Totness Sewer Pipeline

Native Vegetation Clearance

Data Report

Clearance under the *Native Vegetation Regulations 2017*

25/03/2022

Prepared by EBS Ecology (NVC Accredited Consultant)

Totness Sewer Pipeline Native Vegetation Clearance Data Report

17/03/2022

Version 2

Prepared by EBS Ecology for Adelin Holdings Pty. Ltd.

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Glossary and Abbreviations

Adelin	Adelin Holdings Pty Ltd
BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia (maintained by Department of Environment and Water)
DIT	Department of Infrastructure and Transport
EBS	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ha	Hectare(s)
IBRA	Interim Biogeographical Regionalisation of Australia
km	Kilometre(s)
m	metre(s)
mm	millimetre(s)
NatureMaps	Initiative of DEW that provides a common access point to maps and geographic information about South Australia's natural resources in an interactive online mapping format
NPW Act	*National Parks and Wildlife Act 1972*
NV Act	*Native Vegetation Act 1991*
NVC	Native Vegetation Council
PDI Act	Planning, Development and Infrastructure Act 2016
PMST	Protected Matters Search Tool (under the EPBC Act; maintained by Department of Agriculture, Water and the Environment)
Project	Totness sewer pipeline
Project Area	5 km corridor, centred on the sewer pipeline alignment
SA	South Australia(n)
Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches
SEB	Significant Environmental Benefit
sp.	Species
spp.	Species (plural)
ssp.	Sub-species
STAM	Scattered Tree Assessment Method
TEC	Threatened Ecological Community
var.	Variety (a taxonomic rank below that of species and subspecies, but above that of form)

Table of Contents

List of Tables

List of Figures

1. Application Information

Table 1. Application details.

Applicant:	Adelin Holdings Pty Ltd		
Key contact:	Shayne Linford Email: slinford@adelin.net.au		
Landowner:	Department of Infrastructure and Transport		
Site Address:	Princes Highway, TOTNESS SA 5250		
Local Government Area:	Mount Barker	**Hundred:**	Macclesfield
Title ID:	Princes Highway road corridor	**Parcel ID**	Princes Highway road corridor

Table 2. Summary of the proposed clearance.

Purpose of clearance:	Clearance required for the laying of a sewer pipeline.
Native Vegetation Regulation:	Regulation 12(34) – Infrastructure.
Description of the vegetation under application:	Open Forest in poor condition, with an understorey dominated by introduced grasses. Scattered trees, generally in good condition. Trees range in height from 2 to 13 metres. None are hollow-bearing.
Total proposed clearance – area (ha) and/or number of trees:	0.058 hectares (ha) and 44 scattered trees are proposed to be cleared.
Level of clearance:	Level 4
Overlay (Planning and Design Code):	Native Vegetation Overlay
Map of proposed clearance area:	See Figure 2 and Figure 3
Mitigation Hierarchy:	Vegetation clearance cannot be avoided due to design constraints. Impact will be minimised by only clearing poor condition vegetation where possible and using existing cleared areas for site access, parking and laydown areas. Impact is temporary, with the site rehabilitated following construction.
SEB Offset proposal	Payment of $26,001.31

2. Purpose of Clearance

2.1. Description

Adelin (Adelin) Holdings Pty Ltd are developing a new commercial subdivision at Totness, Mount Barker. A new sewer pipeline is required as part of the infrastructure to support the subdivision. Laying of the sewer pipeline will require the removal of some native vegetation within the road corridor of the Princes Highway.

2.2. General location map

The Project Area includes the pipeline alignment and 5 metre (m) wide corridor, required for machinery and equipment access. The pipeline is located in the road corridor of the South eastern Freeway at Totness, 1.3 kilometres (km) north-west of the centre of Mount Barker.

The Project Area is located in the Hundred of Macclesfield in the District Council of Mount Barker, as shown in Figure 1

2.3. Details of the project

A sewer pipeline is required to service new commercial subdivisions at Totness, Mount Barker. The Project covered by this Native Vegetation Clearance Application includes the section of pipeline between Mount Barker Road in the east and the western end of the Mount Barker exit ramp of the South Eastern Freeway, as shown in Figure 1. This is a distance of 465 metres (m).

The pipeline will be trenched to an average depth of 1.9 metres (m), varying between 1.4 m and 4.0 m. A width of up to 1000 millimetres (mm) is required. A corridor of up to 5 m will be cleared to allow for machinery access, with existing cleared areas to be used as laydown and parking areas.

Design drawings of the Project are provided as Attachment 1.

2.4. Background

The Project Area is located in a road corridor. Vegetation in the corridor is currently maintained by the Department of Infrastructure and Transport (DIT), who currently undertake management such as mowing/slashing and some weed control.

The area is utilised as a road corridor, with surrounding land use including residential housing, industrial and commercial estate and primary production. There are no watercourses or wetlands in the Project Area.

The environmental context of the surrounding landscape has been classified according to the Interim Biogeographical Regionalisation of Australia (IBRA). This classification groups regions, subregions and environmental associations based on similar geography, soils and vegetation characteristics. The IBRA classification of the Project Area is shown in Table 3.

The Project Area receives an annual average rainfall of 754 millimetres (mm) (Department for Environment and Water, 2022).

Table 3. IBRA classification of the Project Area.

IBRA Bioregion	IBRA Subregion	SA Environmental Association	Vegetation Remnancy
Flinders Lofty Block	Mount Lofty Ranges	Hahndorf	8%

Figure 1. Location of the Project Area.

2.5. Approvals required *or* obtained

2.5.1. Native Vegetation Act 1991 (NV Act)

Approval for clearing native vegetation associated with the commercial subdivision at Totness has been granted to Adelin:

- Application Number 2021/2022/580.

2.5.2. Planning, Development and Infrastructure Act 2016 (PDI Act)

Development Application Number: DA 580/D046/20.

2.5.3. Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

No Matters of National Environmental Significance will be significantly impacted by the Project. Referral of the Project under the EPBC Act is not required.

2.5.4. National Parks and Wildlife Act 1972 (NPW Act)

EBS Ecology operates under the following scientific licence, valid until 2 September 2022:

- K25613-20.

2.6. Native Vegetation Regulation

Clearance for the Project is permitted under Regulation 12(34) – Infrastructure.

2.7. Development Application information

Relevant information applicable to the Development Application is provided in Table 4.

Table 4. Development Application information.

Relevant Information	Description
Zone	Road corridor (Department of Infrastructure and Transport)
Natural Resources and Environment Overlays	Native Vegetation Scenic Quality Regulated and Significant Tree

3. Method

3.1. Flora assessment

The flora assessment was undertaken by NVC Accredited Consultant Jesse Carpenter on 2 March 2022 in accordance with the Bushland Assessment Method (BAM) (Native Vegetation Council, 2020a) and Scattered Tree Assessment Method (STAM) (Native Vegetation Council, 2020b). These methods are further described in the following Sections.

3.1.1. Bushland Assessment Method

The BAM is derived from the Nature Conservation Society of South Australia's Bushland Condition Monitoring methodology (Croft, Pedler, & Milne, 2008). The BAM is used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

Details of site selection/stratification and assessment protocols, and the biodiversity value components assessed and the factors that influence these components are outlined in the *Bushland Assessment Manual* (NVC 2020a).

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known to occur in the PMST, and fauna with Biological Database of South Australia (BDBSA) records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM scoresheets. Species determined as unlikely to occur within the Project Area will be removed by the Native Vegetation Branch if the finding is supported. Marine and/or wetland species were omitted from the scoresheets given the Project Area is terrestrial.

