Native Vegetation Clearance

MM 147 Stockyard Plain Parking Bay Upgrade

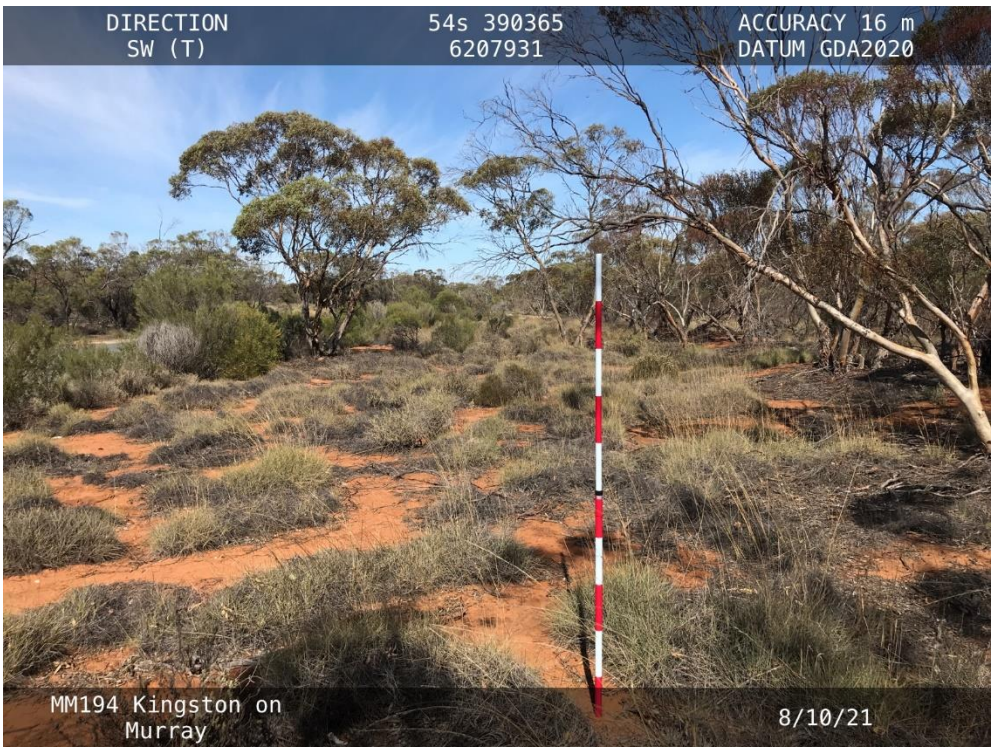
Data Report

VS 2021/92

Clearance under the *Native Vegetation Regulations 2017*

5/11/2021

Prepared by Ecosphere Ecological Solutions



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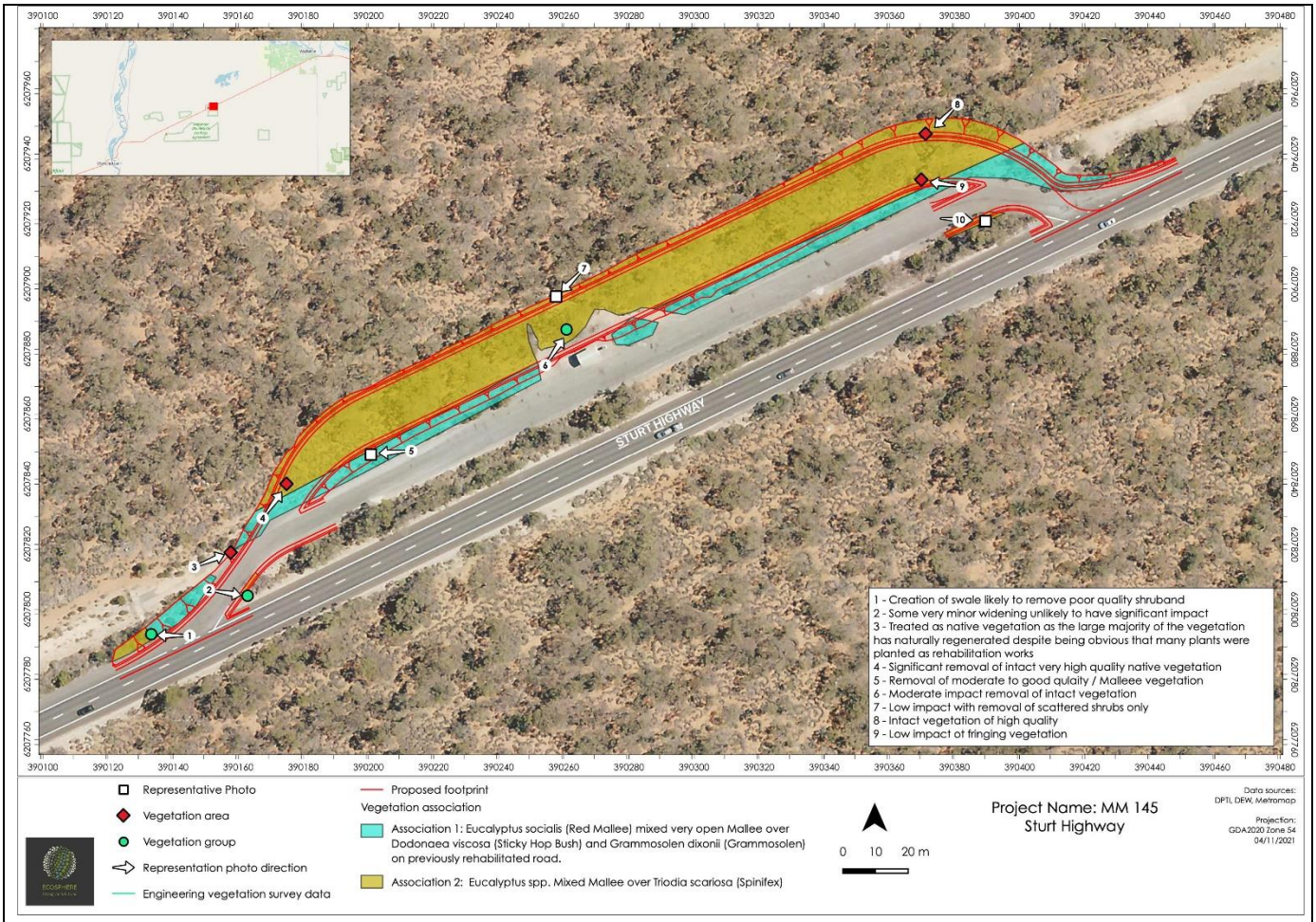
1. Application information

Application Details

Applicant:	Department for Infrastructure and Transport (DIT)		
Key contact:	DIT Project manager		
Landowner:	N/A		
Site Address:	Sturt Highway, Stockyard Plain, SA 5330		
Local Government Area:	The District Council of Loxton Waikerie	**Hundred:**	Murbko
Title ID:	N/A	**Parcel ID**	N/A

Summary of proposed clearance

Purpose of clearance	Upgrade of existing parking bay on LHS of Sturt Highway at Stockyard Plain, approximately 133 km north-east of the Adelaide CBD and 18 km south-west of Waikerie, SA.
Native Vegetation Regulation	Regulation 12(32) – Works on behalf of Commissioner of Highways
Description of the vegetation under application	*Eucalyptus* spp. Mixed Mallee over *Triodia scariosa* (Spinifex)
Total proposed clearance - area (ha) and number of trees	0.695 ha of *Eucalyptus* spp. Mixed Mallee over *Triodia scariosa* (Spinifex)
Level of clearance	Level 4
Overlay (Planning and Design Code)	Rural



Mitigation hierarchy	The existing parking bay is surrounded by a native Mallee community and there is limited ability to completely avoid vegetation impacts. However, throughout the progression of the design the following changes were adopted to optimise the areas of lowest condition vegetation: - The new parking pay has been located to optimise the areas of lowest vegetation condition and is located on a previously cleared road alignment with rehabilitated native vegetation. This cover is not consistent with the adjoining intact vegetation. - The option to widen the existing bay to accommodate use by heavy vehicles was initially investigated, however through the design process it was found that the creation of a separate heavy vehicle bay would be a preferred option for this location as it will provide better safety outcomes by deterring heavy vehicles from using the light vehicle bay and will also allow increased capacity for both light and heavy vehicles. - The design utilises the existing entrance and exit of the light vehicle bay as far as possible. Works will be required to extend outside of the existing footprint to widen batters at the entrance and to allow for the realignment of the exit to the required 90-degree angle and supporting batters.
SEB Offset proposal	Payment into the fund of $13,021.77

2. Purpose of clearance

2.1 Description

The proposal relates to an upgrade of the existing parking bay on LHS of Sturt Highway at Stockyard Plain, approximately 133 km north-east of the Adelaide CBD and 18 km south-west of Waikerie, SA (Figure 1). The project at the 70% design phase includes the widening and realignment of the existing parking bay (Figure 2).

2.2 Background

IBRA

The Interim Biogeographical Regionalisation of Australia (IBRA) was developed in 1993-94 and is endorsed by all levels of government as a key tool for identifying land for conservation under Australia's Strategy for the National Reserve System 2009-2030 (DoEE 2012). 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 falls within the Murray Darling Depression IBRA Bioregion and is characterised by a Mediterranean climate, with predominantly winter rainfall, hot summers and mild winters. The subregion is the Murray Mallee which has a remnancy of 20%. The Holder IBRA association has 18% remnancy and is described as gently undulating calcrete plain with low easterly trending sand dunes and shallow depressions.

NVIS Mapping

The Native Vegetation Floristic Areas - NVIS - Statewide South Australian government vegetation mapping describes the Project areas as being dominated by woodland vegetation communities with variable understorey composition. The following vegetation description applies to the general Project area.

- *Eucalyptus gracilis, Eucalyptus oleosa* ssp. *oleosa* mid open mallee woodland over +/-*Melaleuca lanceolata* shrubs over *Sclerolaena diacantha/uniflora*, *Austrostipa sp., Zygophyllum apiculatum, Maireana pentatropis* shrubs

Administrative boundaries

The Project area is in the Loxton Waikerie Council Local Government Area (LGA) and the Hundred of Murbko. It falls within the Murraylands and Riverland Landscape Management Area.

