

Table 10: PCT selection justification

PCT ID	PCT Name	Selection criteria	Species relied upon for identification of vegetation type and relative abundance
1776	Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	IBRA region, subregion, soil landscape, elevation and presence of remnant vegetation adjacent to the development site	The vegetation within the development site has been planted and does not represent locally indigenous species. Revegetation works have included planted canopy, shrubs and ground cover species which cannot be utilised to determine a suitable PCT or to provide quantitative analysis results.

1.4.3 Vegetation integrity assessment

A vegetation integrity assessment using the Credit Calculator (BAMC) was undertaken and the results are outlined in Table 11. It should be noted that when the impact area of 0.035 ha is entered into the BAMC it is automatically adjusted to 0.04 ha.

Table 11: Vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score
1	1776	Planted	0.035	37.8	31.9	39.6	36.3

1.4.4 Use of local data

The use of local data is not proposed for this assessment.

Figure 4: Plant Community Types and native vegetation extent

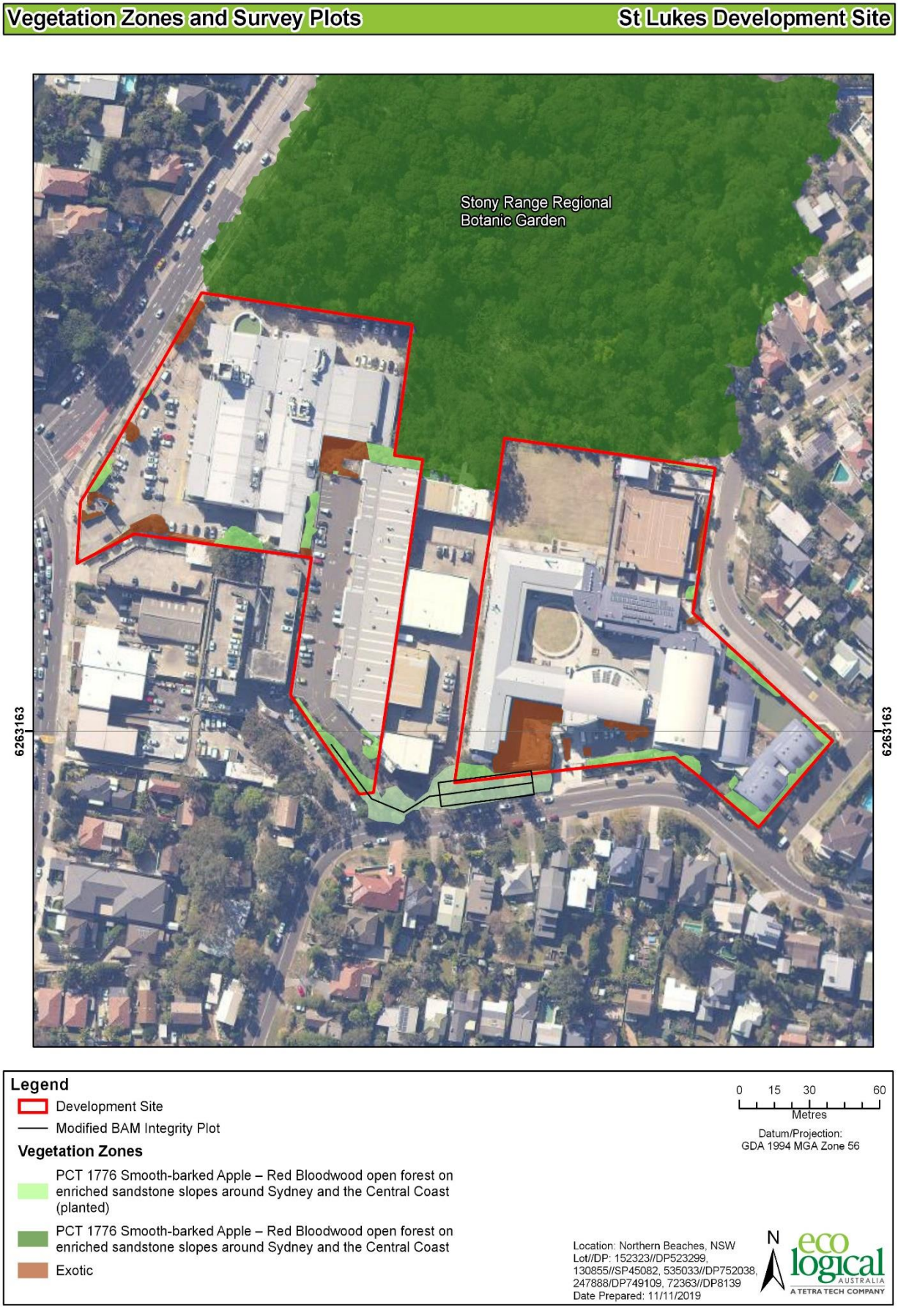

Figure 5: Plot locations

Photo 1: Example of *PCT 1776_Planted* along Headland Road

Photo 2: Example of planted exotic vegetation at frontage of 800 Pittwater Road, Dee Why

Photo 3: Overhanging PCT 1776 located within Stony Ranges Botanic Gardens to the north of the development area

1.5 Threatened Species

1.5.1 Ecosystem credit species

Ecosystem credit species predicted to occur at the development site, their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 12. Ecosystem credit species which have been excluded from the assessment and relevant justification are also included in Table 12. An additional species was entered into the BAMC, *Ninox strenua* (Powerful Owl). This species was not listed as a candidate ecosystem credit species associated with the PCT 1776. However, there are eight BioNet records for this species including a recent (2013) record from the adjacent Stony Range Regional Botanic Garden. Therefore, it was determined that this species should be considered as part of the assessment.

