

2800 COWALLA ROAD, COWALLA

VEGETATION ASSESSMENT

Prepared for: Greenacres Turf Group

Report Date: 31 March 2021

Version: 1

Report No. 2021-578

The logo for PGV Environmental is located in the bottom right corner of the page. It features the letters 'PGV' in a large, bold, white sans-serif font. Below 'PGV', the word 'ENVIRONMENTAL' is written in a smaller, white, all-caps sans-serif font. The background of the logo area is a vibrant orange with a subtle, diagonal line pattern.

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1 INTRODUCTION

1.1 Background

2800 (Lot 5257) Cowalla Road, Cowalla is located approximately 100km north-north-west of the Perth Central Business District in the Shire of Gingin (Figure 1). The site is 123.6973ha in size and has been used for stock grazing for many years (Figure 2).

The site is predominantly cleared of native vegetation although many native trees occur throughout the site. The trees occur in low-lying wetland areas as well as on higher, well-drained parts of the site.

The owners of the property, the Greenacres Turf Group, have applied to the Shire of Gingin to develop the site for a turf farm. Developing the turf farm will require clearing many of the native trees on the property.

PGV Environmental was commissioned by the Greenacres Turf Group to assess the vegetation on the property, in particular any areas of native vegetation that occur on the low-lying wetland areas.

2 EXISTING ENVIRONMENT

2.1 Land Use

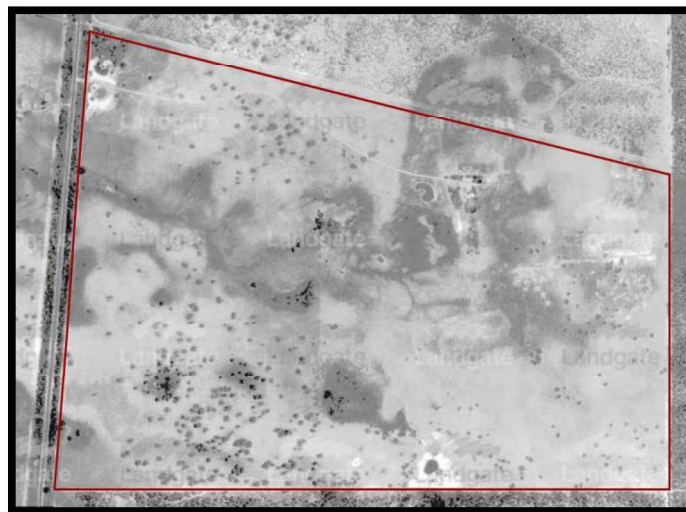
2.1.1 Zoning

The site is zoned 'General Rural' under the Shire of Gingin Local Planning Scheme No. 9.

2.1.2 Historical Land Use

The earliest available historic aerial photograph on-line shows that the site was mostly cleared of native vegetation in 1999 (Plate 1). The black and white photo clearly outlines the lower lying parts of the site (darker grey) as well as showing a large number of remnant trees dotted around the site.

Plate 1: Aerial Photograph 1999 (Landgate, 2021)



The most recently available aerial photograph from 2017 shows the condition of the site has remained largely unchanged apart from some additional infrastructure around the house and sheds (Plate 2).

Plate 2: Aerial Photograph 2017 (Landgate, 2021)



2.2 Topography

The site is flat to gently undulating with a range in elevation from around 51m – 60m AHD. The higher parts of the site are mostly in the southern area (Figure 2).

2.3 Geology and Soils

The site is mapped as part of the Bassendean System. The Bassendean System consists of very low relief, leached, grey siliceous Pleistocene sand dunes, intervening sandy and clayey swamps and gently undulating plains.

The soil phases mapped on the are:

- Bassendean, Phase 9 (212Bs_9) – Humic dark grey swamp soils;
- Bassendean, Phase 7 (212Bs_7) – Bleached sands; and
- Bassendean, Phase 7+8 (212Bs_7+8) – Bleached sands and lower slopes and flat areas (DPIRD, 2021)

2.4 Hydrology

Groundwater under the site is approximately between 40 and 60m AHD (Rutherford *et al.*, 2005) and is close to the surface in parts of the site. The regional direction of groundwater flow is generally to the west.

2.5 Wetlands

Seven wetlands are mapped on the site, either in their entirety or partially (Table 1, Plate 3, Figure 3). The wetlands are mostly Damplands (seasonally waterlogged basins) with the largest wetland (UFI 9068) designated as a Sumpland (seasonally inundated basin).

Table 1: Wetlands Mapped on the Site

Wetland UFI	Wetland Type	Management Category	
		Feb 2021	March 2021*
9233	Dampland	Conservation	Multiple Use
9232	Dampland	Multiple Use	Multiple Use
9068	Sumpland	Resource Enhancement	Multiple Use
9234	Dampland	Resource Enhancement	Multiple Use
9218	Dampland	Resource Enhancement	Multiple Use
9078	Dampland	Resource Enhancement	Multiple Use
9230	Dampland	Resource Enhancement	Multiple Use

* DBCA (2021)

At the time of the site assessment in February 2021 the management category of the wetlands included one small Conservation Category wetland (green on Plate 3), five Resource Enhancement wetlands (light green on Plate 3) and one Multiple Use wetland (blue on Plate 3) (National Map, 2021).

Plate 3: Geomorphic Wetland Map (8 February 2021)



Subsequent to the site assessment the hydrological consultant for Greenacres Turf Group was advised by the Department of Biodiversity, Conservation and Attractions (Michael Roberts email, 8 March 2021 Appendix 1) confirming that all wetlands on the site have been remapped as Multiple Use wetlands (DBCA, 2021). The email stated that *“the wetlands on Lot 5257 are no longer considered to be Resources Enhancement (REW) or Conservation category wetland (CCW) classification with the wetlands remapped to multiple use (MUW)”*.

3 VEGETATION AND FLORA

3.1 Methodology

A survey of the vegetation on the site was conducted by Dr Paul van der Moezel of PGV Environmental on 18 February 2021. The focus of the survey was mainly to assess the vegetation in the seven areas mapped as wetlands. However, observations of the vegetation in the dryland areas were also taken during the assessment.

Thirteen relevés of approximately 100m² were sampled from within the wetland areas.

3.2 Vegetation

3.2.1 Vegetation Types

The vegetation assessment found that the site consists almost entirely of cleared pasture with a large number of scattered trees on both wetland and dryland soils. Some native trees, shrubs and sedges occurred in parts of some wetlands. No intact native vegetation was recorded in any dryland areas.

