

*Native Vegetation Clearance  
Proposal – Cadell Training  
Centre, Cadell*

Clearance under the Native Vegetation Act 1991

*For the Minister for Correctional Services.*

Prepared by Sheree Bowman  
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**This report is advisory only – the final decision rests with the Native Vegetation Council of South Australia.**

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# 1. Application information

Applicant:	Department for Correctional Services		
Key contact:	Peter Wilson, Industries Manager – Cadell Training Centre.		
	E: Peter.Wilson9@sa.gov.au	P: (08) 8540 3671	
Landowner:	The Minister for Corrections (Government of South Australia)		
Site Address:	Boden Road, Cadell South Australia.		
Local Government Area:	Mid Murray	Hundred:	Cadell
Certificate of Title:	CR6185/529	Section/Allotment:	S211
<b>Summary of Application</b>			
Proposed clearance area:	31.74 Hectares - areas across 10 sites and 66 Scattered trees		
Applicable regulation and purpose of the clearance	Clearance incidental to the expansion of horticultural enterprise. No regulation applicable.		
Level of risk	Level 4 Risk – Total Biodiversity Score greater than 250 (1,356,10)		
Proposed SEB offset:	249.53 Hectares of native vegetation to be actively protected and management as an on-ground SEB Offset. Refer: Section 5: Significant Environmental Benefit.		

## 2. Background

### 2.1 Purpose of the proposal and Background

The purpose of this native clearance application is to clear native vegetation protected under the Native Vegetation Act 1991. The proposed clearance is incidental to the expansion of horticultural and agricultural enterprises at the Cadell Training Centre (CTC). In line with the Department for Correctional Services Strategic Plan, the development seeks to:

- Drive the Working Prisons model to ensure prisoners build job ready employment skills through training and prison industries;
- Improve the accountability and cost effectiveness of our system to monitor and review performance to drive improvement and increase competition;
- Deliver a strategic infrastructure plan for South Australia to build a better prison system.

The surrounding area is characterized by mixed farming enterprises dominated by citrus, wine grapes and domestic stock grazing. The rural township of Cadell is approximately 1km from the first proposed clearance area. The township is small and is characterized by large lifestyle blocks and primary production properties. The proposed clearance sites are within the River Murray Development Zone.

The CTC was opened in 1960 as a minimum security training facility for prisoners to learn vocational skills which may not be available within other prisons and focuses on the rehabilitation of prisoners and preparing them to take their place in the community upon release. The CTC houses up to 206 prisoners. It plays a key role in the rehabilitation of prisoners and reducing reoffending within the prison population. It does this by providing vocational training and courses to prisoners incl. addressing violent behavior, drug and alcohol addictions and in making positive life choices. It provides training courses to increase opportunities post release, including to gain vehicle, truck, forklift and backhoe licenses and TAFE courses.

CTC has a Community Workgroup Unit that takes prisoners to various location to assist with community projects & events. It has assisted previously with the clean up after the Pinery fires and with orchardist's that needed to remove hail damage fruit through the Riverland. Also, CTC participates in the local Cadell CFS unit with prisoners, officers & public members participating. It attends to fires & emergency call out's as part of regular CFS duties.

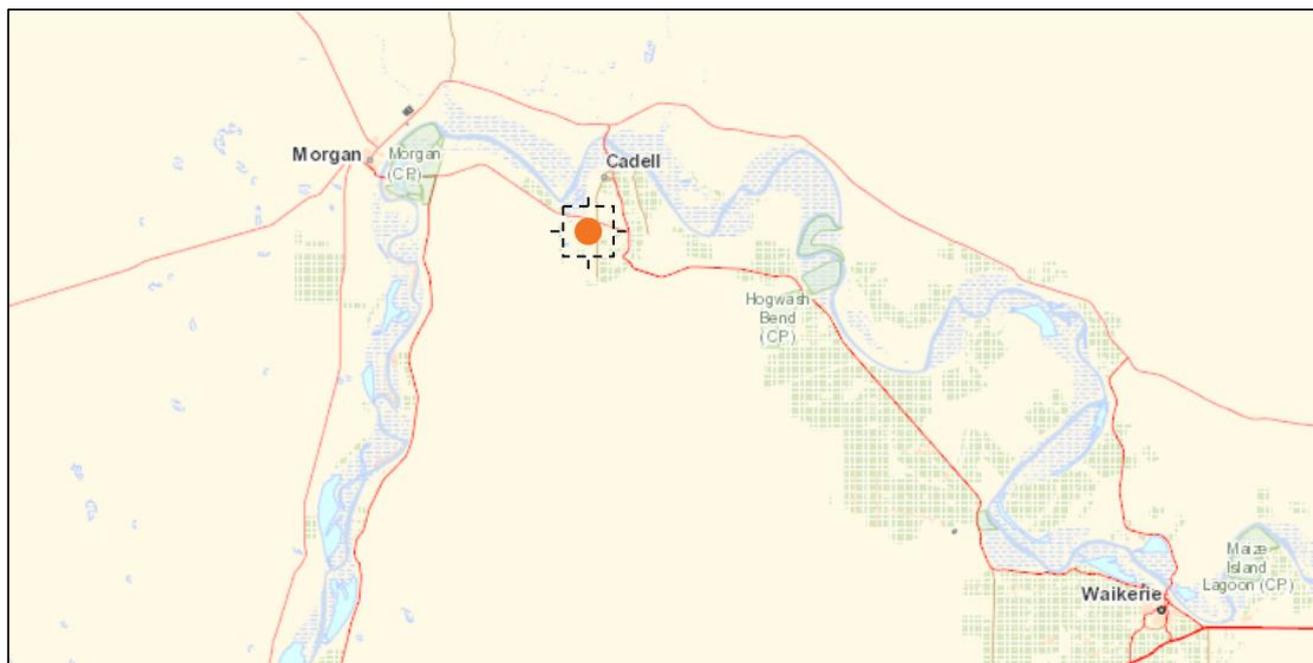
The prison has a strong farming background. It focuses on a structured day for prisoners. The CTC is situated on approximately 1,600 hectares of land in a rural environment with a focus on delivering training programs to prisoners. There is a strong farming focus with 93 hectares currently in dairy farming, citrus (20Ha) and olive production (22Ha). The prison utilizes milking and packaging facilities to produce up to 14,000L of milk weekly which is supplied to 5 other institutions, the Queen Elizabeth Hospital, the Hutt Street Centre Living Without Barriers – Berri and to the Waikerie High School Breakfast program. The olive groves are utilized for olive oil production with 40,000L produced in a good year.