3.1.2. Scattered Tree Assessment Method

The STAM is derived from the *Scattered Tree Clearance Assessment in South Australia: Streamlining, Guidelines for Assessment and Rural Industry Extension* report (Cutten & Hodder, 2002). The STAM is suitable for assessing scattered trees in the following instances:

- Individual scattered trees (i.e. canopy does not overlap). The spatial distribution of trees may vary from approaching what would be considered their original distribution (pre-European) through to single isolated trees in the middle of a paddock; or
- Dead trees (when a dead tree is considered native vegetation); or
- Clumps of trees (contiguous overlapping canopies) if the clump is small (approximately <0.1 ha); and
- For both scattered trees and clumps:
  - The ground layer comprises wholly or largely of introduced species;
  - Some scattered colonising native species may be present, but represent <5% of the ground cover; and
  - The area around the trees consists of introduced pasture or crops.

Details of the scattered tree Point Scoring System are outlined in the *Scattered Tree Assessment Manual* (NVC 2020c).

The numbers of uncommon and threatened scattered tree using fauna species entered into the Scattered Tree Scoresheet were determined by cross-referring the BDBSA data extract (see Section 3.2.2) and the lists of scattered tree

using fauna in the *Scattered Tree Assessment Manual* (Native Vegetation Council, 2020b). The resource use of each species identified was considered when determining each tree's suitability for threatened fauna species (e.g. species that only use hollows in scattered trees were only assigned to scattered trees containing hollows).

3.2. Fauna assessment

A desktop assessment was undertaken to determine the potential for any threatened fauna species, and Threatened Ecological Communities (TECs) (both Commonwealth and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area).

3.2.1. PMST report

A Protected Matters Search Tool (PMST) report was generated on 01/03/2022 to identify nationally threatened flora and fauna, migratory fauna and TEC listed under the EPBC Act relevant to the Project Area (Department of Agriculture, Water and the Environment, 2022a). Only species and TECs identified in the PMST report that are likely or known to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area.

3.2.2. BDBSA data extract

A data from the Biological Database of South Australia (BDBSA) was obtained from NatureMaps to identify flora and fauna species that have been recorded within 5 km of the Project Area (data obtained 28/02/2022; Department of Environment and Water, 2022). The BDBSA is comprised of an integrated collection of species records from the South Australian Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia and the Australasian Wader Study Group, which meet the Department for Environment and Water's standards for data quality, integrity and maintenance. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

3.2.3. Field survey

A dedicated bird survey was carried out using an area search method. The entire pipeline alignment was searched for 45 minutes, walking from east to west along the pipeline alignment. Birds were identified by sight and call

Observations of any other fauna on site were recorded opportunistically. This included direct observation and signs of fauna presence, such as tracks, scats, burrows and diggings.

3.2.4. Likelihood of occurrence

The criteria for the likelihood of occurrence of threatened species within the Project Area are described in Table 5.

Table 5. Criteria for the likelihood of occurrence of threatened species within the Project Area.

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.

Likelihood	Criteria
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provides limited habitat or feeding resources for the species. Recorded within 20 -40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within the previous 20 years, but the area provides no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records despite adequate survey effort.

4. Assessment Outcomes

4.1. Vegetation assessment

4.1.1. General description of the vegetation, the site and matters of significance

The Project Area is located on the steep slope of a road cutting. Soil consists of sandy clay, shallow in some areas with skeletal soil over rock exposed by historical road works. Native vegetation consists of some scattered trees and one Vegetation Association. This patch is isolated from any other area of native vegetation, although scattered trees are spread throughout the surrounding landscape.

Introduced plants, or weeds, dominate the surrounding landscape and understorey in native vegetation patches. This includes two species of plants declared under the *Landscape South Australia Act* and three species listed as environmental weeds in the Bushland Condition Monitoring Manual (Croft, Pedler, & Milne, 2008). These species are listed in Table 6. A total of 19 plant species were recorded during the survey (Table 7). This included six native and 13 introduced species. No threatened plant species were recorded.

Vegetation is heavily modified by historical clearing, road construction and ongoing vegetation management within the road corridor and on surrounding properties. Only six species of native plants were recorded. Within native vegetation patches, regeneration of dominant canopy species is extensive, although there are few mature trees present.

Mature trees are not of sufficient size or age to provide habitat features such as hollows, with no hollow-bearing trees inside the Project Area. Litter is generally sparse and there are no long-dead trees or fallen timber present.

Table 6. Declared and environmental weeds recorded during the field survey.

Scientific Name	Common Name	Declared Plant*	Environmental Weed⁺
Echium plantagineum	Salvation Jane	Yes	
Ehrharta calycina	Perennial Veldt Grass		Yes
Fraxinus angustissima	Desert Ash	Yes	
Hypericum perforatum	St. John's Wort		Yes
Phalaris aquatica	Phalaris		Yes
Senecio pterophorus	African Daisy		Yes

Declared under the *Landscape South Australia Act
⁺As listed in the Bushland Condition Monitoring Manual (Croft, Pedler, & Milne, 2008)

Table 7. Plant species recorded during the survey. Introduced species are indicated by *.

Scientific Name	Common Name	Conservation Status	
		EPBC Act	NPW Act
Acacia melanoxylon	Blackwood	-	-
Acacia retinodes	Wirilda	-	-
*Briza maxima**	Large Quaking Grass	-	-
*Dactylis glomerata**	Cocksfoot	-	-
*Echium plantagineum**	Salvation Jane	-	-
*Ehrharta calycina**	Perennial Veldt Grass	-	-
Enneapogon nigricans	Black-head Grass	-	-
Enteropogon acicularis	Umbrella grass	-	-
Eucalyptus camaldulensis var. camaldulensis	River Red Gum	-	-
*Fraxinus angustifolia**	Narrow-leaved Ash	-	-
*Hypericum perforatum**	St Johns Wort	-	-
*Lactuca serriola**	Prickly Lettuce	-	-
*Phalaris aquatica**	Phalaris	-	-
*Plantago lanceolata**	Ribwort	-	-
Rytidosperma sp.	Wallaby Grass	-	-
*Scabiosa atropurpurea**	Pincushion	-	-
*Senecio pterophorus**	African Daisy	-	-
*Sisymbrium erysimoides**	Smooth Mustard	-	-
*Trifolium angustifolium**	Narrow-leaf Clover	-	-

4.1.2. Details of the Vegetation Associations/scattered trees proposed to be impacted

One Vegetation Association occurs in the Project Area and will be impacted:

A1 – *Eucalyptus camaldulensis* var. *camaldulensis* Low Forest over *Dactylis glomerata.*

This association is described in Table 8 and mapped in Figure 2 on Page 14. It does not represent a Threatened Ecological Community as listed under the EPBC Act or threatened ecosystem listed in the *Provisional list of threatened ecosystems* (Department for Environment and Heritage, 2001).

A total of 44 scattered trees, assessed as 17 individual trees and 6 groups of trees, will be impacted. Most are young, regenerating canopy species less than 10 m tall. Trees are generally in fair-to-good health, most with less than 20% dieback. None contain hollows. All trees belong to the same species – *Eucalyptus camaldulensis* var. *camaldulensis* (River Red Gum).

Scattered tree data collected during the field survey is presented in Table 9, with the location of trees assessed shown in Figure 2 (Page 14) and Figure 3 (Page 15). Scattered Tree photographs are provided in Appendix 1.

Table 8. Summary of A1.

