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DESKTOP ASSESSMENT AND INVESTIGATION ADVICE– STIRLING CRESCENT ROAD UPGRADES

1 INTRODUCTION

The City of Swan ('the proponent') is investigating the environmental considerations relevant for road upgrades along Stirling Crescent, Hazelmere. Emerge Associates have been engaged to complete a Desktop Environmental Assessment and Investigation Advice defining and quantifying the known environmental values potentially impacted by the works and any environmental approvals or management required for works to progress.

The Stirling Crescent proposed upgrades (shown in **Attachment A**) includes a section of Stirling Crescent, the intersection of Stirling Crescent and Talbot Road, a portion of Talbot Road and the intersection of Stirling Crescent and Adelaide Street as shown in **Figure 1** (here in referred to as 'the site'). The site is approximately 5.56 ha, located in the City of Swan, and is approximately 15 km northeast of the Perth Central Business District (CBD).

The following advice is based on publicly available databases as well as data collected during a reconnaissance flora vegetation and fauna site visit undertaken on 17 August 2025.

2 EXISTING ENVIRONMENT

2.1 Existing and historical land uses

Based on a review of publicly available historical aerial imagery (WALIA 2024), clearing within the site for the construction of the current roads, occurred prior to the earliest available aerial imagery dated 1953 (WALIA 2025).

2.2 Soils and topography

The topography of the site is gently undulating with elevations within the site ranging from 14 m Australian height datum (AHD) at the western extent of talbot road to 24 mAHD at the eastern extent of talbot road, as shown on **Figure 2**.

The site occurs on the Swan Coastal Plain, the geomorphic unit that characterises much of the Perth metropolitan area. The site is within the soil classifications of the Bassendean and Pinjarra System.

The characteristics of the Bassendean system include lower relief, with variable depth to groundwater, consisting of lower sandy hills interspersed with permanent and seasonal wetlands. The Pinjarra system is characterised as the Swan Coastal Plain from Perth to Capel, poorly drained with variable alluvial and aeolian soils.

Broad scale soil landscape mapping by the Department of Primary Industries and Regional Development (DPIRD) places the site within the following soil complexes as shown on **Figure 2** (DPIRD 2025):

- Pinjarra phase Gf7: Minor rises with deep rapidly drained brownish, siliceous or bleached sands underlain by mottled yellow clay. Low woodland of *B. prionotes* and some tall *C. calophylla* with *E. rudis* along streamlines.
- Pinjarra, Ya2 phase: Plain and swamp margins with deep poorly drained grey siliceous sand overlying clay.
- EnvGeol S8 phase: SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin.
- EnvGeol S10 phase: SAND - as S8 as relatively thin veneer over sandy clay to clayey sand. Of eolian origin.

2.3 Flora and vegetation

2.3.1 Regional context

Native vegetation is described and mapped at different scales to illustrate patterns in its distribution. At a continental scale the *Interim Biogeographic Regionalisation for 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 by mainly 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. The Department of Biodiversity, Conservation and Attraction's (DBCA) Vegetation Complexes - Swan Coastal Plain (DBCA-046) dataset maps the site as within the Southern River complex (DBCA 2021). The complex is described as 'open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus marginata* (Jarrah) - Banksia species with fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca rhaphiophylla* (Swamp Paperbark) along creek beds.' State wide vegetation statistics indicate that 18.43 % of the pre-European extent of the Southern River complex remained on the Swan Coastal Plain in 2018, with 1.18% protected for conservation purposes (Government of Western Australia 2019).

2.3.2 Local context

A site visit was conducted on 17 of August 2025 to determine the extent of flora and vegetation values across the site. The extent of native vegetation identified in the site is 0.14 ha (see **Figure 3**) and occurs in the northern and western portion of the site intersecting with Talbot Road. The majority of the vegetation was mapped as occurring in 'degraded – completely degraded' or 'completely degraded' condition using the Keighery (1994) scale. The native vegetation includes the following species *Acacia saligna, Adenanthos cygnorum* (woollybush) *, Allocasuarina fraseriana* (western sheoak)*, Banksia menziesii* (firewood banksia), *Corymbria calophylla* (marri), *Eucalyptus todtiana* (river red gum) and *Xanthorrhoea preissii* (grass tree)

2.3.3 Threatened and priority flora

Flora species that are considered to be rare or under threat warrant special protection under Commonwealth and/or State legislation. At a Commonwealth and State level, flora species may be listed as 'threatened' pursuant to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and/or the State Biodiversity Conservation Act 2016 (BC Act), however listing status may be different between Commonwealth and State levels. Additionally, flora species that are not listed as threatened, but are otherwise considered rare or under threat, may be added to DBCA's priority list (DBCA 2022, 2023). Priority flora are classified as either 'priority 1' (P1), 'priority 2' (P2), 'priority 3' (P3) or 'priority 4' (P4). Whilst priority flora are not afforded statutory protection under the BC Act, they are recognised and categorised by the DBCA and are considered through approval processes relevant to the WA policy framework.

2.3.3.1 Likelihood of occurrence

Known locations of threatened and priority flora within 10 km of the site were searched using the Department of Climate Change, Energy, the Environment and Water's (DCCEEW's) publicly available *Protected Matters Search Tool* (PMST) (DCCEEW 2024) and the DBCA conservation significant flora databases (reference no. 28-0825FL) (DBCA 2025). The distribution and habitat preferences of threatened and priority flora species and ecological communities were reviewed against site context information[1]. The database search results identified a total of 57 threatened and priority flora species occurring or potentially occurring within a 10 km radius of the site as listed in **Attachment B**.

The distribution and habitat preferences of threatened and priority flora species was reviewed against environmental context information available for the site. The likelihood of the occurrence of threatened and priority flora species within the site was classified as 'high', 'moderate', 'low' or 'negligible' as outlined in **Table 2** below.

Table 1: Decision matrix for likelihood of occurrence of threatened and priority flora and ecological communities.

		Distribution[1]	
		Reliable record within search area	**No reliable record within search area (10 km)**
Habitat	**Suitable**	High	Negligible
	Potentially suitable	Moderate	
	Unsuitable	Low	

[1]Reliable record defined as validated, recent (within the last ~40 years) and spatially accurate (refer DBCA search meta data) in order to exclude unverified range or habitat projections.

Four (4) threatened and fifteen (15) priority flora were classified as having a 'moderate' likelihood of occurrence within the site, as outlined in **Table 2**. The remaining 37 species were classified as having a 'low' or 'negligible' likelihood of occurrence. The complete likelihood of occurrence assessment is provided as **Attachment B**.

Table 2: Threatened or priority flora species with a high or moderate likelihood of occurrence in the site

Scientific name	**WA status**	**EPBC Act status**	**Likelihood of occurrence**
Grevillea thelemanniana	CR	CR	Moderate
Macarthuria keigheryi	EN	EN	Moderate
Conospermum undulatum	VU	VU	Moderate

[1] Including relevant Commonwealth documentation such as approved conservation advice, listing advice and other relevant literature.

Table 2: Threatened or priority flora species with a high or moderate likelihood of occurrence in the site (continued)

Scientific name	WA status	EPBC Act status	Likelihood of occurrence
Diuris drummondii	VU	VU	Moderate
Levenhookia preissii	P1	-	Moderate
Johnsonia pubescens subsp. *cygnorum*	P2	-	Moderate
Lepyrodia curvescens	P2	-	Moderate
Poranthera moorokatta	P2	-	Moderate
Byblis gigantea	P3	-	Moderate
Isopogon autumnalis	P3	-	Moderate
Jacksonia gracillima	P3	-	Moderate
Platysace ramosissima	P3	-	Moderate
Schoenus benthamii	P3	-	Moderate
Schoenus pennisetis	P3	-	Moderate
Styphelia filifolia	P3	-	Moderate
Tricostularia drummondii	P3	-	Moderate
Jacksonia sericea	P4	-	Moderate
Schoenus griffinianus	P4	-	Moderate
Thysanotus glaucus	P4	-	Moderate

Note: CR=critically endangered, EN=endangered, VU=vulnerable, P1-P4=priority 1-4

No conservation significant flora species were recorded within or in close proximity to the site during the site visit and none are considered to have the potential to occur.