It is a registered Holstein Friesian stud and operates as an accredited dairy primary production business, dairy processing business and dairy transport business. Herd total has increased to around 200 head and milking around 100 head. Excess milk & cream is sold to cheese manufacturers. The dairy has operated for more than 50 years and has been providing packaged milk for over 20 years.

It has approx. 30 ha of irrigated pastures. Pasture & hay production is conducted to feed the stock. Not all feed requirements are met, and stock feed is purchased to supplement the herd. The herd numbers have doubled over the past 5-8 yrs to cater for the increase in the prison population. The need for increased pastures has not expanded at the same rate and is limited to the areas already grazed. During periods of drought the increased cost of stock feed impacts on budgets. The CTC has substantial land holdings but cannot expand its irrigation without the relevant approvals. It is also limited in procuring other suitable land suitable for production which is limited to the areas within close proximity for prisoners to access training opportunities.

It is proposed that the production areas will be expanded by over 25 hectares to enable additional land to be grazed by dairy cows and to reduce the reliance on sourcing feed off-site and additional areas of almonds and olives to be established. Significant additional training opportunities will be provided to prisoners with this expansion.

## 2.2 General location map



# Proposed Clearance Areas - Cadell Training Centre.



Map data is compiled from a variety of sources and hence its accuracy is variable.

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0 467 Metres

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# 3. Method

The flora assessment was undertaken by Sheree Bowman (Native Vegetation Accredited Consultant) on the 3<sup>rd</sup> of September 2018, with approximately 6.5 hours spent on site (including SEB offset assessment). The Bushland Assessment and Scattered Tree Assessment Methodology was undertaken as detailed in the Native Vegetation Council Bushland Assessment Manual (Feb 2017) approved by the Native Vegetation Management Group of the Department for Environment and Water. 25 Hectares of native vegetation and over 70 scattered tree/ clumps were assessed as shown by Peter Wilson, Industries Manager of the Cadell Training Centre during the field inspection. A Level 4 assessment was completed due to the size of the proposed native vegetation clearance footprint.

A subsequent field assessment was completed on the 18<sup>th</sup> of December to assess a proposed Significant Environmental Benefit (SEB) Offset site located on Hurst Plain Road, Cadell SA. In an attempt to minimize native vegetation clearance, several proposed clearance sites were reviewed, and proposals amended and re-assessed as required.

A re-assessment was undertaken to convert the figures to align with the revised assessment methodology and metric post July 2019.

Calibrated field assessment techniques were used to undertake the assessment. Plant specimens were collected where required for further identification. A GPS with +/- 5m accuracy and field maps were used to record photo point locations. Both 50m and 100m tapes are employed to measure assessment site quadrats. The scattered tree was assessed using calibrated field assessment techniques to assess tree health, hollows, size and tree dimensions. A laser rangefinder was used to measure tree height, GPS to +/- 5m accuracy and field maps were used to record tree locations and a forestry diameter tape was used to measure the diameter of the trunk diameter at 1.5m above the ground.

A pre-field desktop assessment was undertaken utilizing searches for the presence of species listed under the National Parks and Wildlife Act 1972 (SA) and the Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth). The following databases were queried for records within the last 20 years and within 5km's of the proposed clearance site - EPBC Act Protected Matters Search Tool, Biological Database of South Australia and Atlas of Living Australia.

## **3.1 Fauna assessment**

Fauna assessment was undertaken on the site in November 2018 and April 2019 by Dr. Peter Cale, Senior Ecologist - Australian Landscape Trust. 3 Reports outlining the method, findings and recommendations are attached.

# 4. Assessment outcomes

## 4.1 Vegetation Assessment

### General description of the vegetation, the site and matters of significance

The Upper Murray Valley Land System is a complex landscape of wetlands and older terraces, with slopes and cliffs running up to the adjacent highlands. The soils are highly variable depending on the nature of the alluvium (on flats), or the older material exposed (on slopes) by the downcutting of the river. The wetlands and low terraces are little used for primary production but have high conservation and recreation value. The higher terraces dominated by medium to fine textured soils are commonly used for horticultural irrigation. The slopes with a range of sandy to sandy loam soils over highly calcareous subsoils are also widely used for horticulture, except where they are too steep and / or eroded.

The topographic pattern is predominantly high terraces (saltbush and box flats) and are subject to occasional flooding. There are sporadic sandhills on these terraces. The soils on site are characterized as sandy loam over grey sodic clay (Grey Sodosol, medium to thick grey sandy loam over a grey coarsely structured heavy clay), continuing below 100 cm with deep sand Deep reddish sand overlying buried river flat soil below 100 cm.

Table 1: Database search results (past records) for fauna search within 5km's of proposed clearance site (A1, B1, B2, C1, E1 & Scattered Trees).

