

Native Vegetation Clearance

Sturt Highway Overtaking Lane Project

Site 1 Data Report

Clearance under the *Native Vegetation Regulations 2017*

04 May 2022

Prepared by H. Merigot – EBS Ecology



Native Vegetation Clearance Sturt Highway Overtaking Lane Project Site 1 Data Report

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Glossary and abbreviations

BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia (maintained by DEW)
DAWE	Department of Agriculture, Water and the Environment (Commonwealth)
DEW	Department for Environment and Water (South Australia)
EBS	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ha	Hectare(s)
IBRA	Interim Biogeographical Regionalisation of Australia
km	Kilometre(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	<i>National Parks and Wildlife Act 1972</i>
NV Act	<i>Native Vegetation Act 1991</i>
NVC	Native Vegetation Council
PMST	Protected Matters Search Tool (under the EPBC Act; maintained by DAWE)
Project	Sturt Highway Overtaking Lanes
Project Area	Site 1 Sturt Highway, 27 km west of Blanchetown
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
TEC	Threatened Ecological Community
var.	Variety (a taxonomic rank below that of species and subspecies, but above that of form)

Table of contents

Glossary and abbreviations.....	4
Table of contents	5
1. Application information	7
2. Purpose of clearance	10
2.1. Description.....	10
2.2. Background	11
2.3. General Location Map.....	11
2.4. Details of the proposal	13
2.5. Approvals required <i>or</i> obtained.....	13
2.6. Native Vegetation Regulation.....	14
3. Method	15
3.1. Desktop assessment	15
3.1.1. PMST report.....	15
3.1.2. BDBSA data extract.....	15
3.1.3. Likelihood of occurrence.....	15
3.2. Flora assessment	16
3.2.1. Bushland Assessment Method	16
3.3. Fauna assessment	16
4. Assessment outcomes	17
4.1. Vegetation assessment.....	17
4.1.1. General description of the vegetation, the site and matters of significance	17
4.1.2. Details of the vegetation associates/scattered trees proposed to be impacted.....	17
4.1.3. Site maps showing areas of proposed impact.....	21
4.2. Threatened species assessment.....	35
4.2.1. Matters of national environmental significance.....	35
4.2.2. Threatened Fauna and Flora.....	35
4.3. Cumulative impacts.....	39
4.4. Addressing the Mitigation Hierarchy	39
4.5. Principles of Clearance (Schedule 1, <i>Native Vegetation Act 1991</i>)	41
4.6. Risk assessment	44
5. Clearance summary	44

6. Significant Environmental Benefit	45
7. References	46
8. Appendices.....	48

List of Tables

Table 1. Application details.	7
Table 2. Summary of the proposed clearance.	7
Table 3. Criteria for the likelihood of occurrence of threatened species within the Project Area.	15
Table 4. Summary of vegetation association A1.....	17
Table 5. Summary of vegetation association proposed to be impacted: Site A2.....	19
Table 6. Nationally (EPBC Act) or State (NPW Act) threatened species potentially occurring within Site 1.	37
Table 7. Assessment against the Principles of Clearance.	41
Table 8. Summary of the level of risk associated with the application.	44
Table 9 Bushland Assessment Method clearance Summary.....	44
Table 10 Bushland Assessment Method clearance Summary Totals.....	44

List of Figures

Figure 1 Proposed clearance areas for four overtaking lanes (Project Areas) along Sturt Highway between Annadale and Cobdogla, South Australia. Site 1 is highlighted in red.	12
Figure 2. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 1 of 14).....	21
Figure 3. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 2 of 14).....	22
Figure 4. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 3 of 14).....	23
Figure 5. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 4 of 14).....	24
Figure 6. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 5 of 14).....	25
Figure 7. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 6 of 14).....	26
Figure 8. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 7 of 14).....	27
Figure 9. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 8 of 14).....	28
Figure 10. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 9 of 14).	29
Figure 11. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 10 of 14).....	30
Figure 12. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 11 of 14).....	31
Figure 13. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 12 of 14).....	32
Figure 14. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 13 of 14).....	33
Figure 15. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 14 of 14).....	34

Attachments

- Attachment 1 - BAM A1 Scoresheet - EX200512B_Site 1_BAM_A1_Amended_Final_20220503 (Excel file)
- Attachment 2 - BAM A2 Scoresheet - EX200512B_Site 1_BAM_A2_Amended_Final_20220503 (Excel file)
- Attachment 3 - EX200512C_TEC_EPBC Self Assessment_Final_20220404 (PDF File)

1. Application information

Table 1. Application details.

Applicant:	Department for Infrastructure and Transport (DIT)		
Key contact:			
Landowner:	Department for Infrastructure and Transport		
Site Address:	Sturt Highway Site 1 – eastbound overtaking lane from Stonefield Road intersection (MM93.8) to MM 96.5, Annadale.		
Local Government Area:	Mid Murray Council	Hundred:	Anna
Title ID:	n/a – road reserve.	Parcel ID	n/a – road reserve.

Table 2. Summary of the proposed clearance.

Purpose of clearance:	Clearance required for installation of overtaking lane for east bound traffic and widening of the verge on both sides of the road.
Native Vegetation Regulation:	Regulation 12, Schedule 1: Clause 32 – Works on behalf of Commissioner of Highways
Description of the vegetation under application:	3.467 ha of <i>Maireana brevifolia</i> low open shrubland in poor to good condition, and 0.035 ha of <i>Eucalyptus odorata</i> mallee over <i>Atriplex vesicaria</i> and <i>Enchylaena tomentosa</i> .
Total proposed clearance – area (ha) and/or number of trees:	3.502 ha of native vegetation is proposed to be cleared. <i>This area includes an offset provision for up to a 1 m Construction Activity Zone (Refer to DIT Master Specification) around the overtaking lane design extent to enable construction should it be required.</i>
Level of clearance:	Level 4 clearance
Overlay (Planning and Design Code):	Native Vegetation Overlay
Map of proposed clearance area:	<p>Map of proposed clearance area: The map shows an aerial view of the site with a yellow line indicating the proposed clearance area. The area is bounded by Stonefield Road to the west and Sturt Highway to the east. The map includes a legend, an inset map of South Australia, and a scale bar.</p>
Mitigation Hierarchy:	Avoidance - As overtaking lanes are built immediately adjacent to the existing roads construction is required next to the existing Sturt Highway, within the existing road

corridor boundary. As the land within the road corridor contains remnant native vegetation for its full extent the ability to completely avoid removal is not able to be achieved. As complete native vegetation avoidance is not possible and alternative alignments beyond the road corridor without vegetation are not available for overtaking lanes the project needed to focus on measures to minimise the impacts. Identifying alternate sites within a 10.5km extent and undertaking preliminary assessments during the planning phase, and steepening batter slopes during the design phase were the primary measures used to avoid native vegetation.