The native vegetation types mapped on the site are shown in Figure 4 and described in Table 2. The native vegetation types recorded were as follows:


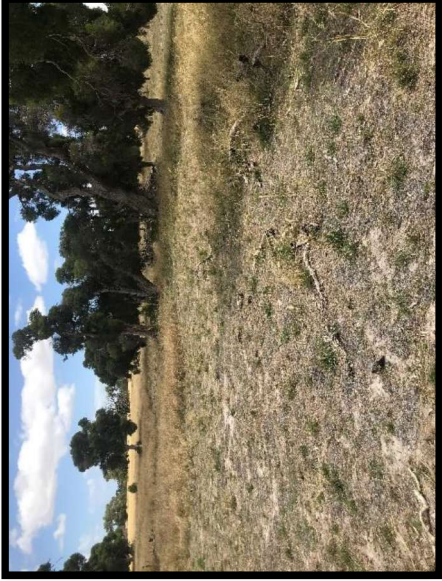
Wetlands

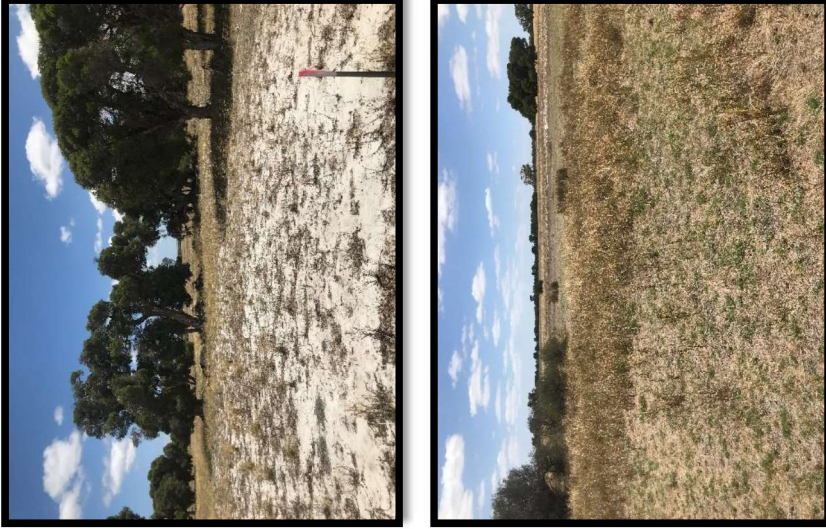
- Mp *Melaleuca preissiana* scattered trees over pasture
- MrMt *Melaleuca raphiophylla*/*M. teretifolia* Tall Open Scrub over *Lepidosperma longitudinale*/*Gahnia trifida* Sedgeland
- LIgt *Lepidosperma longitudinale*/*Gahnia trifida* Sedgeland
- Fn *Ficinia nodosa* Sedgeland
- Er *Eucalyptus rudis* tree

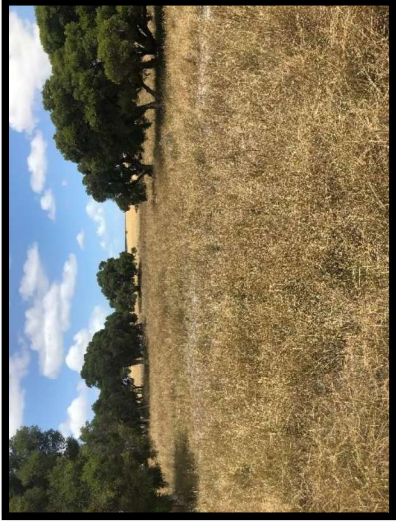

Drylands

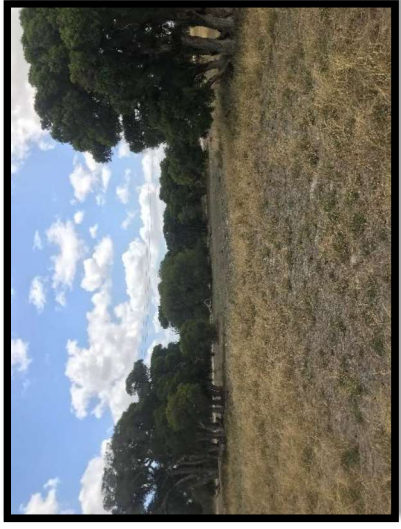
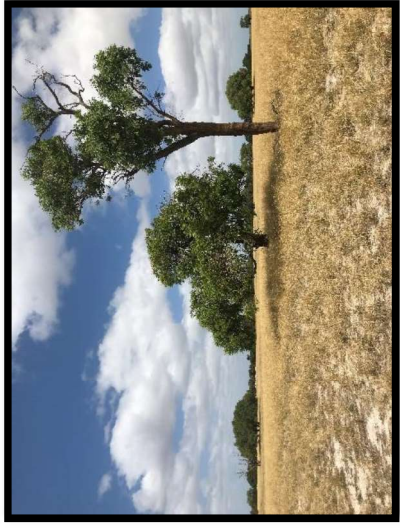
Et *Eucalyptus todtiana* scattered trees over pasture

The Relevés data recorded on the site are provided in Appendix 2.

Vegetation Type	Description	Photograph
<p>Wetland Vegetation</p>	<p>A small stand of native <i>Melaleuca raphiophylla</i> and <i>Melaleuca teretifolia</i> over <i>Lepidosperma longitudinale</i> and <i>Gahnia trifida</i> occurs in the central part of the wetland (bottom photo to the right). Most of the understorey however contains introduced species particularly Couch Grass and Barley Grass and also <i>Rumex acetosella</i>, <i>Rumex crispus</i> (Dock), <i>Cirsium vulgare</i> (Spear Thistle) and <i>Citrullus amarus</i> (Melon).</p> <p>Relevés 1,2,3,4,5 and 6 were located in this wetland</p>	
<p>UFI 9233</p> <p>Vegetation Types: Cleared, Mp</p>	<p>This is a small wetland that was previously mapped as a Conservation Category wetland and is now considered a Multiple Use wetland. The vegetation consists of several <i>Melaleuca preissiana</i> trees to 8m over introduced species including <i>Ehrharta calycina</i> (Perennial Veldtgrass), <i>Cynodon dactylon</i> (Couch Grass), <i>Arctotheca calendula</i> (Capeweed), <i>Cyperus</i> sp. No native understorey was present.</p> <p>Relevé 9 was located in this wetland</p>	