Scientific name	Common name	Record/ Suitable Habitat	EPBC Act	NP&W Act
<i>Polytelis anthopeplus</i>	Regent Parrot	Record	ssp	V
<i>Haliaeetus leucogaster</i>	White-Bellied Sea-Eagle	Record		E
<i>Anhinga novaehollandiae</i>	Australasian Darter	Record		R
<i>Myiagra cyanleuca</i>	Satin Flycatcher	Record		E
<i>Morelia spilota</i>	Carpet Python	Record		R

Table 2: Database search results (past records) for fauna search within 5km's of proposed clearance site (D1, F1, G2, H1 and I1).

Scientific name	Common name	Record/ Suitable Habitat	EPBC Act	NP&W Act
<i>Polytelis anthopeplus</i>	Regent Parrot	Record	ssp	V
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Record		R
<i>Anhinga novaehollandiae</i>	Australasian Darter	Record		R
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	Record	ssp	
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater	Record		R
<i>Philemon citreogularis</i>	Little Friarbird	Record		R
<i>Morelia spilota</i>	Carpet Python	Record		R

# Proposed Clearance Area - A1, B1, B2, C1 & Scattered Tree Area.



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# Proposed Clearance Area - E1.



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## Proposed Clearance Area - D1, F1, G1, H1 & I1.



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## Details of the vegetation associations and scattered trees proposed to be impacted

Site A1: *Dodonaea viscosa* ssp. *angustissima* shrubland +/- *Callitris verrucosa* on low and/or isolated red sand dunes with *Carpobrotus modestus*, *Triodia irritans*, *Enchylaena tomentosa* understory. Photopoint: 0439462 6213481 West.



Assessment site A1 is 1.12 hectares in size. The Native Plant Species Diversity Score is 16/30. The vegetation condition score is 52.89/ 80. 3 native plant species were observed regenerating, these include, *Triodia irritans*, *Carpobrotus modestus* and *Enchylaena tomentosa* var. *tomensosa*. Weed species recorded include *Brassica* sp. providing less than 1% cover across the site. No hollows observed. No NP&W Act or EPBC Act listed species or communities observed. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1). NOTE: The proposed vegetation clearance in this site is of the understory only. A loss factor of 0.8 has been applied.

Table 3: Site A1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	1.12
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	60.55
Total Biodiversity Score	67.81

Site B1 & B2: *Eucalyptus largiflorens* open Woodlands +/- *Myoporum montanum* with sparse *Dodonaea viscosa* ssp *angustissima*, *Atriplex stipitata* Understorey. Photopoint: 0383335 6226826 South-West.



Assessment site B1 is 4.11 hectares in size. The Native Plant Species Diversity Score is 6/30. The vegetation condition score is 29.25/ 80. No regenerating native plant species observed. Weed species recorded include *Brassica* sp. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. Large and small hollows scattered but not common. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1). **NOTE: The proposed vegetation clearance in this site is of the understorey only. A loss factor of 0.8 has been applied.**

Table 3: Site B1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	4.11
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	32.85
Total Biodiversity Score	135.03

Assessment site B2 is 15.67 hectares in size. The proposed vegetation clearance in this site was assessed using the same data as B1. As the entire 15.67 hectares is proposed to be cleared a loss factor of 1.0 has been applied.

Table 4: Site B2 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	15.67
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	33.49
Total Biodiversity Score	524.72

Site C1: *Dodonea viscosa* ssp *angustissima* Shrublands with Chenopod Understorey on Low Red Sand Dunes.  
Photo Point: 385065 6229896. Photo Direction: North West



Assessment site C1 is 1.36 hectares in size. The Native Plant Species Diversity Score is 14/30. The vegetation condition score is 33.54 80. No regenerating native plant species observed. Weed species recorded include *Sisymbrium* sp. and *Salvia verbenaca* var. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1).

Table 5: Site C1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	1.36
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	37.31
Total Biodiversity Score	50.74

Site D1: *Eucalyptus largiflorens* open woodland with degraded herb understorey. Photo Point: 385088 6231370

Photo direction: South.



Assessment site D1 is 0.31 hectares in size. The Native Plant Species Diversity Score is 10/30. The vegetation condition score is 21.15/ 80. All strata of vegetation impacted with limited structural diversity, largely uniform age classes and reduced vegetation cover. Very low regeneration, consisting of highly scattered juvenile plants of a limited number of species. Weed species recorded include *Hordeum vulgare*, *Carrichtera annua* and *Sonchus asper* ssp. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. Small hollows only. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1). NOTE: The proposed vegetation clearance in this site is of the understorey only. A loss factor of 0.8 has been applied.

Table 6: Site D1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	0.31
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.06
Unit Biodiversity Score	23.09
Total Biodiversity Score	7.16

Site E1: *Dodonaea viscosa* ssp *angustissima* Shrublands with Chenopod Understorey on Low Red Sand Dunes.  
 Photo Point: 384321 62307116. Photo Direction: East.



Assessment site E1 is 8.10 hectares in size. The Native Plant Species Diversity Score is 18/30. The vegetation condition score is 49.02/80. 2 regenerating native plant species observed. Weed species recorded include *Brassica* sp., *Lycium ferocissimum* and *Pinus radiata*, providing less than 1% cover across the site. *Lycium ferocissimum* (African Boxthorn) is a declared pest plant under the Natural Resources Management Act 2004. No NP&W Act or EPBC Act listed species or communities observed. Small hollows only. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1).

Table 7: Site E1 Attributes – Derived from Desktop and Field Assessment Data.

Attribute	Score
Clearance Footprint Area (Ha)	8.10
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	55.59
Total Biodiversity Score	448.60

Site F1: *Dodonea viscosa* ssp *angustissima* Shrublands with Chenopod Understorey on Low Red Sand Dunes.  
Photo Point: 385185 6231551. Photo Direction: East.



Assessment site F1 is 0.77 hectares in size. The Native Plant Species Diversity Score is 18/30. The vegetation condition score is 42.38/ 80. One regenerating native plant species observed. Weed species recorded include *Brassica* sp. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. No hollows observed. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1).