Minimization - Mott Mac have stated the following minimisation measures have been undertaken:

The project sought to initially identify and minimise vegetation impacts by:

- Identifying and assessing alternative sites for the 2.3 km westbound overtaking lane within a 10.5 km extent;
- Undertaking a preliminary environment and heritage site assessment for a 10.5 km extent of the Sturt Highway which informed the location of the OTL with respect to important vegetation;
- Engaging a Department for Transport and Infrastructure prequalified specialist consultant to confirm the initial assessment and provide an Ecological Constraints Summary for the 10.5 km extent;
- Undertaking a defined multi-criteria assessment process for three sites that considered the maximum safety outcome and benefit, proximity to other overtaking lanes, existing road geometry, environmental and heritage assets, landholder access and services constraints; and
- Consulting with the Murraylands and Riverland Landscape Board regarding environmental and declared pest plant species of concern within roadsides in the region (including Buffel grass).

The preferred site avoids the Department for Infrastructure and Transport (DIT) Roadside Significant Site (RSS) 155, located on the northern side of the highway between MM 101.11 to MM 108.07. The RSS 155 contains Mallee vegetation considered important by DIT.

The area chosen minimises vegetation impacts by selecting an area with evidence of previous disturbance with a high ratio of exotic to native species present. Additionally, as the site is primarily *Maireana brevifolia* low open shrub land, with a small stand of *Eucalyptus odorata* mallee low, open shrubland, tree removal has been significantly limited when compared with other options within the 10.5 km extent.

To minimise the vegetation impact for the preferred site (between MM 93.7 and MM 96) the design has:

- Implemented steeper batters in area proximity to the *Eucalyptus odorata* mallee over low open shrubland, so the maximum extent remains intact and identified individuals of *Maireana rohrlichii* are avoided; and
- Minimised clearance at the at the batter construction extents by pruning rather than removing some of the trees identified within the *Eucalyptus odorata* mallee over low open shrubland extent.

The Murraylands and Riverland Landscape Board confirmed limited declared pest plant species of concern to roadsides in this location, with no Buffel grass recorded within the preferred site. The preferred site maximises the distance from the Brookfield Conservation Park offering the best opportunity to minimise the potential for vehicle and wombat conflict.

Rehabilitation or restoration - The overtaking lanes are permanent land clearance that is unlikely to be rehabilitated or restored. However, some Declared and

	<p>Environmental weed species will be controlled during in accordance with the Department for Transport and Infrastructure's Master Specification Part PC-ENV2.</p> <p>Offset - Any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised will be offset by implementing an SEB that outweighs that impact (see Section 6).</p>
SEB Offset proposal	Payment of \$80,412.82 into the fund, which includes an administration fee of \$4,192.14.

2. Purpose of clearance

2.1. Description

EBS Ecology was engaged by Mott MacDonald on behalf of the Department for Infrastructure and Transport (DIT) to assess vegetation for the duplication of four overtaking lanes (OTL) (Sites 1 to 4) on the Sturt Highway, extending from approximately 27 kilometres (km) west of Blanchetown to approximately 15 km east of Waikerie South Australia (SA) (Figure 1). The current report relates to the assessment for Site 1 (the Project), located approximately 27 km west of Blanchetown, South Australia (SA) from Maintenance Marker (MM) 93.7 to MM 96 (Figure 1).

The Project involves the clearance of 3.467 ha of *Maireana brevifolia* low open shrublands and 0.035 *Eucalyptus odorata* mallee over *Atriplex vesicaria* and *Enchylaena tomentosa*.

Objectives

EBS Ecology were engaged by Mott MacDonald to undertake a flora and fauna assessment for the proposed OTL sites including the following project components:

- Undertake a desktop assessment of the likelihood of occurrence and status of threatened flora and fauna protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and State *National Parks and Wildlife Act 1972* (NPW Act);
- Assess native vegetation within the Project Area for clearance using the Native Vegetation Council (NVC) endorsed Bushland Assessment Method (BAM); and
- Calculate the Significant Environmental Benefit (SEB) offset requirements based on the impact footprint.

The current report relates to the assessment for Site 1 an OTL for east bound traffic. The report presents findings of the desktop assessment; in addition to results of the Bushland Assessment (BAM) required for assessing patches of vegetation proposed for clearance under the Native Vegetation Regulations.

2.2. Background

Current and surrounding land use

The Site 1 Project Area consists of roadside vegetation to the west of Blanchetown. The area has previously been mapped as grassland in poor condition dominated by weed grasses and forbs with emergent *Maireana brevifolia* and *Eucalyptus spp.* The Project Area is surrounded by cleared farmland. The nearest conservation park is Brookfield Conservation Park situated 15 km east of the Project Area.

Administrative boundaries

The Project Area occurs within the Mid Murray Council Area, Murraylands and Riverland Landscape Management Region, Anna Hundreds and Eyre County.

Bioregions

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The bioregions are further refined into subregions and environmental associations. The Project Area is located in the Murray Darling Depression IBRA Bioregion, Murray Mallee IBRA Subregion and Stonefield IBRA Environmental Association.

Approximately 21% (444,401 ha) of the Murray Mallee IBRA Subregion and approximately 30% (7025 ha) of the Stonefield IBRA Environmental Association is mapped as remnant vegetation. Of this, 17% (76,180 ha) and 1% (86 ha) is formerly conserved and protected, respectively.

2.3. General Location Map

The location of the proposed Overtaking Lane is displayed in Figure 1. The Project Area is located approximately 27 km west of Blanchetown.

