



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

<b>Purpose Permit number:</b>	CPS 8057/1
<b>Permit Holder:</b>	B and J Catalano
<b>Duration of Permit:</b>	28 May 2020 – 28 May 2030

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

### **PART I – CLEARING AUTHORISED**

**1. Purpose for which clearing may be done**

Clearing for the purpose of limestone extraction.

**2. Land on which clearing is to be done**

Lot 4 on Plan 15419, Myalup

Lot 5 on Plan 15419, Myalup

**3. Area of Clearing**

The Permit Holder must not clear more than 7.4 hectares of native vegetation within the area hatched yellow on attached Plan 8057/1a.

**4. Application**

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

**5. Type of clearing authorised**

The Permit Holder shall not clear any native vegetation after 18 May 2025.

### **PART II – MANAGEMENT CONDITIONS**

**6. 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.

## 7. 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;
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared;

## 8. Direction of Clearing

The Permit Holder shall conduct clearing in a slow, progressive manner towards remnant vegetation to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

## 9. Wind erosion management

The Permit Holder shall not clear native vegetation unless development commences within three months of the authorised clearing being undertaken.

## 10. Retain vegetative material and topsoil, revegetation and rehabilitation

The Permit Holder shall:

- (a) retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil within an area that has already been cleared.
- (b) within 3 months following completion of extraction activities, *revegetate* and *rehabilitate* the area(s) within the area cross-hatched red on attached Plan 8057/1(b) by:
  - (i) re-shaping the surface of the land so that it is consistent with the surrounding 5 metres of uncleared land; and
  - (ii) ripping the ground on the contour to remove soil compaction; and
  - (iii) ripping the pit floor and contour batters within the extraction site; and
  - (iv) laying the vegetative material and topsoil retained under condition 10(a) on the area cross-hatched red on attached Plan 8057/1(b).
- (c) within 18 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 10(b) of this Permit:
  - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
  - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 10(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.

## **PART III - RECORD KEEPING AND REPORTING**

### 11. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
  - (i) 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;
  - (ii) the date that the area was cleared; and
  - (iii) the size of the area cleared (in hectares).
  - (iv) Actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of the Permit;
  - (v) Actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 7 of the Permit;

- (b) In relation to the *revegetation and rehabilitation* of areas pursuant to condition 10 of this Permit:
  - (i) the location of any areas *revegetated* and *rehabilitated*, 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;
  - (ii) a description of the *revegetation* and *rehabilitation* activities undertaken;
  - (iii) the size of the area *revegetated* and *rehabilitated* (in hectares);
  - (iv) the species composition, structure and density of *revegetation* and *rehabilitation*, and
  - (v) a copy of the environmental specialist's report.

## 12. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
  - (i) of records required under condition 11 of this Permit; and
  - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 20 February 2029, the Permit Holder must provide to the *CEO* a written report of records required under condition 11 of this Permit where these records have not already been provided under condition 12(a) of this Permit.

## DEFINITIONS

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

*CEO* means the Chief Executive Officer of the Department responsible for administering the clearing provisions contained within the *Environmental Protection Act 1986*;

*direct seeding* means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species;

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

*environmental specialist*: means a person who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the *CEO* as a suitable environmental specialist;

*local provenance* means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared;

*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;

*planting* means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

*regenerate/ed/ion* means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing *mulch*;

*rehabilitate/ed/ion* means actively managing an area containing native vegetation in order to improve the ecological function of that area;

*revegetate/ed/ion* means the re-establishment of a cover of *local provenance* native vegetation in an area using methods such as natural *regeneration*, *direct seeding* and/or *planting*, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.

*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.