Vegetation Type	Description	Photograph
<p>Wetland Vegetation</p> <p>UFI 9232</p> <p>Vegetation Types: Cleared, Mp, MrMt, LIGt</p>	<p>This is a medium sized wetland that has remained as a Multiple Use wetland. The southern half of the wetland contains <i>Melaleuca preissiana</i> trees to 5m over a mix of native sedges (<i>Ficinia nodosa</i>, <i>Lepidosperma longituidinale</i>) and introduced species Perennial Veldtgrass, Capeweed, Couch Grass and <i>Cyperus</i> sp. (top photo to the right)</p> <p>The northwestern end of the mapped wetland is wetter than the southern end and contains a few <i>Melaleuca teretifolia</i> shrubs to 2m. (bottom photo to the right)</p> <p>Relevés 7 and 8 were located in this wetland</p>	

Vegetation Type	Description	Photograph
<p>Wetland Vegetation</p> <p>UFI 9234</p> <p>Vegetation Types: Cleared, Mp</p>	<p>This is a small wetland that was previously mapped as a Resource Enhancement wetland and is now considered a Multiple Use wetland. The vegetation consists of several <i>Melaleuca preissiana</i> trees to 5m over introduced species including <i>Ehrharta calycina</i> (Perennial Veldtgrass), <i>Taraxacum officinale</i> (Dandelion) and <i>Cyperus</i> sp. No native understorey was present.</p> <p>Relevé 10 was located in this wetland</p>	
<p>UFI 9230</p> <p>Vegetation Types: Cleared, Fn</p>	<p>This is a very small wetland straddling the mid-west boundary of the site that was previously mapped as a Resource Enhancement wetland and is now considered a Multiple Use wetland. The vegetation consists of native <i>Ficinia nodosa</i> Sedgeland with introduced species particularly Perennial Veldtgrass, Couch Grass as well as Guildford Grass, Capeweed and <i>Cyperus congestus</i>.</p> <p>Relevé 13 was located in this wetland</p>	

Vegetation Type	Description	Photograph
<p>Wetland Vegetation</p> <p>UFI 9078</p> <p>Vegetation Types: Cleared, Fn</p>	<p>This is a small wetland in the south-west corner of the site that was previously mapped as a Resource Enhancement wetland and is now considered a Multiple Use wetland. The vegetation is mostly cleared pasture grasses. One small stand of <i>Melaleuca preissiana</i> occurs at the north-west tip of the wetland.</p> <p>Relevés 11 and 12 were located in this wetland</p>	
<p>Dryland Vegetation</p> <p><i>Eucalyptus tottiana</i> scattered trees over pasture</p>	<p>Most of the elevated parts of the site contained scattered <i>Eucalyptus tottiana</i> (Pricklybark) trees over pasture on sandy dry soils. No other native shrubs, sedges, herbs etc were present in these areas apart from a few <i>Jacksonia furcellata</i> shrubs.</p> <p>No relevés were sampled from the areas of scattered <i>Eucalyptus tottiana</i>.</p>	

3.2.2 Vegetation Condition

The vegetation on the whole site was rated as Completely Degraded due to the absence of intact vegetation structure (trees, shrubs, sedges, herbs) and the predominance of introduced species.

3.2.3 Conservation Significance

None of the areas of vegetation on the site is a Threatened or Priority Ecological Community at State or Commonwealth level.

The vegetation is not part of an ecological corridor due to the highly cleared nature of the site.

3.3 Flora

3.3.1 Flora List

A total of 33 plant species were recorded in the relevé data as well as from walking through the site. The list includes 13 native and 20 non-native species.

The list is not exhaustive as the survey was not a Detailed Flora survey and was not undertaken in the peak flowering time of spring. However, due to the absence of any intact native vegetation or any areas of native vegetation in Good condition or better the list is likely to represent most of the native species on the site.

3.3.2 Conservation Significance

None of the species recorded in the vegetation assessment is a Threatened or Priority plant species.

A review of the Naturemap database and the EPBC Act Protected Matters Search Tool indicated that six Threatened species have been recorded in the general area of the site.

- *Drakaea elastica* (Glossy leafed Hammer Orchid)
- *Grevillea curviloba* subsp. *curviloba* (Narrow curved-leaf Grevillea)
- *Andersonia gracilis* (Slender Andersonia)
- *Anigozanthos viridis* subsp. *viridis* (Dwarf Green Kangaroo Paw)
- *Eleocharis keigheryi* (Keighery's Eleocharis)
- *Paracaleana dixonii* (Sandplain Duck Orchid)

None of the listed Threatened species is expected to occur on the site due to the absence of intact native vegetation.

Carnaby's Black Cockatoo are known to forage on the seed of *Eucalyptus tottiana* (Pricklybark, also known as Coastal Blackbutt). *Eucalyptus tottiana* is listed as a Medium priority species by Groom (2011).

4 TURF FARM

4.1 Design

The proposed turf farm includes the following elements:

- Five centre pivot irrigation plots ranging in area from 8.55ha to 21.63ha;
- a Research and Development Nursery;
- a constructed wetland;
- solar grid; and
- associated sheds and other buildings.

The proposed layout is shown in Appendix 4.

4.2 Impact on Vegetation

The proposed turf farm configuration will result in most of the scattered trees in the paddocks being cleared as well as many of small areas containing native vegetation in some of the wetlands.

To offset the clearing of trees from the site the turf farm proposes to construct and rehabilitate a wetland in the low-lying area that is a part of wetland UFI 9068. In addition to the rehabilitation around the constructed wetland, other parts of the site not developed for pivot irrigation will be able to be planted with native trees and shrubs, both dryland and wetland species.

The overall impact of the development should result in more trees and shrubs occurring on the site than currently exists and in a structure that encourages native wildlife, rather than the predominance of scattered trees in the paddocks.

4.3 Environmental Approvals

1.1 State Approvals

The scattered native trees shrubs and some sedgeland areas is considered to be 'native vegetation' as defined by the *Environmental Protection Act 1986*.

Any clearing of native vegetation requires a Clearing Permit unless an exemption applies.

Some trees may be able to be cleared according to Regulation 5, Item 19 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* which allows clearing of isolated trees if they are more than 50m away from any other native vegetation, and the vegetation is not in an Environmentally Sensitive Area (ESA). The site is not in an ESA. However, this exemption is only likely to apply to a small number of trees as most trees in the paddocks are closer than 50m from another tree.

Another possible exemption for clearing native vegetation on the site is Regulation 5, Item 14 of Regulations which allows the clearing of land for grazing that was lawfully cleared within 20 years prior to the proposed clearing. This exemption does not seem to apply to the scattered trees on the site as historic aerial photography, and the overall age of the many trees observed on the site indicates shows they are older than 20 years.

An approved Development Application for a turf farm does not provide an exemption in our opinion.

PGV Environmental therefore concludes that a Clearing Permit will be required to clear most of the native vegetation on the site.

