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Your ref: DDWO05725-23
Our ref: 12627544

19 December 2024

Elise Harrison
Project Manager
New South Wales Department of Education – School Infrastructure

New High School for Jordan Springs Biodiversity Assessment

Dear Elise

1. Introduction

1.1 Background

This biodiversity assessment has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for the construction and operation of a New High School for Jordan Springs (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI).

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments - Consideration of environmental factors for health services facilities and schools – Addendum October 2024 (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and Environmental Planning and Assessment Regulations 2021 under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Table 1.

Table 1 Summary of relevant section of the Part 5 guidelines and EP&A Regulation

Regulation/ Guideline Section	Requirement	Response	Report section
2c	Any environmental impact on the ecosystems of the locality	The proposed activity will have minimal impacts on native biota	4
3f	Any impact on the habitat of protected animals (within the meaning of the *Biodiversity Conservation Act* 2016)	The proposed activity will have minimal impacts on native biota	4
3g	Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	The proposed activity will have minimal impacts on native biota	4
3h	Any long-term effects on the environment	The proposed activity will have minimal impacts on native biota	4

Regulation/ Guideline Section	Requirement	Response	Report section
3i	Any degradation of the quality of the environment	The proposed activity will have minimal impacts on native biota	4

GHD has previously prepared a preliminary biodiversity constraints report for the site (GHD 2024, attached). This letter summarises the results of the constraints assessment (GHD (2024) and the survey of the on-site detention (OSD) basin conducted on 3 October 2024, and provides a summary of potential significance of impacts of the proposed activity on biodiversity values and advice as to whether a BDAR or Species Impact Statement (SIS) is required.

1.2 Documentation review

A desktop assessment was undertaken to identify threatened flora and fauna species, populations and ecological communities listed under the BC Act and MNES listed under the EPBC Act that may occur in the study area. Database records pertaining to the study area and locality (i.e. within a 10 km radius of the subject site and within the last 20 years) were reviewed, along with relevant report and, mapping, including:

- NSW Department of Planning and Environment (DPE) NSW BioNet Atlas database for records of threatened species listed under the BC Act (DPE 2023a). Accessed on 21 November 2023
- DPE Threatened biodiversity profile search online database for threatened ecological communities listed under the BC Act (DPE 2023c)
- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Online Search Tool for MNES listed under the EPBC Act that are known or predicted to occur in the locality (DCCEEW 2023a). Accessed on 22 November 2023
- NSW Department of Primary Industries (DPI) Fisheries NSW Spatial Data for records of threatened species, populations or ecological communities listed under the FM Act (DPI 2023). Accessed on 27 November 2023
- NearMap for a photographic review of disturbance within the study area (NearMap 2023). Image from 9 December 2023
- NSW BioNet Vegetation Classification (DPE 2023b) to identify plant community types (PCTs) in the study area
- SEED portal for historical aerial photography and additional GIS datasets including soil, topography, geology and riparian lands watercourses (DPE 2023d)
- State Vegetation Type Map (SVTM) (DPE 2023e).
- Guidelines for Division 5.1 assessments (2022).

The following plans/reports identified in have been reviewed to inform the assessment contained within this report (Table 2).

Table 2 Plans and reports reviewed

Discipline	Document name	Revision	Date
Architectural	JSHS Architectural REF Drawings	REV 2	6/12/2024

1.3 Proposed activity description

The proposed activity is for the construction and operation of a New High School for Jordan Springs, which is proposed to have a capacity of 1,000 students and 80 staff to meet forecast enrolment demand associated with population growth in Jordan Springs and Ropes Crossing. The school will provide permanent General Learning Spaces (GLS), Support Learning Spaces (SLS), staff facilities and a library across three (3), three storey buildings, a single storey hall, half playing field, three (3) outdoor sport courts,

72 operational at grade parking spaces (including two (2) accessible spaces), 100 bicycle spaces and landscaping.

Public domain works and the off-site OSD Basin are to be constructed by others under separate planning pathways.

1.4 Proposed activity scenarios

The project scope of works includes two (2) Scenarios, to allow construction and operation of the school, with (Scenario 1 – preferred option) or without (Scenario 2 – Interim Solution) the public domain works and permanent off-site basin being constructed by others under a separate planning pathway..

1.4.1 Scenario 1 – Preferred Option - Road Network completed and permanent OSD Basin Constructed

External works undertaken by others to facilitate Scenario 1

– Construction of Park Edge Road;
– Any adjustments to Infantry Street;
– Kiss and drop zone along Park Edge Road;
– Support drop off zone located along Infantry Street; and
– Construction and operation of OSD Basin off site.

Note – Scenario 1 is not to proceed if external works undertaken by others is not completed.

Scenario 1

– Construction and Operation of the New High School for Jordan Springs, including:
  - Decommissioning of existing OSD basin;
  - Earthworks;
  - Three (3) multi-storey classroom buildings;
  - One (1) school hall;
  - Three (3) outdoor sport's courts;
  - One (1) sport's field;
  - 72 at grade car parking spaces, including two (2) accessible parking spaces, and waste services, accessed via Park Edge Road;
  - 100 bicycle parking spaces across; and
  - Landscaping.

1.4.2 Scenario 2 - Interim Solution – Road network not completed, Permanent OSD Basin not constructed.

Scenario 2 - Stage 1

– Construction and operation of a temporary OSD Basin;
– Construction and operation of the New High School for Jordan Springs, including;
  - Earthworks;
  - Three (3) multi-storey classroom buildings;
  - One (1) sport's field;
  - Temporary carpark - 72 at grade car parking spaces, including two (2) accessible parking spaces and waste services, located on the northwest corner of the site, accessed off Armoury Road;
  - 100 bicycle parking spaces across;
  - Temporary Kiss and drop facilities on Armoury Road; and

- Associated landscaping.

Scenario 2 - Stage 2

Stage 2 is not to be undertaken until the temporary OSD basin under stage 1 works is completed and operational.

– Decommissioning of existing OSD basin, prior to the following works being undertaken:
  - 72 at grade car parking spaces, including two (2) accessible parking spaces, and waste services, located on the southeast corner of the site. This car park cannot be constructed until the decommissioning of the existing OSD basin is completed and will be non-operational with no road connection until completion of Scenario 2 – Stage 3;
  - One (1) school hall;
  - Three (3) outdoor sport's courts; and
  - Associated landscaping.

External works undertaken by others to facilitate Stage 3

– Construction of Park Edge Road;
– Any adjustments to Infantry Street;
– Kiss and drop zone along Park Edge Road;
– Support drop off zone located along Infantry Street; and
– Construction and operation of OSD Basin off site.

– Note – Scenario 2 - Stage 3 is not to proceed until the external works undertaken by others have been completed.

Scenario 2 - Stage 3

– Connection of the southeast carpark to Park Edge Road;
– Rectification works along Armoury Road to remove temporary kiss and drop facilities and cross over for temporary carpark;
– Demolition of temporary carpark, once permanent car park is operational; and
– Decommissioning of temporary OSD basin.

1.5 Activity site

The project site is located on the corner of Armoury Road and Infantry Street in Jordan Springs and is legally described as part of Lots 2 and 3 in DP 1248480. Figure 1 provides an aerial photograph of the project site, outlines the boundaries of the project site (in red) and the boundaries of Lots 2 and 3 in DP 1248480 (in blue).

Figure 1 Arial photograph (provided by DFP planning consultants)

The project site is within the Central Precinct of the St Mary's Release Area in the Penrith Local Government Area.

1.6 Other approvals

External works and construction of the permanent off-site OSD Basin are to be constructed by others.

2. Legislative context

2.1 Environmental Planning and Assessment Act 1979

The EP&A Act forms the legal and policy platform for proposal assessment and approval in NSW and aims to, inter alia, 'encourage the proper management, assessment and conservation of natural and artificial resources'. Development in NSW is assessed in accordance with the provisions of the EP&A Act and EPA Regulation 2021. Under section 5.5 (1) of the EP&A Act, determining authorities must 'examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity'.

The EP&A Act is subject to the provisions of Part 7 of the BC Act and Part 7A of the FM Act. Part 7.3 of the BC Act and section 220ZZ of the FM Act list factors that must be taken into account when determining the significance of potential impacts of a proposed activity on threatened species, populations or ecological communities (or their habitats) listed under the BC Act and/or FM Act.

2.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides legal status for biota of conservation significance in NSW. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act aims, amongst other things, to maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations, and to support conservation and threat abatement action to slow the rate of biodiversity loss and conserve threatened species and ecological communities in nature.

Under Part 7.8 of the BC Act, a Part 5 activity (ie an REF) is likely to significantly affect threatened species if:

– it is carried out in an area of outstanding biodiversity value (AOBV)
– it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 of the Act.

The Biodiversity Offsets Scheme (BOS) thresholds do not apply to Part 5 activities. While the site is mapped on the Biodiversity Values Map this does not trigger the BOS. Proponents of Part 5 activities can opt into the BOS if required to comply with their obligations under Part 5 of the EP&A Act.

Part 7.3 of the BC Act lists five factors that must be taken into account when determining the significance of potential impacts of a proposed activity on threatened species, populations or ecological communities (or their habitats) listed under the BC Act. The 'five part test' or 'assessment of significance' is used to assist in the determination of whether a project is 'likely' to impose 'a significant effect' on threatened biota and thus whether a Species Impact Statement (SIS) is required. There is also the option to prepare a Biodiversity Development Assessment Report (BDAR) rather than a SIS, where a significant impact is likely. If the proponent opts into the BOS and a decision has been made to carry out the activity, the credit obligation (and any other actions required) will be included as conditions of approval.

This report provides a summary of terrestrial biodiversity values present at the site and an assessment of potential impacts of the proposed redevelopment.

2.3 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act 1994* (FM Act) are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It provides for the listing of threatened species, populations and ecological communities, key threatening processes and requirements or otherwise for the preparation of a SIS. One of the objectives of the FM Act is to 'conserve key fish habitats' which includes aquatic habitats that are important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. To assist in the protection of key fish habitats, DPI has produced the *Policy and guidelines for fish habitat conservation and management* (DPI, 2013).

This report provides a summary of biodiversity values present at the site and an assessment of potential impacts of the proposed redevelopment.

2.4 Environmental Protection and Biodiversity Conservation Act 1999

The purpose of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is to ensure that actions likely to cause a significant impact on matters of national environmental significance (MNES) undergo an assessment and approval process. An action that 'has, will have or is likely to have a significant impact on a matter of national environmental significance' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Australian Government Minister for the Environment. MNES of potential relevance to this site include threatened species and ecological communities and migratory species.

This report provides a summary of biodiversity values present at the site and an assessment of potential impacts of the proposed redevelopment on MNES.