2.3.4 Threatened and priority ecological communities

Threatened ecological communities (TEC) are recognised as ecological communities that are rare or under threat and therefore warrant special protection. At a Commonwealth level, TECs are afforded statutory protection under the EPBC Act and at a State level, TECs are afforded statutory protection under the BC Act. Under both Acts, TEC are listed as either 'critically endangered', 'endangered' or 'vulnerable', noting listing status may be different between Commonwealth and State frameworks.

Ecological communities that are not listed as threatened, but are otherwise considered rare or under threat, may be added to the DBCA priority list (DBCA 2022, 2023). Priority ecological communities (PEC) are classified as either 'priority 1' (P1), 'priority 2' (P2), 'priority 3' (P3) or 'priority 4' (P4). Whilst PECs are not afforded statutory protection under the BC Act, they are recognised and categorised by DBCA and are considered through State environmental approval processes.

2.3.4.1 Likelihood of occurrence

Known locations of TEC and PEC within 10 km of the site were searched using the PMST (DCCEEW 2024), and DBCA conservation significant communities databases (reference no. 28-0825EC) (DBCA 2025). These database searches identified fifteen (15) TECs and four PECs as occurring or potentially occurring within a 10 km radius of the site as listed in **Attachment C**.

A likelihood of occurrence assessment was undertaken using the methodology outlined in **Section 2.3.3** and **Table 1**. No TECs or PECs were classified as having a 'high' or 'moderate' likelihood of occurrence within the site.

All remaining communities were classified as having a 'low' or 'negligible' likelihood of occurrence. The complete likelihood of occurrence assessment is provided as **Attachment C**.

No threatened or priority ecological communities were recorded within or in close proximity to the site during the site visit and none are considered to have the potential to occur within the site.

2.3.5 Ecological linkages

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. The Perth Biodiversity Project, supported by the Western Australian Local Government Association (WALGA), identified and mapped regional ecological linkages within the Perth Metropolitan Region (WALGA and PBP 2004).

No ecological linkages intersect the site, however two ecological linkages occur in close proximity to the site as shown in **Figure 4**. Ecological linkage No. 33 occurs approximately 800 m east of the site running in a northwest to southeast direction. Ecological Linkage No. 40 occurs approximately 1.3km west of the site running in a north-south direction. As no linkages intersect the site, no further consideration is required for ecological linkages.

2.3.6 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 (BF) 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 481 (BF481) occurs approximately 100m northeast of the northernmost extent of the site as shown in **Figure 4** and will not be impacted by the proposed road upgrades.

2.3.7 Environmentally sensitive areas

Environmentally sensitive areas (ESAs) are prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and have been identified to protect native vegetation values of areas surrounding significant, threatened or scheduled flora, vegetation communities or ecosystems. The regulation exemptions from the requirement for a clearing permit do not apply in ESAs.

The site is largely mapped as an ESA due to the nearby presence of a TEC and BF 481. **Figure 5** shows the areas mapped as an ESA as well as the extent of native vegetation across the site as determined during the site visit. As further outlined in **Section 3.1**, clearing regulation exemptions do not apply in an ESA.

2.4 Terrestrial Fauna

Fauna species that are considered to be rare or under threat warrant special protection under Commonwealth and/or State legislation. At a Commonwealth and State level, fauna species may be listed as 'threatened' pursuant to the EPBC Act and BC Act, respectively, however listing status may be different between Commonwealth and State levels.

Fauna species that are not listed as threatened, but are otherwise considered rare or under threat, may be added to the DBCA priority list (DBCA 2022, 2023). Priority fauna are classified as either 'priority 1' (P1), 'priority 2' (P2), 'priority 3' (P3) or 'priority 4' (P4). Whilst priority fauna are not afforded statutory protection under the BC Act, they are recognised and categorised by the DBCA and are considered through environmental approval processes under the WA policy framework. Fauna taxa may be classed as 'specially protected' under the BC Act which is enforced by DBCA.

Specially protected fauna species are listed under Schedules 1 to 7 according to their conservation status. It is an offence to 'take' or 'disturb' threatened fauna without Ministerial approval.

2.4.1 Likelihood of occurrence

Known locations of threatened and priority fauna within 10 km of the site were searched using the PMST (DCCEEW 2024) and the DBCA conservation significant fauna databases (reference no. 23-0525FA) (DBCA 2025). The distribution and habitat preferences of the threatened and specially protected fauna species were reviewed against site context[2] information and preliminary survey results. The database search results identified a total of 47 fauna species as occurring or potentially occurring within the 10 km radius of the site. Likelihood of occurrence of threatened and specially protected fauna species within the site were classified as 'high', 'moderate', 'low', 'very low', 'negligible' or 'nil' as outlined in **Table 3**. Some marine species were excluded from the assessment due to lack of habitat.

Table 3: Decision matrix for likelihood of occurrence of threatened, specially protected and priority fauna

		Distribution	
		Reliable record[1]	**Unreliable record[2]**
Habitat	**Suitable**	High	Negligible
	Potentially suitable	Moderate	
	Unsuitable	Low	
	Absent	Nil	

[1]Reliable record defined as DBCA or validated ALA record from the last ~20 years, [2]Unreliable record defined as record >20 years old or PMST prediction.

Three threatened and one priority fauna species were classified as having a 'moderate' likelihood of occurrence. The legislative or policy status of these species are shown in **Table 4**.

The remainder of the conservation significant fauna species identified in the desktop assessment (43 species) were considered as having a 'low', 'very low', 'negligible' or 'nil' likelihood of occurrence. Refer to **Table 4** and **Attachment D** for detail on individual species likelihood of occurrence.

Table 4: Conservation significant fauna species with a high or moderate likelihood of occurrence in the site

Scientific name	Common name	WA status	EPBC Act status	Likelihood of occurrence
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	VU	Moderate
Zanda baudinii	Baudin's black cockatoo	EN	EN	Moderate
Zanda latirostris	Carnaby's black cockatoo	EN	EN	Moderate
Isoodon fusciventer	Quenda	P4	-	Moderate

No conservation significant fauna species recorded during the survey. However, potential nesting and foraging habitat for the three threatened species of black cockatoo, forest red-tailed black cockatoo, Carnaby's black cockatoo and Baudin's black cockatoo was recorded during the survey. It is noted that potential nesting trees are defined by the *Referral guideline for 3 WA Threatened Black Cockatoo Species* (DAWE 2022) as 'Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows'.

[2] Including relevant Commonwealth documentation such as approved conservation advice, listing advice and other relevant literature.

Several of the *Corymbia calophylla* (marri) trees and one *Eucalyptus todtiana* (river red gums) within the western portion of the site are greater than 50 centimetres (cm) diameter at breast height (DBH) and therefore would be classified as 'potential nesting trees'. Inspection of these trees would be required prior to any clearing occurring to confirm if suitable hollows are present. If hollows are determined to be present, trees containing hollows would be considered suitable nesting trees. Disturbance to suitable nesting trees may require consideration of a referral pursuant to the EPBC act more likely)

A number of flora species present within the site that are mapped as native vegetation identified as 0.14 ha in **Figure 5** (*Corymbia calophylla*, *Banksia menziesii*, *Xanthorrhoea preissii*, *Acacia saligna*, *Allocasuarina fraseriana* and *Eucalyptus todtiana*) are known foraging plants for the threatened species of black cockatoo. The extent of the primary and secondary foraging habitat for each species of black cockatoo are outlined in **Table 5** below.

Table 5: Foraging habitat extent for each species of black cockatoo within the site

Species	Primary Foraging Habitat (ha)	Secondary Foraging Habitat (ha)	Total foraging habitat (ha)
Carnaby's black cockatoo	0.086	0.055	0.141
Forest red-tailed black cockatoo	0.080	0.033	0.113
Baudins black cockatoo	0.080	0.027	0.107

In addition to the three threatened black cockatoo species, quenda (*Isoodon fusciventer*) (Priority 4) may occur within the site where dense, grassy weeds are present.

2.5 Contaminated sites

Regional Acid Sulfate Soils (ASS) risk mapping indicates that the majority of the site is classified as having a 'moderate to low' risk of ASS occurring within 3 m of the natural soil surface. A small portion of the southernmost portion of the site is indicated to be 'high to moderate' ASS risk. ASS mapping published by the Department of Water and Environmental Regulation (DWER 2024a) can be seen in **Figure 6**.

