



Biodiversity Development Assessment Report

Bomaderry CO₂ Processing Site

Prepared for Babbage Consultants Australia, on behalf of Air Liquide Australia Solutions Pty Ltd.

FINAL Report

30 April 2026

DOCUMENT TRACKING

Item	Detail
Project Name	Bomaderry C02 processing site
Project Number	1014
Citation	Ecological Strategies 2026. Bomaderry C02 processing site Biodiversity Development Assessment report. Prepared for Babbage Consultants Australia, on behalf of Air Liquide Australia Solutions Pty Ltd.

Version	Author	Reviewer	Date of review
Draft	Sarah Allison / Rebecca Goodwin	Rebecca Goodwin	23/04/2026
Final	Rebecca Goodwin	Rebecca Goodwin	29/04/2026

Acknowledgements

This document has been prepared by Ecological Strategies with support from the following:

- Tim Barrettt and Shane Skinner from Babbage Consultants Australia.
- Deidre Krejzlik from DKGIS, assistance with mapping.

Disclaimer

This document may only be used for the purpose for which it was commissioned. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information.

Ecological Strategies accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report and its supporting material by any third party. Information provided is not intended to be a substitute for site specific assessment or legal advice in relation to any matter. Unauthorised use of this report in any form is prohibited.

Ecological Strategies- Environmental Consulting | ABN: 88 770 270 228 | rgoodwin@ecologicalstrategies.com.au

Contents

Abbreviations	7
Executive Summary	9
Declaration	12
1 Introduction.....	13
1.1 Purpose of this report	13
1.2 Proposed development	13
1.2.1 Location	14
1.2.2 Assessment area, Subject land, development site and development footprint	14
1.3 Legislative pathway	15
1.4 Information sources	16
2 Methodology	18
2.1 Desktop assessment	18
2.1.1 Review of existing information	18
2.1.2 Background database searches	18
2.1.3 Threatened species habitat suitability	19
2.1.4 Local data	19
2.1.5 Spatial data.....	19
2.2 Field investigation	20
2.2.1 Native vegetation, threatened ecological communities & vegetation integrity	20
2.2.2 Habitat constraints assessment	21
2.2.3 Threatened flora survey methods	24
2.2.4 Threatened fauna survey methods	24
2.3 Weather Conditions.....	25

2.4	Limitations	25
3	Site context	26
3.1	Assessment area.....	26
3.2	Subject land description	26
3.3	Landscape features	26
3.3.1	IBRA bioregions and IBRA subregions	27
3.3.2	Native vegetation cover	27
3.3.1	Connectivity.....	27
3.3.2	Rivers, streams, estuaries and wetlands	28
3.3.3	Wetlands	28
3.3.4	Areas of Geological Significance	28
3.3.5	Areas of outstanding biodiversity value	28
3.3.6	Soil hazard features	28
3.3.7	Hydrology	29
3.3.8	NSW Mitchell Landscape	29
4	Results- Vegetation	32
4.1	Native vegetation extent.....	32
4.1.1	Existing information	32
4.1.2	Mapping native vegetation extent	32
4.2	Plant Community Types	33
4.2.1	PCT 4051 South Coast Lowland Red Gum-Swamp Oak Forest.....	33
4.2.2	Non-native vegetation	34
4.3	Vegetation integrity and patch size	36
4.3.1	Patch size	37
4.3.2	Vegetation integrity score	38

5	Results- Threatened species.....	44
5.1	Habitat assessment results	44
5.1.1	Hollow-bearing Trees	44
5.1.2	Searches for fauna signs	45
5.1.3	Fauna species recorded.....	45
5.2	Ecosystem credit species.....	45
5.3	Species credit species	46
6	Avoid and minimise impacts	50
7	Mitigation measures	52
7.1	Adaptive management strategy	54
8	Impact Assessment	55
8.1	Residual impacts of the proposed development	55
8.1.1	Direct impacts.....	55
8.1.2	Indirect impacts	56
8.1.3	Prescribed Impacts	58
8.1.4	Impacts considered uncertain	59
8.1.5	Impacts to Groundwater Dependant Ecosystems	59
8.1.6	Serious and Irreversible Impacts	59
8.2	Relevant legislation	67
8.2.1	Environment Protection and Biodiversity Conservation Act 1999	67
8.2.2	Water Management Act 2000	68
8.2.3	Fisheries Management Act 1994	68
8.2.4	State Environment Planning Policy (Biodiversity and Conservation) 2021	69
8.2.5	State Environment Planning Policy (Resilience and Hazards) 2021	70
8.2.6	Shoalhaven Local Environment Plan 2014	72

8.2.7	Biosecurity Act 2015.....	72
9	Impact summary	73
9.1	Identifying Impacts requiring offset	73
9.1.1	Impacts on native vegetation (ecosystem credits)	73
9.1.2	Impacts on threatened species and their habitat (species credits)	73
9.1.3	Indirect.....	73
9.1.4	Identification of impacts not requiring assessment	74
9.2	Biodiversity credit report	74
	References	75
Appendix A	BAM plots	77
Appendix B	Threatened Species Assessment	81
Appendix C	Biodiversity Credit Summary Report	91

FIGURES

FIGURE 1: SUBJECT LAND.....	17
FIGURE 2: DEVELOPMENT SITE.....	30
FIGURE 3: LOCATION	31
FIGURE 4: NATIVE VEGETATION	40
FIGURE 5: VEGETATION OF THE SUBJECT LAND	41
FIGURE 5A: VEGETATION OF THE SUBJECT LAND – EAST	42
FIGURE 5B: VEGETATION OF THE SUBJECT LAND – WEST	43
FIGURE 6: PATCH SIZE.....	48
FIGURE 7: FIELD SURVEY EFFORT.....	49
FIGURE 8: FINAL DEVELOPMENT FOOTPRINT.....	60

FIGURE 8A: FINAL DEVELOPMENT FOOTPRINT- EAST	61
FIGURE 8B: FINAL DEVELOPMENT FOOTPRINT- WEST	62
FIGURE 9: ALTERNATIVE DEVELOPMENT FOOTPRINT	63
FIGURE 10: INDIRECT IMPACTS	64
FIGURE 11: IMPACTS REQUIRING OFFSET AND IMPACTS NOT REQUIRING OFFSET	65

Abbreviations

Abbreviation	Definition
AWS	Automatic Weather Station
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CBD	Central Business District
CEEC	Critically endangered ecological community
CEMP	Construction Environmental Management Plan
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DA	Development Application
DBH	Diameter at breast height
DPE	Department of Planning and Environment (NSW) (renamed to DCCEEW in 2024)
DPIE	Department Of Planning, Industry & Environment (renamed to DPE in 2021)
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESCP	Erosion and Sediment Control Plan
FM Act	<i>Fisheries Management Act 1994</i>
GDE	Groundwater Dependent Ecosystem
GIS	Geographic Information Systems
ha	hectares

Abbreviation	Definition
IBRA	Interim Biogeographic Regionalisation for Australia
KFH	Key Fish Habitat
km	kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
LVMP	Landscape & Vegetation Management Plan
m	meters
MNES	Matters of National Environmental Significance
NoG	Non-offsetable Grassland
NSW	New South Wales
NSW DCCEEW	Department of Climate Change, Energy, Environment and Water (NSW)
OEHS	Office of Environment and Heritage (NSW) (renamed to DPIE in 2019)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impact
SPRAT	Species Profile and Threats Database
SSD	State Significant Development
SVTM	State Vegetation Type Map
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
VIS	Vegetation integrity Score

Executive Summary

Manildra Energy Australia Pty Ltd and Air Liquide Australia Solutions Pty Ltd propose the development of a liquid Carbon Dioxide processing facility and associated pipeline and access routes at 340 Bolong Road in Bolong, New South Wales (NSW). The development will occur across the norther portion of seven lots, which adjoin the Shoalhaven River, the total area of the subject land discussed in this assessment is approximately 43.9 hectares (ha).

The proposed development will involve the construction of the processing plant within Lot A DP 384559, with a pipeline to connect westward to existing facilities, crossing the northern boundary area of Lot 1 DP 544730, Lot 5 and 6 DP 621040, Lot 1 DP 605942, Lot 3 DP 3885 and Lot 143 DP 1069758. The development is located approximately 5 kilometres (km) north-east of Nowra town centre and 120 km south of the central business district (CBD) of Sydney. The land is located in the Shoalhaven Local Government Area (LGA) and the South East Local Land Services (LLS) area and is zoned under the *Shoalhaven Local Environmental Plan 2009* (LEP) as land zoned E4 – General Industrial and RU1 - Primary Production.

The project is considered a State Significant Development (SDD). Under the *Environmental Planning and Assessment Act 1979* (EP&A Act), all development applications for SSD projects must be accompanied by a Biodiversity Development Assessment Report (BDAR).

The proposed work occurs across seven lots, with a minimum lot size of 40 ha under Shoalhaven LEP. The subject site contains native vegetation which has been determined as potentially providing threatened species habitat, as well as potential to have indirect and prescribed impacts on the adjacent Shoalhaven River. Therefore assessment is required in accordance with the NSW Biodiversity Assessment Method (BAM) (DPIE, 2020a) and the NSW *Biodiversity Conservation Act 2016* (BC Act).

Field investigation determined that 2.4 ha of native vegetation occur within the subject land, comprised of:

- 17.1 ha exotic grassland / cleared land.
- 0.19 ha of exotic vegetation.
- 2.1 ha of PCT 4051 South Coast Lowland Red Gum-Swamp Oak Forest.
- 0.27 ha of PCT 4049 South Coast Floodplain Grassy Swamp Forest.

Native vegetation within the subject land is highly disturbed, occurring predominantly as planted native vegetation in clear rows around the boundaries of lots. Historic clearing and agricultural use of the subject land is evident with the majority of the subject land comprised of previously cleared exotic grassland. The vegetation in the subject land was not found to be consistent with any state or commonwealth listed Threatened Ecological Communities (TECs).

Two vegetation zones occur within the development footprint and were identified as:

- 4051_Moderate – South Coast Lowland Red Gum-Swamp Oak Forest.
- 4051_Non-offsetable Grassland (NoG) – exotic grassland with no canopy or midstory species.

The proposed works have been sited to avoid clearing of vegetation as far as practical and have included:

- The initial proposed site of the pipeline was located adjacent the Shoalhaven River, and was moved north along Bolong Road to better align with previously cleared areas and to avoid indirect impacts to the Shoalhaven River.
- Vegetation removal and potential indirect impacts to water sustainability within the catchment of the Shoalhaven River have been minimised.
- The pipeline is proposed to be drilled in the section of remnant canopy (UNE) in Lot 1 DP 605942 to avoid removal/impact to native planted vegetation along Bolong Road.
- The retained vegetation provides a connection to other areas of habitat within the locality and will continue to provide habitat for flora and fauna currently occurring within the subject land.
- The total area of native vegetation retained by the final development footprint is 22.33 ha.
- The impacts to native vegetation within the subject land, equate to a reduction of 0.17% native vegetation cover within the assessment area.

The residual impacts to the subject land from the proposed development have been determined as total clearing of vegetation including:

- 0.18 ha of PCT 4051 South Coast Lowland Red Gum-Swamp Oak Forest
- 1.88 ha Exotic Grassland (NoG).

Field assessment included collection of full BAM floristic plots, used to determine PCT identification and Vegetation integrity score. Vegetation integrity scores are provided in below.

Habitat assessment determined the habitat within the subject land is heavily degraded and modified by past and current land use. Habitat is limited to potential foraging resources for highly mobile species, including regrowth stands of Swamp Oak (*Casuarina glauca*) which may provide foraging for South-east Glossy Black-Cockatoo, planted Forest Red Gum (*Eucalyptus tereticornis*) and Grey Ironbark (*Eucalyptus paniculata*) which may provide resources for some nectivorous birds.

The subject land is heavily degraded and did not provide suitable habitat for threatened flora species. Targeted searches, habitat assessment and random meanders did not detect any threatened species and as such the project does not require offsets for any species credits.

Offsets are required for the vegetation zone 4051_Moderate in accordance with the BAM, as the VI score is greater than 20 (33.7) and the vegetation in the subject land was not consistent with any TECs. The credit summary in **Table E. 1** below were calculated on the 24 April 2026.

TABLE E. 1: VEGETATION ZONES, INTEGRITY AND ECOSYSTEM CREDITS

Zone	PCT	TEC	Area impacted (ha)	VI Score	Future VI score	Change in VI Score	Biodiversity risk weighting	Credit requirement
4051_Moderate	4051	no	0.18	33.7	0	-33.7	2	3
4051_NoG	Exotic/cleared	no	1.88	1	0	-1	2	0
Total credits								3

This BDAR has been prepared by Sarah Tobin and Accredited Assessor Rebecca Goodwin (BAAS 17067), with review conducted by Rebecca Goodwin. This BDAR describes the outcome of the development assessment case (BAM-C 63693) conducted consistent with the BAM.

Declaration

Certification under clause 6.15 Biodiversity Conservation Act 2016

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature: R. Goodwin

Date: 30/04/2026

BAM Assessor Accreditation no: BAAS#17067

This BDAR has been prepared to meet the requirements of BAM 2020. **Appendix A** provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

1 Introduction

1.1 PURPOSE OF THIS REPORT

Ecological Strategies have been engaged by Babbage Consultants Australia, on behalf of Air Liquide Australia Solutions Pty Ltd to prepare a BDAR for the liquid Carbon Dioxide processing facility at 340 Bolong Road, Bolong in New South Wales (NSW).

This BDAR will:

- Address the BAM (DPIE 2020a) and the BOS.
- Identify how the proponent has avoided and minimised impacts to biodiversity.
- Identify any potential impact that could be characterised as serious and irreversible.
- Describe the offset obligations required to compensate for any unavoidable biodiversity impact resulting from the proposed development.
- Consider and assess the proposal in accordance with other relevant legislation such as the Commonwealth EPBC Act.

This BDAR has been prepared in accordance with the BAM by Accredited Assessor Rebecca Goodwin (BAAS17067). This report describes the outcome of the development assessment case (BAM-C 65800) conducted consistent with the BAM.

The proposed impacts to native vegetation are below 2 ha and the land is not Core Koala habitat under the NSW State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Koala Habitat Protection), therefore Appendix C streamlined assessment module for small area developments of the BAM has been applied.

1.2 PROPOSED DEVELOPMENT

The proposed development is located primarily within the property at 340 Bolong Road, with the processing plant and pipeline occurring across a number of lots including Lot A DP 384559, Lot 1 DP 544730, Lot 5 and 6 DP 621040, Lot 1 DP 605942, Lot 3 DP 3885 and Lot 143 DP 1069758 (hereafter referred to as the subject land). The proposed development seeks consent for a liquid carbon dioxide processing plant and associated pipeline at the subject land. The processing plant has been sited primarily within previously cleared areas of Lot A DP 384559 with the pipeline following the northern boundary of the remaining lots, to connect with the Manildra Factory.

Previous assessment of the subject land and submission of a request for BDAR waiver was prepared, based on the information provided the BDAR waiver was refused. The letter of refusal (dated 31 March 2026) outlines the determination for the subject land to require a BDAR as the vegetation to be impacted could provide habitat for threatened species and there exists potential for prescribed or indirect impacts

on water sustainability in the Shoalhaven River. This BDAR is provided to address potential impacts to biodiversity values within the subject land.

1.2.1 Location

The proposed development is located across seven lots on the south side of Bolong Road (from 220 – 340 Bolong Road), with the primary development occurring at 340 Bolong Road Bomaderry, approximately 3 km north of Nowra town centre. The development is within the Shoalhaven Council Local Government Area (LGA) (**FIGURE 3**), approximately 100 km south of the City of Sydney. The north western portion of Lot A DP 384559 is proposed for the processing plant. The associated proposed pipeline follows the northern boundary of the remaining lots (Lot 1 DP 544730, Lot 5 and 6 DP 621040, Lot 1 DP 605942, Lot 3 DP 3885 and Lot 143 DP 1069758) to the west, to join the Manildra Factory, creating a linear polygon approximately 1.3 km long, along Bolong Road.

1.2.2 Assessment area, Subject land, development site and development footprint

The subject land, development site and assessment area are terms used to define specific areas of assessment for the purposes of this BDAR in accordance with the BAM. These terms are further defined below. The extent of the subject land and assessment area can be found in **Figure 1** and **Figure 4**. The final development footprint is provided in **Figure 8**.

- The subject land is located 120 km southwest of the Sydney Central Business District Central Business District (CBD) within the suburb of Bolong. The land is in the Shoalhaven City Council Local Government Area (LGA) and the Greater Sydney Local Land Services (LLS) Region and is zoned as RU1 – Primary Production and E4 – General Industrial under the Shoalhaven Local Environmental Plan 2014 (LEP). The subject land is approximately 43.9 ha and is comprised of six lots, including the north-west portion of Lot A DP 384559 to contain the proposed processing plant, and the northern portion of the following lots adjacent to Bolong Rd proposed for the pipeline:
 - Lot 1 DP 544730
 - Lot 5 and 6 DP 621040
 - Lot 1 DP 605942
 - Lot 3 DP 3885
 - Lot 143 DP 1069758
- The development footprint is approximately 2.15 ha in area and comprises the extent of the proposed direct impacts related to all earthworks, the processing plant, pipeline and associated infrastructure, construction laydown and ancillary sites.
- The assessment area includes the subject land and the area of land within the 1500 metre (m) buffer zone surrounding the subject land.

1.3 LEGISLATIVE PATHWAY

The project has considered, or has been assessed against, relevant biodiversity legislation and government policy. This is provided in **Table 1-1**

TABLE 1-1: LEGISLATION RELEVANT TO THE PROJECT

Legislation	Description	Relevance to the current assessment
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Commonwealth legislation, applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act.	No impacts to MNES are anticipated to occur as a result of the proposal. Assessment against the EPBC Act is provided in Section 8.2.1
<i>Environmental Planning and Assessment Act 1979</i>	Provides the overarching structure for planning in NSW and is supported by other statutory environmental planning instruments (EPIs).	Determines the approval pathway for the Project, and prescribes the consideration of relevant EPIs. Assessment against the EP&A Act is provided in Section 8.2.
<i>Biodiversity Conservation Act 2016</i>	Key piece of NSW state legislation providing for the protection and conservation of biodiversity through the listing of threatened species and communities and key threatening processes.	Mandates the application of the NSW BOS and BAM.
<i>Fisheries Management Act 1994</i>	The FM identifies the aquatic species and ecological communities that are listed as threatened or otherwise protected in NSW. If development or activity is likely to have any impact on a threatened species listed under the FM Act, an assessment of the potential impacts must be made according to the test of significance.	The subject land does not contain Key Fish Habitat, however the subject land is adjacent to the Shoalhaven River which is mapped as KFH and as such, potential indirect impacts require mitigation. Assessment against the FM Act is provided in Section 8.2.
<i>Biosecurity Act 2015</i>	Outlines biosecurity risks and impacts, and prescribes requirements for the management of risk to reduce the severity of impacts.	Biosecurity risks relevant to the current assessment include weeds, pest animals and pathogens that are known to occur, or potentially occur, within the development site. Further details of biosecurity risks present in the assessment area are provided in Section 8.
State Environmental Planning Policy (SEPP) (Biodiversity and Conversation) 2021	Consolidates 11 previous SEPP's relating to biodiversity and conservation. The SEPP was consolidated to align with theme-based focus areas to make the planning system more accessible and user-friendly.	The subject land is within the City of Shoalhaven LGA which is within the Central and Southern Tablelands Koala Management area as listed in Schedule 2 of the Koala habitat protection SEPP 2021. Assessment against the SEPP is provided in Section 8.2.4.

