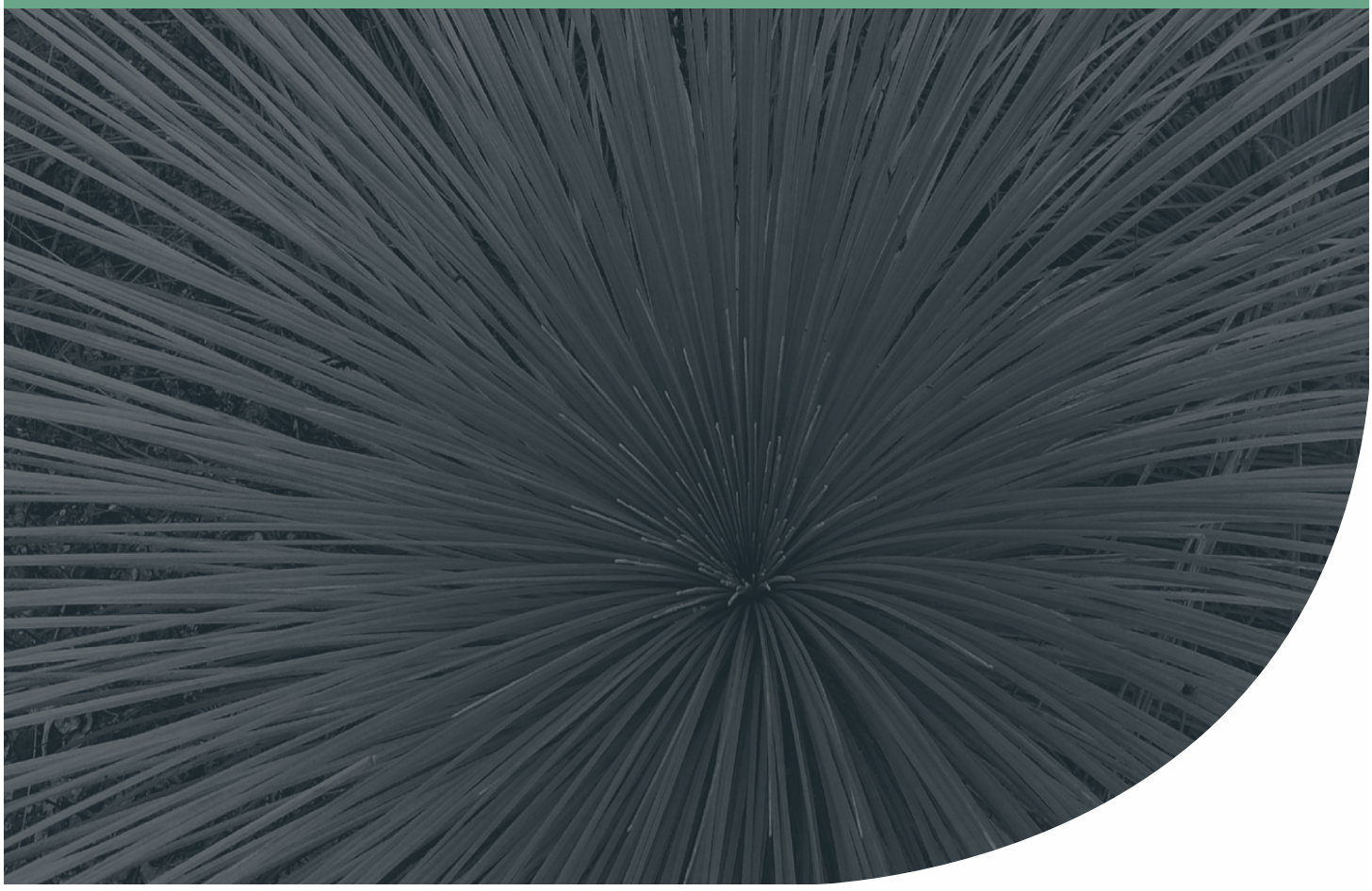
Reconnaissance Flora and Vegetation Assessment

Kent Street Sand Pit

Project No: EP20-055(05)

Prepared for Town of Victoria Park
July 2021



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Executive Summary

The Town of Victoria Park engaged Emerge Associates to conduct a reconnaissance flora and vegetation assessment to provide information on the flora and vegetation values the 'Kent Street Sand Pit' which comprises part of Lot 705 Kent Street in Kensington (referred to herein as the 'site').

As part of the assessment a desktop review of relevant background information was completed and a field survey was undertaken on 23 June 2021. During the field survey an assessment was made on the type, condition and values of vegetation across the site.

Outcomes of the survey include the following:

- A total of 31 native and 28 non-native (weed) species were recorded in the site.
- Three individuals of the priority 4 flora species, *Dodonaea hackettiana,* were recorded in the south-western portion of the site.
- No threatened flora species were recorded within the site.
- No threatened or other priority flora species are considered likely to occur in the site due to lack of suitable habitat.
- The vegetation within the site was classified into the following two plant communities:
    - **Mixed shrubland** which occurs on the perimeter of the site and extends over 0.26 ha. This community was mapped as being in 'degraded' condition.
    - **Non-native** which occurs across the remainder of the site and extends over 4.06 ha. This community was mapped as being in 'completely degraded' condition.
- The **mixed shrubland** vegetation is part of a larger patch of the 'banksia woodlands of the Swan Coastal Plain' threatened ecological community (TEC). This TEC is listed as 'endangered' under the *Environment Protection and Biodiversity Conservation Act 1999*.
- The **mixed shrubland** vegetation also represents the 'banksia woodlands of the Swan Coastal Plain' priority ecological community (PEC). This PEC is listed as 'priority 3'.
- The **mixed shrubland** plant community contributes to a larger patch of native vegetation that provides habitat for native fauna species including some of conservation significance.

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Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
EPA	Environmental Protection Authority
DBCA	Department of Biodiversity, Conservation and Attractions
DoW	Department of Water (now DWER)
DWER	Department of Water and Environmental Regulation
DPaW	Department of Parks and Wildlife
WALGA	Western Australia Local Government Association

Table A2: Abbreviations – General terms

General terms	
ESA	Environmentally sensitive area
FCT	Floristic community type
IBRA	Interim Biogeographic Regionalisation of Australia
NVIS	National Vegetation Inventory System (ESCAVI 2003)
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
PEC	Priority ecological community
T	Threatened
TEC	Threatened ecological communities
WoNS	Weeds of National Significance

Table A3: Abbreviations – Legislation

Legislation	
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
CALM Act	Conservation and Land Management Act 1984
CS Act	Contaminated Sites Act 2003
EP Act	Environmental Protection Act 1986
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
LA Act	Land Administration Act 1997
SCRM Act	Swan and Canning Rivers Management Act 2006

Table A4: Abbreviations – Units of measurement

Units of measurement	
ha	Hectare
km	Kilometre
m	Metre
mAHD	m in relation to the Australian height datum
mm	Millimetre
^{o}C	Degrees Celsius

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1 Introduction

1.1 Project background

Emerge Associates (Emerge) were engaged by the Town of Victoria Park to characterise the flora and vegetation values within the Kent Street Sand Pit, which is part of Lot 705 Kent Street in Kensington (referred to herein as the 'site'). The site is located approximately five kilometres (km) south-east of the Perth Central Business District within the Town of Victoria Park.

The site is approximately 4.32 hectares (ha) in size and is bounded by Kent Street to the south-east, Baron-Hay Court to the south-west and Kensington Bushland Reserve to the other sides. The location and extent of the site is shown in **Figure 1**.

1.2 Purpose and scope of work

The scope of work was specifically to undertake a flora and vegetation assessment within the site to the standard required of a reconnaissance survey with reference to the Environmental Protection Authority's (EPA's) technical guidance (EPA 2016).

As part of this scope of work, the following tasks were undertaken:

- Desktop review of relevant background information pertaining to the site and surrounds, including database searches for threatened flora species and ecological communities.
- A field survey to record a comprehensive list of flora species and assess vegetation type and condition.
- Mapping of plant communities, vegetation condition and conservation significant flora and vegetation.
- Identification of potential habitat for conservation significant flora and vegetation and an assessment of likelihood of occurrence.
- Documentation of the desktop assessment, methodology, field survey and results into a report.

2 Environmental Context

2.1 Climate

Climate influences the types of vegetation that grow in a region and the life cycles of the flora present. It is therefore critical for a flora and vegetation survey to respond appropriately to climatic conditions to ensure that surveys are conducted during times when flora species are easiest to detect and identify.

The south-west of Western Australia experiences a Mediterranean climate of hot dry summers and cool wet winters. In Mediterranean type climates some flora species will typically spend part of their lifecycle as either underground storage organs or as seed. This is an adaptation to unfavourable environmental conditions such as excessive heat and drought that occur over the summer period. These species, known as 'geophytes' or 'annuals', tend to re-emerge during winter when favourable conditions return and are most visible during spring, which is the flowering period for a majority of plant species. Therefore, spring is the optimal time to complete flora and vegetation surveys in the south-west of WA.

An average of 730.9 millimetres (mm) of rainfall is recorded annually from the Perth Metro weather station (no. 9225), which is the closest weather station, located approximately 5 km from the site. The majority of this rainfall is received between the months of May and September. Mean maximum temperatures at the Perth Metro weather station range from 18.5°C in July to 31.5°C in February, while mean minimum temperatures range from 7.9°C in July to 18.3°C in February (BoM 2021).

A total of 194.8 mm of rain was recorded during the period from March to May 2021 prior to the survey which is higher than the combined long-term average of 144.4 mm for the same months (BoM 2021). Since the survey was undertaken outside of the main flowering period (spring), the amount of rainfall was not considered to affect the survey outcomes.

2.2 Geomorphology and soils

Landform and soils influence vegetation types at regional and local scales. The site occurs on the Swan Coastal Plain, which is the geomorphic unit that characterises much of the Perth metropolitan area.

The Swan Coastal Plain is approximately 500 km long and 20 to 30 km wide and is roughly bound by the Indian Ocean to the west and the Darling Scarp to the east. Broadly, the Swan Coastal Plain consists of two sedimentary belts of different origin. Its eastern side comprises the Pinjarra Plain which formed from the deposition of alluvial material washed down from the Darling Scarp, while its western side comprises three dune systems that run roughly parallel to the Indian Ocean coastline (Seddon 2004). These dune systems, referred to as Quindalup, Spearwood and Bassendean associations, represent a succession of coastal deposition that has occurred since the late Quaternary period (approximately two million years ago) (Kendrick *et al.* 1991) and, as a result, they contain soils at different stages of leaching and formation.