Roadside Significant Site Database

Two roadside significant site database records (RSSD) were located on the Sturt Highway overlapping the project area on the northern and southern sides of the highway and have the following descriptions:

RSSD 189 On Sturt Hwy commencing from 4.05km E of the unnamed road intersection and extending E for 9.01km on the left (north) side of the road. Roadside width 29m.

- Native Vegetation *Eucalyptus oleosa / E. gracilis / E. socialis +/- Myoporum platycarpum* Open mallee over very sparse *Acacia, Hakea, Dodonaea* over sparse *Atriplex, Maireana* Low shrubs over dense Grass *Triodia*. Disturbances include old road length of site; old borrow pits; stockpile/parking bay MM143.75; numerous access tracks; and rubbish scattered throughout.
- FROM: 143+.55 TO: 148+.94

RSSD 156 On Sturt Hwy commencing from 4.73 km NE of the unnamed road intersection and extending NE for 8.93km on the right (south) side of the road. Roadside width 14m - 40m.

- Native Vegetation 1. *Eucalyptus oleosa, E. gracilis, E. socialis +/- Myoporum platycarpum* Open mallee over sparse *Acacia, Dodonaea* Tall Shrubs over sparse *Atriplex* Low shrubs over mid dense Grass *Triodia*. 2. *Dodonaea viscosa* ssp. *angustissima* Tall open shrubland over dense *Dampiera* Low shrub over mid dense Grass *Triodia*.
- FROM: 144+.23 TO: 146+.66

2.3 General location map

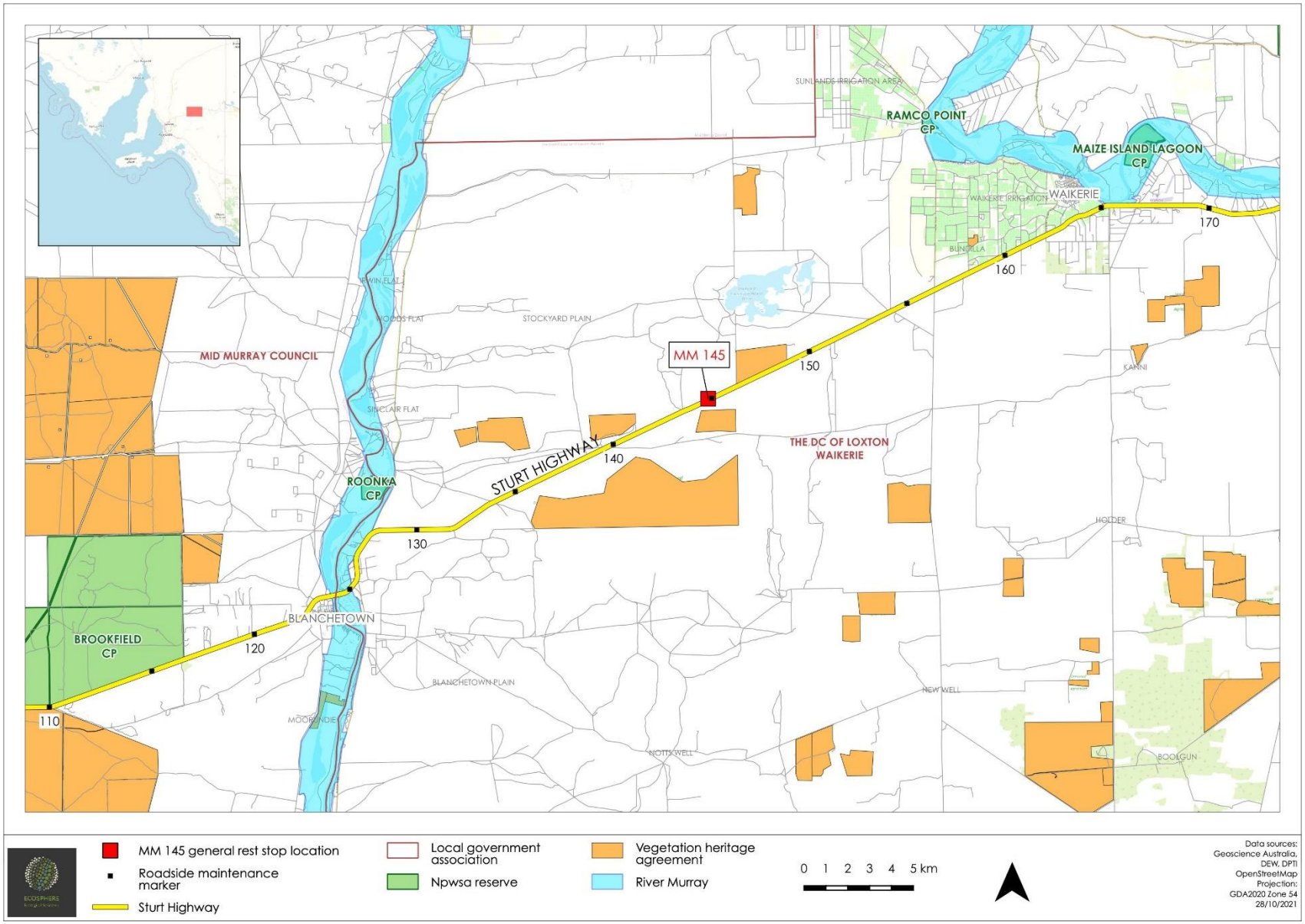
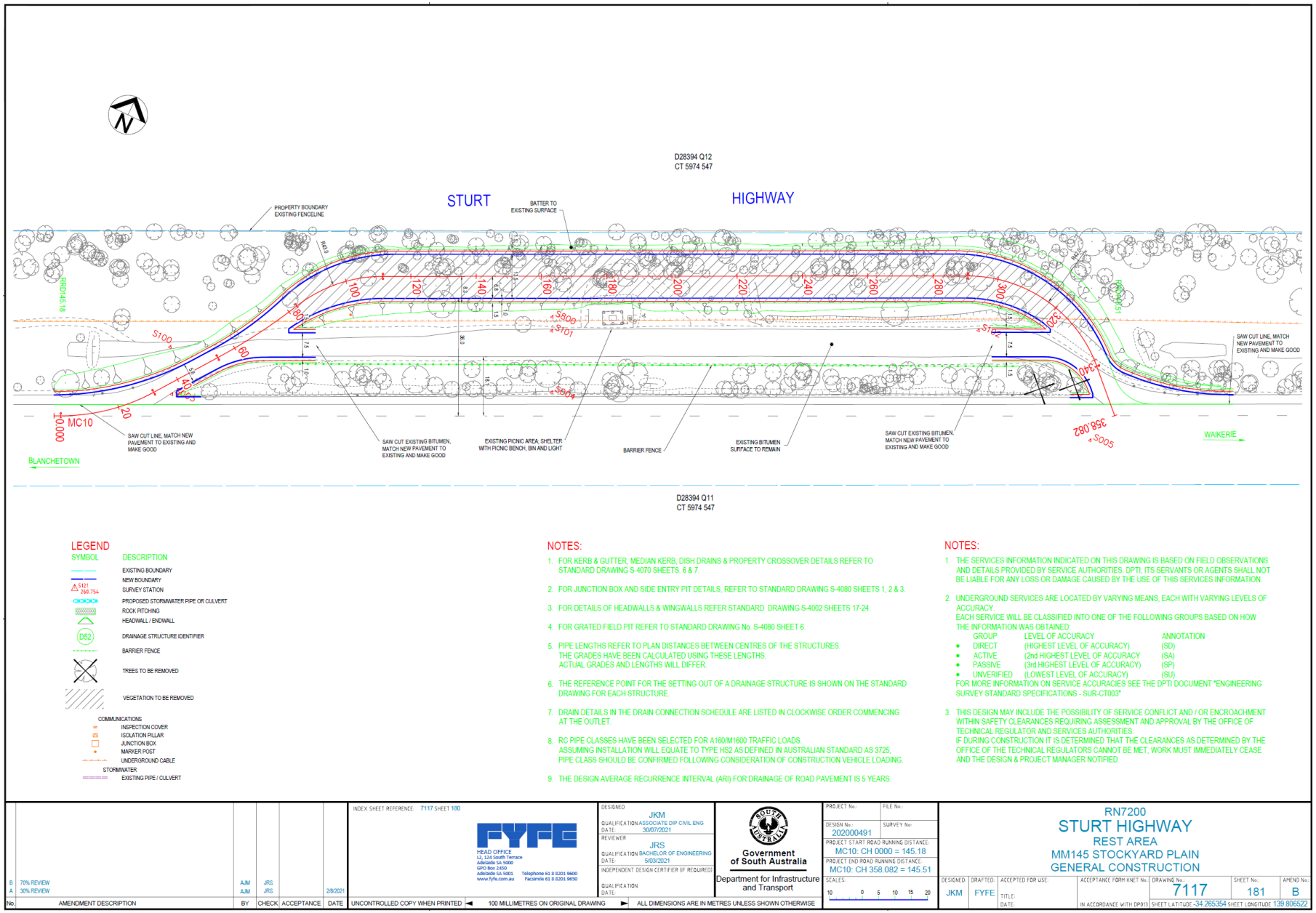


Figure 1. Location of project area on the Sturt Highway.