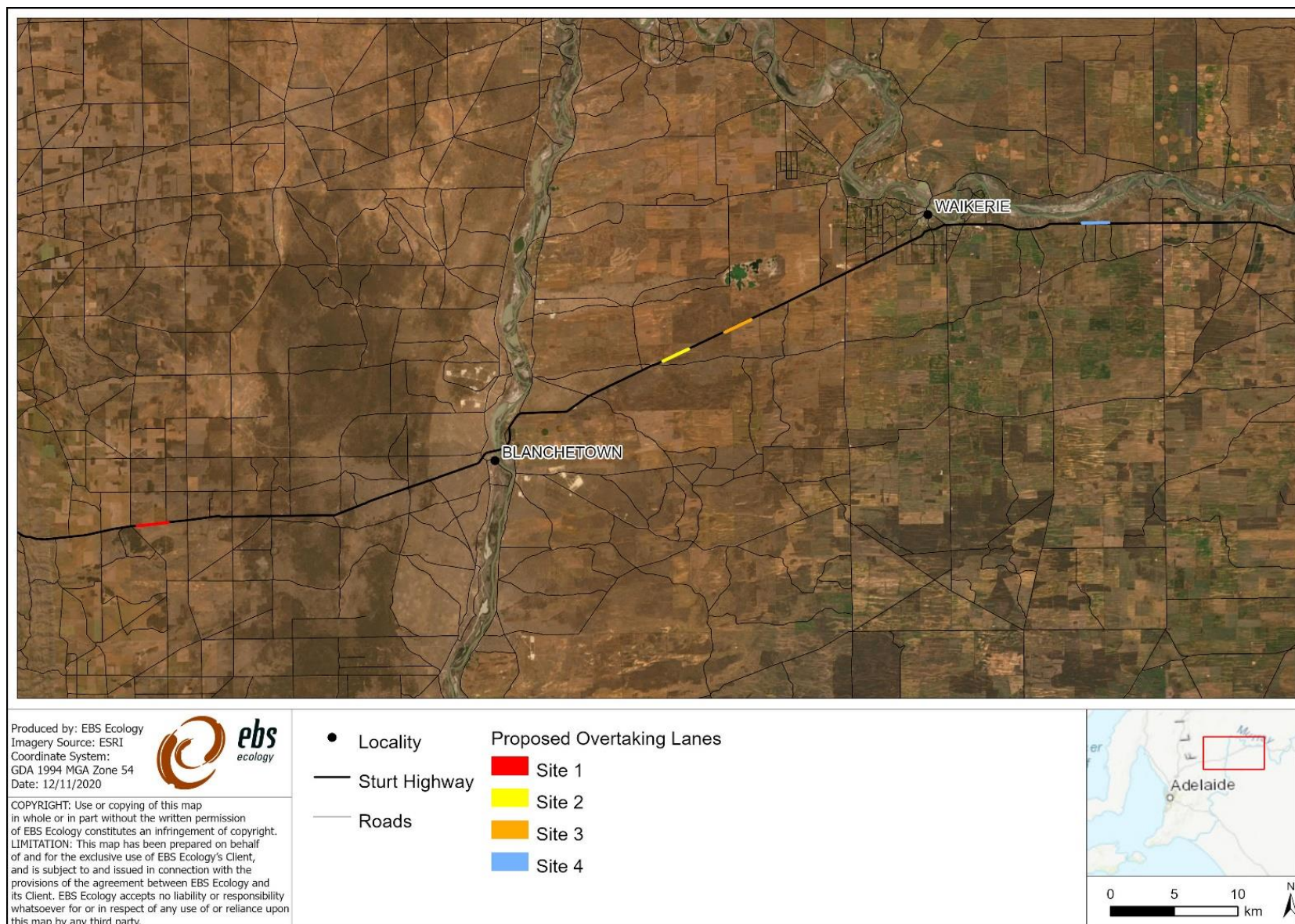


Figure 1 Proposed clearance areas for four overtaking lanes (Project Areas) along Sturt Highway between Annadale and Cobdogla, South Australia. Site 1 is highlighted in red.

2.4. Details of the proposal

The proposed clearance area for the Overtaking lanes include clearance from the intersection of Stonefield Road to MM 96.5. Clearance is occurring on the east bound roadside for construction of an overtaking lane, and on both sides of the road for verge widening. The layout of the proposed overtaking lanes is illustrated in Figure 1.

2.5. Approvals required or obtained

Environment Protection and Biodiversity Conservation Act 1999 - The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Environment Protection and Biodiversity Conservation Regulations 2000* provide a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the Act as ‘matters of national environmental significance’. Any action that has, will have, or is likely to have a significant impact on Matters of National Environmental Significance (MNES) requires referral under the EPBC Act.

National Parks and Wildlife Act 1972 (NPW Act) - Native plants and animals in South Australia are protected under the NPW Act. It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 (Endangered species), 8 (Vulnerable species) and 9 (Rare species) of the Act. Persons must not:

- Take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land;
- Take a native plant of a prescribed species on private land;
- Take a native plant on private land without the consent of the owner (such plants may also be protected by the NV Act);
- Take a protected animal or the eggs of a protected animal without approval;
- Keep protected animals unless authorised to do so; and
- Use poison to kill a protected animal without approval.

Conservation rated flora and fauna species listed on Schedules 7, 8, or 9 of the NPW Act may occur within the Project Area. Persons must comply with the conditions imposed upon permits and approvals.

Examples of other potential approvals include:

- transport of declared weeds under the *Landscapes South Australia Act 2019*, and
- *Aboriginal Heritage Act 1988* if any sites, objects or remains are uncovered during the works.

Other legislative approvals may be required.

2.6. Native Vegetation Regulation

The Project is considered to be permitted under the following regulation:

Regulation 12(32)—Works on behalf of Commissioner of Highways

- Clearance of vegetation incidental to work being undertaken by or on behalf of the Commissioner of Highways (other than repair or maintenance work of a kind referred to in Part 1 clause 2).

3. Method

3.1. Desktop assessment

A desktop assessment was undertaken to determine the potential for any threatened flora and 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).

3.1.1. PMST report

A Protected Matters Search Tool (PMST) report was generated on 10/8/2020 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (DAWE 2020). 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.

3.1.2. BDBSA data extract

A data extract 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 extracted 10/8/2020; DEW 2020). 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 (DEW) 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.