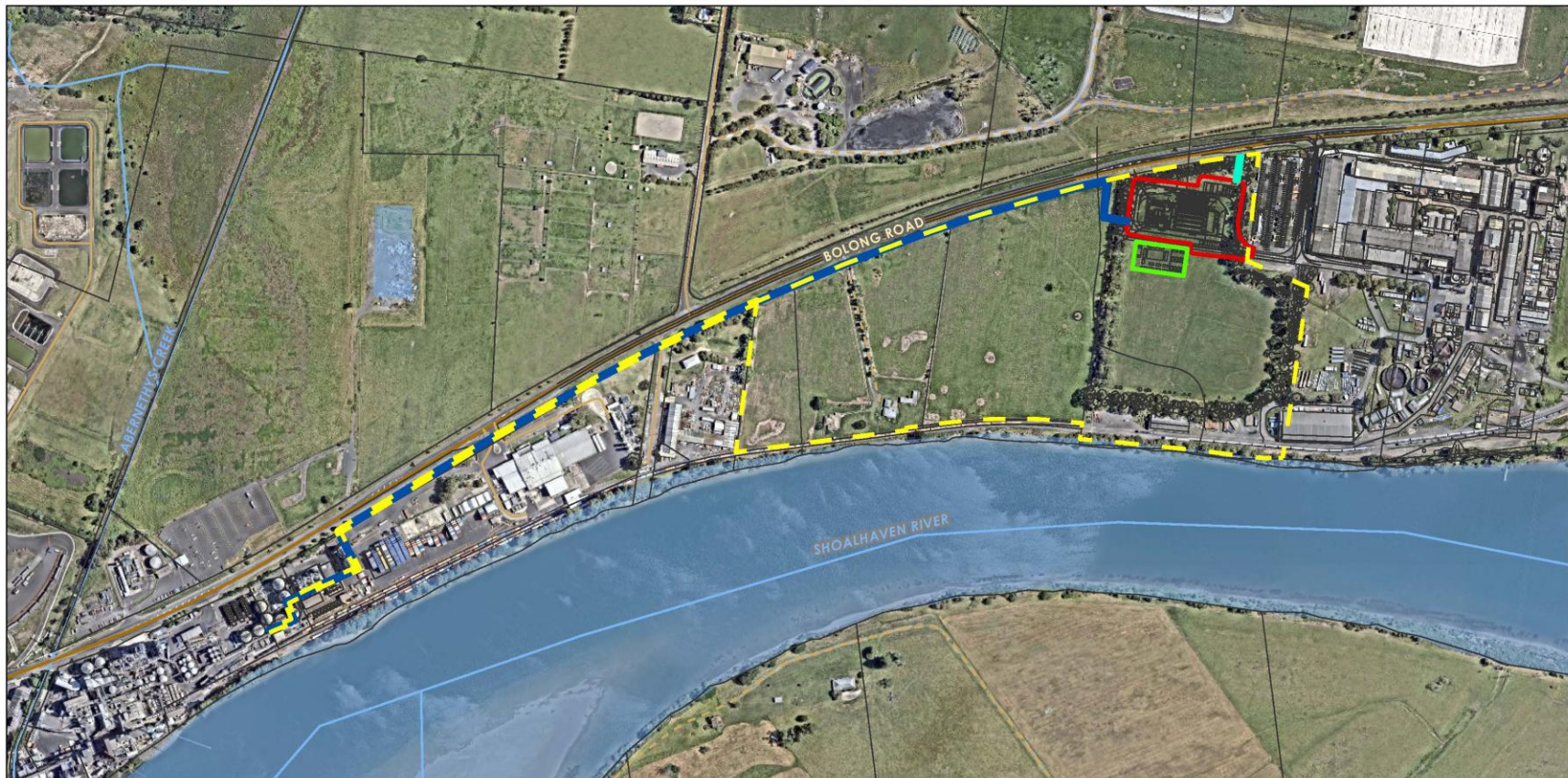
Legislation	Description	Relevance to the current assessment
SEPP (Resilience and Hazards) 2021	The SEPP aims to promote integrated and coordinated approach to land use planning in the coastal zone, in a manner consistent with the objects of the <i>Coastal Management Act 2016</i> .	This SEPP applies to land within the coastal zone. The subject land is within the Coastal use area map. Assessment against the SEPP is provided in Section 8.2.5.
<i>Shoalhaven Local Environmental Plan (LEP) 2014.</i>	This Plan aims to make local environmental planning provisions for land in Shoalhaven LGA in accordance with the relevant standard environmental planning instrument under Section 3.20 of the Act.	The subject land is located within the Shoalhaven City LGA. As such, the Shoalhaven LEP 2014 applies. Riparian lands and watercourses map , the subject site is within 50 m of the top of bank of a 'Watercourse Category 1' on the Riparian lands and Watercourses Map. Assessment against the LEP is provided in Section 8.2.6.

1.4 INFORMATION SOURCES

Desktop research was undertaken to identify site characteristics, landscape context and threatened species and ecological communities known or likely to occur in or within 10 km of the subject land. The databases, resources and search tools included:

- Atlas of Living Australia (ALA).
- Biodiversity Assessment Method Calculator (BAM-C).
- Biodiversity Assessment Method Operational Manual Stage 1 and Stage 2.
- Biodiversity Offsets and Agreement Management System (BOAMS).
- BioNet Atlas of NSW Wildlife.
- BioNet Threatened Biodiversity Data Collection (TBDC).
- BioNet Vegetation Classification.
- Commonwealth EPBC Act Protected Matters Search Tool (PMST).
- Directory of Important Wetlands in Australia.
- National Species Profiles and Threats (SPRAT) database.
- NSW and Commonwealth guidelines for targeted threatened species surveys.
- NSW Biodiversity Values Map.
- NSW eSpade soil and land information database.
- NSW Flora Online PlantNet.
- NSW Guidance on Serious and Irreversible Impacts (SAII).
- NSW Threatened Biodiversity Profile tool.
- SEED environmental data portal.

FIGURE 1: SUBJECT LAND



Legend

- | | |
|--------------|--|
| Site Plan | Air Liquide CO2 Processing Plant - Development Footprint |
| Major Road | Surface Impacts - Pipe |
| Minor Road | Temporary Access - 5m Wide |
| Track | Temporary Construction Area |
| Watercourse | |
| Waterbody | |
| Subject Land | |

 N
 DKGIS
 Date: 22/04/2026
 Metres 0 50 100 200
 Coordinate System: GDA2020 MGA Zone 56
 Imagery: © Nearmap


ECOLOGICAL
 STRATEGIES
 ENVIRONMENTAL CONSULTING

2 Methodology

2.1 DESKTOP ASSESSMENT

Desktop assessment of databases and review of existing information was undertaken to determine the landscape features and biota present in the locality (5 km). This involved a review of both aerial imagery and spatial data as well as general field observations of the areas surrounding the subject land. Sources of information used in the assessment included relevant databases, spatial data, literature and previous site reports.

2.1.1 Review of existing information

Existing information regarding native vegetation was reviewed to inform field investigations including:

- Regional Vegetation Mapping including:
 - Southeast NSW Native Vegetation Classification and Mapping - SCIVI. VIS_ID 2230 (NSW DCCEEW, 2010b)
- The NSW Plant Community Types (PCTs), as held within the BioNet Vegetation Classification database (DCCEEW, 2025).
- Review of site plans and supporting documents, including:
 - EcoPlanning 2026. *BDAR waiver, Bolong Road (Lot A // DP 384559, Lot 1 // DP 544730, Lot 5 and 6 DP // 621040, Lot 1, DP // 605942, Lot 3 // DP 3885 and Lot 143 DP 1069758), Bolong NSW 2540.*
 - Allied Tree Consultancy 2025. *Arboricultural Impact Assessment Report, for the site address Lot A DP384559, Lot 1 DP1305953, Lot 241 SP1130535, Lot 143 DP1069758, Lot 3 DP3885 Bolong Road, BOMADERRY, NSW.* Prepared for Allen Price Pty Ltd, C/- Manildra Energy Australia Pty Ltd & Air Liquide Australia Solutions Pty Ltd.

2.1.2 Background database searches

Database searches were undertaken for the locality (10km) to provide the ecological context of the subject land and included:

- Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) Protected Matters Search Tool for matters protected by the EPBC Act.
- NSW BioNet - the database for the Atlas of NSW Wildlife, Environment, Energy and Science (EES), for species, populations and ecological communities listed under the BC Act.
- NSW BAM Calculator.
- Biodiversity Values Map.
- Native vegetation regulatory map.
- BAM Important Areas maps.
- PlantNET (The Royal Botanic Gardens and Domain Trust).

Based on the results of the background review, and the requirements of the BAM, appropriate surveys were designed with respect to this BDAR for the subject land and development footprint.

Basemap data was obtained from NSW Land and property information (LPI) 1:25,000 digital topographic databases (DTDB), with cadastral data obtained from LPI digital cadastral database (DCDB).

2.1.3 Threatened species habitat suitability

Information from the Threatened Biodiversity Data Collection (TBDC) was used to assess the subject land for threatened fauna species habitats and microhabitats. This information was accessed through the BAM-C, and included the suite of species that require assessment. Additional information about threatened species was reviewed to inform aspects of habitat suitability and as evidence of microhabitats depended on by a species. Additional information was reviewed from relevant sources as allowed by the BAM, including:

- BioNet (e.g., the profile of a threatened species),
- Important Area Map,
- TBDC,
- National Species Profiles and Threats Database (SPRAT), and
- Published, peer-reviewed literature.

Initial field data entered into the BAM-C automatically generated a list of threatened species predicted to occur within the subject land based on similar parameters and species associations with the identified PCTs. Species were further refined utilising the TBDC, with regards to the habitat features and constraints present in the subject land to determine those requiring targeted survey.

Species requiring assessment by the small area module are limited to those species at risk of a serious or irreversible impact, or those that are incidentally recorded during field investigations. A full list of species identified by the background information with potential to occur in the subject land, and the likely occurrence of each species is provided in **Appendix B**.

The candidate ecosystem credit species and species credit species are listed and further discussed in sections **5.2** and **0**.

2.1.4 Local data

No additional local data was utilised for the assessment of the subject land.

2.1.5 Spatial data

A number of spatial datasets were utilised in assessing background information and development of this report, these include:

- Catchment Boundaries of New South Wales dataset.

- Mitchell Landscapes Version 3.0.
- Interim Biogeographic Regionalisation of Australia (IBRA) Version 7.
- Spatial data associated with The Native Vegetation of the Sydney Metropolitan Area (DPE 2016a).
- NSW Soil and Land Information System (SALIS).
- Mapping has been produced using a Geographic Information System (GIS). The following maps and data have been provided:
 - Digital mapping with aerial photography showing 1:1000 or finer.
 - Site map produced as described in subsection 3.1.1 of the BAM (DPIE, 2020b).
 - Location map produced as described in subsection 3.1.2 of the BAM (DPIE, 2020b).
 - Landscape map with features including 1500 m buffer, as described in section 3.1.3 of the BAM (DPIE, 2020b).

2.2 FIELD INVESTIGATION

Field investigations were undertaken over one day on the 9 April 2026 by Rebecca Goodwin (Principal Ecologist and BAM Accredited Assessor (BAAS17067) in accordance with the BAM.

Field surveys were undertaken under Scientific Licence SL103079 (expiry 30 April 2028). All fauna survey is conducted in accordance with approval VF26/63 from the NSW Animal Care and Ethics Committee (expiry date 2 April 2029).

Field mapping and collection of GPS point locations were conducted using hand-held GPS and running the Avenza Maps application, and aerial photo interpretation. Spatial locations are considered to generally have an accuracy of ± 5 m.

2.2.1 Native vegetation, threatened ecological communities and vegetation integrity

The subject land was surveyed to validate vegetation, identify fauna habitat and determine suitability or presence of threatened biota, in accordance with the BAM which involved:

- The identification and mapping of PCTs according to the structural definitions held in the BioNet Vegetation Classification database, with reference to information provided in NSW State Vegetation Type Mapping (DCCEEW, 2020).
- Undertaking floristic plots (BAM plots) within each vegetation zone in accordance with Section 4 of the BAM (DPIE, 2020b), considering avoidance of ecotones, areas of disturbance, and edges.
- Targeted transect survey for plant species of conservation significance in accordance with Surveying Threatened Plants and Their Habitats (DPIE, 2020c).
- Incidental observations using the “random meander” method (Cropper, 1993).
- Identifying factors (historic and current) affecting the ecological function and survival of native vegetation within and surrounding the subject land.
- Identifying, mapping and assessing the condition of fauna habitats (e.g., hollow-bearing trees, rock outcropping, waterways etc.).

- Observation and searches for indirect evidence of fauna (such as nests, diggings, scats, hollows, tracks, scratches and burrows).
- Targeted surveys for threatened fauna species.

Survey effort including the location of the BAM survey plots is provided in **Figure 5**, further information on BAM plots is provided in the sections below.

The conservation significance of plant species and plant communities was determined according to:

- BC Act for significance within NSW.
- EPBC Act for significance within Australia.

The extent of native vegetation, threatened ecological communities, and vegetation integrity within the subject land was determined by the results of site investigations and Section 4 of the BAM (DPIE, 2020b).

Vegetation integrity, or condition, was assessed using data obtained from undertaking BAM plots within the vegetation zones, as per Section 4.3.4 of the BAM (DPIE 2020a). Plot data was collected via:

- A 20 m x 50 m quadrat and 50 m transect for assessment of site attributes and function.
- A 20 m x 20 m quadrat, nested within the larger quadrat for full floristic survey to determine composition and structure of the PCT.

The minimum number of BAM plots per vegetation zone was determined in respect to Table 3 of the BAM (DPIE, 2020b). A total of two BAM plots were undertaken across the development footprint within vegetation zones present in accordance with the BAM, details are provided in **Section 4.3** below.

Native vegetation extent within the subject land is provided in **Figure 4**. The figure includes all areas of native vegetation (native ground cover and areas with canopy) within the subject land, areas not shown as native vegetation cover are considered cleared / non-native vegetation (or waterbodies).

2.2.2 Habitat constraints assessment

Field assessment was undertaken to determine the presence of habitat constraints and microhabitats required for threatened flora species considered likely to occur on the subject land. This involved a traverse of the subject land with a focus on identification of areas containing native vegetation or with potential to contain habitat constraints/microhabitat features. Field assessment evaluated the broad vegetation condition across the subject land, identifying habitat constraints and microhabitats that support threatened fauna species likely to occur in the area.

Field surveys included active observation and recording of species on site and key habitat types including but not limited to:

- Mostly native vegetation and floristic diversity.
- Hydro lines and areas of accumulated moisture.

- Areas with the presence of cryptogams such as biofilm soil crusts.
- Areas of reduced grazing or protected from stock grazing.
- Hollow-bearing trees and associated attributes such as size of hollows (diameter) and distance from the ground for each hollow.
- The extent and condition of riparian habitat, including waterways, water bodies and riparian vegetation.
- Presence of stick nests (particularly focussing on presence of large stick nests for threatened raptors).
- Presence of mistletoe, *Allocasuarina* and *Casuarina* species providing potential foraging resources for targeted threatened birds.
- Presence of flowering and fruiting trees providing potential foraging resources.

Survey for threatened species and their habitat within the subject land is detailed in **Table 2-1** below.

TABLE 2-1: SURVEY FOR THREATENED FAUNA HABITAT

Survey type	Survey effort	Methods	Species targeted
Specialist breeding habitat surveys	One observer over one day on the 9 April 2026.	Survey was undertaken to identify hollow bearing trees within the subject land, including recording the size (diameter) of each hollow and approximate distance from the ground. Hollow sizes are categorised as follows: • small hollows (2.5 - 5 cm), • medium hollows (5 - 10 cm), • large hollows (10 - 20 cm), • extra-large hollows (20 - 25 cm), and • extra-extra-large hollows (more than 25 cm). All trees within the subject land were searched for signs of breeding such as active hollows, stick nests, begging birds and occupied nests.	Threatened hollow dwelling species including: • Woodland Birds • Microbats • South-eastern Glossy Black-Cockatoo • Forest Owls (Barking Owl, Powerful Owl, Masked Owl).
Raptor nest searches	One observer over one day on the 9 April 2026.	All trees within the subject land were searched for signs of breeding such as active hollows, stick nests, begging birds and occupied nests. A survey was undertaken to identify all hollow bearing trees within the subject land, including recording the size (diameter) of each hollow and approximate distance from the	Threatened raptors: • Little Eagle • White-bellied Sea-Eagle • Eastern Osprey • Square-tailed Kite • Spotted Harrier

Survey type	Survey effort	Methods	Species targeted
		ground. Hollow sizes were categorised as follows: • small hollows (2.5 - 5 cm), • medium hollows (5 - 10 cm), • large hollows (10 - 20 cm), • extra-large hollows (20 - 25 cm), and • extra-extra-large hollows (more than 25 cm).	
Waterways and waterbodies	Habitat assessment over one day on the 9 April 2026.	The subject land was searched for suitable streams and waterbodies, farm dams and pools of water. These features were visually inspected from land for suitable habitat for threatened species habitat.	Threatened amphibians: • Green and Golden Bell Frog • Giant Burrowing Frog Foraging microbats: • Southern Myotis Threatened Fish: • Macquarie Perch • Australian Grayling
Diurnal bird surveys	Bird census undertaken during habitat assessment on the 9 April 2026.	Opportunistic bird surveys were conducted during all field investigations. While conducting daytime surveys, observations were also made to target diurnal raptor species.	Threatened bird species including: • Small birds (e.g., Dusky Woodswallow, Diamond Firetail, Southern Whiteface); • Large birds (e.g., Gang-gang Cockatoo, Glossy-black Cockatoo) • Wetland species such as, Latham's Snipe, Painted Snipe, Australasian Bittern • Little Eagle • White-bellied Sea-Eagle • Eastern Osprey • Square-tailed Kite
Specialist foraging survey	One observer over one day	Searches for chewed orts in stands of Swamp Oak. Searching for signs of Cockatoo presence including broken/chewed twigs and presence of birds in the subject land.	South-eastern Glossy Black-Cockatoo

2.2.3 Threatened flora survey methods

Targeted surveys were conducted to determine the presence of candidate flora species credit species on 9 April 2026. Surveys and assessment of threatened species were undertaken by experienced and qualified ecologist Rebecca Goodwin (BAAS#17067), with over 20 years' local knowledge of native and threatened flora in the region.

Potential constraints of the studies have been recognized and dealt with through appropriate sampling design where possible, with any unavoidable constraints acknowledged as limitations, in which the precautionary principle would be adopted for assuming species presence.

Habitat for threatened flora species is restricted to PCT 4051 within the development site. The remainder of the development site is dominated by exotic pasture grasses and planted vegetation due to the high degree of historic clearing, grazing and history of pasture improvement. Targeted flora survey was undertaken within suitable habitat, provided by areas of moderate condition PCT 4051 and a number of random meander/10 m traverses were also undertaken within exotic grassland (**Figure 7**).