LEGEND

SYMBOL	DESCRIPTION
	EXISTING BOUNDARY
	NEW BOUNDARY
5121 266.754	SURVEY STATION
	PROPOSED STORMWATER PIPE OR CULVERT
	ROCK PITCHING
	HEADWALL / ENDWALL
D52	DRAINAGE STRUCTURE IDENTIFIER
	BARRIER FENCE
	TREES TO BE REMOVED
	VEGETATION TO BE REMOVED
COMMUNICATIONS	
	INSPECTION COVER
	ISOLATION PILLAR
	JUNCTION BOX
	MARKER POST
	UNDERGROUND CABLE
STORMWATER	
	EXISTING PIPE / CULVERT

NOTES:

1. FOR KERB & GUTTER, MEDIAN KERB, DISH DRAINS & PROPERTY CROSSOVER DETAILS REFER TO STANDARD DRAWING S-4070 SHEETS. 6 & 7.
2. FOR JUNCTION BOX AND SIDE ENTRY PIT DETAILS, REFER TO STANDARD DRAWING S-4080 SHEETS 1, 2 & 3.
3. FOR DETAILS OF HEADWALLS & WINGWALLS REFER STANDARD DRAWING S-4002 SHEETS 17-24.
4. FOR GRATED FIELD PIT REFER TO STANDARD DRAWING No. S-4080 SHEET 6.
5. PIPE LENGTHS REFER TO PLAN DISTANCES BETWEEN CENTRES OF THE STRUCTURES. THE GRADES HAVE BEEN CALCULATED USING THESE LENGTHS. ACTUAL GRADES AND LENGTHS WILL DIFFER.
6. THE REFERENCE POINT FOR THE SETTING OUT OF A DRAINAGE STRUCTURE IS SHOWN ON THE STANDARD DRAWING FOR EACH STRUCTURE.
7. DRAIN DETAILS IN THE DRAIN CONNECTION SCHEDULE ARE LISTED IN CLOCKWISE ORDER COMMENCING AT THE OUTLET.
8. RC PIPE CLASSES HAVE BEEN SELECTED FOR A160/M1600 TRAFFIC LOADS. ASSUMING INSTALLATION WILL EQUATE TO TYPE HS2 AS DEFINED IN AUSTRALIAN STANDARD AS 3725. PIPE CLASS SHOULD BE CONFIRMED FOLLOWING CONSIDERATION OF CONSTRUCTION VEHICLE LOADING.
9. THE DESIGN AVERAGE RECURRENCE INTERVAL (ARI) FOR DRAINAGE OF ROAD PAVEMENT IS 5 YEARS.

NOTES:

1. THE SERVICES INFORMATION INDICATED ON THIS DRAWING IS BASED ON FIELD OBSERVATIONS AND DETAILS PROVIDED BY SERVICE AUTHORITIES. DPTI, ITS SERVANTS OR AGENTS SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED BY THE USE OF THIS SERVICES INFORMATION.
2. UNDERGROUND SERVICES ARE LOCATED BY VARYING MEANS, EACH WITH VARYING LEVELS OF ACCURACY
   EACH SERVICE WILL BE CLASSIFIED INTO ONE OF THE FOLLOWING GROUPS BASED ON HOW THE INFORMATION WAS OBTAINED:

GROUP	LEVEL OF ACCURACY	ANNOTATION
• DIRECT	(HIGHEST LEVEL OF ACCURACY)	(SD)
• ACTIVE	(2nd HIGHEST LEVEL OF ACCURACY	(SA)
• PASSIVE	(3rd HIGHEST LEVEL OF ACCURACY)	(SP)
• UNVERIFIED	(LOWEST LEVEL OF ACCURACY)	(SU)

   FOR MORE INFORMATION ON SERVICE ACCURACIES SEE THE DPTI DOCUMENT "ENGINEERING SURVEY STANDARD SPECIFICATIONS - SUR-CT003"
3. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.
   IF DURING CONSTRUCTION IT IS DETERMINED THAT THE CLEARANCES AS DETERMINED BY THE OFFICE OF THE TECHNICAL REGULATORS CANNOT BE MET, WORK MUST IMMEDIATELY CEASE AND THE DESIGN & PROJECT MANAGER NOTIFIED.

No.	AMENDMENT DESCRIPTION	BY	CHECK	ACCEPTANCE	DATE
B	70% REVIEW	AJM	JRS		
A	30% REVIEW	AJM	JRS		2/8/2021

INDEX SHEET REFERENCE: 7117 SHEET 180

FYFE
HEAD OFFICE
L2, 124 South Terrace
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www.fyfe.com.au Facsimile 61 8 8201 9650

DESIGNED: JKM
QUALIFICATION: ASSOCIATE DIP CIVIL ENG
DATE: 30/07/2021
REVIEWER: JRS
QUALIFICATION: BACHELOR OF ENGINEERING
DATE: 5/03/2021
INDEPENDENT DESIGN CERTIFIER (IF REQUIRED)
QUALIFICATION
DATE:

Government of South Australia
Department for Infrastructure and Transport

PROJECT No.: FILE No.:
DESIGN No.: 202000491 SURVEY No.:
PROJECT START ROAD RUNNING DISTANCE: MC10: CH 0000 = 145.18
PROJECT END ROAD RUNNING DISTANCE: MC10: CH 358.082 = 145.51
SCALES: 10 0 5 10 15 20

RN7200
STURT HIGHWAY
REST AREA
MM145 STOCKYARD PLAIN
GENERAL CONSTRUCTION

DESIGNED	DRAFTED	ACCEPTED FOR USE	ACCEPTANCE FORM KNET No.	DRAWING No.	SHEET No.	AMEND No.
JKM	FYFE	TITLE: DATE:		7117	181	B

IN ACCORDANCE WITH DP013 SHEET LATITUDE -34.265354 SHEET LONGITUDE 139.806522

UNCONTROLLED COPY WHEN PRINTED ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE

Figure 2. 70% design plan and tree removal markup.

2.4 Details of the proposal

The proposal includes an upgrade to an existing parking bay to a proposed Class 4 heavy vehicle rest area (HVRA). As per the Austroads Guidelines for the Provision of HVRA Facilities (2019), the HVRA shall have a minimum of five heavy vehicle parking bays of 36.5 to 42 m in length. To allow for adequate parking space and vehicle movement turn paths, the total width of the rest area road shall be a minimum of 13.5m, consisting of a 3.5m wide road aisle, 3.5m parking width on either side of the road aisle, and 1.5m transition section between the bay and aisle lane on either side. To encourage usage of the rest area, the desired minimum offset is 20 m from the centre of the carriageway. Site amenities (if any) may include a shelter and bench seating with minor solar lighting. The pavement surface will be sealed and fenced on the outer sides of the bays to prevent movement of vehicles into the surrounding landscape. Stormwater runoff will be directed to swales created next to the sealed surface.

2.5 Approvals required *or* obtained

A summary of key legislation relating to flora and fauna consideration and their relevance to the proposed project is provided in Table 1 below.

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides protection for matters of national environmental significance (NES). Any action that has, will have or is likely to have a significant impact on matters of NES requires referral under the EPBC Act.

Any clearance of native vegetation in South Australia requires approval under the relevant legislation.

Native plants and animals in South Australia are protected under the *National Parks and Wildlife Act 1972* (NPW Act). Under this Act, it is an offence to take a native plant or protected animal without approval. Conservation significant flora and fauna species listed on Schedules 7, 8, or 9 of the NPW Act potentially occur within the Project area.

From July 1, 2020, the *Landscape South Australia Act 2019* (LSA Act) replaced the *Natural Resources Management Act 2004* (NRM Act), as the key framework for managing the state's land, water, pest plants and animals, and biodiversity across the state.

Table 1. Legislative summary.

Legislation	Summary	Relevance
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999	To protect 'matters of national environmental significance' (MNES): • World Heritage properties • National Heritage properties • wetlands of international importance (Ramsar wetlands) • listed threatened species and ecological communities • migratory species • Commonwealth marine areas • the Great Barrier Reef Marine Park • nuclear actions (including uranium mining).	Where an activity may trigger requirements of the EPBC Act, this legislation must be considered. Any action that has, will have, or is likely to have a significant impact on a matter of national environmental significance requires referral and approval. Significant penalties apply. To determine whether an action is likely to have a significant impact on a matter of national environmental significance, refer to the Significant Impact Guidelines (Commonwealth of Australia 2009) at: http://www.environment.gov.au/epbc/publications/pubs/nes-guidelines.pdf.
South Australia		
National Parks and Wildlife Act 1972	Allows for the protection of habitat and wildlife through the establishment of parks and reserves (both on land and in State waters); provides for the protection of native flora and fauna; identifies flora and fauna species considered to be of conservation significance (under Schedules 7, 8, and 9 of the Act); and provides for the use of approved wildlife through a system of permits	A person must not "take" a native plant, protected animal or the eggs of a protected animal without approval (s.48A). Significant penalties apply. To take a native plant means to remove the plant or part of the plant, from the place in which it is growing; or to damage the plant. To take a

Legislation	Summary	Relevance
	allowing certain actions, i.e. keeping and selling (s.58), harvesting (s.60G), farming (s.60C), hunting (s.68A), releasing (s.55) and undertaking scientific research (s.53) on/of native fauna species, and for the taking of plants (s.49).	protected animal means to remove, hunt, catch, restrain, kill or injure an animal, or attempt to do so. A person may take non-prescribed plant species from private land with the consent of the owner; however, these species may also be covered under the *Native Vegetation Act 1991*. There are several non-complying activities in parks and reserves that result in penalty (parts 4-6).
Native Vegetation Act 1991	To preserve, enhance and manage the State's native vegetation; provide a regulatory framework to control clearance of vegetation; and provide incentives and assistance to landowners to encourage them to preserve and enhance native vegetation. The Act protects all native vegetation that naturally occurs, i.e., vegetation which has not been planted. This includes all naturally occurring local native plants, from small ground covers and native grasses to mallee scrub and tall trees. It does not cover planted trees. Approval is required for the clearance of native vegetation. Clearance is defined as: • the killing or destruction of native vegetation • the removal of native vegetation • the severing of branches, limbs, stems or trunks of native vegetation • the burning, poisoning and slashing of native vegetation • any other substantial damage to native vegetation including activities such as the draining for the reclamation of wetlands or flooding of land, grazing land where stock have been excluded for more than ten years.	Persons wanting to clear native vegetation must apply for a permit from the Native Vegetation Council (NVC) (ss.7,14), unless exempt under the regulations. The NVC will consider the impacts of the proposed clearance and may grant consent, refuse consent or grant consent subject to certain conditions (s.29). A net environment benefit is generally conditional on an approval being granted. Significant penalties apply if a person clears native vegetation without the permission of the NVC (s.26). The NVC can also take civil enforcement proceedings in the District Court for an order that the native vegetation be re-instated (s.31). The Act also provides the opportunity for landholders to enter into voluntary "Heritage Agreement(s)" to ensure vegetation on private land is protected for perpetuity (s.23).
Landscape South Australia Act 2019	From July 1, 2020, the *Landscape South Australia Act 2019* (LSA Act) replaced the *Natural Resources Management Act 2004*, as the key framework for managing the state's land, water, pest plants and animals, and biodiversity across the state.	Under the South Australian LSA Act landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation. A key priority of landscape boards is to support local communities and landowners to be solely responsible for sustainably managing their region's landscapes with an emphasis on land and water management, pest animal and plant control, and biodiversity. This includes providing greater funding and partnership opportunities with local community organisations to deliver on ground works and projects.
Planning Development and Infrastructure Act 2016	The Planning and Design Code is the cornerstone of the new system and has replaced all council development plans to become the sole source of	Any activity that damages a 'regulated tree' or 'significant tree' is 'development', and as such requires a development approval. Specifically, development approval is required for removal,

Legislation	Summary	Relevance
	planning policy for assessing development applications. The *Development Act 1993* has been replaced by the new Act state-wide and is no longer operational. The *Planning Development and Infrastructure Act 2016* provides provision for the protection of 'regulated trees' and 'significant trees.	killing or destruction, branch or limb lopping, ringbarking, or topping, or any other substantial damage to a regulated or significant tree, including to its root system other than maintenance pruning. Significant fines apply if breaches are proven.