A clearing permit would need to be submitted to the Department of Water and Environmental Regulation (DWER) who would assess the permit according to the ten Clearing Principles which include environmental factors such as flora, fauna and wetlands as well as other impacts such as erosion.

DWER should not require a detailed flora survey of the vegetation to be cleared given the absence of any intact native vegetation on the site.

1.2 Commonwealth Approvals

The Commonwealth *Environment Protection and Biodiversity Conservation Act 2000* (EPBC Act) protects species and plant communities that are listed as Matters of National Environmental Significance. The vegetation on the site may provide some habitat for the listed species Carnaby's Black Cockatoos. Carnaby's Black Cockatoo are known to forage on the seed of *Eucalyptus todtiana* of which there are numerous trees scattered on the upland sections of the site.

Any proposal to clear the *Eucalyptus todtiana* trees would need to consider whether the clearing is likely to lead to a significant impact on Carnaby's Cockatoos. According to the Black Cockatoo Referral Guidelines (2012) a significant impact on Carnaby's Cockatoo is the clearing of more than 1ha of foraging habitat.

The number of trees to be cleared and retained in the proposed turf farm layout, and the area of canopy that the cleared trees would cover, has not been calculated.

A potential significant impact would need to be referred to the Department of Agriculture, Water and the Environment in Canberra for determination whether to assess the proposed clearing or not.

5 CONCLUSIONS

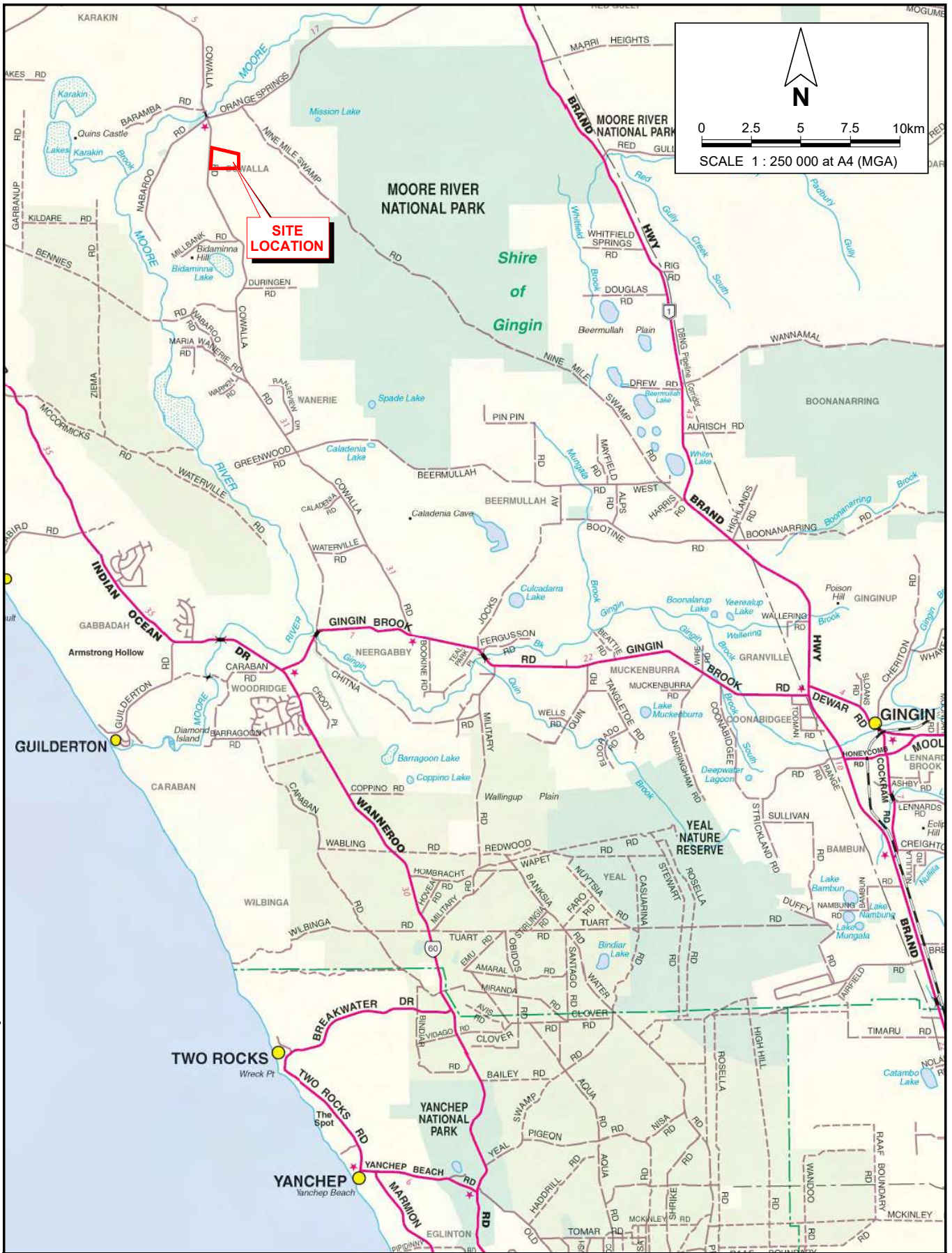
The vegetation assessment of 2800 Cowalla Road, Cowalla concludes the following:

- the site consists almost entirely of cleared pasture with a large number of scattered trees on both wetland and dryland soils.
- Some native trees, shrubs and sedges occur in parts of some wetlands. No intact native vegetation was recorded in any dryland areas.
- The native vegetation recorded on the site consisted of the following:
 - Et *Eucalyptus todtiana* scattered trees over pasture
 - Mp *Melaleuca preissiana* scattered trees over pasture
 - MrMt *Melaleuca raphiophylla*/*M. teretifolia* Tall Open Scrub over *Lepidosperma longitudinale*/*Gahnia trifida* Sedgeland
 - LIgt *Lepidosperma longitudinale*/*Gahnia trifida* Sedgeland
 - Fn *Ficinia nodosa* Sedgeland
 - Er *Eucalyptus rudis* tree
- The native vegetation is all rated as Completely Degraded condition and does not have any conservation significance as a Threatened or Priority Ecological Community;
- The native vegetation is not part of any ecological corridor between adjoining bushland areas;
- The seven wetlands on the site have all been reclassified by DBCA as Multiple Use wetlands. The vegetation assessment of the wetlands in this report supports the DBCA wetland reclassification;
- A total of 33 plant species were recorded on the site, including 13 native and 20 non-native species. A follow-up survey in spring is not considered necessary due to the Completely Degraded nature of the vegetation on the site;
- None of the Threatened species that have been recorded within proximity to the site would occur on the site due to the Completely Degraded nature of the vegetation;
- The proposed turf farm will result in many of the scattered trees in the dryland and wetland areas being cleared. A clearing permit will be required to clear any areas of native vegetation apart from a few isolated trees; and
- The *Eucalyptus todtiana* trees on the dryland soils provide foraging habitat for Carnaby's Black Cockatoo. The number of trees and amount of tree canopy to be cleared for the turf farm has not been calculated. The clearing of more than 1ha of foraging habitat may need to be referred under the Commonwealth EPBC Act for a decision whether to assess the clearing or not.