Examination of physiographic mapping by Gozzard (2011) places the site within the Bassendean dunes, which was later confirmed during the field survey. The Bassendean dunes are characterised

by non-calcareous sands and podolised soils with low-lying wet areas (Purdie *et al.* 2004). The Gozzard (2011) mapping in relation to the site is shown in **Figure 2**.

In addition to natural soils, the central parts of the site contain a layer of fill consisting of brown fine to medium grained sandy material with building materials throughout including fragments of bricks and concrete, gravels of blue metal, limestone and pea gravel (AECOM 2012).

The site is not known to contain any restricted landforms or unique geological features.

2.3 Topography

The elevation of the site ranges from 11 m in relation to the Australian height datum (mAHD) on the eastern side to 17 mAHD on the north-western side (DoW 2008) (**Figure 2**).

2.4 Hydrology and wetlands

Wetlands are areas of seasonally, intermittently or permanently waterlogged land such as poorly drained soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries (Wetlands Advisory Committee 1977). Wetlands can be recognised by the presence of vegetation associated with waterlogging or the presence of hydric soils such as peat, peaty sand or carbonate mud (Hill *et al.* 1996).

Wetlands of national or international significance may be afforded special protection under Commonwealth or international agreements. The following lists of important wetlands were checked as part of this assessment:

- *Ramsar List of Wetlands of International Importance* (DBCA 2017)
- *A Directory of Important Wetlands in Australia* (DBCA 2018)

No Ramsar or listed 'important wetlands' are located within or near the site.

The Department of Biodiversity, Conservation and Attractions (DBCA) has developed the *Geomorphic Wetlands of the Swan Coastal Plain* dataset (DBCA 2020). This dataset maps geomorphic wetland features and classifies them based on their landform shape and water permanence. A review of the *Geomorphic Wetlands of the Swan Coastal Plain* dataset indicated that no wetlands occur within or adjacent to the site (DBCA 2020).

Examination of the Department of Water and Environmental Regulation (DWER) hydrography dataset (DWER 2018) shows no wetland or water related features occur within the site.

2.5 Regional vegetation

Native vegetation is described and mapped at different scales in order to illustrate patterns in its distribution. At a continental scale the *Interim Biogeographic Regionalisation of Australia* (IBRA) divides Australia into floristic subregions (Environment Australia 2000).

The site is contained within the Swan Coastal Plain IBRA region and within the 'SWA02' or Perth subregion. The Perth subregion is characterised as mainly supporting *Banksia* low woodland on

leached sands with *Melaleuca* swamps where ill-drained; and woodland of *Eucalyptus gomphocephala* (tuart), *E. marginata* (jarrah) and *Corymbia calophylla* (marri) on less leached soils (Beard 1990). This subregion is recognised as a biodiversity hotspot and contains a wide variety of endemic flora and vegetation types.

Variations in native vegetation can be further classified based on regional vegetation mapping. Heddle *et al.* (1980) mapping shows the site as comprising the 'Bassendean central and south' complex, which is described as vegetation ranging from woodland of *Eucalyptus marginata*, *Allocasuarina fraseriana* and *Banksia* spp. to low woodland of *Melaleuca* spp. and sedgelands on the moister sites (Government of Western Australia 2019).

The 'Bassendean central and south' complex was determined to have 26.87% of its pre-European extent remaining in 2018, of which 2.15% is protected for conservation purposes (Government of Western Australia 2019).

2.6 Historical land use

A review of historical images available from 1953 onwards shows that the majority of the site was cleared of native vegetation by 1974 as part of sand mining operations (WALIA 2021).

The history of the site is not well documented, but it is generally thought to have been used for sand mining and landfill between the mid-1960s and 1992. From 1992 to 2006 the site was used for the storage and disposal of inert waste and the storage and washing of heavy vehicles (DWER 2021).

Given the historical use of the site, it was classified as a contaminated site for many years. After a series of site investigations to assess the extent of the contamination on-site and following the development of a site management plan, DWER reclassified the site to 'remediated for restricted' use in July 2017 (Town of Victoria Park 2021; DWER 2021).

2.7 Conservation significant flora and vegetation

2.7.1 Threatened and priority flora

Certain flora taxa that are considered to be rare or under threat warrant special protection under Commonwealth and/or State legislation. At a Commonwealth level, flora taxa may be listed as 'threatened' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Threatened flora species listed under the EPBC Act are assigned a conservation status according to attributes such as population size and geographic distribution. Any action likely to have a significant impact on a taxon listed under the EPBC Act requires Ministerial approval.

In Western Australia flora species may also be classed as 'threatened' under *the Biodiversity Conservation Act 2016* (BC Act). Similarly, it is an offence to 'take' or 'disturb' threatened flora listed under the BC Act without Ministerial approval.

Flora species that do not currently meet the criteria for listing as threatened but are potentially rare or threatened may be added to the DBCA's *Priority Flora List*. These species are classified into 'priority' levels based on threat. Whilst priority species are not under direct statutory protection, they are considered during State approval processes.

Further information on threatened and priority species and their categories is provided in **Appendix A**. An assessment of the likelihood of occurrence of threatened and priority flora within the site was undertaken (refer to **Sections 3.1** and **4.2.1**).

2.7.2 Threatened and priority ecological communities

An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. An ecological community's structure, composition and distribution are influenced by environmental factors such as soil type, position in the landscape, altitude, climate and water availability (DAWE 2021a). 'Threatened ecological communities' (TECs) are ecological communities that are recognised as rare or under threat and therefore warrant special protection.

Selected TECs are afforded statutory protection at a Commonwealth level under the EPBC Act. Similar to flora species, TECs listed under the EPBC Act are assigned a conservation status. Any action likely to have a significant impact on a community listed under the EPBC Act requires Ministerial approval.

TECs are also listed within Western Australia under the BC Act and the BC Regulations. Their significance is also acknowledged through other state environmental approval processes such as 'environmental impact assessment' pursuant to Part IV of *the Environmental Protection Act 1986* (EP Act) and the *Environmental Protection* (Clearing of Native Vegetation) *Regulations 2004*.

A plant community that is under consideration for listing as a TEC in Western Australia but does not yet meet survey criteria or has not been adequately defined may be listed as a 'priority ecological community' (PEC). Listing as a PEC is similarly considered during State approval processes.

Further information on categories of TECs and PECs is provided in **Appendix A**. An assessment of the likelihood of occurrence of threatened and priority ecological communities within the site was undertaken (refer to **Sections 3.1** and **4.3.1**).

2.7.3 Local and regional significance

Flora species and ecological communities may be significant irrespective of whether they have special protection under policy or legislation.

Two key reasons that vegetation within the site may be significant are listed below:

- The site is located adjacent to the Kensington Bushland Reserve which is a significant bushland remnant in the Town of Victoria Park.
- The vegetation has potential value as habitat for threatened or priority fauna species including, in particular, black cockatoos listed as threatened under the EPBC Act and BC Act.

2.8 Weeds and pests

The term 'weed' can refer to any plant that requires some form of action to reduce its effect on the economy, the environment, human health and amenity. Many non-native flora species and some native species are considered to be weeds. The likelihood of weeds occurring is higher in disturbed areas, especially areas that have been set aside for agricultural or urban land use.

A particularly invasive or detrimental weed species may be listed as a 'declared pest' pursuant to *Western Australia's Biosecurity and Agriculture Management Act 2007* (BAM Act), indicating that it warrants special management to limit its spread.

The Commonwealth government has further compiled a list of 32 *Weeds of National Significance* (WoNS) (DAWE 2021b). Whilst the WoNS list is non-statutory, many WoNS are also listed under the BAM Act. Further information on weeds and declared pests is provided in **Appendix A**.

2.9 Bush Forever

The Government of Western Australia's *Bush Forever* policy is a strategic plan for conserving regionally significant bushland within the Swan Coastal Plain portion of the Perth Metropolitan Region. The objective of *Bush Forever* is to protect comprehensive representations of all original ecological communities by targeting a minimum of 10% of each vegetation complex for protection (Government of WA 2000). *Bush Forever* sites are representative of regional ecosystems and habitat and have a key role in the conservation of Perth's biodiversity.

Bush Forever Site 48 (Kensington Bushland) lies adjacent to the northern, eastern and western boundaries of the site and extends into the south-western portion. Significant flora species are known to occur in this *Bush Forever* site (Government of WA 2000). The location of Bush Forever Site 48 is shown in **Figure 3**.

2.10 Environmentally sensitive areas

Environmentally sensitive areas are prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and have been identified to protect native vegetation values of areas surrounding environmental values such as significant wetlands, threatened flora, threatened communities and *Bush Forever* sites. Within an ESA none of the exemptions under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* apply.

Bush Forever Site 48 is mapped as an ESA and occurs within the south-western portion of the site, as shown in **Figure 3**.

2.11 DBCA managed or legislated lands

DBCA has tenure of or interests in numerous areas of land across the state for a range of purposes. Tenure categories include national parks, nature reserves, conservation parks, marine parks, marine nature reserves, marine management areas, section 5(1)(g) reserves, state forest and timber reserves. These areas are mapped within the *Legislated Lands and Waters* (DBCA 2021b) and *Lands of Interest* (DBCA 2021a) datasets. The *Legislated Lands and Waters* (DBCA 2021b) dataset includes lands subject to the following legislation: the *Conservation and Land Management Act 1984* (CALM Act), *Swan and Canning Rivers Management Act 2006* (SCRM Act) and lands identified under the *Land Administration Act 1997* (LA Act). The *Lands of Interest* (DBCA 2021a) dataset includes all other lands of which DBCA is recognised as the manager but is not vested under any act. These lands comprise of crown land and freehold land which DBCA has been acknowledged by the Department of Lands as the responsible agency.

No DBCA managed or legislated lands occur within the site or adjacent to the site. The closest legislated land is a small reserve listed under the CALM Act which lies approximately 400 m to the south-west of the site.

2.12 Ecological linkages

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. This exchange of genetic material between vegetation remnants improves the viability of those remnants by allowing greater access to breeding partners and food sources, refuge from disturbances such as fire and maintenance of genetic diversity of plant communities and populations. Ecological linkages are ideally continuous or near-continuous as the more fractured a linkage is, the less ease flora and fauna have in moving within the corridor (Alan Tingay and Associates 1998).

The Perth Biodiversity Project, supported by the Western Australia Local Government Association (WALGA), have identified and mapped ecological linkages within the Perth Metropolitan Region (WALGA and PBP 2004). This study was extended beyond the Perth Metropolitan Region through the South West Biodiversity Project, resulting in the identification and mapping of the South West regional ecological linkages (Molloy *et al.* 2009).

There are no mapped ecological linkages within or in close proximity to the site. Two ecological linkages occur approximately 3 km from the site and are associated with the Swan and Canning River Reserves.