DWER's Contaminated Sites Database (DWER 2024b) indicates that four contaminated sites occur adjacent to the road alignments included in the proposed road upgrades , as shown on **Figure 6**. All four of these contaminated sites are indicated to be remediated for restricted uses.

2.6 Hydrology

Wetlands include 'areas of seasonally, intermittently or permanently waterlogged soils or inundated land, whether natural or otherwise, fresh and saline, e.g. waterlogged soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries' (Wetlands Advisory Committee 1977). Wetlands can further 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 international significance (such as Ramsar wetlands) are afforded protection under the EPBC Act. Locations of Ramsar wetlands within 10 km of the site were searched using the Department of Climate Change, the Environment, Energy and Water's (DCCEEW) *Protected Matters Search Tool* (PMST) (DCCEEW 2024) and confirmed that none occur within or in close proximity to the site. The closest Ramsar wetlands are Forrestdale Lake, located approximately 25.5 km south of the site and Thomson Lake, located approximately 28km southwest of the site.

At a regional level, DBCA maintains the Geomorphic Wetlands of the Swan Coastal Plain dataset (DBCA 2024), which categorises wetland features into management categories to guide land use and conservation, as outlined in **Table 6**. Wetland types are based on landform shape and water permanence, whilst management categories of wetlands are determined based on hydrological, biological and human use features.

Table 6: Geomorphic wetland management categories

Management Category	Description of wetland	Management objectives
Conservation Category Wetland (CCW)	Support high levels of attributes	Preserve wetland attributes and functions through reservation in national parks, crown reserves and state-owned land. Protection provided under environmental protection policies.
Resource Enhancement Wetland (REW)	Modified or degraded but still supporting substantial attributes and functions	Restore wetland through maintenance and enhancement of wetland functions and attributes. Protection via crown reserves, state or local government owned land, environmental protection policies and sustainable management on private properties.
Multiple Use Wetland (MUW)	Few remaining important wetland attributes and functions but still provide important hydrological functions	Use, development and management considered in the context of water, town and environmental planning through land care.

A review of the *Geomorphic Wetlands on the Swan Coastal Plain* dataset (DBCA 2020) indicates that two MUW's occur within the site (UFI 15267 and UFI 15899) as shown on **Figure 7**. The proposed road upgrades are not likely to have any hydrological impact and as such are inline with the management objectives of MUW's. As such no further consideration is required regarding geomorphic wetlands.

A review of the Water Register (DWER 2024c) shows that the site is located within the 'Perth' groundwater area, 'Shire of Swan South' subarea and the 'Perth - Superficial Swan' Aquifer. The site is not located in any public drinking water source areas.

Through a review of the DWER's Groundwater map (DWER 2025), it was determined that groundwater occurs between approximately 10 and 5 m below the natural ground surface.

DWER's hydrography linear dataset (DWER 2020) has indicated that there are no surface water flows across the site. Within the areas surrounding the site Helena River runs parallel to the site approximately 1.6 km northeast of the site.

2.7 Heritage

In WA, Aboriginal Cultural Heritage (ACH) is currently managed pursuant to the *Aboriginal Heritage Act 1972* (AH Act). DPLH maintain the Aboriginal Cultural Heritage Inquiry System (ACHIS), which is a directory containing locations and information about Aboriginal Cultural Heritage (ACH) in the State.

A desktop assessment of the ACHIS (DPLH 2023) identified that no Aboriginal Heritage sites have been identified within the site. Two registered sites and one lodged heritage site have been identified within close proximity to the site with three additional historic sites (stored data/not a site) intersecting and or in close proximity to the site, the details of which are shown below in **Table 7** and on **Figure 7**.

Table 7: Heritage sites within or immediately surrounding the site

Site Name	Site ID	Type of site	Location in relation to the site	Heritage values
High Wycombe: Adelaide St S	3669	Registered heritage site	Approximately 110 m southeast of the site	Artefacts / Scatter
Great Eastern Highway / Stirling Crescent Scatter	16110	Registered heritage site	Approximately 60 m northeast of the site	Artefacts / Scatter
Coverley Sand Quarry 1 & 2	4014	Lodged heritage site	Approximately 50 m east of the site	Artefacts / Scatter
Stirling Cresent A & B	4008	Stored data / not a site	Intersecting the site	Artefacts / Scatter

Table 7: Heritage sites within or immediately surrounding the site (continued)

Site Name	Site ID	Type of site	Location in relation to the site	Heritage values
Great Eastern Highway Isolated Artefact	21313	Stored data / not a site	Approximately 60 m northeast of the site	Artefacts / Scatter
Adelaide Street	17506	Stored data / not a site	Approximately 120 m west of the site	Artefacts / Scatter

Any impacts to the above registered or lodged sites should be avoided during detailed design. Any unavoidable impacts on registered Aboriginal heritage sites will require Section 18 consent under the AH Act to proceed. A site which is stored data such as Site 4008 under the AH Act is not considered to be a registered Aboriginal heritage site however consideration should be given during construction activities to be aware of previous Aboriginal cultural significance and in this specific case artefacts and scatter and address these through construction implementation activities accordingly.

A review of the State Heritage Office database (Heritage Council WA 2022) was undertaken to determine presence of sites or features of non-indigenous heritage significance within the site at a federal, state and local government level and no sites were identified.

3 ENVIRONMENTAL LEGISLATION

Based on the environmental conditions observed within the site, this section provides an outline of the key environmental approval considerations relevant for the proposed development.

3.1 Environmental Protection Act 1986 (EP Act)

Under Section 51C of the EP Act, clearing of native vegetation is an offence unless a clearing permit has been obtained or an exemption applies (as defined in Schedule 6 of the EP Act or the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*).

Vegetation meeting the definition of native vegetation under Section 3(1) of the EP Act has been identified in the northern and western portion of the site intersecting with Talbot Road as seen on **Figure 3**. Where this vegetation occurs within the disturbance footprint of the road upgrade works, and is required to be removed, consideration is to be given to the clearing permit process.

As the site is identified as an ESA (as outlined in **Section 2.3.7**) clearing permit regulation exemptions do not apply. DEWR have two pathways for clearing approvals, one is a referral process, and the other is a clearing permit. A referral process can be used when the significance of the impact to environmental considerations are not deemed significant. Therefore, as the site contains very limited native vegetation in a degraded condition it is considered that a clearing referral for the entire site is more appropriate than a clearing permit and is likely to satisfy the requirements pursuant to Part V of the EP Act. A clearing referral pathway can be utilised when the significance of the native vegetation removal is reduced however should DWER determine a greater significance, a clearing permit may still be required.

It is understood that the City of Swan has previously submitted a clearing referral for a small portion of the site (the northeastern road reserve of the intersection between Stirling Crescent and Talbot Road). Advice from DWER referred to ESA advice referencing Regulation 5, Item 2 of the *Guide to the Exemptions and Regulations for Clearing Native Vegetation* (DWER 2019) which states:

> *'While this exemption does not apply in an environmentally sensitive area, an area that would otherwise be an environmentally sensitive area is not an environmentally sensitive area to the extent it is in a maintenance area of a road or railway.'*

However, Regulation 5, Item 22 considers clearing in existing transport corridors and must be in accordance with Schedule 2 of the regulations which states that the extent of clearing for the maintenance of transport corridors is only applicable if the previous clearing occurred within the last 10 years, and the clearing was lawful. In applying the above to the entirety of the site, the ESA

designation is still considered applicable as the proposed clearing is not within an existing transport corridor as the works pertain to expanding the transport corridor creating an expanded road reserve boundary.

It is noted here that the intersection referred to in previous discussions with DWER was mapped as only containing native vegetation in the form of 0.001 ha of *Adenanthos cygnorum* (woollybush). Should a native species be planted in an area, it is unlikely to meet the definition of native vegetation under the EP Act and therefore would be exempt from requiring a clearing permit.

Therefore, given the site visit has confirmed the presence of native vegetation under the definition of the EP Act, an no exemptions under the Clearing Regulations apply, a clearing referral is considered applicable to this proposal to satisfy the requirements pursuant to Part V of the EP Act.

The EP Act also assesses significant proposals under Section 38 for their impact on the environment. This proposal will not meet the significance criteria and a referral under Section 38 will not be required

3.2 Biodiversity Conservation Act 2016 (BC Act)

The *Biodiversity Conservation Act 2016* (BC Act) of WA provides direct statutory acknowledgement and protection for TECs and threatened flora and fauna at a state level.