<table>
<tr><td>Vegetation Association</td><td colspan="5">A1 – Eucalyptus camaldulensis var. camaldulensis Low Forest over Dactylis glomerata.</td></tr>
<tr><td></td><td colspan="5">  </td></tr>
<tr><td>General description</td><td colspan="5">Low forest dominated by a few mature Eucalyptus camaldulensis var. camaldulensis over dense, regenerating canopy species. Shrubs are absent from the understorey, which is dominated by introduced grasses, particularly Dactylis glomerata.
The Vegetation Association is isolated from any other area of native vegetation, situated on the mid to lower slopes of a steep road cutting.
Surrounding vegetation consists of grassland dominated by introduced species (e.g. Dactylis glomerata, Phalaris aquatica and Ehrharta calycina) and is managed by slashing and/or mowing.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">The Yellow-tailed Black Cockatoo (Zanda funerea) was recorded feeding in introduced Pinus sp. trees at the edge of the Vegetation Association.</td></tr>
<tr><td>Landscape context score</td><td>1.13</td><td>Vegetation Condition Score</td><td>13.18</td><td>Conservation significance score</td><td>1.1</td></tr>
<tr><td>Unit biodiversity Score</td><td>16.38</td><td>Area (ha)</td><td>0.06</td><td>Total biodiversity Score</td><td>0.98</td></tr>
</table>

Table 9. Summary of scattered tree attributes.

Tree #	Tree Species	No. of trees	Height (m)	No. of Hollows	Diameter (cm)	Canopy dieback (%)	Total Biodiversity Score	Photo #
1	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.2	0	51.5	5	1.93	Tree 1
2	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.4	0	19.5	5	0.40	Tree 2
3	*Eucalyptus camaldulensis* var. *camaldulensis*	1	5.4	0	15	0	0.35	Tree 3
4	*Eucalyptus camaldulensis* var. *camaldulensis*	1	13.2	0	43	0	2.03	Tree 4
5	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.2	0	46	10	1.32	Tree 5
6	*Eucalyptus camaldulensis* var. *camaldulensis*	1	3.8	0	7.2	0	0.25	Tree 6
7	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.6	0	26.5	5	0.49	Tree 7
8	*Eucalyptus camaldulensis* var. *camaldulensis*	1	12.5	0	49	0	2.08	Tree 8
9	*Eucalyptus camaldulensis* var. *camaldulensis*	1	5.1	0	14.8	15	0.29	Tree 9
10	*Eucalyptus camaldulensis* var. *camaldulensis*	2	7.6	0	24	5	0.98	Tree 10
11	*Eucalyptus camaldulensis* var. *camaldulensis*	1	3.2	0	14	30	0.21	Tree 11
12	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.6	0	32	0	1.04	Tree 12
13	*Eucalyptus camaldulensis* var. *camaldulensis*	1	10.4	0	31	5	1.02	Tree 13
14	*Eucalyptus camaldulensis* var. *camaldulensis*	1	8.2	0	20.5	0	0.49	Tree 14
15	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.6	0	27.4	0	1.04	Tree 15
16	*Eucalyptus camaldulensis* var. *camaldulensis*	6	4.0	0	6	15	1.21	Tree 16
17	*Eucalyptus camaldulensis* var. *camaldulensis*	4	8.0	0	8.5	5	1.32	Tree 17
18	*Eucalyptus camaldulensis* var. *camaldulensis*	9	11.6	0	11.5	5	4.06	Tree 18
19	*Eucalyptus camaldulensis* var. *camaldulensis*	1	4.8	0	11.5	40	0.19	Tree 19
20	*Eucalyptus camaldulensis* var. *camaldulensis*	4	2.1	0	3	0	0.76	Tree 20

Tree #	Tree Species	No. of trees	Height (m)	No. of Hollows	Diameter (cm)	Canopy dieback (%)	Total Biodiversity Score	Photo #
21	*Eucalyptus camaldulensis* var. *camaldulensis*	2	4.1	0	6	15	0.41	Tree 21
22	*Eucalyptus camaldulensis* var. *camaldulensis*	1	4.3	0	7	15	0.21	Tree 22
23	*Eucalyptus camaldulensis* var. *camaldulensis*	1	5.0	0	5.5	5	0.24	Tree 23

Figure 2. Native vegetation in the Project Area, east. The map shows the location of vegetation patch A1, scattered trees and photo log locations.

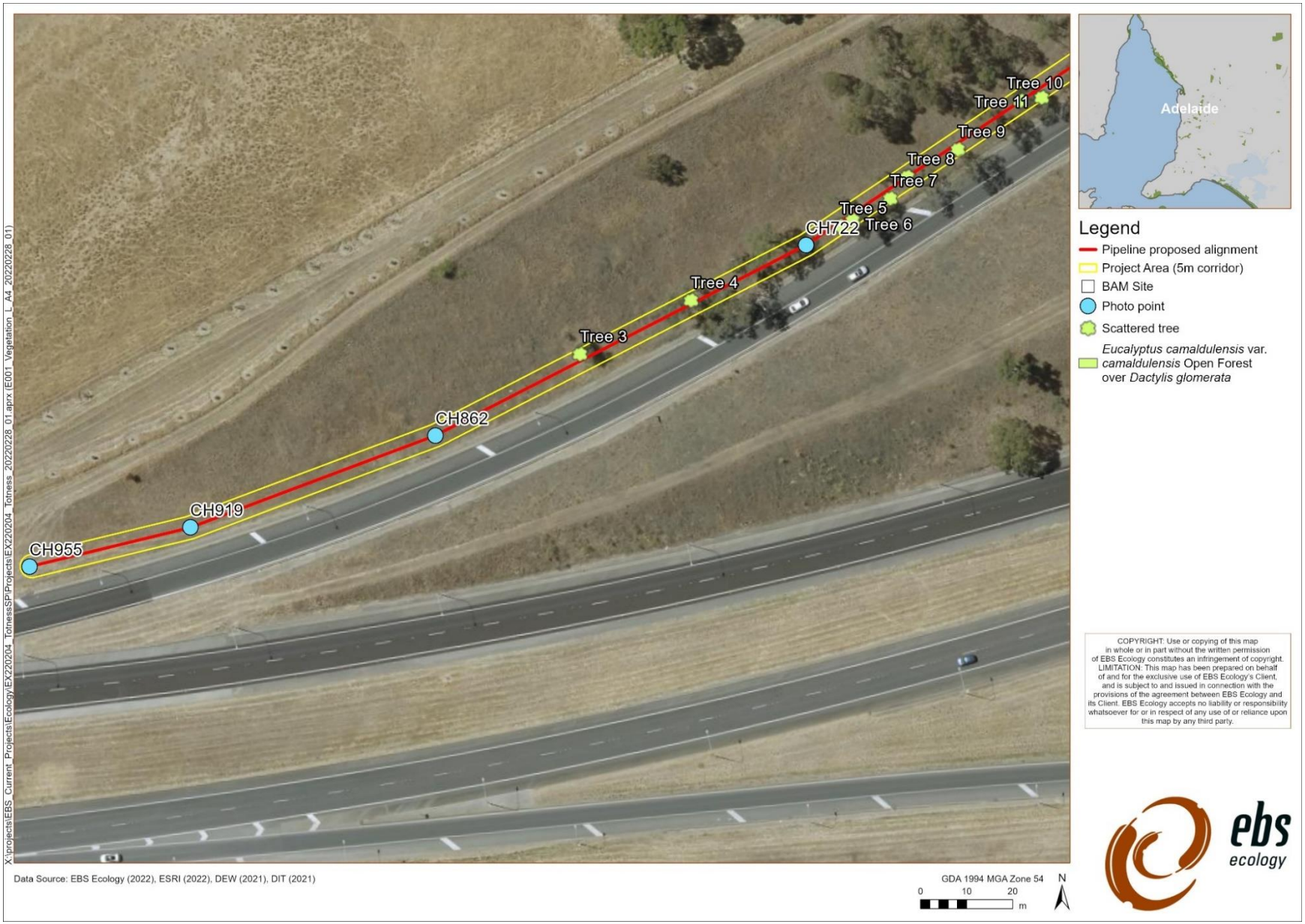

Figure 3. Native vegetation in the Project Area, west. The map shows the location of vegetation patch A1, scattered trees and photo log locations.

