GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS
Area Permit Number: 8471/1
File Number: DWERVT2685
Duration of Permit: From 17 April 2020 to 17 April 2022

PERMIT HOLDER
City of Cockburn

LAND ON WHICH CLEARING IS TO BE DONE
Frankland Reserve, Lot 2022 on Diagram 27846, Hammond Park

AUTHORISED ACTIVITY
The Permit Holder shall not clear more than 2.4 hectares of native vegetation within the area cross-hatched yellow on attached Plan 8471/1a.

CONDITIONS

1. **Avoid, minimise and reduce the impacts and extent of clearing**
   In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:
   (a) avoid the clearing of native vegetation;
   (b) minimise the amount of native vegetation to be cleared; and
   (c) reduce the impact of clearing on any environmental value.

2. **Dieback and weed control**
   When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:
   (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
   (b) ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
   (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

3. **Fauna management**
   Clearing shall be conducted in a slow, progressive manner from east to west to allow fauna to move out of the clearing area and into adjacent remnant vegetation.

4. **Land degradation (wind erosion)**
   The Permit Holder must begin construction works within 2 months of clearing activity to mitigate against land degradation through wind erosion.

5. **Offset – Land acquisition**
   Prior to 1 August 2021, the Permit Holder shall provide to the *CEO* a copy of the executed change in purpose of Lot 140 on Deposited Plan 226007 (being Crown Reserve 1820) from 'Recreation' to 'Conservation'.

6. Vegetation management - fencing

(a) Within six months of clearing, the Permit Holder shall construct a fence along the perimeter outlined in blue/black on attached Plan 8471/2a.
(b) Within six months of clearing, the Permit Holder shall construct a fence enclosing the area coloured grey on Plan 8471/2b.
(c) Prior to the expiry of this Permit, the Permit Holder shall construct a fence enclosing the area coloured orange on Plan 8471/2b.
(d) Fences should allow for the movement of wildlife by being raised 15cm from the ground.
(e) Within one month of installing the above fences, the Permit Holder shall notify the *CEO* in writing that the fence has been completed.

7. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit, in relation to the clearing of native vegetation authorised under this Permit:

(a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
(b) the date that the area was cleared;
(c) the size of the area cleared (in hectares);
(d) the direction that clearing was undertaken;
(e) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 1 of this Permit;
(f) actions taken to minimise the risk of the introduction and spread of dieback and weeds in accordance with condition 2 of this Permit; and
(g) evidence supporting compliance with conditions 3, 4, and 6 of this Permit.

8. Reporting

The Permit Holder must provide to the *CEO* the records required under condition 7 of this Permit, when requested by the *CEO*.

DEFINITIONS

The following meanings are given to terms used in this Permit:

CEO: means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

dieback means the effect of *Phytophthora* species on native vegetation;

fill means material used to increase the ground level, or fill a hollow;

land degradation includes salinity, erosion, soil acidity and waterlogging;

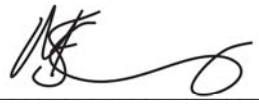
mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

weed/s means any plant -

(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or

(b) published in a Department of Biodiversity, Conservation and Attractions Regional Weed Rankings Summary, regardless of ranking; or

(c) not indigenous to the area concerned.

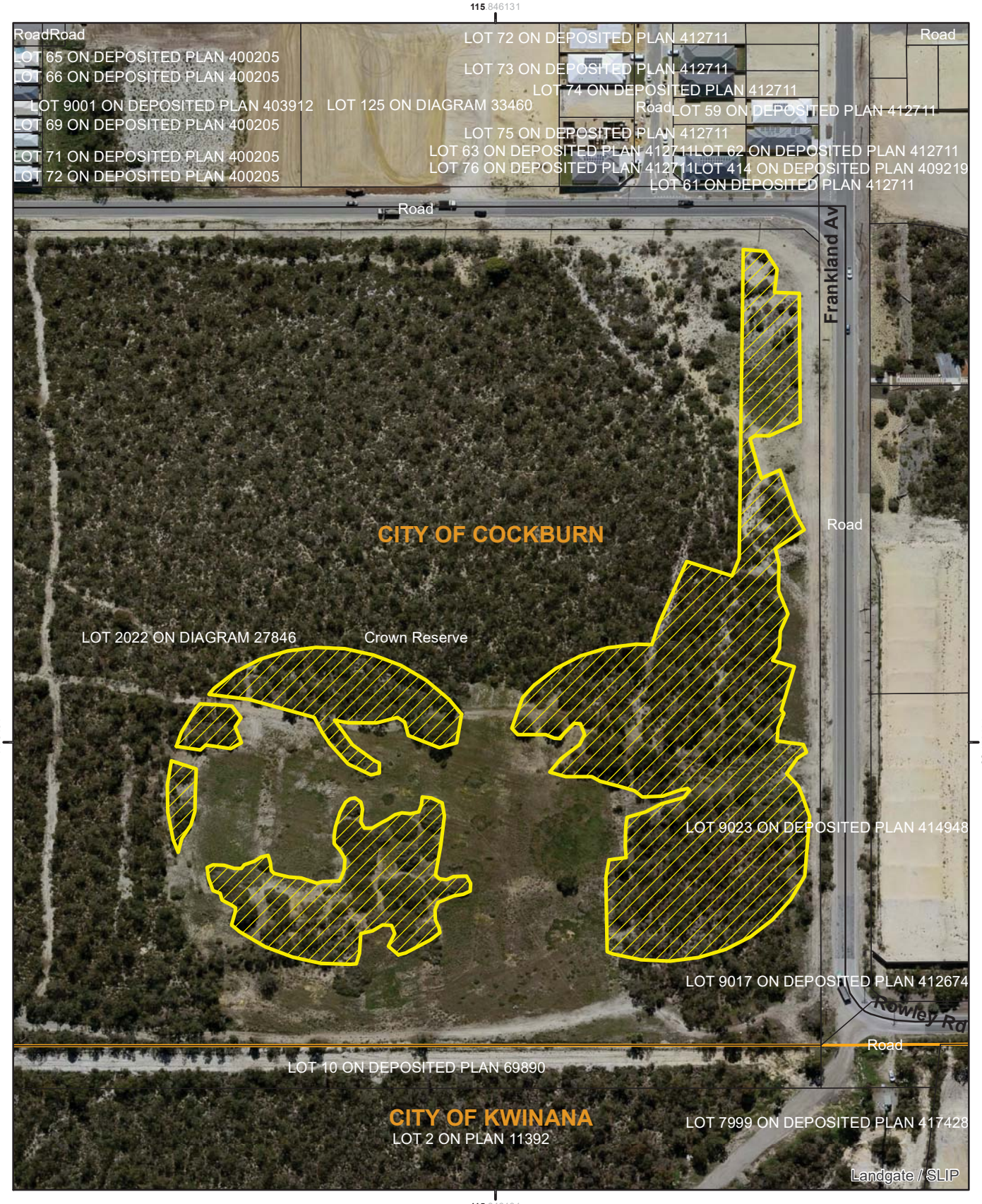


Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

18 March 2020

Plan 8471/1a



0 15 30 60 90 120 150

Meters

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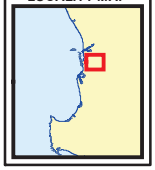
LOCALITY MAP



LEGEND

- Area approved to clear
- Local Government Authorities
- State roads
- Major roads

N

Datum and Projection Information
Geocentric Datum of Australia 94
Projection: MGA 94 Zone 50
Spheroid: Australian National Spheroid

Project Information
Map Author: Carly Bishop
Compilation date: 06/02/20
Edition: 1

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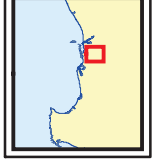
Officer with delegation authority under Section 20 of the Environmental Protection Act 1986

Government of Western Australia
Department of Water and Environmental Regulation

Plan 8471/1b
Location of offset site

LOCALITY MAP



LEGEND

- Offset site
- Local Government Authorities
- State roads
- Major roads

N

Datum and Projection Information
Geocentric Datum of Australia 94
Projection: MGA 94 Zone 50
Spheroid: Australian National Spheroid