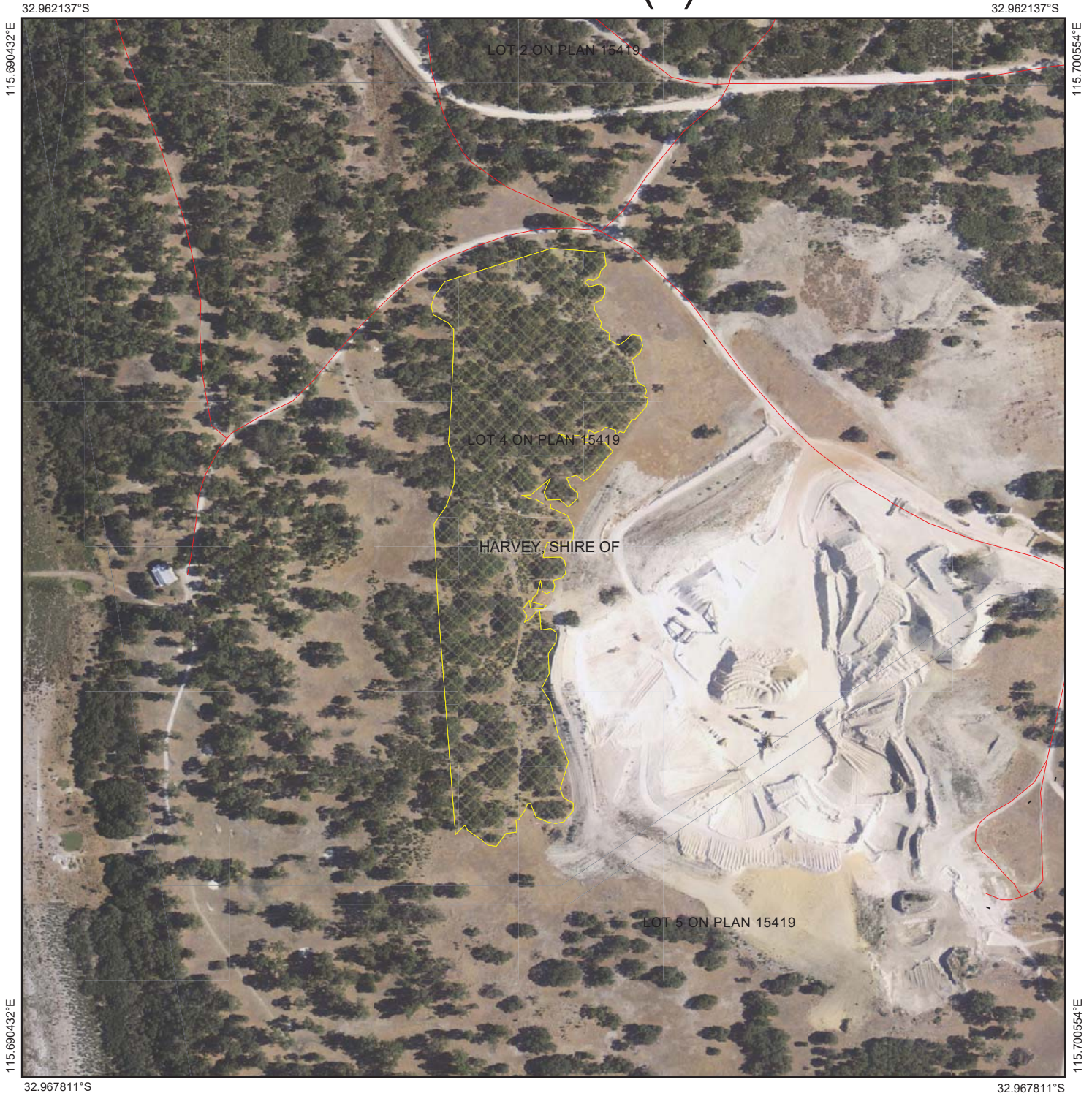
---

Richard Newman  
DIRECTOR  
NATIVE VEGETATION PROTECTION





*Officer delegated under Section 20  
of the Environmental Protection Act 1986*

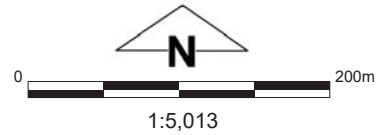
28 April 2020

# Plan 8057/1(a)




## Legend

-  Imagery
-  Clearing Instruments Activities
-  Local Government Authority
-  Roads