Table 8: Site F1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	0.77
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	48.05
Total Biodiversity Score	37.00

G1: *Eucalyptus largiflorens* open woodland with degraded understorey. Photo Point: 384996 6231504. Photo Direction: North



Assessment site G1 is 0.23 hectares in size. The Native Plant Species Diversity Score is 14/30. The vegetation condition score is 28.76/ 80. All strata of vegetation impacted with limited structural diversity, largely uniform age classes and reduced vegetation cover. Very low regeneration, consisting of highly scattered juvenile plants of a limited number of species. Weed species recorded include *Carrichtera annua* and *Sonchus asper* var. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. Large and small hollows scattered but not common. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1). NOTE: The proposed vegetation clearance in this site is of the understorey only. A loss factor of 0.8 has been applied.

Table 9: Site G1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	0.23
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.08
Unit Biodiversity Score	32.32
Total Biodiversity Score	7.43

H1: Very open and degraded *Dodonaea viscosa* ssp *angustissima* Shrublands. Photo Point: 385128 6231495. Photo Direction: West.



Assessment site H1 is 1.62 hectares in size. The Native Plant Species Diversity Score is 12/30. The vegetation condition score is 25.80/ 80. No regenerating native plant species observed. Weed species recorded include *Carrichtera annua* and *Sonchus asper* var. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. No hollows observed. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1). NOTE: Due to the very sparse and scattered native vegetation in this site staff at the Native Vegetation Unit suggested the SEB Offset Calculations be based on 5% cover- this is detailed below. In 5. Significant Environment Benefit Section this will be detailed with the 5% cover assessment measures.

Table 10: Site H1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	1.62 (5% cover – 0.08Ha)
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.06
Unit Biodiversity Score	28.19
Total Biodiversity Score	2.25 (based on 5% cover)

I1: *Alectryon oleifolius* ssp. *canescens* Open Woodland with Degraded Chenopod Understorey. Photo Point: 385093 6231435. Photo Direction: North East.



Assessment site I1 is 0.019 hectares in size. The Native Plant Species Diversity Score is 8/30. The vegetation condition score is 24.86/ 80. At least one strata of vegetation has been impacted, with reduced structural diversity, elements may be missing (such as plant species that provide specific structural features e.g. sedges or mid layer shrubs) and reduce vegetation cover. Regeneration present, consisting of multiple individual juvenile plants but a limited number of species. Weed species recorded include *Hordeum vulgare*, *Carrichtera annua* and *Sonchus asper* var. providing less than 1% cover across the site. No NP&W Act or EPBC Act listed species or communities observed. Large and small hollows scattered but not common. Previous fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded (See Table 1).

Table 11: Site I1 Attributes – Derived from Desktop and Field Assessment Data.

<b>Attribute</b>	<b>Score</b>
Clearance Footprint Area (Ha)	0.019
Threatened Ecosystem Score	1
Threatened Flora Score	0
Threatened Fauna Score	0.06
Unit Biodiversity Score	27.14
Total Biodiversity Score	0.52

**Scattered Trees Assessment:**

Tree 1: *Eucalyptus largiflorens*, River Box



Tree 2: *Eucalyptus largiflorens*, River Box – Clump of 7 trees



Tree 3: *Eucalyptus largiflorens*, River Box – Clump of 7 trees



Tree 4: *Eucalyptus largiflorens*, River Box – Clump of 44 trees (Photo 1 – 15 trees)



Tree 4: Eucalyptus largiflorens, River Box – Clump of 44 trees (Photo 2 – 29 trees)



Tree 5: *Eucalyptus largiflorens*, River Box – Clump of 9 trees



Tree 6: *Eucalyptus largiflorens*, River Box



Table 12: Scattered tree condition and values.

Tree/ Clump	Number of Trees	Tree Species	Height (m)	Trunk diameter (cm 1.5 above ground)	Dieback (%)	Tree Score
1	1	<i>Eucalyptus largiflorens</i>	10.0	67	5	3.53
2	7	<i>Eucalyptus largiflorens</i>	9.6	31	7	1.32
3	4	<i>Eucalyptus largiflorens</i>	12.0	67	12	3.79
4	44	<i>Eucalyptus largiflorens</i>	8.8	28	13	0.63
5	9	<i>Eucalyptus largiflorens</i>	9.4	39	11.5	1.98
6	1	<i>Eucalyptus largiflorens</i>	6.2	63	12	2.04

## 4.1 Presence of Substantially Intact Vegetation

*If the vegetation is considered to represent a substantially intact stratum, the NVC cannot approve clearance, unless for the purpose of harvesting native vegetation (section 27(3)). For more information see the NVC's [Guide for Applications to Clear Native Vegetation](#).*

Sites D1, F1, G1, H1 & I1 do not constitute intact stratum as they have been degraded by human disturbance over the last 20 years, predominantly cropping and grazing practices. The sites do not contain a diversity of species similar to Pre-European vegetation of the benchmark communities identified and the densities of all stratum differ from what we would expect in the pre-European benchmark communities.

The site which consists of scattered trees for removal only, has no introduced or native understorey and it has been grazed by dairy cows with supplementary feeding for some time. With reference to the photopoints, the ground layer is de-void of any vegetation. The scattered trees do not represent a diversity of species similar to the original pre-European vegetation community – 10.7 or 10.8 - *Eucalyptus largiflorens* open woodland.

Sites A1, B1 & B2 have areas throughout which have been cleared for access tracks during the last 20 years, other wise the remaining vegetation could be considered in-tact stratum. Site C1 & E1 could be considered in-tact as they adhere to the full criteria of in-tact stratum, as follows: the vegetation constitutes a continuous stratum and the vegetation has not been subject to human degradation within the past 20 years.