Parallel field traverses were undertaken in accordance with relevant BAM and NSW government guidelines for surveying threatened plants and their habitats (DPIE, 2020d). Traverses were recorded on a GPS device and extent of targeted surveys are shown in **Figure 7**.

Guidelines utilised in the undertaking of targeted flora survey include:

- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC, 2004).
- *Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method* (DPIE, 2020a).

Candidate threatened flora species considered in this assessment and a summary of the targeted surveys for threatened flora are provided in **section 5.3**.

2.2.4 Threatened fauna survey methods

During all field surveys and site inspections, incidental information on fauna presence and activity was recorded through opportunistic sightings (including fauna identifiable by call). Evidence of fauna activity, such as scats, diggings, scratch marks, nests, dreys, chewed orts, burrows etc, were also noted. Surveys were conducted within the entire subject land with particular focus on habitat features and areas of suitable habitat for threatened species.

Particular emphasis was placed on searching for signs of Koala and for signs of foraging by Glossy Black-Cockatoo, which included searches within stands of Swamp Oak trees for chewed orts. Searches for signs of Koala included the undertaking of an opportunistic informal SAT search under 30 trees within the highest quality vegetation within the subject land (PCT 4051, moderate condition) adjacent to Bolong Road.

Habitat assessment and incidental surveys were undertaken in April 2026. No additional threatened fauna survey was required as no threatened species at risk of SAI or listed under the EPBC Act were considered likely to occur, except as rare vagrants, based on microhabitat present within the subject land.

2.3 WEATHER CONDITIONS

Surveys were undertaken on the 9 April during warm dry weather, data recorded at Nowra RAN Air Station (station 068072) included a daily minimum temperature of 15.3, a daily maximum of 31.6, maximum wind gust for the day was 37 km/h, with calmer conditions during survey (13 km/h at 9am and 11 km/h at 3pm). There was no rain during the day of survey and a total of 6.4 millimetres (mm) of rain fell in the preceding 7 days.

2.4 LIMITATIONS

Field surveys were undertaken in accordance with the BAM. Ecological surveys provide a sampling of flora and fauna at a given time and season. Factors influencing detectability of species during survey include species dormancy, seasonal conditions, ephemeral status of waterbodies, and migration and breeding behaviours of some fauna. In many cases, these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The field survey was conducted in April 2026 during warm, calm weather conditions, which is a suitable time to determine the presence of most threatened species.

Surveys undertaken, combined with habitat assessments and desktop analysis are considered sufficient to reach the conclusions herein, in regards to species likelihood of occurrence within the development site.

Database searches, and associated conclusions on the likelihood of species to occur within the assessment area, are reliant upon external data sources and information managed by third parties.

3 Site context

3.1 ASSESSMENT AREA

The BAM assessment area is approximately 1209.46 ha, it encompasses the subject land and the area of land within a 1500 m buffer zone surrounding the subject land (**Figure 3**). The landscape features required to be assessed by the BAM are discussed for the assessment area and subject land in the below chapter.

3.2 SUBJECT LAND DESCRIPTION

The subject land occurs within the semi-rural suburb of Bolong, west of Bomaderry on the northern shore of the Shoalhaven River within the Shoalhaven LGA. The subject land is approximately 120 km south of Sydney and is located on land zoned E4 – General Industrial, RU1 - Primary Production and adjacent to the road reserve of Bomaderry Road (zoned SP2 - infrastructure).

The subject land is approximately 43.9 ha, primarily consisting of urban native/exotic vegetation, planted native vegetation and large areas of cleared land consisting of both exotic and native grassland.

The subject land is within the Sydney 1:100,000 soil landscape and is entirely mapped as the Shoalhaven Landscape (Chapman G A et al., 2009).

The Shoalhaven soil landscape is characterised by gently undulating present river bed and banks, active floodplain with levees and backwater swamps on alluvium with flat to gently undulating terrace surfaces on the Shoalhaven River (Chapman G A et al., 2009). The landscape is completely cleared with a relief of < 5 m and slopes < 3%. The vegetation of the landscape is completely cleared except for scattered decorative paperbark (*Melaleuca decora*), Swamp Oak (*Casuarina glauca*) and Illawarra Flame Tree (*Brachychiton acerifolium*) on terraces with various reeds in swamps (Chapman G A et al., 2009).

3.3 LANDSCAPE FEATURES

Desktop assessment was undertaken to determine the landscape features of the assessment area, this involved a review of both aerial imagery and spatial data as well as general field observations of the areas surrounding the subject land.

Landscape features identified within the subject land and assessment area are shown on **Figure 1** and **Figure 3** respectively. Further discussion of relevant landscape features is provided below.

Field assessment was conducted 9 April 2026. Field assessment involved walking the subject land and immediate surrounds to confirm the extent and condition of landscape features detailed below.

3.3.1 IBRA bioregions and IBRA subregions

Under the Interim Biogeographic Regionalisation for Australia (IBRA v7), the subject land is located in the Illawarra IBRA subregion of the Sydney Basin Bioregion **Figure 3**.

3.3.2 Native vegetation cover

Aerial imagery and existing vegetation mapping were used to assess native vegetation cover within the assessment area, with field validation within the subject land and limited accessible surrounds. The use of aerial imagery included assumptions made for areas expected to be native vegetation and appearing to display native grassland, grassy woodlands, and other native trees (i.e. native forestry plantings).

Information reviewed to determine native vegetation extent include:

- NSW State vegetation Type Map (DCCEEW, 2020).
- Native vegetation mapping.
- Database searches.

Appropriate surveys were designed for the subject land and development footprint based on the background information and requirements of the BAM.

Areas mapped as PCT 0: non-native vegetation were removed from the vegetation mapping. Edits were also made to the layer where obvious changes to vegetation extent had occurred. Native vegetation cover across the assessment area was determined as both woody and non-woody vegetation, mostly grasslands and grassy woodlands. The total native vegetation in the assessment area is 105.53 ha, which equates to 6.95%. **Figure 4** provides the extent of native vegetation within the assessment area, and **Figure 5** provides native vegetation in the subject land.

3.3.1 Connectivity

The subject land occurs in a predominantly cleared landscape on the northern shore of the Shoalhaven River, approximately 2 km east of town of Bomaderry and 11 km to the west of the Pacific Ocean. The subject land is surrounded by rural, agricultural land which has been subject to historic clearing, and contains limited habitat in the form of planted native canopy species and lines of regenerating Casuarina species around the borders of Lot A DP 384559 and adjacent to Bomaderry Rd. Connectivity in the subject land extends south through the boundary of Lot A to the shores of the Shoalhaven River, and east into the previously developed section of Lot A where a small number of canopy trees occur. Due to the position in the landscape, absence of remnant native vegetation the subject land, historic clearing of the locality for agricultural use, and the current surrounding land use, the subject land has limited, poor connectivity to larger areas of native vegetation or habitat. This is emphasised by the small patch size (0.36 ha), determined by sequential mapping in accordance with the BAM.

3.3.2 Rivers, streams, estuaries and wetlands

The subject land occurs within the northern section of boundary of private lots that are immediately adjacent to the Shoalhaven River, approximately 11 km west from the River mouth at Shoalhaven Heads. The natural river entrance is often closed by build up of the sand berm through natural onshore oceanic processes (such as wave action from storms), with the opening of the entrance caused by flooding. To the south, Berry's Canal allows flow of water through to Crookhaven River, the Canal was constructed in 1822 to alleviate flooding processes on the Shoalhaven area (Shoalhaven City Council, 2026).

Within the subject land there are no mapped waterways, the subject land is largely flat with no obvious slope, however drainage channels have been placed in Lot A, from Bomaderry Rd along the length of the eastern and western boundary and contain predominantly coppiced regrowth of Casuarina trees previously removed (Allied Tree Consultancy, 2025).

The Shoalhaven River estuary occurs immediately south of the subject land, adjoining the southern boundaries of the six lots on which the development is sited. The Shoalhaven River flows to the Pacific Ocean approximately 11 km from the subject land. Pig Island, within the Shoalhaven River is located south of the subject land.

No other mapped waterways were identified within or surrounding the subject land (DCCEEW, 2025)

3.3.3 Wetlands

The nearest Wetlands (located within 5km) is the Shoalhaven River listed as 'NSW wetlands' (NSW DCCEEW, 2010a). No commonwealth significant, RAMSAR sites are located within 10 km of the subject land. The closest RAMSAR site is Towra Point Nature Reserve, approximately 100 km north-east within Botany Bay.

3.3.4 Areas of Geological Significance

There were no recorded karst, caves, crevices, cliffs or other areas of geological significance within the subject land or within the assessment area. No cliffs occur within 2 km of the subject land.

3.3.5 Areas of outstanding biodiversity value

There are no areas of outstanding biodiversity or biodiversity values mapped within the subject land (DCCEEW, 2018). The Shoalhaven River to the south of the subject land is mapped on the biodiversity values mapping. The proposed development has been sited to the north side of the subject land, to avoid impacts to the Shoalhaven River and associated remnant riparian vegetation or regrowth.

3.3.6 Soil hazard features

No soil hazard features are mapped within the subject land, the majority of the subject land is mapped with a low probability of acid sulfate soil occurrence.

3.3.7 Hydrology

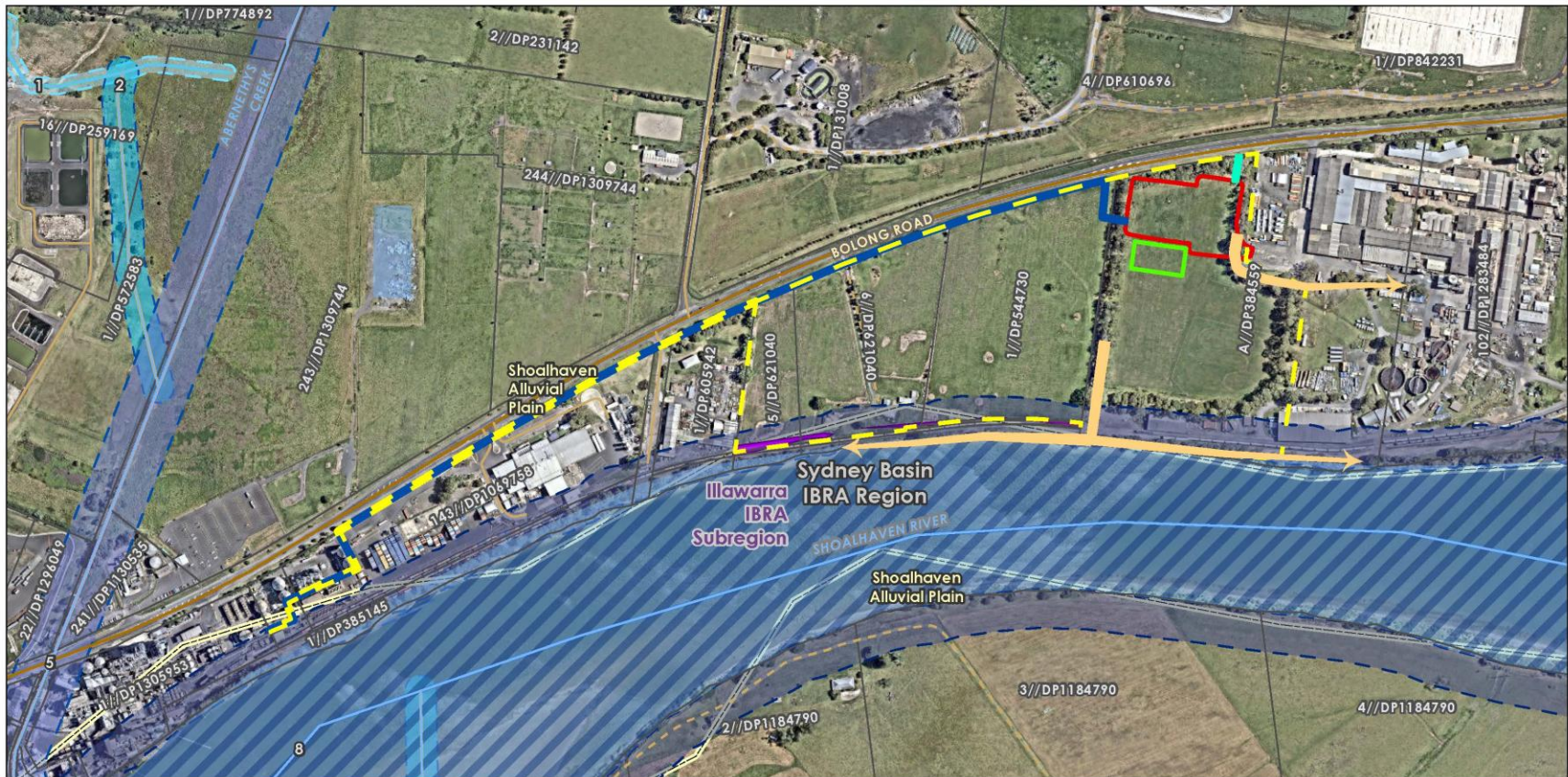
The site was assessed for the potential to support Groundwater Dependant Ecosystems (GDEs) using the Australian Government's Bureau of Meteorology Groundwater Dependant Ecosystems Atlas (Bureau of Meteorology, 2025) and the spatial portal for GDE High Ecological Value Aquatic Ecosystems (HEVAE) (DPIE, 2025). A small part of Lot A in the subject land is mapped as containing high potential for terrestrial GDE by the GDE Atlas. Vegetation in the south of Lot 1 DP 544730, and Lot A DP 384559, adjacent to the Shoalhaven River as well vegetation in Lot 6, Lot 5 and Lot 1 DP 605942 are mapped as medium potential GDE by HEVAE.

3.3.8 NSW Mitchell Landscape

The subject land lies within the Shoalhaven Alluvial Plain (DECC, 2018) with a general relief <10 m and elevation of 0 to 30 m above sea level. The landscape is comprised of quaternary sands and gravels below the mountain and gorge tract of the Shoalhaven River, on the floodplains and terraces of the Shoalhaven River. Soils are generally uniform sandy loam with a high organic content (DECC, 2018).

Vegetation is dominated by River Peppermint (*Eucalyptus elata*) and River Oak (*Casuarina cunninghamiana*) in upper reaches and brackish and saline riparian communities of Swamp Oak (*Casuarina glauca*), River Mangrove (*Aegiceras corniculatum*) and Common Reed (*Phragmites australis*) to Grey Mangrove (*Avicennia marina*).

FIGURE 2: DEVELOPMENT SITE



Legend

- Major Road
- Minor Road
- Track

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 5th Order Stream
- 8th Order Stream

Riparian Buffers

- 10m
- 20m
- 40m
- 50m

Biodiversity Values

- Biodiverse riparian land

- Threatened species or communities with potential for serious and irreversible impacts
- Waterbody
- Subject Land
- Air Liquide CO2 Processing Plant - Development Footprint
- Surface Impacts - Pipe

- Temporary Access - 5m Wide
- Temporary Construction Area
- Cadastre
- Mitchell Landscapes
- IBRA Region - Sydney Basin
- IBRA Subregion - Illawarra
- Habitat Connectivity

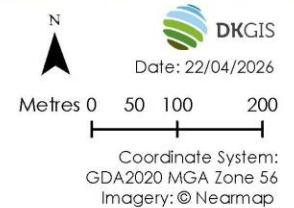
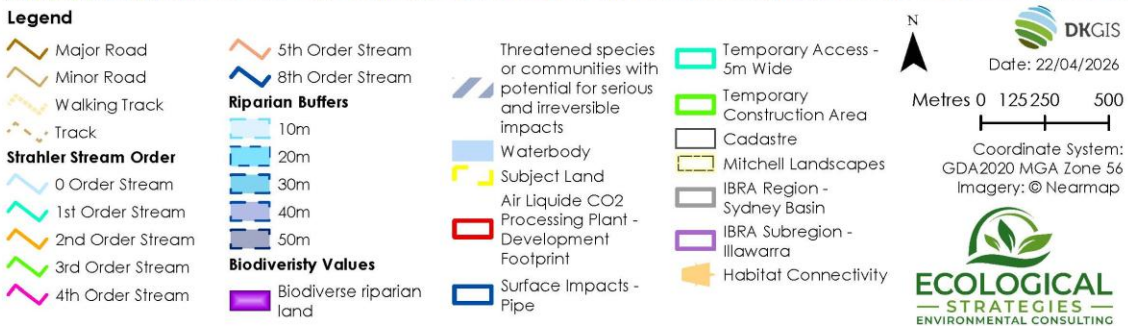
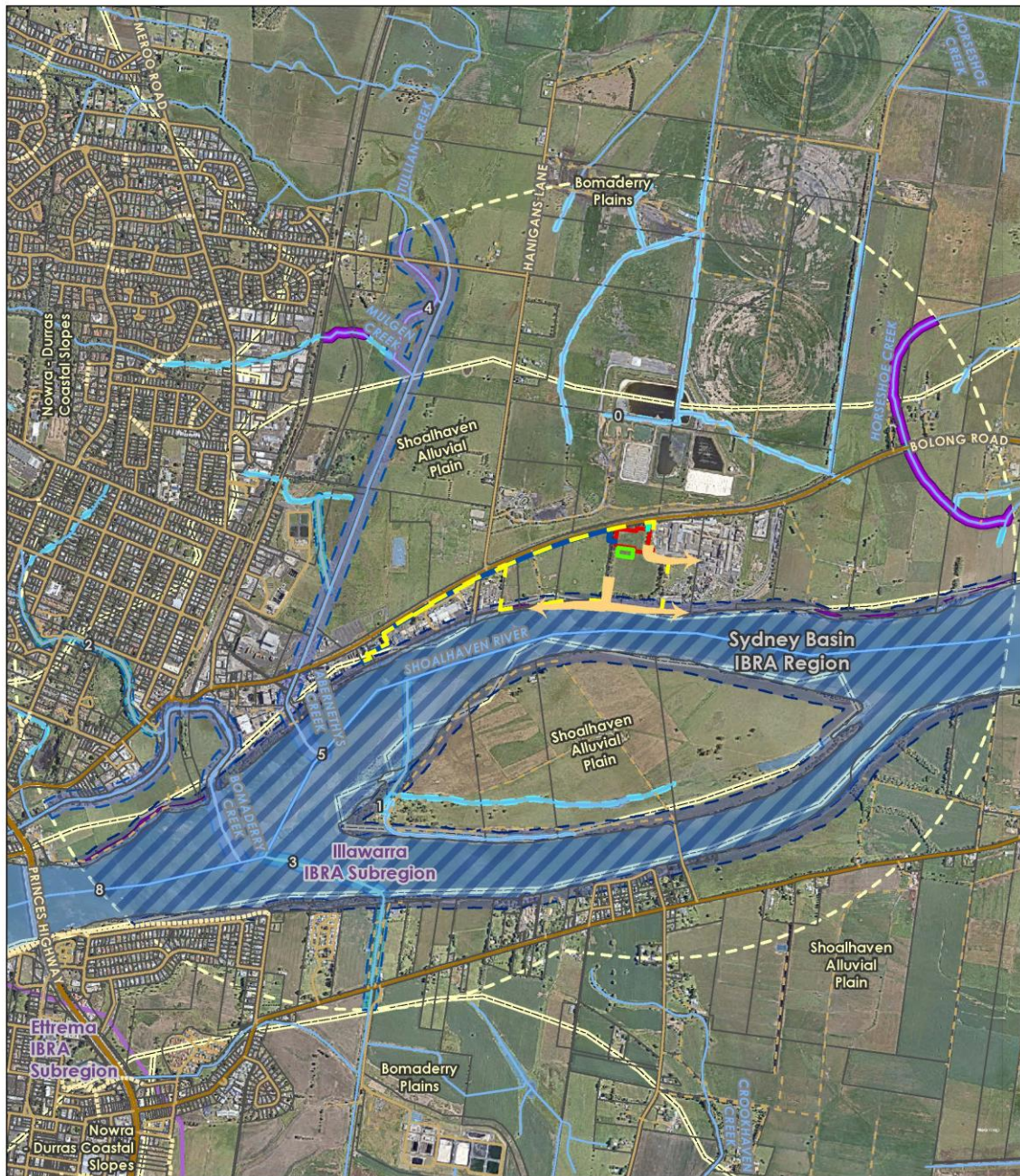


FIGURE 3: LOCATION



4 Results- Vegetation

4.1 NATIVE VEGETATION EXTENT

The subject land is 43.9 ha, with native vegetation occurring over 24 ha consisting primarily of PCT 4051 South Coast Lowland Red Gum-Swamp Oak Forest in a Moderate condition state, and 17.2 ha occurring as previously cleared/exotic grassland. 0.3 ha of PCT 4049 South Coast Floodplain Grassy Swamp Forest occur at the southern boundaries of the subject land, associated with the Shoalhaven River and will not be impacted by the proposed works. The remaining 0.2 ha consists of exotic vegetation. The highest quality vegetation occurring on the subject land was areas of moderate-quality native vegetation. These areas were primarily associated with planted native canopy along the boundaries of the subject land.