3. Existing environment

The proposal site exists as a mostly cleared area of land with new roads and re-established grassland. Juvenile native street trees (Water Gum, *Tristaniopsis laurina*) (<3 m in height) have recently been planted at regular intervals on the nature strip along the new roads (see Figure 2). The proposal site is surrounded by new residential buildings to the west and south and remnant native bushland to the east. No native plant

community types are present at the proposal site. Prior to vegetation clearing works, the site is likely to have supported at least one threatened ecological community listed under the BC Act and/or EPBC Act, however removal of all vegetation and bulk earthworks that have been completed since 2016 mean the site no longer supports any native vegetation communities. Water Gums at the proposal site are a typical planted street tree species in Sydney and not a species that would have occurred naturally at the proposal site. Mown grassland and planted trees provide habitat for common bird species typical of urban environments, such as the Australian Magpie (*Cracticus tibicen*) and Magpie-lark (*Grallina cyanoleuca*).

An OSD basin was constructed on the proposal site between Coorabin and Baralga Streets in March of 2019 (see Figure 3). The dam has generally bare sides and only limited native reed species have colonized it. Several common frog species were identified, including the Common Eastern Froglet (*Crinia signifera*) and Peron's Tree Frog (*Litoria peroni*), as well as common waterbird species including the Australian Wood Duck (*Chenonetta jubata*), Australasian Swamphen (*Porphyrio porphyrio*) and Little Pied Cormorant (*Microcarbo melanoleucos*). No noxious fish such as the Mosquitofish (*Gambusia holbrooki*) were observed.

No evidence of threatened species was recorded. A likelihood of occurrence assessment provided in GHD (2024) (attached) contains further information on habitat values in the surrounding areas and an assessment of the likelihood of occurrence of threatened biota. The constraints report concluded that threatened species predicted or known to occur in the locality would not occur within the proposal site due to the absence of suitable habitat features. No threatened species are likely to rely on habitats at the proposal site other than as transient individuals.

The proposal site is mapped on the Biodiversity Values Map due to the presence of threatened species or communities with the potential for serious and irreversible impacts. This vegetation was removed previously as a result of bulk earthworks that have been completed since 2016 and no longer occurs on the site. As noted in section 2.2, impacts on land mapped on the Biodiversity Values Map do not trigger the BOS for a Part 5 activity.

Figure 2 OSD basin. ***The proposal site. Taken on Academy Street, facing north-east towards the***

Figure 3 *The OSD basin on the proposal site. Taken facing south.*

4. Evaluation of environmental impacts

The site is considered to be in a very poor condition with low biodiversity value due to the lack of intact native vegetation, presence of exotic species and previous broad-scale clearing. The preliminary constraints report (GHD 2024) found that the proposal site has a very low to low biodiversity constraint. The site visit further confirmed that habitat values are limited. Most planted native street trees (Water Gums) are to be retained, and additional trees are to be planted as part of the activity. No threatened species are likely to occur at the proposal site, other than as transient individuals. As such, no threatened biota listed under the BC Act, FM Act or EPBC Act are likely to be impacted by the proposal. Given the low biodiversity values present and negligible risk of impacts on threatened biota, assessments of significance are not considered necessary for the proposal. The activity will not have a 'significant affect on the environment' (refer to Section 5.7 of the EP&A Act). The proposed activity will not have any significant impact on threatened biota listed under the BC Act, FM Act or EPBC Act. A BDAR or SIS is not required, and the proposed activity does not require referral to the Commonwealth Minister for the Environment.

5 Mitigation measures

The proposed activity will have minimal impacts on native biota. Planting of additional trees will substantially increase tree cover and improve habitat values and wildlife connectivity for many species. Relevant mitigation measures are provided in Table 3 for the various scenarios and stages (as relevant).

Table 3 Mitigation measures

Mitigation Number/ Name	When is Mitigation Measure to be complied with	Mitigation Measure	Reason for Mitigation Measure
Scenario 1			
Decommissioning of existing OSD Basin	Prior to commence of any construction works	If dewatering is required, water should be irrigated within the property boundaries or fed into an off-site permanent basin or temporary on-site basin rather than discharged to the nearby South Creek.	To ensure there is no negative impact on South Creek.
Decommissioning of existing OSD Basin	Prior to decommissioning	Decommissioning of existing OSD Basin should occur outside the breeding season (spring) of waterfowl). A qualified ecologist should inspect the OSD basin prior to decommissioning to check for active nests. If active nests are present decommissioning should be delayed until all birds have fledged.	To ensure there is no negative impact on native wildlife.
Decommissioning of existing OSD Basin	During decommissioning	A qualified ecologist should be present if necessary to ensure safe relocation of less mobile fauna such as frogs, turtles and eels to a safe location (eg South Creek).	To ensure there is no negative impact on native wildlife.
Decommissioning of existing OSD Basin	During decommissioning	If a threatened species is observed during decommissioning, works should cease until the project ecologist has assessed the mobility of the species or relocated the species to a safe location (eg South Creek). If the species cannot be relocated, works must not recommence until the species has moved on of its own volition.	To ensure there is no negative impact on threatened biota.
Landscaping	Following construction	Any street trees removed should be replaced with advanced trees, at least at a 1:1 ratio, and preferably locally endemic native species. Advanced trees are to be planted to	To improve biodiversity values of the proposal site.

Mitigation Number/ Name	When is Mitigation Measure to be complied with	Mitigation Measure	Reason for Mitigation Measure
		increase canopy cover and provide shade/ reduce urban heat affects.	
Scenario 2 – stage 2			
Decommissioning of existing OSD Basin	Prior to commence of any construction works	If dewatering is required, water should be irrigated within the property boundaries or fed into an off-site permanent basin or temporary on-site basin rather than discharged to the nearby South Creek.	To ensure there is no negative impact on South Creek.
Decommissioning of existing OSD Basin	Prior to decommissioning	Decommissioning of existing OSD Basin should occur outside the breeding season (spring) of waterfowl). A qualified ecologist should inspect the OSD basin prior to decommissioning to check for active nests. If active nests are present decommissioning should be delayed until all birds have fledged.	To ensure there is no negative impact on native wildlife.
Decommissioning of existing OSD Basin	During decommissioning	A qualified ecologist should be present if necessary to ensure safe relocation of less mobile fauna such as frogs, turtles and eels to a safe location (eg South Creek).	To ensure there is no negative impact on native wildlife.
Decommissioning of existing OSD Basin	During decommissioning	If a threatened species is observed during decommissioning, works should cease until the project ecologist has assessed the mobility of the species or relocated the species to a safe location (eg South Creek). If the species cannot be relocated, works must not recommence until the species has moved on of its own volition.	To ensure there is no negative impact on threatened biota.
Landscaping	Following construction	Any street trees removed should be replaced with advanced trees, at least at a 1:1 ratio, and preferably locally endemic native species. Advanced trees are to be planted to increase canopy cover and provide shade/ reduce urban heat affects.	To improve biodiversity values of the proposal site.
Scenario 2 – stage 3			

Mitigation Number/ Name	When is Mitigation Measure to be complied with	Mitigation Measure	Reason for Mitigation Measure
Decommissioning of temporary OSD Basin	Prior to commence of any construction works	If dewatering is required, water should be irrigated within the property boundaries or fed into an off-site permanent basin rather than discharged to the nearby South Creek.	To ensure there is no negative impact on South Creek.
Decommissioning of temporary OSD Basin	Prior to decommissioning	Decommissioning of the temporary OSD Basin should occur outside the breeding season (spring) of waterfowl). A qualified ecologist should inspect the OSD basin prior to decommissioning to check for active nests. If active nests are present decommissioning should be delayed until all birds have fledged.	To ensure there is no negative impact on native wildlife.
Decommissioning of temporary OSD Basin	During decommissioning	A qualified ecologist should be present if necessary to ensure safe relocation of less mobile fauna such as frogs, turtles and eels to a safe location (eg South Creek).	To ensure there is no negative impact on native wildlife.
Decommissioning of temporary OSD Basin	During decommissioning	If a threatened species is observed during decommissioning, works should cease until the project ecologist has assessed the mobility of the species or relocated the species to a safe location (eg South Creek). If the species cannot be relocated, works must not recommence until the species has moved on of its own volition.	To ensure there is no negative impact on threatened biota.

6. Recommendation

The proposal site exists as a mostly cleared area of land. An OSD basin has been constructed on the proposal site and several street trees have been planted. No threatened biota is likely to be impacted by the activity. The activity will not have a significant effect on the environment. Mitigation measures are recommended for decommissioning of the OSD basin and for landscaping.

7. References

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Regards

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Copy to: Becky Chung

Biodiversity Constraints Report

New high school at Jordan Springs

NSW Department of Education

05 February 2024

→ **The Power of Commitment**

School Name:	New high school at Jordan Springs	Company Name:	GHD Pty Ltd
School ID:	Not available	Report Status:	Final
School Address:	Corner of Armoury Road and Infantry Street, Jordan Springs East, NSW	Report Date:	5 February 2024
School Region:	Sydney	Contract Number:	DDWO05725-23

Project name	Jordan Springs HS - Biodiversity					
Document title	Biodiversity Constraints Report | New high school at Jordan Springs					
Project number	12627544					
File name	Biodiversity Constraints DD – New high school at Jordan Springs – GHD – DDWO05725-23					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	A	K. Blain	A. Smith	* on file	P. Dellow	* on file	29/01/2024
Final	0	K. Blain	K. Crosby		N. Bailey		5/02/2024