3.1.3. Likelihood of occurrence

The criteria for the likelihood of occurrence of threatened species within the Project Area are described in Table 3.

Table 3. 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.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provide 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	<p>Recorded within the previous 20 years, but the area provide no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter.</p> <p>Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area.</p> <p>No records despite adequate survey effort.</p>
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3.2. Flora assessment

The flora assessment was undertaken by NVC Accredited Consultant Sue Kenny and Hayley Merigot on 27 October 2020 and 29 April 2021 in accordance with the Bushland Assessment Method (BAM) (NVC, 2020a).

3.2.1. Bushland Assessment Method

The Bushland Assessment Method was 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 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 scoresheet. 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.

3.3. Fauna assessment

Fauna surveys were conducted in conjunction with the flora assessments along the site. All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests and other signs of presence) during the native vegetation assessment were recorded. Potential fauna refuge sites, such as hollows, were noted as an indication of availability of suitable habitat. Particular attention was paid to identifying habitat for threatened species. For each opportunistic fauna observation, the species, number of individuals, GPS location, detection methodology (sight, sound or sign) and habitat were recorded. Weather conditions during the survey were favourable, with mild daytime temperatures, light winds and occasional light showers.

4. Assessment outcomes

4.1. Vegetation assessment

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


Two native vegetation associations were mapped as a result of the field survey at Site 1 (Figure 2 - Figure 15):

- *Maireana brevifolia* low open shrub land (Table 4);
- *Eucalyptus odorata* mallee over *Atriplex vesicaria* and *Enchylaena tomentosa* (Table 5).

The native vegetation in these vegetation associations ranged from poor to good, with some impacts from weeds, particularly *Reichardia tingitana* and *Carrichtera annua*, and there was also a few individuals of the declared weed, *Lycium ferocissimum* at the site. Along this site the gravel shoulder extends for 50 cm from the edge of the road before the vegetation begins. Site 1 is surrounded by agricultural land along the length of the site, and the vegetation assemblage is mostly homogeneous.


4.1.2. Details of the vegetation associates/scattered trees proposed to be impacted

Table 4. Summary of vegetation association A1.

Vegetation Association	A1: <i>Maireana brevifolia</i> low open shrubland
	
General Description	Dominant species was <i>Maireana brevifolia</i> and <i>Atriplex vesicaria</i> with a high ratio of exotic species to native species. Within this VA, the State Threatened plant species <i>Maireana rohrlachii</i> was observed predominantly at the Stonefield Road intersection.

Threatened species or community	<p>Known</p> <ul style="list-style-type: none"> - The Mallee Bird Community of the Murray Darling Depression Bioregion (EN); - <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (EPBC: VU, State: V); - <i>Maireana rohrlachii</i> (Rohrlach’s Bluebush) (State: R). <p>Likely</p> <ul style="list-style-type: none"> - <i>Corcorax melanorhamphos</i> (White-winged Chough) (State: R); - <i>Neophema Chrysostoma</i> (Blue-winged Parrot) (State: V); <p>Possible</p> <ul style="list-style-type: none"> - <i>Hieraaetus morphnoides</i> (Little Eagle) (State: V); - <i>Leipoa ocellata</i> (Malleefowl) (EPBC: VU, State: V); - <i>Cinclosoma castanotum</i> (Chestnut-backed Quailthrush) (State: Rare); - <i>Melanodryas cucullata cucullata</i> (Hooded Robin) (State: R); - <i>Myiagra inquieta</i> (Restless Flycatcher) (State: R); - <i>Pachycephala inornata</i> (Gilbert’s Whistler) (State: R); - <i>Plectorhyncha lanceolata</i> (Striped Honeyeater) (State: R); - <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State: R); - <i>Falco subniger</i> (Black Falcon) (State: R); - <i>Falco hypoleucos</i> (Grey Falcon) (State: R); - <i>Hylacola cauta</i> (Shy Heathwren) (State: R). 				
	Landscape context score	1.13	Vegetation Condition Score	46.05	Conservation significance score
Unit biodiversity Score	80.14	Area (ha)	3.467	Total biodiversity Score	277.86

Table 5. Summary of vegetation association proposed to be impacted: Site A2.

Vegetation Association	A2: <i>Eucalyptus odorata</i> mallee over <i>Atriplex vesicaria</i> and <i>Enchylaena tomentosa</i> .
	
General Description	Dominant overstorey species was <i>Eucalyptus odorata</i> and the dominant understorey species <i>Atriplex vesicaria</i> with little mid-storey. Within this VA, the State Threatened plant species <i>Maireana rohrlachii</i> was observed among the trees furthest from the road on a mounded area that formed part of a man-made drain.
Threatened species observed	<p>Known</p> <ul style="list-style-type: none"> - The Mallee Bird Community of the Murray Darling Depression Bioregion (EN); - <i>Maireana rohrlachii</i> (Rohrlach's Bluebush) (State: R) <p>Likely</p> <ul style="list-style-type: none"> - <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (EPBC: VU, State: V) <p>Possible</p> <ul style="list-style-type: none"> - <i>Corcorax melanorhamphos</i> (White-winged Chough) (State: R) - <i>Neophema Chrysostoma</i> (Blue-winged Parrot) (State: V) - <i>Hieraaetus morphnoides</i> (Little Eagle) (State: V) - <i>Leipoa ocellata</i> (Malleefowl) (EPBC: VU, State: V) - <i>Cinclosoma castanotum</i> (Chestnut-backed Quailthrush) (State: R) - <i>Melanodryas cucullata cucullata</i> (Hooded Robin) (State: R) - <i>Myiagra inquieta</i> (Restless Flycatcher) (State: R) - <i>Pachycephala inornata</i> (Gilbert's Whistler) (State: R) - <i>Plectorhyncha lanceolata</i> (Striped Honeyeater) (State: R) - <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State: R) - <i>Falco subniger</i> (Black Falcon) (State: R) - <i>Hylacola cauta</i> (Shy Heathwren) (State: R) - <i>Falco hypoleucos</i> (Grey Falcon) (State: R)

Landscape context score	1.13	Vegetation Condition Score	48.75	Conservation significance score	1.54
Unit biodiversity Score	84.83	Area (ha)	0.035	Total biodiversity Score	2.98

4.1.3. Site maps showing areas of proposed impact



Figure 2. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 1 of 14).