4.1.1 Existing information

A review of existing information on native vegetation type and extent was undertaken to identify plant community types (PCTs) currently mapped as occurring in the subject land and assessment area. This information was compared to the results of the field survey, including through use of the PCT filter tool (DCCEEW & University of NSW, 2025) within the BioNet Vegetation Classification database to find the best fit PCT for the subject land. The most appropriate PCT's based on the IBRA bioregion and subregion, landscape position, geomorphology, vegetation class type and structure and species composition. PCT association with Threatened Ecological Communities (TECs) were determined using the relevant NSW and Commonwealth listing advice and guidelines.

Using the results of the background review and requirements of the BAM, appropriate surveys have been designed and undertaken with respect to the proposed development footprint and the subject site.

4.1.2 Mapping native vegetation extent

The extent of native vegetation, TECs and vegetation integrity within the development site was determined using the results of site investigations and Section 4 of the BAM (DPIE, 2020b).

Figure 5 provides a map of the native vegetation extent recorded within the subject land, as assessed during field investigations undertaken in April 2026. The figure includes all areas of native vegetation (native ground cover and areas with canopy) within the subject land. Areas not shown as native vegetation cover within **Figure 5**, are considered cleared/non-native vegetation, and are addressed further below. Detailed view of the vegetation within the subject land are provided in figure **Figure 6**.

4.2 PLANT COMMUNITY TYPES

4.2.1 PCT 4051 South Coast Lowland Red Gum-Swamp Oak Forest

The description and determination for PCT 4051 South Coast Lowland Red Gum-Swamp Oak Forest is provided in **Table 1-3** below.

TABLE 1-3: PCT 4051 SOUTH COAST LOWLAND RED GUM-SWAMP OAK FOREST

PCT and condition	Description
PCT 4051 Moderate	Within the subject land, PCT 4051 occurred in a moderate condition. This community consists of planted rows of vegetation along the internal boundary of Lot A DP384559. Historical aerial imagery shows that this vegetation was planted between 1970 and 2001. The positioning of the plantings in rows along the lot boundary and roads, as evident in the 1993 aerial image, suggests this vegetation may have been planted to serve as an agricultural windbreak, privacy screening and/or landscape plantings. The community was primarily represented by a dominant canopy of Forest Red Gum (<i>Eucalyptus tereticornis</i>), Swamp Mahogany (<i>Eucalyptus robusta</i>), Grey Ironbark (<i>Eucalyptus paniculata</i>), Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), Prickly-leaved Paperbark (<i>Melaleuca styphelioides</i>) and Swamp Oak (<i>Casuarina glauca</i>). Exotic canopy species such as Camphor Laurel (<i>Cinnamomum camphora</i>) and Jacaranda (<i>Jacaranda mimosifolia</i>) also occur. The midstorey was absent. The groundcover consisted of scattered native species in the ground layer included Weeping Grass (<i>Microlaena stipoides</i>), Kidney Weed (<i>Dichondra repens</i>), Berry Saltbush (<i>Einadia hastata</i>), Native Wandering Jew (<i>Commelina cyanea</i>), Native Oxalis (<i>Oxalis perennans</i>), Slender Knotweed (<i>Persicaria decipiens</i>) and Native Geranium (<i>Geranium solanderi</i>). Exotic species recorded included Panic Veldtgrass (<i>Ehrharta erecta</i>), Kikuyu Grass (<i>Cenchrus clandestinus</i>), Beared Oats (<i>Avena barbata</i>), Blackberry Nightshade (<i>Solanum nigrum</i>), Moth Vine (<i>Araujia sericifera</i>), Cobblers Pegs (<i>Bidens pilosa</i>) and Flaxleaf Fleabane (<i>Conyza bonariensis</i>). Analysis of floristic data from the BAM_02 survey plot determined the most suitable PCT for the subject land. Given the site's location in Eastern NSW, the Plot to PCT Assignment Tool (13/04/2026) was employed to provide a quantitative identification based on the 2022 revised Eastern NSW classification. While the tool initially identified high correlations with both PCT 3327 (Illawarra Lowland Red Gum Grassy Forest) and PCT 4051 (South Coast Lowland Red Gum-Swamp Oak Forest), PCT 4051 was selected. This decision was based on a 75% match with key characteristic species, compared to only a 20% match for PCT 3327. Both communities are known to occur within the Illawarra Subregion. Conservation status: • NSW BC Act: Not listed • Commonwealth EPBC Act: Not listed

PCT and condition	Description
Photograph: PCT 4051 Moderate within the subject land	

4.2.2 Non-native vegetation

Within the subject land a total of 0.19 ha of exotic /planted native vegetation occurs, as well as a further 17.2 ha of previously cleared, exotic grassland containing no midstory or canopy strata. Descriptions of the non-native vegetation are included in **Table 1-2** and **Table 1-3** below.

Non-native vegetation has been assessed for threatened species; however it is highly disturbed, subjected to weed ingress, and does not provide habitat features suitable for threatened species.

TABLE 1-2: EXOTIC GRASSLAND

PCT and condition	Description
Exotic grassland	Historic clearing and agricultural use of the subject land is evident with the majority of the subject land comprised of previously cleared exotic grassland. This community occurs as an absent canopy and mid-storey. The ground cover is dominated by Slender Pigeon Grass (<i>Setaria parviflora</i>), Paspalum (<i>Paspalum dilatatum</i>), Panic Veldtgrass, Kikuyu Grass, Bearded Oats, Cobblers Pegs. White Clover (<i>Trifolium repens</i>), Red Clover (<i>Trifolium pratense</i>),

PCT and condition	Description
	Lamb's Tongue (<i>Plantago lanceolata</i>), Common Chickweed (<i>Stellaria media</i>), Curled Dock (<i>Rumex crispus</i>), and Purpletop (<i>Verbena bonariensis</i>). The vegetation community has a VI Score of 1, and therefore has been allocated as non-offsettable grassland (NoG), under the BAM. Conservation status: • NSW BC Act: Not listed • Commonwealth EPBC Act: Not listed
Photograph: Exotic grassland within the subject land	

TABLE 1-3: PLANTED NATIVE/EXOTIC VEGETATION

PCT and condition	Description
Planted native/ exotic	Planted native/exotic vegetation also occurs in sections of linear landscape plantings along Bolong Road within Lot 1, DP // 605942 and Lot 143 DP 1069758. The canopy and mid-storey was primarily represented by Silky Oak (<i>Grevillea robusta</i>), Sweet Pittosporum (<i>Pittosporum undulatum</i>), Lilly Pilly (<i>Acmena smithii</i>), <i>Callistemon</i> spp., Lemon Scented Gum (<i>Corymbia citrioidora</i>), Prickly-leaved Paperbark, Swamp Oak and Water Gum (<i>Tristaniaopsis laurina</i>). The groundcover consisted of modified landscaping with exotic garden species such as African Lilly (<i>Agapanthus</i> spp.), and exotic grasses and forbs.

PCT and condition	Description
	Conservation status: • NSW BC Act: Not listed • Commonwealth EPBC Act: Not listed
Photograph: UNE within the subject land	

4.3 VEGETATION INTEGRITY AND PATCH SIZE

Vegetation zones were determined for the subject land in accordance with section 4.3 of the BAM. Based on the broad condition state of the PCTs, three vegetation zones were identified in the subject land. Two vegetation integrity survey plots were undertaken, consistent with the BAM subsection 4.3.1. Details of each vegetation zone are summarised above in **section 4.2**.

Exotic grassland vegetation was confirmed by one BAM plots as vegetation not representative of a native community and could not be assigned to a PCT. BAM plots were not undertaken in the Exotic vegetation/ UNE vegetation zone, due to its exotic native and avoidance of impacts to naïve vegetation within the UNE vegetation zone. Exotic vegetation impacts are considered as part of the assessment of prescribed impacts in **section 8.1.3**.

4.3.1 Patch size

Patch sizes were determined for all zones based on definitions in the BAM subsections 3.3.3. and 4.3.2. i.e.:

“A patch is an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). The patch may extend onto land adjoining the subject land.”

Patch size was determined based on field observation and plot data, and analysis of spatial data and aerial imagery. As a result of sequential mapping of the vegetation of the subject land, the vegetation was found to form a very small patch of connecting vegetation, totalling 0.36 ha (>5 ha patch size class). As the patch is less than 1 hectare, the patch size has been entered into the BAM-C as 1 ha.

The assessment area covers 1209.46 ha, the vegetation within the assessment area totals 105.53 ha (6.95% of the assessment area). Native vegetation in the assessment area occurs predominantly on the edges of the Shoalhaven River, and towards the western boundary of the assessment area, to the west of Bomaderry Creek and connects continuously to further native vegetation beyond the assessment area.

TABLE 1-4: VEGETATION ZONES AND PATCH SIZE

Vegetation zone	Plant Community Type	Condition	Patch size class	Subject land area	BAM Plots completed	Development footprint area (ha)	BAM plot reference
4051_Moderate	4051	Moderate	<5	21.4	1	0.18	BAM_02
4051_NoG	Native/exotic grassland	Non-offsettable Grassland	10 ha	17.2	1	1.88	BAM_01
Exotic vegetation/ UNE	Exotic vegetation and UNE	Low	<5	0.2	0	0.08	N/A

Plot data was entered into the BAM calculator to determine vegetation integrity score. Plot data is presented in [Appendix A](#), vegetation integrity scores are provided in **Table 1-5** below. One vegetation integrity survey plot was undertaken to meet the minimum number of plots required for each vegetation zone in accordance with subsection 4.3.4. Table 3 of the BAM. Records of all flora species will be submitted to EES for incorporation into the Atlas of NSW Wildlife.

Exotic vegetation was sampled using rapid assessment techniques to determine that the zone was not representative of a native community and could not be assigned to a PCT.

4.3.2 Vegetation integrity score

Vegetation integrity plots were not undertaken for exotic vegetation as the small area of exotic vegetation does not require assessment under the BAM and plots were not utilised in the small fragmented area mapped. Exotic vegetation impacts are considered as part of the prescribed impacts assessment in **section 8.1.3**.

Composition, structure, function and resulting vegetation integrity scores for each zone are presented in **Table 1-5**.

TABLE 1-5: VEGETATION INTEGRITY SCORES

Vegetation Zone ID	Composition condition score	Structure condition score	Function condition score	Vegetation integrity score	Risk weighting	Hollow bearing trees present?
4051_Moderate	28	21.8	62.8	33.7	2	0
4051_NoG	0	0	0.9	1	2	0

Vegetation Condition Benchmarks are derived from the analysis of vegetation survey plot data and are maintained within the BioNet Vegetation Classification. Subsection 3.4.4 of the BAM defines Vegetation Condition Benchmarks as:

“The reference state to which sites are compared to score their site-scale biodiversity values or set goals for management or restoration. The 3 primary attributes of biodiversity; composition, structure and function are described by benchmarks”.

The vegetation integrity score within each vegetation type can be compared to best examples of the PCT in the landscape benchmarks.

Benchmark data for PCT 4051 was reviewed in the BioNet Vegetation Classification to gain an indication of the original vegetation type for each zone. Additional information was considered to determine the most likely original PCT for each zone. Guided by the BAM subsection 3.4.4 Box 6, this included consideration of:

- remaining species composition,
- patterns of surrounding vegetation,
- landscape attributes, including aspect, slope, and position,
- soil type and underlying lithology, and
- historical land management practices in the area.

When entering plot data for the subject land, the relevant benchmark data from the BioNet Vegetation Classification was automatically populated when the PCT was selected, and vegetation zone and IBRA

Bioregion added in the BAM-C. It is noted that benchmark (pristine) vegetation zones would receive a VI score of 100.

As outlined in Section 9.2.1 of the BAM (DPIE, 2020b), an offset is required for impacts on native vegetation where the vegetation integrity score is:

- ≥ 15 where the PCT is representative of an endangered or critically endangered ecological community.
- ≥ 17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or is representative of a vulnerable ecological community.
- ≥ 20 where the PCT is not representative of a TEC or associated with threatened species habitat.

As such, ecosystem credit offsets are not required for vegetation zone 4051_NoG or Exotic planted vegetation.

FIGURE 4: NATIVE VEGETATION



Legend

- Subject Land
- Assessment Buffer - 1500m
- Major Road
- Minor Road
- Walking Track
- Track
- Watercourse

Plant Community Type

- PCT3045: South Coast Temperate Gully Rainforest
- PCT3153: Illawarra Escarpment Bangalay x Blue Gum Wet Forest
- PCT3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest

- PCT3270: Shoalhaven Lowland Wet Gully Forest
- PCT3654: Shoalhaven Lowland Bloodwood Shrub Forest
- PCT3962: Coastal Floodplain Phragmites Reedland

- PCT4049: South Coast Floodplain Grassy Swamp Forest
- PCT4051: South Coast Lowland Red Gum-Swamp Oak Forest
- Exotic Vegetation
- Urban Native Exotic Vegetation



DKGIS

Date: 15/04/2026

Metres 0 125 250 500

Coordinate System:
GDA2020 MGA Zone 56
Imagery: © Nearmap



FIGURE 5: VEGETATION OF THE SUBJECT LAND



FIGURE 6A: VEGETATION OF THE SUBJECT LAND – EAST



Legend

- | | | | | | |
|--|--|-----------------------------|---|--|---|
| | Plot Start and End | | Surface Impacts - Pipe | | PCT4051: South Coast Lowland Red Gum-Swamp Oak Forest |
| | Hollow-bearing Tree | | Temporary Access - 5m Wide | | Exotic Vegetation |
| | Major Road | | Temporary Construction Area | | Urban Native Exotic Vegetation |
| | Minor Road | Plant Community Type | | | |
| | Track | | PCT4049: South Coast Floodplain Grassy Swamp Forest | | |
| | Subject Land | | | | |
| | Air Liquide CO2 Processing Plant - Development Footprint | | | | |

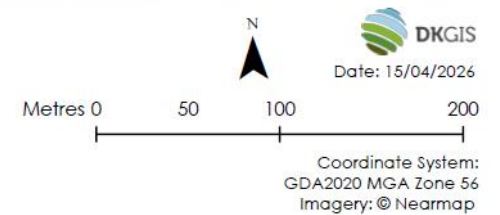


FIGURE 7B: VEGETATION OF THE SUBJECT LAND – WEST

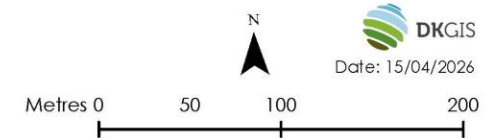


Legend

- Watercourse
- Major Road
- Minor Road
- Track
- Subject Land
- Surface Impacts - Pipe

Plant Community Type

- PCT4049: South Coast Floodplain Grassy Swamp Forest
- Urban Native Exotic Vegetation



Coordinate System:
GDA2020 MGA Zone 56
Imagery: © Nearmap



5 Results- Threatened species

5.1 HABITAT ASSESSMENT RESULTS

The subject land contains 24.1 ha of native vegetation potentially providing habitat for threatened species. Habitat within the subject land is limited to planted and remnant native canopy vegetation. Midstorey strata are largely absent with exotic species dominating the groundcover. The native canopy habitat within PCT 4051 provides potential seasonal foraging resources for mobile fauna such as nectivorous birds and Grey-headed Flying-fox. Historic clearing and grazing of the land has resulted in exotic groundcover species dominating the ground layers across the subject land and removed terrestrial habitat features such as fallen timber, leaf litter and surface rock and the highly degraded condition does not provide adequate areas of open leaf litter, woody debris or native grasses for foraging and shelter by terrestrial threatened species.

5.1.1 Hollow-bearing Trees

Five hollow-bearing trees (stags) were recorded within the subject land, containing small hollows, which may provide suitable roosting habitat for microbats. These hollows are located >200 m from any waterbody, and therefore are not considered to provide suitable roosting habitat for Southern Myotis. In addition, no impacts are anticipated to occur to these hollow-bearing trees.

Some highly mobile nectivorous species such as Little Lorikeet *Glossopsitta pusilla* may also occur on occasion as vagrant records, as part of larger foraging movements, however given the lack of suitable hollows and relative isolation from larger areas of more in-tact habitat it is unlikely these vagrant species would be impacted by the proposed works.



PHOTO 1: HOLLOW-BEARING TREES WITHIN THE SUBJECT SITE

5.1.2 Searches for fauna signs

No chewed orts, bark or twigs were recorded during searches for South-eastern Glossy Black-Cockatoo foraging signs. No evidence of Koala was recorded within any vegetation within the subject land (including scratches, scats, urine staining or individual Koala).

5.1.3 Fauna species recorded

Fauna species recorded within the subject land included common species typically found in roadside vegetation, open, cleared and agricultural areas, including:

- Australian Magpie (*Gymnorhina tibicen*)
- Laughing Kookaburra (*Dacelo novaeguineae*)
- Magpie-lark (*Grallina cyanoleuca*)
- Rainbow Lorikeet (*Trichoglossus moluccanus*)
- Red-bellied Black Snake (*Pseudechis porphyriacus*)
- Common Eastern Froglet (*Crinia signifera*)

5.2 ECOSYSTEM CREDIT SPECIES

Ecosystem credit fauna species predicted to occur within the study area were determined in accordance with Section 5 of the BAM. The species identified as ecosystem credit species in the Threatened Biodiversity Data Collection (TBDC). These species are assumed to occur based on the presence of suitable PCTs within the subject land and targeted survey is not required.

The species which could not be discounted from occurring based on the habitat within the subject land, or as they may occur across the locality on occasion are listed in **Table 5-1** below.