Project Information
Map Author: Carly Bishop
Compilation date: 06/02/20
Edition: 1

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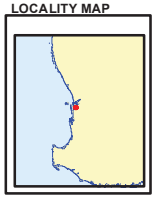
Government of Western Australia
Department of Water and Environmental Regulation

CPS 8471/1 Plan 2a - Frankland Reserve boundary fence

LOCALITY MAP



LEGEND

- Boundary fence
- Area approved to clear
- Cadastre
- Local Government Authorities

Datum and Projection Information
Vertical Datum:
Australian Height Datum (AHD)
Horizontal Datum:
Geocentric Datum of Australia 94
Projection:
MGA 94 Zone 50
Spheroid: Australian National Spheroid

Project Information
Client: City of Cockburn
Map Author: C. Bishop
Task ID: 8471/1
Filepath: J:
Filename:
Compilation date: 6 March 2020
Edition: 1

Government of Western Australia
Department of Water and Environmental Regulation

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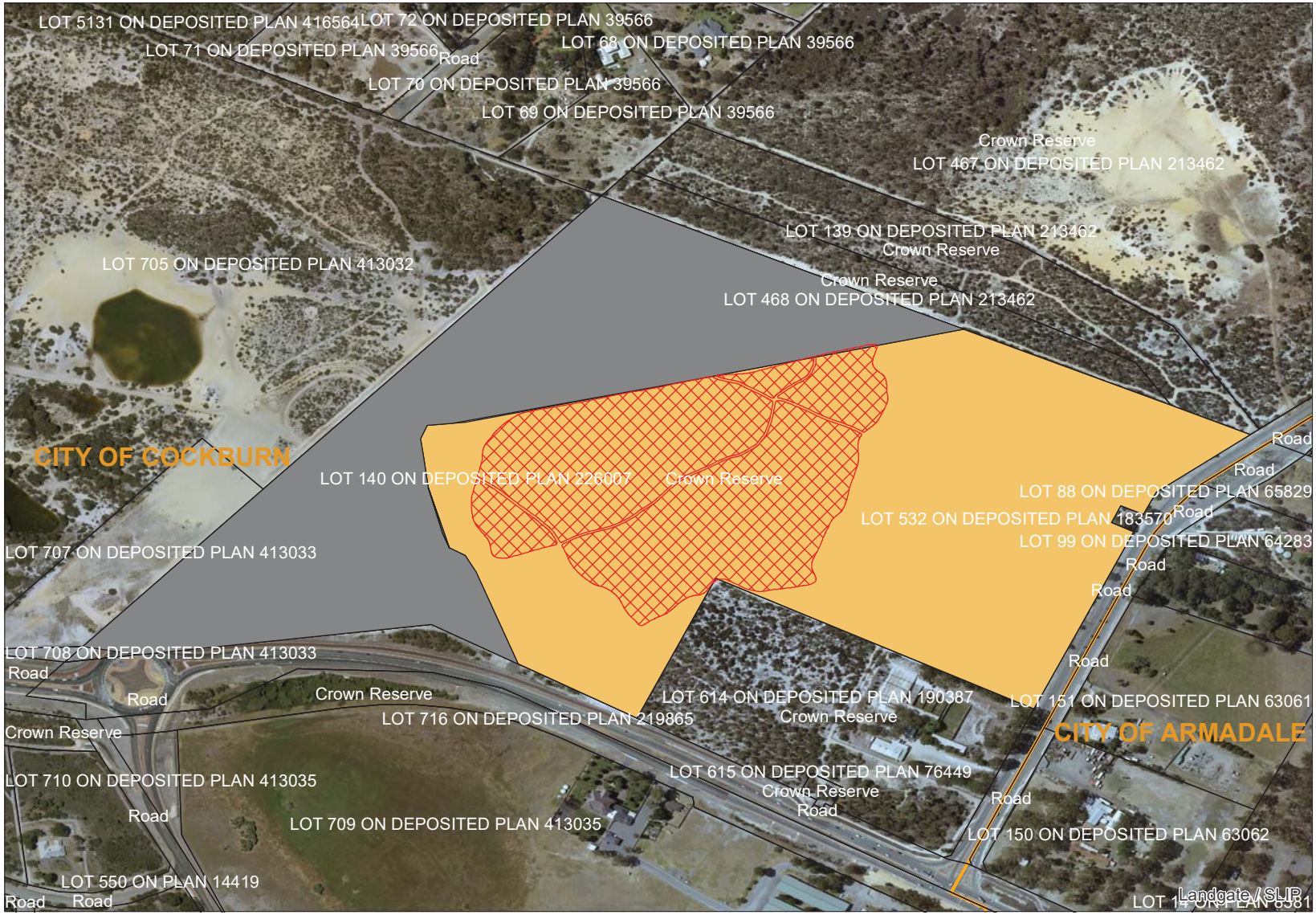
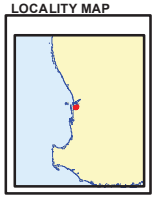
Kilometres

CPS 8471/1 Plan 2b - Rose Shanks Reserve - Phase 1 & Phase 2 boundary fencing



LOCALITY MAP



LEGEND

- Offset site
- Phase 1 fence
- Phase 2 fence
- Cadastre
- Local Government Authorities

Datum and Projection Information
Vertical Datum:
Australian Height Datum (AHD)
Horizontal Datum:
Geocentric Datum of Australia 94
Projection:
MGA 94 Zone 50
Spheroid: Australian National Spheroid
Project Information
Client: City of Cockburn
Map Author: C. Bishop
Task ID: 8471/1
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Government of Western Australia
Department of Water and Environmental Regulation

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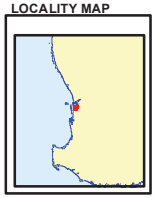
0 0.1 0.2 0.4 0.6 0.8 1
Kilometres

CPS 8471/1 - Rose Shanks Reserve banksed offset site

LOCALITY MAP



LEGEND

- Offset site
- Banked offset
- Cadastre
- Local Government Authorities

Datum and Projection Information
Vertical Datum:
Australian Height Datum (AHD)
Horizontal Datum:
Geocentric Datum of Australia 94
Projection:
MGA 94 Zone 50
Spheroid: Australian National Spheroid

Project Information
Client: City of Cockburn
Map Author: C. Bishop
Task ID: 8471/1
Filepath: J:
Filename:
Compilation date: 6 March 2020
Edition: 1

Government of Western Australia
Department of Water and Environmental Regulation

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0 0.1 0.2 0.4 0.6 0.8 1

Kilometres

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8471/1
Permit type: Area Permit

1.2. Applicant details

Applicant's name: City of Cockburn
Application received date: 17 April 2019

1.3. Property details

Property: Lot 2022 on Diagram 27846, Hammond Park
Local Government Authority: Cockburn, City of
Localities: Hammond Park

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
2.4		Mechanical Removal	Recreation

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 18 March 2020

Reasons for Decision:

The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance with principles (a), (b) and (e), may be at variance with principle (g), and is not likely to be at variance with the remaining principles.

The Delegated Officer noted the application area contains 1.4 hectares of Carnaby's cockatoo (*Calyptorhynchus latirostris*) significant foraging habitat. To mitigate the significant environment impacts identified above, and in accordance with the WA Environmental Offset Policy and Environmental Offsets Guidelines, an offset of 9.9 hectares of Carnaby's cockatoo foraging habitat in Excellent condition (Keighery, 1994) within Rose Shanks Reserve is required. The vesting of Rose Shanks Reserve will be changed to Conservation from its current purpose of Public Recreation. Vegetation in Rose Shanks Reserve (9.9 hectares) is to be maintained and managed in perpetuity as Carnaby's Cockatoo foraging habitat with the remaining remnant vegetation banked for future clearing activities. Rose Shanks Reserve forms part of the Jandakot Regional Park.