2.6 Native Vegetation Regulation

Schedule 1 Part 6 Clause 32 – Clearance of vegetation incidental to work being undertaken by, or on behalf of, the Commissioner of Highways.

2.7 Development Application information (if applicable)

Under the *Planning Development and Infrastructure Act 2016* the site is zoned Rural.

2.8 Phytophthora

Phytophthora cinnamomi (Phytophthora) is a plant pathogen whose growth, reproduction and spread are favoured by free water in the soil or ponding on the soil surface and is identified as a key threatening process to biodiversity in Australia. The pathogen potentially affects all native species.

The project site is located in a Low Potential Threat Phytophthora area and has been assessed as Low Risk. Controls according to DIT Environmental Instruction 21.3 [Phytophthora (Dieback) Control] will be needed to minimise risks associated with this pathogen.

3. Method

Desktop study

3.1.1 Protected Matters Search Tool (PMST) – EPBC Act

The online Protected Matters Search Tool was used to determine MNES under the EPBC Act relevant to the Project area (DoEE 2020). The PMST is maintained by the Commonwealth Department of Agriculture Water and the Environment (DAWE) and was used to identify flora and fauna species or ecological communities of national environmental significance that may occur or likely to have suitable habitat within the Project areas. Nationally threatened species potentially occurring within the sites were identified from this source.

3.1.2 Biological Database of South Australia (BDBSA) – NPW Act

A Biological Database of South Australian (BDBSA) Supertable search was obtained from the South Australian Department for Environment and Water (DEW) on 15th October to identify flora and fauna species previously recorded within a 5 km buffer around the Project area (DEW 2020). The BDBSA is comprised of an integrated collection of corporate databases which meet DEWNR standards for data quality, integrity and maintenance. In addition to DEWNR biological data the BDBSA also includes data from partner organisations (Birds Australia, Birds SA, Australasian Wader Study Group, SA Museum, and other State Government Agencies). This data is included under agreement with the partner organisation for ease of distribution, but they remain owners of the data and should be contacted directly for further information.

3.1.3 Assessment of the likelihood of occurrence

The likelihood of each threatened flora and fauna species occurring within the Project areas was assessed. A likelihood of occurrence rating (Highly Likely / Known, Likely, Possible and Unlikely) was assigned to each threatened species identified in the desktop PMST and BDBSA search (Table 2).

Table 2. Likelihood criteria summary.

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is largely intact 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 species habitat which is largely intact.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area does not provide species habitat which is largely intact. Recorded within 20 -40 years, survey effort is considered adequate, habitat is present and intact, and species of similar habitat needs have been recorded in the area.
Unlikely	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 within the previous 40 years despite suitable habitat being known to occur in the area. No records despite adequate survey effort.

3.2 Field Survey

The field survey was conducted on October 10th, 2021, by NVC accredited ecologists Andrew Sinel and Rob Kelman. The field survey included a vegetation survey and fauna assessment. All sites were assessed using the Bushland Assessment Methodology (BAM) (NVC 2020).

3.2.1 Vegetation survey

The area was assessed using the Bushland Assessment Method (BAM) (NVC 2019). The NVC BAM was designed for assessing vegetation that is found within the agricultural region of South Australia. The BAM uses biodiversity 'surrogates' or 'indicators' to measure biodiversity value against benchmark communities. Each area to be assessed is termed an application area ('Block'), within which different vegetation associations ('Sites') are identified.

For the NVC BAM, three components of the biodiversity value of the site are measured and scored.

- Vegetation condition.
- Conservation value.
- Landscape context.

These three component scores are combined to provide a 'Unit Biodiversity Score' (UBS) for a hectare and then multiplied by the size (hectares) of the site to provide a total biodiversity score.

3.2.2 Fauna survey

The resultant level of risk under NVC guidelines was 3 (see Section 4.6). As the project site was close to an extremely high disturbance highway carrying a considerable number of vehicles a reasonable assumption as to the species which are likely to use the project area can be made. In this instance, existing records and knowledge of species habitat preferences have been used to determine the species likely to use the landscape present as either permanent or transient habitat. Species likelihoods are based on Table 2.

4. Assessment Outcomes

4.1 Vegetation Assessment

Two vegetation associations were recorded within the project footprint and are summarised below in Table 4.

Table 3. Vegetation associations summary.

Assoc #	Description	Area (ha)
1	*Eucalyptus socialis* (Red Mallee) over *Dodonaea viscosa* ssp. *angustissimus* (Sticky Hop Bush) and *Triodia scariosa* (Spinifex)	**0.268**
2	*Eucalyptus socialis* (Red Mallee) Mixed Mallee over *Triodia scariosa* (Spinifex)	**0.427**
	Total	**0.695**

Table 4. Vegetation association 1 summary.

Vegetation Association 1	Vegetation Association 1; *Dodonaea viscosa ssp. angustissimus* (Sticky Hop Bush) mixed shrubland over *Triodia scariosa* (Spinifex).				
					
General description	Semi degraded vegetation on previously rehabilitated road alignment (>40 years) in moderate condition. Moderately disturbed due to existing rest area.				
Threatened species or community	Not a threatened community and well represented within the region.				
Landscape context score	1.11	Vegetation Condition Score	43.94	Conservation significance score	1.10
Unit biodiversity Score	54.61	Area (ha)	0.268	Total biodiversity Score	14.64

Table 5

Vegetation Association 2	*Eucalyptus oleosa* (Red Mallee) Mixed Mallee over *Triodia scariosa* (Spinifex).

General description	Very high value Mallee community in good condition and adjacent to intact block of good quality vegetation.				
Threatened species or community	Not a threatened community and well represented within the region.				
Landscape context score	1.11	Vegetation Condition Score	63.00	Conservation significance score	1.10
Unit biodiversity Score	76.92	Area (ha)	0.427	Total biodiversity Score	32.84

Table 6. Summary pf map reference photo points as shown in Figure 3.

Photo/Map ref	Easting	Northing	Type	Description	Impact	Area (ha)
1	390134	6207792	Representative Photo	Southwestern entrance to existing rest area.	Creation of swale likely to remove inferior quality shrubland.	
2	390154	6207802	Representative Photo	Existing entrance with poor quality but intact mallee adjacent road shoulder.	Minor widening unlikely to have significant impact.	
3	390160	6207823	Representative Photo	Association 1: *Eucalyptus socialis* (Red Mallee) mixed open Mallee over *Dodonaea viscosa* (Sticky Hop Bush) and *Grammosolen dixonii* (Grammosolen) on previously rehabilitated road.	Treated as native vegetation as the large majority of the vegetation has naturally regenerated despite being obvious that many plants were planted as rehabilitation works.	
4	390185	6207850	Representative Photo	Association 2: *Eucalyptus* spp. Mixed Mallee over *Triodia scariosa* (Spinifex).	Significant removal of intact very high-quality native vegetation.	
5	390201	6207848	Representative Photo	Representative photo showing natural regeneration of native vegetation with plantings of *Grammosolen dixonii*.	Removal of moderate to superior quality /Mallee vegetation.	
6	390259	6207884	Representative Photo	Small intact patch adjacent existing shelter showing extent of understorey cover in better sections.	Moderate impact removal of intact vegetation.	
7	390260	6207898	Representative Photo	Area disturbed by vehicles and dumping of garden waste.	Minimal impact with removal of scattered shrubs only.	
8	390360	6207942	Representative Photo	Fringe area between previously undisturbed and disturbed areas.	Intact vegetation of high quality.	
9	390364	6207930	Representative Photo	Vegetation at edge of existing parking bay where runoff has allowed for regeneration of Dodonaea viscosa ssp.	Minimal impact to fringing vegetation.	
10	390384	6207919	Representative Photo	Eastern exit excellent quality Mallee.	May require pruning to allow for ongoing clear line of sight.	