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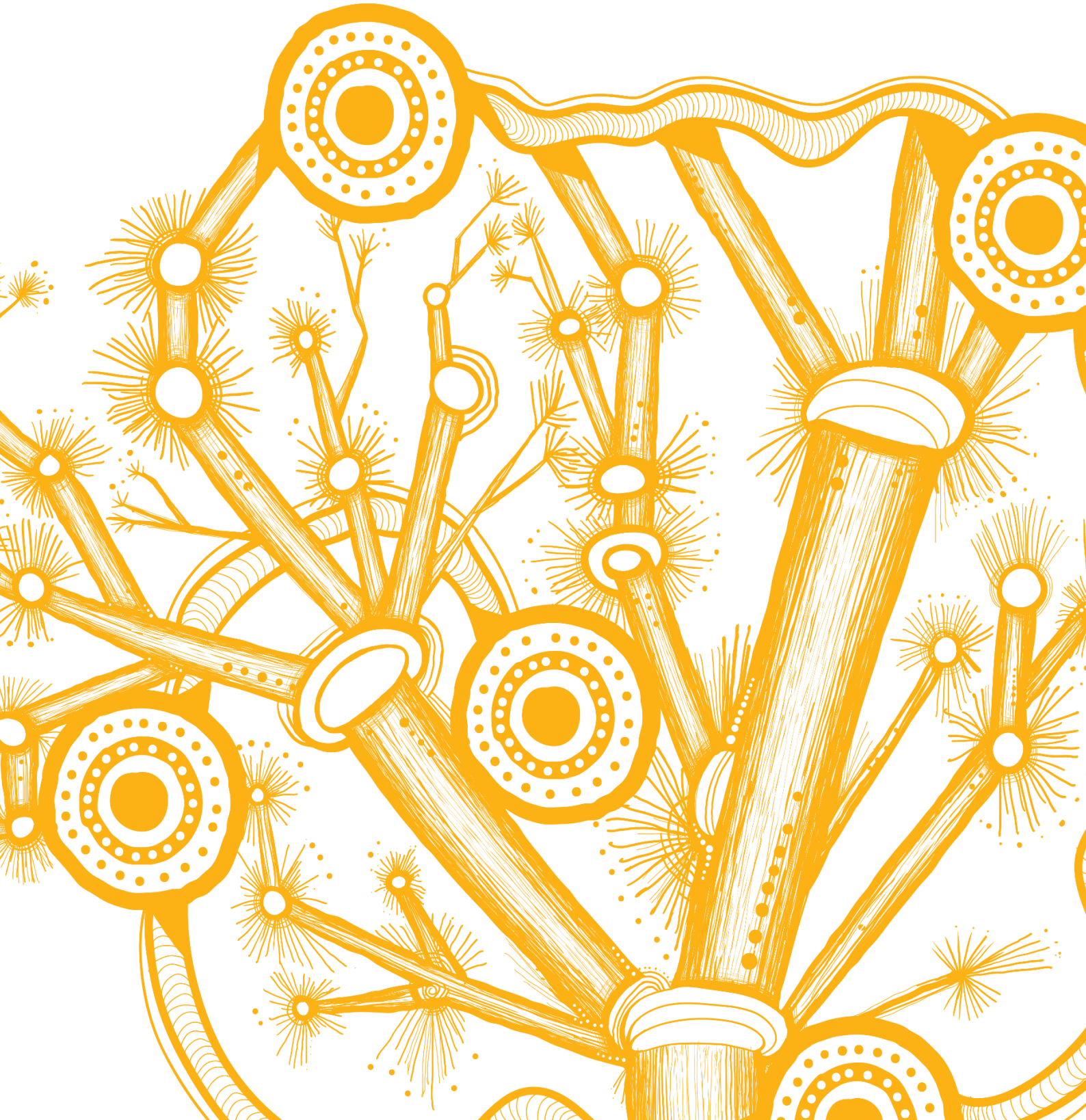
Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.



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1. Introduction

1.1 The proposal

GHD Pty Ltd (GHD) was engaged by the New South Wales (NSW) Department of Education - School Infrastructure to provide a Biodiversity Constraints Assessment Report for the new high school at Jordan Springs. The proposed works are for the construction of a new high school at the new suburb of Jordan Springs. Aerial imagery shows the proposal site and surrounding area being cleared in March 2016 as a part of the development of the new suburb. Detention basins were created on the northern and western side of the subject site adjacent to Lasetter Street and Flynn Circuit respectively, in May 2016. Construction began on roads and residential buildings on the subject site and surrounding area in April 2018. In March 2019, an additional detention dam was created on the subject site between Coorabin and Baralga Streets (NearMap 2023).

It is noted that a design had not been finalised at the time of reporting, and therefore the purpose of the report is to assess for the presence of any potential biodiversity constraints that might be present in the school grounds. The results of this constraints assessment will be used to inform the design of any future development; with an aim to minimise or avoid any impacts to threatened biota and provide recommendations regarding the need for further assessment.

The purpose of this Biodiversity Constraints Assessment is to:

- confirm the conservation significance of the subject site, including the presence of threatened biota listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 199*4 (FM Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and their habitats.
- provide advice regarding the need or otherwise for further assessment, including whether a Biodiversity Development Assessment Report (BDAR) or a BDAR waiver would be required for an application for State Significant Development (SSD) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Site description

The subject site is located at the corner of Armoury Road and Infantry Street, Jordan Springs East, NSW (Lot 2 DP1248480), in the City of Penrith Council Local Government Area (LGA) and covers an area of approximately 3.67 hectares (ha). The subject site is situated in the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) region and Cumberland IBRA subregion. The subject site is mostly bare having been cleared in 2016 and comprises new roads and re-established grassland. A detention dam was constructed on the subject site between Coorabin and Baralga Streets in March of 2019. The proposal is surrounded by new residential buildings to the west and south and native bushland to the east (see Figure 1).

1.3 Key terms used in this report

The following terms have been used throughout this report:

- the '**proposal**' is the construction of a new school at Jordan Springs
- the **'subject site**' is the new high school at Jordan Springs grounds, as shown on Figure 1
- the '**study area**', which comprises the subject site and the immediate surrounds
- the '**locality**' which is a 10 kilometres (km) radius of the subject site that is considered as a part of desktop assessments for local threatened flora, fauna and ecological communities (discussed in Section 3).

1.4 Scope and limitations

This report: has been prepared by GHD for NSW Department of Education and may only be used and relied on by NSW Department of Education for the purpose agreed between GHD and NSW Department of Education as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than NSW Department of Education arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

This survey was, by design, a rapid survey to understand biodiversity constraints of the subject site area. No detailed surveys such as nocturnal surveys or trapping were conducted.

1.5 Abbreviations and acronyms

Abbreviation / Acronym	Descriptions
AOBV	Areas of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	NSW *Biosecurity Act 2015*
BOS	NSW Biodiversity Offset Scheme
CPCP	Cumberland Plain Conservation Plan
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water NSW Department of Climate Change, Energy, the Environment and Water (previously part of DPE)
DPE	NSW Department of Planning and Environment (now DPHI and NSW DCCEEW)
DPHI	NSW Department of Planning, Housing and Infrastructure (previously DPE)
DPI	NSW Department of Primary Industries
DoEE	Commonwealth Department of the Environment and Energy (now Commonwealth DCCEEW)
DotE	Commonwealth Department of the Environment (now Commonwealth DCCEEW)
EEC	Endangered Ecological Community
EP&A Act	NSW *Environmental Planning & Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GHD	GHD Pty Ltd
ha	Hectares
HBT	Hollow-bearing Tree
IBRA	Interim Biogeographic Regionalisation for Australia
KFH	Key Fish Habitat
km	Kilometres
KTP	Key Threatening Process
LGA	Local Government Area
m	Metres
MNES	Matters of National Environmental Significance
NSW	New South Wales
OEH	NSW Office of Environment and Heritage (now NSW DCCEEW)
PCT	Plant community type
PMST	Protected Matters Search Tool
RGBT	NSW Royal Botanic Gardens and Domain Trust
SAII	Serious and irreversible impacts
SEPP	State Environmental Planning Policy
SVTM	State Vegetation Type Map

SIS	Species Impact Statement
SSD	State Significant Development
TEC	Threatened Ecological Community

Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

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Biodiversity Due Diligence

Project No. **12627544**
Revision No. **A**
Date **18/12/2023**

Site location

FIGURE 1

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Print date: 18 Dec 2023 - 17:30

Data source: World Hillshade: Esri, CGIAR
Imagery - Nearmap:
World Topographic Map: Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS Cadastre, Roads, Suburbs - NSWSS, 2023. SVTM - DPE, 2023. Created by: pfernandes

2. Statutory framework

2.1 NSW legislation

2.1.1 Environmental Planning and Assessment Act 1979

The EP&A Act forms the legal and policy platform for proposal assessment and approval in NSW and aims to, inter alia, 'encourage the proper management, assessment and conservation of natural and artificial resources'. Development in NSW is assessed in accordance with the provisions of the EP&A Act and EP&A Regulation 2000. Under section 5.5 (1) of the EP&A Act, determining authorities must 'examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity'. Under this legislation, there are provisions for a Biodiversity Offsets Scheme (BOS), which includes a framework to avoid, minimise and offset impacts of development on biodiversity.

In 2017 the State Environmental Planning Policy (SEPP) Educational Establishments and Child Care Facilities was introduced with provisions that apply to school State Significant Development (SSD) applications. An amendment was also made to the State and Regional Development SEPP which amended the trigger for school applications to become a SSD. The Minister for Planning and Homes is the consent authority for SSD applications. SSD applications are assessed via an environmental impact statement (EIS).

2.1.2 Biodiversity Conservation Act 2016

The BC Act provides legal status for biota of conservation significance in NSW. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act aims to amongst other things, to maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations, and to support conservation and threat abatement action to slow the rate of biodiversity loss and conserve threatened species and ecological communities in nature. Under this legislation, there are provisions for a Biodiversity Offsets Scheme (BOS), which includes a framework to avoid, minimise and offset impacts of development on biodiversity.

An application for development consent under Part 4 of the EP&A Act for SSD must be accompanied by a biodiversity development assessment report (BDAR) prepared in accordance with the NSW Biodiversity Assessment Methodology (BAM) unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values, in which case a BDAR waiver should be prepared.

The BC Act has been considered in this report through:

– desktop review to identify the threatened biota that have been previously recorded within the locality of the subject site and that could occur subject to the habitats present
– identification of biodiversity constraints based on the conservation significance of the species, communities and environments predicted to occur
– recommendations regarding whether a BDAR or BDAR waiver may be required to support an SSD application.

2.3 Commonwealth legislation

2.3.1 Environmental Protection and Biodiversity Conservation Act 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on matters of national environmental significance (MNES) undergo an assessment and approval process. Under the EPBC Act, an action includes a project, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things (DCCEEW 2021). An action that 'has, will have or is likely to have a significant impact on a matter of national environmental significance' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Australian Government Minister for the Environment. MNES of potential relevance to this site include threatened species and ecological communities and migratory species.

Potential impacts of a future development on relevant MNES would need to be considered with reference to the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DotE 2013). If a significant impact is considered likely, a referral under the EPBC Act must be submitted to the Commonwealth Environment Minister. If a referral is required, it should be submitted early enough in the program to allow assessment under the Bilateral Agreement.

The NSW Government and Australian Government finalised amendments to the Assessment Bilateral Agreement after changes to NSW legislation, and the Amending Agreement no. 1 was signed on 24 March 2020. The Australian Government formally endorsed the NSW Biodiversity Offsets Scheme through the EPBC Act Condition-setting Policy (DAWE 2020). Under the bilateral agreement, only one decision including conditions on approval is made by NSW, accounting for NSW MNES. The EPBC Act condition setting policy (DAWE 2020) notes that where a project demonstrates compliance with an endorsed state or territory policy, the proponent will not be required to simultaneously comply with the corresponding Australian Government policy.