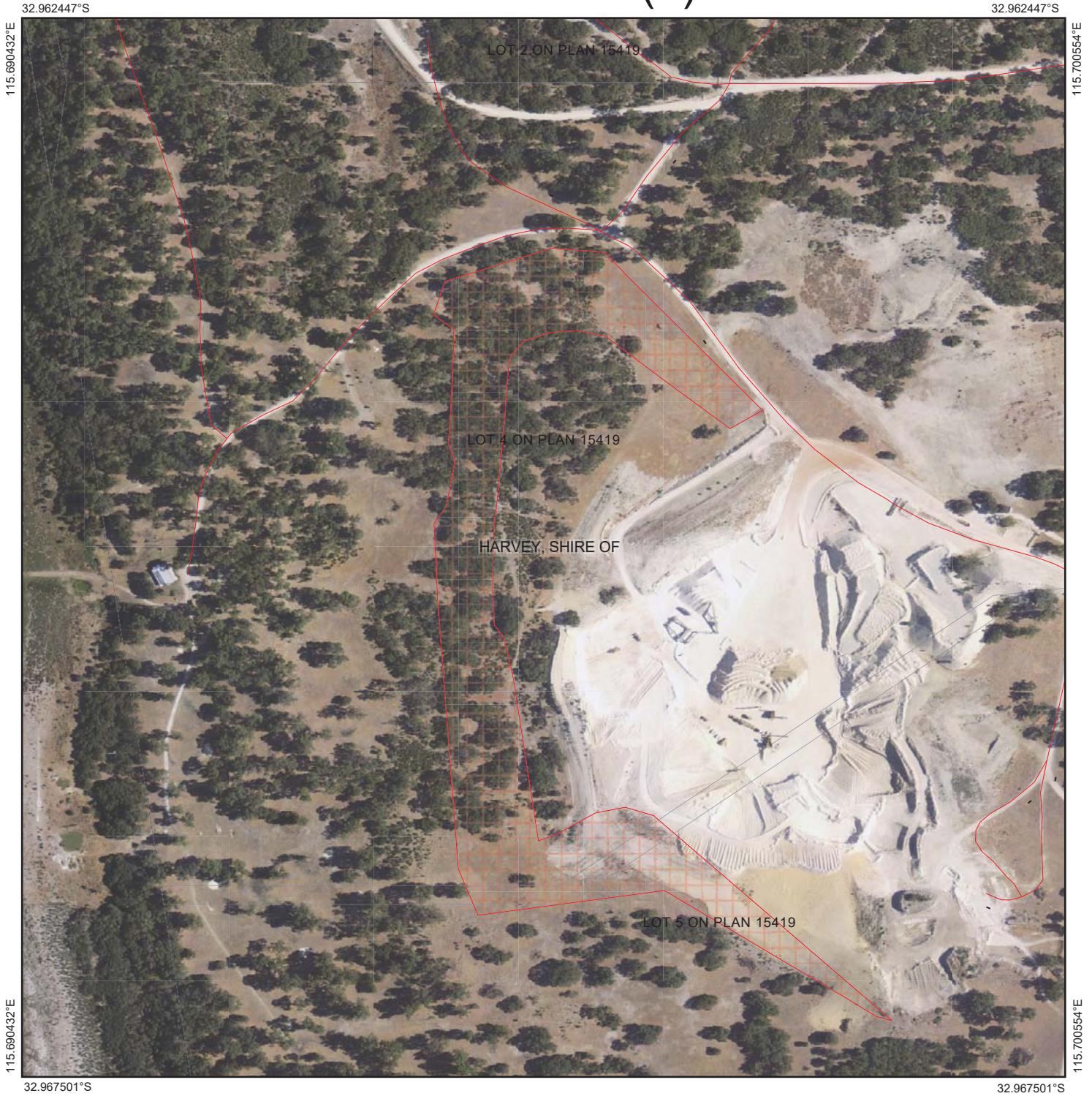


(Approximate when reproduced at A4)  
GDA 94 (Lat/Long)  
Geocentric Datum of Australia 1994





 Date 28 April 2020

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

# Plan 8057/1(b)



## Legend

-  Clearing Instruments Conditions
-  Imagery
-  Local Government Authority
-  Roads



1:5,013

(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

..... Date 28 April 2020...  
Richard Newman

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



GOVERNMENT OF  
WESTERN AUSTRALIA  
WA Crown Copyright 2020



## 1. Application details

### 1.1. Permit application details

Permit application No.: 8057/1  
Permit type: Purpose Permit

### 1.2. Applicant details

Applicant's name: B and J Catalano  
Application received date: 26 April 2018

### 1.3. Property details

Property: Lot 4 on Plan 15419, Myalup  
Lot 5 on Plan 15419, Myalup  
Local Government Authority: Shire of Harvey  
Localities: Myalup

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
7.4		Mechanical Removal	Clearing for the purpose of limestone extraction

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 28 April 2020  
Reasons for Decision:

The clearing permit application was received on 26 April 2018, and 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 may be at variance to principles (g), (h) and (i) and is not likely to be at variance to the remaining principles.

Through assessment, the Delegated Officer determined that the proposed clearing may cause the spread of weeds and dieback into adjacent areas of remnant vegetation and the nearby Yalgorup National Park. To mitigate potential impacts to adjacent vegetation, a weed and dieback management condition has included in the permit. The weed management condition requires earth-moving machinery to be clean of weeds when entering and exiting the clearing area, that no known weed-affected soil, mulch, fill or other material is brought into the area to be cleared, and restriction to the movement of machines and other vehicles to the boundaries of the area to be cleared.

The Delegated Officer determined that the proposed clearing may cause appreciable land degradation in the form of wind erosion. To mitigate potential impacts of wind erosion, a condition requiring the applicant to commence works within three months of clearing has been included in the permit.

To mitigate the potential impacts to fauna individuals present at the time of clearing, the applicant will be required to undertake clearing in a slow, progressive and directional (i.e. east to west) manner.

The Delegated Officer decided to grant a clearing permit subject to weed and dieback management, wind erosion and fauna management conditions.

In determining to grant a clearing permit subject to the above management conditions, the Delegated Officer found that the proposed clearing is not likely to lead to an unacceptable risk to the environment.

## 2. Site Information

### Clearing Description

The application is to clear 7.4 hectares of native vegetation within Lot 4 on Plan 15419, Myalup, for the purpose of extracting limestone (Figure 1). The applicant has advised that revegetation with native species of an area of approximately 7.4 hectares will occur within a portion of and adjacent to the application area post-extraction within Lots 4 and 5 on Plan 15419, to create a similar species composition, structure and density to the pre-cleared vegetation types (Figure 2).

## Vegetation Description

The application area is mapped as Cottesloe Complex - Central And South, which is described as mosaic of woodland of *Eucalyptus gomphocephala* (tuart) and open forest of *Eucalyptus gomphocephala* (tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (marri) with closed heath on the Limestone outcrops (Heddle, et al 1980).

A flora survey of the application area undertaken by Plantecology Consulting on 19 November 2018 identified that the application area comprises the following vegetation types (Plantecology Consulting, 2018):

- *Eucalyptus decipiens* open woodland on the shallow soils over limestone on the ridge crest and upper slopes; and
- Patches of *Melaleuca systema* shrubland, which support a greater number of native species (mainly shrubs), on the crest and upper slopes of the application area. Aggressive weed species such as *Gomphocarpus fruticosus* were still prevalent within this area.

A flora and vegetation environmental values survey of the application area undertaken by Lundstrom Environmental Consultants Pty Ltd in April 2018 described the vegetation within the application area as: 'Closed low woodland of *Eucalyptus decipiens*, *Eucalyptus petrensis*, *Agonis flexuosa*, and isolated *Banksia attenuata*, and *Nuytsia floribunda* over *Melaleuca viminea* and *Templetonia retusa* and occasional *Rhagodia baccata* and *Hardenbergia comptoniana* on grey sands with numerous limestone outcrops.

