

Your reference: CPS7063/1
Our reference: JEC16093.01

**SPRING FLORA AND VEGETATION SURVEY AND TARGETED CONOSPERMUM
UNDULATUM SEARCH, LOT 107 CLIFFORD ROAD, MADDINGTON (CPS7063/1)**

Juceda Investments Pty Ltd (Juceda) submitted an application to the Department of Environmental Regulation (DER) to clear 4.62 ha of vegetation, including an area of 2.36 ha within Lot 107 Clifford Road, Maddington (referred to by DER as Area A; hereafter referred to in this letter as the Survey Area). DER responded with a letter with the following advice:

- Native vegetation growing in association with a Conservation Category Wetland will be impacted by the proposed clearing in Area A and is likely to impact on the water quality of the wetland. A 50 metre buffer to this wetland is recommended to mitigate these impacts. Alternatively, information on actions to be taken to mitigate these impacts is required.
- A rare flora species, *Conospermum undulatum*, has been recorded within Area A, is known to occur within the local area and there is a reasonable probability that these may continue to occur within the area under application. As the flora survey undertaken in March 2016 was not undertaken within this species' flowering period it may not have been identifiable. A flora survey targeted at this species undertaken at the appropriate time of the year will determine whether the proposed clearing will impact on this flora species. Please note that should rare flora be identified, additional survey of surrounding areas to determine population size may also be required.
- In accordance with section 51E(1)(d) of the EP Act, . . . a flora survey [must] be carried out for the proposed area of clearing within Area A. The survey methodology must be consistent with Guidance Statement no. 51 published by the Environmental Protection Authority.

A Senior Ecologist from Strategen conducted a spring flora and vegetation survey and a targeted search for *Conospermum undulatum* on Lot 107 on 21 September 2016 to satisfy the requirements of this letter.

Methods

Traverses throughout the Survey Area were undertaken to search for *Conospermum undulatum*, and any other Threatened or Priority Flora species.

Three quadrats were sampled within the Survey Area to compile a species list and refine the vegetation types defined in the report entitled *Native vegetation clearing permit application [Purpose Permit] - Supporting documentation: Lots 23, 101, 103, 105 and 107 Clifford Street, Lots 3, 4 and 5 Bickley Road, Lots 3 and 4 Kenwick Road and Lot 305 Kelvin Road, Maddington* prepared by Strategen in May 2016. Vegetation condition was assessed according to the scale outlined in *Bushland Plant Survey: A Guide to Plant Community Survey for the Community* (Keighery 1994). The survey was conducted in line with Guidance Statement No. 51 prepared by the Environmental Protection Authority (EPA): *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004).

Additionally, notes were made regarding connectivity of the vegetation within the Survey Area to vegetation of the adjacent Conservation Category Wetland.

Results and discussion

The *Wavy-leaved Smokebush (Conospermum undulatum) Recovery Plan* (Department of Environment and Conservation 2009) describes the habitat for this species as “sand and sandy clay soils, often over laterite, on flat or gently sloping sites between the Swan and Canning Rivers. A few records are from slightly swampy habitat.” As the habitat requirements for this species are very general, the entirety of the Survey Area could be considered suitable habitat; as such, the entire Survey Area was thoroughly traversed in order to search for the species. No individuals of *Conospermum undulatum* or any other Threatened or Priority Flora species were recorded within the Survey Area.

Four vegetation types were recorded within the Survey Area (Table 1, Figure 1). Vegetation condition ranged from Good, which encompassed a small area of vegetation along the fenceline running southwest to northeast between the Survey Area and the adjacent Bush Forever site (Clifford St Bushland, Maddington), to Completely Degraded. Vegetation types broadly concur with those described in the Strategen survey conducted in March 2016; minor differences are due to the more detailed study of the Survey Area as described in this letter, and the presence of more species in flower during spring.