3. Methodology

3.1 Desktop review

A desktop assessment was undertaken to identify threatened flora and fauna species, populations and ecological communities listed under the BC Act and MNES listed under the EPBC Act that may occur in the study area. Database records pertaining to the study area and locality (i.e. within a 10 km radius of the subject site and within the last 20 years) were reviewed, along with relevant reports and mapping, including:

- NSW Department of Planning and Environment (DPE) *NSW BioNet Atlas* database for records of threatened species listed under the BC Act (DPE 2023a). Accessed on 21 November 2023
- DPE *Threatened biodiversity profile search* online database for threatened ecological communities listed under the BC Act (DPE 2023c)
- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) *Protected Matters Online Search Tool* for MNES listed under the EPBC Act that are known or predicted to occur in the locality (DCCEEW 2023a). Accessed on 22 November 2023
- NSW Department of Primary Industries (DPI) Fisheries NSW Spatial Data for records of threatened species, populations or ecological communities listed under the FM Act (DPI 2023). Accessed on 27 November 2023
- NearMap for a photographic review of disturbance within the study area (NearMap 2023). Image from 9 December 2023
- NSW *BioNet Vegetation Classification* (DPE 2023b) to identify plant community types (PCTs) in the study area
- SEED portal for historical aerial photography and additional GIS datasets including soil, topography, geology and riparian lands watercourses (DPE 2023d)
- State Vegetation Type Map (SVTM) (DPE 2023e).

3.2 Assessment of likelihood of occurrence

Following collation of database records and species and community profiles (DPE 2023c), a 'likelihood of occurrence' assessment was prepared with reference to the habitats contained within the study area. Identification of potential habitat for threatened and migratory species was based on information provided in the species profiles (DPE 2023c; DCCEEW 2023b), recovery plans and the GHD staff knowledge of species habitat requirements. The likelihood of threatened and migratory biota occurring in the study area was assessed based on presence of records from the locality, species distribution and habitat preferences, and the suitability of habitat present. The results of this assessment informed the biodiversity constraints assessment and are provided in Appendix A. Threatened and migratory biota known or considered likely to occur are discussed further in Section 5. Table 1 shows the key used to determine the likelihood of occurrence for threatened biota.

Table 1 Key to likelihood of occurrence for threatened biota

Likelihood	Definition
Present	Threatened species, population or community was recorded in the study area.
Likely	Numerous records of species, population or community previously recorded within a 10 km radius of the study area and suitable high-quality habitat occurs within the study area.
Possible	Species, population or community previously recorded within a 10 km radius of the study area but only marginally suitable habitat recorded; OR Species, population or community not previously recorded within a 10 km radius of the study area, but the study area is within the species' known distribution and suitable habitat occurs within the study area.
Unlikely	Species, population or community previously recorded within a 10 km radius of the study area but no suitable habitat recorded.

Likelihood	Definition
Nil	Species, population or community not previously recorded within a 10 km radius of the study area, suitable habitat not recorded within the study area, and/or the study area is outside the species' known distribution

3.3 Constraints and opportunities assessment

Biodiversity constraints in the study area were assigned to classes based on conservation significance and sensitivity to impacts arising from development. Constraint classes are outlined below:

– **Very Low**: developed or cleared land that does not contain any habitat resources of particular value for threatened or migratory species or other native flora and fauna
– **Low:** developed or cleared land that contains very little habitat resources of particular value for threatened or migratory species or other native flora and fauna

4. Existing environment

4.1 Physical environment

The subject site is approximately 3.67ha in size and comprises recently cleared land mostly surrounded by new residential buildings and roads. The subject site is bounded by Armoury Road to the west, Lasetter Street to the north and Charlie Street to the south. Beyond these, the immediate surrounding lands are mostly residential buildings, aside from the eastern boundary which is predominantly bushland (see Figure 1). In a broader context, Wianamatta Regional Park lies approximately 1km to the north, east and west of the subject site.

The eastern boundary is approximately 540m from South Creek, the southern boundary 2.2km to Werrington Creek, and the western boundary is approximately 5km from Penrith Lake wetlands (artificial water bodies) and the Nepean River. There is an unnamed non-perennial creek approximately 230m from the western boundary and 100m from the northern boundary, where detention basins have been created. The subject site is separated from these aquatic habitats by residential buildings, roads and bushland. The site is generally flat, likely a result of earthworks associated with the establishment of the new suburb. There are no drainage lines within the study area, however a detention basin is present on the subject site between Coorabin and Baralga Streets.

The NSW (Mitchell) Landscape of the subject site is mapped as Hawkesbury Nepean Channels and Floodplains. The Soil Landscape of the subject site is mapped as South Creek Landscape: level with flat to gently sloping alluvial plains draining Wianamatta Group shales and Hawkesbury Sandstone. The South Creek Landscape comprises the active floodplain of many drainage networks of the Cumberland Plain.

The vegetation on the subject site is mapped as Cumberland Red Gum Riverflat Forest (PCT 4025) on the SVTM (DPE 2023e). However, the subject site has been recently cleared with re-established grassland (likely exotic) present. Native vegetation within the surrounding land listed on the SVTM consists of Cumberland Red Gum Riverflat Forest (PCT 4025), Cumberland Shale Plains Woodland (PCT 3320) and Coastal Valleys Swamp Oak Riparian Forest (PCT 4023), (see Figure 3) all of which are listed as threatened ecological communities under the BC Act and/or EPBC Act.

The subject site is not mapped as having Biodiversity Values on the Biodiversity Values Map and is not mapped as having important habitat for any threatened or migratory species on the BAM Important Habitat Map. The subject site is not mapped as having areas of outstanding biodiversity values (AOBV) (DPE 2023d).

The study area falls within the land included with the Cumberland Plain Conservation Plan (CPCP) (DPE 2022). The entire study area is mapped as ‘excluded land’ under the CPCP, defined as ‘land that has been excluded from the CPCP and for which NSW strategic biodiversity certification and approval through the federal strategic assessment will not be sought’.

4.2 Vegetation and flora

The site was cleared of native vegetation in approximately March of 2016 as part of the establishment works for the new suburb of Jordan Springs. Native vegetation recorded prior to the clearance of the site has been replaced by a stabilising cover crop of exotic species. This cover of exotic species cannot be allocated to any locally occurring plant community type (PCT). A number of eucalypts appear to have been planted as street trees based on a review of Google Streetview (December 2023).

Figure 2 shows the PCTs that were present within the site prior to vegetation clearing works, however none of this vegetation has been retained and the site is now cleared of all native vegetation.

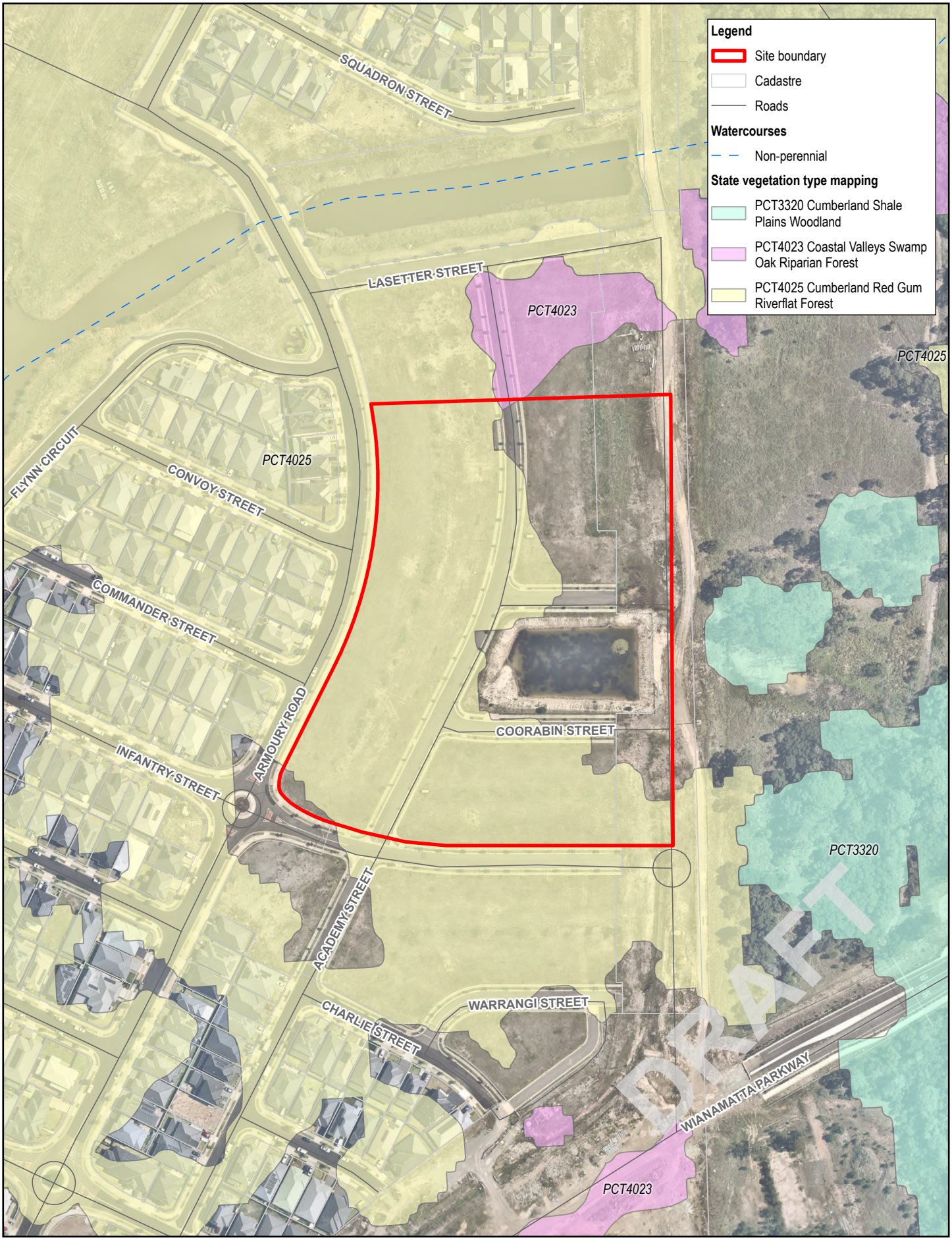
4.3 Habitat and fauna

Given the lack of vegetative cover, the study area provides very limited habitat resources of relevance for any native species. The only species likely to occur are mobile and generalist species capable of persisting in heavily modified and cleared landscapes, such as Australian Magpies (*Cracticus tibicen*) and raptors which may occasionally forage over the site, and common reptiles such as skinks that may bask in sunny areas.