4.1.3. Photo log

Photographs were taken periodically along the length of the pipeline alignment, moving from east to west. Photographs are shown below, in Figure 4 to Figure 10, with the location of each photo point shown on the maps in Figure 2 and Figure 3.

Figure 4. Location CH489, facing west.

Figure 5. Location CH580, facing west.

Figure 6. Location CH625, facing west.

Figure 7. Location CH722, facing west.

Figure 8. Location CH862, facing west.

Figure 9. Location CH919, facing west.

Figure 10. Location CH955, facing east.

4.2. Threatened species assessment

The database searches identified 13 threatened plants and 28 threatened fauna species that have been recorded or are likely to occur within 5 km of the Project Area (Table 10). Of these, 24 species (3 plants and 21 fauna) have been recorded since 1995. Since the Project Area does not contain any riparian or wetland habitat, aquatic/wetland species have been excluded from the assessment. This includes 13 species, as indicated by the habitat information in Table 10. Eight fauna species have therefore been included in the assessment scoresheets, with the likelihood of their occurrence in the Project Area discussed in Table 10.

The likelihood of occurrence assessment found that given the habitat and condition of vegetation in the Project Area, seven threatened fauna species are possible, likely or highly likely to occur there, as indicated in Table 10 and listed below.

- Brown Quail (*Coturnix ypsilophora australis*) – NPW Act Vulnerable. Possibly occurs.
- Eastern Shrike-tit (*Falcunculus frontatus frontatus*) – NPW Act Rare. Possibly occurs.
- Little Eagle (*Hieraaetus morphnoides*) – NPW Act Vulnerable. Possibly occurs, but likely as a flyover only.
- Elegant Parrot (*Neophema elegans elegans*) – NPW Act Rare. Possibly occurs.
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – EPBC Act Vulnerable. Likely to occur (foraging only).
- Common Brushtail Possum (*Trichosurus vulpecula*) – NPW Act Rare. Likely to occur (foraging only).
- Yellow-tailed Black Cockatoo (*Zanda funerea*) – NPW Act Vulnerable. Highly likely to occur and recorded during the field survey.

Due largely to the poor condition of the vegetation and disturbance factors, threatened plant species are unlikely to occur in the Project Area.

The field survey recorded 13 fauna species (Table 11). One threatened species, Yellow-tailed Black Cockatoo (*Zanda funerea*) was observed. A flock of 20 individuals were recorded feeding in nearby *Pinus* sp., outside the impacted area. The Yellow-tailed Black Cockatoo is listed as Vulnerable under the NPW Act. It is not listed under the EPBC Act.

The remaining species recorded are generally common in similar habitat throughout the landscape. They are species typical of highly fragmented vegetation within a cleared, agricultural landscape.

The impacted vegetation is in poor condition, with an understorey dominated by introduced grass species, and is located in the Princes Highway corridor. The area is highly disturbed by traffic, noise and vegetation management activities and is isolated from any other area of native vegetation. Trees in the Project Area do not contain hollows and the Project Area lacks habitat features such as deep litter mats and fallen timber. While larger trees in the Project Area may provide some seasonal foraging resources, particularly for scattered tree using species, the vegetation under application provides poor, non-essential habitat for threatened species.

Given the condition of vegetation and disturbance factors already present in the Project Area, removal of the vegetation under application is not likely to significantly impact species listed above.

Table 10. Likelihood of occurrence of threatened species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
Threatened Flora								
Caladenia behrii	Pink-lipped Spider-orchid		EN	3			Fertile, shallow loams, amongst Long-leaved Box (*Eucalyptus goniocalyx*)/Pink Gum (*E. fasciculosa*) woodland and amongst Messmate (*E. obliqua*)/Grey Box (*E. microcarpa*)/Yellow Gum (*E. leucoxylon*) woodland. The understorey is usually open and shrubby, with typical plants including Large-leaf Bush-pea (*Pultenaea daphnoides*), Twiggy Bush-pea (*P. largiflorens*), Dusty Miller (*Spyridium parvifolium*), Golden Wattle (*Acacia pycnantha*), Beaked Hakea (*Hakea rostrata*) and Erect Hakea (*H. carinata*) (Department of Agriculture, Water and the Environment, 2022b).	**Unlikely.** Habitat in the Project Area is not suitable and there are no records within 5km.
Caladenia gladiolata	Bayonet Spider-orchid		EN	3			South Australian Blue Gum (*Eucalyptus leucoxylon*)/Sugar Gum (*E. cladocalyx*) Woodland in the Mount Remarkable NP, and South Australian Blue Gum/Pink Gum (*E. fasciculosa*) Woodland in Scott Creek CP. Understorey vegetation includes Golden Wattle (*Acacia pycnantha*), Graceful Wattle (*A. gracilifolia*), Cough Bush (*Cassinia laevis*), Scented Bush-pea (*Pultenaea graveolens*), Dusty Miller (*Spyridium parvifolium*), Cranberry Heath (*Astroloma humifusum*) and Common Raspwort (*Gonocarpus tetragynus*). All extant subpopulations grow on slopes (moderate to steep) in sandy loam soils with scattered shale and quartzite (Department of Agriculture, Water and the Environment, 2022c).	**Unlikely.** Habitat in the Project Area is not suitable and there are no records within 5km.

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
Caladenia rigida	Stiff White Spider-orchid		EN	3			The White Spider-orchid is found on ridge tops and hillslopes in grey-brown loam often associated with coarse quartzite gravel or sandstone pebbles. Vegetation is usually an open-forest dominated by Messmate Stringybark (*Eucalyptus obliqua*), Long-leaved Box (*E. goniocalyx*), South Australian Blue Gum (*E. leucoxylon*), Pink Gum (*E. fasciculosa*) and Grey Box (*E. microcarpa*). Sites have a relatively open understorey of low shrubs and sedges dominated by Grass Tree (*Xanthorrhoea semiplana*), Golden Wattle (*Acacia pycnantha*), Spiky Guinea-flower (*Hibbertia exutiacies*), *Pultenaea largiflorens*, Large-leaf Bush-pea (*P. daphnoides*), Dusty Miller (*Spyridium parvifolium*), Beaked Hakea (*Hakea rostrata*) and Erect Hakea (*H. carinata*) (Department of Agriculture, Water and the Environment, 2022d).	**Unlikely.** Habitat in the Project Area is not suitable and there are no records within 5km.
Eucalyptus dalrympleana ssp. *dalrympleana*	Candlebark Gum	R		1	2008		In SA, the species is mainly restricted to the Onkaparinga River catchment from Gumeracha to Parawa, but most common in Lobethal to Mylor area. Grows in deep well-watered, but well-drained soils and commonly associated with *Eucalyptus obliqua* (Nicolle, 2013).	**Unlikely.** The species was not recorded during the survey, despite adequate searching.
Eucalyptus fasciculosa	Pink Gum	R		1	2013		Often in poorer sandy soils, in woodland or as an emergent in low shrublands. Commonly associated with *E. baxteri, E. cosmophylla, E. diversifolia, E. leptophylla* and *E. leucoxylon* (Nicolle, 2013).	**Unlikely.** The species was not recorded during the survey, despite adequate searching.
Eucalyptus viminalis ssp. *viminalis*	Manna Gum	R		1	2008		Grows on moist, well-drained alluvial soils near watercourses but also grows on drier sites at higher altitudes (Nicolle, 2013).	**Unlikely.** The species was not recorded during the survey, despite adequate searching.