Review of aerial imagery indicates that the vegetation within the site is connected to a larger area of native vegetation within the Kensington Bushland Reserve.

2.13 Previous surveys

No flora and vegetation surveys are known to have been previously undertaken within the site.

Emerge previously prepared a *Design Opportunities and Considerations Report* for the site, which provided information on design options for rehabilitation of the site to inform future landscape planning, detailed design and project management (Emerge Associates 2020).

Various flora and vegetation surveys have been undertaken within the adjacent Kensington Bushland Reserve (Eco Logical Australia 2017).

3 Methods

3.1 Desktop assessment

A search was conducted for threatened and priority flora that may occur or have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DAWE 2021c), *NatureMap* (DBCA 2021) and DBCA's threatened and priority flora database (reference no. 11-0721FL).

A search was also conducted for TECs and PECs that may occur or have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DAWE 2021c), the *weed and native flora dataset* (Keighery *et al.* 2012) and DBCA's threatened and priority ecological communities' databases (reference no. EP20-055).

Prior to undertaking the field survey, information on the habitat preferences of threatened and priority flora species and communities identified from database searches was reviewed. This was compared to existing environmental information available for the site, such as geomorphology, soils, regional vegetation and historic land use, to identify species and communities for which habitat may occur in the site.

3.2 Field survey

An ecologist from Emerge visited the site on 23 June 2021 to conduct the field survey.

3.2.1 Flora and vegetation

The site was traversed on foot and the composition and condition of vegetation was recorded.

No samples were collected due to the disturbed condition of vegetation in the site. Plant taxa were systematically recorded as the ecologist traversed the site. Photographs were taken throughout the field visit to show particular site conditions.

The suitability of habitat within the site for conservation significant species identified in the desktop assessment was assessed (refer to **Section 3.1**). Where identified, areas of suitable habitat were traversed to search for conservation significant species.

All plant specimens collected during the field survey were dried, pressed and then named in accordance with requirements of the Western Australian Herbarium. Identification of specimens occurred through comparison with named material and through the use of taxonomic keys. Flora species not native to Western Australia are denoted by an asterisk ('*') in text and raw data.

Changes in vegetation condition were also noted and mapped across the site. The condition of the vegetation was assessed using methods from Keighery (1994), as shown in **Table 1**. For vegetation in the site containing *Banksia* spp., the condition scale provided in the conservation advice for the 'banksia woodlands of the Swan Coastal Plain' TEC (DoEE 2016a) was applied in addition to the Keighery scale, as shown in **Table 1**.

Table 1: Vegetation condition scale applied during the field assessment

Condition category	Definition (Keighery 1994)	Indicator (DoEE 2016a)	
		Typical native vegetation composition	Typical weed cover
Pristine	Pristine or nearly so, no obvious signs of disturbance.	Native plant species diversity fully retained or almost so	Zero or close to
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.	High native plant species diversity	Less than 10%
Very good	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Moderate native plant species diversity	5-20%
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.	Low native plant species diversity	5-50%
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	Very low native plant species diversity	20-70%
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.	Very low to no native species diversity	Greater than 70%

3.3 Mapping and analysis

3.3.1 Conservation significant flora and vegetation

Based on the information recorded during the field survey, an assessment of the likelihood of occurrence of threatened and priority flora species and communities within the site was undertaken using the categories outlined in **Table 2**.

Table 2: Likelihood of occurrence assessment categories and definitions

Likelihood	Definition
Recorded	The species was recorded during the current field survey.
Likely	The site contains suitable habitat for the species and it is likely the species may occur based on presence of a recent historical record within or close to the site.
Possible	The site contains suitable habitat for the species but there is no other information to suggest that the species may occur within or close to the site.
Unlikely	The site does not contain suitable habitat for the species or the site contains suitable habitat for the species within which thorough targeted searches were completed and conclusion has been made that the species is unlikely to be present.

3.3.2 Plant community identification and description

The plant communities within the site were identified from the data collected during the field survey. The vegetation was described according to the dominant species present using the structural formation descriptions of the *National Vegetation Inventory System* (NVIS) (NVIS Technical Working Group 2017). The identified plant communities were mapped on aerial photography during the field survey and boundaries were interpreted from aerial photography and notes taken in the field. Vegetation condition was mapped on aerial photography based on notes recorded during the field survey to define areas with differing condition.

3.3.3 Floristic community type assignment

No floristic community type (FCT) analysis was completed due to the high level of disturbance and because the vegetation was considered unlikely to currently represent an FCT.

3.3.4 Threatened and priority ecological communities

Areas of native vegetation potentially representing a TEC were assessed against key diagnostic characteristics and, if available, size and/or vegetation condition thresholds.

3.4 Survey limitations

It is important to note the specific constraints imposed on surveys and the degree to which these may have limited survey outcomes. An evaluation of the survey methodology against standard constraints outlined in the EPA document *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) is provided in **Table 3**.

Table 3: Evaluation of survey methodology against standard constraints outlined in EPA (2016)

Constraint	Degree of limitation	Details
Availability of contextual information	No limitation	The broad scale contextual information described in **Section 2** is adequate to place the site and vegetation in context.
Experience level of personnel	No limitation	This flora and vegetation assessment was undertaken by a qualified environmental consultant with seven-years' experience in environmental science in Western Australia. Technical review was undertaken by a senior botanist with 10 years of botanical experience in Western Australia.
Suitability of timing	Moderate limitation	The survey was conducted in June and thus outside of the main flowering season. The site has been subject to historical disturbance and so it is unlikely that annual and geophytic threatened and priority species occur. The survey timing was sufficient for a reconnaissance level survey.
Temporal coverage	Moderate Limitation	Comprehensive flora and vegetation assessments can require multiple visits, at different times of year, and over a period of a number of years, to enable observation of all species present. The site was only surveyed once, and the survey was undertaken outside of the spring main flowering period. However, the site is highly disturbed and one visit was considered sufficient for a reconnaissance level survey.
Spatial coverage and access	No limitation	Site coverage was comprehensive (track logged).
	No limitation	All parts of the site could be accessed as required.
Sampling intensity	Minor limitation	The site was traversed comprehensively and a total of 59 species were recorded. No formal sampling was undertaken or considered necessary due to the highly disturbed condition of the site. Opportunistic records of flora, plant communities and vegetation condition were sufficient to accurately characterise the vegetation within the site.
Influence of disturbance	Minor limitation	Time since fire is greater than 65 years as interpreted from aerial imagery and therefore short-lived species more common after fire may not have been visible.
	Major limitation	Historical ground disturbance and clearing was evident in most of the site and a large portion of the native vegetation occurring in the site is regrowth with a high number of non-native species present. The disturbance history of the site was considered when undertaking field sampling.
Adequacy of resources	No limitation	All resources required to perform the survey were available.

4 Results

4.1 General site conditions

As a result of previous quarrying, the site is lower than the surrounding area and has sloping banks on the perimeter. The soil is a light-coloured sand.

The site contains small areas of native vegetation on the margins, where native plants have re-established or been planted on the banks. The central portion of the site contains predominantly non-native vegetation including planted trees.

4.2 Flora

4.2.1 Desktop assessment

The database search results identified a total of 29 threatened and 82 priority flora species occurring or potentially occurring within a 10 km radius of the site. One presumed extinct species was also identified during the database search. Information on these species including their habitat preferences and flowering period is provided in **Appendix B**.

Based on background information available for the site, suitable habitat was considered to potentially occur within the site for one threatened flora species and 12 priority flora species as shown in **Table 4**.

Table 4: Conservation significant flora species considered to have potential to occur in the site based on known habitat preferences

Species	Level of significance		Life strategy	Habitat	Flowering period
	State	EPBC Act			
Caladenia huegelii	CR	EN	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov
Calectasia grandiflora	P2	-	P	White, grey or yellow sand.	Jun-Nov
Calothamnus macrocarpus	P2	-	P	Rocky quartzite soils, sand. Slopes.	Feb or Aug-Dec
Johnsonia pubescens subsp. cygnorum	P2	-	P	Grey white yellow sands on flats and seasonally wet areas.	Sep
Poranthera moorokatta	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes.	Oct or Feb
Babingtonia urbana	P3	-	P	Grey sand, lateritic gravel.	Jan-Mar
Haemodorum loratum	P3	-	P	Grey or yellow sand, gravel.	Nov
Isopogon autumnalis	P3	-	P	Yellow-grey sand.	Feb, Mar, Apr, May or June
Isopogon drummondii	P3	-	P	Yellow-grey sand.	Feb, Mar, Apr, May or June
Platysace ramosissima	P3	-	P	Sandy soils.	Oct-Nov
Thysanotus anceps	P3	-	P	White or grey sand, lateritic gravel, laterite.	Oct-Dec
Dodonaea hackettiana	P4	-	P	Sand, outcropping limestone.	Jul-Oct
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb

CR=critically endangered, EN=endangered, P1-P4=priority 1-priority 4, A=annual, P=perennial, PG=perennial geophyte.

4.2.2 Species inventory

A total of 31 native and 28 non-native (weed) species were recorded within the site during the field survey, representing 22 families and 47 genera. The dominant families containing native taxa were Myrtaceae (ten native taxa and four weed taxa) and Fabaceae (nine native taxa and one weed taxa). The most common genus was *Melaleuca* with four taxa and *Eucalyptus* and *Jacksonia* with three taxa each.

A complete species list is provided in **Appendix C.**

4.2.3 Threatened and priority flora

Three mature individuals of the 'priority 4' species *Dodonaea hackettiana* were recorded in the south-western portion of the site, near the boundary and in open areas. The *D. hackettiana* plants were not flowering at the time of the survey but were able to be identified from a sterile specimen. The locations of the *D. hackettiana* individuals are shown in **Figure 4**.

No threatened flora species were recorded within the site. The threatened and other priority flora species identified in the desktop assessment are not considered to occur in the site due to the high level of disturbance which has led to a lack of suitable habitat.

4.2.4 Locally and regionally significant flora

No locally or regionally significant flora species were recorded within the site.

4.2.5 Declared pests

No declared pests or WoNS were recorded within the site.

4.3 Vegetation

4.3.1 Desktop assessment

The database search results identified eleven TECs and six PECs occurring or potentially occurring within a 10 km radius of the site. Information on these communities is provided in **Appendix D**.

Based on geomorphology, soils and regional vegetation patterns, one community listed as a TEC and a PEC was considered to have potential to occur in the site: 'banksia woodlands of the Swan Coastal Plain' (banksia woodlands TEC/PEC). This community is listed as 'endangered' under the EPBC Act and 'priority 3' (P3) in WA.