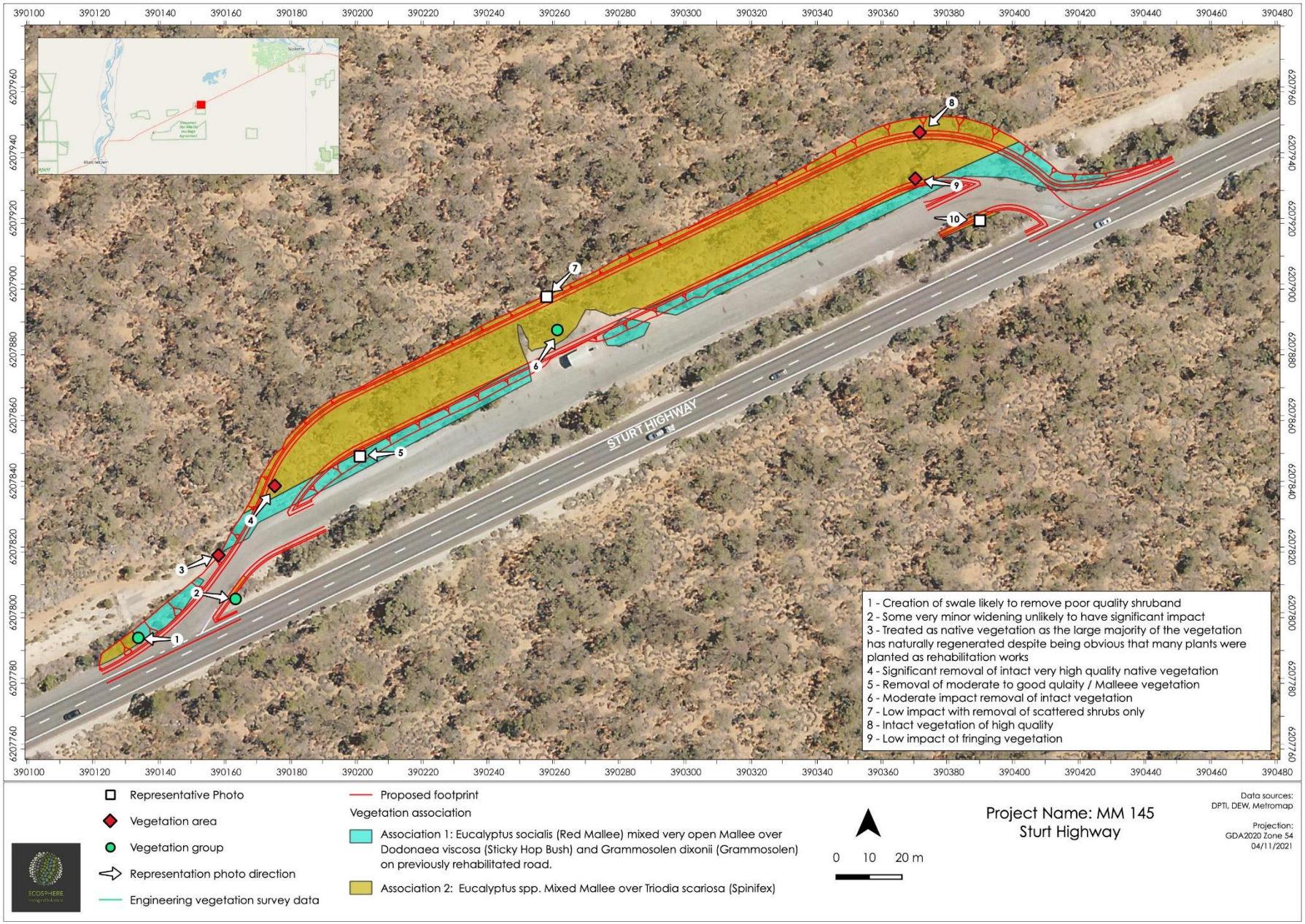

Figure 3. Vegetation association mapping with representative photos as described in Table 6 and provided in photo log.

Photo log


DIRECTION
SW (T)
54s 390157
6207807
ACCURACY 6 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

1


DIRECTION
NE (T)
54s 390157
6207807
ACCURACY 4 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

2


DIRECTION
N (T)
54s 390158
6207812
ACCURACY 6 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

3


DIRECTION
NE (T)
54s 390160
6207847
ACCURACY 48 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

4


DIRECTION
SW (T)
54s 390187
6207858
ACCURACY 8 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

5


DIRECTION
NE (T)
54s 390251
6207885
ACCURACY 24 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

6


DIRECTION
SW (T)
54s 390268
6207912
ACCURACY 8 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

7


DIRECTION
SW (T)
54s 390365
6207931
ACCURACY 16 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

8


DIRECTION
W (T)
54s 390377
6207931
ACCURACY 6 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

9


DIRECTION
E (T)
54s 390378
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ACCURACY 8 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

10


DIRECTION
E (T)
54s 436007
6215641
ACCURACY 6 m
DATUM GDA2020
MM194 Kingston on
Murray
8/10/21

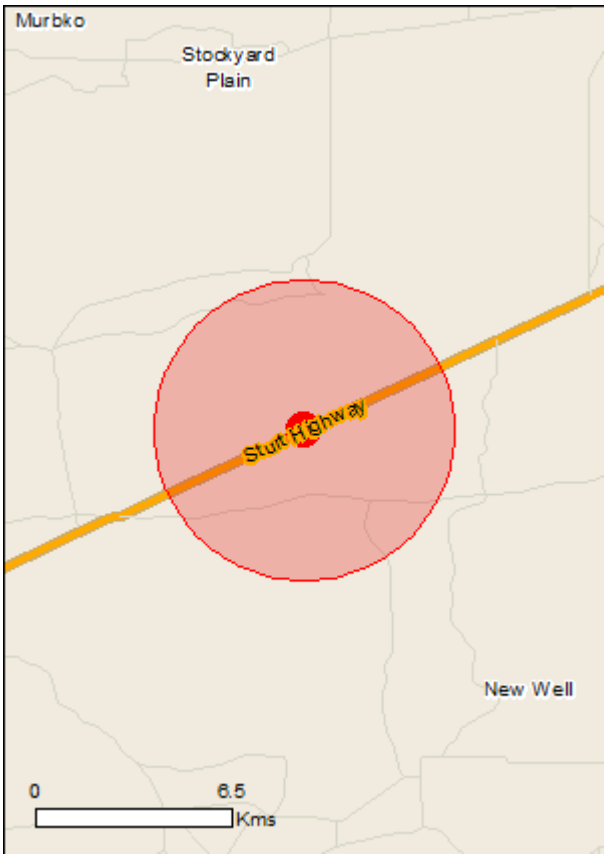
11

4.2 Threatened Species assessment

Matters of National Significance

A total of 16 listed threatened species and 12 migratory species were identified by the EPBC Act PMST report as potentially occurring or having suitable habitat potentially occurring within 5 km of the project area (Table 7) (DAWE 2020a). The relevant MNES protected under the EPBC Act are discussed in detail below.

Table 7. EPBC Act PMST report results summary.

Search area (5 km buffer)	Matters of national environmental significance under the EPBC Act	Identified within the search area
	World heritage properties	None
	National heritage properties	None
	Wetlands of international importance	1
	Great Barrier Reef marine park	None
	Commonwealth marine area	None
	Threatened ecological communities	3
	Listed Threatened species	16
	Migratory species	12
	Commonwealth land	None
	Commonwealth heritage places	None
	Listed marine species	18
	Whales and other cetaceans	None
	Critical habitats	None
	Commonwealth reserves terrestrial	None
	Commonwealth reserves marine	None
	State and Territory reserves	2
	Regional forest agreements	None
	Invasive species	27
	Nationally important wetlands	1
	Key ecological features (marine)	None

Wetlands of International Importance (RAMSAR)

The PMST identified The Coorong, and Lakes Alexandrina and Albert wetland occurring within 5km of the Project Area.

The Coorong and Lakes Alexandrina and Albert Ramsar site is located at the downstream end of the Murray River, in south-east South Australia. It is also a Living Murray Icon site. The Murray River flows into Lake Alexandrina and out to the Southern Ocean through the Murray Mouth Estuary. Lake Albert is a terminal lake connected to Lake Alexandrina by a narrow channel. Its primary source of water is from Lake Alexandrina, supplemented by groundwater discharge and surface water runoff. Any works associated with this project are not directly interacting with either of these wetlands.

Threatened Ecological Communities.

Two Threatened Ecological Communities (TEC) were found in the PMST as potentially occurring within 5 km of the Project area. A summary of these TEC and comment about their likelihood of occurrence in the Project area are provided in Table 8.

Table 8. The threatened ecological communities identified in the PMST and their likelihood of presence within the Project area.

Threatened Ecological Community	EPBC Status	Likelihood of occurrence in the Project area
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Unlikely. A feature common to many areas where the woodlands occur is the presence of clayey and/or alkaline sub-soils. In many of the South Australian areas, massive calcrete underlies the sub-soil at depths of less than one metre. The nominated woodland's component communities are generally characterised as woodland or open woodland with a well-developed ground stratum that is usually grassy, but also includes many subshrubs and herbs; some component communities have understoreys that are predominantly shrubby or herbaceous. Most component communities lack a well-developed tall shrub layer. Buloke is common to all component communities, but slender Cypress-pine and grey box may be structurally dominant in some.
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	Critically Endangered	It is a medium to tall open mallee eucalypt woodland with a canopy typically dominated by 'mallee box' Eucalyptus species and an understorey in which tussock grasses may be prominent in relatively wet years, low chenopod shrubs occur in variable densities, and taller shrubs are typically sparse. The ecological community is associated with relatively medium-heavy textured soils on near-level to gently sloping plains
River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea	Approval Disallowed	Listed as Approval Disallowed (Date effective 12-Dec-2013). There is no longer an approved Conservation Advice for this ecological community.

Nationally threatened flora

Three flora species listed as threatened under the EPBC Act were identified in the PMST report as potentially occurring or having suitable habitat within the Project area (**Error! Reference source not found.** and **Error! Reference source not found.**). No species of national conservation significance had historical records within 5 km of the Project area. None of these species were recorded during the field survey or considered to occur within the Project area due to a lack of preferred habitat.

State threatened flora.

One flora species of state conservation significance had a historical record from the BDBSA (Table 9 and Figure 4). These were:

- *Eremophila gibbifolia (Coccid emu bush) R SA*

Following field survey of the project footprint, it was considered that this species is unlikely/do not occur within the Project area. All existing records occur on the Murray River floodplain and area unlikely to be present within disturbed habitats.

Table 9. Threatened flora species listed under the EPBC Act and NPW Act identified in the PMST (Source 5) and Naturemaps (Source 3) database searches within 5 km of the Project area.