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
Glycine latrobeana	Clover Glycine, Purple Clover		VU	3			Native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In the Mount Lofty Ranges, it is found in *E. viminalis* woodland and open woodland sometimes with *E. leucoxylon*. The understory is often mid-dense to very sparse with *Leptocarpus brownii* or *Acacia pycnantha*, *Leptospermum myrsinoides*, *Gonocarpus elatus*, *Themeda triandra* or *Pteridium esculentum*, *Dichondra repens*, *Acaena* species and *Ajuga* species (Department of Agriculture, Water and the Environment, 2022e).	**Unlikely.** There are no records within 5 km of the Project Area and the dense weedy understorey means that limited suitable habitat is present.
Prasophyllum pallidum	Pale Leek-orchid		VU	3			Well-grassed open forest.	**Unlikely.** Habitat in the Project Area is not suitable due to the dominance of grassy weed species. There are no records within 5km.
Prasophyllum pruinosum	Plum Leek-orchid		EN	3			Open woodland habitats; usually with an overstorey of Pink Gum (*Eucalyptus fasciculosa*), South Australian Blue Gum (*E. leucoxylon*), *Acacia leucoxylon* and *Callitris gracilis* (Department of Agriculture, Water and the Environment, 2022f).	**Unlikely.** Habitat in the Project Area is not suitable and there are no records within 5km.
Pterostylis cucullata	Leafy Greenhood		VU	3			In South Australia, populations have been recorded in Brown Stringybark/Messmate Stringybark (*Eucalyptus baxteri/Eucalyptus obliqua*) forest and Blue Gum/Manna Gum (*E. leucoxylon/E. viminalis*) woodland in the Mount Lofty Ranges (Department of Agriculture, Water and the Environment, 2022g).	**Unlikely.** Habitat in the Project Area is not suitable and there are no records within 5km.
Pterostylis curta	Blunt Greenhood	R		1	No date		Forms small to extensive colonies in fertile loams in deeply shaded gullies, especially	**Unlikely.**

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
							along creeks where it flowers freely (Bates, 2009).	The Project Area is not situated in the preferred landscape position. There is no creek bank habitat present.
Thelymitra grandiflora	Great Sun-orchid	R		1	No date		Occurs singly or as small clumps of plants in forest clearings, woodland and scrub in well drained gravelly clay soils which may be laterite or podsols, or mixed with sand, extending to dry rocky ridges in better soils (Bates, 2009).	**Unlikely.** Given the dominance of weeds and constant disturbance of grassland and understorey vegetation, it is unlikely that habitat is suitable for the species in the Project Area.
Veronica derwentiana ssp. *homalodonta*	Mount Lofty Speedwell		CR	3			The Mount Lofty Speedwell is found in moist sites and gullies, and near creeks, in high rainfall areas. The subspecies has restricted habitat requirements for high moisture, with excellent drainage and a high light requirement. The majority of records for the species are from Stringybark (*Eucalyptus obliqua*) forests with or without additional overstorey species (Department of Agriculture, Water and the Environment, 2022h).	**Unlikely.** There is no suitable habitat for the species in the Project Area and no records within 5km.
Threatened fauna								
Actitis hypoleucos	Common Sandpiper	R		1	2020	No	Habitat is banks, rocks and sandy beaches near water. Found in coastal or inland wetlands, both saline or fresh.	**Unlikely.** No wetland habitat is impacted by the Project.
Anhinga novaehollandiae novaehollandiae	Australasian Darter	R		1	2019	No	Habitat is lakes, rivers, swamps; rarely coastal.	**Unlikely.** No wetland habitat is impacted by the Project.
Ardea intermedia plumifera	Plumed Egret	R		1	2012	No	Occupies a great variety of habitats but is mainly found around shallow inland freshwater areas with abundant emergent aquatic vegetation.	**Unlikely.** No wetland habitat is impacted by the Project.

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
Biziura lobata menziesi	Musk Duck	R		1	2017	No	Occurs in deep freshwater lagoons, with dense reed beds.	**Unlikely.** No wetland habitat is impacted by the Project.
Botaurus poiciloptilus	Australasian Bittern		EN	3		No	Found mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate.	**Unlikely.** No wetland habitat is impacted by the Project.
Corcorax melanorhamphos	White-winged Chough	R		1	2000	No	Drier forests and woodlands including mallee. Timbered watercourses, farmland and gardens (Pizzey & Knight, 2013).	**Unlikely.** Nearby records are more than 20 years old. Suitable habitat in the Project Area is limited and the species was not recorded during the survey, despite targeted bird surveys.
Coturnix ypsilophora australis	Brown Quail	V		1	2012	No	Rank grass near watercourses; drains, green pastures and stubble. Coastal heaths; bracken; *Melaleuca* and *Banksia* thickets (Pizzey & Knight, 2013).	**Possible.** Recorded within 5 km in the last 10 years. Habitat within A1 has limited suitable habitat for the species due to disturbance factors.
Egretta garzetta nigripes	Little Egret	R		1	2012	No	It inhabits fresh, brackish or saline wetlands and shows a preference for shallow waters (10-15 cm deep) in open, unvegetated sites.	**Unlikely.** No wetland habitat is impacted by the Project.
Emydura macquarii	Macquarie River Turtle	V		1	2017	No	Occurs primarily in rivers and waterbodies associated with backwaters, oxbows, anabranches and deep, permanent waterholes on floodplains.	**Unlikely.** No wetland habitat is impacted by the Project.
Falco hypoleucos	Grey Falcon		VU	3		No	The species occurs in arid and semi-arid Australia, where annual rainfall is < 500mm. It is essentially confined to the arid and	**Unlikely.** The Project area is outside the normal distribution of the species, there are no

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
							semi-arid zones, except in rare circumstances (Schoenjahn, 2018).	records within 5 km and habitat is not suitable.
Falcunculus frontatus frontatus	Eastern Shriketit	R		1	2020	Yes	Eucalyptus forests and woodlands; River Red Gums on watercourses, including saplings and young trees.	**Possible.** Recorded within 5 km in the last 10 years. Habitat within A1 has limited suitable habitat for the species due to disturbance factors.
Gallinago hardwickii	Latham's Snipe	R		1	2017	No	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation.	**Unlikely.** No wetland habitat is impacted by the Project.
Grantiella picta	Painted Honeyeater		VU	3		No	Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries.	**Unlikely.** There are no records within 5 km of the Project Area.
Hieraaetus morphnoides	Little Eagle	V		1	2012	Yes	The Little Eagle is widespread in mainland Australia, central and eastern New Guinea. It is seen over woodland and forested lands and open country, extending into the arid zone.	**Possible.** Recorded within 5 km in the last 10 years. Habitat within A1 has limited suitable habitat for the species due to disturbance factors.
Hirundapus caudacutus	White-throated Needletail		VU	3		No	In Australia, the White-throated Needletail is almost exclusively aerial. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitats, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland	**Unlikely.** There are no records of the species within 5 km. The species is unlikely to use terrestrial habitats impacted by the Project.