Given that no natural and only limited temporary artificial stands of water are present, no key fish habitat (KFH) or habitat for threatened aquatic biota is present. No habitat for the threatened Green and Golden Bell Frog (*Litoria aurea*) is present as there is no emergent aquatic vegetation present (DPE 2023c). The highly modified environment on the study site is only likely to provide suitable habitat to support common species such as Common Eastern Froglet (*Crinia signifera*).

Suitable habitat for a range of fauna species is available in larger stands of native vegetation, wetlands and riparian areas located in nearby areas including parks and reserves. These include Wianamatta Regional Park, Yiraaldiya National Park, Castlereagh Nature Reserve and Wianamatta Nature Reserve (Six Maps 2023).

Prior to the vegetation clearing works in about March 2016, it is likely that the site would have provided suitable habitat for a range of common and threatened fauna species. Since the site has been cleared of vegetation, there are few, if any, habitat resources of relevance for any threatened fauna species.



Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

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Date **19/01/2024**

Results of the SVTM review

FIGURE 2

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Print date: 19 Jan 2024 - 14:13

Data source: Imagery - Nearmap: Cadastre, Roads, Suburbs - NSWSS, 2023. SVTM - DPE, 2023. Created by: pfernandes

5. Conservation significance

5.1 Threatened ecological communities

The vegetation on the subject site consists only of grassland due to past disturbance from land clearing during the development of the new suburb. These processes have resulted in the vegetation on site effectively losing the ability to recover to the point of representing a natural PCT or TEC, as the soil stored seed bank has very likely been depleted of the midstory and ground layer species and there is no opportunity for regeneration or recruitment of any of the structural layers.

Prior to vegetation clearing works, the site is likely to have supported at least one threatened ecological community listed under the BC Act and/or EPBC Act, however removal of all vegetation and bulk earthworks that have been completed since 2016 mean the site no longer supports any TEC vegetation, and it is unlikely that any TEC vegetation would establish on the site without substantial revegetation efforts.

5.2 Threatened flora species

From the desktop survey, there are numerous records of various threatened flora species recorded within the locality of the study area (refer to appendix A). These include *Grevillea juniperina* subsp. *juniperina* (Juniper-leaved Grevillea)*, Marsdenia viridiflora* subsp*. viridiflora* - endangered population, *Dillwynia tenuifolia, Pultenaea parviflora* and *Pimelea spicata* (Spiked Rice-flower). These records are generally associated in the parks and reserves of the wider locality such as Wianamatta Regional Park, Yiraaldiya National Park, Castlereagh Nature Reserve and Wianamatta Nature Reserve, or were recorded prior to the clearance of the site. There is no suitable habitat within the study area for any of the threatened species predicted by the desktop review, given the broadscale land clearing that has occurred within the study area.

An assessment of the threatened flora species known or likely to occur within the locality of the subject site is provided in Appendix A. No threatened flora species are likely to occur or to be impacted by the proposal.

5.3 Threatened fauna species

From the desktop survey, threatened fauna species recorded in the locality include the Cumberland Plain Land Snail (*Meridolum corneovirens*), Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) and Southern Myotis (*Myotis macropus*). While there are several records of the latter species in the locality, these are generally associated with the larger stands of intact vegetation within nearby reserves and parks or were recorded prior to clearing. Most of these threatened species would not occur within the subject site due to the absence of the required habitat features. There are no mature native trees on the subject site, therefore, suitable foraging or roosting habitat for most mobile threatened fauna species and hollow-dependent fauna is lacking. The Large Bent-winged Bat could forage above the study area on occasion as this species is known to hunt insects over grassland. Suitable habitat for a range of fauna species is present in the nearby Wianamatta Regional Park, Yiraaldiya National Park, Castlereagh Nature Reserve and Wianamatta Nature Reserve (Six Maps 2023).

An assessment of the threatened fauna species known or likely to occur within the locality of the subject site is provided in Appendix A. No threatened fauna species are likely to be impacted by the proposal.

6. Constraints assessment

The subject site has previously been cleared as part of the development of a new suburb. The subject site contains new roads, re-established grassland, and a detention basin. There is no native vegetation present within the site. The cover-crop of stabilising grassland that is present is not commensurate with any PCT or TEC. The subject site is considered to be in very poor condition and has low biodiversity value due to the lack of intact native vegetation, presence of exotic species and previous broad-scale land clearing. The subject site lacks any mature canopy trees and hollows. The entirety of the subject site (3.67ha) is considered to have a very low to low biodiversity constraint (see Figure 3).

Development of the subject site could occur subject to appropriate environmental impact assessment under relevant approval processes. For a State Significance Development, a biodiversity development assessment report (BDAR) or an application for a BDAR waiver would be required. Given the lack of biodiversity values within the site, it is appropriate to apply for a BDAR waiver. An application for a BDAR waiver should be supported by a brief field survey to confirm the lack of biodiversity values within the site, particularly with reference to the detention pond on site. Biodiversity offsets under the BAM are unlikely to be required.

A summary of the biodiversity constraints and their implications for assessment and approval is provided in Table 22.

Table 2 Biodiversity constraint classes

Biodiversity constraint class	Description	Implications for assessment and approval of a development
Very Low	Very low biodiversity values that do not contain any habitat resources of particular value for threatened or migratory species or other native flora and fauna: - Cleared areas	Development activities should be concentrated in these areas where possible. Development activities could occur in these areas subject to appropriate environmental impact assessment under relevant approval processes. Detailed biodiversity surveys would generally not be required. Biodiversity offsets are unlikely to be required.
Low	Low biodiversity values that contain very low habitat resources of particular value for threatened or migratory species or other native flora and fauna: - Detention pond	Development activities should be concentrated in these areas where possible. Development activities could occur in these areas subject to appropriate environmental impact assessment under relevant approval processes. Detailed biodiversity surveys would generally not be required, however a site visit should be completed to confirm that the detention pond lacks habitat values for threatened biota. Biodiversity offsets are unlikely to be required.

Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

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Date **18/12/2023**

Biodiversity constraints

FIGURE 3

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Print date: 18 Dec 2023 - 17:29

Data source: Imagery - Nearmap: Cadastre, Roads, Suburbs - NSWSS, 2023. SVTM - DPE, 2023. Created by: pfernandes

7. Conclusion

Ongoing and past disturbances associated with land clearing and urban development have heavily impacted and modified the subject site. The site is primarily comprised of re-established grassland, new roads and a detention dam. Pre-clearance native vegetation has been replaced by a cover crop of exotic species designed to stabilise the site post broad scale land clearing. This provides minimal habitat for any native species, and no habitat resources of relevance for predicted threatened species. The only species likely to utilise the site are mobile and generalist species (both native and exotic) capable of surviving in heavily modified and cleared landscapes that may hunt or forage over the site as part of a wider home range, but would not depend on any resources present for their continued persistence in the locality. The subject site is considered to have a low biodiversity constraint to development.

Development of the subject site is unlikely to require a detailed biodiversity assessment in line with the Biodiversity Assessment Methodology (BAM) or biodiversity offsets under the NSW Biodiversity Offsets Scheme (BOS). An application for a BDAR Waiver should be suitable to accompany a future application for SSD.

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Appendices

Appendix A

Likelihood of occurrence of threatened biota

Table 3 Threatened flora likely to occur within 10 km of the study area

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Acacia bynoeana	Bynoe's Wattle	E	V	8 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Endemic to central eastern NSW, known a limited number of locations, often comprising populations of few plants. Grows mainly in heath/ dry sclerophyll forest on sandy soils, prefers open, sometimes slightly disturbed sites such as trail margins, road edges, and in recently burnt open patches. Flowers September to March, and fruit matures in November.	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Acacia pubescens	Downy Wattle	V	V	1 record within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Occurs mainly in Bankstown-Fairfield-Rookwood and Pitt Town areas, with outliers at Barden Ridge, Oakdale and Mountain Lagoon. Grows on alluviums, shales and shale/sandstone intergrades. Soils characteristically gravely, often with ironstone. Occurs in open woodland and forest, in communities including Cooks River/ Castlereagh Ironbark Forest, Shale/ Gravel Transition Forest and Cumberland Plain Woodland. Flowers from August to October.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Allocasuarina glareicola	-	E	E	1 record within 10 km (DPE 2023a), migration route known to occur within area (DCCEEW 2023a)	Primarily found in Richmond district; although outlier populations exist in Voyager Point, Liverpool. Found in open castlereagh woodland on lateritic soil. The species is associated with the following species: Parramatta Red Gum, Red Ironbark, Narrow-leaved Apple, Hard-leaved Scribbly Gum and Melaleuca decora. Common associated understorey species include Prickly-leaved Paperbark, Finger Hakea, Needlebush, *Dillwynia tenuifolia*, *Micromyrtus minutiflora*, Swamp Wattle, *Acacia brownei*, *Themeda australis* and *Xanthorrhoea minor*.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs in coastal areas from East Gippsland to southern Queensland. Habitat preferences not well defined. Grows mostly in coastal heathlands, margins of coastal swamps and sedgelands, coastal forest, dry woodland, and lowland forest. Prefers open areas in the understorey and is often found in association with Large Tongue Orchid and the Bonnet Orchid. Soils include moist sands, moist to dry clay loam and occasionally in accumulated eucalypt leaves. Flowers November-February.	Nil, no local records of this species and no suitable habitat present within the highly modified study area.	Nil
Cynanchum elegans	White-flowered Wax Plant	E	E	Species or species habitat likely to occur	Occurs from Gerroa (Illawarra) to Brunswick Heads and west to Merriwa in the upper Hunter. Most common near Kempsey. Usually occurs on the edge of dry rainforest or	Nil, no local records of this species and no	Nil

