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Lot 8904 Northwood Drive Mirrabooka

Native Vegetation Clearing Permit Application Supporting Documentation

Prepared for
Service Stream Limited
by Strategen

June 2019

**Lot 8904 Northwood Drive
Mirrabooka**

**Native Vegetation Clearing Permit Application
Supporting Documentation**

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June 2019

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Client: Service Stream Limited

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1. Introduction

1.1 Purpose and scope

This document provides supporting information for a Native Vegetation Clearing Permit (NVCP) application for an area permit to clear 0.008ha of native vegetation within a portion of Lot 8904 on Deposited Plan 180631 Northwood Drive, Mirrabooka Western Australia (Figure 1), within the City of Stirling (the City).

Service Stream Limited (SSL) have been contracted by Optus Mobile Pty Ltd to construct a mobile phone tower base station and compound (the Project Area; Figure 2). Implementation of these works requires clearing 0.008 ha of native vegetation within the Project Area. Infrastructure proposed to be constructed within the Project Area includes:

- new 23.8m high steel monopole (26.5 m overall structure height)
- six (6) new panel antennas mounted to a new headframe at the top of the monopole and at 25 m centrelines
- eighteen (18) new Remote Radio Units (RRUs) mounted to the headframe at 25.5 m centrelines
- eighteen (18) new Remote Radio Units (RRUs) mounted to the headframe at 24.5 m centrelines
- associated ancillary equipment, including Combiners, Feeders, Mast Head Amplifiers
- compound with an area of 80 m², which consists of fencing 10 m x 8 m x 2.4 m including access gates on the western boundary for access from Northwood Drive
- equipment shelter within the compound and at the base of the monopole, finished in 'Pale Eucalypt'.

This document has been prepared to support the NVCP application for the project, for assessment under s51E of the Environmental Protection Act 1986 (EP Act) and includes the following information relating to clearing impacts:

- an overview of the existing environmental conditions of the Project Area
- a summary of investigations undertaken within the Project Area
- an evaluation of the considerations in State Planning Policy 2.8 for development within Bush Forever sites
- an evaluation of the proposed clearing against the 10 clearing principles listed under Schedule 5 of the EP Act
- environmental approvals and management requirements.

1.2 Project background and description

Due to increasing network demands for data, Optus Mobile Pty Ltd (Optus) in partnership with Vodafone Hutchinson Australia (VHA) have identified the need to install a telecommunications facility to improve both voice and data services within the Mirrabooka locality. Overall, the project will see the consolidation of the telecommunications infrastructure of the two network operators and improve customer experience through faster and more reliable voice and data services.

Several potential location options were considered before selecting the site. Each potential option was assessed against a variety of factors including co-location opportunities, proximity to sensitive land uses, planning scheme considerations, technical and coverage objectives, cost considerations, land tenure, visual impact and engineering/design criteria. The site was selected as the most appropriate location due to the following considerations:

- adjacent a main road
- site accessibility
- good physical and visual separation from residential uses
- no requirement for additional setback into vegetation
- appropriate land use planning considerations
- distance from other sensitive land uses such as residential areas, schools, playcentres, public open space etc.

Lot 8904 is zoned as Parks and Recreation under the Metropolitan Regional Scheme and forms part of Bush Forever (BF) Site 385. The topography of the Site is mostly flat. Several large trees occur within Lot 8904, however, initial site visits undertaken by SSL during the planning phase identified these trees and design considerations have located the Project Area specifically to ensure these trees are avoided. A Development Application (DA) was submitted to the Western Australian Planning Commission (WAPC) and subsequently referred to the Statutory Planning Committee for determination. Following its consideration of the project, the committee resolved to approve the DA on 14 August 2018 (ref. 20-51038-1), subject to a series of environmental conditions including:

4. *a Landscaping Plan shall be submitted and approved to the specification of the City of Stirling and the satisfaction of the Western Australian Planning Commission, prior to the commencement of site works. Once approved, the Landscaping Plan is to be implemented in its entirety.*
6. *no building materials, rubbish or other matter shall be deposited on the adjacent land reserved for Parks and Recreation and identified as Bush Forever Site 385 in the Metropolitan Region Scheme during or after construction of the development.*
7. *a Construction Management Plan shall be submitted and approved to the specification of the City of Stirling and the satisfaction of the Western Australian Planning Commission, prior to the commencement of site works. Once approved, the Construction Management Plan is to be implemented in its entirety.*

Specific advice was provided with the DA approval which states:

In relation to Condition 4, the Landscaping Plan shall include, but not be limited to:

- a) *the number of substantial trees/vegetation proposed to be retained*
- b) *the number of substantial trees/vegetation proposed to be removed and pruned*
- c) *the areas, numbers and species of trees/vegetation to be planted to offset those being removed.*

In relation to Condition 7, the Construction Management Plan shall include, but not be limited to:

- a) *access and egress to the site*
- b) *noise and dust control*
- c) *waste management*
- d) *parking arrangements for contractors and subcontractors*
- e) *storage of materials*
- f) *traffic management*
- g) *site safety and security.*

Both the LMP and the Construction Management Plan are under development and are yet to be submitted to the City of Stirling for approval.

1.2.1 Timing and clearing method

Construction is proposed to commence in Q3 – Q4 2019, subject to approvals and detailed design. Vegetation clearing will be conducted by stripping the vegetation and topsoil/overburden. Vegetation and topsoil/overburden material will be stockpiled separately and removed from the Site. All clearing will be to provide space for infrastructure only, temporary laydown areas and vehicle parking will be placed in the road reserve which is cleared of native vegetation.

Site access will be achieved via the road reserve along Inglewood Drive to the west of the Project Area.



Figure 1: The Site



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Figure 2: Project Area



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2. Overview of existing environment

2.1 Geology and landform

Regional geological mapping (Gozzard 1983) indicates the Project Area is underlain by only one geological unit:

- Spearwood System (211Sp_S7) – SAND - pale and olive yellow, medium to coarse-grained, sub-angular to sub-rounded quartz, trace of feldspar, moderately sorted, of residual origin.

2.2 Acid sulfate soils

Soil and groundwater mapping conducted by the Department of Water and Environmental Regulation (DWER) identifies that there is no known (ASS) risk occurring within 3 m of the surface (Perth Groundwater Atlas 2004).

2.3 Hydrology

Depth to groundwater across the project area has been mapped to between 50 m and 51 m below the surface (Water and Rivers Commission 1997). No surface water flows occur within the project area, the nearest surface water collection occurs approximately 430 m to the north west of the project area within Lot 247 on Plan 003031.

A Resource Enhancement wetland (Sumpland; UFI 8264) occurs approximately 1.5 km to the east of the Project Area, no other wetlands occur within 2 km of the Project Area.

2.4 Vegetation and flora

2.4.1 Regional vegetation

Native vegetation in the Project Area has been mapped as the Karrakatta Complex central and south by Heddle et al 1980, which reflects the pre-European extent of this vegetation complex within the Swan Coastal Plain region.

Table 1 below, presents the estimated pre-European and current (as at 2017) extent remaining of the Karrakatta Complex central and south. Vegetation within the Project Area represents less than 0.01% of the current extent remaining of Karrakatta Complex central and south.

Table 1: Extent of Pre-European vegetation within the Project Area

Vegetation complex (Swan Coastal Plain dataset)	Description	Pre-European extent (ha) [^]	Current Extent (ha) as 2017 [^]	% Remaining of Pre-European extent [^]
Karrakatta Complex central and south	Predominantly open forest of <i>Eucalyptus gomphocephala</i> (Tuart), <i>Eucalyptus marginata</i> (Jarrah), <i>Corymbia calophylla</i> (Marril) and woodland of <i>Eucalyptus marginata</i> (Jarrah) with various <i>Banksia</i> species. <i>Agonis flexuosa</i> (Peppermint) is co-dominant south of the Capel River.	53,080	12,465	23.48

[^]Source DPaW 2017

2.4.2 Bush Forever

Bush Forever site (BF) 385 is divided into two large remanent patches of bushland divided by Northwood Drive. The Project Area is located on the western boundary of the eastern portion of BF 385, adjacent to the Northwood Drive road reserve (Figure 1). BF site 385 comprises approximately 96 ha of bushland. Aerial mapping indicates vegetation condition within BF 385 most likely varies from Completely Degraded to Very Good. Bush Forever site 385 forms part of the Perth Ecological Linkage connecting regionally significant bushland, corridors are identified to converge on BF site 385 east to west and north to south.

State Planning Policy (SPP) 2.8 provides guidance on the impact assessment process which should be followed when proposing impacts to bush forever sites, Section 3 below details the assessment process undertaken for the Project Area.

2.4.3 Vegetation Survey Results

Strategen Environmental (Strategen) established a 20 m X 20 m Survey Area which encompassed the Project Area (Figure 2) and conducted a reconnaissance survey on 12 November 2018 which included:

- definition of Vegetation Types (VTs) and condition
- identification of potential Black Cockatoos habitat trees (>500 mm DBH) within the Project Area
- determining the presence/absence of potential Threatened Ecological Community (TEC) and Priority Ecological Community (PEC)

Within the Project Area, only one vegetation type (VT) was identified by the reconnaissance survey. VT1 was in very good condition as presented in Table 2 and Figure 4.

A vehicle access track occurs through the BF site directly to the east of the Project Area which is completely degraded (Figure 4).

Table 2: Vegetation type and condition within the Project Area

Vegetation type	Description	Vegetation condition	Area (ha) within Project Area	Percentage of Project Area
VT1	Open woodland of <i>Eucalyptus marginata</i> , <i>Allocasuarina fraseriana</i> and <i>Banksia attenuata</i> over heathland of <i>Xanthorrhoea preissii</i> , <i>Daviesia nudiflora</i> and <i>Hibbertia hypericoides</i> over hermland of <i>Alexgeorgea nitens</i> , mixed native herbs and introduced species on sand.	Very Good	0.008	100

2.5 Conservation significant vegetation

Flora

Prior to the recognisance survey a desktop assessment and surveys for threatened and priority flora species listed under Commonwealth and State legislation was conducted. Several conservation significant species were identified in the searches, their habitat requirements and an assessment of their likelihood to be present is provided below in Figure 3.