Where a project is assessed under the EP Act (Part IV or Part V) and involves the taking of a threatened species, or modification of an occurrence of a threatened ecological community, the assessment process is coordinated between DWER and DBCA. This also results in the need for the Environment Minister's approval.

The likely relevant threatened species pursuant to the BC Act that will require will be dealt with under the clearing referral include the three species of black cockatoo's and would be considered in the application of the EPBC Act as outlined in **Section 3.3**.

3.3 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The Commonwealth EPBC Act protects listed Matters of National Environmental Significance (MNES) and it is an offence to implement any action that would have a significant impact on MNES. It is up to individual proponents to refer a proposed action to DCCEEW if they consider this action likely to have a significant impact on MNES. DCCEEW will consider the referred proposed action and determine it to be 'not controlled' or 'controlled'. If it is determined to be a 'controlled action', it will be subject to a more formal assessment process and commencement of the proposed action cannot occur until approval is provided by DCCEEW. It is in the best interest of the proponent to design the road upgrade works to minimise the significance of the impact and provide avoidance strategies to impacting MNES.

Based on the preliminary environmental assessment, the desktop assessment and ecological survey results, the MNES species that were determined to have a 'moderate' likelihood of occurrence within the site included the *Zanda latirostris* (Carnaby's black cockatoo), *Zanda baudinii* (Baudin's black cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).

The site contains both foraging habitat and potential nesting trees for the three species of black cockatoos as outlined in **Section 2.4.1**. The *Referral guideline for 3 WA Threatened Black Cockatoo Species* (DAWE 2022) considers the need for referrals as highly likely where impacts include more than 1 ha of clearing of high quality foraging habitat, 10 ha of lower quality foraging habitat, removal of any part of a known roosting site or any loss of or impact to known, suitable or potential nesting trees. As the site contains **0.14 ha** of foraging habitat this is not likely to result in the requirement for a referral pursuant to the EPBC Act. However, a further survey is required to determine if suitable nesting hollows are present within the potential nesting trees on site. If they are determined to be present, and avoidance is not possible a referral is likely to be required.

4 SUMMARY AND RECOMMENDATIONS

The following is a summary of the environmental considerations within the site and related environmental advice.

- The site contains 0.14 ha of native vegetation and intersects with an Environmentally Sensitive Area and therefore no clearing permit regulation exemptions apply. Due to the limited extent of native vegetation, a clearing referral is likely to be the best approvals pathway to satisfy the requirements of Part V of the EP Act.
- 0.14 ha of foraging habitat for black cockatoos has been identified within the site as well as potential nesting trees. There is a limited extent of the foraging habitat, which does not meet the threshold for EPBC Act referral. However, a further survey is required to determine if potential nesting trees contain suitable hollows. If suitable hollows are present on site there may be a requirement for referral. Impacts to these would require further approval consideration through either EP Act Part V clearing permit and/or EPBC Act referral and/or assessment.
- Bush Forever site 481 occurs approximately 100 m northwest of the site, all works and disturbance will need to be excluded from this area.
- No additional threatened or priority species to those described above or ecological communities were considered likely to occur within the site based on the desktop survey or recorded during the site survey.
- The majority of the site is classified as having a 'moderate to low' risk of Acid Sulphate Soils occurring within 3 m of the natural soil surface, this is a consideration for deep excavation and dewatering which is unlikely to be relevant to these works. The site also has an interface along four contaminated sites indicated to be remediated for restricted uses.
- Two multiple use wetlands occur across the site, this is unlikely to pose major restrictions to the proposed works.
- Two registered Aboriginal heritage sites occur in close proximity to the site (60m northeast and 100m southeast), any impacts to these sites are to be avoided. Impacts to a registered Aboriginal site will require Section 18 consent under the AH Act to proceed. A number of historic sites were also determined to be present within the site and as such whilst a Section 18 approval is not required for these site, consideration should be given during construction activities to be aware of previous Aboriginal cultural significance including artefacts and scatter and address these through construction implementation activities accordingly.

We trust that the above satisfies the requirements of the desktop assessment and environmental approvals advice for the Stirling Crescent road upgrades. Should you have any queries or additional information requirements please don't hesitate to contact [redacted]

Yours sincerely
Emerge Associates

[redacted]

cc: n/a

Encl: Figure 1: Site Location
Figure 2: Soils and Topography
Figure 3: Native Vegetation Extent
Figure 4: Environmental Features
Figure 5: Environmentally Sensitive Areas
Figure 6: Acid Sulphate Soils Risk and Contaminated Sites
Figure 7: Hydrology and Heritage

Attachment A – Proposed upgrades
Attachment B – Threatened and priority flora likelihood of occurrence
Attachment C – Threatened and priority ecological communities likelihood of occurrence
Attachment D – Threatened and priority fauna likelihood of occurrence

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Figures

Figure 1: **Site Location**

Project: Desktop Assessment and Investigation Advice
Stirling Crescent Road Upgrades

Client: City of Swan

Plan Number: EP25-071(01)--F01

Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

N

0 50 100
Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

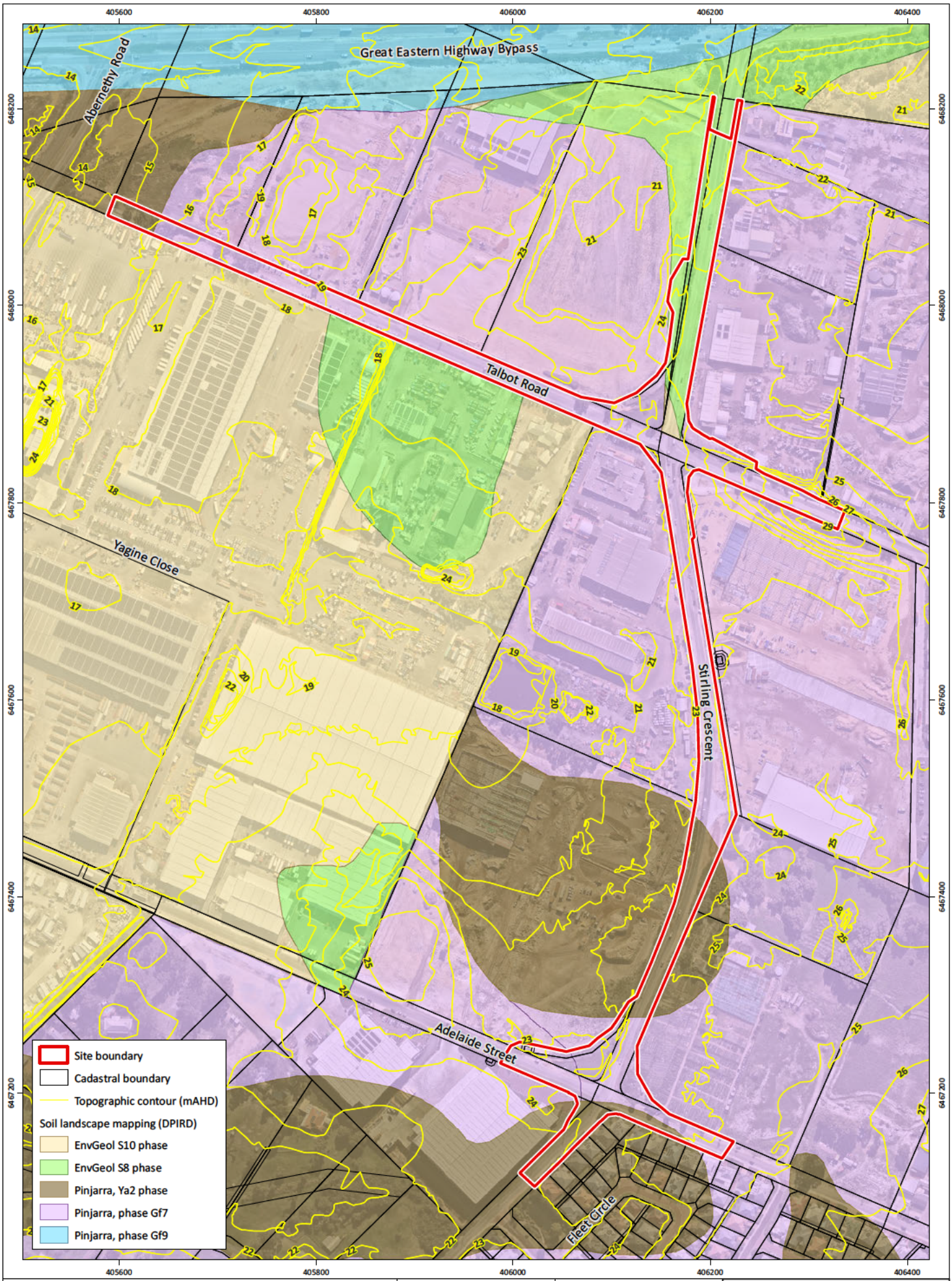

Figure 2: Soils and Topography

Project: Desktop Assessment and Investigation Advice
Stirling Crescent Road Upgrades