4.3.2 Plant communities

Two plant communities were identified within the site. **Mixed shrubland** vegetation occurs on the sloping banks on the margins of the site. This plant community extends over 0.26 ha. The remainder of the site has been heavily disturbed and supports **non-native** vegetation.

A description and the area of each plant community is provided in **Table 5** and representative photographs of each are provided in **Plate 1** and **Plate 2**. The location of each plant community is shown in **Figure 4**.

Table 5: Description and extent of plant communities identified within the site

Plant community	Description	Area (ha)
Mixed shrubland	Scattered juvenile *Eucalyptus marginata* and *Corymbia calophylla* over tall open shrubland to open shrubland of *Banksia* spp., *Adenanthos cygnorum*, *Allocasuarina humilis* and *Acacia saligna* over scattered non-native grasses and herbs and bare ground.	0.26
Non-native	Heavily disturbed area with closed non-native grassland of **Cynodon dactylon* and other non-native species with occasional native species and planted non-native trees such as **Eucalyptus camaldulensis*. Bare areas and tracks were also included in this community.	4.06

*Plate 1: Plant community **mixed shrubland** in 'degraded' condition*

*Plate 2: Plant community **non-native** in 'completely degraded' condition*

4.3.3 Vegetation condition

The site has been subject to a high level of historic disturbance. The **mixed shrubland** plant community was mapped as being in 'degraded' condition as the vegetation structure has been severely impacted and native species cover and diversity was low.

The **non-native** vegetation was mapped as being in 'completely degraded' condition as it is dominated by non-native species.

The extent of vegetation by condition category is detailed in **Table 6** and shown in **Figure 5**.

Table 6: Extent of vegetation condition categories within the site

Condition category (Keighery 1994)	Size (ha)
Pristine	0
Excellent	0
Very good	0
Good	0
Degraded	0.26
Completely degraded	4.06

4.3.4 Threatened and priority ecological communities

The **mixed shrubland** vegetation represents the banksia woodlands TEC, as outlined in **Table 7**. This TEC extends over 0.26 ha and is part of a larger patch outside of the site. The areas where the TEC occurs within the site are shown in **Figure 6**.

The banksia woodlands TEC also represents a State listed PEC of the same name. Therefore, 0.26 ha of the 'banksia woodlands of the Swan Coastal Plain' PEC also occurs within the site as shown in **Figure 6**.

No other TECs or PECs occur within the site.

Table 7: Criteria for determining presence of Banksia Woodlands of the Swan Coastal Plain TEC adapted from DoEE (2016a)

Criteria	Requirements for meeting criteria	Site implications
1. Must meet key diagnostic characteristics	A variety of factors relating to: • Location • Soils • Structure • Composition	• Site meets location and soils criteria. • The **mixed shrubland** vegetation includes the key diagnostic feature of *Banksia attenuata* and *Banksia menziesii,* although they are mainly present as shrubs rather than trees.
2. Must meet condition thresholds	• A patch should at least meet the 'good' condition category (see **Table 1**)	• The **mixed shrubland** vegetation is present in 'degraded' condition, which does not meet this criterion. • The conservation advice indicates that a single patch may include areas of variable condition, meaning the **mixed shrubland** vegetation in 'degraded' condition may still be considered the TEC if it is part of a larger patch of the TEC.

Table 7: Criteria for determining presence of Banksia Woodlands of the Swan Coastal Plain TEC adapted from DoEE (2016a) (continued)

Criteria	Requirements for meeting criteria	Site implications
3. Must meet minimum patch size	Minimum size of patch: • Pristine=no minimum size • Excellent=0.5 ha • Very Good=1 ha • Good=2 ha	• The **mixed shrubland** vegetation is in 'degraded' condition and does not independently meet this criterion. • The **mixed shrubland** vegetation in the site is contiguous with vegetation in Kensington Bushland Reserve which represents the TEC and would be viewed as part of the same patch. • Therefore, the **mixed shrubland** vegetation meets the minimum patch size and represents the TEC.
4. Must incorporate surrounding context	• Breaks (e.g. tracks) < 30 m do not separate vegetation into separate patches • Buffer zones may apply (20-50 m recommended from patch edge) • The site should be thoroughly sampled (2 surveys in same spring). • Survey timing should be appropriate. • Surrounding environment should be considered (e.g. connectivity, conservation values, fauna habitat)	• The site is connected to vegetation in Kensington Bushland Reserve that has been confirmed to represent the TEC. • Small scale tracks (<30 m wide) exist within the patch in Kensington Bushland Reserve.
Result	The site supports 0.26 ha of the banksia woodlands of the Swan Coastal Plain TEC.	

4.3.5 Locally and regionally significant vegetation

The site contains a small number of tall trees which may provide roosting habitat for threatened black cockatoos. The **mixed shrubland** plant community and, to a lesser extent the **non-native** plant community, support a range of plants that provide a food source for black cockatoo species, including marri, jarrah, *B. menziesii* and *B. attenuata*, along with other ecological services.

5 Discussion

5.1 Threatened and priority flora

Three individuals of the P4 species *Dodonaea hackettiana* were recorded in the south-western portion of the site. It is possible that other *D. hackettiana* individuals occur outside of the site within the adjacent native vegetation, although this species has not been recorded in the Kensington Bushland Reserve (Eco Logical Australia 2017). In addition, other *D. hackettiana* individuals may occur near the boundary of the site and were not recorded due to GPS spatial accuracy.

It is unknown whether these individuals are naturally occurring within the site or have been planted. A DBCA record of *D. hackettiana* exists approximately 1.2 km north-east of the site. The location of this record is stated as 'Kent St Reserve. Vacant block opposite the Department of Agriculture, Baron-Hay Crt, Kensington'. The date of this record is 1981 and, based on the description, it appears that the record should actually be located within or adjacent to the site (placement of the record approximately 1.2 km from the site is likely due to spatial error). Other DBCA records of *D. hackettiana* also occur in the local area. Therefore, it is likely that, following previous disturbance, the *D. hackettiana* individuals established in the site through recruitment from the adjacent vegetation outside of the site.

No threatened or other priority flora species were recorded and none are considered likely to occur as the site has been subject to intensive historical disturbance.

5.2 Vegetation condition

The method applied to assess vegetation condition was robust, as it combined the standard qualitative, categorical scheme of Keighery (1994), with the additional indicators for diversity and weed cover outlined in DoEE (2016b).

The **non-native** vegetation was clearly in 'completely degraded' condition as it comprises a parkland type structure and is dominated by non-native species.

The **mixed shrubland** vegetation was mapped as being in 'degraded' condition as it comprises regrowth and planted vegetation with an altered structure. This is likely due to the long-term historical disturbances associated with the previous use of the site as a quarry. The site is contiguous with higher quality native vegetation in the adjacent Kensington Bushland Reserve, which enhances the value of the **mixed shrubland** community within the site and provides opportunities for recruitment. The condition of the **mixed shrubland** vegetation within the site is likely to increase as active revegetation (planting) on the perimeter of the site, adjacent to Kensington Bushland Reserve, is ongoing (Eco Logical Australia 2017).

5.3 Threatened and priority ecological communities

The **mixed shrubland** vegetation in the site does not independently qualify as the banksia woodlands TEC/PEC due to lack of canopy banksia trees and as it does not meet size and condition thresholds. The banksia woodlands TEC/PEC occurs within the adjacent Kensington Bushland Reserve (Eco

Logical Australia 2017). Since the **mixed shrubland** vegetation is contiguous with vegetation in the Kensington Bushland Reserve, and a patch of the TEC can include areas of lower condition, the **mixed shrubland** vegetation represents the TEC.

5.4 Local and regional significance

The **mixed shrubland** plant community contributes to a larger patch of native vegetation that provides habitat for native fauna species including some of conservation significance.

6 Conclusions

Three individuals of one priority flora species, *Dodonaea hackettiana* (P4), were recorded near the south-western boundary of the site.

No threatened or other priority flora species were recorded or are considered likely to occur in the site due to lack of suitable habitat.

The site has been subject to significant disturbance and the majority (94%) of the vegetation is in 'completely degraded' condition. The remainder of the site supports native vegetation in 'degraded' condition.

The site contains 0.26 ha of EPBC Act listed TEC and State listed PEC banksia woodlands of the Swan Coastal Plain, which is part of a larger patch outside of the site.

The **mixed shrubland** plant community contributes to a larger patch of native vegetation that provides habitat for native fauna species including some of conservation significance.

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Figures

Figure 1: Site Location

Project:	Reconnaissance Flora and Vegetation Assessment Kent Street Sand Pit
Client:	Town of Victoria Park