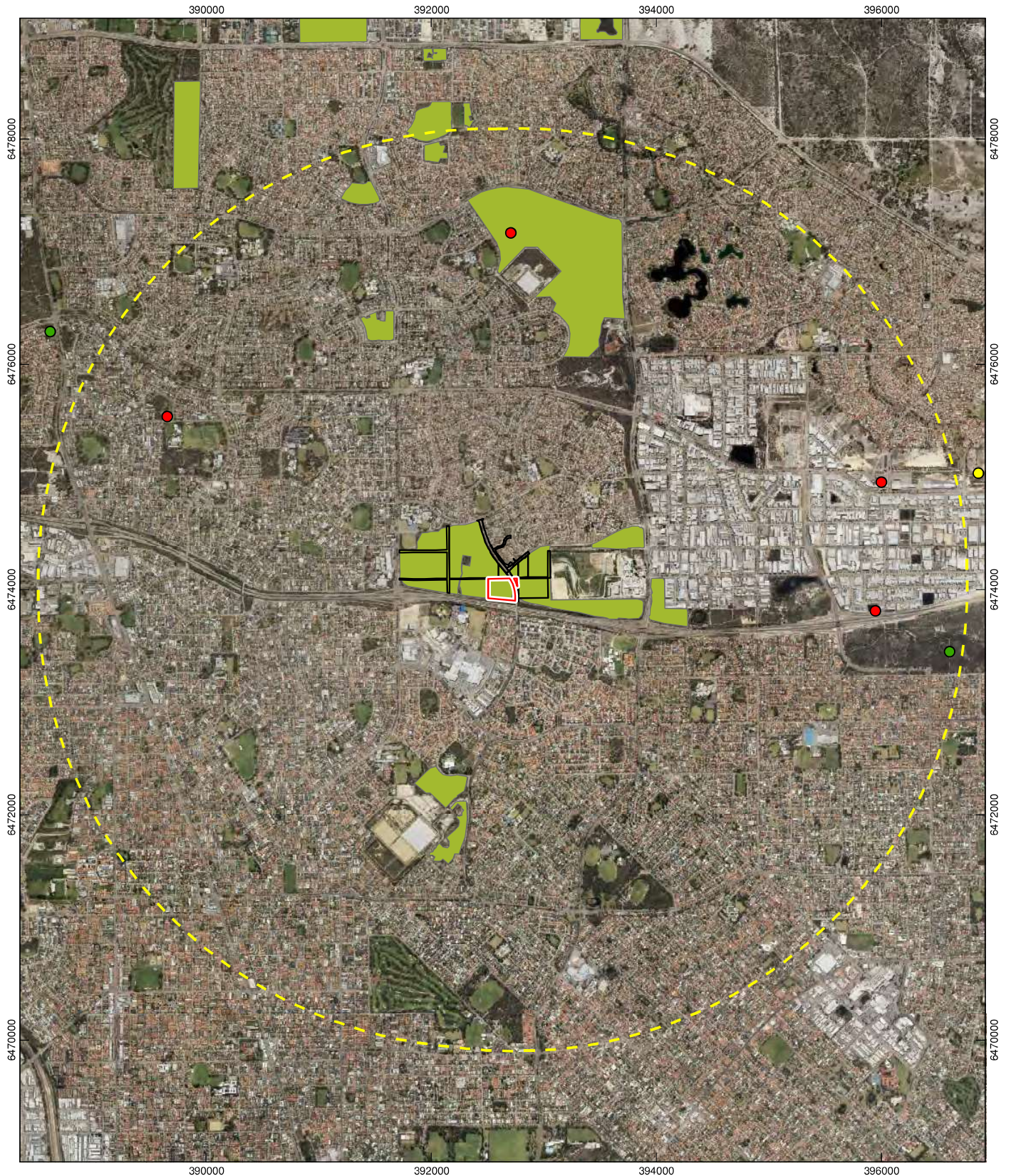
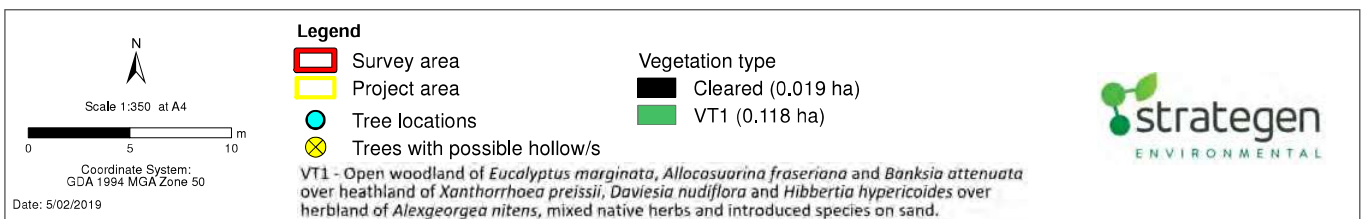


Figure 3: Conservation Significant Vegetation





Figure 4: Vegetation type



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Mapping available online from the Department of Biodiversity Conservation and Attractions (DBCA) via Naturemap, indicate several TEC buffers occur over the Project Area. A request to review the data was made to the DBCA which confirmed the indicative statistical analysis the FCT20A was within the Site and all of BF 385.

Data acquired from the DBCA provides the locations of Rare and Threatened Flora near the Project Area. No rare or Threatened flora species have previously been identified to occur within BF 385; however, several species occur within 4 km as identified below in Table 3 and Figure 3.

Table 3: Conservation significant flora identified in database searches

Species	Conservation status	Habitat description	Previously identified within 4 km of the Project Area	Likelihood of presence
<i>Amanita preissii</i> (Cinnamon-ring Lepidella)	P3 (BC Act)	A habitat description for this species is unavailable.	Recorded 3,9 km to the east of the Project Area	Unknown - but recorded in bushland nearby
<i>Andersonia gracilis</i> — Slender Andersonia	Endangered (EPBC Act)	<i>Andersonia gracilis</i> is currently known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils supporting low open heath vegetation with species such as <i>Calothamnus hirsutus</i> , <i>Verticordia densiflora</i> and <i>Kunzea recurva</i> over sedges (DEC 2006).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area
<i>Anigozanthos viridis</i> subsp. <i>terraspectans</i> — Dwarf Green Kangaroo Paw	Vulnerable (EPBC Act)	Dwarf Green Kangaroo Paw occurs in winter-wet depressions where it grows on grey sandy clay loam, or grey sand, in low post-fire regenerating heath. It is associated with species such as Slender-leaved Banksia (<i>Banksia leptophylla</i>), <i>Melaleuca</i> (<i>Melaleuca</i> spp.), Compact Featherflower (<i>Verticordia densiflora</i>), coneflowers (<i>Conostylis</i> spp.) and sedges (DotE 2017).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area
<i>Cyathochaeta teretifolia</i>	P3 (BC Act)	Rhizomatous, clumped, robust perennial, grass-like or herb (sedge) to 2 m high. Flowers brown. Occurs on grey sand and sandy clay in swamps and at creek edges (Western Australian Herbarium 1998-).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area
<i>Caladenia huegelii</i> — King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	Endangered (EPBC Act) Threatened (BC Act)	The King Spider-orchid grows in well-drained, deep sandy soils in low mixed woodlands of Coast Banksia (<i>Banksia attenuata</i>), Firewood Banksia (<i>B. menziesii</i>), Holly-leaved Banksia (<i>Banksia ilicifolia</i>), Western Sheoak (<i>Allocasuarina fraseriana</i>) and Jarrah (<i>Eucalyptus marginata</i>). It tends to favour areas of lush undergrowth (DotE 2017).	Not recorded within 4 km of the Project Area	Possible – required habitat is present within the Project Area

Species	Conservation status	Habitat description	Previously identified within 4 km of the Project Area	Likelihood of presence
<i>Calectasia cyanea</i>	Critically Endangered (EPBC Act) Threatened (BC Act)	A woody perennial herb, 0.1-0.6 m high to 0.3 m wide. Flowers blue/purple between June and October. Occurs on white, grey or yellow sand and gravel (Western Australian Herbarium 1998-, DEE 2019b).	Not recorded within 4 km of the Project Area	Possible due to presence of preferred habitat
<i>Diuris micrantha</i> — Dwarf Bee-orchid	Vulnerable (EPBC Act)	It is found in small populations, on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps. The bases of the flowering plants are often covered with shallow water (DotE 2016).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area
<i>Diuris purdiei</i> — Purdie's Donkey-orchid	Endangered (EPBC Act)	It grows on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath with scattered emergent <i>Melaleuca preissiana</i> , <i>Eucalyptus calophylla</i> , <i>E. marginata</i> and <i>Nuytsia floribunda</i> (DotE 2008).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area
<i>Drakaea elastica</i> — Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid	Endangered (EPBCA)	The species grows on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, typically in banksia (<i>Banksia menziesii</i> , <i>B. attenuata</i> and <i>B. ilicifolia</i>) woodland or spearwood (<i>Kunzea glabrescens</i>) thicket vegetation. <i>D. elastica</i> often occurs with other orchid species such as <i>Drakaea glyptodon</i> (king-in-his-carriage), <i>D. livida</i> (warty hammer orchid) and <i>Paracaleana nigrita</i> (flying duck orchid). The increased rates of survival in sites with relatively little direct sun exposure (Carstairs and Coates 1994) indicate a requirement for shady canopy cover to be present (DEC 2009).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area

Species	Conservation status	Habitat description	Previously identified within 4 km of the Project Area	Likelihood of presence
<i>Drakaea micrantha</i>	Vulnerable (EPBC Act) Threatened (BC Act)	A tuberous, terrestrial herb which has a diminutive red and yellow flower, 1.2–2.5 cm long, on a stem that grows to 30 cm. Flowering occurs from September to October. Its heart-shaped leaf, about 1.5 cm long, is silvery grey with prominent green veins. Habitat for this species occurs within cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed (Western Australian Herbarium 1998-, DEE 2019b).	Not recorded within 4 km of the Project Area	Possible due to presence of preferred habitat
<i>Drosera occidentalis</i> <i>Morrison</i>	Priority 4 (BC Act)	Fibrous-rooted, rosetted perennial, herb, to 0.025 m high. Flowers pink / white between October and December or January (Western Australian Herbarium 1998-). No habitat information available.	Not recorded within 4 km of the Project Area	Possible. As no habitat information is available to definitively rule out the presence of this species from the Survey Area, it should be considered to be potentially present
<i>Jacksonia sericea</i> (Waldjumi)	Priority 4 (BC Act)	<i>J. sericea</i> grown in calcareous and sandy soils and flowers from December to November.	Recorded in several locations surrounding the Project Area: 3.0 km to the North 3.3 km to the North west 3.1 km to the East 3.9 km to the East 3.3 km to the South	Possible – required habitat is present within the Project Area
<i>Lepidosperma rostratum</i> — Beaked <i>Lepidosperma</i>	Endangered (EPBC Act)	Beaked <i>Lepidosperma</i> grows in peaty sand and clay amongst low heath, in winter-wet swamps (Brown et al. 1998; Western Australian Herbarium 2013). In the Greater Brixton Street Wetlands, the species occurs in sedgeland dominated by <i>Meeboldina cana</i> , <i>Calytrix aristatus</i> , <i>M. coangustata</i> , <i>Tremulina tremula</i> , <i>Cyathochaeta avenacea</i> and combinations of these (Government of WA 2000).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area

Species	Conservation status	Habitat description	Previously identified within 4 km of the Project Area	Likelihood of presence
<i>Synaphea</i> sp. Fairbridge Farm (D. Papenfus 696) — Selena's Synaphea	Critically endangered (EPBC Act)	Selena's <i>Synaphea</i> occurs on grey, clayey sand with lateritic pebbles in low woodland areas near winter flats (DEC, 2007). Selena's <i>Synaphea</i> is endemic to the Pinjarra Plain of Western Australia (DEC, 2007). It is known from five subpopulations from Serpentine to Dardanup (a range of approximately 120 km north to south), south of Perth, Western Australia (DEC, 2009). The extent of occurrence of the species is approximately 950 km ² and the area of occupancy is estimated to be less than 10 km ² (DEC, 2009).	Not recorded within 4 km of the Project Area	Unlikely – habitat required is not present within the Project Area
<i>Thelymitra stellata</i> — Star Sun-orchid	Endangered (EPBC Act)	The Star Sun-orchid grows among low heath and scrub in Jarrah (<i>Eucalyptus marginata</i>) and Wandoo (<i>E. wandoo</i>) woodland, both on ridges and slopes, flats, also on riverbanks and breakaways. Soil types are red, brown, yellow, or grey sandy loams clay or gravel over laterite or gravel. Dry, moist or saline conditions are tolerated (Atkins 1998; Brown et al. 1998; Kelly et al. 1990; Patrick & Brown 2001). In the north of its range, Woodman Environmental Consulting (2013) considered potential habitat for this species (based on known locations) to be areas where laterite is exposed, with areas considered as primary habitat being the tops of breakaways and hills.	Not recorded within 4 km of the Project Area	Unlikely due to absence of preferred habitat

No threatened or priority flora species listed under Commonwealth or State legislation were observed within the Project Area during the field surveys; however, the survey was not conducted at the optimal flowering time for both species identified as possible to occur due to required habitat present. Consequently, their presence / absence cannot be conclusively confirmed.