TABLE 5-1: ECOSYSTEM CREDIT SPECIES

Scientific name	Common name
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>
Eastern Osprey	<i>Pandion cristatus</i>
Little Lorikeet	<i>Parvipsitta pusilla</i>
Regent Honeyeater	<i>Anthochaera phrygia</i>
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>
Swift Parrot	<i>Lathamus discolor</i>
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>
White-throated Needletail	<i>Hirundapus caudacutus</i>

Species removed from the ecosystem credit list due to an absence of suitable microhabitat features include:

- Australasian Bittern
- Australian Painted Snipe
- Black-necked Stork
- Curlew Sandpiper

- Latham's Snipe

These species were removed from the candidate ecosystem credit species due to habitat constraints which are not present on site. These habitat constraints may be present in adjacent areas, and the species may occur as vagrants while moving in the locality, however, the subject land and development site did not contain suitable habitat, and no impacts will occur on areas of habitat for these species.

5.3 SPECIES CREDIT SPECIES

Species credit species are those candidate species which cannot be reliably predicted to occur by vegetation and /or landscape features, or for which vegetation and landscape features cannot reliably determine the presence of their habitat components. The native vegetation cover present within the 1500 m assessment area, the PCTs present within development site, and patch sizes are listed in **Table 1-4**.

For these species credit species, presence is required to be determined through the undertaking targeted survey or an expert report, alternatively the species can be assumed to be present (DPIE, 2020).

In accordance with Appendix C of the BAM, the streamlined assessment is required to determine candidate species assessed for species credits as per section 5.2 of the BAM. However, for the purpose of the small area assessment, only those species that are at risk of an SAI must be further assessed in accordance with steps 3-5 of section 5.2 in the BAM. Candidate species credit species that are not at risk of an SAI, and which are not incidentally recorded on the subject land do not require further assessment. Candidate species credit species returned by the BAM are provided below in **Table 5-2**.

TABLE 5-2: CANDIDATE SPECIES CREDIT SPECIES

Scientific name	Common name	BC Act Listing	EPBC Act listing
<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered	Critically Endangered
<i>Pandion cristatus</i>	Eastern Osprey	Vulnerable	Not listed
<i>Litoria aurea</i>	Green and Golden Bell Frog	Endangered	Vulnerable
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	Vulnerable	Vulnerable
<i>Myotis macropus</i>	Southern Myotis	Vulnerable	Not listed
<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	Vulnerable	Not listed

Transect searches for threatened flora and fauna, including searching for signs of foraging (chewed orts) by South-eastern Glossy Black-Cockatoo, hollow-bearing trees and stick nests are shown on **Figure 7**. No additional threatened species were incidentally recorded within the subject land. and therefore no species were added to the candidate species list.

Appendix C provides the full lists of species predicted to occur within the subject land, produced by undertaking background database searches based on the IBRA subregion where the project occurs. The list also provides an assessment of the likely occurrence of each species within the subject land based on habitat present, and identified those species which have been considered candidate species credit species (species at risk of SAI) for survey, or which can be assumed present.

Assessment is not required for those species which have geographical restrictions, or those that have habitat constraints not present within the subject land. The potential for a species to occur within the development site was assessed in accordance with Section 5.2 of the BAM and found no further assessment was required for any threatened fauna species.

FIGURE 6: PATCH SIZE



Legend

- Subject Land
- Assessment Buffer - 1500m
- Air Liquide CO2 Processing Plant - Development Footprint
- Surface Impacts - Pipe
- Temporary Access - 5m Wide
- Temporary Construction Area
- Major Road
- Minor Road
- Walking Track
- Track
- Patch - Size 3618.03m²
- Watercourse
- Plant Community Type**
 - PCT3045: South Coast Temperate Gully Rainforest

- PCT3153: Illawarra Escarpment Bangalay x Blue Gum Wet Forest
- PCT3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest
- PCT3270: Shoalhaven Lowland Wet Gully Forest
- PCT3654: Shoalhaven Lowland Bloodwood Shrub Forest
- PCT3962: Coastal Floodplain Phragmites Reedland
- PCT4049: South Coast Floodplain Grassy Swamp Forest
- PCT4051: South Coast Lowland Red Gum-Swamp Oak Forest
- Exotic Vegetation
- Urban Native Exotic Vegetation



DKGIS

Date: 15/04/2026

Metres 0 125 250 500

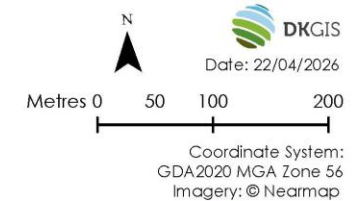
Coordinate System:
GDA2020 MGA Zone 56
Imagery: © Nearmap

FIGURE 7: FIELD SURVEY EFFORT



Legend

- | | | |
|---|--|---|
|  SAT Survey |  Watercourse |  Surface Impacts - Pipe |
|  Targeted Flora Survey |  Subject Land |  Temporary Access - 5m Wide |
|  Major Road |  Air Liquide CO2 Processing Plant - Development Footprint |  Temporary Construction Area |
|  Minor Road | | |
|  Track | | |



6 Avoid and minimise impacts

The primary method to reduce impacts by the proposal is to avoid and/or minimise the direct impact of removal of native vegetation and fauna habitats. Initial design investigations undertaken by the proponent indicated areas of avoidance to consider. Consideration has been given to avoiding and minimising impacts to biodiversity where possible during the assessment and detailed design, to protect the diversity of native flora and fauna within the subject site (**Table 5-3**). Particular emphasis was placed on the Riparian zone of the Shoalhaven River.

Impacts to biodiversity were considered in design of the proposed works and resulted in a reduction in the overall impacts to remnant canopy vegetation:

- The initial proposed site of the pipeline was located adjacent the Shoalhaven River, and was moved north along Bolong Road to better align with previously cleared areas and to avoid indirect impacts to the Shoalhaven River.
- Vegetation removal and potential indirect impacts to water sustainability within the catchment of the Shoalhaven River have been minimised.
- The pipeline is proposed to be drilled in the section of remnant canopy (UNE) in Lot 1 DP 605942 to avoid removal/impact to native planted vegetation along Bolong Road.
- The retained vegetation provides a connection to other areas of habitat within the locality and will continue to provide habitat for flora and fauna currently occurring within the subject land.
- The total area of native vegetation retained by the final development footprint is 22.33 ha.
- The impacts to native vegetation within the subject land, equate to a reduction of 0.17% native vegetation cover within the assessment area.

The final footprint is provide in **Figure 8** and the alternative design is provided in **Figure 9**.

TABLE 5-3: AVOID AND MINIMISE IMPACTS

Avoidance and minimisation components	Action	Outcome	Timing and responsibility
Alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	• Subject land selection avoids areas of higher quality vegetation containing native understorey and groundcover. • Subject site location occurs within a highly cleared landscape, within similar surrounding existing land use. • Avoids work within larger patches of more in-tact native vegetation. • Avoids removal of native vegetation for laydown areas.	Reduction to impacts on native vegetation and quality habitat. Reduce impact on biodiversity, notably the remnant PCT 4051 along Bolong Road. Reduce impact on biodiversity within the Shoalhaven River and associated riparian corridor.	Prior to work commencement Landowner
Alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification	• The development site utilises previously cleared areas for construction laydown and the processing plant. • The pipeline is proposed to be drilled in the section of remnant canopy		

Avoidance and minimisation components	Action	Outcome	Timing and responsibility
for selecting the proposed site.	(UNE) in Lot 1 DP 605942 to avoid removal of trees along Bolong Road. Avoids removal of canopy species associated with the Shoalhaven River riparian corridor, providing biodiversity value within the site.		
Efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design.	The development site utilises previously cleared areas and drilling underground for the pipeline alignment to avoid removal of vegetation, including exotic and planted vegetation. A temporary access road will be utilised while the permanent access route to the adjacent lot is established during construction.	Reduction to impact on native vegetation and quality habitat. No trees require removal for temporary access and permanent access will avoid removal of native vegetation.	Prior to work commencement Land owner
Site constraints that the proponent has considered in determining the location and design of the proposal.	The development site has been subjected to extensive prior disturbance. Situating the development within cleared areas and fragmented vegetation, in order to retain areas of higher condition vegetation was selected where feasible, in line with land access constraints and existing infrastructure.	Reduced impacts to biodiversity as a whole by utilising areas already cleared and subject to edge effects and noise/light pollution.	Prior to work commencement Landowner
Timing of works	It is recommended where feasible that timing of vegetation clearing avoids potential foraging resources availability (eg, Winter for Swamp Oak) to avoid indirect impacts on retained vegetation from noise.	Reduction of impact on adjacent retained vegetation.	Commencement of vegetation clearing

7 Mitigation measures

Measures to mitigate or manage impacts have been identified in accordance with the BAM (DPIE, 2020b) with consideration given to include measures such as:

- Techniques, timing, frequency and responsibility.
- Identification of measures for which there is risk of failure.
- Evaluation of the risk and consequence of any residual impacts.
- Documentation of any adaptive management strategy proposed.

These include measures to be undertaken before, during and after construction to mitigate the direct impacts of the proposal and Indirect impacts on native vegetation and habitat.

Construction and operational phases of the subject land have been considered, with identification of measures for mitigating impacts related to:

- Mitigating prescribed biodiversity impacts.
- Displacement of resident fauna.
- Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain.

Measures include the development and implementation of detailed plans which will include a Construction Environmental Management Plan (CEMP), Erosion and Sediment Control Plan (ESCP), Stormwater Management Plan (Babbage, 2026), and any other required management plans as directed by conditions of consent.

The measures proposed in **Table 7-1** have been identified to manage construction and operational impacts of the proposal to biodiversity.

TABLE 7-1: MITIGATION MEASURES

Action	Mitigation	Responsibility and timing	Outcome
Displacement of resident fauna	Implement a CEMP that would include the following protocols: • Biodiversity management. • Unexpected finds protocol. • Fauna injury protocol.	Construction contractor Ongoing/throughout earthworks	Mitigate the risk of impact to the surrounding and retained environment during project construction. Mitigate the risk of unexpected interactions with fauna.
Indirect impacts on native vegetation and habitat	• Install appropriate stormwater and erosion controls on site. • Tree protection is to be implemented for retained trees in accordance with AS 4970-2009 (Protection of Trees on Development Sites). • Fencing of all retained vegetation to adequately prevent accidental encroachment.	Construction Contractor Before and throughout construction.	No degradation to retained vegetation and habitats.

Action	Mitigation	Responsibility and timing	Outcome
	- Include appropriate signage such as 'no go zones' and identify the location of any 'No Go Zones' in site inductions and a Construction Environmental Management Plan. - All material stockpiles, vehicle parking and machinery storage will be located within cleared areas proposed for clearing, and not in areas of native vegetation that are to be retained. - Implement of an appropriate CEMP during works.		
Soil erosion and sediment runoff	- Where appropriate works areas should be wet down to reduce dust generation during construction. - Appropriate erosion and sediment controls to be installed prior to earthworks commencing.	Construction Contractor Throughout construction.	No degradation to retained vegetation and habitats.
Indirect impacts to native vegetation, habitat and threatened species from light spill	No night work or lighting is required.	N/A	N/A
Indirect impacts on native vegetation and habitat	- Prior to the vegetation clearing the development site boundary will be marked out by the environmental supervisor. Particular note will be made regarding overhead branches, patches of soft ground, surface water and any other potential hazards. - Implement of an appropriate CEMP during works. - Adherence to strict no-go zones to protect the Coastal Wetlands areas. - Avoid undertaking construction works during spring to prevent noise disturbance of adjacent habitats potentially used for foraging and breeding by nesting birds.	Construction Contractor Throughout earthworks and construction	Mitigate impacts to the retained vegetation, including TECs within the subject land and impacts to Lake Illawarra, including risk of impacts to water quality from sediment runoff. Mitigate risk of impact to environmental controls during project construction.
Adaptive management strategies proposed to monitor and respond	- Implementation of appropriate strategies for unexpected/unlikely events (such as spills) within the CEMP during construction works. - Implementation of appropriate strategies for the operational phase of the project.	Prior to earthworks/vegetation clearing. Ongoing.	Mitigate impacts to the retained vegetation, including TECs within the subject land. Mitigate risk of impact to environmental controls during project construction.

7.1 ADAPTIVE MANAGEMENT STRATEGY

Adaptive management strategies are implemented as the strategies are receptive to new and relevant data that may arise throughout the project and operation phase. Ongoing assessment and monitoring are key to the successful implementation of crucial objectives and allow flexibility and ongoing feedback and results, to achieve desired objectives. This includes measures to monitor predicted and uncertain impacts which will trigger adaptive management actions and allow for effective and quick responses to prevent further impact. Construction and operational management plans are to contain an adaptive management component to manage unexpected fauna, general maintenance of the operational site and spills.

8 Impact Assessment

8.1 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The primary impacts of the proposal on biodiversity is the loss of native vegetation and associated habitats within the subject land. Direct impacts include clearing or other modification and disturbance of:

- 0.18 ha of PCT 4051: South Coast Lowland Red Gum-Swamp Oak Forest
- 1.88 hectares of Exotic grassland
- 0.08 ha of exotic vegetation.

Assessment of direct and indirect impacts unable to be avoided has been undertaken in accordance with the BAM (DPIE 2020a) and have been provided below. Direct impacts are identified in **Figure 13**.

This assessment has conservatively assumed, for the purpose of assessment and calculation of impacts that all land within the development footprint would be completely cleared of all native vegetation, with the exception of the pipeline to be drilled in the section of remnant canopy (UNE) in Lot 1 DP 605942 to avoid removal of trees along Bolong Road.

At this design level there is necessarily some uncertainty over the extent of indirect impacts, and extent of off-site impacts. Reasonable and justified assumptions have been made on the basis of known information and in consultation with relevant experts on the project team. Indirect impacts are not expected to occur as a result of the proposal, and will be avoided through the mitigation measures provided in Section 0 of this BDAR including implementation of a CEMP. Therefore, offsets for indirect impacts are not anticipated to be required for the project.

8.1.1 Direct impacts

Direct impacts include vegetation clearing calculated from the area of proposed pipeline, processing plant and associated ancillary sites (construction laydown, stockpile etc).

The offset requirement for the proposal was calculated using the BAM Calculator.

Table 8-1 provides a summary of the impacts to native vegetation from proposed development at the subject land.

These impacts will be permanent and will occur from the outset of the development. Mitigation measures outlined in **Section 0** will provide further avoidance measures to be implemented and to minimise the potential impacts to biodiversity values that remain present within the subject land.

TABLE 8-1: DIRECT IMPACTS TO NATIVE VEGETATION

Zone	PCT	TEC	Area within subject land (ha)	Area impacted (ha)	VI Score	Future VI score
4051_Moderate	4051	no	21.4	0.18	33.7	0

Zone	PCT	TEC	Area within subject land (ha)	Area impacted (ha)	VI Score	Future VI score
4051_NoG	Exotic/cleared	no	17.2	1.88	1	0

Native vegetation was not found to provide habitat for threatened species requiring assessment, which includes species at risk of a serious and irreversible impact (SAIL) in accordance with Appendix C of the BAM (DPIE, 2020b).

No threatened species credit species were recorded within the subject land and no offsets are required for threatened species.

8.1.2 Indirect impacts

Potential indirect impacts arising from the project are outlined and addressed in **Table 8-2** and shown in **Figure 12**.

Indirect impacts are not expected to occur as a result of the proposal, indirect impacts will be avoided through the mitigation measures provided in Section 0 of this BDAR including implementation of a CEMP. Therefore, offsets for indirect impacts are not anticipated to be required for the project.

TABLE 8-2: POTENTIAL INDIRECT IMPACTS OF THE PROJECT

Indirect impact	Likelihood and consequences
Impacts on retained or adjacent vegetation or habitat	Construction activities have the potential to indirectly impact adjacent vegetation due to production of dust and sediment runoff when vegetation clearing and earthworks are conducted. Potential impacts can be prevented or minimised through implementation of exclusion fencing and a CEMP detailing best practice environmental protection measures, strict water quality practices and stormwater controls. In addition, potential lighting impacts during the operation of the proposed development would be mitigated by ensuring any lighting is directed towards the developed area, rather than towards the adjacent retained habitats.
Impacts of stormwater runoff on adjacent waterways	Stormwater runoff has potential to impact water quality in the adjacent Shoalhaven River due to the development providing increased hard surface within the subject land for water to accumulate, and potential for general building related contamination from the development site during construction and operation. A Stormwater Management Plan (Babbage, 2026) has been prepared to outline the design and operational procedures for the stormwater network at the site, to ensure regulatory compliance and prevent indirect impacts on the Shoalhaven River from the proposed development. During operation, water quality in the Shoalhaven River has the potential to be impacted by runoff from the development, which is approximately 250m from the Shoalhaven River. The Stormwater Management plan includes provision to protect water quality by ensuring maintenance requirements are detailed, including frequency of maintenance. Mitigation measures include detention ponds to restrict water flow post development, to match pre-development flows. The stormwater management plan also outlines treatment plans to remove contaminants

Indirect impact	Likelihood and consequences
	from the stormwater, as well as maintenance schedules to prevent sedimentation and rinse filter cartridges. Emergency spill response actions are also detailed to contain accidental spills from contaminating the adjacent environment and entering the Shoalhaven River.
Transport of weeds and pathogens from the site to adjacent vegetation	Weeds occurring within the subject land are common and also occur within adjacent vegetation to be retained. Increased transport of pathogens and weeds is unlikely to occur as a result of the development, and will be managed by biosecurity measures outlined in the CEMP.
Reduced viability of adjacent habitat due to noise, dust or light spill	It is predicted that the adjacent habitat will be impacted in a small way by noise, dust and light spill, during construction and operation of the future development of the subject land. However, this will be managed via best practices outlined in a CEMP. Retained vegetation will occur predominantly to the south of the development footprint, along the Shoalhaven River, with limited vegetation retained immediately adjacent to the works. The subject land already occurs near industrial facilities, and light and noise pollution is most likely low - moderate. This will likely not substantially increase due to the proposed future development.
Loss of breeding habitats	No specialist breeding habitat will be impacted by the proposed development. The vegetation within the subject land occurs as an isolated patch, disconnected to other areas of habitat and is not likely to result in loss of connectivity to breeding habitats.
Increased risk of starvation, exposure and loss of shade or shelter	The majority of the habitat present in the subject land considered marginal for most fauna species given the disturbed planted condition, absence of hollows and understorey strata. The vegetation in the subject land is disconnected from larger patches (patch size of 0.36 ha) and the connectivity to other patches will not be impacted by the proposed works. The proposed future development will not result in an increased risk of starvation, exposure and loss of shade or shelter to native species due to the location of the vegetation being removed within the subject land and locality, and the very small area in proportion to commensurate habitats available in the broader assessment area.
Trampling of threatened flora species	No threatened flora species were found, or are considered likely to occur, within the subject land, and thus trampling of threatened flora species is not likely.
Inhibition of nitrogen fixation and increased soil salinity	This impact is not expected as a result of the proposal. The removal of vegetation from this area will not lead to increased soil salinity or affect nitrogen fixation for vegetation in surrounding areas.
Fertiliser drift	No impacts from fertiliser drift are anticipated to occur from these works.
Rubbish dumping	The subject land is partially cleared and presents an opportunity for illegally rubbish dumping. Standard environmental controls for the development will ensure potential impacts are minimised. The proposed development is likely to result in a decrease in the potential for this impact.
Wood collection	Development proposed within the subject land is not likely to increase access to retained vegetation beyond current access capacity. The development of the site will limit access to the general public and as the site is an industrial processing facility, future landholders are not expected to be likely to undertake wood collection within the retained vegetation. Unauthorised access and collection of wood is expected to be minimal based on the proposed land use.
Removal and disturbance of rocks, including bush rock	The subject land does not support bush rock.
Increase in predators	The subject land already occurs within a semi-urbanised setting with pets, such as Dogs <i>Canis familiaris</i> and Cats <i>Felis catus</i> , common. The subject land is already largely cleared. The remaining vegetation clearance proposed by

Indirect impact	Likelihood and consequences
	the development, and proposed land use, is unlikely to increase predatory species populations.
Increase in pest animal populations	The proposal occurs in a semi-urbanised area with impacts including introduced domestic pets such as cats currently occurring within the locality. Pest animals such as Rats <i>Rattus rattus</i> and European Rabbit <i>Oryctolagus cuniculus</i> are also widely spread within the region and are likely to occur across the locality. The proposal will not result in an increase in available habitat for these species and is unlikely to lead to an increase in pest animal populations. Suitable waste disposal implemented during and post construction will further reduce the resources available for pest species.
Changed fire regimes	The proposal occurs in a semi-urbanised area. Appropriate asset protection zones and fire mitigation systems will be implemented for the future development and the proposal will not result in an increased risk of fire.
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds	The proposed works will not impact specialist breeding and foraging habitat for any threatened species.
Fragmentation of movement corridors	Movement corridors are currently restricted in width and availability through the locality. The project will result in the removal of 5.83 ha of native vegetation that occurs the subject land to the north, south and west. The removal of vegetation along the south may fragment movement corridors from the north and south, however extensive remnant vegetation exists to the southeast of the subject site down to the riparian corridor of Back Creek and vegetation (possible movement corridors) to the west of the subject land to the state conservation area will remain intact and not be fragmented.