## Vegetation Condition

The condition of the vegetation within the application area ranges from degraded to completely degraded (Keighery, 1994) as described below, largely due to historical stock grazing. The degraded portions generally occur within the patches of *Melaleuca systema* shrubland, presumably where cattle found it less preferable to graze (Plantecology Consulting, 2018; DWER, 2018).

- Degraded: Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching good condition without intensive management (Keighery, 1994).
- Completely degraded: The structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery 1994).

## Soil type

The application area is mapped as the Spearwood S1a Phase landform subsystem, which is described as dune ridges with shallow to moderately deep siliceous yellow-brown sands, very common limestone outcrop and slopes up to 15 per cent (DPIRD, 2017).

A site inspection of the application area undertaken by Department of Water and Environmental Regulation officers identified that the soils largely comprise of thin grey sands over irregular outcropping limestone, with limestone outcropping less prevalent within the southern portion of the site where soil cover is presumably thicker. The northern and central portions of the application area occur on a subtle ridge (DWER, 2018).

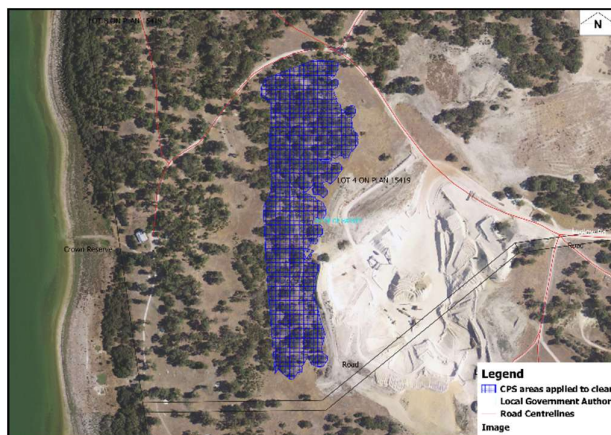


Figure 1: Application Area

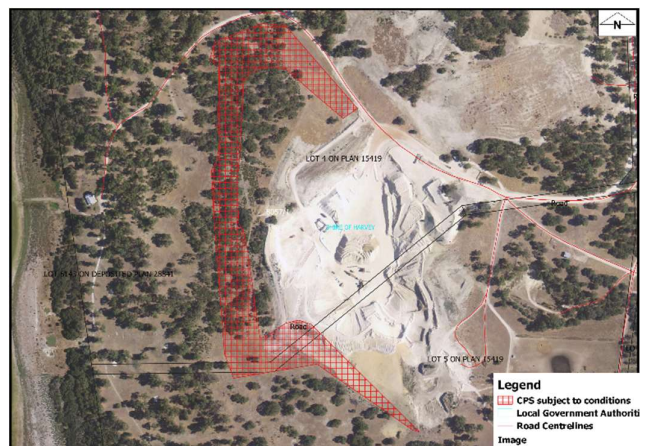


Figure 2: Proposed Revegetation Area

### 3. Minimisation and mitigation measures

The applicant has amended the application area and reduced the proposed clearing from 12.9 hectares to 7.4 hectares. The applicant has amended the application area to provide a 270 metre buffer to the nearby mapped Peel-Yalgorup System Ramsar site and Lake Preston, which is a conservation category wetland and forms part of the Ramsar site.

The applicant has also excluded the vegetation type '*Eucalyptus gomphocephala* woodland' which may have been representative of the Commonwealth listed threatened ecological community (TEC) 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests



of the Swan Coastal Plain'. Two large tuart trees (*Eucalyptus gomphocephala*) which contained suitably-sized breeding hollows for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo were also removed from the application area.

The applicant has advised that an area of 7.4 hectares will be revegetated with native species within and adjacent to the application area, to create a similar species composition, structure and density to the pre-cleared vegetation types post extraction (see Figure 2). This will help to minimise the cumulative long term impacts of clearing within close proximity to the Peel-Yalgorup System Ramsar site and Lake Preston.

The applicant has prepared a weed management plan which includes control methods for two weed species identified within the application area (*Gomphocarpus fruticosus* and *Solanaum linneanum*) declared under the *Biosecurity and Agriculture Management Act 2007*.

#### 4. Assessment of application against clearing principles

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

###### Proposed clearing is not likely to be at variance with his Principle

A flora survey of the application area undertaken by Plantecology Consulting on 19 November 2018 identified that the vegetation within the application area includes *Eucalyptus decipiens* open woodland on the shallow soils over limestone on the ridge crest and upper slopes (Plantecology Consulting, 2018). The survey identified that this vegetation type was in a completely degraded (Keighery, 1994) condition, as the native understorey was largely absent and replaced by weed species, whereby the original structure had been almost entirely lost (Plantecology Consulting, 2018).

The crest and upper slopes of the application area also support patches of *Melaleuca systema* shrubland, which were in a degraded (Keighery, 1994) condition and supported a greater number of native species (mainly shrubs), however aggressive weed species such as *Gomphocarpus fruticosus* were still prevalent (Plantecology Consulting, 2018).