Client: City of Swan

Plan Number: EP25-071(01)--F02

Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Figure 3: Native Vegetation Extent

Project: Desktop Assessment and Investigation Advice
Stirling Crescent Road Upgrades

Client: City of Swan

Plan Number: EP25-071(01)--F03

Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

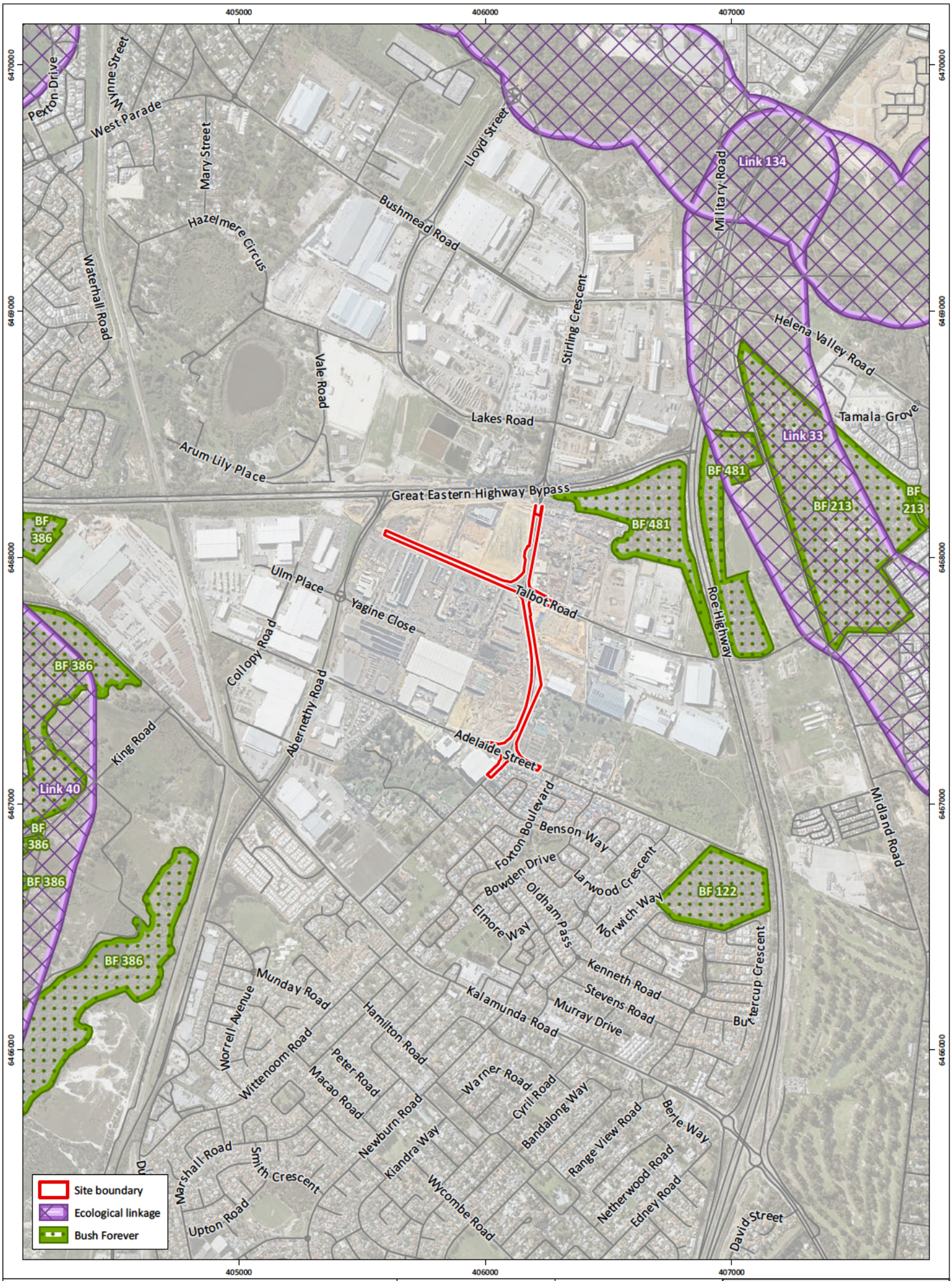

Figure 4: Environmental Features

Project:	Desktop Assessment and Investigation Advice Stirling Crescent Road Upgrades
Client:	City of Swan

Plan Number:	**EP25-071(01)--F04**
Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

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Metres

Scale: 1:20,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Figure 5: Environmentally Sensitive Areas

Project: Desktop Assessment and Investigation Advice
Stirling Crescent Road Upgrades

Client: City of Swan

Plan Number: EP25-071(01)--F05

Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

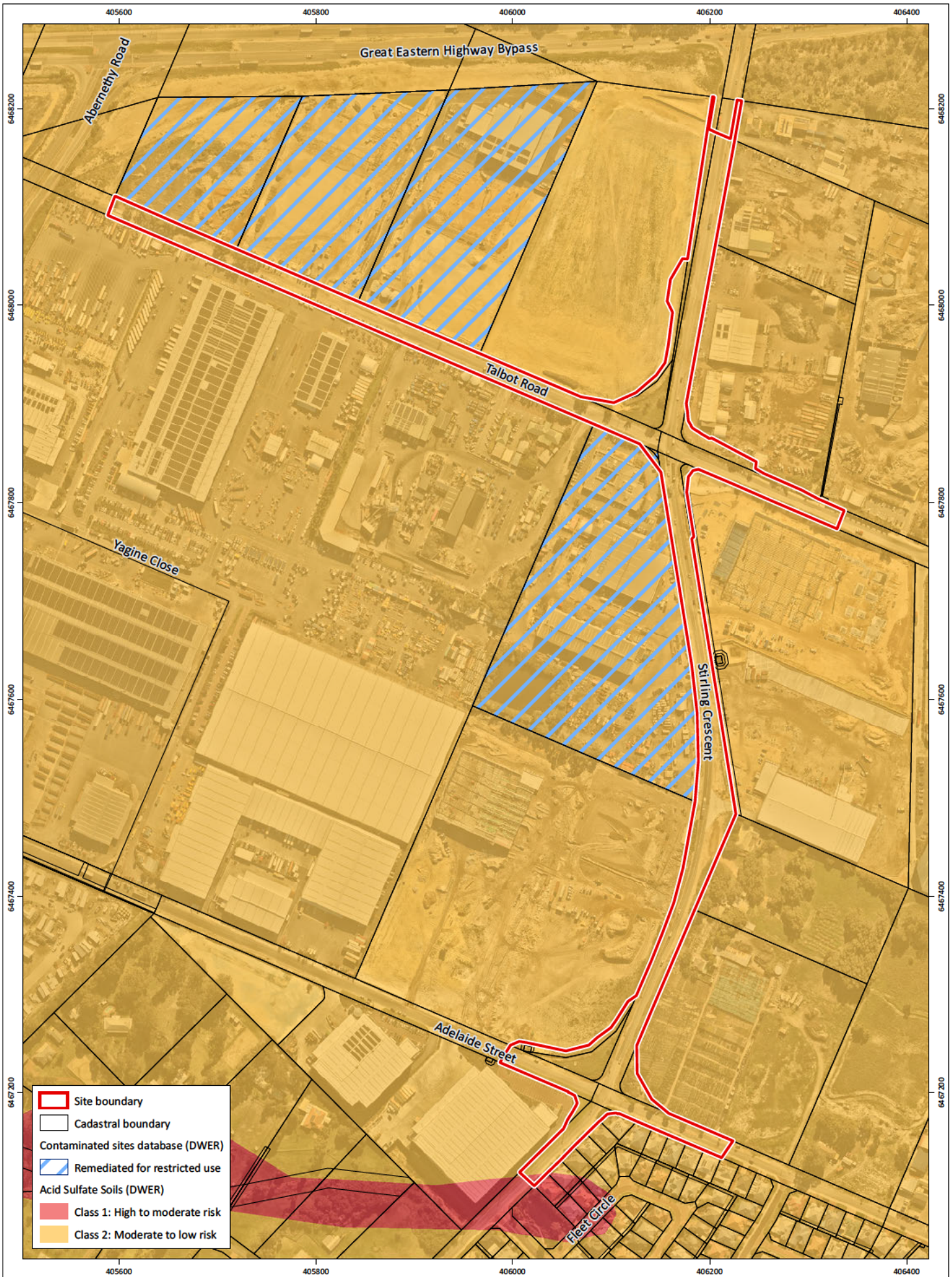

Figure 6: Acid Sulfate Soils Risk and Contaminated Sites

Project: Desktop Assessment and Investigation Advice
Stirling Crescent Road Upgrades