8.1.3 Prescribed Impacts

Prescribed impacts are any additional impacts which cannot be quantified and assessed by the vegetation on site. These may include but are not necessarily limited to, geological features such as caves, man-made structures, connective habitat and increased vehicle strike risk.

An assessment of potential prescribed impacts is provided in **Table 8-3** below and shown in **Figure 12**. Prescribed impacts are not expected to arise from the proposed development.

TABLE 8-3: PRESCRIBED IMPACTS

Feature	Likelihood and consequences
Karst, caves, crevices, cliffs, rocks and other geological features of significance	The subject land does not contain any geological features which may be impacted, and will not impact on threatened ecological species or communities associated with these geological features.
Occurrences of human-made structures, non-native vegetation and cleared land	No threatened species or communities are associated with human-made structures within the subject land. 1.97 ha of non-native vegetation in the form of exotic grassland and exotic vegetation is mapped within the development footprint and does not provide habitat for threatened species.

Feature	Likelihood and consequences
Corridors or other areas of connectivity linking habitat for threatened entities	The development will not require removal of trees within the subject land and has been sited to utilise previously cleared areas for access, laydown and borehole positioning. As the development will retain woody vegetation within the subject land, particularly areas connected to the riparian corridor of the Shoalhaven River, and impact on a very small area (2.15 ha), the proposed work is not expected to impact corridors or other areas of connectivity linking habitat for threatened entities.
Water bodies or any hydrological processes that sustain threatened entities	The subject land does not contain any waterways or waterbodies, however is adjacent to the Shoalhaven River. Erosion and sediment control to prevent indirect impacts to the River for the duration of the construction works will be implemented in accordance with mitigation measures outlined in Section 7 of this BDAR. A stormwater management plan (Babbage, 2026) has been prepared and outlines actions to prevent contamination from runoff, maintain mitigation measures and provides a framework for prevention of contamination by accidental spills. No threatened fauna were recorded during field surveys and the proposed work is not expected to directly impact the habitat provided by the Shoalhaven River. Mitigation measures including the implementation of the Stormwater Management Plan will prevent indirect or prescribed impacts on the Shoalhaven River.
Protected animals that may use the proposed wind farm development site as a flyway or migration route	Not applicable to the project.
Where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community	The development of the processing plant in land adjacent to existing industrial infrastructure is not expected to significantly increase traffic within the subject land. The subject land occurs adjacent to an existing 2 lane roadway and any additional movements from construction crew would be a marginal increase in vehicle movement in the immediate vicinity over the short term. The proposed development will increase local traffic on the subject land, however the short duration (during construction) is not expected to introduce high speed limits or heavy vehicle movement such that it could impact threatened species. The development will occur primarily on land previously cleared, and construction management plans will include mitigation measures for unexpected finds of fauna.

8.1.4 Impacts considered uncertain

There are no impacts considered uncertain for the current assessment. The assessment provides an overestimation of the extent of impacts across the subject land, with pipeline placement and drilling aiming to avoid impacts to vegetation wherever possible.

8.1.5 Impacts to Groundwater Dependant Ecosystems

No impacts are expected to GDE as the development footprint is sited to avoid mapped potential GDE.

8.1.6 Serious and Irreversible Impacts

No entities at risk of Serious and Irreversible Impacts were recorded within the subject land.

FIGURE 8: FINAL DEVELOPMENT FOOTPRINT



Legend

- | | | |
|--|---|---|
|  Site Plan |  Surface Impacts - Pipe |  Major Road |
|  Subject Land |  Temporary Access - 5m Wide |  Minor Road |
|  Air Liquide CO2 |  Temporary Construction Area |  Track |
|  Processing Plant - Development Footprint | |  Watercourse |
| | |  Waterbody |

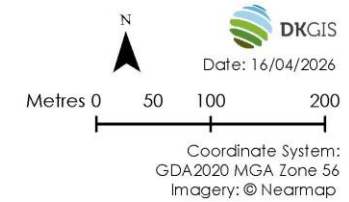


FIGURE 9A: FINAL DEVELOPMENT FOOTPRINT- EAST



Legend

- | | | |
|--|-----------------------------|-------------|
| Site Plan | Surface Impacts - Pipe | Major Road |
| Subject Land | Temporary Access - 5m Wide | Minor Road |
| Processing Plant - Development Footprint | Temporary Construction Area | Track |
| | | Watercourse |
| | | Waterbody |

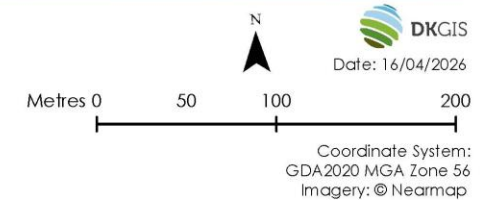


FIGURE 10B: FINAL DEVELOPMENT FOOTPRINT- WEST



Legend

- | | | |
|--|---|--|
|  Site Plan |  Surface Impacts - Pipe |  Major Road |
|  Subject Land |  Temporary Access - 5m Wide |  Minor Road |
|  Air Liquide CO2 Processing Plant - Development Footprint |  Temporary Construction Area |  Track |
| |  Watercourse |  Waterbody |

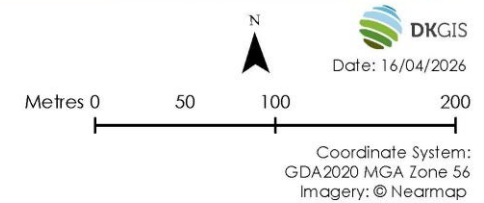


FIGURE 11: ALTERNATIVE DEVELOPMENT FOOTPRINT



Legend

- | | | | |
|---|--|---|-----------------------------|
|  | Subject Land |  | Temporary Construction Area |
|  | Air Liquide CO2 Processing Plant - Development Footprint |  | Major Road |
|  | Surface Impacts - Pipe |  | Minor Road |
|  | Temporary Access - 5m Wide |  | Track |
| | |  | Watercourse |
| | |  | Waterbody |

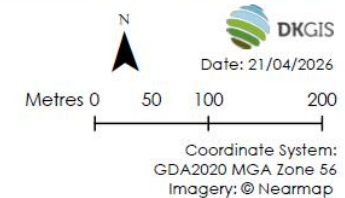
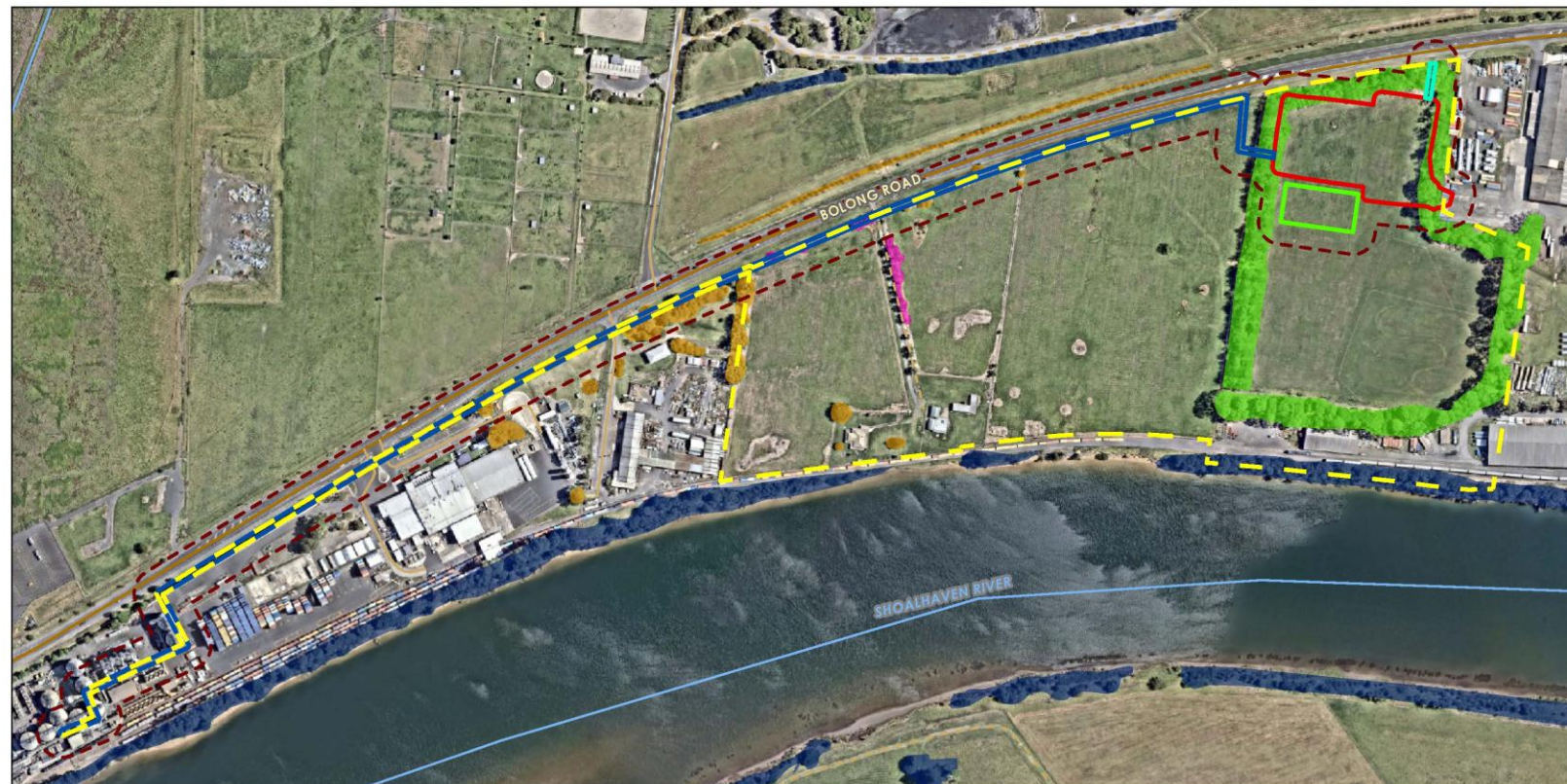


FIGURE 12: INDIRECT IMPACTS



Legend

- | | | | |
|--|--|--|---|
| Motorway | Temporary Access - 5m Wide | PCT3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest | PCT4049: South Coast Floodplain Grassy Swamp Forest |
| Major Road | Temporary Construction Area | PCT3270: Shoalhaven Lowland Wet Gully Forest | PCT4051: South Coast Lowland Red Gum-Swamp Oak Forest |
| Minor Road | Indirect Impacts | PCT3654: Shoalhaven Lowland Bloodwood Shrub Forest | Exotic Vegetation |
| Walking Track | Plant Community Type | PCT3962: Coastal Floodplain Phragmites Reedland | Urban Native Exotic Vegetation |
| Track | PCT3045: South Coast Temperate Gully Rainforest | | |
| Watercourse | PCT3153: Illawarra Escarpment Bangalay x Blue Gum Wet Forest | | |
| Subject Land | | | |
| Air Liquide CO2 Processing Plant - Development Footprint | | | |
| Surface Impacts - Pipe | | | |

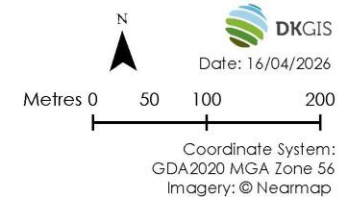
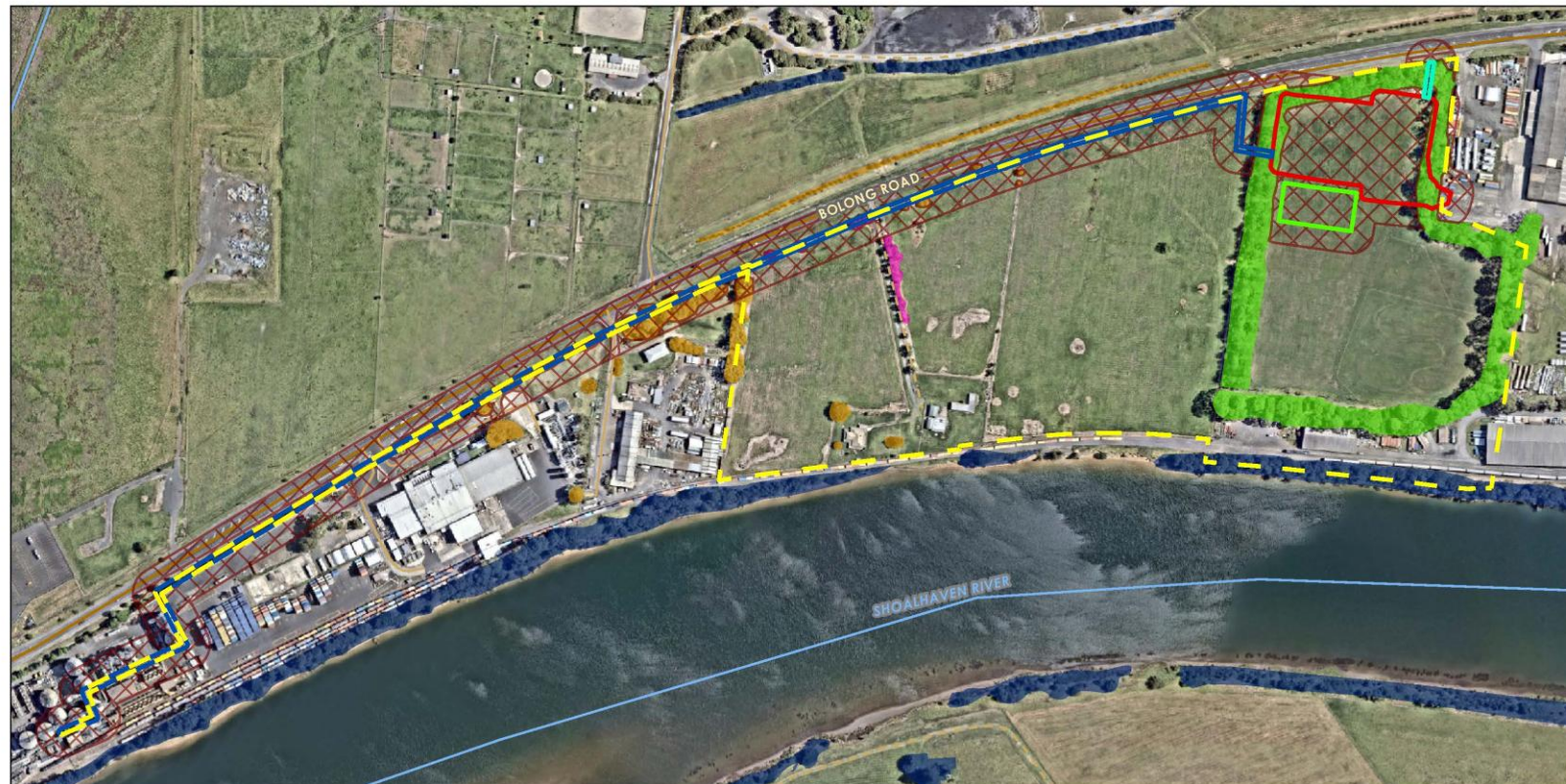


FIGURE 13: IMPACTS REQUIRING OFFSET AND IMPACTS NOT REQUIRING OFFSET



FIGURE 12: PRESCRIBED IMPACTS



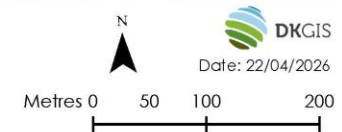
Legend

- Motorway
- Major Road
- Minor Road
- Walking Track
- Track
- Watercourse
- Prescribed Impacts
- Subject Land

- Air Liquide CO2 Processing Plant - Development Footprint
- Surface Impacts - Pipe
- Temporary Access - 5m Wide
- Temporary Construction Area

Plant Community Type

- PCT4049: South Coast Floodplain Grassy Swamp Forest
- PCT4051: South Coast Lowland Red Gum-Swamp Oak Forest
- Exotic Vegetation
- Urban Native Exotic Vegetation



Date: 22/04/2026
Coordinate System:
GDA2020 MGA Zone 56
Imagery: © Nearmap

8.2 RELEVANT LEGISLATION

8.2.1 Environment Protection and Biodiversity Conservation Act 1999

Desktop research using the Commonwealth Protected Matters Search Tool (the PMST) on 15 April 2026 identified several Matters of national environment significance (MNES) with potential to occur within or near the site. MNES relevant to the current proposal and subject land are summarised in **Table 8-4** below.