6 REFERENCES

- DBCA (2021). email from Michael Roberts (DBCA) to Marie Egan (Sports Turf Technology Pty Ltd) 8 March 2021
- Department of Primary Industries and Regional Development (DPIRD) (2021) *Natural Resource Information*. Accessed March 2021 <http://maps.agric.wa.gov.au/nrm-info/> Government of Western Australia, Perth.
- Groom (2011) *Plants Used by Carnaby's Black Cockatoo*. Department of Environment and Conservation.
- Landgate (2021) Historical Aerial Photography Accessed March 2021 <https://www.landgate.wa.gov.au/bmvf/app/mapviewer/> Government of Western Australia, Perth.
- National Map (2021) Map-Based Access to Spatial Data from Australian Government Agencies <http://nationalmap.gov.au/#wa> Accessed March 2021 Government of Australia
- Managed Recharge (2019). *2800 Cowalla Road: Numerical Groundwater Modelling Results*. Prepared for Greenacres Turf Group, 2 July 2019.
- Rutherford, J.L., Roy, V.J. and Johnson, S.L. (2005) Water Resource Series *The hydrogeology of groundwater dependent ecosystems in the Northern Perth Basin* Department of Environment Perth Western Australia

FIGURES



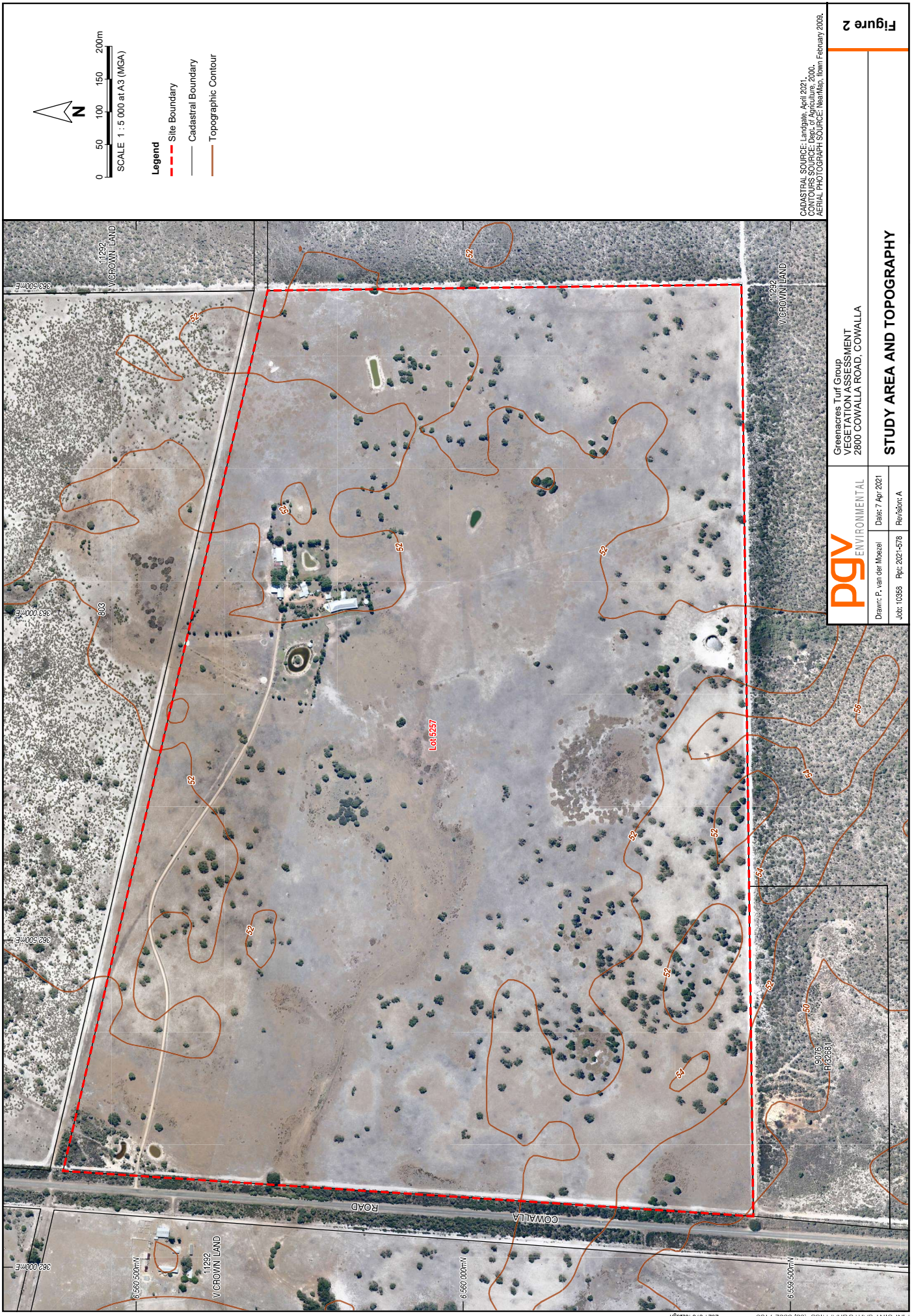
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Job: 10358 Rpt: 2021-578	Revision: A

Greenacres Turf Group
 VEGETATION ASSESSMENT
 2800 COWALLA ROAD, COWALLA

SITE LOCATION

Figure 1



CADASTRAL SOURCE: Landgate, April 2021.
 CONTOURS SOURCE: Dept. of Agriculture, 2000.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown February 2009.