Plan Number:
EP20-055(05)--F09

Drawn:	GAR
Date:	09/07/2021
Checked:	ASF
Approved:	RAW
Date:	12/07/2021

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Metres

Scale: 1:2,500@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

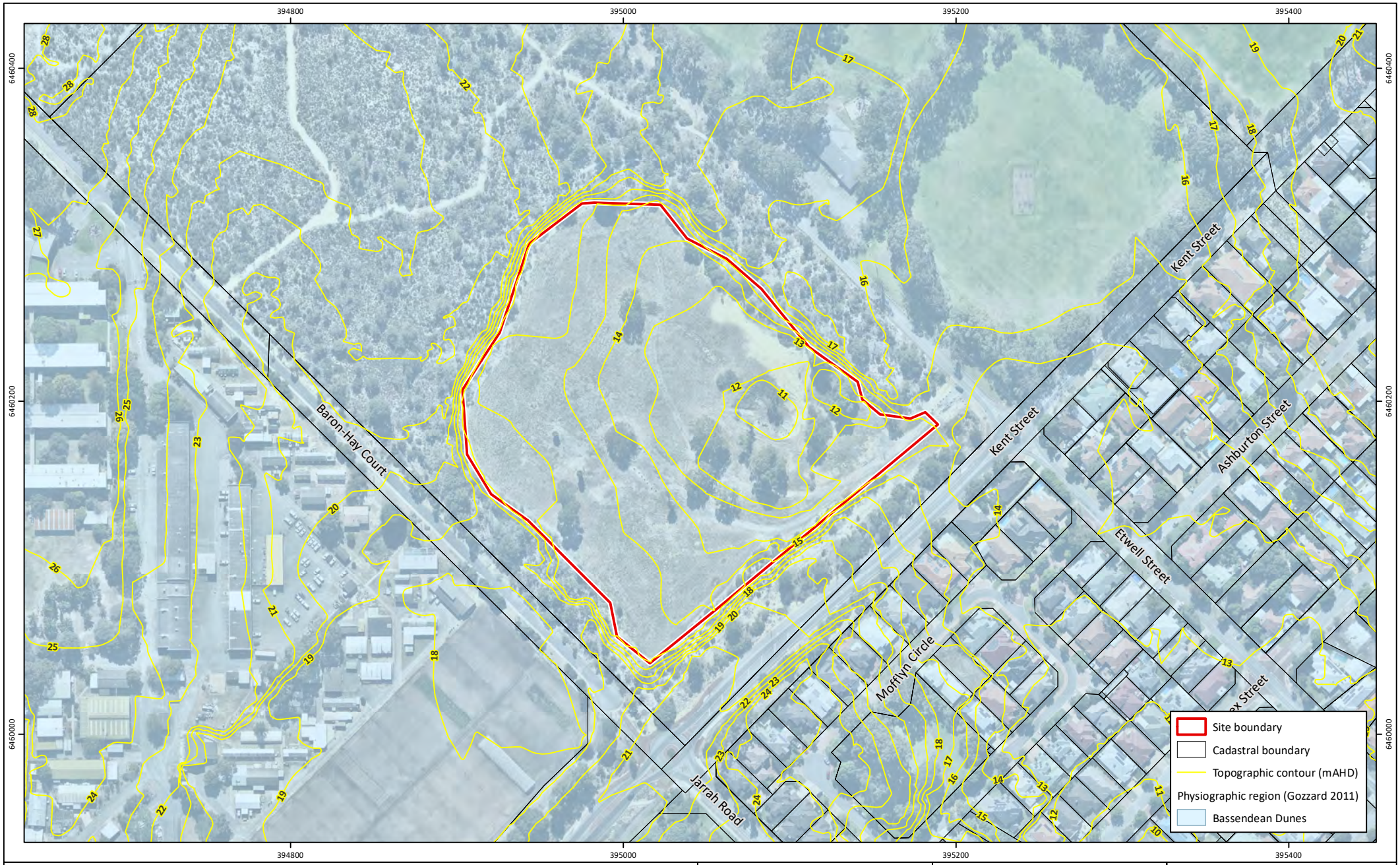

Figure 2: Soils and Topography

Project: Reconnaissance Flora and Vegetation Assessment
Kent Street Sand Pit
Client: Town of Victoria Park

Plan Number:
EP20-055(05)--F10

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Date:	09/07/2021
Checked:	ASF
Approved:	RAW
Date:	12/07/2021

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Scale: 1:3,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Figure 3: Environmental Features

Project:	Reconnaissance Flora and Vegetation Assessment Kent Street Sand Pit
Client:	Town of Victoria Park

Plan Number:
EP20-055(05)--F11

Drawn:	GAR
Date:	09/07/2021
Checked:	ASF
Approved:	RAW
Date:	12/07/2021

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GDA 1994 MGA Zone 50

emerge ASSOCIATES

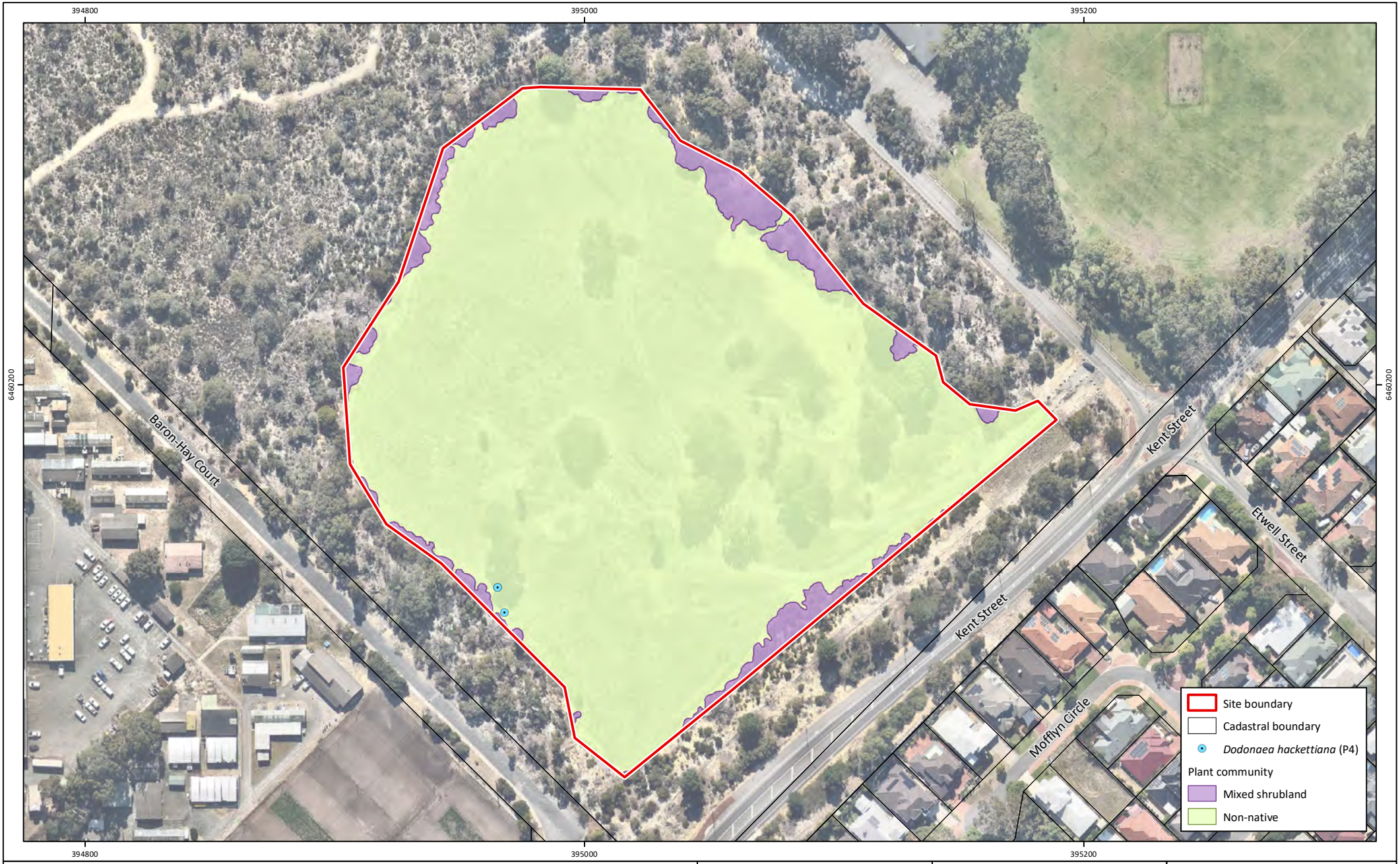

Figure 4: Plant Communities and Priority Flora

Project: Reconnaissance Flora and Vegetation Assessment
Kent Street Sand Pit
Client: Town of Victoria Park

Plan Number:
EP20-055(05)--F12
Drawn: GAR
Date: 02/07/2021
Checked: ASF
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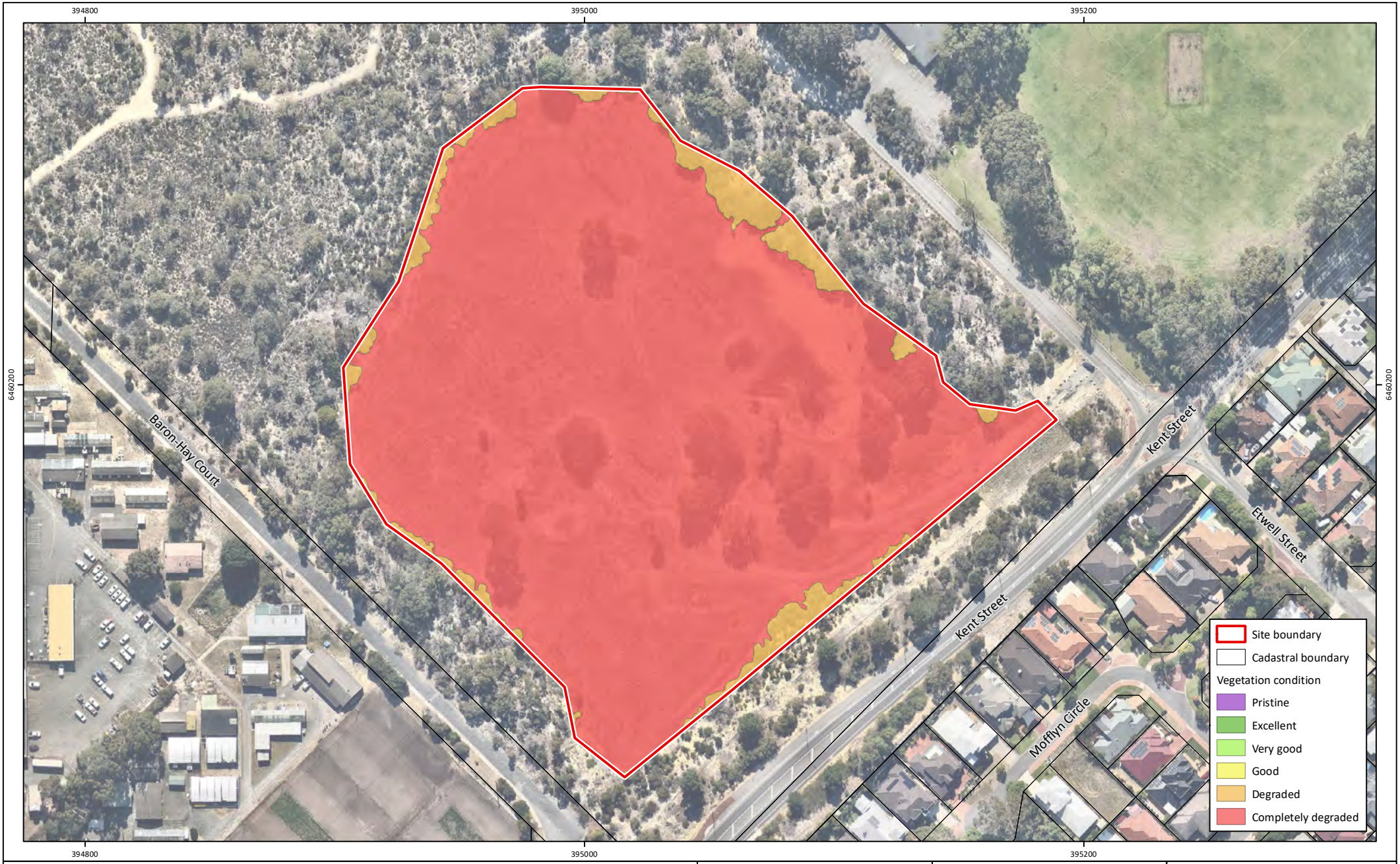