Caladenia huegelii — King Spider-orchid

Within the Perth Metropolitan Region (PMR) the King Spider orchid has been significantly reduced from its former range, all known population occur south of the Swan River (DEC 2009); however, the Project Area occurs within a large remnant bushland (approximately 90 ha), therefore, this species may be present.

Threatened and priority ecological communities

The Government of Western Australia (2000) Bush Forever Directory lists all BF sites within Perth and their known vegetation attributes, no information relating to Floristic Community Types or Threatened Ecological Communities are available in this document.

DBCA mapping of the 'Banksia Woodlands of the Swan Coastal Plain' Priority Ecological Community (PEC), corresponding with the Commonwealth listed Threatened Ecological Community (TEC), indicates that the PEC/TEC lies within the Project Area and its vicinity. Onsite vegetation mapping identified the presence of the TEC within the Project Area.

Survey timing was not optimal for an accurate Floristic Community Type (FCT) statistical analysis of the vegetation type within the Project Area; therefore, only an interpretation of the results of the flora survey can be performed. FCT analysis identified SCP20A is likely to be present within the Project Area with seven of the eight indicator species present. SCP20A is listed as a state TEC under the Biodiversity Conservation (BC) Act 2016 (Formally the Wildlife Conservation Act 1950); additionally, SCP20A represents the federally listed TEC '*Banksia Woodlands of the Swan Coastal Plain*' under the Commonwealth Environment Protection Biodiversity Conservation (EPBC) Act 1999, both the EPBC Act and the BC Act list the TEC as Endangered.

Under the EPBC Act 1999, the threshold for clearing Banksia TEC requiring referral for potential significant impacts is:

- 0.5 ha of excellent quality
- 1 ha of very good quality
- 2 ha of good quality.

Due to the limited and highly localised clearing activities proposed, the TEC present is below the referral guidelines stated above and does not constitute a significant impact; therefore, a referral under the EPBC Act is not required for this site.

Interim Recovery Plan No. 359 details the strategy applied by regulators and managers for the protection of FCT SPC20a (DPaW 2016). Within this document a series of criteria for success are identified which include:

- representative areas of the community across its geographical range with condition rank maintained, or with improved condition rank (Bush Forever, Government of Western Australia (2000) scales) over the life of the plan
- 90% or more of the aerial extent of occurrences maintained at the same condition rank, or improved (Bush Forever 2000 scales) over the life of the plan, excluding effects of drying climate that are outside the scope of this plan.

Bush Forever sites host the majority of the remaining extent of this community totalling approximately 433 ha, any proposal likely to affect this TEC are recommended to be dealt with through the Bush Forever planning process (DPaW 2016).

Rehabilitation of this TEC forms part of the strategy identified within the Interim Recovery Plan No 359. Rehabilitation and revegetation activities are recommended to be conducted in conjunction with weed control measures, which a focus on the control of perennial/annual grass weeds.

SCP20a encompasses all the vegetation within the Survey Area, which totals 0.04 ha, including the Project Area (0.008 ha). Vegetation condition within the Survey Area was all assessment to be Very Good and is representative of the vegetation surrounding the Survey Area. Mapping data files supplied by the DBCA indicate the SCP20a encompasses approximately 77 ha of BF 385, of which the Project Area represents 0.05 % of the total extent of SCP20a within BF 385.

2.5.1 Introduced species and pests

During the field survey six weed species were observed within the Survey Area, weed cover across the Project Area is considered to represent <1% of total vegetation cover. None of the weed species observed within the survey area are declared pests under the *Biosecurity and Agricultural Management (BAM) Act 2007*.

2.6 Fauna

Given the small extent of the Project Area, a desktop analysis was performed of conservation significant species and compared to the habitat available within the Project Area, to consider the likelihood of species occurring. Several migratory and marine species were identified within the EPBC search, the Project Area occurs approximately 12 km from the coast and 1.5 km from the nearest water body; therefore, habitat for these species is not present with the Project Area and these species are not discussed further. A total of 15 conservation significant fauna have been identified in State and Commonwealth database search.

Table 4: Conservation significant fauna within the Project Area

Species	Conservation status	Preferred habitat	Likelihood of occurrence
<i>Australotomurus morbidus</i> cemetery springtail	Priority 3 (BC Act)	Typical habitats for <i>Australotomurus</i> species are long undisturbed native grasslands and heathland at low and high elevations.	Unlikely , the preferred habitat is not present within the Project Area
<i>Bettongia penicillata</i> subsp. <i>Ogilbyi</i> - Woylie, Brush-tailed Bettong	Threatened (BC Act)	Woylies were known to inhabit a variety of habitats including semiarid scrub, mallee, woodland and open forest. The species is now mostly restricted to dry sclerophyll forests and woodlands dominated by Jarrah <i>Eucalyptus marginata</i> and Wandoo <i>Eucalyptus wandoo</i> with an understorey of scrub or tussock grass and well drained, deep, sandy soils. Habitat considered critical to the species' survival is the tall eucalypt forests and woodlands, dense myrtaceous shrublands, and kwongan (proteaceous) or mallee heath within its current range with adequate introduced predator control (DBCA 2017).	Unlikely , the only know population within Perth is at Whiteman Park, due to the lack of predator control within the Site, namely cats and foxes, this species is considered highly unlikely to be present within the Project Area
<i>Calidris canutus</i> — Red Knot, Knot	Endangered (EPBC Act)	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (Higgins & Davies 1996).	Unlikely , the preferred habitat is not present within the Project Area

Species	Conservation status	Preferred habitat	Likelihood of occurrence
<i>Calidris ferruginea</i> — Curlew Sandpiper	Critically Endangered (EPBC Act)	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (Higgins & Davies 1996).	Unlikely , the preferred habitat is not present within the Project Area
<i>Calyptorhynchus banksii naso</i> — Forest Red-tailed Black-Cockatoo	Vulnerable (EPBC Act) Threatened (BC Act)	The Forest Red-tailed Black Cockatoo inhabits the dense jarrah, karri (<i>Eucalyptus diversicolor</i>) and marri forests receiving more than 600 mm average rainfall annually (Saunders et al. 1985; Saunders & Ingram 1995; Chapman 2008), mainly in the hilly interior (Johnstone et al. 2013a). Although most records are in jarrah-marri forests, the subspecies has been observed in a range of other forest and woodland types, including blackbutt (<i>E. patens</i>), wandoo (<i>E. wandoo</i>), tuart (<i>E. gomphocephala</i>), Albany blackbutt (<i>E. staeri</i>), yate (<i>E. cornuta</i>) and flooded gum (<i>E. rudis</i>) (Abbott 1998a, 1998b).	Possible , foraging habitat required by this species is present within the Project Area
<i>Calyptorhynchus baudinii</i> - Baudin's Cockatoo, White-tailed	Endangered (EPBCA) Threatened (BC Act)	Baudin's Cockatoo mainly occurs in eucalypt forests, especially jarrah, marri and karri forest. The species is less frequently in woodlands of wandoo (<i>E. wandoo</i>), blackbutt (<i>Eucalyptus patens</i>), flooded gum (<i>Eucalyptus rudis</i>), yate (<i>Eucalyptus cornuta</i>), partly cleared farmlands and urban areas, including roadside trees and house gardens (Johnstone & Kirkby 2008). This cockatoo forages at all levels of the forest, from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs, especially banksias, and in orchards (both in trees and on dropped or fallen fruit on the ground) (Johnstone & Kirkby 2008).	Possible , foraging habitat required by this species is present within the Project Area
<i>Calyptorhynchus latirostris</i> — Carnaby's Cockatoo, Short-billed Black-Cockatoo	Endangered (EPBC Act) Threatened (BC Act)	Carnaby's Cockatoo occurs in uncleared or remnant native eucalypt woodlands, especially those that contain salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture.	Likely , foraging habitat required by this species is present within the Project Area
<i>Hylaeus globuliferus</i> - woolybush bee	Priority 3 (BC Act)	Specific habitat information relating to the Woolybush bee is unavailable; however, typically, native bees are solitary and inhabit a range of habitats from small hollows in vegetation to burrowing into sand on the ground.	Possible , this species may be present within the Project Area

Species	Conservation status	Preferred habitat	Likelihood of occurrence
Isodon fusciventer - Quenda, southwestern brown bandicoot	Priority 4 (BC Act)	Scrubby, often swampy, vegetation with dense cover up to 1 m high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (DEC 2012). Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quenda will thrive in more open habitat subject to introduced predator control. On the Swan Coastal Plain, Quenda are often associated with wetlands (DEC 2012).	Unlikely , the preferred habitat is not present within the Project Area
<i>Leipoa ocellata</i> — Malleefowl	Vulnerable (EPBC Act)	The Malleefowl is found in some shrublands dominated by acacia, and occasionally in woodlands dominated by eucalypts such as Wandoo E, wandoo, Marri <i>Corymbia calophylla</i> and Mallet <i>E. astringens</i> .	Unlikely , the preferred habitat is not present within the Project Area
<i>Neelaps calonotos</i> Black-striped Snake	Priority 3 (WC Act)	<i>Neelaps calonotos</i> , is a terrestrial reptile that lives in Banksia woodlands and sandy areas of the Perth region.	Possible , foraging habitat required by this species is present within the Project Area
<i>Notamacropus irma</i> Western Brush Wallaby	Priority 4 (WC Act)	The Western Brush Wallaby's optimum habitat is open forest or woodland, particularly favouring open, seasonally-wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heath-land.	Unlikely , the range this species inhabits has been reduced and this species is not considered to occur on the SCP
<i>Numenius madagascariensis</i> — Eastern Curlew, Far Eastern Curlew	Critically Endangered (EPBC Act)	During the non-breeding season in Australia, the eastern curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (<i>Zosteraceae</i>). Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves. The birds are also found in coastal saltworks and sewage farms (Marchant & Higgins, 1993).	Unlikely , the preferred habitat is not present within the Project Area
<i>Oxyura australis</i> Blue-billed Duck	Priority 4 (WC Act)	The Blue-billed Duck is almost wholly aquatic and is seldom seen on land. Non-breeding flocks, often with several hundred individuals, congregate on large, deep open freshwater dams and lakes in autumn.	Unlikely , the preferred habitat is not present within the Project Area
<i>Rostratula australis</i> — Australian Painted-snipe	Endangered (EPBC Act)	The Australian painted snipe occurs in shallow freshwater (occasionally brackish) wetlands, both ephemeral and permanent, such as lakes, swamps, claypans, inundated or waterlogged grassland/saltmarsh, dams, rice crops, sewage farms and bore drains, generally with a good cover of grasses, rushes and reeds, low scrub, <i>Muehlenbeckia</i> spp. (lignum), open timber or samphire (Marchant and Higgins, 2003).	Unlikely , the preferred habitat is not present within the Project Area

Species	Conservation status	Preferred habitat	Likelihood of occurrence
<i>Synemon gratioiosa</i> — Graceful Sun Moth	Priority 4 (WC Act)	The graceful sun moth is known from two general vegetation types: open areas of herbland, heathland and shrubland on secondary Quindalup dunes containing <i>Lomandra maritima</i> and banksia woodland with <i>L. hermaphrodita</i> .	Unlikely, the preferred habitat is not present within the Project Area
<i>Dasyurus geoffroii</i> — Chuditch, Western Quoll	Vulnerable (EPBC Act)	The major portion of the remaining natural populations occur in varying densities in jarrah (<i>Eucalyptus marginata</i>) forests and woodlands in the south-west corner of WA. Chuditch had not been recorded on the Swan Coastal Plain since the 1930s, however there have been records in the outer metropolitan areas such as Gooseberry Hill, East Martin and on the Swan Coastal Plain, Upper Swan Valley, High Wycombe, Wandi, Yalgorup National Park and Leschenault Conservation Park.	Unlikely, the species no longer inhabits the region within the Project Area
<i>Pseudocheirus occidentalis</i> — Western Ringtail Possum	Critically Endangered (EPBC Act)	Vegetation communities critical to the species include long unburnt mature remnants of peppermint (<i>Agonis flexuosa</i>) woodlands with high canopy continuity and high foliage nutrients (high in nitrogen and low toxin levels); jarrah (<i>Eucalyptus marginata</i>)/marri (<i>Corymbia calophylla</i>) forests and woodlands with limited anthropogenic disturbance that are intensively fox-baited and have low indices of fragmentation.	Unlikely, this species will likely have been driven out of this area due to human pressures and predation

Black Cockatoos

Foraging habitat used by two of the Black Cockatoo species is available within the Project Area; additionally, potential habitat trees were identified within the survey area but outside the Project Area. All potential breeding habitat trees will be avoided by the development and the overall clearing footprint will be small enough that significant impacts to these species will not result.