## 4.2 Principles of Clearance (Schedule 1, Native Vegetation Act 1991)

*It comprises a high level of diversity of plant species (patches of vegetation only):*

Table 7: Species Diversity

Site(s)	Weeds Score	Native Plant Species Diversity Score	Variance Value	Moderating Factor Applied
A1	15	16	At variance	Not at variance
B1	15	6	Not at variance	Not at variance
B2	15	6	Not at variance	Not at variance
C1	15	14	At variance	Not at variance
D1	13	10	Not at variance	Not at variance
E1	13	18	At variance	Not at variance
F1	15	18	At variance	Not at variance

G1	14	14	At variance	Not at variance
H1	15	12	At variance	Not at variance
I1	15	8	Not at variance	Not at variance

Moderating factor: Amount of clearance related to the remnant area.

The proposed vegetation to be cleared forms part of a patch of remnant vegetation which is more than 6,900 hectares including areas along the River Murray corridor. The proposed clearance footprint is considered less than 10% of the total vegetation area. Due to this moderating factor A1, C1, D1, E1, F1, G1, H1 are reduced from 'At variance' to 'Not at variance' and the remaining sites B1, B2 & I1 are already considered 'Not at Variance'.

**This application is considered 'Not at variance' with this principle.**

*It has significance as a habitat for wildlife:*

In November 2018 and April 2019 fauna studies were undertaken by Dr Peter Cale Senior Ecologist of Australian Landscape Trust. This study determined that this area whilst utilized by common species the site has limited value for threatened or rare fauna, in particular the fauna identified in the 5km database search for state and nationally rated species No federal or state rated fauna species were noted during the field inspection or fauna study.

Sites A1, B1, B2, C1 are a good representation of the vegetation associated with the transition from the river floodplain to the mallee, and therefore has value as habitat for many fauna species. The surveys indicate that it is unlikely there are any National or State-listed species occupying the site currently, but it supports a good assemblage of the regional native bird community.

The most significant habitat is the black box/Callitris woodland patch along the eastern edge of the site(s), along Boden Road. This is likely to be the core habitat for many of the bird species recorded. When assessing fauna, the data needs to be considered in the context of the broader landscape, because many species of fauna occupy areas larger than the site. The black box/Callitris woodland patch represents a habitat in the landscape that does not appear to occur elsewhere in this section of the river, and therefore has added significance as fauna habitat.

Site E1 is an area with reasonable habitat value supporting many species of the regional native bird community. The abundance and species richness recorded in standard survey quadrats is comparable with black box sites in the Riverland Ramsar site. However, this diversity of birds is likely dependent on the larger area of native vegetation in the Cadell area as opposed to this particular block of native vegetation.

Sites D1, F1, G1, H1 & I1 are highly degraded and is unlikely to be an important habitat for any native species. The surveys indicate that it is unlikely there are any National or State-listed species occupying the site currently.

Many sites contain some suitable shelter habitat for the State-listed carpet python, *Morelia spilota*, but no evidence of its likely presence was found. Further, carpet pythons can exist in modified landscapes if their core shelter habitats (in this case large mature black box trees) remain. Therefore, given some of these trees are to be retained within some sites and others exist outside the proposed clearance it is unlikely—if this species exists in the area—the habitat value for this species will be removed entirely by the proposed development.

Table 8: Threatened Fauna

Site(s)	Threatened Fauna score	Unit Biodiversity Score	At variance with the principles	Moderating factor applied
A1	0.08	60.55	Seriously at variance	At variance
B1	0.08	32.85	Seriously at variance	At variance
B2	0.08	33.49	Seriously at variance	At variance
C1	0.08	37.31	Seriously at variance	At variance
D1	0.06	23.09	Seriously at variance	At variance
E1	0.08	55.59	Seriously at variance	At variance
F1	0.08	48.05	Seriously at variance	At variance
G1	0.06	32.32	Seriously at variance	At variance
H1	0.06	28.17	Seriously at variance	At variance
I1	0.06	27.14	Seriously at variance	At variance

Moderating Factor: Non-Essential Habitat, Impact Significance.

As described above and supported by the Fauna reports from Dr. Peter Cale Senior Ecologist for Australian Landscape Trust, the proposed clearance will impact non-essential habitat for threatened fauna species and is highly unlikely to impact on threatened fauna species. The variance statements for all sites will decrease from 'seriously at variance' to 'at variance' due to these moderating factors.

**This application is considered 'at variance' with this principle.**

*It includes plants of a rare, vulnerable or endangered species:*

The vegetation under application does not include any rare, vulnerable or endangered species.

Table 9: Threatened Flora

Site(s)	Threatened Flora score	At variance with the principles
A1-I1	0	Not at variance

**This application is considered 'not at variance' with this principle.**

*The vegetation comprises the whole, or a part, of a plant community that is rare, vulnerable or endangered (patches of vegetation only):*

The vegetation does not comprise the whole, or a part, of a plant community that is rare, vulnerable or endangered.

**This application is considered 'not at variance' with this principle.**

*It is significant as a remnant of vegetation in an area which has been extensively cleared:*

The vegetation under application is within the Renmark IBRA Association which has 58% of native vegetation remaining. This is consistent with data for the Murray Scroll Belt sub-region which suggests that approximately 56% of the sub-region has been identified as native vegetation. These figures indicate that the area has not been extensively cleared.

The total biodiversity score for this clearance application exceeds 500, with a combined score of 1408.79

**The application is considered 'at variance' with this principle.**

It is growing in, or in association with, a wetland environment:

This vegetation is not growing in, or in association with, a wetland environment.