The local area considered in the assessment of this application is defined as a 10 kilometre radius surrounding the application area.

According to available datasets, there are records of 21 priority flora species within the local area. Based on the suitability of habitat for these species within the application area, it was determined that seven species may occur within the application area, including:

- *Alyogyne* sp. Rockingham (G.J. Keighery 14463) (Priority (P) 2);
- *Pterostylis frenchii* (P2);
- *Hibbertia spicata* subsp. *Leptotheca* (P3);
- *Lasiopetalum membranaceum* (P3);
- *Pimelea calcicola* (P3);
- *Sphaerolobium calcicola* (P3); and
- *Stylidium maritimum* (P3).

Based on the number of known records and distribution of the abovementioned species, it was considered that if present, the proposed clearing had the potential to impact on the conservation status of *Alyogyne* sp. Rockingham (G.J. Keighery 14463), *Pterostylis frenchii* and *Hibbertia spicata* subsp. *Leptotheca* (DBCA, 2018a).

The aforementioned flora survey was undertaken on 18 November 2018, which is considered to be a suitable time to identify *Alyogyne* sp. Rockingham (G.J. Keighery 14463). The survey included a targeted search for priority flora which involved two botanists walking in parallel transects approximately 10 to 20 metres apart, and closer in the denser vegetation, such as the *Melaleuca systema* shrubland (Plantecology Consulting, 2018).

The flora survey did not identify any priority flora species (Plantecology Consulting, 2018). The flora survey methodology is considered to be adequate to identify the abovementioned priority flora species, and thus it is considered that the proposed clearing is unlikely to impact on any priority flora species.

As discussed under Principle (c), the application area is not likely to contain any rare flora species.

To determine the floristic community types within the application area, a survey of the vegetation within the application area was undertaken at three sampling points, each 10 metres by 10 metres within the best condition vegetation. Within each plot, all plant species were recorded (Plantecology Consulting, 2018). The flora survey incorporated a floristic analysis of species composition using multiple methods of analysis. Analyses incorporated both hierarchical and non-hierarchical clustering methods to determine which floristic community type (FCT) the vegetation within the application area most closely aligned with (Plantecology Consulting, 2018).

The results of the analyses showed that the portion of *Melaleuca systema* shrubland within the application area had the highest similarity to FCT 29a and FCT 6. The appropriate FCT for the woodland areas was not determined, as these areas are largely parkland cleared, with the flora survey noting that any analysis would produce unreliable results (Plantecology Consulting, 2018).

FCT 29a is listed by the Department of Biodiversity, Conservation and Attractions as a Priority 3 Ecological Community known as 'Coastal shrublands on shallow sands, southern Swan Coastal Plain' and described as mostly heaths on shallow sands over limestone close to the coast. This community does not comprise a single dominant species, however important species include *Spyridium globulosum*, *Rhagodia baccata*, and *Olearia axillaris* (Gibson et al., 1994). FCT 6 can generally be described as weed dominated wetlands (Gibson et al., 1994).

The flora survey noted that the alignment of the application area to these FCT's (known as the strength of membership) is not strong and not much greater than to other FCT's, which was attributed to the high number of weed species (Plantecology Consulting, 2018). The strength of membership to FCT 6 for Plots 1, 2 and 3 was approximately 19.8, 25.3 and 19.5 per cent respectively whereas for FCT 29a it was approximately 26.6, 23 and 34.1 per cent respectively. The flora survey determined that while the results of the FCT assessment were inconclusive, it is most likely that the patches of *Melaleuca systema* shrubland (comprising 1.8 hectares) are part of FCT 29a.

While the application area may be representative of the abovementioned Priority 3 Ecological Community, given that only a portion (approximately 1.8 hectares) of the application area was potentially representative of this community, and noting that the application area has undergone significant historical disturbance, the proposed clearing is not likely to significantly impact on the conservation status of this community.

According to available databases one priority ecological community (PEC) has been recorded 'as likely to occur' within the application area being 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' (Tuart Woodlands TEC). This PEC is listed as Priority 3(iii) by Department of Biodiversity Conservation and Attractions (DBCA) and as a 'Critically Endangered' threatened ecological community (TEC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The flora survey undertaken within the application area did not identify any vegetation considered representative of this TEC. The flora survey identified a vegetation type '*Eucalyptus gomphocephala* woodland' located adjacent to the application area that has the potential to be representative of the ecological community. As discussed in section 3, the applicant removed this vegetation type from application area for the proposed clearing. The proposed clearing may indirectly impact this TEC (if present) through the spread of weeds and dieback. Weed and dieback management practices will help mitigate this risk.

As discussed under Principle (d), the application area is not considered to be representative of any known state listed TECs.

As discussed under Principle (b), 31 fauna species of conservation significance have been recorded within the application area (DBCA, 2007- ). A fauna survey of the application area determined that five of these species may occur, based on the suitability of habitat within the application area (Harewood, 2018). The fauna survey did not identify any evidence of these species utilising the application area (Harewood, 2018), and given that the applicant has excluded large trees containing hollows, the proposed clearing is not likely to impact on significant fauna habitat. Slow, progressive and directional clearing (i.e. from east to west) will assist in mitigating potential impacts to individual fauna that maybe residing or traversing within the application area at the time of clearing.