Other conservation significant species

Clearing within the Project Area represents < 0.01% of the total bushland immediately surrounding the Project Area. Vegetation within the Project Area is unlikely to represent habitat critical to the survival of the conservation significant species within the potential to occur within the Project Area. All clearing activities will be conducted to allow fauna to migrate out of the Project Area during clearing operations. Furthermore, significant extents of remnant vegetation will remain immediately surrounding the Project Area; therefore, the conservation significant fauna species identified to potentially occur, are considered unlikely to be significantly impacted as a result of the Project.

3. Bush forever impact assessment

A review of SPP 2.8 was undertaken as part of this assessment to ensure the decision-making process for this location was consistent with the required considerations. Prior to considering the Site, several alternative locations were explored, Table 5 below describes the initial investigative options to build a new base station.

Table 5: Previously explored options

Potential site	Reasons for consideration	Reason rejected
Mirrabooka Mosque at 135 Boyare Avenue	Existing telecommunications facility on this site	existing facility is a roof mounted station and a new structure would be required adjacent to the building site owners rejected the proposal.
Mirrabooka Softball Association, 38 Ashbury Crescent	existing Optus base station on this site	this site is south of the coverage objective area and out of the search ring. The site would not achieve the required coverage objectives without a significant increase in power. The existing pole would also require strengthening to accommodate new equipment. This site is not suitable as a co-location opportunity.
Telstra site at 15 Crocker Drive Malaga	existing Telstra base station on this site	this site was too far to the east to meet the coverage objectives.

In total, twenty-one candidate sites were investigated for the Project. The location of community sensitive land uses, such as schools and child care centres was an important consideration for site selection, site selection was further governed by SPP 5.2 Telecommunications infrastructure and Local Planning Policy 4.1 Reserves and other zones design guidelines.

In determining the final site selection for the Project, most sites were rejected for the following reasons: proximity to sensitive land uses. The site was deemed unsuitable from a planning perspective, the site was not suitable from a radio frequency viewpoint or, the site owner was not amenable to making the site available for the Project. Further details of sites considered and the assessments, are available in the Development Application Planning Assessment which was submitted to the WAPC (Appendix 1).

Final placement of the phone tower is slightly south of the optimal signal radius for the infrastructure; however, a suitable location within the desired signal radius was not available for the reasons stated above.

In considering the impacts to the Bush Forever site, planning and design for the base station compound has made efforts to reduce impacts by placing the Project against the BF boundary which reduced the requirement for setback into the bush.

Avoidance and mitigation measures included in the planning phase consist of:

- placing the Project against the BF boundary
- reducing the clearing footprint to the minimum required
- removing the requirement for an access track or bushfire clearance around the outside of the compound
- maintaining weed control measures regularly within the Project area to prevent the establishment of weeds.

Further considerations made during the planning phase include the assessment of alternative sites which is previously discussed and further available in Appendix 1.

Upon being commissioned for the native vegetation clearing permit supporting document, Strategen requested the flora and threatened ecological community data from the DBCA and performed Naturemap searches to establish the density of threatened and priority species within the local area. Shapefile data from the DBCA confirmed the inferred statistical analysis performed by Strategen which identified SPC20A is present within the Project Area.

DBCA data base mapping, confirms that approximately 77 ha of the 96 ha of BF site 385 supports SPC20a, clearing 0.008 ha within the Project Area represents approximately 0.01% of the total SCP20a within BF site 385. Vegetation surround the Project Area and within the Survey Area was identified to be in Very Good condition, given the fact that historical development within BF site 385 has been limited to the construction of conservation fencing and the creation of walking and access tracks, vegetation condition within the Survey Area is considered to be representative of the condition throughout BF site 385.

Placement of the Project Area was chosen to minimise ingress into BF site 385 which reduces the requirement for access track clearing. Furthermore, the creation of a bushfire asset protection zone (APZ) will occur within the Project Area and no clearing will be required outside the compound.

4. Assessment against the ten clearing principles

Table 6 presents an assessment of the Project against the ten clearing principles outlined in Schedule 5 of the EP Act. This assessment demonstrates that the proposed clearing of 0.008 ha of native vegetation is at variance with principle (d) and may be at variance with principle (a).

Table 6: Assessment against the ten clearing principles

Principle	Assessments	Conclusion
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p>The Project Area contains SCP20a which is listed as endangered under the BC Act 2016.</p> <p>Native vegetation within the Project Area maybe representative of an area of high biodiversity. Clearing will result in the removal of approximately 0.008 ha of vegetation in total. Within BF 385, a total 77 ha of SCP20a has been identified to occur, which means the Project Area represents 0,01% of the local extent of SCP20a.</p> <p>The clearing will occur on the edge of the TEC patch and will leave the majority of the patch intact in a contiguous area.</p>	The proposed clearing may be at variance with this principle
(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	<p>All potential breeding trees within the survey area have been avoided and vegetation being cleared consists of 0.008 ha of foraging habitat for two species of Black Cockatoo. Suitable foraging habitat occurs within BF site 385 which encompasses approximately 96 ha in total.</p> <p>Removal of 0.008 ha of foraging habitat for Black Cockatoos will not result in fragmentation of habitat. No breeding, or roosting habitat will be cleared by the development; therefore, clearing within the Project Area will not result in a significant impact to Black Cockatoos.</p> <p>Other conservation significant species identified to occur within the Project Area are considered mobile and capable of migrating from the Project Area once clearing activities begin. Habitat critical to the survival of the conservation significant species identified to occur and potentially occur, was not identified within the Project Area and therefore, significant habitat will not be cleared within the Project Area.</p>	The proposed clearing is unlikely to be at variance with this principle
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	<p>Surveys within the Project Area did not identify any species of rare flora; however, the survey was not conducted at optimal timing for the one rare flora (<i>Caladenia huegelii</i>), which was identified to potentially be present due to suitable habitat.</p> <p>Database searches identify the closest record for this species occurs approximately 4 km to the East in the Lightning Swamp Bushland.</p>	The proposed clearing is unlikely to be at variance with this principle
(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.	<p>The Project will result in clearing 0.008 ha of 'vegetation expected to comprise SPC20a.</p> <p>Within the Mirrabooka Bushland database searches identify several TEC buffers across the Project Area. Using the data from the site survey the presence of SCP20a can be inferred given the presence of several indicator species for this FCT.</p> <p>DBCA mapping records detail the spatial extent of TEC mapped across the Project Area and confirms the presence of SCP20a within the Project Area and the BF 385. Approximately 77 ha of BF 385 is mapped to contain SCP20a, which is listed as endangered under the BC Act.</p>	The proposed clearing is at variance with this principle

Principle	Assessments	Conclusion
(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	<p>The project will result in clearing 0.008 ha of native vegetation representative of Karrakatta Complex central and south. This vegetation complex is maintained at 23.48% of the pre-European extent. The Project will reduce the extent of the complex by <0.001%.</p> <p>The Project Area lies within a constrained area of the Swan Coastal Plain and the vegetation complex will be retained at well above the 10% threshold.</p>	The proposed clearing is not at variance with this principle
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	Vegetation within the Project Area is not associated with a watercourse or wetland.	The proposed clearing is not at variance with this principle
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	In total, clearing will amount to 0.008 ha of vegetation loss within the Site. All of the Project Area will be permanently cleared and remain in a cleared state to prevent vegetation re-establishing. Given only 0.008 ha of land area will be cleared which is adjacent to vegetation on three sides and a cleared road reserve to the west, appreciable land degradation is unlikely to result across the Project Area.	The proposed clearing is not at variance with this principle
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	<p>The Project Area occurs within the BF site 385, which is an identified conservation reserve. Clearing represents 0.008 ha in total, which represents <0.01% of the conservation reserve.</p> <p>To inform the clearing activity occurring within the Project Area a landscape management plan (LMP) is being developed for the Project, which describes the actions to be taken to retain vegetation and ensure the surrounding vegetation is not impacted by the development.</p>	The proposed clearing is unlikely to be at variance with this principle
(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	Groundwater resources are a minimum of 20 m from ground level and there are no surface water resources within or adjacent to the Project Area.	The proposed clearing is not at variance with this principle
(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.	The Project Area is not within a flood risk area.	The proposed clearing is not at variance with this principle

5. Environmental approval and management

5.1 Environmental management

The key approval required to support the proposed clearing is a NVCP under Section 51 E of the EP Act.

Previously, SSL submitted a Development Application (DA) to the West Australian Planning Commission (WAPC) to construct the infrastructure within the Project Area (Appendix 1). DA approval was granted by the WAPC on 27 August 2018 subject to a series of conditions which include the development of a Landscape Management Plan and a Construction Management Plan which at the time of this application, is still being developed.

While the vegetation within the Project Area contains *Banksia Woodland of the Swan Coastal Plain* TEC and foraging habitat for Black Cockatoos, the quantity of vegetation to be impacted does not meet the thresholds required for significant impacts to either of these Matters of National Environmental Significance (MNES); therefore, referral to the Department of Environment and Energy is not required under the EPBC Act.

No further approvals are required.

5.2 Environmental management

Surveys of the Project Area has identified that no significant trees will be impacted; three Banksia trees will be impacted to construct the compound. To ensure impacts to vegetation does not occur outside the Project Area, the Project Area will be clearly demarcated prior to clearing activities not more than seven days prior to clearing commencing.

Clearing will not be conducted for temporary laydown, access or site office; therefore, there will be no opportunity to revegetation portions of the Project Area following construction, consequently, vegetation cleared from the site will be removed and disposed of off-site and will not impact remaining surrounding vegetation.

As per condition 4 of the DA approval, an LMP and CMP, are currently being developed for the Project Area, to guide construction and post construction activities.

Section 4 of the LMP and Table 7 below, details the management measures to be implemented to mitigate further impacts to the surrounding vegetation within the Site.