Client: City of Swan

Plan Number: EP25-071(01)--F06

Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

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Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

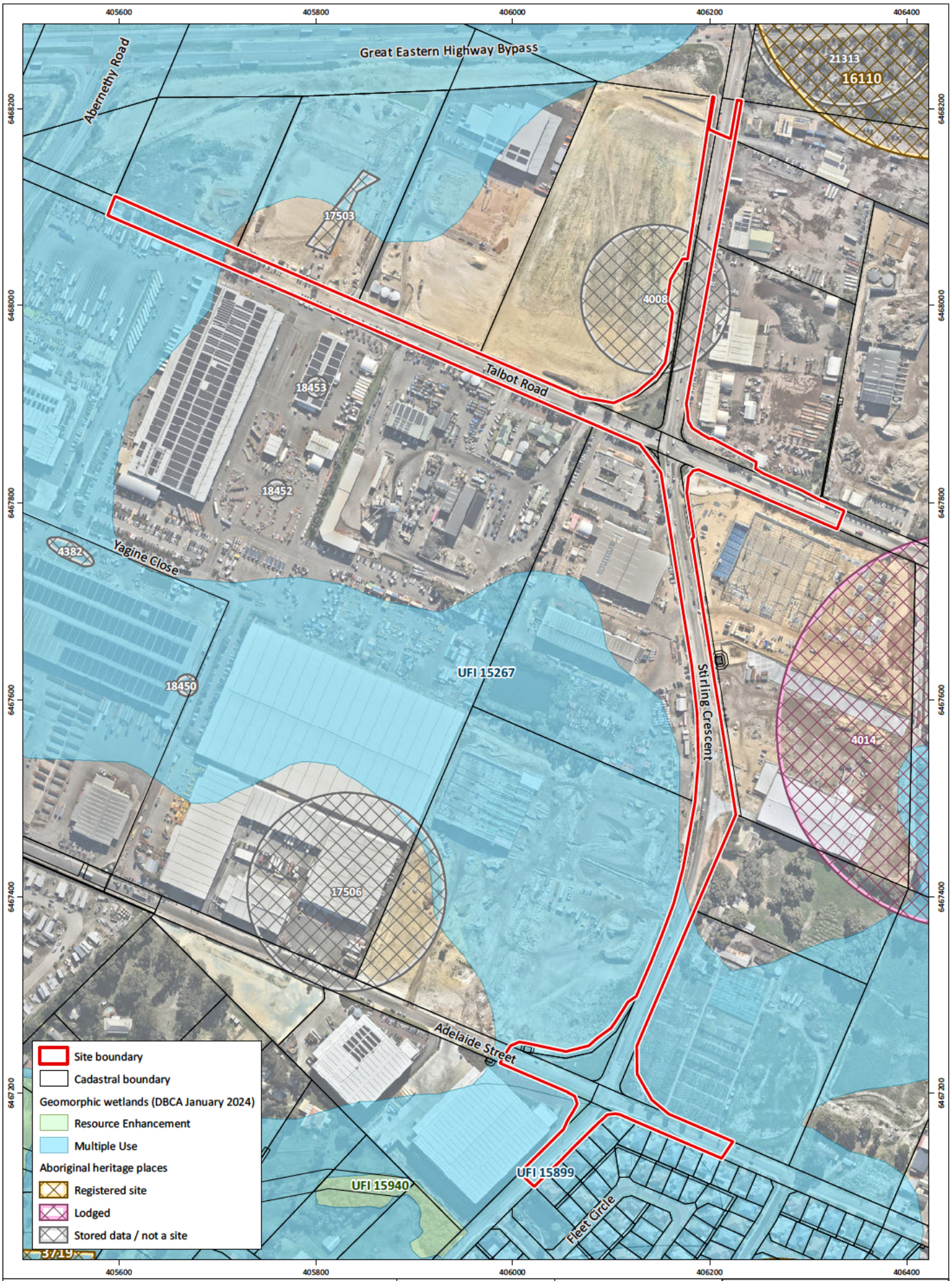

Figure 7: Hydrology and Heritage

Project:	Desktop Assessment and Investigation Advice Stirling Crescent Road Upgrades
Client:	City of Swan

Plan Number: EP25-071(01)--F07

Drawn:	GAR
Date:	23/09/2025
Checked:	CSR
Approved:	TB
Date:	03/10/2025

N

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Attachment A

Proposed Upgrades

N

Coordinate System: GDA2020 MGA Zone 50
Scale: 1:5,491 @ A4
Created Date: 11/03/2025

Stirling Crescent Upgrade project area

0 25 50
Meters

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Attachment B

Threatened and priority flora likelihood of occurrence

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Darwinia foetida	EN	CR	P	Grey-white sand on swampy, seasonally wet sites.	Oct-Nov	Negligible
Grevillea thelemanniana	CR	CR	P	Sand, sandy clay. Winter-wet low-lying flats.	May-Nov	Moderate
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	CR	CR	P	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	Oct	Negligible
Caladenia huegelii	CR	EN	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov	Negligible
Calytrix breviseta subsp. Breviseta	CR	EN	P	Seasonally wet sandy-clay soil on swampy flats	Oct-Nov	Negligible
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	Negligible
Conospermum densiflorum subsp. unicephalatum	EN	EN	P	Clay in low lying areas.	Sep-Nov	Negligible
Darwinia apiculata	EN	EN	P	Open jarrah-marri woodland on shallow gravely soil over laterite, or open heathland over sandy loams with granite boulders.	Oct-Nov	Low
Diuris purdiei	EN	EN	PG	Sand to sandy clay soils in areas subject to winter inundation.		Negligible
Eucalyptus leprophloia	EN	EN	P	White or grey sand over laterite. Valley slopes.	Aug-Oct	Negligible
Macarthuria keigheryi	EN	EN	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec or Feb-Mar	Moderate
Melaleuca sciotostyla	EN	EN	P	Orange clayey sand with lateritic pebbles. Scree slopes.	Aug	Negligible
Thelymitra stellata	EN	EN	PG	Sandy loam, clay or gravel over laterite or gravel.	Sep-Nov	Low

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Chamelaucium lullfitzii	VU	EN	P	White yellow sand in low woodland.	Oct-Nov	Negligible
Grevillea corrugata	VU	EN	P	Gravelly loam. Roadsides.	Aug-Sep	Negligible
Conospermum undulatum	VU	VU	P	Sand and sandy clay soils, on flat or gently sloping sites between the Swan and Canning Rivers	May-Oct	Moderate
Diuris drummondii	VU	VU	PG	In low-lying depressions in peaty and sandy clay swamps.	Nov-Jan	Moderate
Morelotia australiensis	VU	VU	P	Sand over clay, winter wet depressions and drainage lines.	Nov-Dec	Negligible
Bolboschoenus fluviatilis	P1	-	P	Floodplain with grey/brown wet sand.	Nov	Low
Boronia humifusa	P1	-	P	Gravelly clay loam over laterite.	Jun or Sep	Low
Calandrinia sp. Bayswater (C. Andrews s.n. 11/1902)	P1	-	A?	Unknown.	Unknown	Negligible
Drosera patens	P1	-	P	Sandy soils on margins of winter-wet depressions, swamps and lakes.		Negligible
Hydrocotyle striata	P1	-	A	Sand and clay in springs and creeklines.	Nov	Negligible
Levenhookia preissii	P1	-	A	Grey or black, peaty sand. Swamps	Sep-Dec/Jan	Moderate
Senecio gilbertii	P1	-	P	Peaty sand in swamps and on slopes.	Sep-Nov	Negligible
Thelymitra magnifica	P1	-	PG	Gravelly soil on stony ridges.	Sep-Oct	Low
Commersonia sp. Lesmurdie (A.A. Mitchell 11429)	P2	-	P	Hills/slopes of brown cracking clay soil on basalt sill (limited information, species only known from a single location).	?Nov (limited information)	Low
Drosera x badgerupii	P2	-	P	Black sandy soil, winter wet		Low
Johnsonia pubescens subsp. cygnorum	P2	-	P	Grey white yellow sands on flats and seasonally wet areas.	Sep	Moderate
Lepyrodia curvescens	P2	-	P	Sand, laterite. Seasonally inundated swampland.	Sep-Nov	Moderate