The Delegated Officer noted that the application area contains suitable habitat for Quenda/Southern brown bandicoot (*Isoodon obesulus* subsp. *fusciventer*) Priority 4 and Western brush wallaby (*Macropus irma*) Priority 4. To minimise impacts on any individuals present, a condition has been placed on the permit requiring the clearing activity to be undertaken in a slow progressive manner to allow the fauna to disperse into the adjacent remnant (i.e. from east to west).

The Delegated Officer determined that the sandy soils within the application area are prone to wind erosion. It was determined that the risk to land degradation could be mitigated though beginning construction works within two months of the clearing activity.

Although the application area forms part of a significant remnant in an area that has been extensively cleared, an offset is not required due to being in a highly constrained area as part of the Metropolitan Regional Scheme.

After consideration of the above, the Delegated Officer determined that the proposed clearing may increase the spread of weeds and dieback into adjacent vegetation. Weed and dieback management measures may minimise this impact. Furthermore, a condition regarding fencing installation and maintenance at both Frankland Reserve and the Rose Shanks Reserve offset site has been included to protect the remaining remnant vegetation from degradation through edge effects.

Given the above, the Delegated Officer decided to grant a clearing permit subject to weed and dieback, erosion and fauna management, fencing and offset conditions.

2. Site Information

Clearing Description

The application is to clear 2.4 hectares of native vegetation within Lot 2022 on Diagram 27846, Hammond Park, for the purpose of constructing a public sports facility including two playing fields, club house and carpark (Figure 1).

Vegetation Description

Swan Coastal Plain Vegetation complex

The application area is mapped as Bassendean Complex-Central and South with vegetation ranging from woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. This includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth (Mattiske and Havel, 1998).

Vegetation survey

One vegetation unit was recorded within the application area, which is described as Low Woodland of *Banksia attenuata* and *Banksia menziesii* with occasional *Eucalyptus marginata* over Low Scrub of *Xanthorrhoea preissii*, *Allocasuarina humilis* and *Eremaea pauciflora* var. *pauciflora* over Dwarf Scrub of *Hibbertia hypericoides*, *Stirlingia latifolia* and *Hypocalymma robustum* over Open sedges of *Mesomelaena pseudostygia*, *Lyginia imberbis* and *Amphipogon turbinatus* (Focused Vision, 2018).

Conservation listing

The application area is mapped as the state-listed Banksia Dominated Woodlands of the Swan Coastal Plain Priority 3 Ecological Community (PEC). This PEC was confirmed to be representative of FCT SCP28 *Spearwood Banksia attenuata or Banksia attenuata – Eucalyptus woodlands* (Focused Vision, 2018; DWER, 2019). This is synonymous with the Commonwealth-listed Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC), listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Vegetation Condition

The application area ranges from Very good - Excellent to Completely Degraded condition (Keighery, 1994). The vegetation condition mapped by Focused Vision (2018) was confirmed and refined where required through a site inspection undertaken by Department of Water and Environmental Regulation (DWER) in August 2019 (Table 1 and Figure 1). Figure 2 includes photos taken of the application area during the DWER site inspection.

Table 1: Vegetation condition within the application area (Keighery, 1994; Focus, 2018 and DWER, 2019).

Scale	Description	Mapped extent within application area (ha)
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.	0.40
Very Good	Vegetation structure altered; obvious signs of disturbance	0.55
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance; retains basic structure or ability to regenerate	0.52
Degraded	Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching Good condition without intensive management	0.63
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.	0.34
	Total application area	**2.4 hectares**

Soil type

The application area and surrounding Frankland Reserve is mapped as Spearwood S1b Phase (211Sp_S1b) which consists of dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15% (Schoknecht et al., 2004).

Local area

The 'local area' is defined as a 10 kilometre radius measured from the perimeter of the application area.

Within the local area, there is approximately 26.4 per cent of remnant vegetation remaining.

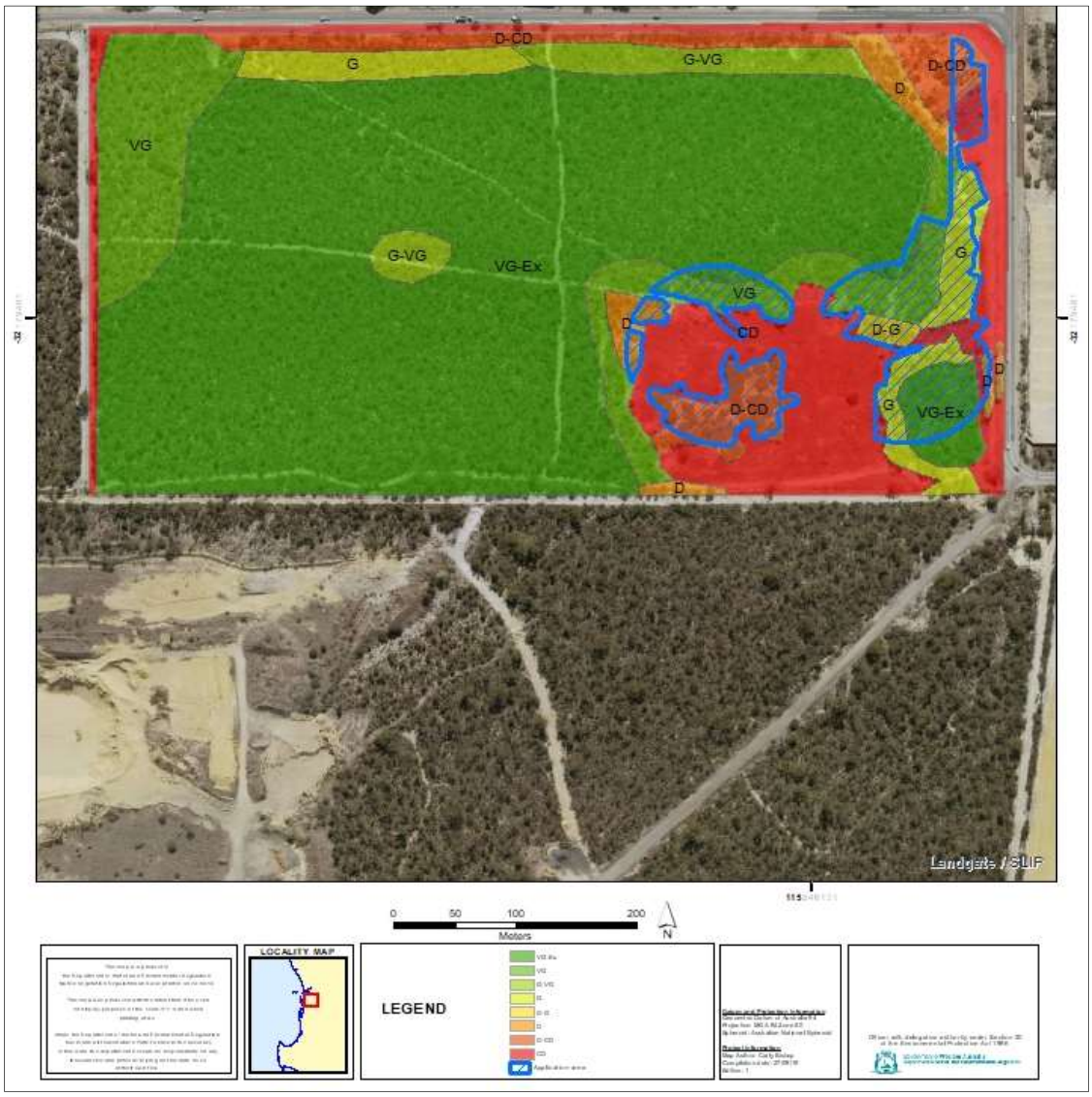

Figure 1: Application area (blue hatched) and vegetation condition – includes DWER corrections (Keighery 1994)

Photo 1: Looking east over Completely Degraded area. Taken from south-western corner of the application area (391127, 6438967).

Photo 2: Looking south-east over Very good to Excellent condition vegetation. Taken from south-eastern corner of application area (391298, 6439034).