Figure 5: Vegetation Condition

Project: Reconnaissance Flora and Vegetation Assessment
Kent Street Sand Pit
Client: Town of Victoria Park

Plan Number:
EP20-055(05)--F13
Drawn: GAR
Date: 02/07/2021
Checked: ASF
Approved: RAW
Date: 12/07/2021

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GDA 1994 MGA Zone 50

emerge ASSOCIATES

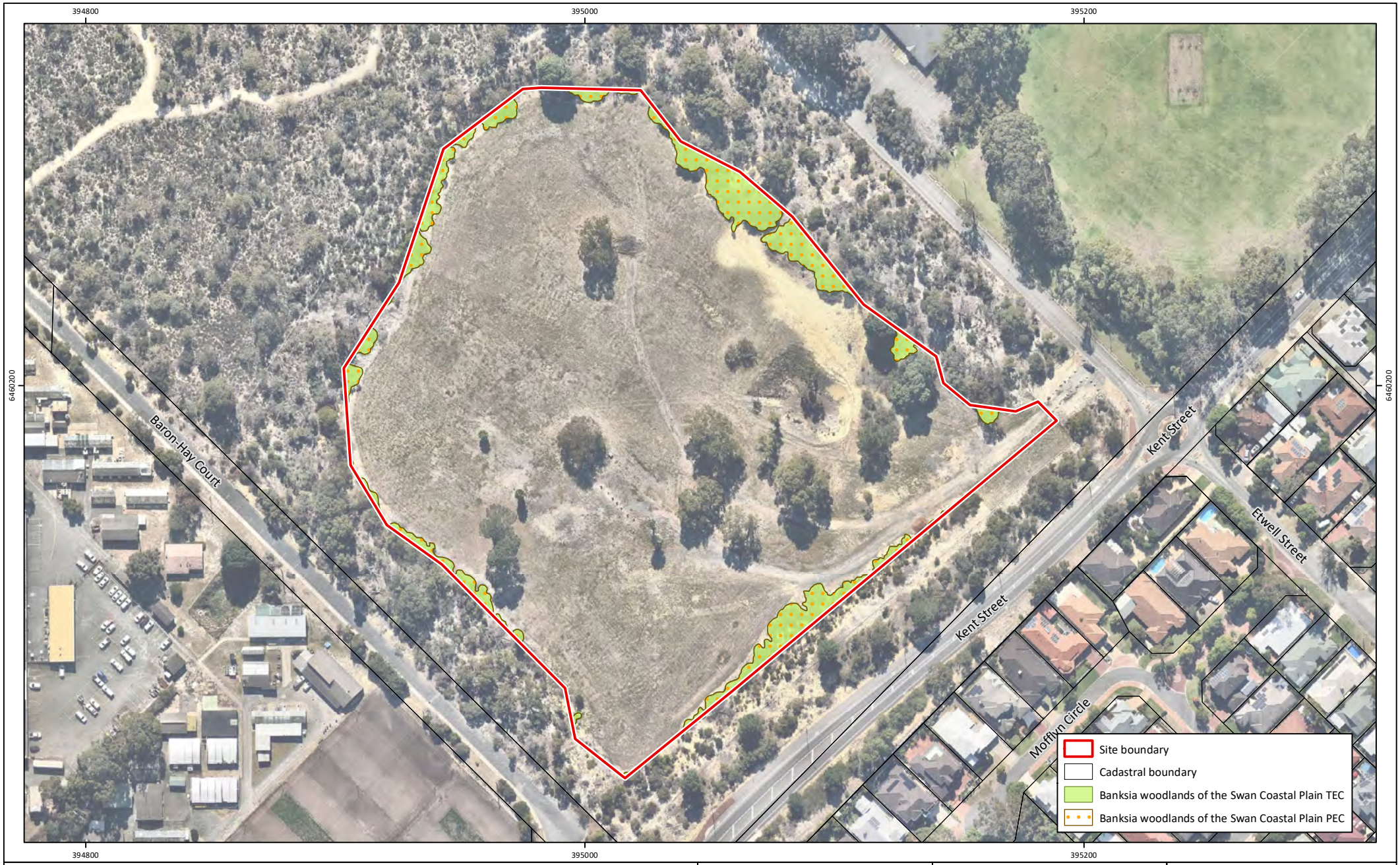

Figure 6: Threatened and Priority Ecological Communities

Project:	Reconnaissance Flora and Vegetation Assessment Kent Street Sand Pit
Client:	Town of Victoria Park

Plan Number:
EP20-055(05)--F14

Drawn:	GAR
Date:	02/07/2021
Checked:	ASF
Approved:	RAW
Date:	12/07/2021

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0 40 80
Metres

Scale: 1:2,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Appendix A

Additional Information

Conservation Significant Flora and Vegetation

Threatened and priority flora

Flora species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. At the Commonwealth level, flora species can be listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Flora species considered 'threatened' pursuant to Schedule 1 of the EPBC Act are assigned categories according to their conservation status, as outlined in **Table 1**.

In Western Australia, plant taxa may be classed as 'threatened' under the *Biodiversity Conservation Act 2016* (BC Act) which is enforced by Department of Biodiversity Conservation and Attractions (DBCA). Threatened flora species are listed under sections 19(1) and 26(2) of the BC Act. It is an offence to 'take' or disturb threatened flora without Ministerial approval. Section 5(1)1 of the Act defines to take as including "… to gather, pluck, cut, pull up, destroy, dig up, remove, harvest or damage flora by any means" or to cause or permit the same to be done. The definition of threatened flora under the BC Act is provided in **Table 1**.

Section 43 of the BC Act requires that an occurrence of a threatened species or threatened ecological community is reported to DBCA where the occurrence has been identified as part of field work completed:

- as part of an assessment under Part IV of the *Environmental Protection Act 1986*; or
- in relation to an application for a clearing permit under the *Environmental Protection Act 1986* section 51E(1)(d).

Penalties apply to individuals and organisations that fail to provide accurate reports of threatened species or communities.

The *Biodiversity Conservation Regulations 2018* (BC Regulations 2018) came into effect on January 1 2019. The BC Regulations include provisions for licencing, charges, penalties and other provisions associated with the BC Act.

Flora species that may be threatened or near threatened but lack sufficient information to be listed under the BC Act may be added to the DBCA's *Priority Flora List* (DBCA 2018b). Priority flora species are considered during State approval processes. Priority flora categories and definitions are listed in **Table 1**.

Table 1: Definitions of conservation significant flora species pursuant to the EPBC Act and BC Act and on DBCA's Priority Flora List (DBCA 2018b)

Conservation code	Description
EX†	Threatened Flora – Presumed Extinct Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.
T^†	Threatened Flora – Extant Taxa which are declared to be likely to become extinct or is rare, or otherwise in need of special protection.
CR^	Threatened Flora – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN^	Threatened Flora – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.
VU^	Threatened Flora – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
P1	Priority One – Poorly Known Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verges, urban areas, farmland, active mineral leases etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two – Poorly Known Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey.
P3	Priority Three – Poorly Known Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but needs further survey.
P4	Priority Four – Rare Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

^pursuant to the EPBC Act, †pursuant to the BC Act, on DBCA's *Priority Flora List*

Threatened and priority ecological communities

'Threatened ecological communities' (TECs) are recognised as ecological communities that are rare or under threat and therefore warrant special protection. Selected TECs are afforded statutory protection at a Commonwealth level under section 181 of the EPBC Act. TECs nominated for listing under the EPBC Act are considered by the Threatened Species Scientific Committee and a final decision is made by the Commonwealth Minister for the Environment. Once listed under the EPBC Act, communities are categorised as either 'critically endangered', 'endangered' or 'vulnerable' as defined in **Table 2**. Any action likely to have a significant impact on a community listed under the EPBC Act requires approval from the Minister for the Environment.

Within Western Australia TECs are determined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee (WATECSAC) and endorsed by the State Minister for the Environment. The WATECSAC is an independent group comprised of representatives from organisations including tertiary institutions, the Western Australian Museum and DBCA. The TECs endorsed by the State Minister are published by DBCA (DBCA 2018a).

TECs are assigned to one of the categories outlined in **Table 2** according to their status (in relation to the level of threat). TECs are afforded direct statutory protection at a State level under the BC Act and BC Regulations. Ecological communities are listed under Section 27(1) and 33 of the BC Act. Their significance is also acknowledged through other state environmental approval processes such as 'environmental impact assessment' pursuant to Part IV of the *Environmental Protection Act 1986* (EP Act) and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Table 2: Categories of threatened ecological communities (English and Blyth 1997; DEC 2009)

Conservation code	Description
PD	Presumably Totally Destroyed An ecological community that has been adequately searched for but for which no representative occurrences have been located.
CE	Critically Endangered An ecological community that has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
E	Endangered An ecological community that has been adequately surveyed and is not critically endangered but is facing a very high risk of total destruction in the near future.
V	Vulnerable An ecological community that has been adequately surveyed and is not critically endangered or endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.

An ecological community that is under consideration for listing as a TEC, but does not yet meet survey criteria or has not been adequately defined may be listed as a 'priority ecological community' (PEC). PECs are categorised as priority category 1, 2 or 3 as described in **Table 3**. Ecological communities that are adequately known and are rare but not threatened, or meet criteria for 'near threatened', or that have been recently removed from the threatened list, are placed in 'priority 4'. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in 'priority 5' (DEC 2013). Listed PECs are published by DBCA (DBCA 2017).

Table 3: Categories of priority ecological communities (DEC 2013)

Priority code	Description
P1	Priority One: Poorly known ecological communities Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2	Priority Two: Poorly known ecological communities Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3	Priority Three: Poorly known ecological communities (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4	Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	Priority Five: Conservation Dependent ecological communities Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Weeds

A number of legislative and policy documents exist in relation to weed management at state and national levels. The *Biosecurity and Agriculture Management Act 2007* (BAM Act) is the principle legislation guiding weed management in Western Australia and lists declared pest species. At a national level, the Australian government has compiled a list of 32 Weeds of National Significance (WoNS) (DoEE 2018), of which many are also listed under the BAM Act.

Declared Pests

Part 2.3.23 of the BAM Act requires a person must not; "*a) keep, breed or cultivate the declared pest; b) keep, breed or cultivate an animal, plant or other thing that is infected or infested with the declared pest; c) release into the environment the declared pest, or an animal, plant or other thing that is infected or infested with the declared pest; or d) intentionally infect or infest, or expose to infection or infestation, a plant, animal or other thing with a declared pest*".

Under the BAM Act, all declared pests are assigned a legal status, as described in **Table 7**. Species assigned to the 'declared pest, prohibited - s12' category are placed in one of three control categories, as described in **Table 8**.