Table 12: Predicted ecosystem credit species and relevant justification for their exclusion or inclusion from the assessment

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
Anthochaera phrygia	Regent Honeyeater (Foraging)	N/A	High	Critically Endangered	Critically Endangered	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	N/A	Moderate	Vulnerable	Not Listed	Excluded Habitat features for this species are not present at this site. The vegetation within the development site is substantially degraded.
Calyptorhynchus lathami	Glossy Black-Cockatoo	Other Presence of *Allocasuarina* and *Casuarina* species	High	Vulnerable	Not Listed	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Dasyurus maculatus	Spotted-tailed Quoll	N/A	High	Vulnerable	Endangered	Excluded Habitat features for this species are not present at this site. This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage.
Glossopsitta pusilla	Little Lorikeet	N/A	High	Vulnerable	Not Listed	**Included** There are 28 BioNet records for this species within a 5 km radius of the development site. This species may utilise the flowering species within the development site for seasonal foraging.
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	Waterbodies Within 1 km of rivers, lakes, large dams or creeks, wetlands and coastlines	High	Vulnerable	Not Listed	**Included** There are 8 BioNet records for this species within a 5 km radius of the development site. The development site does not contain any waterbodies; however, it is located within

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
						1 km of Greendale Creek. The development site is located more than 2 km of Curl Curl Lagoon and Curl Curl beach.
Lathamus discolor	Swift Parrot	N/A	Moderate	Endangered	Critically Endangered	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	N/A	High	Vulnerable	Not Listed	**Included** Seasonal foraging habitat was identified in this assessment.
Miniopterus australis	Little Bent-winged-Bat (Foraging)	N/A	High	Vulnerable	Not Listed	**Included** Seasonal foraging habitat was identified in this assessment.
Miniopterus orianae oceanensis	Large Bent-winged Bat (Foraging)	N/A	High	Vulnerable	Not Listed	**Included** Seasonal foraging habitat was identified in this assessment.
Ninox strenua	Powerful Owl (Foraging)	N/A	High	Vulnerable	Not Listed	**Included** This species was entered into the BAMC because 8 BioNet records were identified within 5 km of the site. It is possible that Powerful Owls may utilise the intact vegetation of Stony Range Botanic Gardens to the north of the development area and may occasionally utilise the development area while traversing the urbanised landscape on foraging forays.
Pandion cristatus	Eastern Osprey (Foraging)	N/A	Moderate	Vulnerable	Not Listed	Excluded Habitat features associated with this species are not present in the development site. This species is a specialist feeder requiring large open waterbodies which are absent from the development site.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
Petroica boodang	Scarlet Robin	N/A	Moderate	Vulnerable	Not Listed	Excluded Habitat features associated with this species includes an abundance of logs and fallen timber, these features were not present in the development site.
Phascolarctos cinereus	Koala (Foraging)	N/A	High	Vulnerable	Vulnerable	Excluded Habitat present is substantially degraded and highly fragmented such that this species is unlikely to utilise the development site. No feed trees were identified within the development site.
Pteropus poliocephalus	Grey-headed Flying-fox (Foraging)	N/A	High	Vulnerable	Vulnerable	**Included** Limited foraging resources were present within the development area for this highly mobile species. This species may occasionally utilise the Eucalyptus and Banksia species during flowering seasons to supplement foraging resources. Stony Range however possesses suitable foraging and roosting habitat compared with this cleared and developed site with the small area of planted natives.

1.6 Species Credit Species

No threatened flora species were recorded during field surveys. The vegetation within the development area has been substantially modified and does not represent suitable habitat for threatened flora species.

No threatened fauna species were recorded during the field survey. Additionally, important habitat features such as hollow bearing trees, intact native vegetation or important breeding/foraging resources were not recorded within the development area. The field survey identified that the existing buildings contain flat, metal roofing which does not contain suitable habitat for threatened microbat species. The roof cavities did not contain suitable small crevices and not white-wash or other indications of microbat use was observed around the existing rooves.

Species credit species predicted to occur at the development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 13. Species credit species which have been excluded from the assessment and relevant justification are also included in Table 13.

Table 13: Candidate species credit species and relevant justification for their exclusion or inclusion from the assessment

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification for exclusion or inclusion
Ancistrachne maidenii	Ancistrachne maidenii	N/A	High	Vulnerable	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Anthochaera phrygia	Regent Honeyeater (Breeding)	Other As per mapped areas	High	Critically Endangered	Critically Endangered	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The specific habitat is not within an important breeding area for the species (National Recovery Plan).
Caladenia tessellata	Thick Lip Spider Orchid	N/A	Moderate	Endangered	Vulnerable	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded.
Callistemon linearifolius	Netted Bottle Brush	N/A	Moderate	Vulnerable	Not Listed	Excluded The presence of this species was not identified (conspicuous species). The development site does not form part of the 5-6 populations remaining in the Sydney area.
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	Hollow bearing trees Living or dead tree with hollows greater than 15 cm diameter and greater than 5 m above ground	High	Vulnerable	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain larger patches of intact vegetation or trees with large hollows that are suitable for the species to utilise the site.
Darwinia peduncularis	Darwinia peduncularis	Rocky areas Or within 50 m of rocky areas	High	Vulnerable	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification for exclusion or inclusion
						associated with this species are not present within the development site.
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	Other Living or dead mature trees within suitable vegetation within 1 km of rivers, lakes, large dams or creeks, wetlands and coastlines	High	Vulnerable	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The site is substantially degraded such that this species is unlikely to utilise the development site for breeding.
Hibbertia puberula	Hibbertia puberula	N/A	High	Endangered	Not Listed	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to occur in the development site.
Hibbertia spanantha	Julian's Hibbertia	N/A	High	Critically Endangered	Critically Endangered	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to occur in the development site.
Lathamus discolour	Swift Parrot (Breeding)	Other As per mapped areas	Moderate	Endangered	Critically Endangered	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The species is known to breed in Tasmania.
Miniopterus australis	Little Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species	Very High	Vulnerable	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The species is known to breed in Tasmania. Existing buildings within