Scientific name	Common name	Conservation status		Source	BDBSA last record (year)	Distribution and preferred habitat	Likelihood of occurrence within Project area
		Aus.	SA				
Dodonaea subglandulifera	Peep Hill Hop Bush	EN	R	5	None	Populations of the Peep Hill Hop-bush occur primarily on low hills on loamy soils associated with rocky (limestone, slate, shale) These low hills occur to the east of the range country, just before the vegetation changes to mallee flats. The species has also been recorded from plains country in sandy soils over limestone.	Unlikely
Eremophila gibbifolia	Coccid Emu-bush		R	3	21/10/2002	Usually found in mallee scrub on sandy loam soils.	Possible
Lepidium monoplocoides	Winged Pepper-cress	EN	E	5	None	Winged Pepper-cress occurs predominantly in mallee scrub in semi-arid areas. Sites are seasonally moist to water-logged with heavy, fertile soils and a mean annual rainfall of around 300 to 500 mm. The predominant vegetation is usually an open-woodland dominated by *Allocasuarina luehmannii* and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box).	Unlikely
Swainsona pyrophila	Yellow Swainson Pea	VU	V	5	None	The Yellow Swainson-pea Swainsona pyrophila is a short-lived, fire-adapted species that occurs in mallee vegetation communities in inland south-eastern Australia, where it is widely distributed from the northern Eyre Peninsula, South Australia, east to north-western Victoria and western New South Wales.	Unlikely

Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others

Conservation status: Aus.: Australia (Environment Protection and Biodiversity Conservation Act 1999). SA: South Australia (National Parks and Wildlife Act 1972). Conservation codes: EN/E: Endangered. VU/V: Vulnerable, R: Rare.

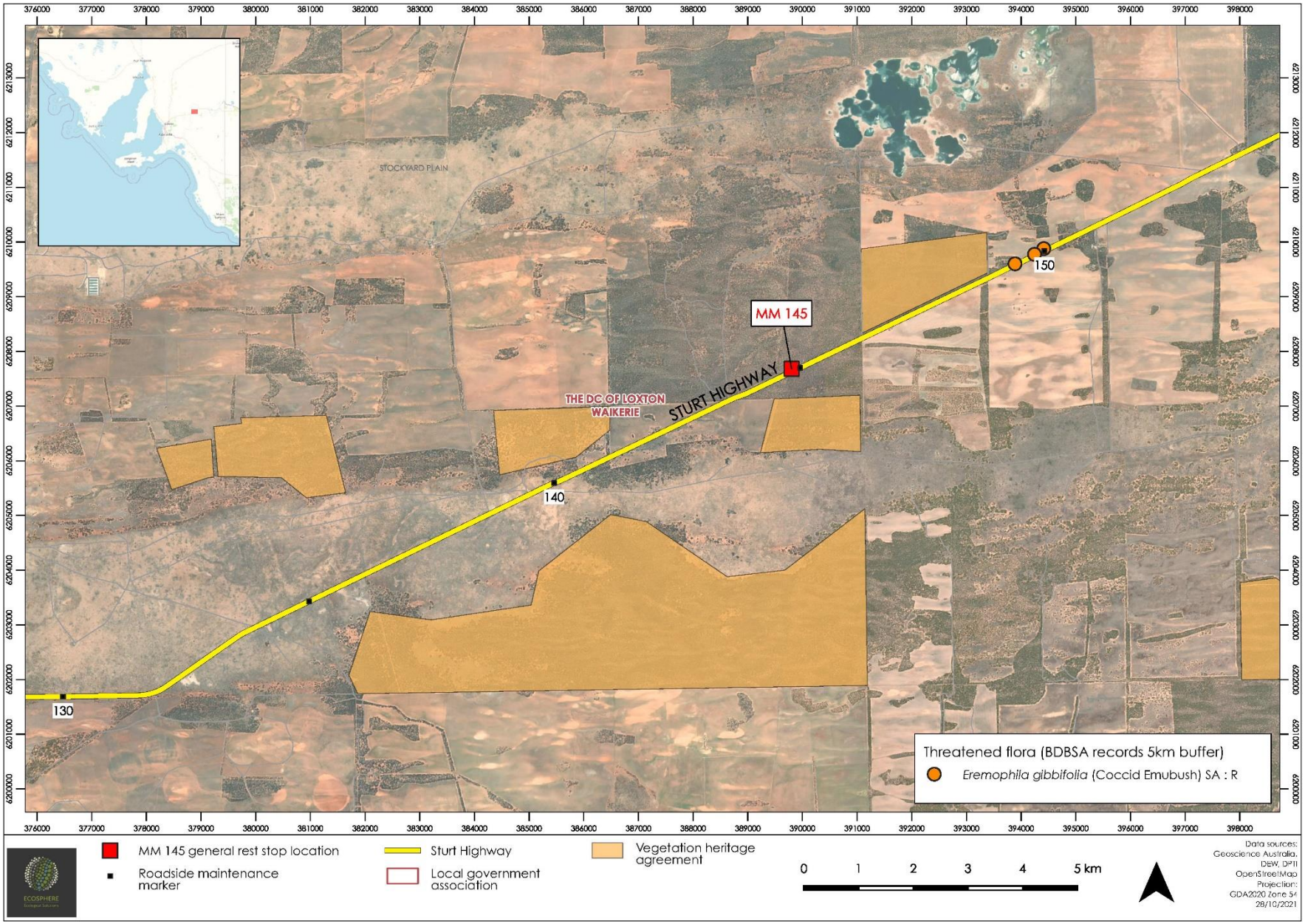


Figure 4. Locations of conservation significant flora within 5km of project site.

Nationally threatened fauna

Thirteen fauna species listed as threatened under the EPBC Act were identified in the PMST report as potentially occurring or having suitable habitat within the Project area (**Error! Reference source not found.** and **Error! Reference source not found.**). This included 10 birds, two fish, and one mammal species. Three species of national conservation significance had historical records within 5 km of the Project area, these were:

- *Pachycephala rufogularis* (Red-lored Whistler), AUS: VU, SA: R.
- *Leipoa ocellata* (Malleefowl), AUS: VU, SA: V
- *Calidris ferruginea* (Curlew Sandpiper), AUS: CR, SA: E.

No species of national conservation significance were recorded during the field survey. Red-lored Whistler was considered as possibly occurring within the Project area however this is likely to be as a pass through only and the area does not provide critical habitat given the level of historical disturbance.

Migratory species

Twelve migratory species listed under the EPBC Act were highlighted as potentially present within 5km of the project area. None were considered likely to occur within the parking bay upgrade area.

State threatened fauna

Eighteen fauna species of state conservation significance had historical records from the Naturemaps BDBSA search within 5km (Table 10). No species were considered likely to utilise the project area as critical habitat with most associated with the Murray River and immediate surrounds (Figure 5). Species with records within 5km and considered as likely or possibly occurring within the project were:

- *Cinclosoma castanotum* (Chestnut Quailthrush) SA: R
- *Melanodryas cucullata cucullata* (Hooded Robin) YP, MN, AP, MLR, MM, SE: R
- *Neophema chrysostoma* (Blue-winged Parrot)SA: V
- *Pachycephala inornata* (Gilbert's Whistler)SA: R
- *Myiagra inquieta* (Restless Flycatcher) SA: R
- *Corcorax melanorhamphos (*White-winged Chough) SA: R

Other species occurring within 5km of the project area were:

- *Anhinga novaehollandiae novaehollandiae (*Australasian Darter), SA: R
- *Arenaria interpres interpres* (Ruddy Turnstone) SA: R
- *Biziura lobata menziesii* (Musk Duck) SA: R
- *Burhinus grallarius* (Bush Stonecurlew) SA: R
- *Cladorhynchus leucocephalus* (Banded Stilt) SA: V
- *Falco subniger* (Black Falcon) SA: R
- *Hieraaetus morphnoides* (Little Eagle) SA: V
- *Oxyura australis* (Blue-billed Duck)SA: R
- *Plectorhyncha lanceolata* (Striped Honeyeater)SA: R
- *Spatula rhynchotis* (Australasian Shoveler) SA: R
- *Stictonetta naevosa* (Freckled Duck) SA: V
- *Tringa Glareola* (Wood Sandpiper)SA: R

Table 10. Threatened fauna species and migratory listed under the EPBC Act and NPW Act identified in the PMST (Source 5) and BDBSA (Source 3) database searches within 5 km of the Project area.

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Actitis hypoleucos	Common Sandpiper	Mi (W)	R	5		The Common Sandpiper breeds in parts of Europe and Asia, and occasionally Africa. Found along all coastlines of Australia and in many areas inland, the species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats.	Unlikely
Anhinga novaehollandiae novaehollandiae	Australasian Darter		R	3	26/05/2001	Found in wetlands and sheltered coastal waters, in the Tropics and Subtropics. It prefers smooth, open waters, for feeding, with tree trunks, branches, stumps or posts fringing the water, for resting and drying its wings. Most often seen inland, around permanent and temporary water bodies at least half a metre deep, but may be seen in calm seas near shore, fishing.	Unlikely
Apus pacificus	Fork-tailed Swift	Mi (Ma)		5		The Fork-tailed Swift is a non-breeding visitor to all states and territories of Australia. In South Australia, the Fork-tailed Swift is widespread from the Victorian border west to the Spencer Gulf. In Australia, the Fork-tailed Swift is almost exclusively aerial.	Unlikely
Arenaria interpres interpres	Ruddy Turnstone		R	3	27/09/2003	The Ruddy Turnstone is found singly or in small groups along the coastline and only occasionally inland. They are found on exposed rocks or reefs, often with shallow pools, and on beaches.	Unlikely
Biziura lobata menziesi	Musk Duck		R	3	21/11/2015	Musk Ducks range from north-west Western Australia, through the south and east to southern Queensland, and can be found several hundred kilometers inland in some areas. They tend to be found in deep freshwater lagoons, with dense reed beds.	Unlikely

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Burhinus grallarius	Bush Stonecurlew			3	26/08/2007	The bush stone-curlew inhabits open forests and grassy woodlands. It is found in all states, except for Tasmania, and numbers have drastically declined in south-eastern parts of Australia.	Unlikely
Calidris acuminata	Sharp-tailed Sandpiper	Mi (W)		5		The Sharp-tailed Sandpiper spends the non-breeding season in Australia. In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely
Calidris ferruginea	Curlew Sandpiper	CE Mi (W)	E	5, 3	27/09/2003	In Australia, Curlew SAandpipers occur around the coasts and are also widespread inland. In Australia, Curlew Sandpipers occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	Unlikely
Calidris melanotos	Pectoral Sandpiper	Mi (W)	R	5		In South Australia, the Pectoral Sandpiper is found mostly in the south-east, from north to the Murray River and west to Yorke Peninsula. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands	Unlikely
Cinclosoma castanotum	Chestnut Quailthrush		R	3	01/04/2017	Usually seen walking around in areas of open mallee woodland and shrubland.	Possible
Cladorhynchus leucocephalus	Banded Stilt		V		27/09/2003	Banded Stilts are found in saline and hypersaline waters of the inland and coast. Typically large, open and shallow.	Unlikely
Corcorax melanorhamphos	White-winged Chough		R	3	30/10/2005	White-winged Choughs are found in open forests and woodlands. They tend to prefer the wetter areas, with lots of leaf-litter, for feeding, and available mud for nest building.	Possible