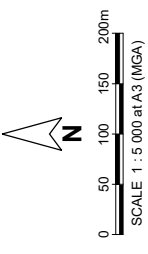
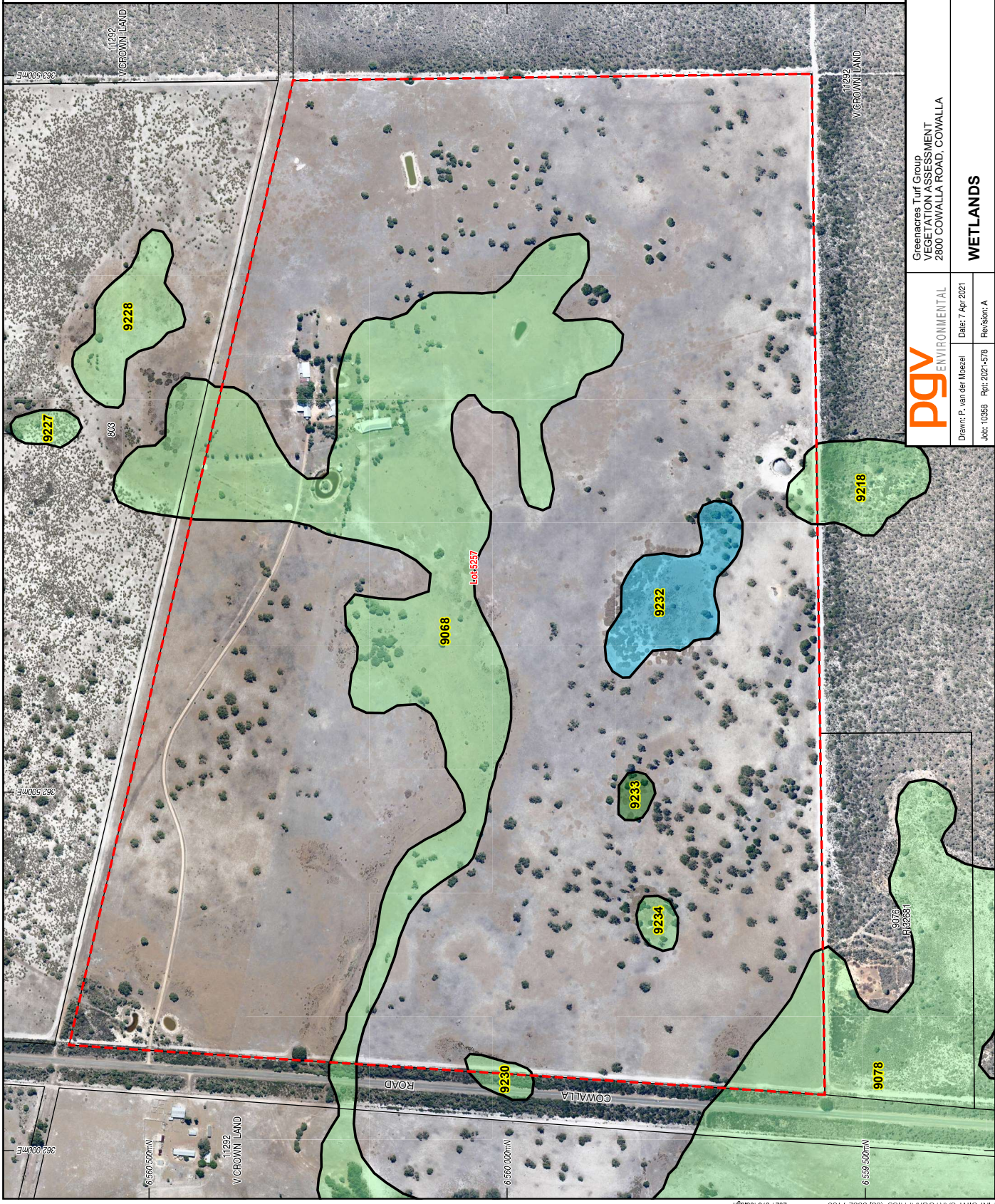
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Greeneyes Turf Club
 VEGETATION ASSESSMENT
 2800 COWALLA ROAD, COWALLA

Drawn: P. van der Meezel Date: 7 Apr 2021
 Job: 10358 Rpt: 2021-578 Revision: A

STUDY AREA AND TOPOGRAPHY

Figure 2

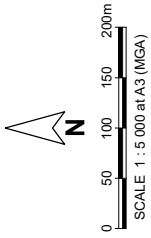


- Legend**
- - - Site Boundary
 - Cadastral Boundary
- Geomorphic Wetlands**
- Conservation Category
 - Resource Enhancement
 - Multiple Use
 - Wetland UFI

CADASTRAL SOURCE: Landgate, April 2021.
 WETLANDS SOURCE: DBCA, September 2020.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown February 2009.

	Greeneyes Turf Group VEGETATION ASSESSMENT 2800 COWALLA ROAD, COWALLA		WETLANDS
	Drawn: P. van der Meisel Job: 10358 Rpt: 2021-578	Date: 7 Apr 2021 Revision: A	