Figure 3. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 2 of 14).



Figure 4. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 3 of 14).



Figure 5. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 4 of 14).



Figure 6. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 5 of 14).



Figure 7. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 6 of 14).



Figure 8. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 7 of 14).



Figure 9. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 8 of 14).



Figure 10. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 9 of 14).



Figure 11. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 10 of 14).



Figure 12. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 11 of 14).



Figure 13. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 12 of 14).



Figure 14. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 13 of 14).



Figure 15. Native Vegetation Association on the Sturt Highway of the Site 1 Project Area (Map 14 of 14).

4.2. Threatened species assessment

4.2.1. Matters of national environmental significance

There are six matters of National Environmental Significance (MNES) relevant to the Project Area, three Listed threatened ecological communities and two Wetlands of International Importance:

Threatened Ecological Communities:

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (Endangered).
- The Mallee Bird Community of the Murray Darling Depression Bioregion (Endangered).
- Peppermint Box (*Eucalyptus odorata*) Grassy Woodland (PBGW) of South Australia (Critically Endangered).
- River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea.

Wetlands of International Importance:

- The Coorong, and lakes Alexandrina and Albert wetland;
- Banrock Station wetland complex.

The Mallee Bird Community of the Murray Darling Depression Bioregion is present within the Project Area (see Attachment 3).

The Critically Endangered (CE) listed Peppermint Box (*Eucalyptus odorata*) Grassy Woodland TEC has been assessed by the PMST as likely occurring in the area. The Project Area contains *Eucalyptus odorata*, however, to be considered as a TEC the patch must meet certain conditions such as, have a good diversity of native species and contain a good selection and cover of perennial native grasses (DEW, 2007). Previous road disturbance has resulted in degradation of surrounding habitat, therefore the Project Area is unlikely to contain a CE Peppermint Box Grassy Woodland. However, the Project Area is likely to contain Class C community (degraded patches amenable to rehabilitation), but only Class A or B communities are considered the TEC.

The remaining vegetation communities and wetlands of international importance are not present in the area or adjacent to the Project Area as indicated by the SA vegetation mapping (NatureMaps, 2020) and therefore, the Project is unlikely to impact on these communities.

4.2.2. Threatened Fauna and Flora

EPBC Act

The PMST and NatureMaps search identified no EPBC listed flora species as potentially occurring within the Project Area. The desktop identified one EPBC listed threatened bird species that may potentially occur within the Project Area (Table 6):

- Regent Parrot (*Polytelis anthopeplus monarchoides*) (Vulnerable).

Regent Parrots typically occur in wooded areas that can provide roosting and nesting habitat for Regent Parrots. Given the absence of large hollows, the area is unlikely to provide important nesting habitat, but may provide roosting habitat in the mallee vegetation association.

NPW Act

The NatureMaps search identified three State listed Threatened flora species within 5 km of the Project Areas, *Maireana Rohrlachii* (Rohrlach's Bluebush), *Phlegmatospermum eremaeum* (Spreading Cress) and *Swainsona fuscoviridis* (Dark green Swainson-pea) were assessed as possibly occurring in the Project Area (Table 6). Only *Maireana Rohrlachii* (Rohrlach's Bluebush) was observed during the field survey.

Nine State threatened fauna species were also identified as occurring within 5 km of the Project Area since 1995:

- *Cinclosoma castanotum* (Chestnut-backed Quailthrush) (Rare);
- *Corcorax melanorhamphos* (White-winged Chough) (Rare);
- *Hieraaetus morphnoides* (Little Eagle) (Vulnerable);
- *Hylacola cauta* (Shy Heathwren) (Rare);
- *Melanodryas cucullata* (Hooded Robin) (Rare);
- *Myiagra inquieta* (Restless Flycatcher) (Rare);
- *Neophema chrysostoma* (Blue-winged Parrot) (Vulnerable);
- *Pachycephala inornata* (Gilberts Whistler) (Rare); and
- *Plectorhyncha lanceolata* (Striped Honeyeater) (Rare).

Table 6. Nationally (EPBC Act) or State (NPW Act) threatened species potentially occurring within Site 1.

Species	**Conservation status		*Data source	Date	***PMST classification	Species known habitat preferences	Likelihood of use for habitat - Comment
	SA	AUS					
<i>Anhinga novaehollandiae</i> (Australasian Darter)	R	-	1	1999	-	Habitat is lakes, rivers, swamps; rarely coastal.	Unlikely – unsuitable habitat.
<i>Cinclosoma castanotum</i> (Chestnut-backed Quailthrush)	R	-	1	2012	-	Throughout its distribution it occurs in a wide range of arid and semi-arid habitats; mainly in the low shrubs and undergrowth of mallee scrub, but also in <i>Acacia</i> scrubs, dry sclerophyll woodland, heath, and native pine (OEH 2020).	Possible – suitable habitat and nearby records.
<i>Corcorax melanorhamphos</i> (White-winged Chough)	R	-	1	2010	-	Dry woodland and mallee. Highly social species.	Likely- nearby records/suitable habitat.
<i>Hieraaetus morphnoides</i> (Little Eagle)	V	-	1	2010	-	The Little Eagle is seen over woodland and forested lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest (Birds in Backyards 2020).	Possible – suitable habitat, records within 5km.
<i>Hylacola cauta</i> (Shy Heathwren)	R	-	1	2010	-	Small bird of open mallee and heathland in southwestern Australia and southern South Australia (eBird 2020)	Possible – suitable habitat, records within 5km.
<i>Melanodryas cucullata</i> (Hooded Robin)	R	-	-	2010	-	Hooded Robins are found in lightly timbered woodland, mainly dominated by <i>Acacia</i> and/or <i>Eucalypts</i> (Birdlife 2020).	Possible - suitable habitat, recent records
<i>Myiagra inqueita</i> (Restless Flycatcher)	R	-	1	1998	-	Found throughout northern and eastern mainland Australia, as well as in south-western Australia. The Restless Flycatcher is found in open forests and woodlands and is frequently seen in farmland (Birds in Backyards 2020).	Possible – record in Mallee at within 50 km.
<i>Neophema chrysostoma</i> (Blue-winged Parrot)	V	-	1	1998	-	This species mainly occurs in Tasmania and Victoria, particularly in southern Victoria and the midlands and eastern areas of Tasmania however sparser populations are also found in western New South Wales and eastern South Australia, extending to south-west Queensland and occasionally into the Northern Territory. Prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones (Birdlife Australia).	Likely – nearby records, suitable habitat.
<i>Pachycephala inornata</i> (Gilberts Whistler)	R	-	1	2010	-	Sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt (Environment and Heritage 2014). Habitat is shrubby woodland and mallee (Simpson and Day 1999, p. 227).	Possible – suitable habitat.
<i>Plectorhyncha lanceolata</i> (Striped Honeyeater)	R	-	1	1998	-	The Striped Honeyeater is found in eastern Australia, mainly inland, from the Yorke Peninsula, South Australia to the coast of New South Wales, around Toukley, and north to	Possible – occasional.