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Craterocephalus fluviatilis	Murray Hardyhead		E	5		The Murray Hardyhead is endemic to the lowland reaches of the Murray and Murrumbidgee rivers and their tributaries, floodplain billabongs and lakes. The species formerly was abundant from Lake Alexandrina, near the mouth of the Murray River, to as far upstream as Yarrawonga on the Murray and Narrandera on the Murrumbidgee River	Unlikely
Falco hypoleucos	Grey Falcon	VU	R	5		The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Marchant and Higgins 1993). The species is found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread.	Unlikely
Falco subniger	Black Falcon		R	3	27/11/1999	Recorded along tree-lined watercourses and in isolated woodlands, in arid and semi-arid areas.	Unlikely
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Mi (W)	R	5		Latham's Snipe breed in Japan and far eastern Russia during the northern hemisphere summer. Latham's Snipe is a non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia. The species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia.	Unlikely
Galaxias rostratus	Flathead Galaxias, Beaked Minnow, Flat-headed	CE		5		*Galaxias rostratus* (flathead galaxias) is a small freshwater fish that belongs to the family Galaxiidae, found in cool latitudes	Unlikely
Grantiella picta	Painted Honeyeater	VU	V	5		The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips.	Unlikely
Hieraaetus morphnoides	Little Eagle		V	3	27/10/2001	The species prefers woodland and forested lands and open country, extending into the arid zone.	Unlikely

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Leipoa ocellata	Malleefowl	VU	V	5, 3	28/04/2015	The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding.	Unlikely
Manorina melanotis	Black-eared Miner		E	5		The Black-eared Miner is endemic to the Murray Mallee region of Victoria, South Australia and New South Wales where it currently occurs in the Riverland Biosphere Reserve, South Australia and the Murray-Sunset National Park, Victoria.	Unlikely
Melanodryas cucullata cucullata	Hooded Robin		R	3	29/04/2015	Hooded Robins are found in lightly timbered woodland, dominated by acacia and/or eucalypts.	Likely
Motacilla flava	Yellow Wagtail	Mi (T)		5		The Yellow Wagtail is a regular wet season visitor to northern Australia. The species is considered a vagrant to Victoria, South Australia and southern Western Australia.	Unlikely
Myiagra cyanoleuca	Satin Flycatcher	Mi (Ma)		5		The Satin Flycatcher is found in tall forests, preferring wetter habitats such as heavily forested gullies	Unlikely
Myiagra inquieta	Restless Flycatcher		R	3	19/10/2013	The Restless Flycatcher is found in open forests and woodlands and is frequently seen in farmland.	Likely
Neophema chrysostoma	Blue-winged Parrot		V	3	2/10/2009	The Blue-winged Parrot inhabits a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones. Throughout their range they favour grasslands and grassy woodlands.	Possible
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	CE, Mi (W)	V	5		Primarily coastal distribution rarely recorded inland. During the non-breeding season in Australia, the eastern curlew is most associated with sheltered coasts, especially estuaries, bays, harbours, inlets, and coastal lagoons.	Unlikely

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Nyctophilus corbeni	Corben's Long-eared Bat	VU		5		This microbat species has a scattered distribution mostly within the Murray-Darling Basin, but with some records outside of this area. It is more common in box, ironbark and cypress pine woodland on the western slopes and plains. It roosts in tree hollows, crevices and under loose bark. It is a slow flying agile bat that hunts for non-flying prey, especially caterpillars and beetles	Unlikely
Oxyura australis	Blue-billed Duck		R	3	2/10/2009	Almost wholly aquatic and is seldom seen on land.	Unlikely
Pachycephala inornata	Gilberts Whistler		R	3	25/11/2011	The Gilberts Whistler is found in semi-arid Mallee or Box–ironbark Eucalypt, Acacia, Cypress-pine or Belah shrublands and woodlands (or mixed assemblages of these), usually with a dense, continuous or patchy understorey of shrubs such as Acacias, Eremophila, Dodonaea or Senna.	Possible
Pachycephala rufogularis	Red-lored Whistler	VU	V	5, 3	27/05/1995	The Red-lored Whistler is found in dry forest and bushland in parts of semi-arid southern Australia	Possible
Pandion haliaetus	Osprey	Mi (W)	E	5		The Eastern Osprey occurs in Indonesia, Philippines, Palau Islands, New Guinea, Solomon Islands, New Caledonia and Australia. The breeding range of the Eastern Osprey extends around the northern coast of Australia (including many offshore islands) from Albany in Western Australia to Lake Macquarie in NSW; with a second isolated breeding population on the coast of South Australia, extending from Head of Bight east to Cape Spencer and Kangaroo Island.	Unlikely

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Pedionomus torquatus	Plains-wanderer	CE	E	5		Plains-wanderers are distributed across north-central Victoria, southern New South Wales (NSW) around the Riverina region, eastern South Australia, and west-central Queensland. Plains-wanderers inhabit sparse native grasslands and are often absent from areas where grass becomes too dense or too sparse. They nest amongst native grasses and herbs, or sometimes amongst crops, feeding on a mixture of seeds, invertebrates and leaves.	Unlikely
Pezoporus occidentalis	Night Parrot	EN	E	5		The current distribution of the night parrot is not known. Historic records and observations are scanty and anecdotal with few substantiated records since 1935. Sometime prior to 2013, a population was located in southwestern Queensland. Most habitat records are of *Triodia* (Spinifex) grasslands and/or chenopod shrublands.	Unlikely
Plectorhyncha lanceolata	Striped Honeyeater		R		24/05/2001	Found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens.	Unlikely
Polytelis anthopeplus monarchoides	Regent Parrot		V	5		The Regent Parrot (eastern) primarily inhabits riparian or littoral River Red Gum (*Eucalyptus camaldulensis*) forests or woodlands and adjacent Black Box (E. *largiflorens*) woodlands. Nearby open mallee woodland or shrubland, usually with a ground cover of spinifex (*Triodia*) or other grasses, supporting various eucalypts.	Unlikely
Rostratula australis	Australian Painted Snipe	EN	V	5		The Australian Painted Snipe occurs in shallow freshwater (occasionally brackish) wetlands, both ephemeral and permanent, such as lakes, swamps, claypans, inundated or waterlogged grassland/saltmarsh, dams, rice crops, sewage farms and bore drain.	Unlikely

Scientific name	Common name	Conservation status		Source	Most recent record	Distribution and habitat preferences	Likelihood of occurrence within Project area
		Aus.	SA				
Spatula rhynchotis	Australasian Shoveler		R	3	13/08/2009	The Australasian Shoveler is found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	Unlikely
Stictonetta naevosa	Freckled Duck		V	3	26/05/2007	The Freckled Duck is found in permanent freshwater swamps and creeks with heavy growth of bullrush, lignum or Tea-tree.	Unlikely
Tringa glareola	Wood Sandpiper		R	3	28/03/1998	The Wood Sandpiper is found in inland shallow freshwater wetlands. Pools with emergent reeds and grass, surrounded by tall plants or dead trees and fallen timber.	Unlikely
Tringa nebularia	Common Greenshank	Mi (W)		5		The Common Greenshank is found in Europe, Africa, Asia, Melanesia and Australasia. The Common Greenshank does not breed in Australia; however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass.	Unlikely

Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others

Conservation status: Aus.: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation codes: EN/E: Endangered. VU/V: Vulnerable, R: Rare.

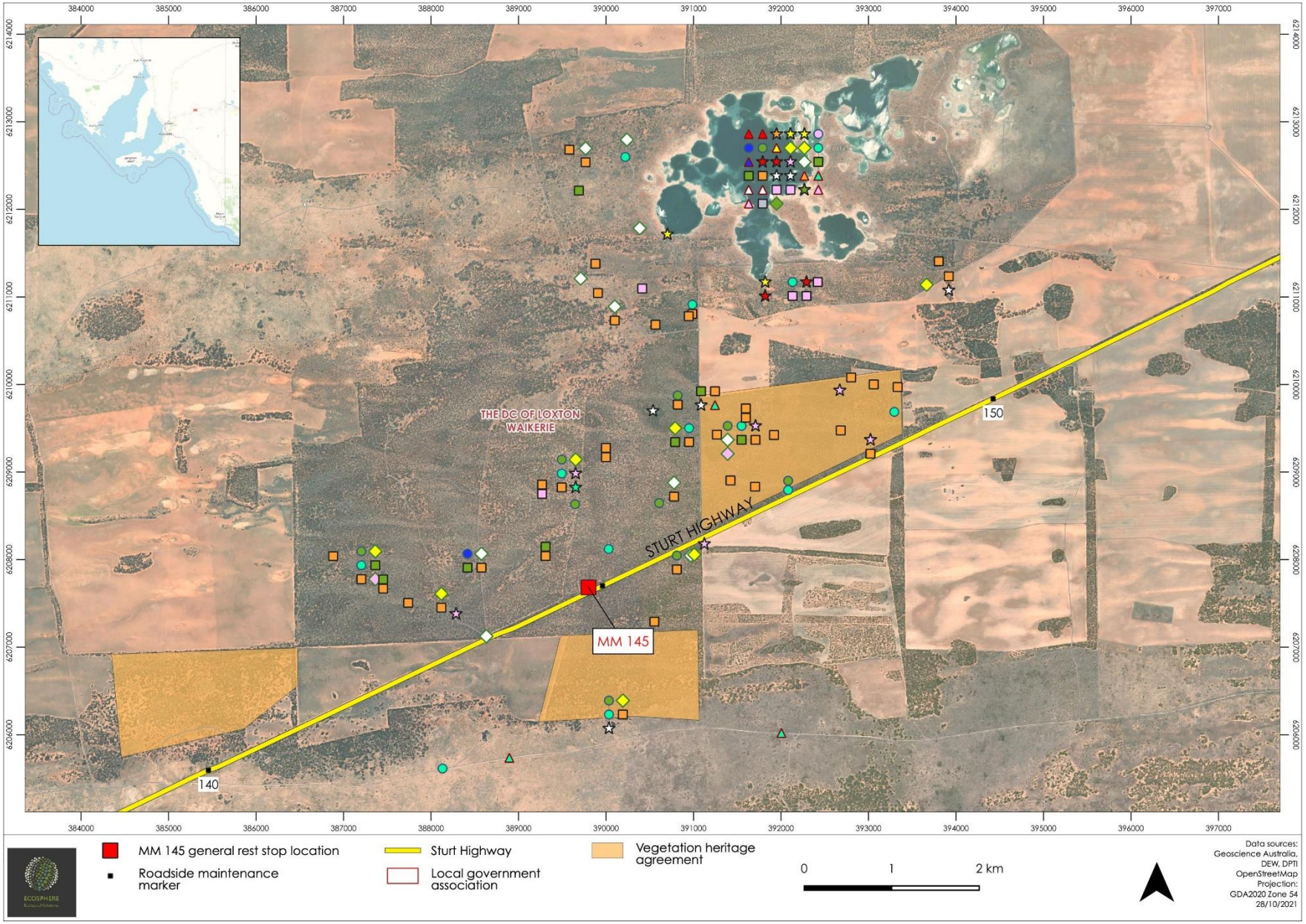


Figure 5. Naturemaps BDBSA conservation significant fauna observations within 5 km of the Project area.