**This application is considered 'not at variance' with this principle.**

It contributes significantly to the amenity of the area in which it is growing or situated:

As part of a process to minimize native vegetation clearance in this development, Dr Peter Cale in consultation with Peter Wilson, Industries Manager - Cadell Training Centre prepared a recommendation to avoid clearing a strip of vegetation along the Boden Road roadside. Not only will this provide an effective wildlife corridor as described in the recommendation report, it will also provide a native vegetation 'screen' along the road edge which will buffer the cleared areas. In addition, where possible and suitable to the future land-use some large trees are being retained. A majority of these trees are *Eucalyptus largiflorens* (River Box) which also provide significant habitat value.

The surrounding area is predominantly mixed farming with horticultural and residential areas throughout and the proposed clearance areas will not significantly affect the amenity of the area.

For the purposes of assessing against this principle, the site does not contain any vegetation which is culturally or historically significant.

**This application is considered 'not at variance' with this principle.**

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

Summary of key findings and assessment of the Principles of Clearance and any additional considerations to support the application.

<b>Principles of Clearance</b>	<b>Assessment</b>
It comprises a high level of diversity of plant species (patches of vegetation only)	Not at variance
It has significance as a habitat for wildlife	<b>At variance</b>
It includes plants of a rare, vulnerable or endangered species	Not at variance
The vegetation comprises the whole, or a part, of a plant community that is rare, vulnerable or endangered (patches of vegetation only)	Not at variance
It is significant as a remnant of vegetation in an area which has been extensively cleared	<b>At variance</b>
It is growing in, or in association with, a wetland environment	Not at variance
It contributes significantly to the amenity of the area in which it is growing or situated	Not at variance

# 5. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Section 28 of the *Native Vegetation Act 1991*. 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.

The Data Report must propose how the SEB will be achieved in accordance with the [SEB Policy and Guide](#), by providing the following information.

## DETERMINATION OF THE SEB OBLIGATION

### Clearance Area Summary

Sites	A1	B1	B2	C1	D1	E1	F1	G1	H1	I1
Area (Ha) of Proposed Impact	1.12	4.11	15.67	1.36	0.31	8.07	0.77	0.23	0.08	0.019
Unit Biodiversity Score	60.55	32.85	33.49	37.31	23.09	55.59	48.05	32.32	28.17	27.14
Total Biodiversity Score	67.81	135.03	524.72	50.74	7.16	448.60	37.00	7.43	2.25	0.52
SEB Points Required	56.96	113.42	550.95	53.28	6.01	471.03	38.85	7.8	2.37	0.54

### Scattered Trees

Table 4: Summary SEB Data per Scattered Tree.

Tree number/ Clump	Species	Biodiversity Score	SEB Points Required
1	<i>Eucalyptus largiflorens</i>	3.53	3.71
2	<i>Eucalyptus largiflorens</i>	9.24	9.70
3	<i>Eucalyptus largiflorens</i>	15.17	15.93
4	<i>Eucalyptus largiflorens</i>	27.55	28.93
5	<i>Eucalyptus largiflorens</i>	17.78	18.67
6	<i>Eucalyptus largiflorens</i>	2.04	2.14

### Summary of Clearance SEB Points Required:

Bushland Areas: 1301.21 Points.

Scattered Trees: 78.08 Points.

### **TOTAL SEB Points Required: 1380.29**

## ACHIEVING AN SEB

Indicate how the SEB will be achieved by ticking the appropriate box:

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

## FOR AN ON-GROUND SEB

**If a proponent proposes to achieve the SEB on-ground, the following information must be provided:**

Ownership:	Crown Land (Department for Environment and Water) under a <u>Perpetual Lease</u> to the Minister for Correctional Services.		
Site Address:	Hurst Plain Road, Cadell SA		
Local Government Area:	Mid Murray	Hundred:	Cadell
Title Details:	CL6186/678	Section:	S622

## Summary Information on proposed on-ground SEB

Offset Site	A1	B1	C1	D1
Area (Ha)	14.06	81.57	9.39	144.51
Unit Biodiversity Score	54.86	50.40	39.22	39.40
Total Biodiversity Score	771.33	4111.45	368.29	5693.15
Gain Score	6.41	6.44	6.51	6.51
<b>SEB Points</b>	<b>90.07</b>	<b>525.16</b>	<b>61.08</b>	<b>940.60</b>

## Summary SEB Points – 1,616.91

**Provide relevant background information relating to the proposed SEB Area. Include land use history, management actions or encumbrances.**

The site has not been developed previously or affected significantly by direct human interference. The site is mostly undisturbed with historical clearing evident on the northern side of the site impacting stratum density and condition of the native vegetation present. The site was fenced off from stock some years ago and the remainder of the property was leased to a grazier. As part of this project, the greater area will be excluded from stock in an effort to reduce impacts and enhance the native vegetation on the area adjacent the SEB site.

The site is isolated and is under the care and control of the Department for Corrections. No existing covenants/ caveats or agreements exist on the land.

The land system comprises two geological features. Underlying the entire area, and exposed on lower lying areas, is calcrete in sheet but more commonly rubbly form. Overlying a large proportion of the landscape are deposits of windblown Molineaux Sand. The land system is a gently undulating calcrete plain, stony where the calcrete is exposed on some flats. Extensive dunefields are superimposed on the plains. These vary from gentle sandy rises to high parabolic and jumbled dunes, which are highly unstable once exposed.

The site forms part of a large area of native vegetation which extends to the River Murray Corridor and is almost 7,000 hectares in size. The patch of vegetation varies in condition which enhances the importance of protecting and managing 258.50 hectares of native vegetation in this condition in this landscape. The site has the habitat to support many common generalist bird and reptile species. Sand Goanna (*Varanus goudii*) tracks and burrows were observed during the field inspection and predominately in the sand dunes.