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				within area (DCCEEW 2023a)	littoral rainforest, but also occurs in Coastal Banksia Scrub, open forest and woodland, and Melaleuca scrub. Soil and geology types are not limiting. Flowering occurs between August and May, with the peak in November.	suitable habitat present within the highly modified study area	
Dillwynia tenuifolia	-	V	-	573 records within 10 km (DPE 2023a)	Occurs in western Sydney, predominately the Cumberland Plain as well as the Lower Blue Mountains and north to Yengo. Grows in scrubby/dry heath areas of Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays, and associated transitional communities including Castlereagh Scribbly Gum Woodland.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Eucalyptus aggregata	Black Gum	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Grows in the lowest parts of the landscape, on grassy woodlands on alluvial soils in moist sites along creeks on broad, cold and poorly-drained flats and hollows. Commonly occurs with Candlebark, Ribbon Gum, and White Sally with a grassy understorey of Tussock. Also occurs as isolated paddock trees in modified native, exotic pastures or travelling stock reserves.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Eucalyptus benthamii	Camden White Gum	CE	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Occurs on the alluvial flats of the Nepean River and its tributaries. Known distribution from The Oaks (south) to Grose Wold (north) and Kedumba Valley (west). Two major subpopulations in Kedumba Valley and Bents Basin State Recreation Area. Occurs in wet open forest on alluvial flats, in well drained alluvial sands and gravels to 1 m deep. Requires a combination of deep alluvial sands and a flooding regime that permits seedling establishment. Associated species of the largest population in the Kedumba Valley include *E. crebra, E. deanei, E. punctata, Leptospermum polygalifolium, Acacia filicifolia* and *Pteridium esculentum* and at the Bents Basin site include *Eucalyptus elata, E. bauerina, E. amplifolia, E. deanei, Angophora subvelutina, Bursaria spinosa*, and *Pteridium esculentum*	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Genoplesium baueri	Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid	E	E	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs from Ulladulla to Port Stephens, with only 13 known extant populations. Grows in sparse sclerophyll forest and moss gardens over sandstone. Flowers from February to March.	Nil, no local records of this species and no suitable habitat present within the	Nil

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
						highly modified study area	
Grevillea juniperina subsp. *juniperina*	Juniper-leaved Grevillea	V	-	1364 records within 10 km (DPE 2023a)	Occurs only within western Sydney in an area bounded by Blacktown, Erskine Park, Londonderry and Windsor. Outlier populations also at Kemps Creek and Pitt Town. Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium, typically containing lateritic gravels. Occurs in association with Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forests.	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Grevillea parviflora subsp. *parviflora*	Small-flower Grevillea	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs between Moss Vale/Bargo and lower Hunter Valley, with most occurrences in Appin, Wedderburn, Picton and Bargo. Broad habitat range including heath, shrubby woodland and open forest on light clay or sandy soils, and often in disturbed areas such as on the fringes of tracks.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Haloragis exalata subsp. *exalata*	Wingless Raspwort, Square Raspwort	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs in 4 widely scattered localities in eastern NSW, disjunctly distributed in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. Requires protected and shaded damp situations in riparian habitats.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Hibbertia puberula	-	E	-	3 records within 10 km (DPE 2023a)	Distribution extending from Wollemi National Park south to Morton National Park and the south coast near Nowra. Favours low heath on sandy soils or rarely in clay, with or without rocks underneath. Habitats are typically dry sclerophyll woodland communities, although heaths are also occupied. Flowers from October to January	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Marsdenia viridiflora subsp. *viridiflora* - endangered population	*Marsdenia viridiflora* R. Br. subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd,	EP	-	1137 records within 10 km (DPE 2023a)	Recent records are from Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Previously known north from Razorback Range. Grows in vine thickets and open shale woodland.	Unlikely, no suitable habitat present within the highly modified study area.	Nil

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
	Liverpool and Penrith local government areas						
Melaleuca deanei	Deane's Melaleuca	V	V	Species or species habitat known to occur within area (DCCEEW 2023a)	Occurs in two distinct areas, in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas. Isolated occurrences at Springwood (Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas. Mostly grows on broad flat ridgetops, dry ridges and slopes and strongly associated with low nutrient sandy loam soils, sometimes with ironstone. Occurs in heath- open forest, often in sandstone ridgetop woodland communities.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Micromyrtus blakelyi	-	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Restricted to areas near the Hawkesbury River, north of Sydney. Distribution extends from north of Maroota in the north, to Cowan in the south. All known populations occur within the Hornsby and Baulkham Hills LGA's. Typically occurs within heathlands in shallow sandy soil in cracks and depressions of sandstone rock platforms.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Micromyrtus minutiflora	-	E	V	101 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Occurs in Richmond and Penrith areas in western Sydney. Grows in Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments.	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Persicaria elatior	Tall Knotweed	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Recorded in south-eastern NSW from Ulladulla to the Victorian border. Known from Raymond Terrace and the Grafton area in northern NSW. Normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Persoonia hirsuta	Hairy Geebung	E	E	Species or species habitat likely to occur within area	Scattered distribution around Sydney, distributed from Singleton in the north, along the east coast to Hilltop in the south west, Dombarton in the south east and the Blue Mountains to the west. Found in clayey and sandy soils in dry sclerophyll open forest, woodland and heath, primarily	Nil, no local records of this species and no suitable habitat present within the	Nil

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				(DCCEEW 2023a)	on the Mittagong Formation and on the upper Hawkesbury Sandstone.	highly modified study area	
Persoonia nutans	Nodding Geebung	E	E	80 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Restricted to the Cumberland Plain in western Sydney, between Richmond in the north and Macquarie Fields in the south. Grows only on aeolian and alluvial sediments in sclerophyll forest and woodland vegetation communities. Largest populations occur in Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland.	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Pimelea curviflora var. *curviflora*	-	V	V	Species or species habitat known to occur within area (DCCEEW 2023a)	Confined to the coastal area of the Sydney and Illawarra regions. Populations known between northern Sydney and Maroota in the north-west and at Croom Reserve near Albion Park in Shellharbour LGA. Grows on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Recorded in Illawarra Lowland Grassy Woodland habitat at Albion Park. Has an inconspicuous cryptic habit as it is fine and scraggly and often grows amongst dense grasses and sedges.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Pimelea spicata	Spiked Rice-flower	E	E	444 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Disjunct populations within the Cumberland Plain ((Marayong and Prospect Reservoir south to Narellan and Douglas Park) and Illawarra (Landsdowne to Shellharbour to northern Kiama). Found on well-structured clay soils in both the Cumberland Plain and Illawarra environments. Associated with Grey Box communities and in areas of ironbark on the Cumberland Plain sites. Occurs commonly in Coast Banksia open woodland in the coastal Illawarra.	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Pomaderris brunnea	Rufous Pomaderris	E	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. Also occurs near Walcha on the New England tablelands. Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Pterostylis gibbosa	Illawarra Greenhood	E	E	Species or species habitat may occur within area	Known from a small number of populations in the Illawarra, Shoalhaven and Hunter regions. Grows in open forest or woodland, on flat or gently sloping land with poor drainage. In the Illawarra region, the species grows in woodland	Nil, no local records of this species and no suitable habitat	Nil

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				(DCCEEW 2023a)	dominated by Forest Red Gum, Woollybutt and Melaleuca decora. Near Nowra, the species grows in an open forest of Spotted Gum, Forest Red Gum and Grey Ironbark. In the Hunter region, the species grows in open woodland dominated by Narrow-leaved Ironbark, Forest Red Gum and Black Cypress Pine.	present within the highly modified study area	
Pterostylis saxicola	Sydney Plains Greenhood	E	E	Species or species habitat likely to occur within area (DCCEEW 2023a)	Occurs in western Sydney between Picton and Freemans Reach. Grows in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines. Associated vegetation above these rock shelves is sclerophyll forest or woodland on shale or shale/sandstone transition soils.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Pultenaea parviflora	-	E	V	491 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Occurs on the Cumberland Plain, with core distribution from Windsor to Penrith and east to Dean Park, and outliers in Kemps Creek and Wilberforce. Grows in dry sclerophyll woodlands, forest or in grasslands on Wianamatta Shale, laterite or Tertiary alluvium, on infertile sandy to clay soils. Associated communities include Castlereagh Ironbark Forest, Shale Gravel transition Forest and intergrade with Castlereagh Scribbly Gum Woodland.	Unlikely, no suitable habitat present within the highly modified study area.	Nil
Rhizanthella slateri	Eastern Underground Orchid	V	E	Species or species habitat may occur within area (DCCEEW 2023a)	Currently known only from 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore usually located only when the soil is disturbed. Flowers September to November.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Rhodamnia rubescens	Scrub Turpentine	CE	CE	Species or species habitat likely to occur within area (DCCEEW 2023a)	Occurs in coastal districts north from Batemans Bay in New South Wales, to areas inland of Bundaberg in Queensland. Populations typically occur in coastal regions and occasionally extend inland onto escarpments up to 600m a.s.l. in areas with rainfall of 1,000 -1,600mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Scientific name	Common name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
					soils. Highly to extremely susceptible to infection by Myrtle Rust.		
Senna acclinis	Rainforest Cassia	E		1 record within 10 km (DPE 2023a)	Coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland. Grows in or on the edges of subtropical and dry rainforest.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Syzygium paniculatum	Magenta Lilly Pilly	E	V	1 record within 10 km (DPE 2023a), species or species habitat may occur within area (DCCEEW 2023a)	Occurs in narrow coastal strip from Upper Lansdowne to Conjola State Forest. On the south coast, the species occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast, it occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Thelymitra kangaloonica	Kangaloon Sun Orchid	CE	CE	Species or species habitat may occur within area (DCCEEW 2023a)	Only known to occur on the southern tablelands of NSW in the Moss Vale / Kangaloon / Fitzroy Falls area at 550-700 m above sea level. Known to occur at three swamps that are above the Kangaloon Aquifer. Found in swamps in sedgelands over grey silty grey loam soils.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Thesium australe	Austral Toadflax	V	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland or grassy woodland and is often found in association with Kangaroo Grass.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Key: CE – critically endangered, E – endangered, EP – endangered population, V – vulnerable