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Poranthera moorokatta	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes in banksia woodland.	Sep-early Nov	Moderate
Thysanotus brachiatus	P2	-	P	Grey sand	Nov-Dec	Negligible
Byblis gigantea	P3	-	P	Sandy-peat swamps. Seasonally wet areas.	Sep-Jan	Moderate
Carex tereticaulis	P3	-	P	Black peaty sand.	Sep-Oct	Low
Cyathochaeta teretifolia	P3	-	P	Grey sand, sandy clay in swamps and creek edges.	Oct-Jan	Low
Grevillea dissectifolia	P3	-	P	White/grey or yellow/brown sand/clay/loam over laterite or granite. Near outcrops, sometimes along creek line or drainage line.	Apr or Jun or Aug-Sep or Nov	Low
Isopogon autumnalis	P3	-	P	Yellow-grey sand.	pr,May or	Moderate
Jacksonia gracillima	P3	-	P	Sand, often adjacent to winter wet areas	Sep-Dec	Moderate
Meionectes tenuifolia	P3	-	P	seasonally wet areas.	Oct-Dec	Negligible
Platysace ramosissima	P3	-	P	Sandy soils.	Oct-Nov	Moderate
Schoenus benthamii	P3	-	P	winter wet flats and swamps.	Oct-Nov	Moderate
Schoenus pennisetis	P3	-	A	and winter-wet depressions.	Aug-Sep	Moderate
Sporobolus blakei	P3	-	P	Red sandy clay, loam. Creeks.	to July	Negligible
blotched corolla (A.	P3	-	P	Granitic soils on slopes.	Sep-Nov	Negligible
Styphelia filifolia	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Moderate
Thysanotus anceps	P3	-	P	gravel, laterite.	Oct-Dec	Low
Tricostularia drummondii	P3	-	P	Low woodland or mallee over sand/laterite. Flats, rises, swampy areas.	Sep-Nov (limited data)	Moderate
Verticordia serrata var. linearis	P3	-	P	White sand, gravel.	Sep-Oct	Negligible
Calothamnus accedens	P4	-	P	Sandy soils over laterite.	Sep-Jan	Negligible
Cyanothamnus tenuis	P4	-	P	Laterite, stony soils, granite.	Aug-Nov	Low
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb	Moderate
Lasiopetalum bracteatum	P4	-	P	Sandy clay, clay, lateritic gravel along drainage lines, creeks, gullies, granite outcrops.	Aug-Nov	Low

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Ornduffia submersa	P4	-	A	In freshwater 0.05-0.6 m deep. Pools, lakes, swamps, winter-wet depressions, claypans.	Aug-Nov	Low
Schoenus griffinianus	P4	-	P	White sand.	Sep-Oct	Moderate
Senecio leucoglossus	P4	-	A	Gravelly lateritic or granitic soils	Aug-Dec	Low
Stylidium striatum	P4	-	P	Brown clay over laterite on hill slopes.	Oct-Nov	Negligible
Thysanotus glaucus	P4	-	P	White, grey or yellow sand, sandy gravel.	Oct-Mar	Moderate

Note: CR=critically endangered, EN=endangered, VU=vulnerable, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4, P=perennial, PG=perennial geophyte, A=annual. Species considered to potentially occur within the site are shaded green.

Attachment C

Threatened and priority ecological communities likelihood of occurrence

Code	Community name	TEC/ PEC	Level of significance		Likelihood of occurrence
			State	EPBC Act	
SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. 1994)	TEC	EN	CR	Low
SCP10a	Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. 1994)	TEC	EN	CR	Low
SCP20b	Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson et al. 1994)	TEC	CR	EN	Low
SCP20a	Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)	TEC	CR	EN	Low
SCP3a	Corymbia calophylla - Kingia australis woodlands on heavy soils (floristic community type 3a as originally described in Gibson et al. 1994)	TEC	CR	EN	Low
SCP20c	Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c as originally described in in Gibson et al. 1994)	TEC	CR	EN	Low
SCP3c	Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. 1994)	TEC	EN	EN	Low
Muchea Limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	TEC	EN	EN	Low
Epodisma peatlands	Epodisma peatlands of southwestern Australia	TEC	-	EN	Negligible
SCP02	Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson et al. 1994)	TEC	CR	-	Low
SCP3b	Corymbia calophylla - Eucalyptus marginata woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson et al. 1994)	TEC	EN	-	Low
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	TEC/ PEC	P3	EN	Low
Coastal saltmarsh	Subtropical and Temperate Coastal Saltmarsh	TEC/ PEC	P3	VU	Negligible
SCP21c	Low lying Banksia attenuata woodlands or shrublands	TEC/ PEC	P3	EN	Low

Code	Community name	TEC/ PEC	Level of significance		Likelihood of occurrence
			State	EPBC Act	
Tuart woodlands	Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community	TEC/ PEC	P3	CR	Negligible
Central Granite Shrublands	Central Northern Darling Scarp Granite Shrubland Community	PEC	P4	-	Low