TABLE 8-4: MNES

MNES	Significant Impact	Site Information
World Heritage Properties	None	The subject land does not contain and is not within 10 km of a World Heritage place. As such, the project is not likely to impact any World Heritage Properties.
National Heritage Places	None	The subject land does not contain and is not within 10 km of National Heritage Places. As such, the project is not likely to impact any National Heritage Places.
Wetlands of international importance	None	The subject land does not contain or drain into a nationally important wetland. The proposed development is not likely to impact a nationally important wetland.
Nationally threatened ecological communities and threatened species	None	An EPBC report flags that five TECs and 85 threatened species listed by the Commonwealth are known or may occur within 10 km of the subject land. These species include marine mammals, fish and reptiles as well as wading shorebird species. As such, these species are not considered likely to be impacted given the absence of habitat within or adjacent to the subject land. In addition, an absence of habitat features such as rocky outcrops, and the absence of hollow-bearing trees limited the number of fauna species considered likely to occur. No roosting Grey-headed Flying-fox were observed within or adjacent to the subject land. While some native tree species may provide nectar resources on occasion, the development site provides limited, isolated canopy fragments of planted species which are attributes to PCT 4051 and may provide nectar resources on occasion. It is considered unlikely the species would utilise the subject land except on occasion, with the subject land providing limited fragmented foraging opportunity as opposed to large areas of intact foraging. The subject land does not occur adjacent to a camp, where fragmented foraging habitat could be important on occasion. The position of the resources in the context of the landscape is considered unlikely to be providing foraging habitat except potentially on limited occasion for individual flying-foxes and as such the species is considered vagrant to the site. No habitat for threatened species, individuals of any threatened species or TECs were recorded within the subject land and no impacts to threatened entities is expected, therefore no further assessment is required. The threatened entities listed under the EPBC Act considered when preparing this BDAR are presented in Appendix B.
Migratory species	Unlikely	The EPBC Act PMST suggests 52 migratory species are known or likely to occur within the subject land. The majority of these species are marine, or wading species and no habitat occurs within the subject land. The proposal is not considered likely to have a significant impact on the remaining species

MNES	Significant Impact	Site Information
		due to the small scale of available habitat to be removed, which does not include removal of any hollow-bearing trees, and has a notable absence of microhabitat features within the subject land.
Commonwealth marine areas	None	The subject land does not contain Commonwealth marine area.
Great Barrier Reef Marine Park	None	The subject land does not contain or adjoin the Great Barrier Reef Marine Park area.
Nuclear actions including uranium mining	None	The subject land does not involve uranium mining or other nuclear actions.
A water resource, in relation to coal seam gas development/ large coal mining development	None	The subject land does not involve coal seam gas or coal mining development.

8.2.2 Water Management Act 2000

The objectives of the WM Act are to provide for the sustainable and integrated management of the state's water sources. Under the WM Act an approval is required to undertake controlled activities on waterfront land, unless that activity is otherwise exempt under Section 91E of the WM Act, Section 4.41 of the EP&A Act, or Part 2 of the *Water Management Regulation 2018*. Waterfront land is defined within the Act as the bed of any river, lake or estuary and any land within 40 m of the river banks, lake shore or estuary mean high water mark.

The WM Act is supported by guidelines which provide design considerations and management measures for works on waterfront land. These considerations and management measures should be considered when planning and undertaking the proposed works.

DPI Water recommends riparian widths recommended by DPI Water are based on watercourse order, stratified in accordance with the Strahler method (Strahler, 1952). Riparian corridor widths are recommended as a basis to protect waterway stability (stabilise stream beds and banks and prevent erosion), protect water quality by trapping nutrients and sediment and waterways and to provide habitats and connectivity for flora and fauna (NSW DPE, 2022). The Shoalhaven River is mapped as an eighth order stream at the location of the proposed works and as such, a corridor of 80 m either side of the top of bank would be required (NSW DPE, 2022). The proposed development of the processing plant will occur > 100 m from the top of bank and as such no controlled activity permit would be required. The pipeline will join the existing facility within Lot 1 DP 1305953 which is within 80 m of the top of the bank of the Shoalhaven River.

8.2.3 Fisheries Management Act 1994

No waterways or mapped key fish habitat occur within the subject land or development site. The Shoalhaven River adjacent to the subject land contains mapped Key Fish Habitat. The proposed works will not alter habitat within the waterway, will not bridge or tunnel under the waterway and will not

block fish passage. Construction mitigation measures including erosion and sediment control will be implemented to prevent indirect impacts to habitat within the Shoalhaven River.

8.2.4 State Environment Planning Policy (Biodiversity and Conservation) 2021

Chapter 4- Koala habitat protection 2021 of the SEPP (Biodiversity and Conservation) pertains to the conservation of Koala habitat with an aim to support a permanent free-living population over their present range and reverse the current trend of Koala population decline.

The subject land is within the City of Shoalhaven LGA which is within the Central and Southern Tablelands Koala Management area as listed in Schedule 2 of the SEPP. In its entirety, the subject land comprises 26.9 ha and under the current Shoalhaven Local Environmental Plan (LEP) 2009 is zoned as E4 (General Industrial) and RU1/SP2 (road reserve). There is no current approved Koala Plan of Management for the subject land.

In accordance with part 4.2 Development Control of Koala Habitats, section 4.9 applies to the development of the land:

- (a) has an area of at least 1 hectare (including adjoining land within the same ownership), and
- (b) does not have an approved koala plan of management applying to the land.

The subject land has an area of at least 1 ha and does not have an approved Koala Plan of Management applying to the land. Therefore, Council must assess whether the development is likely to have a low or no impact on Koalas or Koala habitat before development consent is granted. If a higher level of impact on Koalas or Koala habitat is likely, council must take into account a Koala assessment report for the development.

In accordance with the Sepp, core Koala habitat means:

- a. an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
- b. an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

The proposed development will result in removal of 0.18 ha of native vegetation in the form of PCT 4051 in a moderate condition state which includes potential Koala feed tree species, and 0.08 ha of exotic/planted vegetation containing scattered canopy species which provide potential use for resting Koala. Koala use tree species for the central and southern tablelands and south coast Koala Management Area (KMA) within the subject land include Forest Red Gum (*Eucalyptus tereticornis*) and Grey Ironbark (*Eucalyptus paniculata*).

One Koala record occurs within the locality (5km), this record is from the near the center of the town of Nowra which has likely undergone additional development since the sighting was recorded as it is dated from 1980. One additional record occurs approximately 6 km north of the subject land, near Jaspers Brush. This record is highly disconnected from the subject land by cleared agricultural land and likely is

occurring in relation to the larger patch of in-tact native vegetation occurring around the foothills of Berry Mountain. This native vegetation is well connected to large patches of vegetation within Cambewarra Range Nature Reserve, Budderoo National Park and Barren Grounds National Park.

Although a number of feed trees occur within the subject land, it is not considered to provide highly suitable Koala habitat given the absence of Koala records on the north side of the Shoalhaven River and within 5 km of the subject land, the position of the remnant vegetation within the landscape, the poor connectivity within the assessment area (patch size <1 ha), historic clearing and current surrounding land use. The vegetation in the subject land is poorly connected to other patches of remnant vegetation occurring along the Shoalhaven River. These patches are disconnected from larger areas of potential and known Koala habitat (given the location of records).

In addition, Koala was not returned as a candidate species in the BAM calculator, and no evidence of Koala was recorded during the field survey, including during opportunistic informal SAT searches in areas of canopy tree species, particularly in the areas to be impacted by the proposed development, along Bolong Road. It is considered likely given these factors that the subject land does not provide highly suitable habitat for Koala.

Given the development has prioritized avoidance of native vegetation, resulting in a small area to be impacted, historic records do not occur in conjunction with the subject land, Koala is not associated with the vegetation of the subject land for the assessment, and that Koala was not recorded during field investigations, the proposed development is not expected to have an impact on Koala or their habitat.

8.2.5 State Environment Planning Policy (Resilience and Hazards) 2021

The subject land occurs within the Coastal Use Area map and Coastal Environment map.

In accordance with division 3 Coastal environment area, clause 2.1 (2), development consent must not be granted to development on land to which the section applies unless the consent authority is satisfied that:

- a) the development is designed, sited and will be managed to avoid an adverse impact referred to in subsection (1), or
- b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or
- c) if that impact cannot be minimised —the development will be managed to mitigate that impact.

The consent authority must consider whether the proposed development is likely to cause an adverse impact on features identified in subsection 1:

- a. The integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,
- b. coastal environmental values and natural coastal processes,
- c. the water quality of the marine estate (in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1),

- d. marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,
- e. existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,
- f. Aboriginal cultural heritage, practices and places,
- g. the use of the surf zone.

The proposed development will be located in the northern section of the lots, approximately 220 m from the top of the bank of the Shoalhaven River. The subject land is relatively flat within an alluvial plain and the development will not remove or modify significant geology, or significantly impact water runoff or soil penetration. The development footprint does not contain moderate-high potential GDE's. The subject land is predominantly cleared and the proposed works are not likely to adversely impact on the hydrological environment. Vegetation clearing has been minimised by siting the development predominantly within previously cleared land and is not likely to adversely impact the integrity and resilience of the ecological environment.

The proposed works will include a CEMP with best practice construction controls to manage and mitigate the potential for soil and sediment runoff during construction to prevent impacts to water quality of the Shoalhaven River. No coastal lakes identified in Schedule 1 occur within proximity, or downstream of the proposed works and therefore no impacts are expected on these entities.

The proposed works will not directly impact on marine vegetation due to the location of the works approximately 200 m north of the shoreline of the Shoalhaven River. Construction mitigation measures to be implemented by a CEMP will prevent indirect impacts from sedimentation and runoff during construction. The proposed works do not occur within proximity of, and will not impact on undeveloped headlands and rock platforms.

The proposed works occur on privately owned, fenced properties which do not provide current access to the bank of the river. The proposed works will not impede existing public open space or alter safe access to and along the foreshore, beach, headland or rock platform for members of the public.

The proposed works occur within the northern section of private lots adjoining the Shoalhaven River, approximately 11 km west of where the river meets the ocean. The proposed works do not occur within proximity of the surf zone and are not expected to adversely impact the use of the surf zone.

Impacts to Aboriginal cultural heritage, practices and places are not assessed as part of this BDAR, a due diligence assessment may be required to determine potential impacts of the proposal on these features.

Mitigation measures to prevent indirect impacts to the mapped areas of Coastal Use and Coastal Environment areas are included in **Section 0** of this BDAR. Mitigation measures are proposed to protect the biophysical, hydrological and ecological integrity of the coastal environment and include measures to address sediment runoff, incidental impacts to surrounding vegetation, and general measures to prevent impacts to the retained vegetation and the Shoalhaven River.

Given the small area of impact and proposed mitigation measures, it is not expected that the works will significantly impact on the quantity and quality of surface and ground water flows to and from areas of Coastal Wetland.

8.2.6 Shoalhaven Local Environment Plan 2014

Chapter 7.6 Riparian land and watercourses applies to land identified as Riparian land on the *Riparian Lands and Watercourses Map*, and land identified as Watercourse Category 1, Watercourse Category 2 or Watercourse Category 3 on that map.

The subject land boundary adjoins the 'watercourse category 1' land mapped on the *Riparian lands and Watercourses Map*. The development site does not occur within 50 m of the top of the bank of each watercourse identified as 'Watercourse Category 1'. Therefore the Riparian land and Watercourse provision does not apply to the proposed development.

Other sections of the LEP which were considered included the Coastal Risk Planning and Terrestrial Biodiversity provisions. The proposed development does not occur within Terrestrial Biodiversity Map or the Coastal Risk Planning Map of the LEP.

8.2.7 Biosecurity Act 2015

During the field inspection, it was noted that the site has been extensively modified and disturbed, likely due to historic land management practices. This has led to the establishment of weed species in the study area, including species classified as Weed of National Significance (WoNS) and High Threat Exotics (HTE). Weed species observed within the subject site and their biosecurity duty are provided below.

TABLE 8-5: WEEDS WITHIN THE SUBJECT LAND

Common Name	Scientific name	Listing	Biosecurity duty
Moth Vine	<i>Araujia sericifera</i>	HTE	General Biosecurity Duty
Cobblers Pegs	<i>Bidens pilosa</i>	HTE	General Biosecurity Duty
Umbrella sedge	<i>Cyperus eragrostis</i>	HTE	General Biosecurity Duty
Kikuyu	<i>Cenchrus clandestinus</i>	HTE	General Biosecurity Duty
Panic Veldtgrass	<i>Ehrharta erecta</i>	HTE	General Biosecurity Duty
Blackberry	<i>Rubus fruticosus</i> sp. agg.	HTE/ WoNS	General Biosecurity Duty
Fire Weed	<i>Senecio madagascariensis</i>	HTE/ WoNS	General Biosecurity Duty Prohibition on certain dealings

9 Impact summary

9.1 IDENTIFYING IMPACTS REQUIRING OFFSET

In accordance with Section 9.2.1 of the BAM, the assessor must determine an offset for all impacts of proposals on PCTs that are associated with a vegetation zone that has a vegetation integrity score of:

- ≥15, where the PCT is representative of an EEC or a CEEC.
- ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community.
- ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

On this basis, offsets are required for vegetation zone 4051_Moderate as it has a vegetation integrity score greater than 20 (**Table 1-5**).

9.1.1 Impacts on native vegetation (ecosystem credits)

Offsets are required for impacts of the proposed development within 4051_Moderate as the associated vegetation integrity score is greater than 20. The offset requirements were calculated using the BAM calculator. **Table 9-1** provides a summary of the offsets required for impacts to native vegetation from the proposed development. Impacts requiring offset are shown in **Figure 13**.

TABLE 9-1: OFFSETS REQUIRED (ECOSYSTEM CREDITS)

Zone	PCT	TEC	Area impacted (ha)	VI Score	Future VI score	Change in VI Score	Biodiversity risk weighting	Credit requirement
4051_Moderate	4051	no	0.18	33.7	0	-33.7	2	3
4051_NoG	Exotic/cleared	no	1.88	1	0	-1	2	0
Total credits								3

9.1.2 Impacts on threatened species and their habitat (species credits)

No impacts to threatened species and their habitat (species credits) are proposed to occur as a result of the proposed development.

9.1.3 Indirect

Indirect and prescribed impacts that remain after measures to avoid, minimise, and mitigate have been applied, may be offset using additional biodiversity credits (above the credit requirement generated by the BAM-C for direct impacts) and/or other conservation measures. No additional biodiversity credits are proposed for indirect and prescribed impacts.

9.1.4 Identification of impacts not requiring assessment

The assessment determined the following areas do not require assessment:

- Impacts to 0.08 ha of exotic vegetation

9.2 BIODIVERSITY CREDIT REPORT

The biodiversity credit summary report is provided in **Appendix C**.

References

- Allied Tree Consultancy. (2025). *Aboricultural Impact Assessment Report: for the site address Lot A DP384559, Lot 1 DP1305953, Lot 241 SP1130535, Lot 143 DP1069758, Lot 3 DP3885 Bolong Road, BOMADERRY, NSW*.
- BioNet. (2026) BioNet Atlas. <https://atlas.bionet.nsw.gov.au/>
- Chapman G A, Murphey C L, Tillie P J, Atkinson G, & Morse R J. (2009). *Soil Landscapes of the Sydney 1:100,000 Sheet map* (Vol. 4). Department of Environment, Climate Change and Water, Sydney.
- Commonwealth DCCEEW (2026) Protected Matters Search Tool, Australian Commonwealth Government Department of Climate Change, Energy, the Environment and Water, <https://www.environment.gov.au/epbc/protected-matters-search-tool>.
- Cropper, S. (1993). *Management of endangered plants*. CSIRO.
- DCCEEW. (2018). Biodiversity Values Map, accessed. In *The Sharing and Enabling Environmental Data Portal*. <https://datasets.seed.nsw.gov.au/dataset/4d840c5f-fd68-4d6f-ae07-b75e1b79aa57>
- DCCEEW. (2020). NSW State Vegetation Type Map. In *The Sharing and Enabling Environmental Data Portal*. <https://datasets.seed.nsw.gov.au/dataset/95437fbd-2ef7-44df-8579-d7a64402d42d>
- DCCEEW. (2025). Hydro Line (2012) Strahler Stream Order Classification NSW. In *The Sharing and Enabling Environmental Data Portal*. <https://datasets.seed.nsw.gov.au/dataset/9ea8acc5-41e8-462a-86da-904fee7c29ad>
- DCCEEW, & University of NSW. (2025). *Plot to PCT Assignment Tool*. <https://bionet.shinyapps.io/vegplot/>
- DEC. (2004). *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities, Working Draft*. Department of Environment and Conservation (NSW).
- DECC, N. S. W. (2018). *Descriptions for NSW (Mitchell) Landscapes, Version 2 (2002)* (Vol. 2). <https://datasets.seed.nsw.gov.au/dataset/7a1658be-a632-4d4c-8e94-5f9b3be31055/resource/2b459ccd-7002-481f-9f7c-2e8ed4a6bf13/download/nsw-landscapes-descriptions.pdf>
- DPIE. (2020a). *Biodiversity Assessment Method*. Department of Planning, Industry and Environment.
- DPIE. (2020b). *Biodiversity Assessment Method*. Department of Planning, Industry and Environment.
- DPIE. (2020c). *Surveying Threatened Plants and their Habitats*. <https://www.environment.nsw.gov.au/publications/surveying-threatened-plants-and-their-habitats-bam-survey-guide>
- DPIE. (2020d). *Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method*.