Table 4 Threatened fauna likely to occur within 10 km of the study area

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
BIRDS							
Australasian Bittern	*Botaurus poiciloptilus*	E	E	Species or species habitat known to occur within area (DCCEEW 2023a)	Widespread but uncommon over south-eastern Australia. Found over most of NSW except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. May construct feeding platforms over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Australian Painted Snipe	*Rostratula australis*	E	E	Species or species habitat known to occur within area (DCCEEW 2023a)	In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River, the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mudflats and in shallow water.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Black Bittern	*Ixobrychus flavicollis*	V	-	1 record within 10 km (DPE 2023a)	Scattered records along the east coast of NSW, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. May occur in flooded grassland, forest, woodland, rainforest and mangroves, where permanent water is present.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Black-necked Stork	*Ephippiorhynchus asiaticus*	E	-	1 record within 10 km, last recorded 2006 (DPE 2023a)	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland away from breeding areas). Species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the species. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Blue-winged Parrot	*Neophema chrysostoma*	V	V	Species or species habitat may occur within	During the non-breeding period, from autumn to early spring, birds are recorded in western NSW, with some reaching south-eastern NSW, particularly on the southern migration. Inhabits a range of habitats from coastal, sub-coastal and	Nil, no local records of this species and no suitable habitat	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				area (DCCEEW 2023a)	inland areas, through to semi-arid zones. Tends to favour grasslands and grassy woodlands, often found near wetlands both near the coast and in semi-arid zones. Sometimes seen in altered environments such as airfields, golf-courses and paddocks. Pairs or small parties forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs.	present within the highly modified study area	
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	V	2 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	The western boundary of the species range runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell. Often found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. Also found in mallee and River Red Gum Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Usually not found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging. Also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	Unlikely, only two local records. No suitable habitat present within the highly modified study area	Nil
Bush Stone-curlew	*Burhinus grallarius*	E	-	3 records within 10 km (DPE 2023a)	Found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights and nests on the ground in a scrape or small bare patch.	Unlikely, only three local records. No suitable habitat present within the highly modified study area	Nil
Common Greenshank	*Tringa nebularia*	-	E, M	Species or species habitat likely to occur within area (DCCEEW 2023a)	Common throughout Australia in the summer and recorded in most coastal regions in NSW. Widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. Found both on the coast and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Curlew Sandpiper	*Calidris ferruginea*	E	CE, M	Species or species habitat likely to occur within area	Distributed around most of the Australian coastline. Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of	Nil, no local records of this species and no suitable habitat	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				(DCCEEW 2023a)	birds pausing for a few days during migration. Migrates to Australia for the non-breeding period, arriving between August and November, and departing between March and mid-April. Generally occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts in NSW. Also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	present within the highly modified study area	
Diamond Firetail	*Stagonopleura guttata*	V	V	1 record within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. Scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities, and often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	7 records within 10 km (DPE 2023a)	Occurs throughout most of NSW, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Eastern Curlew	*Numenius madagascariensis*	-	CE, M	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. Generally occupies coastal lakes, inlets, bays and estuarine habitats, and is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts in NSW. Rarely seen inland.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Flame Robin	*Petroica phoenicea*	V	-	1 record within 10 km (DPE 2023a)	Breeds in upland areas in NSW and moves to the inland slopes and plains in winter. Likely two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	Species or species habitat likely to occur within area (DCCEEW 2023a)	Distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes in NSW. Occurs regularly in the ACT. It Rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Grey Falcon	*Falco hypoleucos*	V	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Grey Plover	*Pluvialis squatarola*	-	V, M	1 record within 10 km (DPE 2023a)	Breeds around the Arctic regions and migrates to the southern hemisphere, being a regular summer migrant to Australia, mostly to the west and south coasts. Almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Latham's Snipe	*Gallinago hardwickii*	-	V, M	Species or species habitat known to occur within area (DCCEEW 2023a)	Non-breeding migrant to the south east of Australia. Breeds in Japan and on the east Asian mainland. Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. Found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. Also uses crops and pasture.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Little Eagle	*Hieraaetus morphnoides*	V	-	6 records within 10 km (DPE 2023a)	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Also found in Sheoak or Acacia woodlands and riparian woodlands of inland NSW. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Little Lorikeet	*Glossopsitta pusilla*	V	-	11 records within 10 km (DPE 2023a)	Distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year. 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.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Painted Honeyeater	*Grantiella picta*	V	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Nomadic species occurring at low densities throughout its range. Most commonly found on the inland slopes of the Great Dividing Range in NSW, where almost all breeding occurs. More likely to be found in the north of its distribution in winter. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Pilotbird	*Pycnoptilus floccosus*	-	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the ACT, and in the Snowy Mountains in NSW and north-east Victoria. Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne. Habitat critical to the survival of the Pilotbird includes wet sclerophyll forests in temperate zones in moist gullies with dense undergrowth, and dry sclerophyll forests and woodlands occupying dry slopes and ridges.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Powerful Owl	*Ninox strenua*	V	-	10 records within 10 km (DPE 2023a)	Widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains. Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Requires large tracts of	Unlikely, no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
					forest or woodland habitat but can also occur in fragmented landscapes. Breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. Roosts by day in dense vegetation comprising species such as Turpentine, Black She-oak, Blackwood, Rough-barked Apple, Cherry Ballart and a number of eucalypt species.		
Red Goshawk	*Erythrotriorchis radiatus*	CE	E	Species or species habitat may occur within area (DCCEEW 2023a)	Very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. Inhabits open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. Preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	1 record within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. Very patchy distribution in NSW, mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Flowering of associated species such as Thin-leaved Stringybark *Eucalyptus eugenioides* and other Stringybark species, and Broad-leaved Ironbark *E. fibrosa* can also contribute important nectar flows at times. Nectar and fruit from the mistletoes *Amyema miquelii, A. pendula* and *A. cambagei* are also utilised.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Scarlet Robin	*Petroica boodang*	V	-	1 record within 10 km (DPE 2023a)	Occurs from the coast to the inland slopes in NSW. Disperses to the lower valleys and plains of the tablelands and slopes after breeding. Some birds may appear as far west as the eastern edges of the inland plains in autumn	Unlikely, only one local record. No suitable habitat present within the	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
					and winter. Found in dry eucalypt forests and woodlands with usually open and grassy understorey with few scattered shrubs. Lives in both mature and regrowth vegetation and occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Abundant logs and fallen timber are important components of its habitat.	highly modified study area	
Sharp-tailed Sandpiper	*Calidris acuminata*	-	V, M	Species or species habitat known to occur within area (DCCEEW 2023a)	Most of the population migrates to Australia during non-breeding season, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Sooty Owl	*Tyto tenebricosa*	V	-	1 record within 10 km, last recorded 2007 (DPE 2023a)	Occupies the eastern most one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Found in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roost by day in the hollow of a tall forest tree or in heavy vegetation and nest in very large tree hollows.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	V	V	3 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Uncommon although widespread throughout suitable forest and woodland habitats. Occurs from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species)	Unlikely, only three local records. No suitable habitat present within the highly modified study area	Nil
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	V	E	Species or species habitat likely to occur within area (DCCEEW 2023a)	Found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies picata. Prefers lightly wooded country, usually open eucalypt woodland, Acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Southern Whiteface	*Aphelocephala leucopsis*	-	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occur across most of mainland Australia south of the tropics, from the north- eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range. Lives in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains.	Nil, no local records of this species and no suitable habitat present within the	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
					Forages almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.	highly modified study area	
Speckled Warbler	*Chthonicola sagittata*	V	-	7 records within 10 km (DPE 2023a)	Patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. Most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Square-tailed Kite	*Lophoictinia isura*	V	-	5 records within 10 km (DPE 2023a)	Ranges along coastal and subcoastal areas from south-western to northern Australia. Scattered records throughout NSW indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. Summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests and shows a particular preference for timbered watercourses. Observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland in arid north-western NSW.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Swift Parrot	*Lathamus discolor*	E	CE	4 records within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Migrates from Tasmania to south-eastern Australia in the autumn and winter months. Mostly occurs on the coast and south west slopes in NSW. Occurs on the mainland in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Forest Red Gum, Mugga Ironbark, and White Box.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Varied Sittella	*Daphoenositta chrysoptera*	V	-	17 records within 10 km (DPE 2023a)	Sedentary species, inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Found in eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Unlikely, no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	2 records within 10 km (DPE 2023a)	Widespread along the NSW coast, and along all major inland rivers and waterways. Habitats characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat.	Unlikely, only two local records. No suitable habitat present within the highly modified study area	Nil
FISH							
Australian Grayling	*Prototroctes maraena*	E (FM Act)	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania. Found in fresh and brackish waters of coastal lagoons, from Shoalhaven River in NSW to Ewan Ponds in South Australia. Adults inhabit cool, clear, freshwater streams with gravel substrate and areas alternating between pools and riffle zones.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Macquarie Perch	*Macquaria australasica*	E (FM Act)	E	Species or species habitat may occur within area (DCCEEW 2023a)	Known only from scattered localities in the cool upper reaches of the Murray-Darling system of NSW, including the Hawkesbury-Nepean and Shoalhaven catchments, Victoria and ACT. Also found in man-made lakes on the NSW coast and in lakes and reservoirs, where adults aggregate in small shoals during the spawning season. Inhabits cool, clear freshwaters of rivers with deep holes and shallow riffles.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
FROGS							
Giant Burrowing Frog	*Heleioporus australiacus*	V	V	Species or species habitat known to occur within area (DCCEEW 2023a)	Distributed in south eastern NSW as two distinct populations: a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Green and Golden Bell Frog	*Litoria aurea*	E	V	2 records within 10 km, last recorded 2012 (DPE 2023a) species or	Approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. Large populations are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast. Only one known population on the NSW Southern Tablelands. Inhabits	Unlikely, only two local records. Limited suitable habitat present within the highly	Low

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				species habitat known to occur within area (DCCEEW 2023a)	marshes, dams and stream-sides, particularly those containing bullrushes (*Typha spp*.) or spikerushes (*Eleocharis spp*.). Optimal habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Also recorded in highly disturbed areas.	modified study area	
Stuttering Frog	*Mixophyes balbus*	E	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs along the east coast of Australia from southern Queensland to north-eastern Victoria. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Most recent records are from the north of its range, with few records south of Sydney. The Stuttering Frog is an obligate stream breeder. Eggs are deposited in very shallow, slow-flowing riffle sections of the main channel of streams. Tadpoles forage amongst stones and leaf litter in riffle and pool sections of the stream channel and may take up to 12 months for to reach metamorphosis.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
GASTROPODS							
Cumberland Plain Land Snail	*Meridolum corneovirens*	E	-	180 records within 10 km (DPE 2023a)	Lives in small areas on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. Primarily inhabits Cumberland Plain Woodland which is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities. Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish.	Unlikely. No suitable habitat present within the highly modified study area.	Nil
Dural Land Snail	*Pommerhelix duralensis*	E	E	1 record within 10 km (DPE 2023a), species or species habitat likely to occur within area (DCCEEW 2023a)	Shale-influenced-habitat specialist, which occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes. Found within the Local Government Areas of The Hills Shire, Hawkesbury Shire and Hornsby Shire. Records from the Blue Mountains City, Penrith City and Parramatta City may represent this species. Favours forested habitats with good native cover and woody debris. Shelters under rocks or inside curled-up bark, it does not burrow nor climb.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
MAMMALS							