The vegetation area assessed as A1 supports some older growth *Callitris verrucosa* (Shrub Cypress Pine), *Leptospermum coriaceum* (Dune Tea-tree) and *Myoporum platycarpum* ssp (False Sandalwood) on a tall Red Sand Dune, which is unique in this area in this condition. Due to poor land management in the district and erosion over time, this vegetation community is under-represented. There was an abundance of common generalist birds in this area and Sand goanna tracks throughout.

The SEB Offset Site is an important part of the landscape for the movement of fauna from the River Murray Corridor with potential roosting habitat identified on site for species such as the Regent Parrot (*Polytelis anthopeplus*) (EPBC Act Listing).

The management actions proposed to protect and enhance the SEB site include grazing management of both kangaroos and goats. The impacts of goats and kangaroos were evident during the field inspection and a mob of goats was observed during the field inspection in an adjacent paddock. Other actions include, monitoring for new pests and weeds. Whilst rabbits are not evident on site, the soils are sandy and lend itself to rabbit infestation. Historical rubbish dumping is evident, and this disturbance will be removed in the first year of the proposed offset plan.



Site A1: *Eucalyptus oleosa* ssp +/- *Eucalyptus gracilis* woodland with open shrubland on tall Red Sand Dunes.



Photo Point: 439462 6213481 Photo Direction: West.

The Proposed SEB Site A1 is 14.06 hectares in size. Native plant diversity score of 18/30 with a vegetation condition score of 46.21/80. No native plant species regeneration observed on site. No weed species observed. Signs of both the Sand Goanna and Short-Beaked Echidna were observed during the site assessment. Fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded – these are: Regent Parrot, Musk Duck and White-Bellied Sea-Eagle.

Site B1: *Eucalyptus oleosa* ssp and *Eucalyptus gracilis* woodland dominated by *Triodia irritans* understorey on moderate/ low red sand dunes.



Photo Point: 383338 6226826 Photo Direction: South West

The Proposed SEB Site B1 is 81.57 hectares in size. Native plant diversity score of 20/30 with a vegetation condition score of 43.23/80. *Zygophyllum aurantiacum* (Shrubby Twin-leaf) was observed regenerating during the site assessment. No weed species observed. Signs of both the Sand Goanna and Short-Beaked Echidna were observed during the site assessment. Fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded – these are: Regent Parrot, Musk Duck and White-Bellied Sea-Eagle

Site C1: *Eucalyptus oleosa* ssp *oleosa* open woodland with degraded chenopod understorey



Photo point: 381151 6226893 Photo Direction: West

The Proposed SEB Site C1 is 9.39 hectares in size. Native plant diversity score of 16/30 with a vegetation condition score of 33.64/80. No native plant species regeneration observed on site. No weed species observed. Fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded – these are: Regent Parrot, Musk Duck and White-Bellied Sea-Eagle

D1: *Eucalyptus gracilis* woodland with degraded chenopod understorey



Photo point: 382661 6226909 Photo Direction: South East.

The Proposed SEB Site D1 is 144.51 hectares in size. Native plant diversity score of 10/30 with a vegetation condition score of 33.79/80. *Atriplex stipitata* and *Eucalyptus gracilis* in very small numbers were observed regenerating during the site assessment. No weed species observed. Signs of both the Sand Goanna and Short-Beaked Echidna were observed during the site assessment. Fauna records indicate that EPBC Act Listed Species are known to be utilizing similar habitat in the area and NP&W Act Fauna species previously recorded – these are: Regent Parrot, Musk Duck and White-Bellied Sea-Eagle.

# 6. Appendices

Appendix 1. Bushland, Rangeland or Scattered Tree Vegetation Assessment Scoresheets associated with the proposed clearance and SEB Area (to be submitted in Excel format)

Appendix 2. Flora Species List

Appendix 3: Fauna Report – Dr. Peter Cale

Appendix 4. SEB Management Plan

Flora Species List – By Site(s)

Site A1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Callitris verrucosa	Scrub Cypress Pine	
Triodia irritans	Spinifex	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Carpobrotus modestus	Inland Pigface	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Brassica sp.		*
Acacia ligulata	Umbrella Bush	
Acacia brachybotrya	Grey Mulga-bush	
Atriplex stipitata	Bitter Saltbush	
Maireana brevifolia	Short-leaf Bluebush	

Site B1 & B2 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Eucalyptus largiflorens	River Box	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Carpobrotus modestus	Inland Pigface	
Myoporum montanum	Native Myrtle	
Atriplex stipitata	Bitter Saltbush	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Brassica sp.		*

Site C1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Maireana brevifolia	Short-leaf Bluebush	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Carpobrotus modestus	Inland Pigface	
Acacia ligulata	Umbrella Bush	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Salsola australis	Buckbush	
Rhagodia spinescens	Spiny Saltbush	
Acacia brachybotrya	Grey Mulga-bush	
Sisymbrium sp.	Wild Mustard	*
Salvia verbenaca var.	Wild Sage	*

Site D1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Eucalyptus largiflorens	River Box	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Sonchus asper ssp.	Rough Sow-thistle	*
Carrichtera annua	Ward's Weed	*
Atriplex stipitata	Bitter Saltbush	
Hordeum vulgare	Barley	*
Austrostipa sp.	Spear-grass	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Maireana brevifolia	Short-leaf Bluebush	

Sclerolaena muricata var. Five-spine Bindyi

Site E1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Eucalyptus largiflorens	River Box	
Myoporum platycarpum ssp.	False Sandalwood	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Carpobrotus modestus	Inland Pigface	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Brassica sp.		*
Acacia ligulata	Umbrella Bush	
Acacia brachybotrya	Grey Mulga-bush	
Atriplex stipitata	Bitter Saltbush	
Lycium ferocissimum	African Boxthorn	*
Pinus radiata	Radiata Pine	*
Atriplex suberecta	Lagoon Saltbush	