Species	**Conservation status		*Data source	Date	***PMST classification	Species known habitat preferences	Likelihood of use for habitat - Comment
	SA	AUS					
						Charters Towers, Queensland. The Striped Honeyeater is found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens (Birds in Backyards).	
<i>Polytelis anthopeplus monarchoides</i> (Regent Parrot)	V	VU	1	1997	-	The Regent Parrot (eastern) is confined to the semi-arid interior of south eastern mainland Australia. Primarily inhabits riparian or littoral River Red Gum (<i>Eucalyptus camaldulensis</i>) forests or woodlands and adjacent Black Box (<i>E. largiflorens</i>) woodlands (DAWE 2020b).	Known – record on road.
Plant							
<i>Maireana rohrlachii</i> (Rohrlach's Bluebush)	R	-	1	2015	-	Bushy shrub to 50 cm high found in heavy seasonally waterlogged soil. Records in low lying areas nearby.	Known – observed in Project Area.
<i>Phlegmatospermum eremaeum</i> (Spreading Cress)	R	-	1	2010	-	Scattered distributions on the Nuallabor and in the north-eastern and central parts of South Australia, growing in open Mallee on calcareous clay or loam. Also found in Western Australia and Victoria (SA Seedbank 2020). Annual herb grows in semi-arid regions. Known from the Lake Eyre, Nullabor, Eyre Peninsula, Northern Lofty, Murraylands and Yorke Peninsula herbarium regions of SA. Also from WA and Vic.	Possible – recent record. Suitable habitat.
<i>Swainsona fuscoviridis</i> (Dark-green Swainson-pea)	R	-	1	2005	-	Native. Very rare in South Australia and Endemic to South Australia and confined to an area west of Broken Hill.	Possible – appropriate habitat and nearby records.

*Source: 1 = DEW 2020a, 2 = Protected Matters Search Tool (DAWE 2020a).

**NPW Act; E= Endangered, V = Vulnerable, R= Rare. EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable; Mi = Migratory.

***Species or species habitat 'known to occur', 'likely to occur' or 'may occur' (PMST Search).

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.

The direct impact of the Project is the removal of 3.467 ha of native *Maireana brevifolia* low open shrubland and 0.035 ha of *Eucalyptus odorata* mallee over low, open shrubland. All works fall within the Project Area. The area selected for the OTL avoids areas of more intact vegetation.

Potential indirect impacts of the Project include:

- Dust generation, which may impact surrounding vegetation;
- Noise generation, which may impact fauna species in the area; and

It is unlikely that the Project will alter the hydrology (e.g. raised or lowered water table, flooding, impounding water or reduced water supply) and impact of the condition or health of the native vegetation being retained in surrounding areas.

There may be potential impacts on the root zone of vegetation, depending on the level of impact to the vegetation.

This vegetation clearance is part of four OTLs proposed for construction along Sturt Highway. Each overtaking lane consists of approximately 2 km of vegetation clearance on one side of the road and verge widening on both sides. Vegetation being impacted includes chenopod shrublands, *Eucalyptus dumosa* and *Eucalyptus gracilis* mallee vegetation over grassland, *Eucalyptus odorata* mallee over low open shrubland, *Eucalyptus socialis* mallee with *Triodia irritans* and *Dodonaea viscosa* open shrubland.

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

As overtaking lanes are built immediately adjacent to the existing roads construction is required next to the existing Sturt Highway, within the existing road corridor boundary. As the land within the road corridor contains remnant native vegetation for its full extent the ability to completely avoid removal is not able to be achieved. As complete native vegetation avoidance is not possible and alternative alignments beyond the road corridor without vegetation are not available for overtaking lanes the project needed to focus on measures to minimise the impacts. Identifying alternate sites within a 10.5km extent and undertaking preliminary assessments during the planning phase, and steepening batter slopes during the design phase were the primary measures used to avoid native vegetation. These are discussed further in section (b) minimisation below.

b) Minimization

Mott Mac have stated the following minimisation measures have been undertaken:

The project sought to initially identify and minimise vegetation impacts by:

- Identifying and assessing alternative sites for the 2.3 km westbound overtaking lane within a 10.5 km extent;

- Undertaking a preliminary environment and heritage site assessment for a 10.5 km extent of the Sturt Highway which informed the location of the OTL with respect to important vegetation;
- Engaging a Department for Transport and Infrastructure prequalified specialist consultant to confirm the initial assessment and provide an Ecological Constraints Summary for the 10.5 km extent;
- Undertaking a defined multi-criteria assessment process for three sites that considered the maximum safety outcome and benefit, proximity to other overtaking lanes, existing road geometry, environmental and heritage assets, landholder access and services constraints; and
- Consulting with the Murraylands and Riverland Landscape Board regarding environmental and declared pest plant species of concern within roadsides in the region (including Buffel grass).

The preferred site avoids the Department for Infrastructure and Transport (DIT) Roadside Significant Site (RSS) 155, located on the northern side of the highway between MM 101.11 to MM 108.07. The RSS 155 contains Mallee vegetation considered important by DIT.

The area chosen minimises vegetation impacts by selecting an area with evidence of previous disturbance with a high ratio of exotic to native species present. Additionally, as the site is primarily *Maireana brevifolia* low open shrub land, with a small stand of *Eucalyptus odorata* mallee low, open shrubland, tree removal has been significantly limited when compared with other options within the 10.5 km extent.