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Brush-tailed Rock-wallaby	*Petrogale penicillata*	E	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. It typically shelters or basks during the day in rock crevices, caves and overhangs and are most active at night when foraging. Browse on vegetation in and adjacent to rocky areas.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	24 records within 10 km (DPE 2023a)	Found along the east coast from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	7 records within 10 km (DPE 2023a)	Found on the south-east coast and ranges of Australia, from southern Queensland to Victoria. Prefers moist habitats, with trees taller than 20m. Generally roosts in eucalypt hollows but also found under loose bark on trees or in buildings.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	1 record within 10 km (DPE 2023a)	Distribution extents from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes in NSW. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes and is an important pollinator of heathland plants such as banksias.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	11 records within 10 km (DPE 2023a)	Found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. Extends to the coast over much of its range. Widespread on the New England Tablelands in NSW, however does not occur at altitudes above 500 m. Found in a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, most commonly found in tall wet forest. Usually roosts in tree hollows but also found in buildings.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Greater Glider	*Petauroides volans*	E	E	Species or species habitat may occur within	Occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the	Nil, no local records of this species and no	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
(southern and central)				area (DCCEEW 2023a)	Australian Capital Territory into Victoria. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1-3ha.	suitable habitat present within the highly modified study area	
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	218 records within 10 km (DPE 2023a), roosting known to occur within area (DCCEEW 2023a)	Generally found within 200km of the eastern coast of Australia, from Rockhampton to Adelaide. May be found in unusual locations in times of natural resource shortage. Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Unlikely, no mature trees present and no suitable habitat within the highly modified study area	Nil
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	*Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT)	E	E	4 records within 10 km (DPE 2023a) Species or species habitat known to occur within area (DCCEEW 2023a)	Found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests of NSW, with some smaller populations on the plains west of the Great Dividing Range. Inhabits eucalypt woodlands and forests, and feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but will select preferred browse species in any one area.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	32 records within 10 km (DPE 2023a)	Occurs along the east and north-west coasts of Australia. Uses caves as the primary roosting habitat, but also uses derelict mines, storm-water tunnels, buildings and other man-made structures. Hunts in forested areas, catching moths and other flying insects above the tree tops.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	E	Species or species habitat known to occur within area (DCCEEW 2023a)	Found mainly in areas with extensive cliffs and caves, from Rockhampton to Bungonia in the NSW Southern Highlands. Generally rare with a very patchy distribution in NSW and scattered records from the New England Tablelands and North West Slopes. Roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Little Bent-winged Bat	*Miniopterus australis*	V	-	2 records within 10 km (DPE 2023a)	Occurs along the east coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Prefers moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests	Unlikely, only two local records. No suitable habitat present within the	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
					and banksia scrub. Generally found in well-timbered areas. Roosts in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day. Forages for small insects beneath the canopy of densely vegetated habitats.	highly modified study area	
New Holland Mouse	*Pseudomys novaehollandiae*	-	V	Species or species habitat likely to occur within area (DCCEEW 2023a)	Largely restricted to the coast of central and northern NSW, with one inland occurrence near Parkes. Known from Royal National Park (NP), the Kangaroo Valley, Kuringai Chase NP, and Port Stephens to Evans Head near the Queensland border. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. Soil type may be an important indicator of suitability of habitat, with deeper top soils and softer substrates being preferred for digging burrows.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Parma Wallaby	*Macropus parma*	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Range confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Prefers moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Southern Myotis	*Myotis macropus*	V	-	19 records within 10 km (DPE 2023a)	Mainly coastal but may occur inland along large river systems. Usually associated with permanent waterways at low elevations in flat/undulating country, usually in vegetated areas. Forages over streams and watercourses feeding on fish and insects from the water surface. Roosts in a variety of habitats including caves, mine shafts, hollow-bearing trees, stormwater channels, buildings, under bridges and in dense foliage, typically in close proximity to water.	Unlikely, no suitable habitat present within the highly modified study area	Nil
Spotted-tailed Quoll	*Dasyurus maculatus maculatus*	V	E	1 record within 10 km, last recorded 2006 (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Found in eastern NSW, the species has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges of 200-500 ha, while males occupy very large home ranges from 500 to over 4000 ha. Known to traverse their home ranges along densely vegetated creek lines.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Squirrel Glider	*Petaurus norfolcensis*	V	-	2 records within 10 km (DPE 2023a)	Widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites.	Unlikely, only two local records. No suitable habitat present within the highly modified study area	Nil
Yellow-bellied Glider (south-eastern)	*Petaurus australis australis*	V	V	1 record within 10 km (DPE 2023a), species or species habitat likely to occur within area (DCCEEW 2023a)	Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	2 records within 10 km (DPE 2023a)	Wide-ranging species found across northern and eastern Australia. Rare visitor of south-western NSW in late summer and autumn. Scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. It forages in most habitats across its very wide range, with and without trees.	Unlikely, only two local records. No suitable habitat present within the highly modified study area	Nil
REPTILES							
Broad-headed Snake	*Hoplocephalus bungaroides*	E	E	1 record within 10 km (DPE 2023a), species or species habitat may occur within area (DCCEEW 2023a)	Largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250km of Sydney. Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Pink-tailed Worm-lizard	*Aprasia parapulchella*	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabit sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC status	EPBC status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
					Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.		
Striped Legless Lizard	*Delma impar*	V	V	Species or species habitat may occur within area (DCCEEW 2023a)	Occurs in the Southern Tablelands, the South West Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Found mainly in Natural Temperate Grassland but also in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Key: CE – critically endangered, E – endangered, EP – endangered population, M – migratory, V – vulnerable,

Table 5 Migratory Species predicted to occur within 10 km of the study area

Common name	Scientific name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Black-faced Monarch	*Monarcha melanopsis*	-	Bonn	Species or species habitat known to occur within area (DCCEEW 2023a)	Found along the coast of eastern Australia, becoming less common further south. Occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park, Wombeyan Caves and Canberra. Found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Common Greenshank	*Tringa nebularia*	-	E C,J,K,Bonn	Species or species habitat likely to occur within area (DCCEEW 2023a)	Common throughout Australia in the summer and recorded in most coastal regions in NSW. Widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. Found both on the coast and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Common Sandpiper	*Actitis hypoleucos*	-	C,J,K,Bonn	Species or species habitat likely to occur within area (DCCEEW 2023a)	Found in Australia during non-breeding season, on all coastlines and in inland areas, but is concentrated in the north and west with important areas in WA, the NT and QLD. Utilises a wide range of coastal and inland wetlands with varying salinity levels.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Fork-tailed Swift	*Apus pacificus*	-	C,J,K	Species or species habitat likely to occur within area (DCCEEW 2023a)	Almost exclusively aerial, flying from less than 1m to at least 300 m above ground and probably much higher. Many records occur east of the Great Divide, however, a few populations have been found west of the Great Divide. Mostly occur over inland plains but sometimes above foothills or in coastal areas. Mostly found over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. Also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. Sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines. Also found over settled areas, including towns, urban areas and cities.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
Grey Plover	*Pluvialis squatarola*	-	V C,J,K	1 record within 10 km (DPE 2023a)	Breeds around the Arctic regions and migrates to the southern hemisphere, being a regular summer migrant to Australia, mostly to the west and south coasts. Almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Latham's Snipe	*Gallinago hardwickii*	-	V J,K,Bonn	Species or species habitat known to occur within area (DCCEEW 2023a)	Non-breeding migrant to the south east of Australia. Breeds in Japan and on the east Asian mainland. Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. Found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. Also uses crops and pasture.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Oriental Cuckoo	*Cuculus optatus*	-	C,J,K	Species or species habitat known to occur within area (DCCEEW 2023a)	Migrates to northern and eastern Australia in the warmer months. Occurs south to the Shoalhaven area. Occurs in a range of habitats, including monsoon forest, rainforest edges, leafy trees in paddocks, river flats, roadsides and mangroves.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Osprey	*Pandion haliaetus*	-	Bonn	Species or species habitat known to occur within area (DCCEEW 2023a)	Found right around the Australian coast line, except for Victoria and Tasmania. Common around the northern coast, especially on rocky shorelines, islands and reefs. Uncommon to rare or absent from closely settled parts of south-eastern Australia. Rare records from inland areas. Favours coastal areas, especially the mouths of large rivers, lagoons and lakes. Breeds in NSW from July to September. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Pectoral Sandpiper	*Calidris melanotos*	-	J,K,Bonn	Species or species habitat likely to occur within area	Widespread but scattered records across NSW, east of the divide and in the Riverina and Lower Western regions. Prefers shallow fresh to saline wetlands and is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools,	Nil, no local records of this species and no suitable habitat	Nil

Common name	Scientific name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
				(DCCEEW 2023a)	creeks, floodplains and artificial wetlands. Usually in coastal or near-coastal habitats, and prefers wetlands with open mudflats and low emergent or fringing vegetation such as grass or samphire.	present within the highly modified study area	
Rufous Fantail	*Rhipidura rufifrons*	-	Bonn	Species or species habitat known to occur within area (DCCEEW 2023a)	Found along NSW coast and ranges. Inhabits rainforest, dense wet forests, swamp woodlands and mangroves. During migration, it may be found in more open habitats or urban areas.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Satin Flycatcher	*Myiagra cyanoleuca*	-	Bonn	Species or species habitat known to occur within area (DCCEEW 2023a)	Found along the east coast of Australia from far northern Queensland to Tasmania. Uncommonly seen species, especially in the far south of its range, where it is a summer breeding migrant. Inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Sharp-tailed Sandpiper	*Calidris acuminata*	-	V C,J,K, Bonn	Species or species habitat known to occur within area (DCCEEW 2023a)	Most of the population migrates to Australia during non-breeding season, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil
Spectacled Monarch	*Symposiachrus trivirgatus*	-	Bonn	Species or species habitat may occur within area (DCCEEW 2023a)	Found in coastal north-eastern and eastern Australia, including coastal islands, from Cape York to Port Stephens. It is much less common in the south. Prefers thick understorey in rainforest, wet gullies and waterside vegetation as well as mangroves.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Common name	Scientific name	BC Act status	EPBC Act status	Source	Habitat association	Likelihood of occurrence	Likelihood of impact
White-throated Needletail	*Hirundapus caudacutus*	-	V, C,J,K	1 record within 10 km (DPE 2023a), species or species habitat known to occur within area (DCCEEW 2023a)	Migrates to eastern Australia from October to April. Almost exclusively aerial and most often seen before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. Occurs over most types of habitat, but mostly recorded above wooded areas, including open forest and rainforest. May also fly between trees or in clearings, below the canopy. Recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows.	Unlikely, only one local record. No suitable habitat present within the highly modified study area	Nil
Yellow Wagtail	*Motacilla flava*	-	C,J,K	Species or species habitat known to occur within area (DCCEEW 2023a)	Occurs within Australia in open country habitat with disturbed ground and some water. Recorded in short grass and bare ground, swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land and town lawns. Breeds in temperate Europe and Asia.	Nil, no local records of this species and no suitable habitat present within the highly modified study area	Nil

Key: C – China-Australia Migratory Bird Agreement, CE – critically endangered, E – endangered, J – Japan-Australia Migratory Bird Agreement, K – Republic of Korea-Australia Migratory Bird Agreement, V – vulnerable,