It is acknowledged that the application area is representative of a PEC, however given that the vegetation within the application area is in a degraded to completely degraded (Keighery, 1994) condition, is unlikely to contain any rare or priority flora species and is unlikely to provide significant habitat for fauna, the proposed clearing is not likely to comprise a high level of biological diversity.

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

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

There are records of 31 conservation significant fauna species within the local area (DBCA, 2007- ). Of these species, a fauna survey of the application area determined that five of these may utilise the application area, including the following (Harewood, 2018);

- Carnaby's cockatoo (*Calyptorhynchus Latirostris*) (listed as 'fauna that is rare or is likely to become extinct as endangered fauna' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2017* (WC Notice));
- Baudin's cockatoo (*Calyptorhynchus baudinii*) (listed as 'fauna that is rare or is likely to become extinct as endangered fauna' under the WC Notice);
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) (listed as 'fauna that is rare or is likely to become extinct as vulnerable fauna' under the WC Notice);
- South-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) (listed as 'fauna that is of special conservation need as conservation dependent fauna' under the WC Notice); and
- Western false pipistrelle (*Falsistrellus mackenziei*) (listed as Priority 4 by DBCA).

The fauna survey incorporated daytime field survey work (including a fauna habitat assessment) on 26 and 28 May and 2 June 2018 and a nocturnal survey on 28 May 2018. The fauna survey did not identify any evidence of conservation significant fauna species utilising the application area.

Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo (collectively known as black cockatoos) forage on the seeds, nuts and flowers of a large variety of plants including proteaceous species (*Banksia*, *Hakea*, *Grevillea*), as well as *Allocasuarina* and *Eucalyptus* species, *Corymbia calophylla* and a range of introduced species (Valentine and Stock, 2008). To be suitable as a black cockatoo breeding site, trees require a suitable nest hollow or need to be of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, including tuart trees, a suitable DBH is 500 millimetres (Commonwealth of Australia, 2012).

The fauna survey incorporated an assessment of black cockatoo foraging, breeding and roosting habitat. The fauna survey noted that the most common plant species that provide potentially suitable foraging habitat for black cockatoos were *Eucalyptus gomphocephala* and *Agonis flexuosa* (Harewood, 2018) whereby these species are only rarely foraged upon by black cockatoos. Higher quality foraging habitat in the form of very scattered juvenile *Eucalyptus marginata* and banksia was identified within the application area, however these were few in number (Harewood, 2018) and thus unlikely to constitute significant foraging habitat

for black cockatoos. Since this fauna survey was undertaken, the applicant has removed the vegetation type '*Eucalyptus gomphocephala* woodland' which will further reduce potential impacts to black cockatoo foraging habitat.

The black cockatoo habitat tree assessment identified two trees which appeared to contain hollows with openings of greater than 10 centimetres, which may provide suitable breeding habitat for black cockatoos (Harewood, 2018). The fauna survey noted that both hollows showed signs of use in the form of chew and rub marks around the entrances, however it was not clear whether these were caused by black cockatoos or galahs (Harewood, 2018). Since the fauna survey was undertaken, the applicant has amended the application area to exclude these two trees. Therefore it is considered that the proposed clearing will not impact on any black cockatoo breeding habitat.

The fauna survey did not identify any black cockatoo roosting trees within the application area (Harewood, 2018).

The southern brush-tailed phascogale inhabits dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC 2012). While some tuart trees with small hollows occur within the application area, noting that the applicant has amended the application area to excluded the two tuart trees with the most significant hollows, and that the area of tuart woodland has been parkland cleared, with no native understorey to aid in the protection of southern brush-tailed phascogales should they wish to move between trees and forage, the application area is not likely to contain significant habitat for this species.

Core habitat for the western false pipistrelle includes high rainfall forests dominated by jarrah, karri, marri, and tuart trees. Colonies of up to 30 animals have been found in hollow logs, and this species is a specialist of tall, mature forest (Armstrong, et al., 2017). The application area includes a portion of parkland cleared tuart woodland, however given that the applicant has amended the application area to exclude the two tuart trees with large hollows, and that the western false pipistrelle has a preference for tall mature forest (not characteristic of the application area) the application area is not likely to contain significant habitat for this species.

The fauna survey identified suitable habitat for the western ringtail possum (*Pseudocheirus occidentalis*) within the application area. This species is known to occur within the local area and has been recorded within two kilometres of the application area (DBCA, 2007-). *Agonis flexuosa* was identified within the application area with only few scattered specimens and some small groves identified within the application area. No evidence of western ringtail possums using the application area were identified during the day or night surveys and no fresh dreys, scats or individuals were identified within the application area (Harewood, 2018). Given the completely degraded to degraded (Keighery, 1994) condition of the application area and that no evidence of western ringtails possums was identified the application area is not likely to comprise of significant habitat for this species.

Slow, progressive and directional clearing (i.e. from east to west) will assist in mitigating potential impacts to individual western ringtail possums, western false pipistrelle and southern brush-tailed phascogales that may be residing or traversing within the application area at the time of clearing.

There are several South West Regional Ecological Linkages mapped within two kilometres of the application area (the closest of which is approximately 1.5 kilometres north), however, noting that there is a 200 metre buffer of native vegetation to the west of the application area, including fringing vegetation to Lake Preston, the proposed clearing of vegetation in a degraded to completely degraded (Keighery, 1994) condition is not likely to sever or significantly impact on any linkage values.