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification for exclusion or inclusion
		records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals > 500 Or from the scientific literature				the development site were identified as containing flat, metal roofing which does not contain suitable habitat for this species.
Miniopterus orianae oceanensis	Large Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals > 500 Or from the scientific literature	Very High	Vulnerable	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The species is known to breed in Tasmania. Existing buildings within the development site were identified as containing flat, metal roofing which does not contain suitable habitat for this species.
Mixophyes iteratus	Giant Barred Frog	Other Land within 50 m of semi-permanent and permanent drainages	Moderate	Endangered	Endangered	Excluded The development site does not contain semi-permanent or permanent streams or riparian habitat, which represent the habitat features necessary for this species.
Myotis macropus	Southern Myotis	Hollow bearing trees Within 200 m of riparian zone| Other Bridges, caves or artificial structures within 200 m of riparian zone | Waterbodies	High	Vulnerable	Not Listed	Excluded The development site does not contain hollow bearing trees, structures or waterbodies, which represent the habitat features necessary for this species.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification for exclusion or inclusion
		This includes rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200 m of the site				
Pandion cristatus	Eastern Osprey (Breeding)	Other Presence of stick-nests in living and dead trees (> 15 m) or artificial structures within 100 m of a floodplain for nesting	Moderate	Vulnerable	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain suitable breeding habitat.
Petaurus norfolcensis	Squirrel Glider	N/A	High	Vulnerable	Not Listed	Excluded Habitat present is substantially degraded such that this species is unlikely to utilise the development site. Habitat in the development site is isolated and disturbed with a higher likelihood of this species more suitable habitat within the locality. Additionally, this species has a strong preference for old growth forests which does not include the development site.
Phascolarctos cinereus	Koala (Breeding)	Other Areas identified via survey as important habitat	High	Vulnerable	Vulnerable	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. Habitat present is considered unsuitable and substantially degraded such that this species is highly unlikely to utilise the site for breeding.
Pimelea curviflora var. *curviflora*	Pimelea curviflora var. curviflora	N/A	High	Vulnerable	Vulnerable	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially degraded such that this species is unlikely to occur in the development site.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification for exclusion or inclusion
Pteropus poliocephalus	Grey-headed Flying-fox (Breeding)	Other Breeding camps	High	Vulnerable	Vulnerable	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain any breeding sites that are suitable for the species to utilise. The nearest Nationally Important Flying-fox Camp is located 7 km away.

1.6.1 Targeted surveys

Due to the high level of modification of vegetation within the development site and lack of potential habitat, targeted surveys were not conducted for species credit species.

1.6.2 Use of local data

Use of local data is not proposed for this BDAR.

1.6.3 Expert reports

Expert reports have not been prepared as part of this BDAR.

2. Stage 2: Impact assessment (biodiversity values)

2.1 Avoiding Impacts

2.1.1 Locating and designing a project to avoid and minimise impacts on vegetation and habitat

The proposed development footprint will result in the removal of a small amount (0.035 ha) of planted native vegetation and 0.06 ha of horticultural plantings and opportunistic weeds. The remaining 0.11 ha of planted native vegetation and 0.08 ha of horticultural plantings will be retained within the broader development site.

The site is located in an urban area which avoids and minimises impacts to better quality vegetation and more important habitat in the locality, as outlined in Table 14.

Table 14: Locating and designing a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed	Justification
Locating and designing the project in areas where there are no biodiversity values	The project (i.e. the proposed development footprint) has utilised existing development areas, cleared lands and planted gardens to minimise impacts on areas with the highest biodiversity values. Areas of biodiversity values have been retained where possible within the development site.	The project has utilised areas with existing development in the development site to reduce impacts to areas of high biodiversity values. While the project will require the removal of a small amount of native vegetation, this vegetation has been planted and does not contain high biodiversity values such as canopy trees or HBTs.
Locating and designing the project in areas where the native vegetation or threatened species habitat is in the poorest condition	The project has been designed and located within areas of disturbed planted vegetation and cleared or built land.	The project has been generally located to utilise existing disturbed or previously developed areas. The majority of the planted native vegetation within the development site proposed will be retained. There are no indigenous threatened flora species recorded within the development site. There are no important habitat for threatened fauna species within the development footprint.
Locating and designing the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an EEC or CEEC), indicated by the biodiversity risk weighting for a species	The project has been designed and located within areas of disturbed planted vegetation.	The development footprint does not contain vegetation that comprises important habitat for threatened species or vegetation in high threat categories.
Locating and designing the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained	The project is located in a highly fragmented urban landscape.	The proposed development requires the removal of planted native vegetation. The removal of these trees does not impact upon the connectivity of the development site with adjacent lands.

2.1.2 Prescribed biodiversity impacts

The development site contains prescribed biodiversity impacts.

The list of potential prescribed impacts as per the BAM is provided below:

- Occurrence of karst, caves, crevices and cliffs – none occur within the development site
- Occurrence of rock – no rock outcrops or scattered rocks occur within the development site
- Occurrence of human made structures and non-native vegetation – **Yes, see section below**
- Hydrological processes that sustain and interact with the rivers, streams and wetlands – none occur within the development site
- Proposed development for a wind farm and use by species as a flyway or mitigation route – the project does not involve any wind farm development.