To minimise the vegetation impact for the preferred site (between MM 93.7 and MM 96) the design has:

- Implemented steeper batters in area proximity to the *Eucalyptus odorata* mallee over low open shrubland, so the maximum extent remains intact and identified individuals of *Maireana rohrlichii* are avoided; and
- Minimised clearance at the batter construction extents by pruning rather than removing some of the trees identified within the *Eucalyptus odorata* mallee over low open shrubland extent.

The Murraylands and Riverland Landscape Board confirmed limited declared pest plant species of concern to roadsides in this location, with no Buffel grass recorded within the preferred site. The preferred site maximises the distance from the Brookfield Conservation Park offering the best opportunity to minimise the potential for vehicle and wombat conflict.

c) Rehabilitation or restoration

The overtaking lanes are permanent land clearance that is unlikely to be rehabilitated or restored. However, some Declared and Environmental weed species will be controlled during in accordance with the Department for Transport and Infrastructure's Master Specification Part PC-ENV2.

d) Offset

Any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised will be offset by implementing an SEB that outweighs that impact (see 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*.

Table 7. Assessment against the Principles of Clearance.

Principle of clearance	Considerations
Principle 1(a) – it comprises a high level of diversity of plant species	<u>Relevant information</u> Plant species numbers (native and introduced) recorded at each vegetation association: A1: 19 native and 18 introduced A2: 13 native and 2 introduced Bushland Plant Diversity Score A1: 30/30 A2: 24/30
	<u>Assessment against the principles</u> <u>Seriously at Variance</u> A1 & A2
	<u>Moderating factors that may be considered by the NVC</u> <ul style="list-style-type: none"> - Amount of clearance related to the area of remnant vegetation The IBRA association of Stonefield has 30% native vegetation remaining of which 1% is formerly conserved.
Principle 1(b) – significance as a habitat for wildlife	<u>Relevant information</u> A total of 3 native bird species were recorded using the vegetation during the current fauna assessment. No threatened species were recorded during the fauna assessment. One EPBC listed threatened species was identified as possibly occurring in the Project Area: <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot). Eleven State threatened bird species have also observed since 1995 within 5 km of the Project Areas. Despite these species being identified as possibly occurring in the Project Area, the type of vegetation (devoid of trees) is unlikely to provide suitable habitat for these identified species. The area surrounding the Project Area is used as cropping land and as a result, the Project Area had a high incursion of weeds. Although there are species identified in the desktop search that use shrublands, this vegetation is unlikely to provide a corridor for movements or a habitat refuge. Threatened Fauna Score – 0.1 Biodiversity Score – 207.89

Principle of clearance	Considerations
	<p><u>Assessment against the principles</u></p> <p>Seriously at Variance - A1 & A2</p> <hr/> <p><u>Moderating factors that may be considered by the NVC</u></p> <p><u>Impact significance</u> Impact to EPBC listed species Regent Parrot has been assessed against the <i>Matters of National Environmental Significance - Significant Impact Guidelines 1.1</i>. These assessments found that due to the nature of the habitat on site, absence of breeding habitat (hollows) and the small area of habitat impacted compared to available habitat total, the proposal will have no significant impact. These assessments are provided as Attachment 3.</p> <p>For the NPW Act listed threatened species assessed as potentially occurring within the Project Area, the proposed clearance is in predominantly poor-quality chenopod shrubland that is unlikely to be considered important habitat for these species. As such, the proposed clearance is unlikely to adversely impact these species.</p> <p><u>Common species</u> All species recorded in the Project Area by fauna surveys are species that are commonly found in semi-arid vegetation. This habitat is widespread throughout the surrounding landscape. The Project Area does not include any habitat features essential for maintaining local populations, such as hollow trees or wetlands, that are not widespread in the landscape.</p>
Principle 1(c) – plants of a rare, vulnerable or endangered species	<p><u>Relevant information</u> One State listed threatened species was recorded within the Project Area, <i>Maireana rohrlachii</i> (Rohrlach's Bluebush). Approximately 10 individuals were recorded around the western intersection on a previously disturbed mound and underneath the trees of A2.</p> <p>Threatened Flora Score – 0.04</p> <hr/> <p><u>Assessment against the principles</u></p> <p><u>At Variance</u> - A1 & A2</p> <hr/> <p><u>Moderating factors that may be considered by the NVC</u> N/A</p>
Principle 1(d) – the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered	<p><u>Relevant information</u> The Mallee Bird Community of the Murray Darling Depression Bioregion listed as endangered under the EPBC Act is present within the Project Area. 0.035 ha is proposed to be cleared within this Threatened Ecological Community.</p> <p>Threatened Community Score – 1.4</p> <hr/> <p><u>Assessment against the principles</u> <u>Seriously at Variance</u> - A1 & A2</p> <hr/> <p><u>Moderating factors that may be considered by the NVC</u></p>

Principle of clearance	Considerations
	Impact to EPBC listed Threatened Ecological Community Mallee Bird Community has been assessed against the <i>Matters of National Environmental Significance - Significant Impact Guidelines 1.1</i> . These assessments found that due to the small size of the potential impact relative to surrounding mallee vegetation present and the impact occurring on an already fragmented patch of mallee vegetation, the proposal will have no significant impact. These assessments are provided as Attachment 3.
Principle 1(e) – it is significant as a remnant of vegetation in an area which has been extensively cleared	<u>Relevant information</u> Stonefield IBRA Association remnant – 30% The native vegetation in these vegetation associations ranged from poor to good, with some impacts from weeds, particularly <i>Reichardia tingitana</i> and <i>Carrichtera annua</i> , and there were also a few individuals of the declared weed, <i>Lycium ferocissimum</i> at the site. Total Biodiversity Score – 280.81
	<u>Assessment against the principles</u> <u>At Variance</u> -A1 & A2
	<u>Moderating factors that may be considered by the NVC</u> <ul style="list-style-type: none"> - Impact on trees or a vegetation community that has been selectively removed within the IBRA Association or IBRA Subregion and are therefore underrepresented in the vegetation that remains. - Impact on a remnant in relatively good condition, particularly if the vegetation within the IBRA Association or IBRA Subregion where vegetation has largely been degraded.
Principle 1(f) – it is growing in, or in association with, a wetland environment	<u>Relevant information</u> The vegetation is not associated with a wetland environment.
	<u>Assessment against the principles</u> N/A
	<u>Moderating factors that may be considered by the NVC</u> N/A
Principle 1(g) – it contributes significantly to the amenity of the area in which it is growing or is situated	<u>Relevant information</u> As the vegetation is located alongside or within close proximity to a busy highway, the area is frequented by the public. The intact woodland vegetation is likely to be considered aesthetically pleasing by the public and therefore, considered to have amenity value. However, given the surrounding vegetation and other roadsides also have intact vegetation, the removal of vegetation for an OTL is unlikely to adversely impact the amenity of the area. No cultural or historical values of the areas have been identified.
	N/A
	<u>Moderating factors that may be considered by the NVC</u> N/A