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

Attachment D

Threatened and priority fauna likelihood of occurrence

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Birds					
Actitis hypoleucos	Common sandpiper	MI	MI	Edge of sheltered waters salt or fresh, e.g. estuaries, mangrove creeks, rocky coasts, near-coastal saltlakes (including saltwork ponds), river pools, lagoons, claypans, drying swamps, flood waters, dams and sewage ponds. Preferring situations where low	Negligible
Anous tenuirostris melanops	Australian lesser noddy	EN	VU	Very common in blue-water seas around the Abrolhos (endemic to this area, accidental occurrences on lower west coast of Australia) (Johnstone and Storr 1998).	Negligible
Apus pacificus	Pacific swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Pizzey & Knight 2012).	Negligible
Ardenna pacifica	Wedge-tailed Shearwater	MI	MI	Pelagic species that inhabits tropical and subtropical seas. Common in western and eastern Australian seas. In western Australia breeds on offshore islands from Montebello to Rottnest/Carnac (Morcombe & Stewart 2021; Pizzey & Knight 2012).	Low
Botaurus dubius	Australian little bittern	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of Typha spp., Baumea spp. and tall rushes in freshwater swamps around lakes and along rivers (Johnstone and Storr 1998).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Botaurus poiciloptilus	Australasian bittern	EN	EN	In or over water, in tall reedbeds, sedges, rushes, cumbungi, lignum. Also occurs in ricefields, drains in tussocky paddocks and occasionally in saltmarshes and brackish wetlands (TSSC 2019).	Low
Cacatua pastinator pastinator	Muir's corella	CD	-	Wheat and sheep farming country with remnant native forest. Species is restricted to the south-west corner of WA, near Lake Muir (DPaW 2015).	Negligible
Calidris acuminata	Sharp-tailed sandpiper	VU (MI)	VU (MI)	Occurs in tidal mudflats, saltmarshes and mangroves, as well as, shallow fresh, brackish or saline inland wetlands. It is also known from floodwaters, irrigated pastures and crops, sewage ponds, saltfields (Pizzey & Knight 2012).	Negligible
Calidris ferruginea	Curlew sandpiper	CR	CR (MI)	Mainly shallows of estuaries and near-coastal saltlakes (including saltwork ponds) and drying near-coastal freshwater lakes and swamps. Also beaches and near-coastal sewage ponds (Johnstone & Storr 1988).	Negligible
Calidris melanotos	Pectoral sandpiper	MI	MI	Mainly fresh waters (swamps, lagoons, river pools, irrigation channels and sewage ponds); also samphire flats around estuaries and saltlakes (Johnstone & Storr 1998).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	VU	Eucalypt and Corymbia forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding Corymbia calophylla, Eucalyptus marginata, introduced Melia azedarach and Eucalyptus spp. trees (Johnstone et al. 2013).	Moderate
Charadrius cucullatus	Hooded plover	P4	MA	Margins and shallows of saltlakes, sandy and seaweedy beaches and estuaries; also dams (Johnstone and Storr 1998).	Negligible
Falco peregrinus	Peregrine falcon	OS	-	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	Low
Motacilla cinerea	Grey wagtail	MI	MI	In Australia mostly near running water in disused quarries, sandy and rocky streams in escarpments and rainforests, sewage ponds, ploughed fields and airfields (Pizzey & Knight 2012).	Negligible
Ninox connivens connivens	Barking owl (southwest subpop.)	P3	-	Open forests, woodlands, dense scrubs, foothills, river red gums, and other large trees near watercourses penetrating otherwise open country. Also Melaleuca woodlands, mangroves, rainforests and deciduous vine scrubs (Johnstone and Storr 1998; Pizzey & Knight 2012).	Negligible
Numenius madagascariensis	Eastern curlew	CR	CR (MI)	Mainly tidal mudflats; also reef flats, sandy beaches and rarely near-coastal lakes (including saltwork ponds) (Johnstone and Storr 1998).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Oxyura australis	Blue-billed duck	P4	-	Mainly deeper freshwater swamps and lakes; occasionally saltlakes and estuaries freshened by flood waters (Johnstone and Storr 1998).	Low
Pandion haliaetus	Osprey	MI	MI	Coasts, estuaries, bays, inlets, islands, and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks (Pizzey & Knight 2012).	Low
Plegadis falcinellus	Glossy Ibis	MI	MI	Well-vegetated wetlands, wet pasture, ricefields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats and occasionally dry grassland (Pizzey & Knight 2012).	Low
Rostratula australis	Australian painted snipe	EN	EN	Mainly shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (Marchant and Higgins 1993).	Negligible
Tringa glareola	Wood sandpiper	MI	MI	Mainly shallow fresh waters (lagoons, swamps, claypans, river pools, dams, bore overflows and sewage ponds); occasionally brackish swamps, rarely saltlakes and estuaries (Pizzey & Knight 2012).	Low
Tringa nebularia	Common greenshank	EN (MI)	EN (MI)	Mudflats, estuaries, saltmarshes, margins of lakes, wetlands, claypans (fresh and saline), commercial saltfields, sewage ponds (Pizzey & Knight 2012).	Negligible
Zanda baudinii	Baudin's black cockatoo	EN	EN	Mainly eucalypt forests. Attracted to seeding Corymbia calophylla, Banksia spp., Hakea spp., and to fruiting apples and pears (Johnstone and Storr 1998).	Moderate

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Zanda latirostris	Carnaby's black cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of Pinus spp. Attracted to seeding Banksia spp., Hakea spp., Eucalyptus spp., Corymbia calophylla, Grevillea spp., and Allocasuarina spp. (Johnstone and Storr 1998).	Moderate
Fish					
Galaxiella nigrostriata	Black-stripe minnow	EN	EN	Seasonally dry coastal wetlands. Permanent or ephemeral spring-fed headwater streams, ponds, roadside ditches and small creeks in sandy wetland areas with thick vegetation. Also occurs in the shallow areas of some freshwater lakes with thick vegetation. The water is usually highly tannin-stained and acidic (pH 4.5-6.5) (Bray and Gomon 2017).	Negligible
Invertebrate					
Australotomurus morbidus	Cemetery springtail	P3	-	Typical habitats for Australotomurus species are long undisturbed native grasslands and heathland at low and high elevations. Known only from four locations in Peth.	Negligible
Cherax tenuimanus	Margaret River marron	CR	CR	Occurs primarily in the upper reaches of the Margaret River. Prefers sandy areas, particularly where detritus (organic matter) accumulates, and requires in-stream structural diversity for protection (DoE 2013)	Negligible
Euoplos inornatus	Inornate trapdoor spider	P3	-	Has previously been recorded in jarrah forest, including near clay banks and granite outcrop. Most records are from the Darling scarp/Jarrah Forest Region, with limited records from the Swan Coastal Plain (DBCA 2020).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Leioproctus contrarius	a short-tongued bee	P3	-	Life history and habits are poorly documented/ unknown.	Negligible
Leioproctus douglasiellus	a short-tongued bee	EN	CR	Life history and habits are poorly documented/ unknown. It has been recorded only on the flowers of Goodenia filiformis and Anthotium junciforme (Houston 2000).	Negligible
Synemon gratiosa	Graceful sun-moth	P4	-	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the preferred host plant Lomandra maritima. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread (DEC 2011).	Low
Westralunio carteri	Carter's freshwater mussel	VU	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Also occupies lentic systems including large water supply dams and even on-stream farm dams. Salinity tolerance quite low (Morgan et al. 2011).	Low
Mammal					
Bettongia penicillata ogilbyi	Woylie	CR	EN	Woodlands and adjacent heaths with a dense understorey of shrubs, particularly Gastrolobium spp. (TSSC 2018).	Low
Dasyurus geoffroii	Chuditch	VU	VU	Wide range of habitats from woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. Appears to utilise native vegetation along roadsides in the wheatbelt (DEC 2012).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Hydromys chrysogaster	Rakali	P4	-	Areas with permanent water, fresh, brackish or marine. Likely to occur in all major rivers and most of the larger streams as well as bodies of permanent water in the lower south-west (Christensen et al. 1984). Intact riparian vegetation and associated bank stability is critical to their survival (DWER 2023).	Very low
Isoodon fusciventer	Quenda	P4	-	Dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC 2012)	Moderate
Myrmecobius fasciatus	Numbat	EN	EN	Generally dominated by Eucalyptus spp. that provide hollow logs and branches for shelter and termites for food (van Dyck & Strahan 2008).	Negligible
Notamacropus eugenii derbianus	Tammar wallaby	P4	-	Dry sclerophyll forest, Banksia spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover (Christensen and Strahan 1983).	Low
Notamacropus irma	Western brush wallaby	P4	-	Dry sclerophyll forest, Banksia spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover (Christensen and Strahan 1983).	Low
Petrogale lateralis lateralis	Black-footed rock-wallaby	EN	EN	Occurs in rocky habitats with complex cave and crevices. Permanent water appears to be essential component of species habitat (DBCA 2017).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Phascogale calura	Red-tailed phascogale	CD	VU	Historically occurred in a variety of woodland habitats but not restricted to remnants of mature Eucalyptus wandoo or Allocasuarina huegeliana woodlands in the south-western Wheatbelt where annual rainfall is 300-600 mm (Menkhorst & Knight 2011).	Negligible
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale	CD	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover (Triggs 2003).	Negligible
Pseudocheirus occidentalis	Western ringtail possum	CR	CR	On the Swan Coastal Plain in Agonis flexuosa woodlands and Agonis flexuosa/ Eucalyptus gomphocephala forests. Also Eucalyptus marginata forests (DBCA 2017).	Negligible
Setonix brachyurus	Quokka	VU	VU	On the mainland mostly dense streamside vegetation or shrubland and heath areas, particularly around swamps (Cronin 2007).	Negligible
Reptile					
Ctenotus delli	Dell's skink	P4	-	Jarrah and marri woodland with a shrub dominated understorey, sheltering in dense vegetation, inside grass trees and beneath rocks, sometimes in burrows (Nevill 2005).	Negligible
Neelaps calonotos	Black-striped snake	P3	-	Coastal and near-coastal dunes, sandplains supporting heathlands and Banksia spp. woodlands (Bush et al. 2010).	Negligible
Pseudemydura umbrina	Western swamp tortoise	CR	CR	Clay based ephemeral swamps (Bush et al. 2010).	Low

Note: CR=critically endangered, EN=endangered, VU=vulnerable, CD=conservation dependent, MI=migratory, OS=other specially protected, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4. Species with a high or moderate likelihood to occur within the site are shaded green.