Table 7: Management measures

Item	Management Action	Purpose	Timing	Responsibility
<i>Weed management</i>				
1.	Ensure all machinery and personnel are "clean on entry" (free of soil, seeds and vegetation) and cleaned in a designated area.	To prevent the introduction and spread of weed species	All times	All personnel
2.	Eradicate all weeds within the site boundary through the use of spot spraying.	To prevent the spread of new and existing weeds into adjacent bushland and to mitigate the risk of fire	On-going as required	Project manager
<i>Vegetation clearing management</i>				
3.	Retained vegetation is not to be covered or buried with topsoil.	To maintain the quality of retained vegetation	During construction	Construction manager
4.	Damage caused (beyond the extent of approvals) during the construction to vegetation shall be rehabilitated to the pre-clearing condition.	To ensure there is no lasting damage to retained vegetation beyond the area approved for clearing	During construction	Construction manager

Item	Management Action	Purpose	Timing	Responsibility
<i>Fire mitigation</i>				
5.	All vegetation will be removed from within the site boundary.	To prevent the starting and spread of bushfires	Winter, spring and summer when determined as necessary by monitoring	Project manager
<i>Other</i>				
6.	All waste materials from the site will be removed upon completion of the project.	To maintain the aesthetic and environmental values of retained bushland	All times	All personnel
7.	Commence clearing in such a way as to allow fauna to move out of the clearing area if possible.	To prevent unnecessary fauna mortality	During construction	Construction manager

6. Conclusion

Optus submits that further mitigation or management measures are not required to secure a clearing permit due to the following project elements:

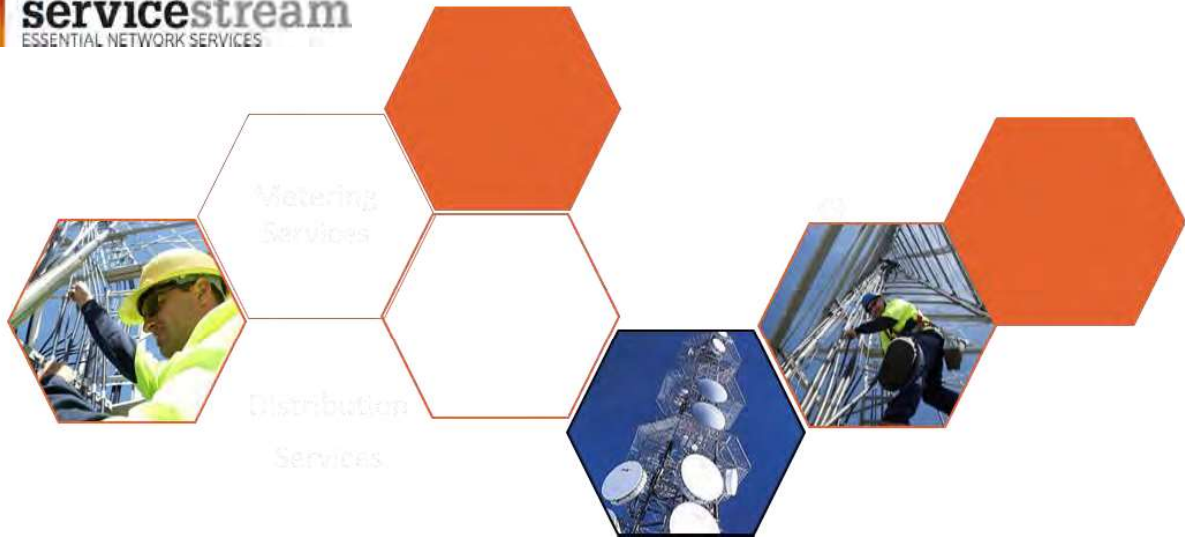
- the small extent of clearing proposed within the Project Area (0.008 ha)
- positioning of the Project Area on the boundary to negate the requirement for access tracks
- the lack of requirement for temporary clearing.

Additionally, the development of the LMP and CMP to the satisfaction of the City of Stirling will further mitigate impacts to the surrounding vegetation and will see the retention of significant trees surrounding the Project Area, results in the proposed action being acceptable and that no further mitigation of management is required in order to secure a clearing permit.

7. References

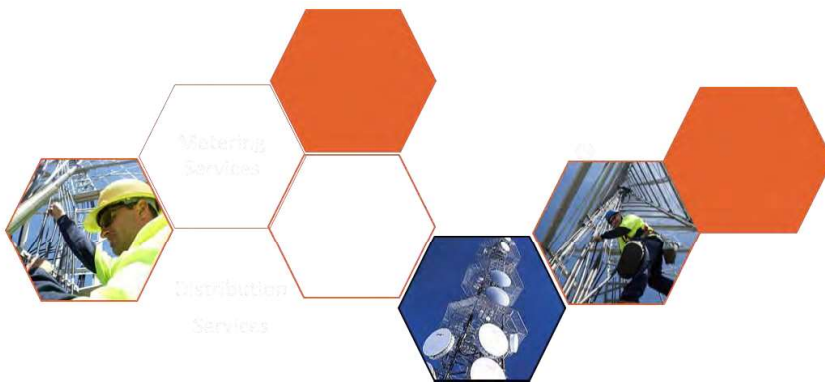
- Abbott, I. (1998a). Counting cockatoos: The status of the Forest Red-tailed Black Cockatoo. *Landscape*. 13 (2):10-16.
- Abbott, I. (1998b). Conservation of the Forest Red-tailed Black Cockatoo, a hollow-dependent species, in the eucalypt forests of Western Australia. *Forest Ecology and Management*. 109:175-185.
- Chapman, T. 2008. Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan.
- Department of Biodiversity Conservation and Attractions (DBCA) 2017. Fauna profile: Woylie *Bettongia penicillata ogilbyi*. Viewed on 4 February 2019, available at: https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/woylie_fauna_profile.pdf
- Department of Environment 2004. Perth Groundwater Atlas. Perth Western Australia.
- Department of Environment and Conservation (DEC) 2008. Forest black cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan. Viewed on 8 January 2018, available from: <http://www.environment.gov.au/resource/forest-black-cockatoo-baudin%E2%80%99s-cockatoo-calyptorhynchus-baudinii-and-forest-red-tailed>.
- Department of Environment and Conservation (DEC) 2009. Grand Spider Orchid (*Caladenia huegelii*) Recovery Plan. Viewed on 19 December 2018, available at: <http://www.environment.gov.au/resource/grand-spider-orchid-caladenia-huegelii-recovery-plan>.
- Department of Environment and Conservation (DEC) 2012. Fauna profiles: Quenda *Isodon obesulus* (Shaw 1797). Viewed on 8 January 2019, available at: https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/quenda_2012.pdf.
- Department of Environment and Conservation (DEC) 2014. NatureMap: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. Available from: <http://naturemap.dec.wa.gov.au/>.
- Department of Parks and Wildlife (DPaW) 2016. Banksia attenuata woodlands over species rich dense shrublands (Swan Coastal Plain community type 20a – Gibson et al. 1994). Interim Recovery Plan No. 359. Parks and Wildlife, Kensington, Western Australia.
- Higgins, P.J. & S.J.J.F. Davies, eds 1996. Handbook of Australian, New Zealand and Antarctic Birds. Volume Three - Snipe to Pigeons. Melbourne, Victoria: Oxford University Press.
- Marchant, S., & Higgins, P.J. (eds). 1993. Handbook of Australian, New Zealand and Antarctic Birds. Volume 2 - Raptors to Lapwings. Melbourne, Victoria: Oxford University Press.
- Saunders, D.A. & J.A. Ingram 1995. *Birds of Southwestern Australia: An Atlas of Changes in the Distribution and Abundance of the Wheatbelt Avifauna*. Surrey Beatty and Sons, Chipping Norton, NSW.
- Saunders, D.A., I. Rowley & G.T. Smith 1985. The effects of clearing for agriculture on the distribution of Cockatoos in the southwest of Western Australia. In: Keast, A., H.F. Recher, H. Ford & D. Saunders, eds. *Birds of Eucalypt Forests and Woodlands*. Page(s) 309-321. Surrey Beatty, Sydney.
- Water and Rivers Commission 1997. Perth Groundwater Atlas. Perth Western Australia.

Appendix 1
Development Application planning
assessment and decision report




PLANNING ASSESSMENT

**Proposed Mobile Telecommunications Facility At:
17 Northwood Drive Mirrabooka WA 6061**



Document Control Record

Document Description	Development Application Submission		
Site No.	P8401	Site Name	Mirraboooka North

	Name	Signed	Date
Prepared By	Graeme Lane		February 7th, 2018

File Location	M:\WA\Nokia\West Australian Sites\P8401 Mirraboooka North\02 SAED\5 Planning
Document Status	Final

Prepared for	Prepared by:
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1 Executive Summary

Site Address	17 Northwood Drive Mirrabooka WA 6061
Property Description	CT 1388/299 Lot 8904 on Deposited Plan 180631
Site Area	41310 m ²
Registered Owner	Western Australian Planning Commission
Proposal	<p>Service Stream, on behalf of Optus Mobile Pty Ltd, seeks to establish a telecommunications facility for a mobile phone base station at the above site. The proposal consists of:</p> <ul style="list-style-type: none"> • The installation of a new 23.8m high steel monopole (26.5 metres overall structure height); • The installation of six (6) new panel antennas mounted to a new headframe at the top of the monopole and at 25m. centrelines; • The installation of eighteen (18) new Remote Radio Units (RRUs) mounted to the headframe at 25.5m centrelines; • The installation of eighteen (18) new Remote Radio Units (RRUs) mounted to the headframe at 24.5m centrelines; • The installation of associated ancillary equipment, including Combiners, Feeders, Mast Head Amplifiers etc.; • The construction of a compound with an area of 96m² and including fencing and gates to a height of 2.4m; • The installation of an equipment shelter within the compound and at the base of the monopole, finished in 'Pale Eucalypt'; • Works within the proposed equipment shelter.
Coverage Objectives	A demonstrated need has been identified for a new telecommunications facility in the area to improve customer voice and data services in the Mirrabooka locality.
Site Selection	The site has been identified as the most appropriate location for the new facility following an extensive site selection process.
Council / Scheme	City of Stirling Planning Scheme 3
Use Definition	Natural Area
Zone	MRS Reserve: Parks & Recreation
Applicant	<p>Optus Mobile Pty Ltd c/- Service Stream Ltd Contact: Graeme Lane Phone: 0427 687 464 Email: Graeme.Lane@servicestream.com.au</p>
Reference No.	<p>Our Site Reference: P8401 RFNSA Reference: 6061006</p>

2 Introduction

This development application has been prepared by Service Stream Ltd, on behalf of Optus Mobile Pty Ltd, and seeks approval to allow the installation of a new telecommunications facility at 17 Northwood Drive Mirrabooka WA 6061.

Optus is currently undertaking the 4G upgrade of their existing mobile phone infrastructure across Australia. Conducted in partnership with Vodafone Hutchinson Australia (VHA), the overall project will see the consolidation of the telecommunications infrastructure of the two network operators and improve customer experience through faster and more reliable voice and data services.

Due to increasing network demands for data, both Optus and Vodafone have identified the need to install a telecommunications facility to improve both voice and data services within the Mirrabooka locality.

A number of potential location options were considered before selecting the site. Each potential option was assessed against a variety of factors including co-location opportunities, proximity to sensitive land uses, planning scheme considerations, technical and coverage objectives, cost considerations, land tenure, visual impact and engineering/design criteria. The site at Northwood Drive was selected as the most appropriate location based on the above considerations, which are detailed in section 3 of this report.