The *Biosecurity and Agriculture Management Regulations 2013* specify keeping categories for species assigned to the 'declared pest - s22(2)' category, which relate to the purposes of which species can be kept, as well as the entities that can keep them. The categories are described in **Table 9**.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act (DPIRD 2020).

Table 4: Legal status of declared pest species listed under the BAM Act (DPIRD 2020)

Category	Description
Declared Pest Prohibited - s12	May only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest s22(2)	Must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia

Table 5: Control categories of declared pest species listed under the BAM Act (DPIRD 2020)

Category	Description
C1	Exclusion Not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2	Eradication Present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3	Management Established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Table 6: Keeping categories of declared pest species listed under the BAM Act (DPIRD 2020)

Category	Description
Prohibited	Can only be kept under a permit for public display and education purposes, and/or genuine scientific research, by entities approved by the state authority.
Exempt	No permit or conditions are required for keeping.
Restricted	Organisms which, relative to other species, have a low risk of becoming a problem for the environment, primary industry or public safety and can be kept under a permit by private individuals.

References

General references

Department of Biodiversity Conservation and Attractions (DBCA) 2017, *Priority Ecological Communities for Western Australia Version 27*, Species and Communities Branch, Department of Biodiversity, Conservation and Attractions.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018a, *List of Threatened Ecological Communities endorsed by the Western Australian Minister for Environment*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018b, *Threatened and Priority Flora List 16 January 2018*, Perth.

Department of Environment and Conservation (DEC) 2009, *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*, Perth.

Department of Conservation (DEC) 2013, *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*, Perth.

English, V. and Blyth, J. 1997, *Identifying and Conserving Threatened Ecological Communities in the South West Botanical Province*, ANCA National Reserves System Cooperative Program, Project Number N702, Perth.

Online references

Department of Environment and Energy (DoEE) 2018, Weeds of National Significance, <http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html>.

Department of Primary Industries and Regional Development (DPIRD) 2020, The Western Australian Organism List (WAOL), < https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>.

Appendix B

Conservation Significant Flora Species and likelihood of Occurrence Assessment

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Acacia benthamii	P2	-	P	Sand, typically on limestone breakaways	Aug - Sept	Unlikely
Acacia denticulosa	VU	VU	P	Sand, loam, clay. Granite outcrops, rarely on sandplains.	Sep-Oct	Unlikely
Acacia horridula	P3	-	P	Gravelly soils over granite, sand, rocky hillsides.	May-Aug	Unlikely
Adenanthos cygnorum subsp. *chamaephyton*	P3	-	P	Grey sand, lateritic gravel.	Jul or Sep to Dec or Jan	Unlikely
Andersonia gracilis	VU	EN	P	Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep-Nov	Unlikely
Angianthus micropodioides	P3	-	A	Saline sandy soils on edge of rivers, depressions and clay pans.	Nov-Dec or Jan-Feb	Unlikely
Anigozanthos viridis subsp. *terraspectans*	VU	VU	P	Grey sand, clay loam. Winter-wet depressions.	Aug-Sep	Unlikely
Aponogeton hexatepalus	P4	-	P	Mud. Freshwater: ponds, rivers, claypans.	Jul-Oct	Unlikely
Austrostipa bronwenae	EN	-	P	Grey-brown sandy loam soil in low lying winter wet areas.	Sep-Nov	Unlikely
Babingtonia urbana	P3	-	P	Grey sand, lateritic gravel.	Jan-Mar	Unlikely
Banksia mimica	VU	EN	P	Flat to gentle slopes in grey and white sand in open woodlands.	Dec-Jan	Unlikely
Banksia pteridifolia subsp. *vernalis*	P3	-	P	White/grey sand over laterite.	Sep-Oct	Unlikely
Bolboschoenus fluviatilis	P1	-	P	Floodplain with grey/brown wet sand.	Nov	Unlikely
Boronia tenuis	P4	-	P	Laterite, stony soils, granite.	Aug-Nov	Unlikely
Byblis gigantea	P3	-	P	Sandy-peat swamps. Seasonally wet areas.	Sep-Jan	Unlikely
Caladenia huegelii	CR	EN	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov	Unlikely
Calandrinia sp. Piawaning	P1	-	A	Brown/grey silty sandy loam over granite.	Oct	Unlikely
Calandrinia uncinella	P1	-	A	Seasonally wet swamps or on saline river flats on ground or embankments just above water, growing in soils described as grey-brown sandy or silty loams or white to creamy sands over clays usually with poor drainage.	Aug-Oct	Unlikely
Calectasia cyanea	CR	CR	P	Heathland on white sand or laterite gravel over laterite. Known only from one population near Albany.	Jun-Oct	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Calectasia grandiflora	P2	-	P	White, grey or yellow sand.	Jun-Nov	Unlikely
Calothamnus graniticus subsp. *leptophyllus*	P4	-	P	Clay over granite, lateritic soils. Hillsides.	Jun-Aug	Unlikely
Calothamnus macrocarpus	P2	-	P	Rocky quartzite soils, sand. Slopes.	Feb or Aug-Dec	Unlikely
Calytrix breviseta subsp. *breviseta*	CR	EN	P	Seasonally wet sandy-clay soil on swampy flats	Oct-Nov	Unlikely
Carex tereticaulis	P3	-	P	Black peaty sand.	Sep-Oct	Unlikely
Chamaescilla gibsonii	P3	-	P	Clay to sandy clay in winter-wet flats, shallow water-filled claypans.	Sep	Unlikely
Chamelaucium floriferum subsp. *diffusum*	P2	-	P	Sand, clay. Frequently with outcropping granite.	Jan-Dec	Unlikely
Chamelaucium lullfitzii	VU	EN	P	White yellow sand in low woodland.	Oct-Nov	Unlikely
Comesperma griffinii	P2	-	A/P	Yellow or grey sand on plains.	Oct	Unlikely
Comesperma rhadinocarpum	P2	-	P	Sandy soils.	Oct-Nov	Unlikely
Conospermum undulatum	VU	VU	P	Sand and sandy clay soils, on flat or gently sloping sites between the Swan and Canning Rivers	May-Oct	Unlikely
Conostylis bracteata	P3	-	P	Sand, limestone. Consolidated sand dunes	Aug-Sep	Unlikely
Cyathochaeta teretifolia	P3	-	P	Grey sand, sandy clay in swamps and creek edges.	Oct-Jan	Unlikely
Dampiera triloba	P3	-	P	Damp peat/loam soil.	Aug-Dec	Unlikely
Dicrastylis micrantha	P3	-	P	Red sand. Sandplains.	Sep-Dec	Unlikely
Dillwynia dillwynioides	P3	-	P	Winter wet depressions on sandy soils	Aug - Dec	Unlikely
Diplolaena andrewsii	EN	EN	P	Granite outcrops & hillsides.	Jul-Oct	Unlikely
Diuris brevis	P2	-	P	Black peaty soil.	Unknown	Unlikely
Diuris drummondii	VU	VU	PG	In low-lying depressions in peaty and sandy clay swamps.	Nov-Jan	Unlikely
Diuris micrantha	VU	VU	PG	Dark grey-black sandy clay-loam in winter wet depressions or swamps. Often in shallow standing water.	Aug/Sep- early Oct	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Diuris purdiei	EN	EN	PG	Sand to sandy clay soils in areas subject to winter inundation.	late September to mid-October, but only after a summer or early autumn fire (Brown et al., 1998)	Unlikely
Dodonaea hackettiana	P4	-	P	Sand, outcropping limestone.	Jul-Oct	Recorded
Drakaea elastica	CR	EN	PG	Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps. Typically in banksia woodland or thickets of Kunzea glabrescens.	late Sep-Oct/Nov, survey Jul-Aug	Unlikely
Drakaea micrantha	EN	VU	PG	Open sandy patches often adjacent to winter-wet swamps.	Sept- early Oct	Unlikely
Drosera occidentalis	P4	-	P	Flat, brown/white/yellow moist sand/clay/peat, often near swamps.	Oct-Dec/Jan	Unlikely
Eleocharis keigheryi	VU	VU	P	Clay or sandy loam in freshwater creeks and transient waterbodies such as seasonally wet clay pans.	Aug-Dec	Unlikely
Eremophila glabra subsp. *chlorella*	EN	-	P	Sandy clay. Winter-wet depressions.	Jul-Nov	Unlikely
Eryngium pinnatifidum subsp. *palustre* (G.J. Keighery 13459)	P3	-	P	Grey brown sand or clay in winter wet flats.	Sep-Nov	Unlikely
Eryngium sp. Subdecumbens (G.J. Keighery 5390)	P3	-	A	Clay in seasonal wetlands.	Sep-Nov	Unlikely
Eucalyptus caesia subsp. *caesia*	P4	-	P	Loam. Granite outcrops.	May-Sep	Unlikely
Eucalyptus caesia subsp. *magna*	P4	-	P	Loam. Granite outcrops.	May-Sep	Unlikely
Eucalyptus educta	P2	-	P	Shallow soils. Granite rocks.	Apr	Unlikely
Eucalyptus kruseana	P4	-	P	Sandy loam. Granite outcrops & hills.	Jun-Sep	Unlikely
Eucalyptus rhodantha var. *rhodantha*	VU	VU	P	Grey/yellow/red sand over laterite. Undulating country, hillslopes.	Jul-Sep or Dec-Jan	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Eucalyptus x *balanites*	CR	EN	P	Light coloured sandy soils over laterite. Habitat consists of gently sloping heathlands; open mallee woodland over shrubland (Population 2) or heathland with emergent mallees (population 1)	Oct - Feb	Unlikely
Eucalyptus x *mundijongensis*	P1	-	P	Loam or grey sand. Paddocks.	Unknown	Unlikely
Grevillea curviloba subsp. *incurva*	EN	EN	P	Sand, sandy loam. Winter-wet heath.	Aug-Sep	Unlikely
Grevillea manglesii subsp. *ornithopoda*	P2	-	P	Red-brown loam over clay	Sep-Nov	Unlikely
Grevillea pimeleoides	P4	-	P	Gravelly soils over granite. Rocky hillsides.	May-Nov	Unlikely
Grevillea thelemanniana	CR	CR	P	Sand, sandy clay. Winter-wet low-lying flats.	May-Nov	Unlikely
Haemodorum loratum	P3	-	P	Grey or yellow sand, gravel.	Nov	Unlikely
Haloragis scoparia	P1	-	P	Clay in winter-wet areas.	May	Unlikely
Hibbertia leptotheca	P3	-	P	Brown to white sand with limestone.	Aug-Sep	Unlikely
Hibbertia spicata subsp. *leptotheca*	P3	-	P	Sand. Near-coastal limestone ridges, outcrops & cliffs	Jul-Oct	Unlikely
Hydrocotyle lemnoides	P4	-	A	Floating in swamps.	Aug-Oct	Unlikely
Hydrocotyle striata	P1	-	A	Sand and clay in springs and creeklines.	Nov	Unlikely
Hypolaena robusta	P4	-	P	White sand. Sandplains.	Sep-Oct	Unlikely
Isopogon autumnalis	P3	-	P	Yellow-grey sand.	Feb,Mar,Apr,May or June	Unlikely
Isopogon drummondii	P3	-	P	Yellow-grey sand.	Feb,Mar,Apr,May or June	Unlikely
Isotropis cuneifolia subsp. *glabra*	P3	-	P	Sand, clay loam in winter-wet flats.	Sep	Unlikely
Jacksonia gracillima	P3	-	P	Sand, often adjacent to winter wet areas	Sep-Dec	Unlikely
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb	Unlikely
Johnsonia pubescens subsp. *cygnorum*	P2	-	P	Grey white yellow sands on flats and seasonally wet areas.	Sep	Unlikely
Lasiopetalum bracteatum	P4	-	P	Sandy clay, clay, lateritic gravel along drainage lines, creeks, gullies, granite outcrops.	Aug-Nov	Unlikely
Lasiopetalum glutinosum subsp. *glutinosum*	P3	-	P	Brown clay loam on slopes	Sep-Dec	Unlikely
Lasiopetalum membranaceum	P3	-	P	Sand over limestone	Sep-Dec	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Lepidosperma rostratum	EN	EN	P	Peaty sand and clay amongst low heath, in winter-wet swamps.	May-Jun (survey late Jun-Aug)	Unlikely
Lepyrodia curvescens	P2	-	P	Sand, laterite. Seasonally inundated swampland.	Sep-Nov	Unlikely
Levenhookia preissii	P1	-	A	Grey or black, peaty sand. Swamps	Sep-Dec/Jan	Unlikely
Macarthuria keigheryi	EN	EN	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec or Feb-Mar	Unlikely
Melaleuca viminalis	P2	-	P	Sand, clay in creeklines and wetlands.	Oct-Dec	Unlikely
Myriophyllum echinatum	P3	-	A	Clay in winter-wet flats.	Nov	Unlikely
Ornduffia submersa	P4	-	A	Sandy clay in inundated wetland/creek.	Aug-Nov	Unlikely
Picris compacta	EX	-	A/P	Loam, limestone. River banks.	Unknown	Unlikely
Platysace ramosissima	P3	-	P	Sandy soils.	Oct-Nov	Unlikely
Poranthera moorokatta	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes.	Oct or Feb	Unlikely
Ptilotus pyramidatus	CR	CR	P	Seasonally inundated, flat floodplain on pale grey muddy sand.	Early Oct	Unlikely
Ptilotus sericostachyus subsp. *roseus*	P1	-	P	Unknown. Seem to be associated with wetlands/rivers.	Sep-Dec	Unlikely
Schoenus benthamii	P3	-	P	White, grey sand, sandy clay in winter wet flats and swamps	Oct-Nov	Unlikely
Schoenus capillifolius	P3	-	A	Brown mud in claypans	Oct-Nov	Unlikely
Schoenus loliaceus	P2	-	A	Sandy soils in winter-wet depressions.	Aug-Nov	Unlikely
Schoenus natans	P4	-	A	Aquatic, in winter-wet depressions.	Oct	Unlikely
Schoenus pennisetis	P3	-	A	Grey or peaty sand in swamps and winter-wet depressions.	Aug-Sep	Unlikely
Schoenus sp. Beaufort (G.J. Keighery 6291)	P1	-	A	Mud in winter-wet clay pans.	Sep-Oct	Unlikely
Schoenus sp. Waroona (G.J. Keighery 12235)	P3	-	A	Clay or sandy clay. Winter-wet flats.	Oct-Nov	Unlikely
Stylidium aceratum	P3	-	A	Sandy soils in swamp heathland.	Oct-Nov	Unlikely
Stylidium asteroideum	P3	-	P	Sand, clay, loam in winter wet areas.	Sep-Nov	Unlikely
Stylidium longitubum	P4	-	A	Sandy clay, clay. Seasonal wetlands.	Oct-Dec	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Stylidium paludicola	P3	-	P	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland	Oct-Dec	Unlikely
Stylidium periscelianthum	P3	-	P	Loamy clay, moist soils pockets on wet flats and low granitic hills.	Sep-Oct	Unlikely
Stylidium striatum	P4	-	P	Brown clay over laterite on hill slopes.	Oct-Nov	Unlikely
Styphelia filifolia	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Unlikely
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	P	Low woodland on grey, clayey sand with lateritic pebbles (Pinjarra Plain) near winter wet flats.	Sep-Nov	Unlikely
Synaphea sp. Pinjarra Plain (A.S. George 17182)	EN	CR	P	White grey clayey sand on edges of seasonally inundated low lying areas.	Sep-Oct	Unlikely
Tetraria australiensis	VU	VU	P	Sand over clay, winter wet depressions and drainage lines.	Nov-Dec	Unlikely
Thelymitra stellata	EN	EN	PG	Sandy loam, clay or gravel over laterite or gravel.	Sep-Nov	Unlikely
Thelymitra variegata	P2	-	P	Sandy clay, sand, laterite.	Jun-Sep	Unlikely
Thysanotus anceps	P3	-	P	White or grey sand, lateritic gravel, laterite.	Oct-Dec	Unlikely
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	P2	-	P	Grey sand with lateritic gravel.	Dec	Unlikely
Tripterococcus sp. Brachylobus (A.S. George	P4	-	P	Winter-wet areas on grey sand.	Oct-Feb	Unlikely
Typhonium peltandroides	P1	-	P	Shallow sand amongst rough sandstone, red clay. Sides of gorges, vine thickets, rocky sites or along watercourses.	Dec or Jan-Feb	Unlikely
Verticordia lindleyi subsp. *lindleyi*	P4	-	P	Sand and sandy clay in winter wet areas.	May or Nov-Jan	Unlikely
Verticordia venusta	P3	-	P	Yellow sand, sandy gravel. Sandplains.	Sep-Dec or Jan	Unlikely