While the application area is not likely to provide significant habitat for any of the abovementioned fauna species, DBCA provided comment on the proposed clearing and advised that "the proposed clearing and loss of habitat values extends to within approximately 185m from the boundary of the Peel-Yalgorup Ramsar site and impacts should be viewed in light of the total cumulative extent of clearing of native vegetation on the eastern side of the catchment of Lake Preston. Significant clearing has already taken place and numerous limestone extraction sites occur in the east side of Lake Preston within 200 metres of the boundary of the Peel-Yalgorup Ramsar site. There is an overall increased risk of:

- loss of habitat value that may be utilised by fauna important to the adjacent Ramsar listed wetland; [and]
- disturbance to migratory shorebirds and resident waterbirds within Ramsar site..." (DBCA, 2018b).

Subsequent to DBCA provided this advice, the applicant has amended the application area to provide a minimum 270 metre buffer to the Ramsar site. The applicant has also committed to revegetating an area of 7.4 hectares (see Figure 2) with native species to create a similar species composition, structure and density to the pre-cleared vegetation types. This will help to mitigate the cumulative loss of native vegetation within close proximity to the Ramsar site.

Given the above, the proposed clearing is not likely 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, threatened flora.**

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

According to available datasets, two rare flora species have been recorded within the local area, being *Diuris purdiei* and *Diuris micrantha*.

*Diuris micrantha* has been recorded approximately four kilometres from the application area. This species is a tuberous perennial herb that grows to between 0.3 and 0.6 metres high within brown loamy clays in winter-wet swamps and in shallow water (Western Australian Herbarium, 1998- ).

*Diuris purdiei* has been recorded approximately nine kilometres from the application area. This species is a tuberous, perennial herb that grows to between 0.15 and 0.35 metres high within grey-black moist sand and within winter-wet swamps (Western Australian Herbarium, 1998- ).

Noting that the application area did not contain any standing water at the time of inspection (DWER, 2018), and that no wetlands or watercourses are mapped within the application area, or were identified within the application area during flora and fauna surveys (DWER, 2018; Harewood, 2018; Plantecology Consulting, 2018), the application area is unlikely to include either *Diuris micrantha* or *Diuris purdiei*.

A targeted flora survey of the application area did not identify any rare flora species (Plantecology Consulting, 2018).

Given 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 datasets, there are no state listed threatened ecological communities (TEC's) mapped within or adjacent to the application area. A site inspection identified that a portion of the application area comprises limestone heath geology (DWER, 2018), and it was considered that this portion may be representative of Floristic Community Type 26a, known as 'Melaleuca huegelii - Melaleuca systena shrublands on limestone ridges (Gibson et al. 1994 FCT type 26a)' (Melaleuca TEC) (DBCA, 2018c), which is a state listed threatened ecological community (TEC).

Subsequently, the applicant commissioned a flora survey of the application area to determine the presence or absence of the abovementioned TEC. Specifically, the flora survey incorporated a floristic analysis of species composition using multiple methods of analyses. Analyses incorporated both hierarchical and non-hierarchical clustering methods to determine which floristic community type (FCT) the vegetation within the application area most closely aligned with, including whether it aligned with FCT 26a (being the abovementioned TEC) (Plantecology Consulting, 2018). The survey methods are considered adequate in determining the presence or absence of FCT 26a.

The flora survey noted that the alignment of the application area to FCT 26a (known as the strength of membership) is very low, whereby for the three plots surveyed, the strength of membership to FCT 26a was 0.38 per cent, 0.07 per cent and 0.08 per cent respectively (Plantecology Consulting, 2018). These figures are significantly lower than the strength of membership for FCT 6 or FCT 29a (as outlined under Principle (a)), which the application area appears to be potentially representative of. Given these results, it is highly unlikely that the vegetation within the application area is part of FCT 26a (Plantecology Consulting, 2018), and the proposed clearing is not likely to impact on this TEC or any other known TEC's.

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 not likely to be 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 percent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

As indicated in table 1, the application area occurs within the Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, which retains approximately 38.6 per cent of its pre-European vegetation extent (Government of Western Australia, 2019a). The vegetation within the application area is mapped as Cottesloe Complex - Central And South, which retains approximately 32.2 per cent of its pre-European vegetation extent within the IBRA bioregion (Government of Western Australia, 2019b).

The local area (10 kilometre radius) retains approximately 37.8 per cent native vegetation cover. The application area represents approximately 0.0014 per cent of the remaining native vegetation within the local area and the proposed clearing would reduce the extent of native vegetation within the local area to approximately 37.7 per cent (8,697.4 hectares).

Noting that the above vegetation extents exceed the 30 per cent targets, that the application area is in a degraded to completely degraded (Keighery, 1994) condition, that the application area is unlikely to contain any rare or priority flora species, and that it is unlikely to provide significant habitat for fauna, the application area is not considered to be a significant remnant within an extensively cleared area.