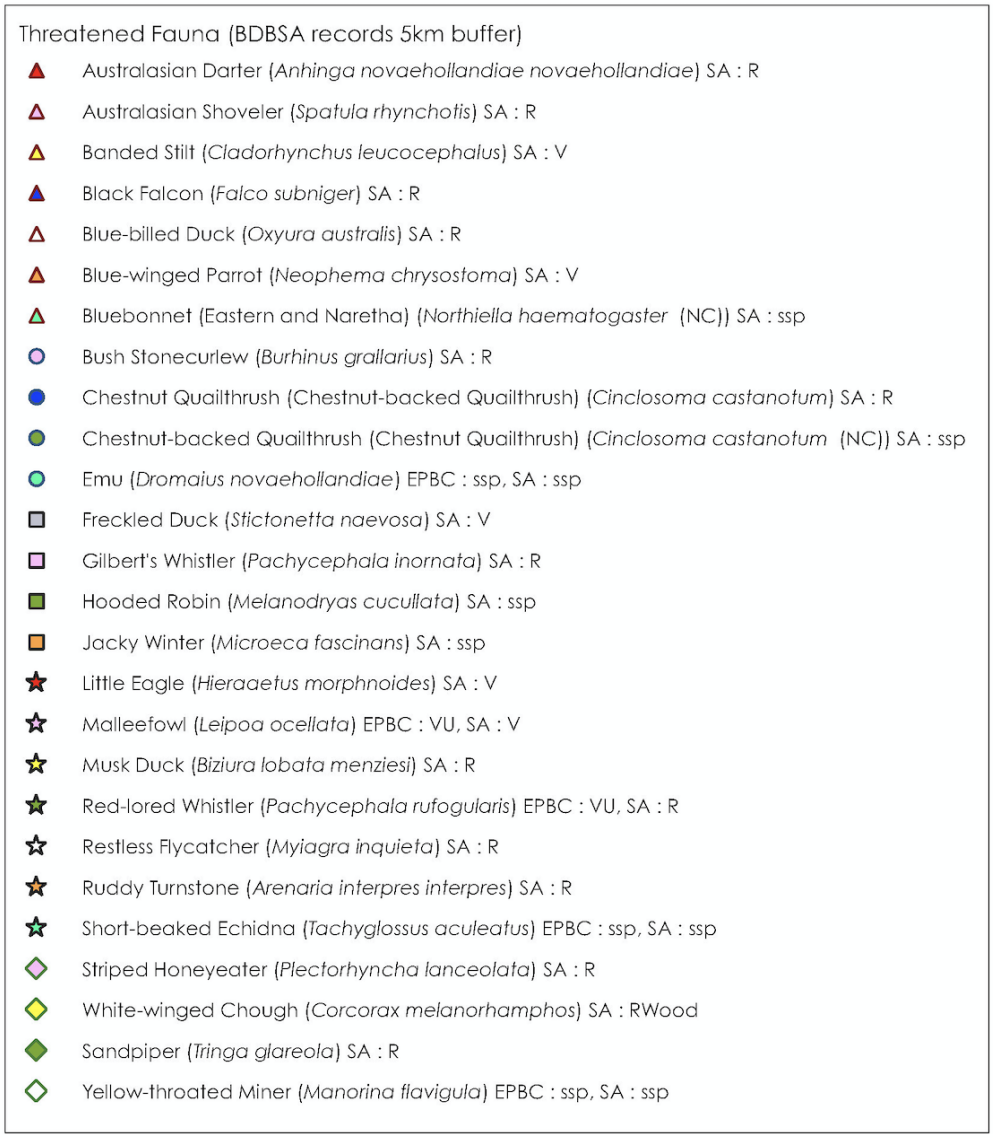


Figure 6. Map legend: Naturemaps BDBSA conservation significant fauna observations within 5 km of the Project area.

4.3 Cumulative impact

Cumulative impacts associated with the project extent include increased edge effects to surrounding vegetation, loss of nesting hollow availability which may lead to reduced avian diversity and increased potential for new weeds.

4.4 Address 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 minimise, 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

The site was located to optimise the areas of lowest vegetation condition. The new heavy vehicle bay is located on a previously cleared road alignment where rehabilitated native vegetation has since formed an intact cover. However, the cover is not consistent with the adjoining intact vegetation in having a pioneer structure whereby spinifex provides the dominant groundcover, and the canopy cover is lower than a natural density. Other alternatives involve areas of intact vegetation with a more homogenous vegetation structure mix of hummock grasses, low shrubs and sedges and an open midstory shrub layer.

The design utilises the existing entrance and exit of the LVRA as far as possible. Works will be required to extend outside of the existing footprint to widen batters at the entrance and to allow for the realignment of the exit to the required 90-degree angle and supporting batters.

The option to widen the existing LVRA to accommodate use by heavy vehicles was initially investigated, however through the design process it was found that the creation of a separate heavy vehicle bay would be a preferred option for this location as it will provide better safety outcomes by deterring heavy vehicles from using the light vehicle bay and will also allow increased capacity for both light and heavy vehicles

b) Minimisation – 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).

Minimisation will occur through locating the large majority of the footprint on the poorest condition vegetation stratum. The possibility of establishing fencing to deter intrusion onto surrounding intact vegetation by users of the parking bays is being investigated, which will limit indirect impacts such as trampling, rubbish dumping and vehicles moving off the LVRA footprint.

The construction contractor will be required to implement a Construction Environmental Management Plan (CEMP) in accordance with DIT Master Specification and Standards and Guidelines to minimise any direct and in-direct impacts including off-target vegetation and fauna protection measures.

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.

Relevelling of soil surrounding the construction site to grade will occur. No other rehabilitation works with respect to vegetation management is planned.

Where possible, DIT will stockpile some of the topsoil from the clearance for re-use on batters to allow natural regeneration of the seedbank from *Triodia* and other smaller shrub species given the largely native structure of the existing vegetation.

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.

The SEB will be met through a payment into the NV fund.

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 Function as relevant, when considering an application referred under the *Planning, Development and Infrastructure Act 2016*.

Principle of clearance	Relevant information	Assessment against the principles	Moderating factors that may be considered by the NVC
Principle 1b - significance as a habitat for wildlife	Vegetation association 1 had a habitat score of 0.1. Fifteen fauna species of national and state conservation significance had historical records from within 5km of the project area.	Association 1 was seriously at variance with this principle.	There were trees present with small hollows present however these were likely to be occupied by common species only. Given the works occur alongside a main arterial highway the project is unlikely to cause the following: • Lead to a long term decrease in the size of any threatened fauna populations • Fragment an existing population into two or more populations • Modify destroy, remove, isolate or decrease the availability of habitat to the extent that the populations are likely to decline • Result in additional invasive species above existing levels becoming established within the threatened species habitats. • Interfere with the recovery of a species It is therefore considered that given the extent of available habitat within the Murray River corridor this project will not have a significant impact on any threatened species currently using the proposed project design footprint for habitat resources.
Principle 1c - plants of a rare, vulnerable or endangered species	No threatened flora species recorded	Not at variance	No threatened plant species were recorded or likely to be present within the design project footprint sue to the level of degradation associated with the road reserve vegetation.
Principle 1d - the vegetation comprises the whole or	No threatened communities present. All vegetation well represented within region.	Not at Variance	

***part of a plant community that is Rare, Vulnerable or endangered*:**			

4.6 Risk Assessment

Determine the level of risk associated with the application

Total clearance	No. of trees	None
	Area (ha)	0.695
	Total biodiversity Score	47.48
Seriously at variance with principle 1(b), 1(c) or 1 (d)		Seriously at variance with 1b
Risk assessment outcome		Level 4

4.7 NVC Guidelines

Provide any other information that demonstrates that the clearance complies with any relevant NVC guidelines related to the activity.

N/A

5. Clearance summary

Clearance Area(s) Summary table

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
1	1	20	1	0	0.1	54.61	0.268	14.64	1			15.37	$3,804.62	$209.25
1	2	24	1	0	0.1	76.92	0.427	32.84	1			34.49	$8,538.29	$469.61
						Total	**0.695**	**47.48**				**49.85**	**$12,342.91**	**$678.86**

Totals summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	47.48	49.85	$12,342.91	$678.86	$13,021.77

IBRA Association percent vegetation remnancy (%)	18
IBRA Subregion percent vegetation remnancy (%)	21
Is the vegetation associated with a Wetland	No
Economies of Scale Factor	0.35
Rainfall (mm)	272

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. 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

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid and the manner of payment:

The SEB payment requirement is $13,021.77

7. Appendices

Appendix 1. Bushland Vegetation Assessment Scoresheets (Site 1)

Appendix 2. Bushland Vegetation Assessment Scoresheets (Site 2)

Appendix 3. Shapefile