4.6. Risk assessment

The level of risk associated with the application

The level of risk associated with the application is Level 4 (Table 8). Although the risk assessment outcome of clearing 3.502 ha of native vegetation with a Total Biodiversity Score of 280.81 is Level 3, the risk assessment outcome was escalated to Level 4 as the clearance is seriously at variance with principles 1 (a), (b) and (d) of the Principles of Clearance (plant species diversity, wildlife habitat and rare plant communities). Moderating factors that the NVC may consider in order to update the outcome of the assessment against the principles are outlined in Table 7. Any further clearance applications associated with the development will consider the level of risk of this application and the determining factors.

Table 8. Summary of the level of risk associated with the application.

Total clearance	No. of trees	-
	Area (ha)	3.502
	Total biodiversity Score	280.81
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1(b) & 1(d)
Risk assessment outcome		Level 4

5. Clearance summary

Table 9 Bushland Assessment Method clearance Summary

Block	Site	Species diversity score	Threatened Ecological community	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	30	1.4	0.04	0.1	80.14	3.467	277.85	1			291.74	75,414.80	4,147.81
A	2	24	1.4	0.04	0.1	84.83	0.035	2.97	1			3.12	805.88	44.32
						Total	3.502	280.81				294.86	\$76,220.68	\$4,192.14

Table 10 Bushland Assessment Method clearance Summary Totals

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	280.81	294.86	\$76,220.68	\$4,192.14	\$80,412.82

Economies of Scale Factor	0.35
Rainfall (mm)	284

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

Indicate how the SEB will be achieved by ticking the appropriate box and providing the associated information:

- ☐ Establish a new SEB Area on land owned by the proponent.
- ☐ Use SEB Credit that the proponent has established.
- ☐ Apply to have SEB Credit assigned from another person or body.
- ☐ Apply to have an SEB to be delivered by a Third Party.
- ☒ Pay into the Native Vegetation Fund. Provide details below

PAYMENT SEB

Mott MacDonald proposes to achieve the SEB by paying into the Native Vegetation Fund. The total SEB payment required for the clearance of 3.502 ha of native vegetation with a Total Biodiversity Score of 280.81 is **\$80,412.82**, which includes an administration fee of \$4,192.14 (Table 10).

This SEB payment amount has been calculated using Rev plans, issued for Final Design 100% 9/2/2022. The payment amount includes offset provision for up to a 1 m Construction Activity Zone (refer to the DIT Master Specification) around the overtaking lane design extent to enable construction to occur should it be required.

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8. Appendices

Appendix 1. Fauna Species List

Species Name	Common name
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
<i>Anthus australis</i>	Australian Pipit
<i>Eolophus roseicapilla</i>	Galah
<i>Turdus merula</i> *	Common Blackbird*

*Denotes exotic species

Appendix 2. Bushland Assessment Scoresheet associated with the proposed clearance (See Attachments 1 & 2)

Appendix 3. Flora Species List

Plant Species Recorded (Native and Introduced*)	
Species	Common Name
<i>Acacia nyssophylla</i>	Spine Bush
<i>Asphodelus fistulosus</i> *	Onion Weed
<i>Atriplex paludosa</i> ssp.	Marsh Saltbush
<i>Atriplex vesicaria</i>	Bladder Saltbush
<i>Austrostipa nitida</i>	Balcarra Spear-grass
<i>Avena barbata</i> *	Bearded Oat
<i>Brassica</i> sp. *	
<i>Bromus diandrus</i> *	Great Brome
<i>Bromus rubens</i> *	Red Brome
<i>Carrichtera annua</i> *	Ward's Weed
<i>Chloris truncata</i>	Windmill Grass
<i>Convolvulus remotus</i>	Grassy Bindweed
<i>Cynara cardunculus</i> ssp. <i>flavescens</i> *	Artichoke Thistle
<i>Dissocarpus paradoxus</i>	Ball Bindyi
<i>Echium plantagineum</i> *	Salvation Jane
<i>Enchylaena tomentosa</i> var.	Ruby Saltbush
<i>Eremophila longifolia</i>	Weeping Emubush
<i>Hordeum leporinum</i> *	Wall Barley-grass
<i>Limonium lobatum</i> *	Winged Sea-lavender
<i>Lolium rigidum</i> *	Wimmera Ryegrass
<i>Maireana aphylla</i>	Cotton-bush
<i>Maireana brevifolia</i>	Short-leaf Bluebush
<i>Maireana pyramidata</i>	Black Bluebush
<i>Medicago polymorpha</i> *	Burr-medic
<i>Mesembryanthemum crystallinum</i> *	Common Iceplant
<i>Onopordum acanthium</i> *	Scotch Thistle
<i>Oxalis pes-caprae</i> *	Soursob
<i>Reichardia tingitana</i> *	False Sowthistle
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass

<i>Sclerolaena patenticuspis</i>	Spear-fruit Bindyi
<i>Senna artemisioides</i> ssp.	Desert Senna
<i>Senna artemisioides</i> ssp. <i>petiolaris</i>	
<i>Sisymbrium</i> sp.*	Wild Mustard
<i>Sonchus oleraceus</i> *	Common Sow-thistle
<i>Vittadinia cuneata</i> var.	Fuzzy New Holland Daisy
<i>Zygophyllum aurantiacum/eremaeum</i>	Shrubby Twinleaf



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