The development site contains human made structures and non-native vegetation. Non-native vegetation was identified and assessed for any potential to provide habitat for threatened flora and fauna species, including presence of hollow bearing trees (HBTs). The existing multistorey buildings will be removed for the proposed works. The field surveys did not record evidence of suitable cracks or crevice's or whitewash within the human-made structures from microchiropteran (microbat) species. The human-made structure is unlikely to contain suitable roosting or breeding habitat for microbats. However, targeted surveys were not conducted. Additional information regarding consideration of human made structures is provided below.

Non-native vegetation will be removed as part of the works. Non-native vegetation includes small hedges of *Murraya paniculata* (Murraya), taller planted *Magnolia grandiflora* (Southern Magnolia) and *Schinus molle* (Peppercorn Tree). Due to the development site's close proximity to the Stony Range Regional Botanic Gardens, the non-native vegetation may also provide occasional supplementary foraging habitat for highly mobile urbanised threatened species such as *Pteropus poliocephalus* (Grey-headed Flying-fox), microchiropteran (microbat) species and *Ninox strenua* (Powerful Owl). The development site has the prescribed biodiversity impacts as outlined in Table 15.

Table 15: Prescribed biodiversity impacts

Prescribed biodiversity impact	Description in relation to the development site	Threatened species or ecological communities effected
Impacts of development on the habitat of threatened species or ecological communities associated with: • karst, caves, crevices, cliffs and other geological features of significance, or • rocks, or • human made structures, or • non-native vegetation	The development site contains nectar producing non-native vegetation canopy, in formal gardens which will be removed as part of the development proposal The development site contains non-native vegetation for common urban arboreal mammals (possums) which provides foraging opportunities for threatened nocturnal bird species (*Ninox strenua* – Powerful Owl). The proposal will result in a reduction in the extent of foraging habitat and reduction in availability of their prey items. Roosting habitat for microbats in not native vegetation is considered to be marginal.	Potential foraging habitat for Pteropus poliocephalus (Grey-headed Flying Fox (GHFF). Potential foraging habitat for *Ninox strenua* (Powerful Owl). Potential foraging habitat for threatened microbat species above non-native vegetation canopy or breeding habitat in non-native hollow-bearing trees. Potential foraging habitat for threatened microbats: • *Miniopterus australis* (Little Bentwing-bat) • *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat).

Prescribed biodiversity impact	Description in relation to the development site	Threatened species or ecological communities effected
		Potential breeding (buildings) and foraging habitat for threatened microbats: • *Saccolaimus flaviventris* (Yellow-bellied Sheath-tail Bat) • *Falsistrellus tasmaniensis* (Eastern False Pipistrelle).
Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	The proposed development will require the removal of non-native vegetation from within the development site. The development will result in a minor reduction in the extent of existing non-native vegetation within the development site which provides stepping stone habitat between urban fragmented patches of vegetation	Reduction in extent of potential foraging habitat for GHFF. Reduction in extent of potential habitat for Powerful Owl. Reduction in extent of foraging habitat for other threatened microbats.
Impacts of development on movement of threatened species that maintains their lifecycle	The proposed development will result in reduction of vegetation within the development site and marginal loss of connectivity for mobile threatened species.	GHFF, Powerful Owl and microbat species.

2.1.2.1 *Locating and designing a project to avoid and minimise prescribed biodiversity impacts*

The development has been located and designed in a way which avoids and minimises prescribed biodiversity impacts as outlined in Table 16.

Table 16: Locating and designing a project to avoid and minimise prescribed biodiversity impacts

Approach	How addressed	Justification
Locating and designing the development to avoid direct impacts on the non-native vegetation and human made structures	Although this is a highly modified site, planted native and non-native canopy is located within the development site and a small amount will be removed for the development.	The project design will involve construction within the development footprint which will involve clearing of existing buildings. Planted and non-native vegetation will be retained within the development site. The development footprint has avoided areas of vegetation along the eastern lot and along the southern boundary. The vegetation in the development footprint is in a disturbed and fragmented condition and includes low lying shrubs and patches of weeds listed under the Biosecurity Act 2015. Weeds and planted non-native do not represent important habitat for species.
Locating and designing the development to avoid severing or interfering with corridors connecting different areas of habitat, migratory flight paths to	The development site is fragmented by major arterial roads which limits migratory/foraging connectivity and exchange of genetic material	As above, in the context of the surrounding locality, it is considered that vegetation is in a disturbed condition and already highly fragmented. Thus, the project design is considered to be located in an area where

Approach	How addressed	Justification
important habitat or preferred local movement pathways	of flora species between patches of vegetation.	exchange of genetic material between adjacent or nearby habitat is already limited.
Optimising project layout to minimise interactions with threatened and protected species and ecological communities, e.g. designing turbine layout to allow buffers around features that attract and support aerial species, such as forest edges, riparian corridors and wetlands, ridgetops and gullies	The development design has utilised areas with minimal impacts to biodiversity values.	The development design has utilised existing disturbed areas to minimise interactions with threatened species habitat.

2.2 Assessment of Impacts

2.2.1 Direct impacts

The direct impacts of the development on:

- Native vegetation is outlined in Table 17
- prescribed biodiversity impacts are outlined in Section 2.2.4.

Direct impacts including the final project footprint (construction and operation) are shown on Figure 6.

Table 17: Direct impacts to native vegetation

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1776	Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.035

2.2.2 Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 18.

Table 18: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	1776	Planted	0.035	36.3	0	-36.3

Figure 6: Final project footprint including construction and operation

2.2.3 Indirect impacts

The indirect impacts of the development are outlined in Table 19. Indirect impact zones are shown on Figure 7.