Photo 3: Looking west into Good condition vegetation. Taken from eastern side of the application area (391337, 6439132).

Photo 4: Looking east into 'Very Good' condition vegetation. Taken from western edge of application area (391091, 6439112).

Figure 2: Photographs of the application area and its surrounds (DWER, 2019)

3. Mitigation hierarchy

Avoid and minimise

The City of Cockburn (the City) has provided the following advice in relation to the avoidance and minimisation of impacts:

- multiple iterations of the development footprint to minimise the amount of native vegetation being cleared ;
- the development footprint area will be clearly demarcated prior to any earthworks/clearing activities being undertaken to ensure no vegetation is cleared outside the designated footprint area;
- a conservation style fence will be erected to reduce negative impacts on or within the bushland area;
- any grass trees and/ or zamia palms will be translocated to an appropriate location on site within Frankland Reserve or an appropriate alternative location within the City of Cockburn (i.e. alternative conservation area with Banksia/Eucalypt Woodland vegetation). The City will also undertake seed and plant collection for future revegetation programs within the City;
- a fauna relocation program will be implemented prior to clearing with a qualified zoologist on site during clearing works to collect and relocate disturbed fauna. Clearing will take place in such a manner that fauna can escape into the remaining bushland;
- a feral animal control program will be implemented after the clearing in the remainder of the reserve;
- landscaping within the car park will utilise endemic vegetation; and
- assorted nesting boxes (10) will be placed in areas of Frankland Reserve that are not being cleared (City of Cockburn, 2020).

Furthermore, in regards to Frankland Reserve, DWER requires the City to:

- suspend clearing in the event that Carnaby's cockatoo, Western Brush Wallaby or Quenda are sighted within the development area and not recommence until the individual/s have moved into adjacent habitat;
- begin works within two months of clearing to reduce the risk land degradation from wind erosion;
- maintain the fence surrounding the remaining remnant;
- specify the type of nesting boxes to be installed (i.e. target species) and use evidence-based specifications to prevent colonisation by European honey bees;
- monitor and replace nest-boxes should honey bees be found; and
- undertake disease (*Phytophthora cinnamomi*) hygiene measures prior to and during clearing to prevent transmission into Frankland Reserve.

4. Assessment of application against clearing principles, planning instruments and other relevant matters

(a) Native vegetation should not be cleared if it comprises a high level of biodiversity.

Proposed clearing is at variance with this Principle

As discussed within Section 2, the application area and surrounding Frankland Reserve is mapped as the state-listed Banksia Dominated Woodlands of the Swan Coastal Plain PEC. This is synonymous with the Commonwealth-listed Banksia Woodlands of the Swan Coastal Plains TEC. These Banksia woodlands of the Swan Coastal Plain are floristically diverse and provide a range of cross-scale ecological functions in the landscape (Threatened Species Scientific Committee 2016).

According to available databases, six Threatened flora species and 34 Priority flora species have been recorded within the local area (Western Australian Herbarium (1998-)). There are no records of conservation significant flora within the application area or within Frankland Reserve. Targeted surveys of Frankland Reserve did not record any Threatened or Priority flora within the application area (Focused Vision, 2018).

Flora and vegetation surveys recorded 109 flora species within Frankland Reserve (Focused Vision, 2018). This included species from 66 genera and 38 families. Dominant families include Poaceae (13 species), Fabaceae (12 species), Myrtaceae (eight species), Proteaceae (eight species) and Asteraceae (eight species). Of these species 82 (75.2%) were native and 27 (24.8%) were introduced species.

As assessed under Principle (b), the application area contains suitable habitat for conservation significant fauna including:
- Carnaby's cockatoo (*Calyptorhynchus latirostris*) Endangered under the *Biodiversity Conservation Act 2016* (BC Act) and the EPBC Act;
- Red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*) listed as Vulnerable under the BC Act and the EPBC Act;
- Quenda/Southern brown bandicoot (*Isoodon obesulus* subsp. *fusciventer*) Priority 4 by the Department of Biodiversity, Conservation and Attractions (DBCA);
- Western brush wallaby (*Macropus irma*) Priority 4 by DBCA;
- Perth lined lerista (*Lerista lineata)* Priority 3 by DBCA*;* and
- Peregrine falcon (*Falco perigrinus*) Other Specially Protected fauna under the BC Act (Focused Vision, 2018).

The application area contains 1.4 hectares of confirmed foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*) (Focused Vision, 2018; DWER, 2019). Despite the relatively small size of the foraging habitat proposed to be impacted, the cumulative impacts upon Carnaby's cockatoo foraging habitat over time, continues to contribute to the decline of the species (Whitehead et al., 2016; Williams et al*.,* 2017). The application area contains significant forging habitat for Carnaby's cockatoo.

Following methodologies outlined in the Conservation Advice (Threatened Species Scientific Committee 2016), it was found that the remnant containing the application area, forms part of a single, medium-sized Banksia woodland patch (mostly very good – excellent condition) of approximately 6 473 ha (Focused Vision, 2018). This has implications for landscape connectivity in addition to its value as Carnaby's cockatoo foraging habitat across a fragmented landscape.

Noting the application area contains significant foraging habitat and is representative of a PEC and Commonwealth-listed TEC, the proposed clearing is 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.

Proposed clearing is at variance with this Principle

According to available databases, there are 14 terrestrial Threatened fauna species, 17 Priority fauna species and one other specially protected fauna species are recorded within the local area. There are no fauna records within the application area.

Two fauna habitats, were described and mapped across the application area, including Banksia woodland and a degraded area (Focused Vision, 2018). Site inspections confirmed the presence of Quenda diggings and evidence of Carnaby's cockatoo foraging on Banksia cones (Focused Vision, 2018; DWER, 2019).

Noting the type and condition of the vegetation within the application area, the habitat requirements and extents of occurrence; the application area comprises suitable habitat for six conservation significant fauna species including:
- Carnaby's cockatoo (*Calyptorhynchus latirostris*);
- Red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*);
- Quenda/Southern brown bandicoot (*Isoodon obesulus* subsp. *fusciventer*);
- Western brush wallaby (*Macropus irma*);
- Perth lined lerista (*Lerista lineata*); and
- Peregrine falcon (*Falco perigrinus*) (Focused Vision, 2018).

Carnaby's cockatoo and Forest red-tailed black cockatoo have been recorded from the local area. The application area contains 1.4 hectares of confirmed foraging habitat for Carnaby's cockatoo (Focused Vision, 2018; DWER, 2019). The application area is representative of the state-listed Banksia woodlands of the Swan Coastal Plain PEC which is a surrogate for Carnaby's cockatoo foraging habitat. As noted previously, the cumulative impacts upon Carnaby's cockatoo foraging habitat over time and geographic extent, continues to contribute to the decline of the species (Johnston, 2013; Williams *et al*, 2017). Because of this, clearing of foraging habitat on the Swan Coastal Plain contributes to a cumulative impact on the viability of the sub-population. The factor limiting population growth of Carnaby's cockatoo is adult survival, related directly to bottlenecks in food resources on

the Swan Coastal Plain (Williams et al., 2017). Resource depletion from the removal of pines and Banksia woodlands, coupled with the large variability in annual seed production are the greatest contributors to the restricted availability of food in the region (Johnston, 2013; Williams et al., 2017). The above assumes that the extent and quality of remaining breeding habitat is maintained in conjunction with current breeding and survival rates.

Site inspections did not identify nesting or roosting habitat within the application area (Focused Vision, 2018; DWER, 2019). However, there are 20 confirmed roost sites (comprising of 17 Carnaby's cockatoo and three Red-tailed black cockatoo) within 2 to 10km of the application area (BirdLife, 2018). The closest confirmed Carnaby's cockatoo roost is 2km away at Wandi. The foraging habitat within the application area is considered significant habitat for Carnaby's cockatoo due to:

- the 17 confirmed roost sites within the local area;
- ongoing cumulative effects of loss of cockatoo foraging habitat on the Swan Coastal Plain (Johnston, 2013; Williams et al, 2017); and
- resultant indirect impacts from edge effects on the remaining foraging habitat surrounding the application area.