- DPIE. (2025). Spatial Layer of HEVAE Vegetation Groundwater Dependent Ecosystems Value in NSW. In *The Sharing and Enabling Environmental Data Portal*.
<https://datasets.seed.nsw.gov.au/dataset/c2aa2b9e-3f9a-40ab-a21f-ed4eb14d99ee>],
- NSW DCCEEW. (2010). NSW Wetlands. In *The Sharing and Enabling Environmental Data Portal*.
<https://datasets.seed.nsw.gov.au/dataset/36c734bd-1c9c-40b9-966a-0ad0f7500a09>
- NSW DCCEEW. (2010). Southeast NSW Native Vegetation Classification and Mapping - SCIVI. VIS_ID 2230. In *The Sharing and Enabling Environmental Data Portal*.
<https://datasets.seed.nsw.gov.au/dataset/a55ea79e-967e-42cc-b6a7-2f2627a606be>
- NSW DPE. (2022). *Controlled Activities - Guidelines for Watercourse Crossings on Waterfront Land*. NSW Government. https://publications.water.nsw.gov.au/watergroupjspui/retrieve/731c761f-bccf-4a6d-b9d5-0fedf2f4e9fa/Controlled_activities_-_Guidelines_for_riparian_corridors_on_waterfront_land.pdf
- Bureau of Meteorology, B. (2025). Groundwater Dependent Ecosystems Atlas. In *Department of Planning and Environment - Water*.
<https://www.bom.gov.au/water/groundwater/gde/copyright.shtml>
- Shoalhaven City Council. (2026). Coastal and Estuary Management. In *Coast and Waterways*. Shoalhaven City Council. <https://www.shoalhaven.nsw.gov.au/Environment-and-emergency/Coast-and-waterways/Coastal-and-estuary-management>
- Standards Australia (2009) Australian Standard Protection of Trees on Development Sites (AS4970).
- Strahler, A. N. (1952). Dynamic Basis of Geomorphology. In *Geological Society of America* (Vol. 63, pp. 923–938). <https://pubs.geoscienceworld.org/gsa/gsabulletin/article-abstract/63/9/923/4513/DYNAMIC-BASIS-OF-GEOMORPHOLOGY>

Appendix A BAM plots

TABLE A. 1: VEGETATION SURVEY DATA AND LOCATIONS

PCT	BAM Plot	
	BAM 1	BAM 2
	0	4051
Condition Class	Exotic Grassland	Moderate
MGA Zone	56	56
Easting	283313	283376
Northing	6140964	6141048
BAM Plot Dimensions	20 x 50 m	10 x 100 m
Bearing	260	250
Composition (Tree)	0	4
Composition (Shrub)	0	0
Composition (Grass)	0	1
Composition (Forbs)	0	4
Composition (Ferns)	0	0
Composition (Other)	0	1
Structure (Tree)	0	80
Structure (Shrub)	0	0
Structure (Grass)	0	5
Structure (Forbs)	0	2.3
Structure (Ferns)	0	0
Structure (Other)	0	5
Large Trees	0	1
Hollow trees	0	0
Litter Cover	7	13
Fallen Logs length	0cm	0cm
Tree Stem 5 – 9 cm	0	0
Tree Stem 10 -19 cm	0	1
Tree Stem 20 – 29 cm	0	1
Tree Stem 30 – 49 cm	0	1
Tree Stem 50 – 79 cm	0	1
Tree Regeneration <5 cm	Absent	Absent
High Threat Exotic	0	58.3
Plot-based vegetation survey	Yes	Yes
Vegetation integrity survey?	Yes	Yes

TABLE A. 2: FLORA SPECIES RECORDED IN THE SUBJECT LAND FROM BAM PLOTS

Family	Scientific name	Common name		1			2		
			N. E or HTE	Cover	Abundance	Growth form	Cover	Abundance	Growth form
Apocynaceae	<i>Araujia sericifera</i>	Moth Vine	HTE				0.1	5	
Asteraceae	<i>Taraxacum officinale</i>	Dandelion	E	0.2	20		9.2	20	
Asteraceae	<i>Bidens pilosa</i>	Cobblers Pegs	HTE	0.1	5		2	30	
Asteraceae	<i>Conyza bonariensis</i>	Flaxleaf Fleabane	E				0.2	20	
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	HTE				0.1	5	
Asteraceae	<i>Lactuca serriola</i>	Prickly Lettuce	E				0.1	2	
Bignoniaceae	<i>Jacaranda mimosifolia</i>	Jacaranda	E				5	2	
Casuarinaceae	<i>Casuarina glauca</i>	Swamp Oak	N				30	6	Tree (TG)
Chenopodiaceae	<i>Einadia hastata</i>	Berry Saltbush	N				0.1	2	Forb (FG)
Commelinaceae	<i>Commelina cyanea</i>	Native Wandering Jew	N				5	50	Other (OG)
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	N				0.1	5	Forb (FG)
Cyperaceae	<i>Cyperus eragrostis</i>	Umbrella Sedge	HTE				0.1	2	
Fabaceae	<i>Trifolium repens</i>	White Clover	E	0.1	5				
Fabaceae	<i>Trifolium pratense</i>	Red Clover	E	0.5	20				
Geraniaceae	<i>Geranium solanderi</i>	Native Geranium	N				2	30	Forb (FG)
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne	E	0.2	2		20	200	
Malvaceae	<i>Modiola caroliniana</i>	Red-flowered Mallow	E				0.1	5	
Myrtaceae	<i>Eucalyptus tereticornis</i>	Forest Red Gum	N				10	3	Tree (TG)
Myrtaceae	<i>Eucalyptus robusta</i>	Swamp Mahogany	N				30	8	Tree (TG)
Myrtaceae	<i>Eucalyptus paniculata</i>	Grey Ironbark	N				10	2	Tree (TG)
Oxalidaceae	<i>Oxalis perennans</i>	Native Oxalis	N				0.1	5	Forb (FG)
Plantaginaceae	<i>Plantago lanceolata</i>	Lamb's Tongues, Plantain	E	1	50		0.2	20	
Polygonaceae	<i>Rumex crispus</i>	Curled Dock	E	1	50				
Poaceae	<i>Avena barbata</i>	Bearded Oats	E				30	100	
Poaceae	<i>Cenchrus clandestinus</i>	Kikuyu Grass	HTE				20	50	

Family	Scientific name	Common name	N, E or HTE	1			2		
				Cover	Abundance	Growth form	Cover	Abundance	Growth form
Poaceae	<i>Ehrharta erecta</i>	Panic Veldtgrass	HTE				30	100	
Poaceae	<i>Microlaena stipoides</i>	Weeping Grass	N				5	10	Grass & grasslike (GG)
Poaceae	<i>Paspalum dilatatum</i>	Paspalum	E	30	100				
Poaceae	<i>Setaria parviflora</i>	Slender Pigeon Grass	E	60	200				
Poaceae	<i>Sporobolus africanus</i>	Parramatta Grass	E	0.1	1				
Solanaceae	<i>Solanum nigrum</i>	Black-berry Nightshade	E				0.1	5	
Verbenaceae	<i>Verbena bonariensis</i>	Purpletop	E	0.1	10				



PHOTO A -2: BAM PLOT 1 – 4051 EXOTIC GRASSLAND



PHOTO A -3: BAM PLOT 2 – 4051 MODERATE

Appendix B Threatened Species Assessment

Table B.3 Flora candidate species assessment

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Albatross Mallee	<i>Eucalyptus langleyi</i>	Vulnerable	Vulnerable	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Austral Toadflax	<i>Thesium australe</i>	Vulnerable	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Bauer's Midge Orchid	<i>Genoplesium baueri</i>	Endangered	Endangered	No	TBDC	No	Not a BAM candidate, not recorded in the subject land. Habitat not suitable.
Biconvex Paperbark	<i>Melaleuca biconvexa</i>	Vulnerable	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Bomaderry Zieria	<i>Zieria baeuerlenii</i>	Endangered	Endangered	No	TBDC	No	Not a BAM candidate, not recorded in the subject land. Habitat not suitable (only known from one site with skeletal sandy loam, overlaying sandstone amongst boulders).
Brown Pomaderris	<i>Pomaderris brunnea</i>	Endangered	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Bynoe's Wattle	<i>Acacia bynoeana</i>	Endangered	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Eastern Underground Orchid	<i>Rhizanthella slateri</i>	Vulnerable	Endangered	No	PMST	No	Not a BAM candidate, not recorded in the subject land. Not known from the locality (5km).
Illawarra Greenhood	<i>Pterostylis gibbosa</i>	Endangered	Endangered	No	PMST	No	Not a BAM candidate, not recorded in the subject land.

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Jervis Bay Leek Orchid	<i>Prasophyllum affine</i>	Endangered	Endangered	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Kangaloon Sun Orchid	<i>Thelymitra kangaloonica</i>	Critically Endangered	Critically Endangered	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Tall Knotweed	<i>Persicaria elatior</i>	Vulnerable	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Leafless Tongue-orchid	<i>Cryptostylis hunteriana</i>	Vulnerable	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	Vulnerable	Vulnerable	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	Vulnerable	Vulnerable	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Native Guava	<i>Rhodomyrtus psidioides</i>	Critically Endangered	Critically Endangered	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Nowra Heath Myrtle	<i>Triplarina nowraensis</i>	Endangered	Endangered	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Scrub Turpentine	<i>Rhodamnia rubescens</i>	Critically Endangered	Critically Endangered	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Solanum celatum	<i>Solanum celatum</i>	Endangered	not listed	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Spiked Rice-flower	<i>Pimelea spicata</i>	Endangered	Endangered	No	PMST	No	Not a BAM candidate, not recorded in the subject land.

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Square Raspwort	<i>Haloragis exalata subsp. exalata</i>	Vulnerable	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Thick-lipped Spider-orchid	<i>Caladenia tessellata</i>	Vulnerable	Vulnerable	No	PMST	No	Not a BAM candidate, not recorded in the subject land.
Wallangarra White Gum	<i>Eucalyptus scoparia</i>	Endangered	Vulnerable	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Hibbertia stricta subsp. furcatula	<i>Hibbertia stricta subsp. furcatula</i>	Endangered	not listed	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
Pterostylis ventricosa	<i>Pterostylis ventricosa</i>	Critically Endangered	Not listed	No	TBDC	No	Not a BAM candidate, not recorded in the subject land.
	<i>Pterostylis vernalis</i>	Critically Endangered	Critically Endangered	No	TBDC	No	Not a BAM candidate, not recorded in the subject land. Habitat not suitable

Table B.4 Fauna candidate species assessment

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Birds							
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Endangered	Endangered	No	TBDC		Habitat not suitable, not a BAM candidate
Australian Painted Snipe	<i>Rostratula australis</i>	Endangered	Endangered	No	TBDC		Habitat not suitable, not a BAM candidate
Barking Owl	<i>Ninox connivens</i>	Vulnerable	not listed	No	TBDC		Not a BAM candidate, not recorded.
Bar-tailed Godwit	<i>Limosa lapponica</i>	P	Migratory	No	TBDC		Habitat not suitable, not a BAM candidate
Black Bittern	<i>Ixobrychus flavicollis</i>	Vulnerable	Not listed	No	TBDC		Habitat not suitable, not a BAM candidate.
Black Falcon	<i>Falco subniger</i>	Vulnerable	Not listed	No	TBDC		Not a BAM candidate, not recorded.
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Endangered	Not Listed	No	TBDC		Habitat not suitable, not a BAM candidate.
Black-tailed Godwit	<i>Limosa limosa</i>	Endangered	Endangered	No	TBDC		Habitat not suitable, not a BAM candidate
Blue-winged Parrot	<i>Neophema chrysostoma</i>	Vulnerable	Vulnerable	No	PMST		Not a BAM candidate, not recorded.
Brown Treecreeper (south-eastern)	<i>Climacteris picumnus victoriae</i>	Vulnerable	Vulnerable	No	PMST		Not a BAM candidate, not recorded.
Bush Stone-curlew	<i>Burhinus grallarius</i>	Endangered	Not listed	No	TBDC		Not a BAM candidate, not recorded.
Curlew Sandpiper	<i>Calidris ferruginea</i>	Critically Endangered	Critically Endangered	Yes	BAM-C PMST		Habitat not suitable, not a BAM candidate

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable	Vulnerable	No	PMST		Not a BAM candidate, not recorded.
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Vulnerable	Not listed	No	TBDC		Not a BAM candidate, not recorded.
Eastern Bristlebird	<i>Dasyornis brachypterus</i>	Endangered	Endangered	No	PMST		Habitat not suitable, not a BAM candidate
Eastern Curlew	<i>Numenius madagascariensis</i>	Critically Endangered	Critically Endangered	No	TBDC		Habitat not suitable, not a BAM candidate
Eastern Hooded Dotterel	<i>Thinornis cucullatus cucullatus</i>	Critically Endangered	Vulnerable	No	TBDC		Habitat not suitable, not a BAM candidate
Eastern Osprey	<i>Pandion cristatus</i>	Vulnerable	Not listed	Yes	BAM-C TBDC	No	Survey undertaken for presence of stick nests. Not detected during survey.
Freckled Duck	<i>Stictonetta naevosa</i>	Vulnerable	Not listed	No	TBDC		Habitat not suitable, not a BAM candidate, not recorded.
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	No	TBDC		Habitat not suitable, not a BAM candidate
Great Knot	<i>Calidris tenuirostris</i>	Vulnerable	Vulnerable	No	PMST		Habitat not suitable, not a BAM candidate
Greater Sand Plover	<i>Charadrius leschenaultii</i>	Vulnerable	Vulnerable	No	PMST		Habitat not suitable, not a BAM candidate
Grey Falcon	<i>Falco hypoleucos</i>	Vulnerable	Vulnerable	No	PMST		Habitat not suitable, not a BAM candidate
Grey Plover	<i>Pluvialis squatarola</i>	Vulnerable	Vulnerable	No	TBDC		Habitat not suitable, not a BAM candidate

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Latham's Snipe	<i>Gallinago hardwickii</i>	Vulnerable	Vulnerable	No	TBDC		Habitat not suitable, not a BAM candidate
Lesser Sand Plover	<i>Charadrius mongolus</i>	Vulnerable	Endangered	No	PMST		Habitat not suitable, not a BAM candidate
Little Eagle	<i>Hieraaetus morphnoides</i>	Vulnerable	Not listed	No	TBDC		Not a BAM candidate. Not detected during survey.
Little Lorikeet	<i>Parvipsitta pusilla</i>	Vulnerable	Not listed	No	TBDC		Not a BAM candidate. Not detected during survey.
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	Not listed	No	TBDC		Not a BAM candidate, no suitable hollows for breeding.
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	Critically Endangered	Critically Endangered	No	PMST		Not a BAM candidate. Not detected during survey.
Painted Honeyeater	<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	No	TBDC		Habitat not suitable, not a BAM candidate
Pied Oystercatcher	<i>Haematopus longirostris</i>	Endangered	Not listed	No	TBDC	No	Habitat not suitable, not a BAM candidate
Pilotbird	<i>Pycnoptilus floccosus</i>	Vulnerable	Vulnerable	No	PMST	No	Habitat not suitable, not a BAM candidate.
Pink Cockatoo	<i>Lophochroa leadbeateri</i>	Vulnerable	Endangered	No	TBDC	No	Habitat not suitable – east of the Great Dividing Range. Not a BAM candidate.
Powerful Owl	<i>Ninox strenua</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate, no suitable hollows for breeding.
Regent Honeyeater	<i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered	Yes	BAM-C PMST	No	Not within mapped important areas, not detected during survey.

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Ruddy Turnstone	<i>Arenaria interpres</i>	Vulnerable	Vulnerable	No	TBDC	No	Habitat not suitable, not a BAM candidate
Scarlet Robin	<i>Petroica boodang</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate. Not detected during survey.
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Vulnerable	Vulnerable	No	TBDC	No	Habitat not suitable, not a BAM candidate
Sooty Owl	<i>Tyto tenebricosa</i>	Vulnerable	Not listed	No	PMST	No	Not a BAM candidate, no suitable hollows for breeding.
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	BAM-C TBDC	No	Not detected within the subject land. No suitable hollows for breeding.
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Endangered	Endangered	No	PMST	No	Not a BAM candidate. Not detected during survey.
Spotted Harrier	<i>Circus assimilis</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate. Not detected during survey.
Square-tailed Kite	<i>Lophoictinia isura</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate. Not detected during survey.
Swift Parrot	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	BAM-C PMST	No	Not within mapped important areas, not detected during survey.
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate. Not detected during survey.
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate. Not detected during survey.
Western Alaskan Bar-tailed Godwit	<i>Limosa lapponica baueri</i>	Endangered	Endangered	No	TBDC	No	Habitat not suitable, not a BAM candidate
Whimbrel	<i>Numenius phaeopus</i>	Not listed	Migratory	No	TBDC	No	Habitat not suitable, not a BAM candidate

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Vulnerable	Not listed	No	TBDC	No	Not a BAM candidate. Not detected during survey.
White-fronted Chat	<i>Epthianura albifrons</i>	Vulnerable	Not listed	No	PMST	No	Not a BAM candidate. Not detected during survey.
White-throated Needle-tail	<i>Hirundapus caudacutus</i>	Vulnerable	Vulnerable	No	TBDC	No	Not a BAM candidate. Not detected during survey.
Mammals							
Australian Fur-seal	<i>Arctocephalus pusillus doriferus</i>	Vulnerable		No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	Vulnerable	Vulnerable	No	PMST	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	Vulnerable	Not listed	No	TBDC	No	No suitable roosting habitat. Not a BAM candidate. Not recorded during survey.
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable	Not listed	No	TBDC	No	No suitable roosting habitat. Not a BAM candidate. Not recorded during survey.
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Vulnerable	Not listed	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	Vulnerable	Not listed	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Greater Glider (southern and central)	<i>Petauroides volans</i>	Endangered	Endangered	No	PMST	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Koala	<i>Phascolarctos cinereus</i>	Endangered	Endangered	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not listed	No	TBDC	No	No suitable roosting habitat. Not a BAM candidate. Not recorded during survey.
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Endangered	Endangered	No	TBDC	No	No suitable roosting habitat. Not a BAM candidate. Not recorded during survey.
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	Vulnerable	Vulnerable	No	PMST	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Southern Brown Bandicoot (eastern)	<i>Isodon obesulus obesulus</i>	Endangered	Endangered	No	PMST	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	Not listed	Yes	TBDC	No	Five hollow bearing trees (stags) containing small hollows were recorded in the subject land. However these hollows are located >200m from any waterbody, and therefore are not considered to provide suitable roosting habitat for Southern Myotis. Culverts under Bolong Road are small and silted over, not suitable for roosting. Habitat not suitable. Not incidentally recorded in subject land during survey.
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Yellow-bellied Glider	<i>Petaurus australis</i>	Vulnerable	Vulnerable	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	Vulnerable	Not listed	No	TBDC	No	No suitable roosting habitat, Not a BAM candidate. Not recorded during survey.

Common name	Scientific name	Listing status		Bam species credit species	Sources	Further assessment required	Rationale for development site
		BC Act	EPBC Act				
Frogs							
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	Vulnerable	Vulnerable	No	TBDC	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Green and Golden Bell Frog	<i>Litoria aurea</i>	Endangered	Vulnerable	Yes	TBDC	No	No suitable habitat. Not recorded during survey.
Southern Giant Burrowing Frog	<i>Heleioporus australiacus flavopunctatus</i>	Vulnerable	Endangered	No	PMST	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Southern Heath Frog	<i>Litoria watsoni</i>	Endangered	Endangered	No	PMST	No	No suitable habitat, Not a BAM candidate. Not recorded during survey.
Fish							
Australian Grayling	<i>Prototroctes maraena</i>	FM Act Endangered	Vulnerable	No	PMST	No	No habitat in the subject land. Stormwater Management Plant and CEMP mitigation measures/controls will prevent indirect impacts on the Shoalhaven River.
Black Rockcod	<i>Epinephelus daemeli</i>	FM Act Vulnerable	Vulnerable	No	PMST	No	No habitat in the subject land. Stormwater Management Plant and CEMP mitigation measures/controls will prevent indirect impacts on the Shoalhaven River.
Macquarie Perch	<i>Macquaria australasica</i>	FM Act Endangered	Endangered	No	PMST	No	No suitable habitat.
Reptiles							
Broad-headed Snake	<i>Hoplocephalus bungaroides</i>	Endangered	Endangered	No	TBDC	No	No suitable habitat. Not a BAM candidate.
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	Vulnerable	Not listed	No	TBDC	No	No suitable habitat. Not a BAM candidate.

Marine migratory species and marine turtles have been excluded as no habitat or breeding colonies occur in the subject land.

Appendix C Biodiversity Credit Summary Report



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00065799/BAAS17067/26/00065800	Bomaderry Air Liquide CO2 recovery Project	09/04/2026
Assessor Name	Report Created	BAM Data version *
Rebecca E. Goodwin	30/04/2026	Current classification (live - default) (94)
Assessor Number	BAM Case Status	Date Finalised
BAAS17067	Finalised	30/04/2026
Assessment Revision	BOS entry trigger	Assessment Type
0		Major Projects

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
South Coast Lowland Red Gum-Swamp Oak Forest												
1	4051_NoG	Not a TEC	1	1.0	1.9	PCT Cleared - 87%	High Sensitivity to Gain			2.00		0

Assessment Id	Proposal Name	Page 1 of 2
00065799/BAAS17067/26/00065800	Bomaderry Air Liquide CO2 recovery Project	



BAM Credit Summary Report

2	4051_Moderate	Not a TEC	33.7	33.7	0.18	PCT Cleared - 87%	High Sensitivity to Gain			2.00		3
											Subtotal	3
											Total	3

Species credits for threatened species

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