To provide mobile service to the Mirrabooka area, the proposed telecommunication installation requires the following works:

- The installation of a new 23.8m high steel monopole (26.5 metres overall structure height);
- The installation of six (6) new panel antennas mounted to a new headframe at the top of the monopole and at 25m. centrelines;
- The installation of eighteen (18) new Remote Radio Units (RRUs) mounted to the headframe at 25.5m centrelines;
- The installation of eighteen (18) new Remote Radio Units (RRUs) mounted to the headframe at 24.5m centrelines;
- The installation of associated ancillary equipment, including Combiners, Feeders, Mast Head Amplifiers etc.;
- The construction of a compound with an area of 96m² including fencing and gates to a height of 2.4m;
- The installation of an equipment shelter within the compound and at the base of the monopole, finished in 'Pale Eucalypt'; and
- Works within the proposed equipment shelter.

All mobile phone network operators are bound by the operational provisions of the federal Telecommunications Act 1997. This application for a planning permit is bound by the core principles and operator requirements outlined within the Telecommunications Act 1997, however consent is required from the relevant Planning Authority in order to undertake the prescribed development. More information regarding the legislative framework pursuant to this proposal is located within Sections 4 and 5 of this report.

Optus has applied the Precautionary Approach in the Selection and Design of the proposed site in accordance with Sections 4.1 and 4.2 of the Code.

3 Site Selection

3.1 Need for the proposed telecommunications facility

Mobile phones work by sending and receiving low power radio signals, much like a two (2) way radio system. The signals are sent to and received from antennas that are attached to radio transmitters and receivers, commonly referred to as mobile phone base stations. The base stations are linked to the rest of the mobile and fixed phone network and pass the signal/call into those networks.

Each base station can only carry a finite number of calls. In areas of high mobile phone use, such as central business districts and high density areas, more base stations are required to handle the level of call and data traffic.

Operators of telecommunications networks must constantly respond to changes in technology or increased demand on their existing infrastructure assets. Recently, LTE or 4G has become the latest industry standard for mobile phone network operators within the Australian marketplace. With consumer demands reflecting an increase in demand for speed and data bandwidth, Optus requires new infrastructure at Mirrabooka to ensure a reliable and fast mobile phone network is maintained.

3.2 Potential Candidates

A number of factors have been considered when selecting the appropriate site for the infrastructure. The factors include investigating opportunities to collocate on existing infrastructure, the proposal's proximity to existing sensitive land uses, planning scheme considerations, technical and coverage objectives, cost considerations, lease and land tenure, visual impact and engineering/design criteria.

Furthermore, the site selection process incorporates the mandatory Mobile Phone Base Station Deployment Code (C564:2011) activities which are undertaken in order to justify the proposed location of the subject site (specifically sections 4.1, 4.2 and 8 of the Deployment Code). Such considerations include preparation of a 'traffic light model' and assessment against the Deployment Code's precautionary approach provisions.

3.2.1 Co-location Options

Wherever possible, Optus actively pursues site sharing arrangements and the use of existing structures so as to prevent the proliferation of mobile phone towers and masts.

The closest existing telecommunications facility in the search area is a new facility located at the Mirrabooka Mosque at 135 Boyare Avenue (RFNSA: 6061008 – small cell), approximately 930m north of the Optus proposal. This Mosque site is a rooftop design and involves only one small antenna. In order to include Optus equipment at this site a new tower would need to be installed next to the Mosque building itself. Service Stream approached the Mosque but there was no interest in accommodating a pole at this site. The site is also very close to the Honeywell Early Learning Centre and not suitable for a large base station. There no co-location opportunities at the mosque site.

The next closest co-location opportunity was at the existing Optus Base Station at the Mirrabooka Softball Association, 38 Ashbury Crescent (RFNSA site # 6061002).

This site is south of the coverage objective area and out of the search ring. The site would not achieve the required coverage objectives without a significant increase in power. The existing pole would also require strengthening to accommodate new equipment. This site is not suitable as a co-location opportunity.

A Telstra site at 15 Crocker Drive Malaga (RFNSA # 6062001) was also investigated as a possible co-location site. This site proved to be too far to the east to meet the coverage objectives.

No other existing telecommunications infrastructure within the area would be suitable for supporting telecommunications facilities to achieve Optus's coverage requirements. Therefore a new facility is required.

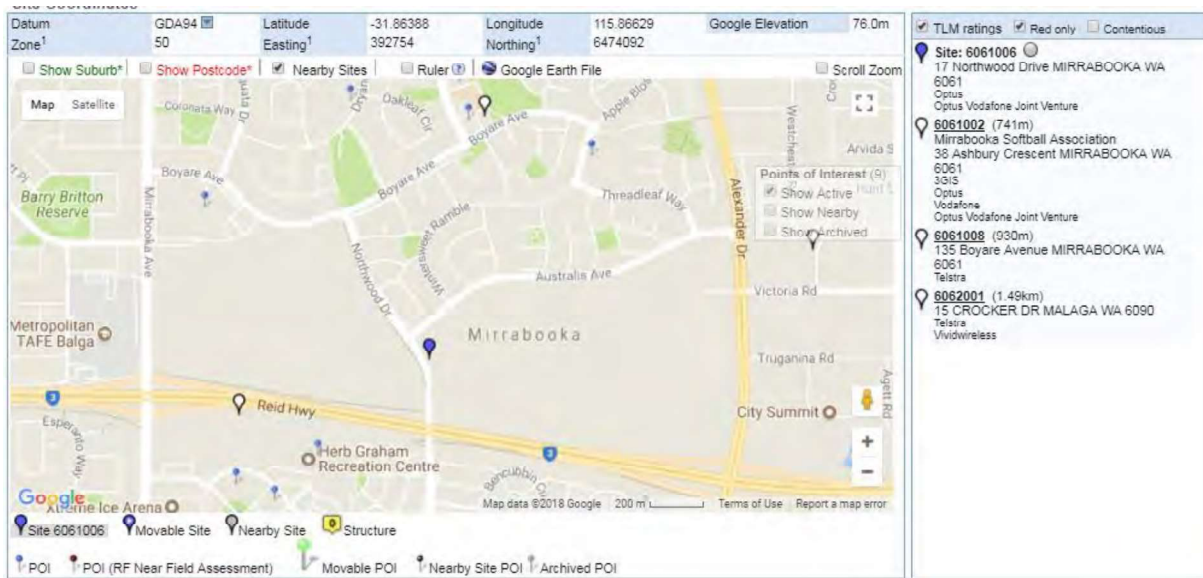


Figure 1: Subject site and location of existing nearby Base Stations, Source: RFNSA.

3.2.2 Potential Greenfield sites

A total of twenty-one (21) potential candidate sites were considered when selecting the most appropriate site for the infrastructure. The locations of the potential candidates are detailed in the below Figure 2.

An important consideration in the selection of a new site is the location of community sensitive uses, especially schools and child-care centres. The locations of community sensitive uses in the locality are shown on Figure 3.



Figure 2. Aerial photograph showing site Candidates A-T



Figure 3. Identified Community Sensitive Uses in the locality

A detailed analysis of each candidate has been undertaken in the below table to determine the most appropriate site location for the new facility.

Candidate	Address	Assessment
A	73 HONEYWELL BVD MIRRABOOKA 6061 Lot 432 On Plan 16579 Strata Plan 2121016	The Candidate site is located at the Local shopping centre – adjacent to 2 childcare centres – The Mirrabooka Family Centre and the Honeywell Early Learning Centre. A rooftop solution at this location was deemed to be unviable for construction cost reasons. Next option would be for a pole or replacement of the existing signage structure. Although a good location in terms of coverage objectives, it was considered to be a contentious site because of the adjacent sensitive uses.
B	135 BOYARE AV MIRRABOOKA 6061 Lot 433 On Plan 16579	A rooftop design would be difficult on the mosque due to the form and design of the structure. A new pole would be required. Considered to be a contentious site because of proximity to sensitive uses. Mosque management is not supportive of a new pole at the site.
C	77 HONEYWELL BVD MIRRABOOKA 6061 Lot 430 On Plan 16579	The candidate site is located at the existing Medical Centre - adjacent to the 2 childcare centres. Base Station at this site would require a new pole. Considered to be contentious due to the proximity of sensitive uses. The lessor has responded that they are not supportive of a base station at the site.
D	139 BOYARE AV MIRRABOOKA 6061 Lot 12807 On Plan 219690	The candidate is located at Fragrant Gardens Reserve (R42249). Local reserve with a cricket pitch. The site contains no existing flood lighting or other vertical structures. Will require a DA for a new structure – close to child care centres and residential – potentially contentious DA. Deemed unsuitable from a planning perspective.
E	13 OAKLEAF CIR MIRRABOOKA 6061 Lot 10834 On Plan 15450	Council Reserve. Close to existing drainage sump and may be subject to inundation. Is also close to residential land (<50m). A new pole in this location would be potentially obtrusive. Considered to be unsuitable from a planning perspective.
F	60A HONEYWELL BVD MIRRABOOKA 6061 Lot 613 On Plan 14983	Council Reserve – Drainage sump, subject to inundation. Will require DA for new structure – close residential with limited screening - potential contentious DA. Unsuitable from a build perspective due to drainage.
G	1 TWINING PL MIRRABOOKA 6061 Lot 10728 On Plan 14983	Twining Reserve. Very close (<50m) to residential uses. Will require DA for new structure, limited screening, potentially contentious. Not suitable.
H	13 DAMPIER LOOP MIRRABOOKA 6061 Lot 10907 On Plan 15156	Dampier Loop Reserve. Very close (<50m) to residential uses. Will require DA for new structure, limited screening, potentially contentious. Not suitable.
I	23 FRAGRANT GDNS MIRRABOOKA 6061 Lot 11278 On Plan 16950	Indigo Close Reserve. Very close (<50m) to residential uses. Will require DA for new structure, limited screening, potentially contentious. Not suitable.
J	1 PENDULA GDNS MIRRABOOKA 6061 Lot 10894 On Plan 15449	District Open Space - Dryandra Pendula Reserve. A good location near centre of search ring. The site accommodates a cricket pitch with existing flood lighting poles. Potential for pole swap out. Will require DA for new structure – close to residential – potential contentious DA due to proximity of residential uses.