Given the lack of contiguous vegetation between the application area and the confirmed roost sites, individuals are likely to utilise foraging habitat within and around the application area. At the landscape-level the remaining foraging habitat on the Swan Coastal Plain forms a series of 'stepping stones' of Carnaby's cockatoo food resources.

The closest confirmed Carnaby's cockatoo breeding site is between Martin and Roleystone 24km to the north-east of the application area. Due to the distance between this breeding site and the application area, it is unlikely to be utilised during breeding season.

No evidence of Forest red-tailed black cockatoo foraging was found at Frankland reserve, although there are records within the local area. Within Frankland Reserve, there are some small areas of remnant vegetation containing Jarrah and Sheoak which may be utilised by the species (Focused Vision, 2018; DWER, 2019).

Evidence of Quenda were seen in Frankland Reserve (Focused Vision, 2018; DWER, 2019). However, given the small size of the application area and mobility of the species, any individuals present may be able to disperse into adjacent remnant vegetation. Clearing is recommended to occur in an east to west direction under the supervision of a suitably qualified zoologist to avoid impacts to individuals at the time of clearing.

The Western brush wallaby has been recorded in nearby remnants and may occasionally utilise Frankland Reserve (Focus, 2018). There are no records within Frankland Reserve. As for Quenda, Western brush wallaby are mobile and if present will be able to disperse into the remaining remnant.

The Perth lined lerista may occur within the application area due to the presence of suitable habitat. If present, individuals may be impacted due to their relatively sedentary nature compared to larger reptile species. Habitat has been recorded nearby and the species is known to inhabit gardens. Because of this it may persist in degraded areas and landscaped gardens subsequent to development (Focused Vision, 2018). The proposed clearing is not likely to significantly impact this species.

The Peregrine falcon may occasionally utilise some areas within Frankland Reserve as part of a substantially larger home range. This species would not breed onsite (Focused Vision, 2018). The proposed clearing is not likely to significantly impact this species.

Noting the above in regards to the impact on Carnaby's cockatoo foraging habitat and individuals of Quenda and Western brush wallaby, the proposed clearing is at variance with this Principle.

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

Proposed clearing is not likely to be at variance with this Principle

Six species of Threatened flora have been recorded in the local area (Table 2). There are no records of Threatened flora within the application area.

No records of Threatened flora were found during spring surveys conducted by Focused Vision (2018). These included:

- A single-phase detailed flora assessment conducted on 25 October 2017; and
- *Caladenia huegelii* transects undertaken on 4 October 2018.

Whilst *Drakaea micrantha* was not specially targeted during the October 2018 survey, DWER considers that as the survey was undertaken at an appropriate flowering time, it would have been recognised.

Table 2: Threatened Flora species within 10km of the application area

Species	Cons Status	Distance from application area (km)	Likelihood of occurrence within application area	Record count
Diuris micrantha	T	2.3	Unlikely as prefers habitat adjacent to low depressions or swamps	5
Caladenia huegelii	T	2.6	May occur - suitable habitat occurs within application area	36
Drakaea elastica	T	2.8	Unlikely as prefers habitat adjacent to low depressions or swamps	6

Diuris drummondii	T	4.1	Unlikely as prefers habitat adjacent to low depressions or swamps	2
Drakaea micrantha	T	7.0	May occur - suitable habitat occurs within application area	1
Diuris purdiei	T	7.2	Unlikely as prefers habitat adjacent to low depressions or swamps	2

Based on the above, the proposed clearing is not likely 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.

Proposed clearing is not likely to be at variance with this Principle

According to available databases, there are three state-listed TEC's mapped within the local area. These are:

- *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain (Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act));
- Herb rich shrublands in clay pans (Vulnerable under the BC Act); and
- *Melaleuca huegelii - Melaleuca acerosa* (*currently M. systena*) shrublands on limestone ridges (Gibson et al. 1994 type 26a) (Endangered under the BC Act).

Noting the results of the flora and vegetation survey and DWER site inspection, the application area is not representative of any state-listed TEC's (Focused Vision, 2018; DWER, 2019).

Given the above, the proposed clearing is not likely to be at variance with this Principle.

(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.

Proposed clearing is at variance with this Principle

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region within the Metropolitan Regional Scheme to be a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008). The application area is located within the Swan Coastal Plain IBRA bioregion and is mapped as the Bassendean Complex-Central And\South vegetation complex (Table 3). This vegetation complex retains approximately 26.9 per cent of pre-European clearing extent (Government of Western Australia, 2018). Additionally, within the local area, only 26.4% remnant vegetation remains, most of which is highly fragmented.

Despite the 'small' size of the application area, if granted it would directly contribute to the cumulative impacts, fragmentation and loss of vegetation across the Swan Coastal Plain. This recognises that indiscriminate impacts accumulate over a range of spatial scales and multiple species (Whitehead et al., 2016).

In addition to the direct loss of vegetation, indirect impacts and edge effects are likely to occur leading to further degradation of the Frankland Reserve remnant, which is predominantly mapped as Very Good to Excellent condition (Keighery, 1994). The proposed clearing will indirectly impact the surrounding vegetation and may undermine the ecological integrity of the remnant due to the introduction of edge effects. The proposed loss of the eastern boundary of the remnant will increase the susceptibility of Frankland Reserve to edge effects and deterioration of vegetation condition. Currently this eastern portion of the application area is providing a buffer against edge effects from surrounding development.

Anticipated edge effects are weed invasion and trampling by people using the proposed sports fields. These indirect impacts may be mitigated by weed management and fencing to prevent vegetation immediately adjacent to the application (currently mapped as Very Good to Excellent condition) from being impacted upon by edge effects. The Frankland Reserve remnant surrounding the application area is currently fenced as it exists in a matrix of urban development. Given the position of the application area and Frankland Reserve in regards to surrounding development, the persistence of environmental values to date is in part due to the existing exclusion fence. In calculating the offset to counterbalance the proposed impact, edge effects were taken into consideration when scoring the impacted area for quality.

Furthermore, the City has indicated that further clearing of Frankland Reserve is planned for future road improvements. This would further degrade the remnant due to a direct reduction in size (and increase in perimeter), leading to further edge effects and reduction of patch size. The cumulative and cross-scale effects from further planned clearing at Frankland Reserve, may undermine the ecological integrity of the Reserve and its role in the landscape as Carnaby's foraging habitat (Whitehead *et al.,* 2016).

Given the above, the application area is considered significant as a remnant of native vegetation in an area that has been extensively cleared. The proposed clearing is at variance with this Principle.

Table 3: Vegetation statistics (Government of Western Australia, 2018)

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed lands (ha)	Extent remaining in all DBCA managed lands (proportion of Pre-European extent) (%)
IBRA bioregion*:					
Swan Coastal Plain	1 501 222	579 814	38.6	222 917	18.0
Vegetation complex **					
Bassendean Complex-Central And\South : WOODLAND TO LOW WOODLAND AND SEDGELANDS	87 476	23 509	26.9	4 377	5.0

* Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
** Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Proposed clearing is not likely to be at variance with this Principle

No watercourses or wetlands have been mapped within the application area. The flora and vegetation survey and DWER site inspection did not observe any vegetation growing in association with a watercourse or wetland (Focused Vision, 2018; DWER 2019). The closest wetland of conservation significance is Mandogolup Swamp North, approximately 1.4km to the south west of the application area.

The application area and its surrounding remnant are not contiguous with Mandogolop Swamp North.

Given the above, the proposed clearing is not likely to be 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.

Proposed clearing may be at variance with this Principle

As described within Section 2, the application area is mapped as Spearwood S1b Phase (211Sp_S1b) which consists of dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15% (Schoknecht, et al. 2004).

Table 4 outlines the land degradation risks levels attributed to the Spearwood S1b Phase map unit (DPIRD, 2019).

Of concern are the high to very high wind erosion ratings for Spearwood S1b Phase soils. Due to the sandy soil type, the application area has a high risk of wind erosion if left un-vegetated. The risk of wind erosion can be mitigated through beginning turf installation and construction within two months of clearing.