Table 19: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Sedimentation and contaminated and / or nutrient rich run-off	Construction	Runoff during construction works	Confined to development site with sediment fencing	During heavy rainfall or storm events	During rainfall events	Short-term impacts
Noise, dust or light spill	Construction	Noise and dust created from machinery (no night works proposed therefore no light spill)	Noise and dust likely to carry beyond development site boundary	Daily, during construction works	Sporadic throughout construction period	Short-term impacts
Inadvertent impacts on adjacent habitat or vegetation	Construction	Damage to adjacent habitat or vegetation	Adjacent vegetation	Daily, during construction works	Throughout construction period	Short-term impacts
Transport of weeds and pathogens from the site to adjacent vegetation	Construction	Spread of weed seed or pathogens	Potential for spread into adjacent habitat	Daily, during construction works	Sporadic throughout construction period	Potentially long-term impacts
Vehicle strike	Construction / operation	Potential for native fauna to be struck by working machinery and moving vehicles	Within access road and development site	Daily, during both construction and operational phases.	Throughout life of project	Short-term impacts

2.2.4 Prescribed biodiversity impacts

The development site has the prescribed biodiversity impacts as outlined in Table 20.

Table 20: Direct impacts on prescribed biodiversity impacts

Prescribed biodiversity impact	Nature	Extent	Frequency	Duration	Timing
Impacts of development on the habitat of threatened species or ecological communities associated with: • karst, caves, crevices, cliffs and other	Construction / operation / on-going	Confined to the development site. Redevelopment of the existing buildings and removal of non-	Daily, during construction works Ongoing additional noise, vibration	Throughout construction period	Short-term impacts

Prescribed biodiversity impact	Nature	Extent	Frequency	Duration	Timing
geological features of significance, or • rocks, or • human made structures, or • non-native vegetation		native vegetation			
Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Construction / operation / on-going	Confined to the development site Production of noise and vibration	Daily, during construction works Ongoing additional noise and vibration during construction	Throughout construction period	Short-term impacts
Impacts of development on movement of threatened species that maintains their lifecycle	Construction / operation / on-going	Confined to the development site	Daily, during construction works Ongoing additional noise and vibration during construction	Throughout construction period	Short-term impacts

Figure 7: Indirect impacts

2.2.5 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in Table 21.

Table 21: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	Moderate	Minor	Pre-clearance survey of trees to be removed and identification / location of habitat trees (i.e. for birds or possums) by a suitably qualified ecologist. Trees identified for retention should be clearly delineated as a 'No Go' zone with high visibility bunting. Supervision by a qualified ecologist/licensed wildlife handler during habitat tree removal in accordance with best practise methods. Any tree removal is to be undertaken by a suitably qualified and insured arborist.	Any fauna utilising habitat within the development site will be identified and managed to ensure clearing works minimise the likelihood of injuring resident fauna	During clearing works	Project Manager / Ecologist
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Minor	Appropriate controls are to be utilised to manage exposed soil surfaces and stockpiles to prevent sediment discharge into waterways or into adjacent Stony Range Regional Botanic Gardens. Soil and erosion measures such as sediment fencing, clean water diversion must be in place prior the commencement of the construction work.	Erosion and sedimentation will be controlled	For the duration of construction works	Project Manager
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Moderate	Minor	Vehicles, machinery should be cleaned of soil prior to entry into the development site as external soil may contain pathogens or disease. Weed management to be undertaken where required.	Spread of weeds prevented	Post-construction	Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development site	Minor	Negligible	Landscaping in the development site is to use locality derived native species and those found within the PCTs present (PTC 1776).	Areas within the development site will be landscaped using appropriate species	Throughout construction and following completion of construction activities.	Project Manager

2.2.6 Serious and Irreversible Impacts (SAII)

The development does not have any Serious and Irreversible Impacts (SAII).

2.3 Risk Assessment

A risk assessment has been undertaken for any residual impacts likely to remain after the mitigation measures have been applied. Likelihood criteria, consequence criteria and the risk matrix are provided in Table 22, Table 23 and Table 24 respectively.

Table 22: Likelihood criteria

Likelihood criteria	Description
Almost certain (Common)	Will occur, or is of a continuous nature, or the likelihood is unknown. There is likely to be an event at least once a year or greater (up to ten times per year). It often occurs in similar environments. The event is expected to occur in most circumstances.
Likely (Has occurred in recent history)	There is likely to be an event on average every one to five years. Likely to have been a similar incident occurring in similar environments. The event will probably occur in most circumstances.
Possible (Could happen, has occurred in the past, but not common)	The event could occur. There is likely to be an event on average every five to twenty years.
Unlikely (Not likely or uncommon)	The event could occur but is not expected. A rare occurrence (once per one hundred years).
Remote (Rare or practically impossible)	The event may occur only in exceptional circumstances. Very rare occurrence (once per one thousand years). Unlikely that it has occurred elsewhere; and, if it has occurred, it is regarded as unique.

Table 23: Consequence criteria

Consequence category	Description
Critical (Severe, widespread long-term effect)	Destruction of sensitive environmental features. Severe impact on ecosystem. Impacts are irreversible and/or widespread. Regulatory and high-level government intervention/action. Community outrage expected. Prosecution likely.
Major (Wider spread, moderate to long term effect)	Long-term impact of regional significance on sensitive environmental features (e.g. wetlands). Likely to result in regulatory intervention/action. Environmental harm either temporary or permanent, requiring immediate attention. Community outrage possible. Prosecution possible.
Moderate (Localised, short-term to moderate effect)	Short term impact on sensitive environmental features. Triggers regulatory investigation. Significant changes that may be rehabilitated with difficulty. Repeated public concern.
Minor (Localised short-term effect)	Impact on fauna, flora and/or habitat but no negative effects on ecosystem. Easily rehabilitated. Requires immediate regulator notification.
Negligible (Minimal impact or no lasting effect)	Negligible impact on fauna/flora, habitat, aquatic ecosystem or water resources. Impacts are local, temporary and reversible. Incident reporting according to routine protocols.