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
							(Deprtment of Agriculture, Water and the Environment, 2022j).	
Isoodon obesulus obesulus	Southern Brown Bandicoot		EN	3		No	Areas of dense vegetation, including wetland fringes and heathland (Paull 2008). It has been observed in both native bushland and areas with exotic shrubby species such as blackberry (*Rubus* spp.) (Threatened Species Scientific Committee, 2016).	**Unlikely.** There is no suitable dense shrubby understorey habitat in the Project Area and no records within 5 km.
Leipoa ocellata	Malleefowl		VU	3		No	Occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or native pine Callitris woodlands, acacia shrublands, Broombush Melaleuca uncinata vegetation or coastal heathlands.	**Unlikely.** There is no suitable habitat in the Project Area and no records within 5 km.
Lewin pectoralis pectoralis	Lewin's Rail	V		1	2006	No	Swamp woodlands; ruches, reeds, rank grass in swamps, creeks paddocks; wet heaths, tree ferns; samphire in saltmarsh.	**Unlikely.** No wetland habitat is impacted by the Project.
Neophema elegans elegans	Elegant Parrot	R		1	2020	Yes	Wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland.	**Possible.** Recorded within 5 km in the last 10 years. Habitat within A1 has limited suitable habitat for the species due to disturbance factors.
Oxyura australis	Blue-billed Duck	R		1	2021	No	Habitat is permanent swamps with dense vegetation. Large open lakes, tidal inlets and bays.	**Unlikely.** No wetland habitat is impacted by the Project.
Pteropus poliocephalus	Grey-headed Flying-fox	V	VU	1, 3	2020	Yes	The Grey-headed Flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps	**Highly likely.** Foraging individuals may seasonally use flowering *Eucalyptus* trees in the Project Area. However, the closest known Flying-fox camp is Adelaide city.

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
							and *Banksia* woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas (Department of Agriculture, Water and the Environment, 2022i).	
Rostratula australis	Australian Painted Snipe		EN			No	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans.	**Unlikely.** No wetland habitat is impacted by the Project.
Spatula rhynchotis	Australasian Shoveler	R		1	2021	No	The Australasian Shoveler is found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps.	**Unlikely.** No wetland habitat is impacted by the Project.
Stictonetta naevosa	Freckled Duck	V		1	2019	No	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree.	**Unlikely.** No wetland habitat is impacted by the Project.
Trichosurus vulpecula	Common Brushtail Possum	R		1	2021	Yes	Found in most treed environments, including cities, towns and farmland (Menkhorst and Knight, 2004).	**Highly likely.** Foraging individuals are highly likely to the vegetation, although lack of hollows means that breeding habitat is very limited.
Tringa glareola	Wood Sandpiper	R		1	2006	No	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes.	**Unlikely.** No wetland habitat is impacted by the Project.
Zanda funerea	Yellow-tailed Black Cockatoo	V		2			*Eucalyptus* forests and woodlands. Plantations of *Eucalyptus* and introduced *Pinus* sp. (Pizzey & Knight, 2013).	**Highly likely.** The species was recorded flying over the Project Area and foraging in nearby trees.
Zapornia tabuensis	Spotless Crake	R		1	2019	No	Found in well vegetated freshwater wetlands with rushes, reeds and cumbungi.	**Unlikely.**

Scientific Name	Common Name	NPW Act	EPBC Act	Data source	Year of last record within 5km	Scattered Tree Using Species	Species known habitat preferences	Likelihood of use for habitat – Comments
							Will also frequent muddy areas, reedbeds or wetlands.	No wetland habitat is impacted by the Project.
Zoothera lunulata halmaturina	South Australian Bassian Thrush	V	VU	1, 3	2005	No	Inhabits damp eucalypt forest or woodland. Densely forested areas and gullies are favoured, usually with a thick canopy overhead, a thick understorey of small trees and tall shrubs, and leaf-litter below (Department of the Environment, 2015).	**Unlikely.** Habitat in the Project Area is not suitable.
Source; 1– NatureMaps, 2 – Observed/recorded in the field, 3 - Protected matters search tool **NPW Act; E= Endangered, V = Vulnerable, R= Rare** **EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable** **Scattered Tree Using Species; According to *Native Vegetation Council (NVC) Scattered Tree Assessment Manual* (Appendix 4) (Native Vegetation Council, 2020b).**								

Table 11. Fauna species recorded during the survey. Introduced species are indicated by *.

Scientific Name	Common Name	Conservation Status	
		EPBC Act	NPW Act
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	-	-
Acanthiza lineata	Striated Thornbill	-	-
Anthochaera carunculata	Red Wattlebird	-	-
Coracina novaehollandiae	Black-faced Cuckooshrike	-	-
Eolophus roseicapilla	Galah	-	-
Gymnorhina tibicen	Australian Magpie	-	-
Malurus cyaneus	Superb Fairywren	-	-
*Oryctolagus cuniculus**	European Rabbit	-	-
Phylidonyris novaehollandiae	New Holland Honeyeater	-	-
Platycercus elegans	Crimson Rosella	-	-
*Turdus merula**	Common Blackbird	-	-
*Vulpes vulpes**	Red Fox	-	-
Zanda funerea	Yellow-tailed Black Cockatoo	-	Vulnerable

4.3. Cumulative impacts

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.

Direct Impact

- All clearance for this stage of the development has been included in this application. No clearing additional to the 5 m wide corridor required for the pipeline is necessary, since existing cleared areas will be utilised for laydown and parking areas and access.
- As no buildings or dwellings are part of the Project, there is no requirement for additional clearance to satisfy fire protection requirements.

Indirect Impact

- Clearing associated with the subdivision and connections to sewer infrastructure beyond the scope of this Project have previously been approved by the Native Vegetation Council, as discussed in Section 2.5.
- Trenching may cause some altered hydrology during construction. However, if it occurs, this impact will be temporary, since trenching will be back-filled following construction and the ground surface returned to is current level.

- Trenching activities may cause indirect impacts to vegetation through dust generation. However, if it occurs, this impact will be temporary, since trenching will be back-filled following construction and vegetation allowed to grow back over the soil surface.
- Although the trench will be no more than 1000 mm wide, this clearing application includes all trees and vegetation within a 5 m corridor. This will account for most instances of tree root zone damage that might occur, although it is possible that there may be some impact on the root zone of trees beyond this area.
- The Project Area is situated within a busy road corridor at a major access/exit point to the Princes Highway. Given the volume of traffic that passes the site and current noise levels impacting the Project Area, it is unlikely that noise associated with construction will cause any indirect impact on fauna.

4.4. Addressing the Mitigation Hierarchy

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NP&W Act.

a) Avoidance – outline measures taken to avoid clearance of native vegetation

Engineering constraints and compliance issues prevents avoiding any clearing of native vegetation. This includes the following:

- Department of Infrastructure and Transport require a setback of 5 m from the existing curb.
- Due to Steep terrain and grades on the pipe, there is little scope to move the alignment further north (upslope) of the currently proposed alignment.
- The above would require deeper trenching and wider disturbance corridor, resulting in additional clearing of vegetation.

b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).

Although vegetation cannot be avoided due to other constraints in the Project Area, Project design has sought to minimise the impact to vegetation by the following:

- Wherever possible, the pipeline alignment has been placed in already cleared areas and poor condition native vegetation already heavily impacted by other factors.
- The alignment follows as close as is practicable to the cleared road shoulder to minimise the impact of fragmentation.

The proponent will further seek to minimise their impact by developing and implementing a Vegetation Management Plan in accordance with Department of Infrastructure and Transport recommendations and guidelines. This will include fencing areas outside of the work zone to prevent access and accidental clearing.

c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.

Clearance is expected to be temporary. At the completion of construction, the trench will be back-filled and the surface returned to its natural ground level. Vegetation will be allowed to naturally grow back over time.

d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.

Any impacts to vegetation that cannot be avoided will be mitigated by fulfilling the Significant Environmental Benefit (SEB) obligations calculated for the Project (Section 5 and Section 6).

4.5. Principles of Clearance (Schedule 1, *Native Vegetation Act 1991*)

The Native Vegetation Council will consider Principles 1(b), 1(c) and 1(d) when assigning a level of Risk under Regulation 16 of the Native Vegetation Regulations. The Native Vegetation Council will consider all the Principles of clearance of the Act as relevant, when considering an application referred under the *Planning, Development and Infrastructure Act 2016*.

Assessment of the Project against the Principles of clearance is shown in Table 12 to Table 18.