Noting the potential for wind erosion to occur, the proposed clearing may be at variance with this Principle.

Table 4: Land degradation risk levels (DPIRD, 2019)

Risk categories	Spearwood S1b Phase (211Sp_S1b) map unit
Wind erosion	40% of map unit has very high wind erosion risk 60% of map unit has high wind erosion risk.
Salinity	100% of map unit has nil or very low salinity risk
Subsurface Acidification	15% of map unit is presently acid 20% of map unit has a moderate risk of subsurface acidification 65% of map unit has a low risk acidification
Subsurface compaction	100% of map unit has a moderate subsurface compaction risk
Flood risk	100% of map unit has a low flood risk
Waterlogging	100% of map unit has nil to low waterlogging risk
Water repellence	35% of map unit has a high water repellence risk 25% of map unit has a moderate water repellence risk 40% of map unit has nil water repellence risk
Phosphorus export risk	25% of map unit has a high phosphorus export risk 75% of map unit has a nil to moderate phosphorus export risk

(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.

Proposed clearing is not likely to be at variance with this Principle

According to available databases, the nearest conservation area is Harry Waring Marsupial Reserve, approximately 640 metres to the north-west of the application area.

As the application area and its surrounding remnant are not contiguous with the conservation area, the proposed clearing is not likely to impact on environmental values.

Given the above, the proposed clearing is not likely 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.

Proposed clearing is not likely to be at variance with this Principle

As discussed under Principle (f), there are no wetlands or watercourses mapped within the application area. The proposed clearing is not likely to cause deterioration in the quality of surface water.

Groundwater salinity within the application area is mapped at <500 milligrams per litre total dissolved solids which is considered low to moderate in regards to vegetation growth. Given the size of the proposed clearing and remnant vegetation remaining within the local area, the proposed clearing is not likely to cause deterioration in the quality of underground water.

The proposed clearing is not likely to be at variance with this Principle.

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Proposed clearing is not likely to be at variance with this Principle

As discussed under Principle (g), the soil within the application area is deep siliceous yellow brown sands or pale sands with yellow-brown subsoil (Schoknecht et al., 2004). These soils have a very low risk of flooding. Noting this, the removal of remnant vegetation from the application area is not likely to contribute to flooding.

The proposed clearing is not likely to be at variance with this Principle.

Planning instruments and other relevant matters.

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 28 May 2019 with a 21 day submission period. No public submissions were received in relation to this application.

The proposal was referred to the Commonwealth Department of the Environment and Energy (DotEE) under the EPBC Act in relation to impacts to Carnaby's cockatoo and the Commonwealth-listed TEC *Banksia Woodlands of the Swan Coastal Plain* (Banksia Woodlands TEC) (reference EPBC 2018/8369). The DotEE determined that the proposed action is not a controlled action on 5 April 2019.

5. Applicant's Submissions

On January 2nd 2020 the applicant provided an offset proposal package for the Frankland Reserve Ovals project (City of Cockburn, 2020).

6. Offsets considered after the assessment.

Offset proposal

The assessment against the ten clearing principles has identified that the proposed clearing is at variance with principles (a), (b), and (e). Although Principle (e) was found to be at variance, an offset is not required as the threshold is reduced to a minimum of 10 per cent within the Metropolitan Regional Scheme.

After consideration of the proposed avoidance and minimisation measures, it is considered that the proposed clearing will result in the following significant residual impacts:

- loss of up to 1.4 hectares of Carnaby's cockatoo foraging habitat.

To counter balance the significant residual impacts to Carnaby's cockatoo foraging habitat, the applicant submitted an offset proposal that involves changing the vesting of Rose Shanks Reserve (R1820) to conservation for management in perpetuity (City of Cockburn, 2020). Rose Shanks Reserve is property of the Western Australian Planning Commission (WAPC) but it is vested in the City of Cockburn through a management order. The Department of Planning, Lands and Heritage (DPLH) has given in principle support to changing the purpose of the reserve to conservation (City of Cockburn, 2019)

EcoLogical Australia (2019) undertook a flora survey of Rose Shanks Reserve to confirm foraging habitat was present and undertake vegetation condition mapping. The Reserve contains two Banksia woodland communities including:

- **BaBmLW** (26.1ha): *Banksia attenuata* and *B. menziesii* low woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Allocasuarina humilis* and *Eremaea pauciflora* var. *pauciflora* tall sparse shrubland over *Hibbertia hypericoides*, *Hibbertia subvaginata* and *Scholtzia involucrata* low sparse shrubland over *Lyginia barbata*, *Stylidium repens* and *Desmocladus asper* mid sparse forbland over *Amphipogon turbinatus* and **Briza maxima* low sparse grassland.
- **BmAfEmLW** (3.7ha): *Banksia menziesii*, *Allocasuarina fraseriana* and *Eucalyptus marginata* subsp. *marginata* low woodland over *Adenanthos cygnorum* subsp. *cygnorum* tall sparse shrubland over *Hypocalymma robustum* and *Stirlingia latifolia* mid sparse shrubland over *Hibbertia hypericoides*, *Scholtzia involucrata* and *Xanthorrhoea preissii* low sparse shrubland over *Lyginia barbata*, *Dasypogon bromeliifolius* and *Desmocladus asper* low sparse forbland over *Amphipogon turbinatus*, **Ehrharta calycina* and **Briza maxima* low sparse grassland.

Error! Reference source not found. and Figure 3 show vegetation condition mapping of Rose Shanks Reserve following Keighery (1994).

Table 5: Rose Shanks Reserve vegetation condition mapping (EcoLogical, 2019)

Condition score (Keighery, 1994)	Hectares	Percentage of Rose Shanks Reserve
Excellent	18.4	62%
Very good	5.7	19%
Good	4.4	15%
Degraded	1.3	4%
Totals	**29.8 ha**	100

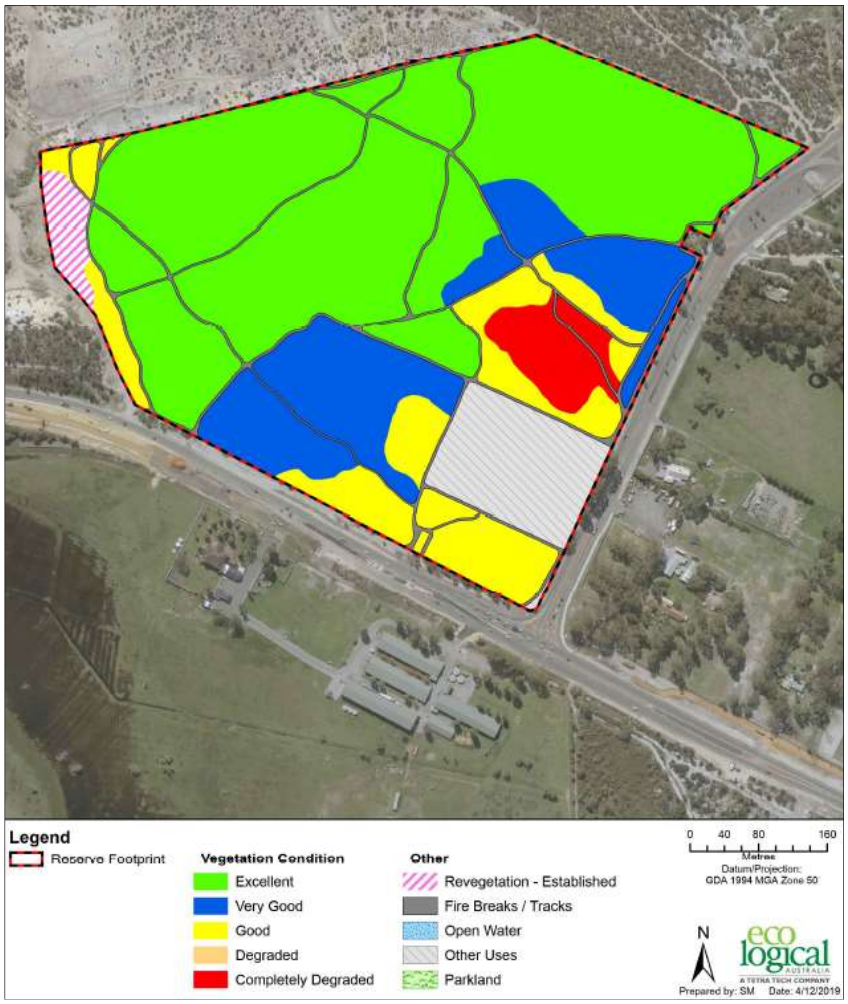

Figure 3: Vegetation condition mapping - Rose Shanks Reserve (Ecologial Australia 2019)