Table 24: Risk matrix

Consequence	Likelihood				
	Almost certain	Likely	Possible	Unlikely	Remote
Critical	Very High	Very High	High	High	Medium
Major	Very High	High	High	Medium	Medium
Moderate	High	Medium	Medium	Medium	Low
Minor	Medium	Medium	Low	Low	Very Low
Negligible	Medium	Low	Low	Very Low	Very Low

Table 25: Risk assessment

Potential impact	Project phase	Risk (pre-mitigation)	Risk (post mitigation)
Vegetation clearing	Construction / operation	Low	Very Low
Sedimentation and contaminated and/or nutrient rich run-off	Construction	High	Low
Noise, dust or light spill	Construction	Medium	Low
Inadvertent impacts on adjacent habitat or vegetation	Construction	Medium	Low
Transport of weeds and pathogens from the site to adjacent vegetation	Construction	Medium	Low
Vehicle strike	Construction / operation	Low	Very Low
Trampling of threatened flora species	Construction / operation	Low	Very Low
Rubbish dumping	Construction / operation	Low	Very Low
Increase in predatory species populations	Construction / operation	Low	Very Low
Increase in pest animal populations	Construction / operation	Low	Very Low
Increased risk of fire	Construction / operation	Low	Very Low
Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	Construction / operation	Low	Very Low

2.4 Impact Summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

2.4.1 Serious and Irreversible Impacts (SAII)

The development does not have any Serious and Irreversible Impacts (SAII).

2.4.2 Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 26 and shown on Figure 8.

Table 26: Impacts to native vegetation that require offsets

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1776	Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.035

2.4.3 Impacts not requiring offsets

All native vegetation within the development site which will be removed requires offsets.

2.4.4 Areas not requiring assessment

Areas not requiring assessment include existing concrete driveways, exotic garden lawn and exotic vegetation. The development site contains build/cleared areas (2.76 ha), exotic lawn and exotic vegetation (0.06 ha) as shown in Figure 9. These areas were not consistent with any listed PCT, nor did they contain any threatened species. An assessment of Prescribed Impacts has been undertaken, hence further assessment under the BAM was not required. Areas not requiring assessment are shown on Figure 9.

2.4.5 Credit summary

The number of ecosystem credits required for the development are outlined in Table 27. A biodiversity credit report is included in Appendix E.

Table 27: Ecosystem credits required

PCT ID	PCT Name	Vegetation Formation	Direct impact (ha)	Credits required
1776	Smooth-barked Apple – Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	Dry Sclerophyll Forests (Shrubby sub-formation)	0.035	1

Figure 8: Impacts requiring offset

Figure 9: Areas not requiring assessment

2.5 Consistency with Legislation and Policy

Additional matters relating to impacts on flora and fauna which are not covered by the BC Act must also be addressed for the proposed development. Potential MNES in accordance with the EPBC Act have been addressed in Section 2.5.1. Matters relating to the Warringah Planning Instruments are provided below in Section 2.5.2 and 2.5.3.

2.5.1 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which 'has, will have, or is likely to have a significant impact on a MNES' is defined as a controlled action and requires approval from the Commonwealth Department of the Environment and Energy (DotEE).

The process includes the application of Significant Impact Criteria for listed MNES that will be affected as a result of the proposed action. Impact assessment guidelines outline a number of criteria to provide assistance in conducting the assessment and help decide whether a referral to the Commonwealth is recommended. These guidelines were used in applying the Significant Impact Criteria to the following species:

- *Pteropus poliocephalus* (Grey-headed Flying-fox)

2.5.1.1 *Pteropus poliocephalus* (Grey-headed Flying-fox)

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	The Matters of National Environmental Significance Impact Guidelines 1.1 (Commonwealth of Australia, 2013) defines an important population as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • Key source populations either for breeding or dispersal • Populations that are necessary for maintaining genetic diversity, and/or • Populations that are near the limit of the species range No important populations have been recorded within the development site. The development site does not support key source populations for breeding or dispersal, populations necessary for maintaining genetic diversity, or populations near the limit of the species range. According to the National Flying-fox Monitoring Program, no Grey-headed Flying-fox camps currently occur or have ever been recorded within the development site (DotEE 2019c). The nearest active Grey-headed Flying-fox camp occurs approximately 7 km to the south of the development site, within Balgowlah (DotEE 2019c).
2)	reduce the area of occupancy of an important population	No important populations have been recorded within the development site. Therefore, the proposed works would not reduce the area of occupancy of an important population.
3)	fragment an existing important population into two or more populations	No important populations have been recorded within the development site. The potential foraging habitat to be removed is marginal relative to adjacent potential habitat within the locality of the development site. Whilst the potential foraging habitat may contribute as a 'steppingstone' for this highly mobile species to other more substantial foraging habitat