Note: T=threatened, CE=critically endangered, E=endangered, V=vulnerable, P1=priority 1, P2=priority 2, P3=priority 3, P4=priority 4, P=perennial, PG=perennial geophyte, A=annual. Species that occur within the site are shaded green

Appendix C

Species List

Family	Status	Species
Anarthriaceae		
		Lyginia barbata
Arecaceae		
	*	*Washingtonia filifera*
Asparagaceae		
		Laxmannia squarrosa
Asteraceae		
	*	*Arctotheca calendula*
	*	*Conyza* sp.
	*	*Hypochaeris glabra*
	*	*Senecio* sp.
	*	*Sonchus oleraceus*
Brassicaceae		
	*	*Alyssum* sp.
	*	*Raphanus raphanistrum*
Casurarinaceae		
		Allocasuarina fraseriana
		Allocasuarina humilis
Cyperaceae		
		Mesomelaena pseudostygia
Euphorbiaceae		
	*	*Euphorbia terracina*
	*	*Ricinus communis*
Fabaceae		
		Acacia pulchella
		Acacia saligna
		Daviesia nudiflora
		Daviesia triflora
		Gompholobium tomentosum
		Hardenbergia comptoniana
		Jacksonia furcellata
		Jacksonia lehmannii
		Jacksonia sternbergiana
	*	*Lupinus* sp.
Geraniaceae		
	*	*Geranium molle*
	*	*Pelargonium capitatum*
Haemodoraceae		
		Anigozanthos manglesii
Iridaceae		
	*	*Gladiolus* sp.
Meliaceae		
	*	*Melia azedarach*
Myrtaceae		
	*	*Agonis flexuosa*
		Calothamnus sanguineus
		Calytrix sp.
	*	*Chamelaucium uncinatum*

Family	Status	Species
		Corymbia calophylla
	*	*Eucalyptus camaldulensis*
		Eucalyptus marginata
		Eucalyptus todtiana
		Kunzea sp.
	*	*Melaleuca nesophila*
		Melaleuca seriata
		Melaleuca sp. 1
		Melaleuca sp. 2
		Regelia inops
Onagraceae		
	*	*Oenothera glazioviana*
	*	*Oenothera* sp.
Oxalidaceae		
	*	*Oxalis pes-caprae*
Pinaceae		
	*	*Pinus radiata*
Poaceae		
	*	*Arundo donax*
	*	*Cynodon dactylon*
	*	*Ehrharta* sp.
	*	*Eragrostis curvula*
Proteaceae		
		Adenanthos cygnorum
		Banksia attenuata
		Banksia menziesii
		Petrophile macrostachya
Sapindaceae		
	P4	*Dodonaea hackettiana*
Solanaceae		
	*	*Solanum nigrum*
Xanthorrhoeaceae		
		Xanthorrhoea preissii

*=non-native, P4=priority 4

Appendix D

Conservation Significant Communities and Likelihood of Occurrence Assessment

Code	Community name	TEC/ PEC	Level of significance		Likelihood of occurrence
			State	EPBC Act	
SCP20a	*Banksia attenuata* woodland over species rich dense shrublands	TEC	EN	-	Does not occur
Banksia woodlands	Banksia woodlands of the Swan Coastal Plain	TEC/ PEC	P3	EN	Recorded
SCP21c	Low lying *Banksia attenuata* woodlands or shrublands	TEC/ PEC	P3	EN	Does not occur
Tuart woodlands	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	TEC/ PEC	P3	CR	Does not occur
SCP24	Northern Spearwood shrublands and woodlands	PEC	P3	-	Does not occur
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain	TEC	CR	EN	Does not occur
Muchea Limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	TEC	EN	EN	Does not occur
Subtropical and Temperate Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh	TEC/ PEC	P3	VU	Does not occur
Wooded waterbird wetlands	Wooded wetlands which support colonial waterbird nesting areas	PEC	P2	-	Does not occur
SCP02	Southern wet shrublands, Swan Coastal Plain	TEC	EN	-	Does not occur
SCP07	Herb rich saline shrublands in clay pans	TEC	VU	CR (Clay Pans of the Swan Coastal Plain)	Does not occur
SCP08	Herb rich shrublands in clay pans	TEC	VU	CR (Clay Pans of the Swan Coastal Plain)	Does not occur
SCP10a	Shrublands on dry clay flats	TEC	EN	CR (Clay Pans of the Swan Coastal Plain)	Does not occur

Note: TEC=threatened ecological community, PEC=priority ecological community, CR=critically endangered, EN=endangered, VU=vulnerable, P3=priority 3