Offset suitability

In assessing whether the proposed offset is adequately proportionate to the significance of the environmental values being impacted, DWER undertook a calculation using the Department of the Environment and Energy (DotEE) Offsets Assessment Guide 'calculator'. The calculator indicated that the allocation of 9.9 hectares of Excellent (Keighery, 1994) vegetation within Rose Shanks Reserve is adequate to counterbalance the significant residual impacts upon 1.4 hectares of Carnaby's cockatoo foraging

habitat from the proposed clearing. This is consistent with the WA Environmental Offsets Policy September 2011. In addition, the proposed offsets are consistent with the WA Environmental Offsets Guidelines September 2014 by enhancing ecological linkages between conservation areas as the Reserve forms part of the Jandakot Regional Park. The remaining foraging habitat (~18ha) within the Reserve may be banked for future authorised clearing.

Figure 4 below illustrates the remaining banked offset in reference to the approved offset site. The 9.9 hectare offset, in addition to the remaining banked portion (32.7 ha), will be recorded in the WA Offsets Register. It should be noted that the condition of this banked offset ranges from Excellent to Completely Degraded. It should be noted that use of the banked offset site will not be automatically accepted in every instance. In each case, the City must demonstrate how the offset counterbalances the significant residual impacts of the associated clearing. Where relevant, this may include a requirement to provide additional site-level information verifying the environmental values Rose Shanks Reserve.

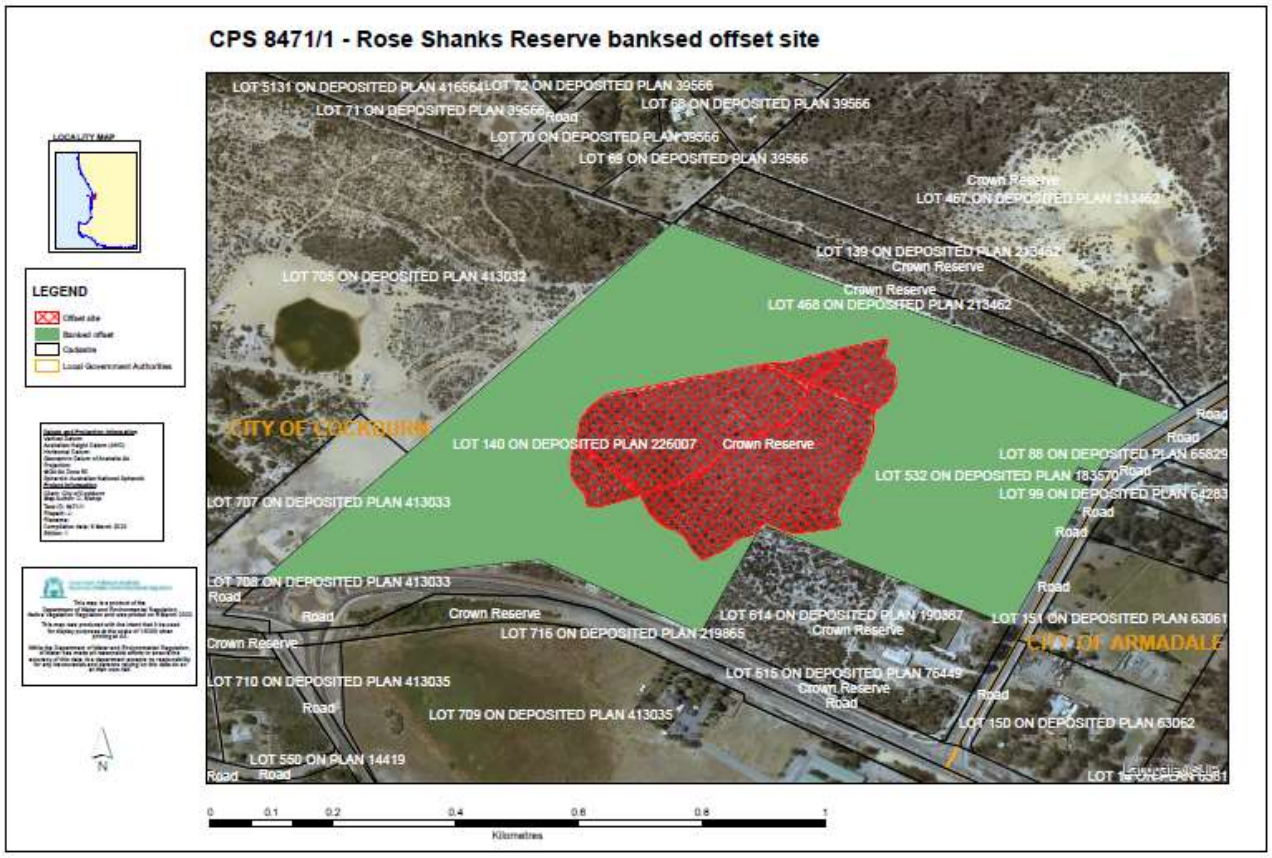

Figure 4: Rose Shanks Reserve approved offset (9.9ha) and banked offset (32.7 ha).

Further to above, the City will be required to fence Rose Shanks reserve to reduce the impact of trespass and associated degradation. This will be conducted in two phases as shown in Figure 5. This approach, as discussed with the City of Cockburn, will protect the offset site from immediate impacts. The City has planned to revegetate the remaining portion of Rose Shanks Reserve to provide an ecological buffer to the offset site. This will further increase the environmental values of Rose Shanks Reserve.