Criterion	Question	Response
		sites, this function is unlikely to be significantly inhibited by the proposed works. Furthermore, this species has been recorded in urban environments and is likely to continue to forage adjacent to the development site and across the broader locality.
4)	adversely affect habitat critical to the survival of a species	0.035 ha of planted native vegetation will be removed. This represents a negligible amount of potential foraging resources in the locality. Potential foraging habitat will persist in close proximity to the development site, within the remaining vegetation adjacent to the development site contains a large stand of high quality intact native vegetation which connects with the Stony Range Botanic Gardens. Given that this species is highly mobile (traveling up to 50 km to forage), it is considered unlikely that the works would adversely affect habitat critical to the survival of this species
5)	disrupt the breeding cycle of an important population	According to the National Flying-fox Monitoring Program, no Grey-headed Flying-fox camps currently occur or have ever been recorded within the development site (DotEE 2019c). The nearest active Grey-headed Flying-fox camp occurs approximately 7 km to the south of the development site, within Balgowlah (DotEE 2019c). Thus, no important population of Grey-headed Flying-fox occurs within the development site, and the proposed works are unlikely to disrupt the breeding cycle of an important population.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The potential foraging habitat to be removed is marginal and of low quality. Given the small amount of potential foraging habitat to be removed, that potential foraging habitat will persist within the development site and across the locality, and that this species is highly mobile, it is unlikely that the habitat to be removed would cause the species to decline. Furthermore, according to the National Flying-fox Monitoring Program, no Grey-headed Flying-fox camps currently occur or have ever been recorded within the study area (DotEE 2019c). The nearest active Grey-headed Flying-fox camp occurs approximately 7 km to the south of the development site, within Balgowlah (DotEE 2019c). Therefore, no known Grey-headed Flying-fox roosting camps for this species will be impacted by the proposed works.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed works will not result in the establishment of an invasive species that is harmful to the Grey-headed Flying-fox.
8)	introduce disease that may cause the species to decline, or	The proposed works will not result in the introduction of a disease that is harmful to the Grey-headed Flying-fox.
9)	interfere substantially with the recovery of the species.	Considering the above factors, the proposed works will not interfere substantially with the recovery of the species.
Conclusion	Is there likely to be a significant impact?	No. In consideration of the above, the proposed works are considered unlikely to have a significant impact on the Grey-headed Flying-fox.

2.5.2 Warringah Local Environment Plan 2011

The proposed development site is zoned as the following under the Warringah Local Environment Plan (LEP) 2011:

- 800 Pittwater Road zoned - B5 Business development
- 224 Headland Road zoned - IN1 General industrial
- 210 Headland Road zoned – R2 Low density residential.

The site is not subject to the Biodiversity or Riparian overlay under the LEP.

2.5.3 Warringah Development Control Plan 2011

Small portions of the proposed development site located on the edges between the development site and Stony Range Regional Botanic Garden comprise land mapped as Native Vegetation under the Warringah DCP. Field validation identified that these mapped areas correspond with overhanging canopy vegetation from the Stony Range Regional Botanic Gardens. There is no vegetation along the northern boundary within the development site (refer to Photo 3). However, the requirements stated in the DCP for land identified on this map must be considered in relation to the proposed development, see table below.

Table 28: Summary of Warringah DCP 2011 controls and response

DCP	Requirement	Response
1.	For modification of native vegetation where the area of land supporting the vegetation to be modified is greater than 100 m^2 or the land supporting the vegetation to be modified forms part of an allotment where vegetation has been modified in the last five years: a. The applicant must demonstrate that the objectives have been achieved through a Flora and Fauna Assessment prepared in accordance with Council guidelines; and b. The applicant must demonstrate that the objectives have been achieved through a Biodiversity Management Plan prepared in accordance with Council guidelines that will protect native vegetation on the subject property.	The development site is 3.06 ha in size. Under the proposed redevelopment will result in the loss of approximately 0.035 ha of native planted vegetation. The planted vegetation impacted by the proposed works has not been mapped as Native Vegetation under the DCP. Overhanging branches from Stony Range Regional Botanic Gardens along the northern boundary has been mapped as Native Vegetation. The proposed works will not directly impact this vegetation. Indirect impacts have been assessed and are included in Section 2.2.3. The development site does not support areas of land with greater than 100 m^2 of native vegetation. BDAR addresses the proposed development impacts upon threatened species, populations and ecological communities listed under the BC Act and EPBC Act. A Biodiversity Management Plan is not required for the SSD application.
2.	For modification of native vegetation in all other cases, the applicant must demonstrate that the objectives have been achieved.	Refer to response above.

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Appendix A Definitions

Terminology	Definition
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, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state:	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
Operational Manual	The Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM
Patch size	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Remaining impact	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on 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	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by OEH and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B Vegetation plot data

Table 29: Species matrix (species recorded by plot)

Scientific Name	Common Name	Native / Exotic / HTE
Angophora hispida	Rough-barked Apple	N
Araujia sericifera	Moth Vine	E
Asparagus aethiopicus	Asparagus Fern	HTE
Banksia ericifolia subsp. ericifolia		N
Banksia integrifolia subsp. integrifolia	Coastal Banksia	N
Bidens pilosa	Cobblers Friend	E
Casuarina glauca	Swamp Oak	N
Cenchrus spp.	Kikuyu	HTE
Chlorophytum spp.		
Cinnamomum camphora	Camphor Laurel	HTE
Commelina cyanea	Native Trad	N
Conyza bonariensis	Fleabane	E
Cotoneaster spp.	Cotoneaster	E
Cotula australis		N
Crocosmia spp.		E
Dianella caerulea var. protensa		N
Doryanthes excelsa	Gymea Lily	N
Ehrharta erecta	Panic Veltgrass	HTE
Elaeocarpus reticulatus	Blueberry Ash	N
Eucalyptus saligna	Sydney Blue Gum	N
Fumaria capreolata subsp. capreolata		
Gamochaeta spp.	Cudweed	
Gardenia spp.		E
Glochidion ferdinandi var. ferdinandi	Cheese Tree	N
Grevillea spp.		N
Hakea sericea		N
Hibbertia scandens		N
Hypochaeris radicata		E
Leptospermum polygalifolium subsp. polygalifolium		N
Ligustrum lucidum		HTE
Ligustrum sinense		HTE
Lomandra longifolia		N