Table 12. Assessment against the Principle of Clearance 1(a).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(a) – it comprises a high level of diversity of plant species	**Relevant information** 19 plant species were recorded (6 native, 13 introduced). Native Plant Species Diversity Score (PSD): 6	Not applicable
	Assessment against the principles Seriously at Variance The application is not seriously at variance with Principle 1(a) (PSD <10). At Variance The application is not at variance with Principle 1(a) (PSD <10). Moderating factors that may be considered by the NVC No moderating factors need be applied.	

Table 13. Assessment against the Principle of Clearance 1(b).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(b) – significance as a habitat for wildlife	**Relevant information** Six species of threatened fauna have been assessed as possible, likely or highly likely to occur in the Project Area. One threatened species was observed during the field survey. These are listed below: • Brown Quail (*Coturnix ypsilophora australis*) – NPW Act Vulnerable. Possibly occurs. • Eastern Shrike-tit (*Falcunculus frontatus frontatus*) – NPW Act Rare. Possibly occurs. • Little Eagle (*Hieraaetus morphnoides*) – NPW Act Vulnerable. Possibly occurs.. • Elegant Parrot (*Neophema elegans elegans*) – NPW Act Rare. Possibly occurs.. • Grey-headed Flying-fox (*Pteropus poliocephalus*) – EPBC Act Vulnerable. Highly likely to occur (foraging only). • Common Brushtail Possum (*Trichosurus vulpecula*) – NPW Act Rare. Highly likely to occur (foraging only). • Yellow-tailed Black Cockatoo (*Zanda funerea*) – NPW Act Vulnerable. Highly likely to occur and recorded during the field survey. Only 13 fauna species were recorded during the field survey, with few habitat attributes such as hollows, intact litter layer and understorey vegetation, that would support a diverse fauna community. The vegetation is isolated from any other areas of native vegetation and is unlikely to act as a corridor or provide opportunities for dispersal, except for species that can cross extensive cleared areas. Patches (A1) Threatened Fauna Score (TFS) – 0.1 Unit biodiversity Score (UBS) – 16.38 Scattered Trees Fauna Habitat Score (FHS) – 1.8 (all scattered trees) Biodiversity Score (BS) – <7 (all scattered trees)	**Impact Significance** 1) Only one threatened species (Yellow-tailed Black Cockatoo) was recorded in the Project Area. While the species may occasionally forage in the habitat, there are no suitable tree hollows for breeding. Species assessed as possibly occurring are only likely to be present occasionally, with the habitat not suitable or of a large enough extent to support a population. The clearance is not likely to cause a decrease in the size of a threatened species' population. 2) Threatened species recorded or assessed as possibly occurring in the Project Area occur throughout the Mount Lofty Ranges. The small extent (0.058 ha) of habitat removed will not reduce the area of occupancy of any threatened species. 3) The clearance will impact a linear corridor of only 5 m at the edge of a patch of vegetation already isolated and fragmented from other areas of native vegetation. 4) Vegetation being cleared is in poor condition and contains few habitat attributes essential for sustaining populations of threatened species, such as hollow-bearing trees and plant diversity. It does not represent critical habitat for any of the species assessed as possibly occurring in the Project Area. 5) Vegetation being cleared is in poor condition and is likely to decline further given disturbances already acting on the Project Area. These are unrelated to the clearance proposal. Modification of the habitat due to the proposed clearance is unlikely to be of an extent that would cause a decline of a threatened species. 6) Weed species already dominate the understorey of the vegetation association, with introduced animals likely to be harmful to threatened species (e.g. Fox, Rabbit) already present on the site.

Principle of clearance	Considerations	Moderating Factors (where applicable)
	Assessment against the principles Seriously at Variance – A1 (TFS ≥ 0.05) – All scattered trees (FHS ≥1.2) At Variance The application is not at variance with Principle 1(b) Moderating factors that may be considered by the NVC The Native Vegetation Council may apply the following moderating factors: *Impact Significance* The NVC are of the opinion that the clearance will not have a significant impact on fauna habitat. The clearance action will have a significant impact on a threatened species if it may (Native Vegetation Council, 2020c): 1) Lead to a long-term decrease in the size of a population. 2) Reduce the area of occupancy of the species. 3) Fragment an existing population into two or more populations. 4) Adversely affect habitat critical to the survival of a species. 5) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. 6) Result in invasive species that are harmful to a threatened species becoming established in the threatened species habitat. 7) Interfere with the recovery of the species. *Common Species* The vegetation provides habitat for native species that are relatively common, and the area of clearance is not considered essential habitat to maintain the local population. *Non-essential habitat* Clearance is of non-essential habitat for threatened species and the clearance will have a negligible impact on that species' local population over the long term (i.e., next 20 to 50 years).	7) Since the Project Area dos not contain critical habitat, threatening processes are already present and would not be exacerbated and the clearance would not cause a long-term decline in a threatened species population, the action will not interfere with the recovery of any species. **Common Species** Most of the 13 fauna species recorded are common species, found extensively within small patches of vegetation and scattered trees within a cleared and fragmented landscape. The extent of habitat being cleared is small and in poor condition. As such, it does not represent habitat essential for maintaining the population of these species. **Non-essential Habitat** Only one threatened species (Yellow-tailed Black Cockatoo) was recorded in the Project Area, with no breeding habitat for that species. It likely represents non-essential habitat for that species, with the clearance likely to have negligible impact in the long-term.

Table 14. Assessment against the Principle of Clearance 1(c).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(c) – plants of a rare, vulnerable or endangered species	**Relevant information** No threatened plant species were recorded during the survey. Only three threatened species have been recorded within 5 km of the Project Area since 1995: – *Eucalyptus dalrympleana* ssp. *dalrympleana* (Candlebark) – *Eucalyptus fasciculosa* (Pink Gum) – *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) None of these species were recorded during the field survey, despite searching the entire pipeline alignment. Patches (A1) Threatened Flora Score (TFS): 0 Scattered Trees (all trees) Threatened Flora Score (TFS): 0	Not applicable
	Assessment against the principles Seriously at Variance The application is not seriously at variance with Principle 1(c) (TFS = 0). At Variance The application is not at variance with Principle 1(c) (TFS = 0). Moderating factors that may be considered by the NVC No moderating factors need be applied.	

Table 15. Assessment against the Principle of Clearance 1(d).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(d) – the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered	**Relevant information** The Vegetation Association under application does not represent a threatened ecological community (EPBC Act) or threatened ecosystem (*Provisional list of threatened ecosystems*). Threatened Community Score – 1	Not applicable
	Assessment against the principles Seriously at Variance The application is not seriously at variance with Principle 1(d). Moderating factors that may be considered by the NVC No moderating factors need be applied.	

Table 16. Assessment against the Principle of Clearance 1(e).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(e) – it is significant as a remnant of vegetation in an area which has been extensively cleared	**Relevant information** IBRA Remnancy Hahndorf IBRA Association: 8% Mount Lofty Ranges IBRA Subregion: 15% The vegetation under application is generally in poor to fair condition. Due to disturbance factors already acting on the vegetation (weeds, vegetation management in road corridor), its condition is likely to continue to decline. Total Biodiversity Score (TBS) 23.28 **Assessment against the principles** Seriously at Variance The application is seriously at variance with Principle 1(e) – Remnancy = 3 – 10%, TBS = 5 – 500. Moderating factors that may be considered by the NVC The Native Vegetation Council may apply the following moderating factors, reducing the clearance to At Variance with Principle 1(e): *Impact Significance* The NVC are of the opinion that the clearance will not have a significant impact on fauna habitat. The clearance action will have a significant impact on a remnant in a highly cleared landscape if it does, will or is likely to (Native Vegetation Council, 2020c): 1) Impact on a tree species or vegetation community that has been selectively removed within the IBRA Association or IBRA subregion and are therefore underrepresented in the vegetation that remains. 2) Impacts on a remnant in a relatively good condition, particularly if the vegetation within the IBRA Association or IBRA subregion where vegetation has been largely degraded. *Quality of remnant* If the vegetation is in poor to very poor condition, is continuing to degrade and its long term (next 20 to 50 years) persistence is unlikely, the clearance may be reduced to At Variance.	**Impact Significance** 1) No available information. 2) Vegetation in the Project Area is in poor condition, impacted by many disturbance factors (weeds, traffic, vegetation management) unrelated to the proposed clearance. **Quality or remnant** Vegetation in the Project Area is in poor condition, impacted by many disturbance factors (weeds, traffic, vegetation management) unrelated to the proposed clearance.