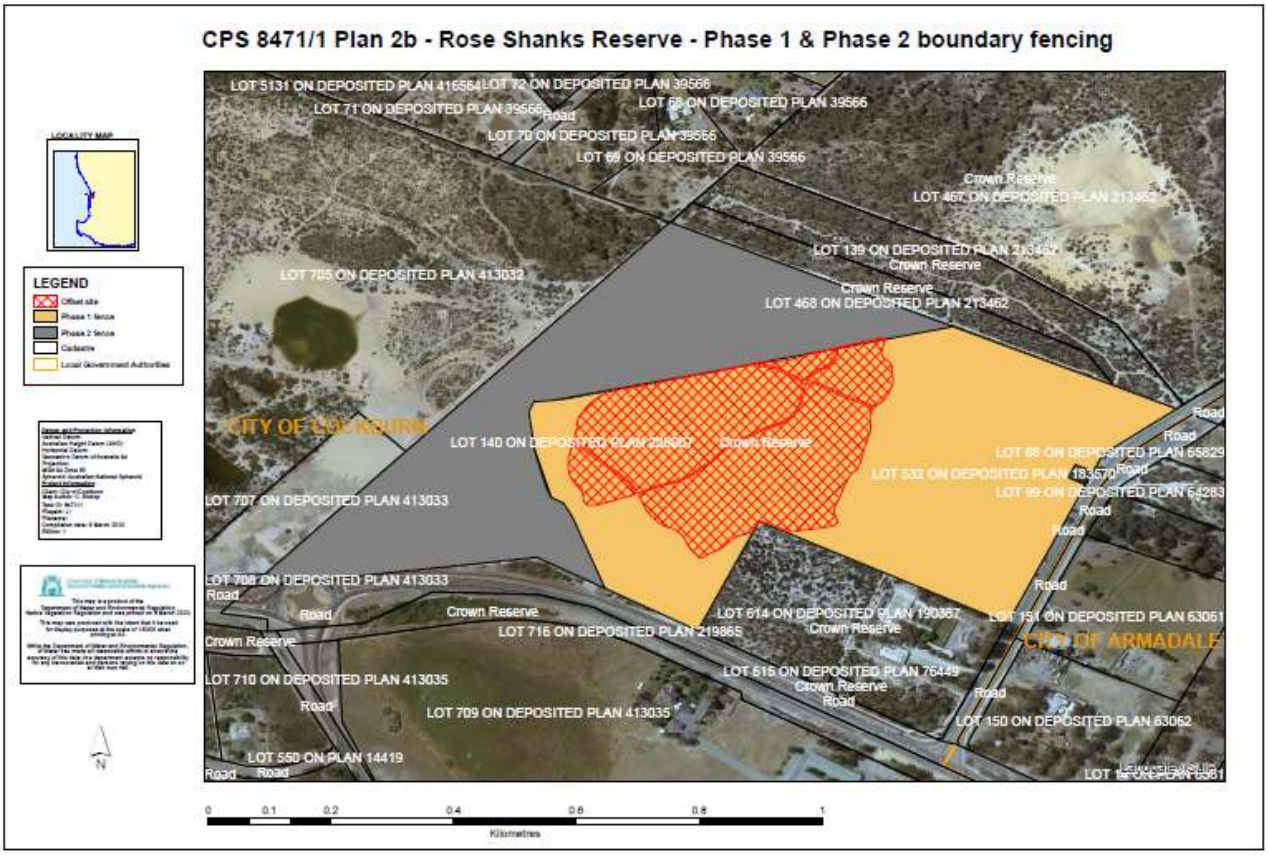

Figure 5: Rose Shanks Reserve two-phase fencing plan

Principle 1 of the WA Environmental Offsets Policy September 2011 outlines that environmental offsets will only be considered after avoidance and mitigation options have been pursued. The WA Environmental Offsets Guidelines August 2014 outlines a four step mitigation hierarchy; avoid, minimise, rehabilitate and offset. The mitigation measures within section 3, are deemed to be adequate in addressing this requirement.

From the DotEE offsets calculator, the Delegated Officer determined that 9.9 hectares of foraging habitat in Excellent condition (Keighery, 19914) is required to counterbalance the 1.4 hectare loss from Frankland Reserve. Justifications used for values in the offsets calculator can be found in Appendix 1.

Residual impact = 1.4 hectares Carnaby's foraging habitat

Offset required = 9.9 hectares of Carnaby's foraging habitat in 'Excellent' condition

In calculating the offset to counterbalance the proposed impact, edge effects resulting from the prosed clearing, was also taken into consideration when scoring the impacted area for quality.

The proposed offset is considered suitable, due to:

- the presence of 28.5 hectares of Carnaby's cockatoo foraging habitat in good to excellent condition (EcoLogical Australia 2019);
- the Reserve is located within the local area, approximately 6.5km to the north-east of the application area; and
- the change of purpose to conservation provides security of tenure and requires the Reserve to be managed for conservation by the City in perpetuity.

The Reserve is part of the Jandakot Regional Park and the Jandakot Regional Park Community Advisory Committee have been consulted and are supportive of the change of purpose.

DBCA Regional Parks Unit expressed concern regarding the areas of Rose Shanks Reserve and surrounds being under mining tenement M 7000357. The 9.9ha approved offset site does not currently have any mining tenements and the change in vesting from recreation to conservation is anticipated to provide an extra level of protection of environmental values in perpetuity.

Although not forming part of the offset, approximately 1.1 hectares of degraded bushland within Rose Shanks Reserve is to be revegetated with initial planting to be undertaken in June 2020. The degraded areas of the Reserve will be revegetated as a component of the City's annual revegetation program which aims to revegetate at least 2.5 hectares annually. At the time of writing, site preparation was underway.

The City's 2020 rehabilitation costs for the 1.1 hectares within the Reserve has been estimated at $100,000 with the costs to change the vesting purpose yet to be determined (City of Cockburn, 2020).

Ongoing management and maintenance of both the remaining remnant of Frankland Reserve and Rose Shanks Reserve will include but is not limited to:

- vegetation condition and weed mapping surveys on a five year rotation;
- flora and fauna surveys every 4 years;
- feral animal control (fox/ rabbit/ cat) annually and when/ if required outside set programs;
- dieback mapping and treatment (folia spray and stem injection) every 3 years if required;
- native bushland weed control seasonally and when/ if required outside set programs; and
- boundary fence installation and maintenance (City of Cockburn, 2020).

7. References

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8. GIS databases

- Aboriginal sites of significance
- DBCA Species & Communities datasets accessed October 2019
- DBCA estate
- Hydrography linear
- Land degradation risk categories
- Remnant vegetation
- Cadastre
- Topographic contours
- Wetlands

Appendix: Justification of values used in the EPCB offsets calculator

Calculator field name	Description	Justification for value used
IUCN Criteria	The IUCN criteria for the value being impacted	1.2% - Afforded to Carnaby's cockatoo habitat as this species is listed as Endangered under the *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*.

Calculator field name	Description	Justification for value used
Area of impact (habitat/community)	The area of habitat impacted (proposed clearing)	1.4 hectares of Carnaby's cockatoo foraging habitat. This is based on revised DWER vegetation condition mapping based on site inspection. Good to Very Good condition vegetation was considered foraging habitat at this site. The remaining Degraded and Completely Degraded areas were not considered foraging habitat based on site inspection.
Quality of impacted area (habitat/community)	The quality score for area of habitat being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability.	The vegetation is in excellent to very good condition in a highly fragmented landscape. Score takes into consideration edge effects introduced to Frankland Reserve from the proposed clearing. This remnant is part of a larger Banksia woodland remnant of ~140 hectares using methodology outlined in the relevant conservation advice (Focused Vision 2018). There are 20 confirmed night roosts within 10 km of the application area.
Time over which loss is averted (habitat/community)	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	The offset site would be conserved in perpetuity through management by the City as a conservation reserve. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/community)	This describes the estimated time (in years) that it will take for the main benefit of the habitat improvement of the proposed offset to be realised	The process for changing the vesting from public recreation to conservation is expected to occur within one year.
Start area (habitat/community)	The area of habitat proposed to offset the impacts	9.9 hectares of vegetation in excellent condition at Rose Shanks Reserve is required to offset 100% the significant residual impacts from the proposed clearing at Frankland Reserve.
Start quality (habitat/community)	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	The vegetation proposed as an offset in Rose Shanks Reserve is in Excellent condition. This is a portion of Rose Shanks Reserve.
Future quality without offset (habitat/community)	The predicted future quality score (habitat/community)	It is assumed that the vegetation would remain at this quality without the offset.
Future quality with offset (habitat/community)	The predicted future quality score (habitat/community)	It is assumed that the vegetation would be maintained at its current quality as it is being managed by the City of Cockburn under their Natural Areas management strategy. Rehabilitation within the Reserve is underway but does not form part of this offset.
Risk of loss (%) without offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	30% - the proposed offset area is not zoned for conservation and has no other previous approvals that may increase the risk of it being cleared without the offset.
Risk of loss (%) with offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	Securing the land parcel within conservation estate should reduce the risk of loss to 10%. The risk of catastrophic events (fire, dieback etc.) remain. It should be noted that the area of Rose Shanks Reserve being used as the offset is adjacent to mining tenement M 7000357. There is no mining tenement over the portion of Rose Shanks being proposed as the offset.
Confidence in result (%) – risk of loss (habitat/community)	The capacity of measures to mitigate risk of loss of the proposed offset site	There is a high level of confidence that securing in conservation estate would mitigate the risk of loss.

Calculator field name	Description	Justification for value used
Confidence in result (%) – Change in quality (habitat/community)	The level of certainty about the successful achievement of the proposed change in quality (habitat/community)	There is a high level of confidence that the offset site would remain in at its current quality if managed for conservation.
% of impact offset	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	100% - obtained through the input of variables explained above.