Scientific Name	Common Name	Native / Exotic / HTE
Lonicera japonica		HTE
Nephrolepis cordifolia	Fishbone Fern	N
Ochna serrulata	Ochna	HTE
Olea europaea subsp. cuspidata	African Olive	HTE
Oxalis articulata		E
Pittosporum undulatum	Sweet Pittosporum	N
Poa annua	Winter Grass	N
Prunus spp.		E
Senna spp.		E
Solanum nigrum		E
Sonchus spp.		E
Syzygium spp.		N
Trifolium repens		E
Westringia fruticosa	Westringia	N

Table 30: Vegetation integrity data (Composition, Structure and function)

Plot location data							
Plot no.	PCT	Vegetation Zone	Condition	Zone	Eastings	Northings	Bearing
1	1776	1	Planted	56	340943	6263134	245

Composition (number of species)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	5	9	2	4	1	2

Structure (Total cover %)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	37.0	10.7	5.1	1.6	15	1

Function												
Plot no.	Large Trees	Hollow trees	Litter Cover (%)	Length Fallen Logs (m)	Tree Stem 5-9 cm	Tree Stem 10-19 cm	Tree Stem 20-29 cm	Tree Stem 30-49 cm	Tree Stem 50-79 cm	Tree Stem 80+ cm	Tree Regen	High Threat Weed Cover (%)
1	1	0	60	0	1	1	1	1	1	0	0	13.4

Appendix C Photos

Photo 4: End of plot 1 looking NE

Appendix D Vegetation analysis

PlantCommunityTypeID		659	661	664	694	724	725	743	771	772	781	806	807	830	835	849	850	875	877	881	882	883	897	898	905
PCT Listing Status										Approved	Approved												Approved		
CommonCommunityName		659 Bangalay - Old-man Banksia open forest on coastal sands, Sydney Basin Bioregion and South East Corner Bioregion	661 Bangalay - Smooth-barked Apple - Swamp Mahogany low open forest of southern Sydney, Sydney Basin Bioregion	664 Banksia heath on aeolian sands of eastern Sydney suburbs, Sydney Basin Bioregion	694 Blackbutt - Turpentine - Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin	724 Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney	725 Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion	743 Brown Barrel - Mountain Grey Gum tall moist forest on basalts of the Southern Highlands Bioregion and Sydney Basin	771 Coast Banksia - Coast Tea-tree low moist forest on coastal sands and headlands, Sydney Basin Bioregion and South East	772 Coast Banksia - Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion	781 Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	806 Derived grasslands on shale hills of the Cumberland Plain (50-300m asl)	807 Derived grasslands on shale plains of the Cumberland Plain (<100m asl)	830 Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	850 Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	875 Grey Myrtle - Lilly Pilly dry rainforest in dry gullies of the Sydney Basin Bioregion and South East Corner Bioregion	877 Grey Myrtle dry rainforest of the Sydney Basin Bioregion and South East Corner Bioregion	881 Hairpin Banksia - Kunzea ambigua - Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin	882 Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion	883 Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion	897 Kangaroo Grass sod tussock grassland of coastal areas of the Sydney Basin Bioregion	898 Kangaroo Grass sod tussock grassland of coastal areas of the Sydney Basin Bioregion and South East Corner	905 Lilly Pilly - Coachwood warm temperate rainforest on moist sheltered slopes and gullies, Sydney Basin Bioregion and South
CharSpeciesByStratumU_ID		Eucalyptu	Eucalyptu	Corymbia	Eucalyptu	Eucalyptu	Eucalyptu	Eucalyptu	Banksia	Banksia				Eucalyptu	Eucalyptu	Eucalyptu	Eucalyptu	Backhous	Backhous		Corymbia	Eucalyptu			Syzygium
CharSpeciesByStratumM_ID		Allocasua	Banksia	Banksia	Breynia	Melaleuca	Melaleuca	Clematis	Breynia	Acacia	Melaleuca			Breynia	Acacia	Bursaria	Acacia	Ficus	Pittosporu	Acacia	Banksia	Acacia		Banksia	Cissus
CharSpeciesByStratumG_ID		Dianella	Actinotus	Eragrostis	Dianella	Aristida	Aristida	Adiantum	Commeli	Carpobrot	Baumea	Aristida	Aristida	Arthropodi	Commeli	Aristida	Aristida	Doodia	Adiantum	Actinotus	Actinotus	Aristida	Centella	Acaena	Aspleniu
	Maximum characteristic																								
Total Characteristic Canopy	1	1							1	1															
Total Characteristic Midstorey	3		2															1	1			1		3	
Total Characteristic Groundlayer	3	1	1	1	2			2	3	1					1								3	3	
All structural layers present?	if present, then "YES"																						YES	YES	
Sum of characteristic present (with all structural layers present)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0

Due to the low species diversity and planted structure of the vegetation, the vegetation analysis did not identify suitable PCTs for the vegetation within the development site.

Appendix E Biodiversity credit report

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BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00018187/BAAS18159/20/00018188	St Lukes Grammar redevelopment	26/11/2019
Assessor Name	**Report Created**	**BAM Data version ***
	20/01/2020	22
Assessor Number	**BAM Case Status**	**Date Finalised**
	Open	To be finalised
Assessment Revision	**Assessment Type**	
0	Major Projects	

* 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	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits

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BAM Credit Summary Report

Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast								
1	1776_planted_natives	36.3	0.0	0.25	High Sensitivity to Potential Gain	1.75		1
							Subtotal	**1**
							Total	**1**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits

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