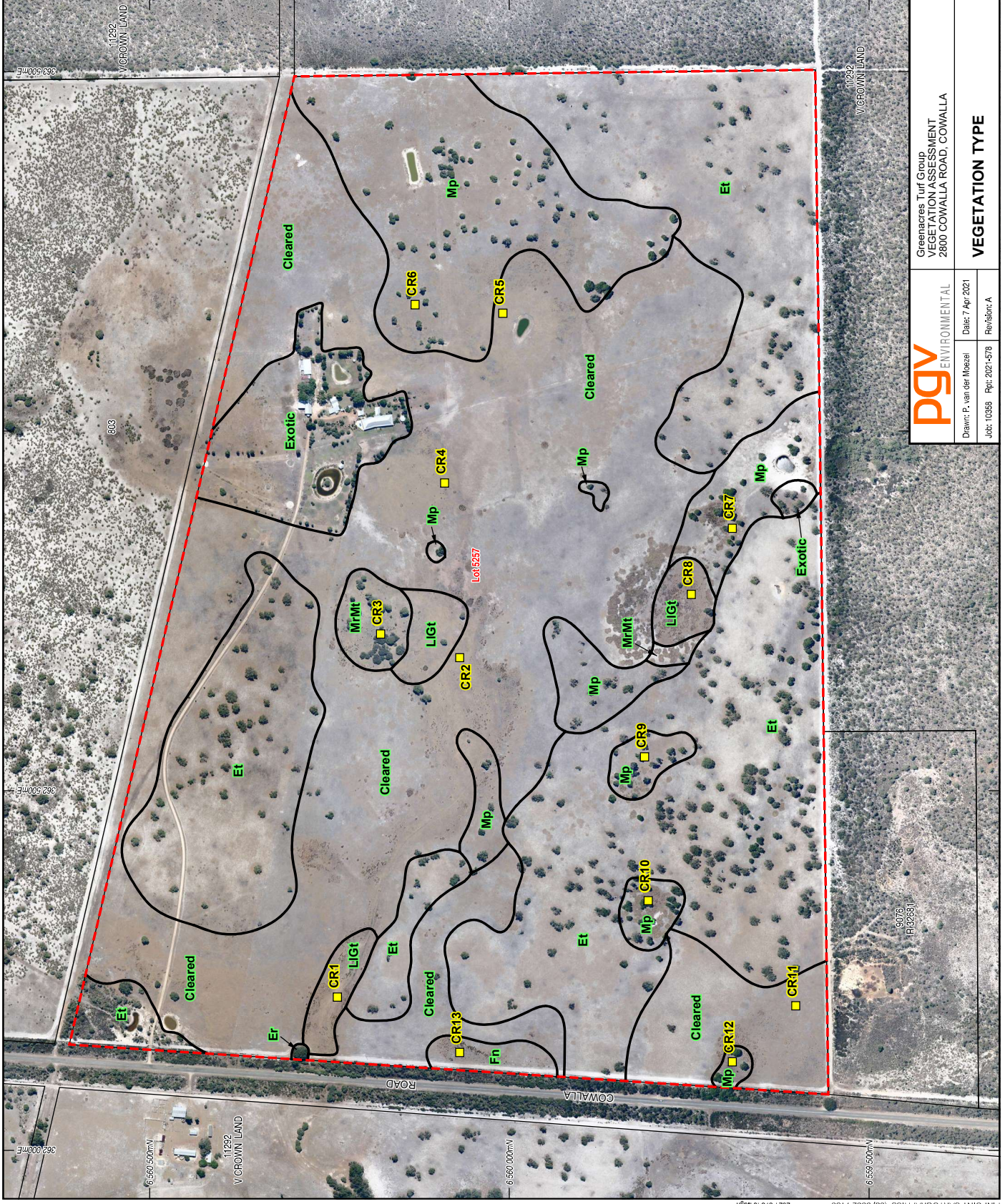
Figure 3



- Legend**
- - - Site Boundary
 - Cadastral Boundary
 - Relevé Location
 - Vegetation Type Boundary
 - Et Vegetation Type

Vegetation Types

- Mp** *Melaleuca preissiana* scattered trees over pasture
- MrMt** *Melaleuca rhaphiophylla/M. teretifolia* Tall Open Scrub over *Lepidosperma longitridate/Gahnia trifida* Sedgeland
- Et** *Eucalyptus toctiana* scattered trees over pasture
- LIGt** *Lepidosperma longitridate/Gahnia trifida* Sedgeland
- Fn** *Ficinia nodosa* Sedgeland
- Er** *Eucalyptus rudis* tree



CADASTRAL SOURCE: Landgate, April 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown February 2009.

	Greenspaces Trust Group VEGETATION ASSESSMENT 2800 COWALLA ROAD, COWALLA		VEGETATION TYPE
	Drawn: P. van der Meisel Job: 10358 Rpt: 2021-578	Date: 7 Apr 2021 Revision: A	

Figure 4

APPENDIX 1

DBCA (2021) Wetland Re-classification Email

From: Michael Roberts <michael.roberts@dbca.wa.gov.au>

Sent: Monday, 8 March 2021 12:56 PM

To: marie@sportsturf.net.au

Subject: RE: Development Application - Turf Farm - Lot 5257 Cowalla Rd, Cowalla (DBCA ref: PRS 46504)

Hello Marie

Apologies for the delay in responding, I have undertaken further liaison within the department and have been advised that as part of the department's review of the Geomorphic Wetlands Swan Coastal Plain dataset, the wetlands on Lot 5257 are no longer considered to be Resources Enhancement (REW) or Conservation category wetland (CCW) classification with the wetlands remapped to multiple use (MUW). This information was not available previously as the revised dataset has not been finalised or publicly released.

Accordingly given that the wetlands are multiple use, there is not the same level of protection or restrictions on development when compared to REW or CCW wetlands. As such the department does not object to the proposed development.

Regards

Michael Roberts | Planning Officer (Land Use) |

Department of Biodiversity, Conservation and Attractions

Parks and Wildlife Service

[Swan Coastal District](#)

[5 Dundobar Road Wanneroo WA 6065](#)

P 9303 7755

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

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Help stop the spread of COVID-19

- Avoid close contact with others
try to keep at least 1.5 metres away
and avoid shaking hands
- Wash your hands regularly
for at least 20 seconds, using soap &
water or alcohol based gel
- Cover your mouth/nose
when you cough/sneeze
using a tissue or flexed elbow
- Stay home if you are sick
don't go to work or school
if you have symptoms

INFORMATION HOTLINE: 132 68 43 WEB: wa.gov.au

APPENDIX 2

Relevé Data

Relevé CR1		
Co-ordinates	362213 6560239	
Vegetation Type	<i>Cynodon dactylon</i> (Couch) Grassland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9068	
Species	Height	Cover
* <i>Cynodon dactylon</i>	0.2	90
<i>Lepidosperma longitudinale</i>	0.4	10
* <i>Lotus subbiflorus</i>	0.1	5
* <i>Ehrharta longiflora</i>	0.3	1
* <i>Hordeum leporinum</i>	0.1	1
* <i>Cyperus gymnocaulos</i>	0.4	<1
* <i>Romulea rosea</i>	0.1	<1
* <i>Rumex crispus</i>	0.3	<1




Relevé CR2		
Co-ordinates	362685 6560069	
Vegetation Type	<i>Cynodon dactylon</i> (Couch) Grassland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9068	
Species	Height	Cover
* <i>Cynodon dactylon</i>	0.2	80
* <i>Hordeum leporinum</i>	0.2	20
<i>Gahnia trifida</i>	0.6	2
* <i>Eragrostis curvula</i>	0.3	1
* <i>Citrullus amarus</i>	0.1	1
* <i>Ehrharta longiflora</i>	0.3	<1
* <i>Romulea rosea</i>	0.1	<1



Relevé CR3		
Co-ordinates	362718 6560179	
Vegetation Type	<i>Melaleuca raphiophylla</i> / <i>M. teretifolia</i> Tall Open Scrub over <i>Lepidosperma longitudinale</i> / <i>Gahnia trifida</i> Sedgeland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9068	
Species	Height	Cover
<i>Melaleuca raphiophylla</i>	5	1
<i>Melaleuca teretifolia</i>	1	2
* <i>Hordeum leporinum</i>	0.3	50
* <i>Cynodon dactylon</i>	0.1	30
* <i>Rumex acetosella</i>	0.2	10
* <i>Dittrichia graveolens</i>	0.4	2
<i>Lepidosperma longitudinale</i>	0.3	1
* <i>Sonchus asper</i>	0.4	<1
* <i>Cirsium vulgare</i>	0.2	<1
* <i>Citrullus amarus</i>	0.1	<1