K	21A TENERIFFE PL MIRRABOOKA 6061 Lot 11739 On Plan 17200	Council Reserve – Public Open Space. A small local park that is very close to residential use. A new pole in this location will likely be contentious. Rejected on Planning grounds.
L	14 ALLAMANDA GDNS MIRRABOOKA 6061 Lot 11729 On Plan 17476	MRS Reserve - Allamanda Gardens Reserve. Main road location and adjacent industrial area. However is close to residential uses. Potentially contentious DA.
M	26 STANFORD WAY MALAGA 6090 Lot 39 On Plan 13931	City of Swan. Zoned General Commercial in TPS17. Industrial land – will require a DA for new pole (no low impact solution due to form of roof) – site has good separation from residential land and benefits from screening along main road. Good option for planning. However, Nokia have advised that this site is not suitable from a Radio Frequency viewpoint.
N	16 STANFORD WAY MALAGA 6090 Lot 46 On Diagram 75207	City Swan. Zoned General Commercial in TPS17. Industrial land – most likely will require a DA for new pole (no low impact solution – low building height) – site has good separation from residential land and benefits from screening along main road. Good option for planning. However, Nokia have advised that this site is not suitable from a Radio Frequency viewpoint.
O	10 STANFORD WAY MALAGA 6090 Lot 500 On Diagram 73481	City Swan. Zoned General Commercial in TPS17. Industrial land – most likely will require a DA for new pole (no low impact solution – low building height) – site has good separation from residential land and benefits from screening along main road. Good option for planning. However, Nokia have advised that this site is not suitable from a Radio Frequency viewpoint.
P	11 MACALISTER GDNS MIRRABOOKA 6061 Lot 452 On Plan 14982	Macalister Gardens Reserve. Public Open Space. The site accommodates a drainage sump and a playground. Will require DA for new structure – close to residential uses and potentially contentious.
Q	27 CORONATA WAY MIRRABOOKA 6061 Lot 12326 On Plan 14633	Redunca Coronata Reserve. Public Open Space. The site is bound by residential uses and accommodates a playground. A potentially contentious location.
R	70 BOYARE AV MIRRABOOKA 6061 Lot 500 On Plan 54504	WAPC Land. Densely Vegetated Reserve – ‘Natural Area’, ‘Local Parks and Recreation in LPS3. Given the size of this parcel there could be opportunity to setback the new structure from the adjacent residential uses. Improved coverage would increase personal safety of people walking through this reserve. A good candidate from a Planning Perspective. However, WAPC has confirmed that this candidate is not viable.
S	10 AUSTRALIS AV MIRRABOOKA 6061 Lot 206 On Plan 3031	WAPC Land. Densely Vegetated Reserve adjacent a quarry. Given the size of this parcel there could be opportunity to setback the new structure from the adjacent residential uses. Improved coverage would increase personal safety of people walking through this reserve. Given the proximity to the quarry Candidate S is preferable to Candidate R from planning perspective. However, WAPC has confirmed that this candidate is not viable.
T	17 Northwood Drive MIRRABOOKA WA 6061	WAPC Land. MRS Reserve: Parks and Recreation. A densely vegetated reserve – ‘Natural Area’. Parks and Recreation in LPS3. The site is adjacent a main road and has good physical and visual separation from residential uses. Although slightly out of the search ring, this site is considered an appropriate site for a new base station. The WAPC has expressed a preference for this site over candidates R and S. Prime Candidate

3.3 Subject Site and Surrounds

The preferred site is on crown land controlled by the Western Australian Planning Commission. The address of the site is 17 Northwood Drive MIRRABOOKA WA 6061. The real property description of the land is Lot 8904 on Deposited Plan 180631 (CT 1388/299). The site is zoned as an MRS Reserve: Parks and Recreation.

The site is on the eastern side of Northwood Drive, approximately 100m south east of the Northwood Drive / Australis Avenue intersection (roundabout).

To the north of the site, across Australis Avenue, lies the bulk of the suburb of Mirrabooka, extending north to Beach Road. To the south, across the Reid Highway, lies a smaller section of Mirrabooka, made up mostly of 'The Square' shopping precinct. Also to the south, east of Northwood Drive and extending to the south east, lies the suburb of Dianella.

The site proper is located on undeveloped bushland adjacent the Northwood Drive road reserve boundary. The site is mostly flat and clear of any large trees.

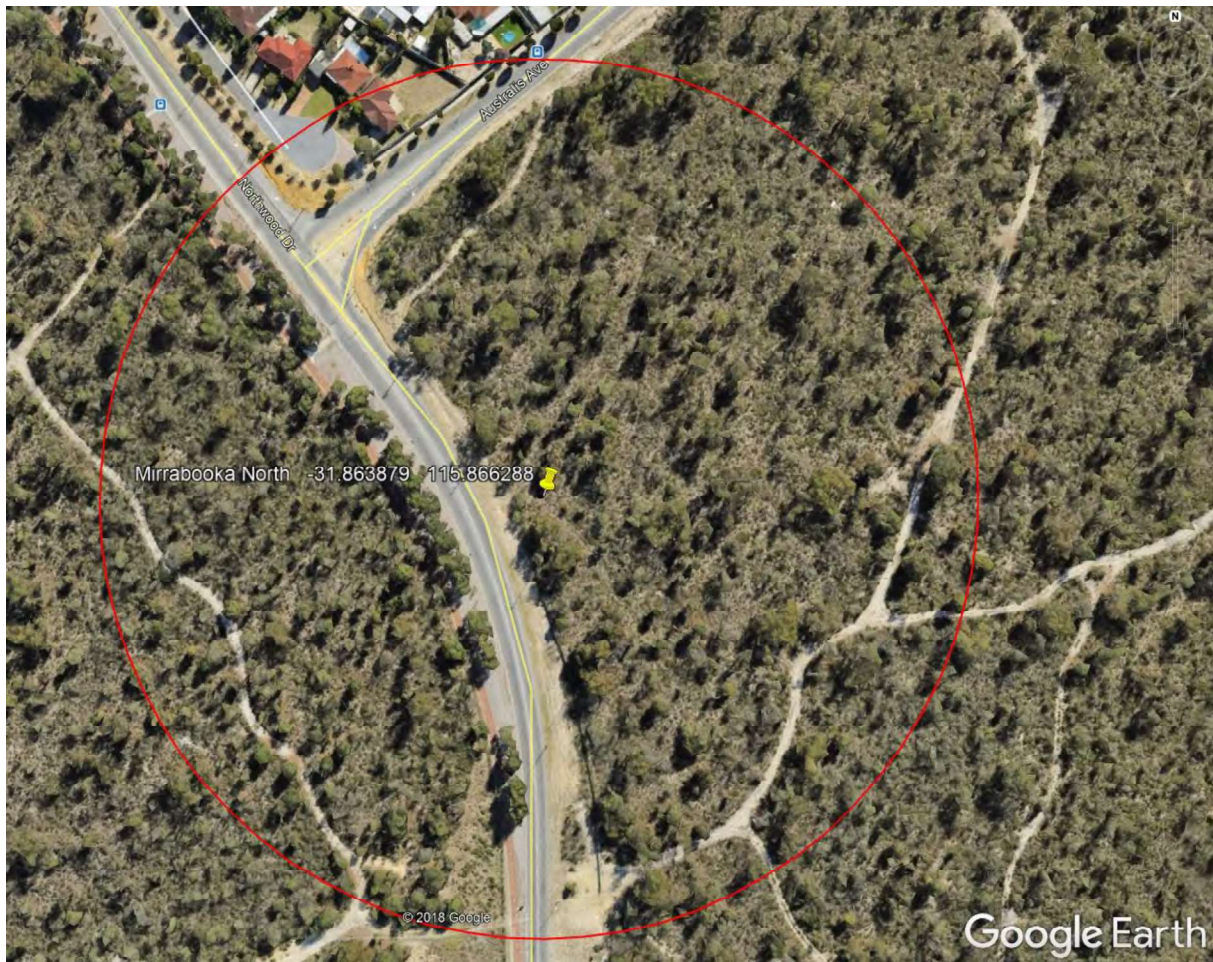


Figure 4: Aerial of Site location and immediate surrounds. The red circle represents a radial distance of 150m. Source: Google Earth.



Figure 5: Site location, looking east from Northwood Drive. Source: Service Stream.

The nearest residence (33 Snowberry Retreat) is located approximately 135m North-Northwest of the proposed site. In addition to dwellings being orientated away from proposal, the monopole will be screened from the residential area by tall vegetation within the crown land reserve.



Figure 6: View from Snowberry Retreat looking South-Southeast towards the site. Source: Service Stream.

3.4 Summary of Proposal

Drawings accompanying this application for planning permit illustrate the site locality and proposed layout, site set out, site elevation, and contextual information (refer **Appendix B**).

The proposal consists of:

- The installation of a new 23.8m high slimline monopole;
- The installation of six (6) new panel antennas mounted to a headframe at 25m centrelines on the monopole;
- The installation of thirty-six (36) new Remote Radio Units (RRUs) mounted to the proposed headframe;
- The construction of a fenced compound (12.0m x 8.0m x 2.4m), including access gates to Northwood Drive;
- The installation of an equipment shelter (xx x x x x x x x x) at the base of the monopole;
- The installation of associated ancillary equipment, including Combiners, Feeders, Mast Head Amplifiers etc.; and
- Works within the proposed equipment cabinet.

4 Regulatory Framework

4.1 Commonwealth Regulatory Framework and Telecommunications Act

In 1991, the Commonwealth Government initiated a major reform of the communications industry in Australia. The reform allowed limited competition until July 1997 at which time full competition was permitted. In July 1997, the *Telecommunications Act 1997* was introduced, replacing the 1991 Act, which facilitated this competition.

Under the 1997 Act, the Government established the *Telecommunications Code of Practice 1997* (Commonwealth Code of Practice), which sets out the conditions under which a carrier must operate. The Carrier, as a licensed telecommunications carrier, must comply with the *Telecommunications Act 1997* and the *Telecommunications Code of Practice 1997* for all telecommunication facilities. Under the 1997 Act, provisions have been made for telecommunications carriers to be subject to State and Territory environmental and planning laws where the proposed facility does not fall within the definition of the *Telecommunications (Low-impact Facilities) Determination 1997 (Amendment no. 1 of 1999)*.

4.2 Commonwealth Telecommunications Code of Practice 1997

Section 2.11 of the Telecommunications Code of Practice 1997 requires carriers to ensure that the design, planning and installation of facilities are in accordance with industry “best practice”. This is required to [2.11(3)]:

“...minimise the potential degradation of the environment and the visual amenity associated with the facilities”.

“Best Practice” involves the carrier complying with any relevant industry code or standard, which is registered by the ACMA under Part 6 of the Act. The planning and siting of the current proposal has taken place in accordance with Section 3 (Planning and Siting) of the Australian Standard, Siting of Radiocommunications Facilities (AS 3516.2).

4.3 Telecommunications (Low-Impact Facilities) Determination

A *Low-Impact Telecommunications Facility* is a Facility which meets with the requirements of the *Telecommunications (Low-impact Facilities) Determination 1997*, which was established by the Federal Minister for Communications utilising the provisions of the *Telecommunications Act 1997*.

The Determination criteria only relate to the size and purpose of the equipment proposed, the type of supporting structure used, and the existing land use category where the facility is proposed. The Determination does not specifically relate to the power levels of the proposed equipment to be used. The Background to the Determination (Section 1.2 Page 3) explains as follows:

A facility cannot be a low-impact facility unless it is specified in this determination. Therefore overhead cabling and new mobile telecommunications towers are not low-impact facilities.

Also, a facility will be a low-impact facility only if it is installed in particular areas identified in this determination. The areas have an order of importance, based on zoning under State or Territory laws, so that any area only has its “highest” possible zoning. The order of priority is:

- *Area of environmental significance*
- *Residential areas*
- *Commercial areas*
- *Industrial areas*
- *Rural areas.*

Telecommunications development, which is classified as low-impact, does not require a planning permit approval from Local or State Government. Telecommunications development, which is not classified as low-impact, requires planning permit approval. Due to the proposed facility being an installation of a new telecommunications tower or pole, the development is not a low-impact facility.

It is the visible physical characteristics of the equipment and supporting structures, rather than radio-frequency emissions which determine a proposal's status as either low-impact or not low-impact.

4.4 Industry Code C564:2011 (the Deployment Code)

The Industry Code (Mobile Base Station Deployment) is a national Code implemented in July 2012 by licensed telecommunications Carriers. The aim of the Code is to address the concerns of the community about the risks of radiofrequency EMR exposure by allowing the community and the Councils to have greater participation in decisions made by Carriers and encouraging a more collaborative approach between carriers, local councils and the community alike to mobile base station deployment. As part of this, Carriers are required to adopt a Precautionary Approach in planning, installing and operating Radiocommunications infrastructure.