Table 1: Vegetation types recorded within Survey Area

Vegetation type	Description	Vegetation condition
1	<i>Eucalyptus marginata</i> , <i>Allocasuarina fraseriana</i> , and * <i>Leptospermum laevigatum</i> woodland over tall shrubland of native and exotic species including * <i>Chamaecytisus palmensis</i> over native and exotic species including <i>Xanthorrhoea preissii</i> , * <i>Ehrharta calycina</i> , * <i>Oxalis pes-caprae</i> and * <i>Arctotheca calendula</i> .	Degraded
2	* <i>Leptospermum laevigatum</i> thicket over isolated occurrences of <i>Adenanthos cygnorum</i> , <i>Jacksonia floribunda</i> and Restionaceae sp., over patches of closed herbland/grassland of exotic species including * <i>Arctotheca calendula</i> and * <i>Bromus diandrus</i> .	Completely Degraded
3	Herbland of <i>Dasyopogon bromeliifolius</i> , <i>Hibbertia hypericoides</i> , <i>Alexgeorgea nitens</i> and <i>Quinetia urvillei</i> with emergent individuals of <i>Adenanthos cygnorum</i> , <i>Xanthorrhoea preissii</i> and <i>Allocasuarina fraseriana</i> .	Good
4	Cleared area with isolated occurrences of <i>Verticordia</i> sp., <i>Adenanthos cygnorum</i> , <i>Hypocalymma angustifolium</i> and <i>Conostylis serrulata</i> and * <i>Leptospermum laevigatum</i> over patches of * <i>Watsonia meriana</i> herbland and * <i>Ehrharta calycina</i> grassland.	Completely Degraded

The only vegetation bearing any relation to vegetation in the adjacent Bush Forever site is that of VT3 in the north-eastern corner of the Survey Area along the fence-line. This area covers 0.09 ha and comprises 18 native species from 17 families, which appeared to be a combination of remnant and naturally regenerating vegetation (Table 2).

Table 2: Native species recorded in VT3

Family	Species	Recorded in adjacent Bush Forever vegetation
Asparagaceae	<i>Lomandra sonderi</i>	
Asteraceae	<i>Quinetia urvillei</i>	
Casuarinaceae	<i>Allocasuarina fraseriana</i>	
Colchicaceae	<i>Burchardia congesta</i>	Y
Cyperaceae	<i>Mesomelaena pseudostygia</i>	Y
Dasypogonaceae	<i>Dasypogon bromeliifolius</i>	Y
Dilleniaceae	<i>Hibbertia hypericoides</i>	Y
Droseraceae	<i>Drosera macrantha</i>	
Goodeniaceae	<i>Dampiera linearis</i>	Y
Haemodoraceae	<i>Conostylis serrulata</i>	Y
Myrtaceae	<i>Beaufortia ?elegans</i>	
Orchidaceae	<i>Diuris corymbosa</i>	
Poaceae	<i>Neurachne alopecuroidea</i>	
Proteaceae	<i>Adenanthos cygnorum</i>	
Restionaceae	<i>Alexgeorgea nitens</i>	Y
Stylidiaceae	<i>Levenhookia pusilla</i>	
	<i>Stylidium calcaratum</i>	Y
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>	

A condition monitoring quadrat surveyed in the adjacent Bush Forever site contained 23 native species, and demonstrated some similarity to the suite of species in VT3 (eight species in common, Table 2) Plate 1. Neither VT3 nor the Bush Forever condition monitoring quadrat contained any of the typical indicator species that would be expected to commonly occur in wetlands of the Swan Coastal Plain. This corresponds to the Geomorphic Wetland of the Swan Coastal Plain mapping provided by the WA Atlas, which shows that the boundary of the Conservation Category Wetland is approximately 20 m from the Lot 107 property boundary (Figure 1).