Site F1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Carpobrotus modestus	Inland Pigface	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Dissocarpus paradoxus	Ball Bindyi	
Rhagodia spinescens	Spiny Saltbush	
Callitris verrucosa	Scrub Cypress Pine	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Maireana brevifolia	Short-leaf Bluebush	
Acacia ligulata	Umbrella Bush	
Senna artemisioides ssp.	Desert Senna	
Brassica sp.		*
Elymus sp.	Wheat-grass	*

Site G1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
Carpobrotus modestus/rossii	Native Pigface	
Atriplex vesicaria	Bladder Saltbush	
Atriplex lindleyi ssp.	Baldoo	
Eucalyptus largiflorens	River Box	
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	
Dodonaea viscosa ssp. angustissima	Narrow-leaf Hop-bush	
Senna artemisioides ssp.	Desert Senna	
Maireana pyramidata	Black Bluebush	
Myoporum montanum	Native Myrtle	
Scleranthus pungens	Prickly Knawel	
Dissocarpus biflorus var.	Two-horn Saltbush	
Nitraria billardierei	Nitre-bush	
Carrichtera annua	Ward's Weed	*
Sonchus asper ssp.	Rough Sow-thistle	*

Site H1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
<i>Senna artemisioides</i> ssp.	Desert Senna	
<i>Dodonaea viscosa</i> ssp. <i>angustissima</i>	Narrow-leaf Hop-bush	
<i>Atriplex stipitata</i>	Bitter Saltbush	
<i>Carrichtera annua</i>	Ward's Weed	*
<i>Sonchus asper</i> ssp.	Rough Sow-thistle	*
<i>Maireana brevifolia</i>	Short-leaf Bluebush	
<i>Enchylaena tomentosa</i> var.	Ruby Saltbush	
<i>Austrostipa</i> sp.	Spear-grass	
<i>Carpobrotus modestus/rossii</i>	Native Pigface	

Site I1 - Proposed Clearance Site.

Common Name	Botanical Name	Introduced
<i>Alectryon oleifolius</i> ssp. <i>canescens</i>	Bullock Bush	
<i>Hordeum vulgare</i>	Barley	*
<i>Atriplex stipitata</i>	Bitter Saltbush	
<i>Sonchus asper</i> ssp.	Rough Sow-thistle	*
<i>Carrichtera annua</i>	Ward's Weed	*
<i>Senna artemisioides</i> ssp.	Desert Senna	
<i>Acacia ligulata</i>	Umbrella Bush	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush	

Site A1 - Proposed SEB Offset Site

Common Name	Botanical Name	Introduced
<i>Triodia irritans</i>	Spinifex	
<i>Callitris verrucosa</i>	Scrub Cypress Pine	
<i>Thysanotus baueri</i>	Mallee Fringe-lily	
<i>Lomandra leucocephala</i> ssp. <i>robusta</i>	Woolly Mat-rush	
<i>Leptospermum coriaceum</i>	Dune Tea-tree	
<i>Eucalyptus gracilis</i>	Yorrell	
<i>Eucalyptus oleosa</i> ssp.		
<i>Myoporum platycarpum</i> ssp.	False Sandalwood	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush	
<i>Atriplex stipitata</i>	Bitter Saltbush	
<i>Chenopodium curvispicatum</i>	Cottony Goosefoot	
<i>Melaleuca lanceolata</i>	Dryland Tea-tree	
<i>Einadia nutans</i> ssp.	Climbing Saltbush	

Site B1 - Proposed SEB Offset Site

Common Name	Botanical Name	Introduced
<i>Triodia irritans</i>	Spinifex	
	Broad-leaf Desert	
<i>Senna artemisioides</i> ssp. <i>X coriacea</i>	Senna	
<i>Dodonaea viscosa</i> ssp.	Sticky Hop-bush	
<i>Zygophyllum aurantiacum</i> ssp.	Shrubby Twinleaf	
<i>Dissocarpus paradoxus</i>	Ball Bindyi	
<i>Maireana pentatropis</i>	Erect Mallee Bluebush	
<i>Atriplex stipitata</i>	Bitter Saltbush	
<i>Chenopodium curvispicatum</i>	Cottony Goosefoot	

<i>Austrostipa elegantissima</i>	Feather Spear-grass
<i>Eucalyptus gracilis</i>	Yorrell
<i>Eucalyptus oleosa</i> ssp.	Mallee
<i>Pimelea stricta</i>	Erect Riceflower
<i>Lomandra effusa</i>	Scented Mat-rush

#### Site C1 - Proposed SEB Offset Site

Common Name	Botanical Name	Introduced
<i>Atriplex stipitata</i>	Bitter Saltbush	
<i>Sclerolaena muricata</i> var.	Five-spine Bindyi	
<i>Myoporum platycarpum</i> ssp.	False Sandalwood	
<i>Senna artemisioides</i> ssp.	Desert Senna	
<i>Maireana pentatropis</i>	Erect Mallee Bluebush	
<i>Zygophyllum apiculatum</i>	Pointed Twinleaf	
<i>Atriplex acutibractea</i> ssp.	Pointed Saltbush	
<i>Maireana sedifolia</i>	Bluebush	
<i>Eucalyptus oleosa</i> ssp.	Mallee	
<i>Lawrencia squamata</i>	Thorny Lawrencia	

#### Site D1 - Proposed SEB Offset Site

Common Name	Botanical Name	Introduced
<i>Melaleuca lanceolata</i>	Dryland Tea-tree	
<i>Eucalyptus gracilis</i>	Yorrell	
<i>Lomandra effusa</i>	Scented Mat-rush	
<i>Atriplex acutibractea</i> ssp.	Pointed Saltbush	
<i>Atriplex stipitata</i>	Bitter Saltbush	
<i>Maireana pentatropis</i>	Erect Mallee Bluebush	
<i>Rhagodia spinescens</i>	Spiny Saltbush	