The Code however does not change the existing regulatory regime at Local, State or Federal level and is a supplement to existing requirements imposed on Carriers. This proposal is compliant with the Industry Code and Optus has applied the Precautionary Approach in the Selection and Design of the proposed site in accordance with Sections 4.1 and 4.2 of this Code.

5 State Planning Framework

As the proposal is not low - impact under Commonwealth legislation, it requires a development permit pursuant to Western Australian Planning Law. The relevant authority is the Western Australian Planning Commission.

5.1 Planning and Development Act 2005

The Minister of Planning and Infrastructure has ultimate authority for town planning in Western Australia. Development within Western Australia is controlled by the *Planning and Development Act 2005* through the application of environmental planning instruments. Under the Planning and Development Act 2005, the Western Australian Planning Commission (WAPC) is the responsible authority for land use planning and development matters and this report seeks to demonstrate compliance with the WAPC and other items of relevant legislation which pertain to the subject application.

The proposed Development is to be assessed against the provisions of the State Planning Policy 5.2 – Telecommunications Infrastructure.

5.2 SPP 5.2 Telecommunications Infrastructure – Guiding Principles

Complimenting SPP 5.2 are the Guidelines for the Location, Siting and Design of Telecommunications Infrastructure’.

An assessment against the Guiding Principles in section 4 are contained in the table below:

Principle	Comment	Complies
There should be a co-ordinated approach to the planning and development of telecommunications infrastructure, although changes in the location and demand for services require a flexible approach.	Optus undertakes a carefully co-ordinated and planned approach to the development of their network.	✓
Telecommunications infrastructure should be strategically planned and co-ordinated, similar to planning for other essential infrastructure such as networks and energy supply.	The complete Optus mobile network is strategically planned and individual sites are co-ordinated into the wider network much like other essential infrastructure.	✓
Telecommunications facilities should be located and designed to meet the communication needs of the community.	The proposed facility will help improve existing Optus customer voice and data services to Mirrabooka and the surrounding locality.	✓
Telecommunications facilities should be designed and sited to minimise any potential adverse visual impact on the character and amenity of the local environment, in particular, impacts on prominent landscape features, general views in the locality and individual significant views.	The proposal involves the installation of a slim line monopole and associated telecommunications infrastructure in an area that is separated from residential uses. It is considered that the overall structure design will have minimal visual impact, due to separation distances and existing screening vegetation.	✓

Telecommunications facilities should be designed and sited to minimise impacts on areas of natural conservation value and places of heritage significance or where declared rare flora are located.	The proposed works are confined to a small land area within crown land. Whilst this is reserve land, its use is for recreation purposes. The area is not a place of heritage significance or declared flora.	✓
Telecommunications facilities should be designed and sited with specific consideration of water catchment protection requirements and the need to minimise land degradation.	The site is not within a water catchment area. Minimal site clearance is required to install the facility.	✓
Telecommunications facilities should be designed and sited to minimise adverse impacts on the visual character and amenity of residential area.	The proposal is to be sighted away from the residential area. The existing tall vegetation within the reserve and proposed structure design offsets any visual amenity impacts. Proposed design features include non - reflective grey and slim - line structure type. Furthermore, the proposed structure, although taller than nearby lighting and transmission poles, is not inconsistent with these existing vertical elements in the immediate vicinity.	✓
Telecommunications cables should be placed underground, unless it is impractical to do so and there would be no significant effect on visual amenity or, in the case of regional areas, it can be demonstrated that there are long-term benefits to the community that outweigh the visual impact.	All cabling from the antenna system to the equipment shelter will be contained within the monopole and then underground to the shelter. Overhead cabling is not proposed for this site.	✓
Telecommunications cables that are installed overhead with other infrastructure such as electricity cables should be removed and placed underground when it can be demonstrated and agreed by the carrier that it is technically feasible and practical to do so.	This principle does not apply to this application.	✓
Unless it is impractical to do so telecommunications towers should be located within commercial, business, industrial and rural areas and areas outside identified conservation areas.	In this case, the facility has been located within a recreation reserve. The reserve is not an identified conservation area.	✓
The design and siting of telecommunications towers and ancillary facilities should be integrated with existing buildings and structures, unless it is impractical to do so, in which case they should be sited and designed so as to minimise any adverse impact on the amenity of the surrounding area.	During the site scoping process several rooftops were considered. However, these were deemed not suitable due to their relationship to existing sensitive sites, such as childcare centres.	✓
Co-location of telecommunications facilities should generally be sought, unless such an arrangement would detract from local amenities or where operation of the facilities would be significantly compromised as a result.	As discussed in Section 3 of this report, co-location opportunities have been investigated. There are no practical co-location opportunities within the search area.	✓

<p>Measures such as surface mounting, concealment, colour co-ordination, camouflage and landscaping to screen at least the base of towers and ancillary structures, and to draw attention away from the tower, should be used, where appropriate, to minimise the visual impact of telecommunications facilities.</p>	<p>The design incorporates a slim -line structure, non - reflective colour, and is sighted away from the residential area and sensitive uses. It is therefore deemed that the overall structure design will have minimal visual impact. Service Stream are also prepared to include additional planting on the advice of the Commission.</p>	<p>✓</p>
<p>Design and operation of a telecommunications facility should accord with the licensing requirements of the Australian Communications Authority, with physical isolation and control of public access to emission hazard zones and use of minimum power levels consistent with quality services.</p>	<p>Telecommunications facilities include radio transmitters that radiate electromagnetic energy (EME) into the surrounding area. The levels of these electromagnetic fields must comply with safety limits imposed by the Australian Communications and Media Authority (ACMA). All Optus installations are designed to operate within these limits See Appendix C - ARPANSA Environmental EME report.</p>	<p>✓</p>

6 Additional matters

6.1 Visual Impact

The primary purpose of the Optus / VHA joint venture is to consolidate existing infrastructure, reducing the number of separate facilities required in the locality. Establishing a combined new facility enables Optus and VHA to improve service to the coverage locality, while maintaining the visual amenity of the surrounding environment through combining services.

The proposal has minimised the visual appearance of the facility through the use of a slim line monopole installation, which has very minimal building bulk, and minimising the height of the monopole. In this instance an overall facility height of 26.5m is required to provide appropriate service to the surrounding area. The proposed structure will be located within crown bushland adjacent Northwood Drive.

In a residential or commercial area, a pole of this height would normally represent as a prominent visual element. It is considered that visual impacts are mitigated by way of location and design to a degree that they are almost negligible.

The slimline monopole structure is designed to be as unobtrusive as possible. It is to be finished in neutral colours and will be mostly obscured from nearby areas. Additional planting will be used to further screen the compound area. The compound fencing and equipment shelter will be finished in colours that will blend with the adjacent bushland.

6.2 Transportation, Access & Construction

The proposed facility will be in close proximity to Northwood Drive and will be accessed via gates that open onto the road reserve. This access arrangement removes the requirement to traverse the site via the existing bush track network within the recreation reserve.

During the construction period there will be trucks, a crane and other associated construction vehicles and equipment on site. All construction activities will be carried out in compliance with relevant regulations and Authority requirements within the shortest possible timeframe.

Construction activity will generate some noise; however, this will be in accordance with relevant guidelines for construction site noise as per the *Environment Protection (Noise) Policy*.

The only noise emitted by the facility once completed is associated with an air conditioning unit attached to the equipment shelter which emits a noise level similar to that of a domestic air conditioner. These operational noise levels would not be noticeable outside of the area immediately surrounding the site and will comply with the policy. It is not expected that this source of noise will affect adjacent land users, particularly residents.

Operation of the base station will not generate any odour emissions, or solid waste, nor discharge any liquid waste.

Once established the site will operate like other utility installations. In the normal course of events the base station would be subject to routine maintenance checks, a maximum of once a month or as required in an electricity outage or similar event.

6.3 Health and Safety

Mobile phone base stations emit electromagnetic energy (EME). It is mandatory that mobile network operators in Australia comply with current and future Australian Radiation protection and Nuclear Safety Agency (ARPANSA) standards for the operation of the proposed facility. The Australian Communications and Media Authority are the regulatory body for compliance with this standard. The current standard is the Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (RPS 3 - 2002). This standard maintains a significant safety margin to prevent adverse health effects.

Optus relies on the expert advice of national and international health authorities such as the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the World Health Organisation (WHO) for overall assessments of health and safety impacts. The consensus is that there is no substantiated scientific evidence of health effects from the EME generated by radio frequency technology, including mobile phones and base stations, when used in accordance with applicable standards.

On 1 March 2003 the ACMA introduced new regulations setting limits for human exposure to EME for all types of radio communication, broadcast and telecommunications transmitters. Previous regulations only applied to telecommunications transmitters. The limits for public human exposure to EME are based on the Radiation Protection Standard - Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300GHz, developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) referred to as the ARPANSA Standard.

The proposed facility will be designed and installed to comply with maximum human exposure levels to radio frequency emissions as defined by this standard.

Optus does not consider the emission of electromagnetic fields relevant to the assessment of the planning merits of a site where the facility operates in accordance with prescribed standards. The proposed facility operates well within the prescribed health standards. The report provided in Appendix C shows the compliance of the proposed facility by way that the maximum cumulative EME level at 1.5m above ground is estimated to be 0.13% of the ACMA mandated exposure limit.

Further information on the regulation of radio emissions and a range of other issues relevant to the placement of mobile phone facilities (including industry codes of practice and legislation; and a video clip on mobile phones and health) is available from the Australian Communications and Media Authority (ACMA) website at <http://emr.acma.gov.au>.

7 Conclusion

A detailed assessment of the proposed site has been undertaken with a view to ensuring that the proposal complies with relevant Commonwealth, State and Local planning policies as applicable.

It is considered that the proposal will not conflict with surrounding land uses, nor will it decrease the general amenity of the area or have a detrimental impact on the local environment.

The proposal is compliant with relevant planning instruments and will assist Optus in its commitment to ensuring that telecommunications infrastructure and services are provided in an efficient and cost effective manner to meet community needs, whilst having a minimal impact on the amenity of the area.

Importantly, the proposal will provide much needed telecommunication services to an area that has been identified as being disadvantaged in relation to service.

The proposed facility will be designed and installed to comply with maximum human exposure levels to radio frequency emissions as defined by the ARPANSA RPS3 standard.

The proposal, which supports the delivery of and access to important, contemporary and reliable telecommunications network services for Mirrabooka and the surrounding area, will moreover have important local and regional benefits and is consistent with current State planning directives and regional planning initiatives.

It is therefore submitted that the proposal is both consistent and compliant with the relevant planning legislation and should be supported.

Appendix A

Copy of Title

Appendix B

Plans of the Proposed Development

Appendix C

Environmental EME Report

Appendix 2
Landowner Approval

Enquiries: Bill Epps (08)6551 9028
Our Ref:
Your Ref:

Department of Water and Environmental Regulation
Locked Bag 33
CLOISTERS SQUARE PO 6850

Dear Sir/Madam

**PORTION OF LOT 8904 – 17 NORTHWOOD DRIVE, MIRRABOOKA – AUTHORISATION
TO CLEAR LAND**

The Western Australian Planning Commission as owner of the above mentioned property gives permission for Service Stream Network Construction Pty Ltd to apply to obtain a clearing permit to clear a portion of the land confined to the site of the telecommunications works at the above described location.

Should you require confirmation of the above, I can be contacted on 6551 9028 or by email to bill.epps@dph.wa.gov.au

Yours faithfully



Bill Epps
For Secretary
WESTERN AUSTRALIAN PLANNING COMMISSION

11 June 2019