Plate 1: Vegetation characteristic of VT3

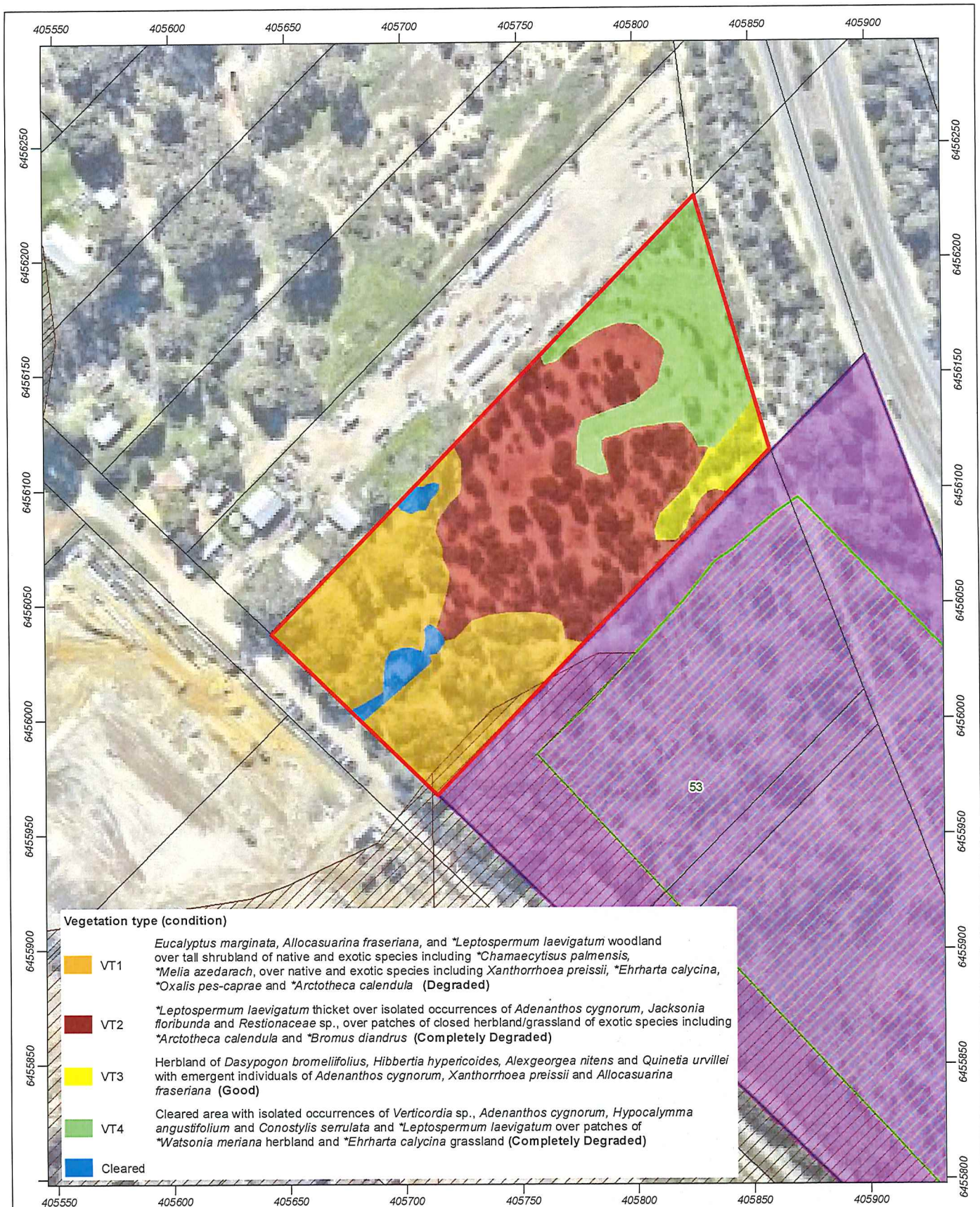
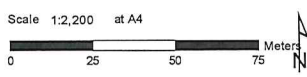


Figure 1: Environmental attributes



Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

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Author: DWhite

Source: Aerial image: Nearmap 2016; Wetlands: DPaW 2014; Bush Forever: DPL 2012;

Legend

- Survey area
- Conservation
- Multiple Use
- Bush Forever sites



Conclusion

No individuals of the species *Conospermum undulatum* were recorded within the Survey Area.

Four vegetation types were recorded, of which one (VT3) could be considered a combination of remnant and regenerating native vegetation, which had eight species in common with a condition monitoring quadrat surveyed in the adjacent Bush Forever site.

While the suite of species recorded in VT3 demonstrated some similarity with nearby vegetation in the adjacent Bush Forever site, there appeared to be limited connectivity between vegetation in the Survey Area and the Bush Forever site due to the two areas of vegetation being separated by a fence-line and a firebreak. The easternmost boundary of VT3 is located at a distance of approximately 17 m from the wetland boundary (Figure 1), and VT3 did not contain typical Swan Coastal Plain wetland species. As such, clearing within VT3 would not result in the removal of any wetland vegetation, or any vegetation mapped as a wetland.

Clearing within the overall Survey Area would be unlikely to impact values of the wetland mapped within the Bush Forever site, for the following reasons:

- lack of groundwater and surface water connectivity between the two sites, as surface water in the Bush Forever site and groundwater within the Survey Area flow approximately north to south
- no increase or change in surface water in the Bush Forever site resulting from construction, as the proposed development of the Survey Area will involve construction of hardstand over the entire site, from which surface water hardstand will be treated and drained to the south
- the association of Lot 107 and the adjacent Bush Forever has been severed or degraded for over 40 years. The site was cleared between 1964 and 1974, potentially for sand mining purposes. The site remained devoid of vegetation until regeneration occurred between 1985 and 1995. Since 1995 the site has remained in a degraded and predominantly cleared state. The site remains in a predominantly degraded state and is unlikely to act as an effective buffer to the wetland due to the fact that the Survey Area is predominantly cleared and revegetated with introduced species
- in addition to drainage, the design of the development on Lot 107 can include structures to manage interaction with the adjacent Bush Forever site.