Table 17. Assessment against the Principle of Clearance 1(f).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(f) – it is growing in, or in association with, a wetland environment	**Relevant information** The vegetation under application is not part of a wetland.	Not applicable
	Assessment against the principles Seriously at Variance The application is not seriously at variance with Principle 1(f). At Variance The application is not at variance with Principle 1(f). Moderating factors that may be considered by the NVC No moderating factors need be applied.	

Table 18. Assessment against the Principle of Clearance 1(g).

Principle of clearance	Considerations	Moderating Factors (where applicable)
Principle 1(g) – it contributes significantly to the amenity of the area in which it is growing or is situated	**Relevant information** The Project Area occurs between the Princes Highway and the commercial district of Totness. Vegetation provides some screening of commercial premises north of the highway for road uses, however there are no nearby residential areas that would be impacted aesthetically by the clearance. The Scenic Quality Overlay applies to the area (Section 2.7).	Not applicable
	Assessment against the principles In determining if the clearance is at variance with Principle 1(g), the NVC will have regard to the local Council's recommendations (if any) in relation to the application.	

Principles of Clearance (h-m) will be considered by comments provided by the local NRM Board or relevant Minister. The Data Report should contain information on these principles where relevant and where sufficient information or expertise is available.

4.6. Risk assessment

The level of risk associated with the application is indicated in Table 19**.**

Table 19. Summary of the level of risk associated with the application.

Total clearance	No. of trees	44
	Area (ha)	0.058
	Total biodiversity Score	23.28
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1(b)
Risk assessment outcome		Level 4

5. Clearance Summary

The clearance summary for the application, including 0.058 ha of native vegetation and 44 scattered trees is presented in Table 20, Table 21 and Table 22. The tables indicate that Total Biodiversity Score, Significant Environmental Benefit (SEB) points and SEB payments required to offset the vegetation clearing associated with the Proposal.

Table 20. Clearance summary table – native vegetation patches.

Block	Site	Species diversity score	Threatened Ecological community Score	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1	6	1	0	0.1	16.38	0.058	0.95	1	0	0	1.00	$1,005.74	$55.32
						Total	**0.058**	**0.95**				**1.00**	**$1,005.74**	**$55.32**

Table 21. Clearance summary table – scattered trees.

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment	Admin Fee
1	1	1.8	0	1.93	1	2.03	$2,160.94	$112.66
2	1	1.8	0	0.40	1	0.42	$451.31	$23.53
3	1	1.8	0	0.35	1	0.37	$393.39	$20.51
4	1	1.8	0	2.03	1	2.13	$2,263.45	$118.00
5	1	1.8	0	1.32	1	1.39	$1,473.97	$76.84
6	1	1.8	0	0.25	1	0.26	$278.35	$14.51
7	1	1.8	0	0.49	1	0.52	$548.66	$28.60
8	1	1.8	0	2.08	1	2.19	$2,325.20	$121.22
9	1	1.8	0	0.29	1	0.31	$325.13	$16.95
10	2	1.8	0	0.98	1	1.03	$1,092.98	$56.98
11	1	1.8	0	0.21	1	0.22	$229.75	$11.98
12	1	1.8	0	1.04	1	1.09	$1,161.13	$60.53
13	1	1.8	0	1.02	1	1.07	$1,135.11	$59.18
14	1	1.8	0	0.49	1	0.51	$543.46	$28.33
15	1	1.8	0	1.04	1	1.09	$1,163.42	$60.65
16	6	1.8	0	1.21	1	1.27	$1,355.29	$70.65
17	4	1.8	0	1.32	1	1.39	$1,474.18	$76.85
18	9	1.8	0	4.06	1	4.27	$4,538.94	$236.63
19	1	1.8	0	0.19	1	0.20	$210.85	$10.99
20	4	1.8	0	0.76	1	0.80	$848.47	$44.23
21	2	1.8	0	0.41	1	0.43	$455.38	$23.74
22	1	1.8	0	0.21	1	0.22	$239.23	$12.47
23	1	1.8	0	0.24	1	0.26	$271.67	$14.16
Total	**0**			**0**		**23.44**	**$23,640.05**	**$1,300.20**

Table 22. Total Significant Environmental Benefit summary table.

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	23.28	24.44	$24,645.79	$1,355.52	$26,001.31

Economies of Scale Factor	0.5
Rainfall (mm)	754

6. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the *Native Vegetation Regulations 2017*. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

ACHIEVING AN SEB

The proponent will achieve the required SEB by undertaking the following:

☐ Establish a new SEB Area on land owned by the proponent.

☐ Use SEB Credit that the proponent has established. Provide the SEB Credit Ref. No. _____

☐ Apply to have SEB Credit assigned from another person or body. The application form needs to be submitted with this Data Report.

☐ Apply to have an SEB to be delivered by a Third Party. The application form needs to be submitted with this Data Report.

☒ Pay into the Native Vegetation Fund.

PAYMENT SEB

The proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, with the payment amount indicated below:

- $26,001.31 (including administration fee).

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8. Appendices

Appendix 1 – Scattered tree photographs

Tree 1

Tree 2

Tree 3

Tree 4

Tree 5

Tree 6

Tree 7

Tree 8

Tree 9

Tree 10

Tree 11

Tree 12

Tree 13

Tree 14

Tree 15

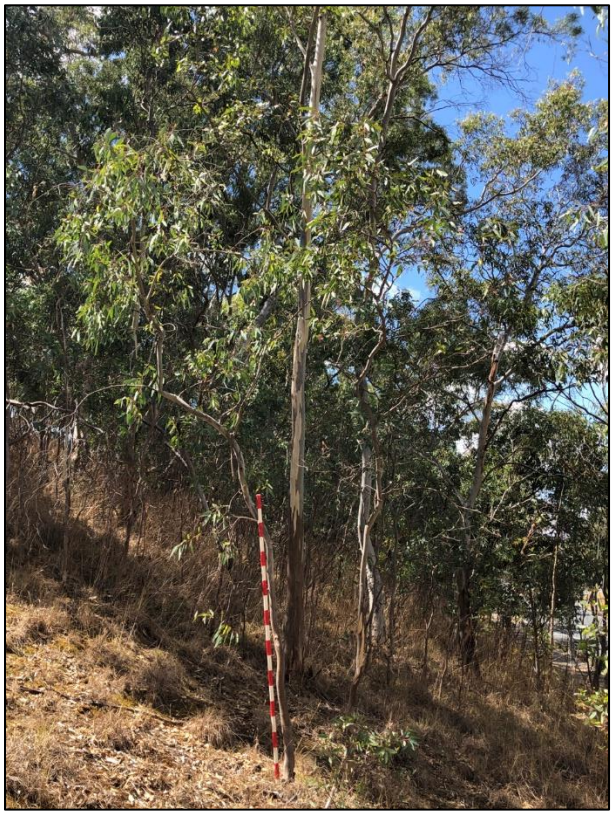
Tree 16

Tree 17

Tree 18

Tree 19

Tree 20



Tree 21

Tree 22

Tree 23

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