Relevé CR4		
Co-ordinates	362928 6560090	
Vegetation Type	<i>Cynodon dactylon</i> (Couch) Grassland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9068	
Species	Height	Cover
* <i>Cynodon dactylon</i>	0.1	60
* <i>Hypochaeris glabra</i>	Flat	10
* <i>Cyperus gymnocaulos</i>	0.5	1
<i>Gahnia trifida</i>	0.5	<1
* <i>Avena fatua</i>	0.5	<1
<i>Ficinia nodosa</i>	0.3	<1



Relevé CR5		
Co-ordinates	363164 6560009	
Vegetation Type	<i>Cynodon dactylon</i> (Couch) Grassland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9068	
Species	Height	Cover
* <i>Cynodon dactylon</i>	0.1	80
* <i>Erodium botrys</i>	0.1	40
* <i>Arctotheca calendula</i>	Flat	20



Relevé CR6		
Co-ordinates	363176 6560131	
Vegetation Type	<i>Melaleuca preissiana</i> scattered trees over weeds	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9068	
Species	Height	Cover
<i>Melaleuca preissiana</i>	6	2
* <i>Cynodon dactylon</i>	0.1	50
* <i>Arctotheca calendula</i>	Flat	50
* <i>Ehrharta calycina</i>	0.1	1
* <i>Cyperus gymnocaulos</i>	0.4	<1
* <i>Persicaria prostrata</i>	0.2	<1
<i>Lepidosperma longitudinale</i>	0.2	<1
* <i>Citrullus amarus</i>	0.1	<1



Relevé CR7		
Co-ordinates	362865 6559690	
Vegetation Type	<i>Melaleuca preissiana</i> scattered trees over weeds	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9232	
Species	Height	Cover
<i>Melaleuca preissiana</i>	5	10
* <i>Ehrharta calycina</i>	0.4	20
* <i>Arctotheca calendula</i>	Flat	2
* <i>Cynodon dactylon</i>	0.1	1
<i>Ficinia nodosa</i>	0.4	<1
* <i>Cyperus gymnocaulos</i>	0.4	<1
<i>Lepidosperma longitudinale</i>	0.3	<1



Relevé CR8		
Co-ordinates	362773 6559747	
Vegetation Type	<i>Cynodon dactylon</i> (Couch) Grassland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9232	
Species	Height	Cover
* <i>Cynodon dactylon</i>	0.1	80
<i>Lepidosperma longitudinale</i>	0.3	20
* <i>Ehrharta calycina</i>	0.4	10
* <i>Hordeum leporinum</i>	0.1	10
<i>Melaleuca teretifolia</i>	1-2	1
* <i>Cyperus gymnocaulos</i>	0.3	1
<i>Ficinia nodosa</i>	0.4	<1
* <i>Romulea rosea</i>	0.2	<1



Relevé CR9		
Co-ordinates	362547 6559812	
Vegetation Type	<i>Melaleuca preissiana</i> scattered trees over weeds	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9233	
Species	Height	Cover
<i>Melaleuca preissiana</i>	8	10
* <i>Ehrharta calycina</i>	0.4	20
* <i>Cynodon dactylon</i>	0.1	20
* <i>Cyperus congestus</i>	0.4	5
* <i>Romulea rosea</i>	0.1	1



Relevé CR10		
Co-ordinates	362347 6559807	
Vegetation Type	<i>Melaleuca preissiana</i> scattered trees over weeds	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9234	
Species	Height	Cover
<i>Melaleuca preissiana</i>	5	10
* <i>Ehrharta calycina</i>	0.4	50
* <i>Cyperus gymnocaulos</i>	0.4	20
* <i>Taraxacum officinale</i>	Flat	<1



Relevé CR11		
Co-ordinates	362201 6559602	
Vegetation Type	<i>Ehrharta calycina</i> (Veldtgrass) Grassland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9078	
Species	Height	Cover
* <i>Ehrharta calycina</i>	0.5	80
* <i>Cynodon dactylon</i>	0.1	5
* <i>Romulea rosea</i>	0.1	<1



Relevé CR12		
Co-ordinates	362123 6559690	
Vegetation Type	<i>Melaleuca preissiana</i> scattered trees over weeds	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9078	
Species	Height	Cover
<i>Melaleuca preissiana</i>	4	5
<i>Melaleuca teretifolia</i>	2	<1
* <i>Cynodon dactylon</i>	0.1	50
* <i>Arctotheca calendula</i>	Flat	30
* <i>Ehrharta calycina</i>	0.4	20
* <i>Cyperus gymnocaulos</i>	0.4	10
* <i>Romulea rosea</i>	0.1	<1



Relevé CR13		
Co-ordinates	362136 6560069	
Vegetation Type	<i>Ficinia nodosa</i> Sedgeland	
Vegetation Condition	Completely Degraded	
Wetland	UFI 9230	
Species	Height	Cover
* <i>Ehrharta calycina</i>	0.5	20
* <i>Arctotheca calendula</i>	Flat	20
<i>Ficinia nodosa</i>	0.5	15
* <i>Cynodon dactylon</i>	0.1	10
<i>Juncus pallidus</i>	0.3	<1
* <i>Romulea rosea</i>	0.1	1
* <i>Cyperus congestus</i>	0.1	<1



APPENDIX 3
Plant Species List

2800 Cowalla Road - Provisional Flora List

* - Introduced species

MONOCOTYLEDONS

CYPERACEAE

Cyathochaeta avenacea

**Cyperus congestus*

**Cyperus gymnocaulos*

Ficinia nodosa

Gahnia trifida

Lepidosperma longitudinale

Lepidosperma sp

IRIDACEAE

**Romulea rosea*

JUNACEAE

Juncus pallidus

POACEAE

**Avena fatua*

**Cynodon dactylon*

**Ehrharta calycina*

**Eragrostis curvula*

**Hordeum leporinum*

DICOTYLEDONS

ASTERACEAE

**Arctotheca calendula*

**Cirsium vulgare*

**Dittrichia graveolens*

**Hypochaeris glabra*

**Sonchus asper*

**Taraxacum officinale*

CUCURBITACEAE

**Citrullus amarus*

FABACEAE

Jacksonia furcellata

**Lotus subbiflorus*

GERANIACEAE

**Erodium botrys*

MYRTACEAE

Eucalyptus rudis

Eucalyptus todtiana

Kunzea glabrescens

Melaleuca preissiana

Melaleuca raphiophylla

Melaleuca teretifolia

POLYGONACEAE

**Persicaria prostrata*

**Rumex acetosella*

**Rumex crispus*