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

**Table 1.** Remnant Vegetation Extents

	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) (%)
<b>IBRA bioregion:</b>					
Swan Coastal Plain	1,501,222	578,813	38.6	222,917	18
<b>Vegetation complex:</b>					
Cottesloe Complex – Central and South	45,299	14,568	32.2	6,606	14.6

**(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**

There are no wetlands or watercourses mapped within the application area. The closest wetland to the application area is Lake Preston, which is classified by DBCA as a conservation management category wetland. The applicant has amended the application area to provide a minimum buffer of 270 metres to Lake Preston (to the west). Lake Preston forms part of the Peel-Yalgorup System Ramsar site.

The Peel-Yalgorup System Ramsar site includes shallow estuarine waters, saline, brackish and freshwater wetlands of the Peel Inlet, Harvey Estuary, several lake systems including Lakes McLarty, Preston and Mealup and the Yalgorup National Park. The Ramsar site is considered to be geomorphically complex and biologically diverse (DEC, 2007).

A site inspection of the application area did not identify the presence of any riparian habitat (DWER, 2018), and a targeted flora survey did not identify any riparian species or vegetation types (Plantecology Consulting, 2018).

Given the absence of riparian habitat within the application area and that the applicant has maintained a minimum buffer of 270 metres to Lake Preston, 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**

The application area is mapped as Spearwood S1a Phase landform subsystem, which is described as dune ridges with shallow to moderately deep siliceous yellow-brown sands, very common limestone outcrop and slopes up to 15 per cent. A site inspection of the application area identified that the soils largely comprise of thin grey sands over irregular outcropping limestone, with limestone outcropping less prevalent within the southern portion of the site where soil cover is presumably thicker. The northern and central portions of the application area occur on a subtle ridge (DWER, 2018). The soils within the site are considered to be highly permeable (DPIRD, 2017).

The former Department of Agriculture and Food Western Australia developed land degradation risk potentials for mapped subsystems, as shown within Table 3 below for the Spearwood S1a Phase landform subsystem (DPIRD, 2017).

**Table 2. Land Degradation Risk**

<b>Risk categories</b>	<b>Karrakatta shallow soils Phase</b>
Wind erosion	Greater than 70 per cent of map unit has a high to extreme wind erosion risk
Water erosion	50 to 70 per cent of map unit has a high to extreme water erosion risk
Salinity	30 to 50 per cent of map unit has a moderate to high salinity risk or is presently saline
Flood risk	Less than 3 per cent of the map unit has a moderate to high flood risk
Waterlogging	Less than 3 per cent of map unit has a moderate to very high waterlogging risk

Based on the above, the greatest risk of land degradation is from wind erosion, water erosion and salinity.

Noting that no signs of salinity were observed within the application area (DWER, 2018), despite being historically parkland cleared, the proposed clearing is not likely to lead to surface water salinity expression and subsequent land degradation.

With regard to the potential for water erosion, noting that there are no watercourses or wetlands mapped within the application area, and noting that the application area is currently in a degraded to completely degraded (Keighery, 1994) condition, the proposed clearing is not expected to result in appreciable land degradation via water erosion.

With regard to the potential for wind erosion, noting that greater than 70 per cent of the Spearwood S1a Phase has a high to extreme wind erosion risk, it is considered that the proposed clearing may result in appreciable land degradation should the site remain bare of vegetation for a lengthy period of time. Therefore, the proposed clearing may be at variance to this Principle.

The applicant has advised that the potential impacts of clearing will be managed by undertaking avoidance and mitigation measures applicable to construction activities, including the revegetation of a portion of the application area and areas surrounding the proposed extraction site (See Figure 2).

To further mitigate the potential for wind erosion the applicant would be required to undertake mining activities within three months of clearing, to prevent the long term exposure of the site to wind erosion.

**(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 may be at variance with this Principle**

The closest conservation area to the application area is the Yalgorup National Park which is located approximately 270 metres west of the application area and this National Park roughly aligns with the aforementioned Lake Preston and Peel-Yalgorup System Ramsar site.

Noting that the applicant has amended the application area to provide a 270 metre buffer to the Yalgorup National Park, the proposed clearing is not likely to directly impact on this conservation area.

There are several ecological linkages mapped within two kilometres of the application area (the closest of which is approximately 1.5 kilometres north) however, noting that there is a 200 metre buffer of native vegetation to the west of the application area, including fringing vegetation to Lake Preston in a better condition than the vegetation within the application area, the proposed clearing of vegetation in a degraded to completely degraded (Keighery, 1994) condition is not likely to sever or significantly impact on any north south linkage values. It is also noted that the applicant has committed to undertaking revegetation works post extraction, which will help to assist in maintaining landscape linkage values.

The proposed clearing may however result in the spread of weeds and dieback into adjacent areas of native vegetation, which may eventually spread to the Yalgorup National Park, and thus impact on its environmental values. Therefore the proposed clearing may be at variance with this Principle.

In order to minimise the potential risk for weeds and dieback to spread into adjacent vegetated areas, the applicant would be required to adhere to weed and dieback management measures. The applicant has also prepared a weed management plan which includes control methods for two weed species identified within the application area (*Gomphocarpus fruticosus* and *Solanaum linneanum*) declared under the *Biosecurity and Agriculture Management Act 2007*.

**(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 may be at variance with this Principle**

As discussed under Principle (f), there are no wetlands or watercourses mapped within the application area. The closest wetland to the application area is Lake Preston, which is classified by DBCA as a conservation management category wetland and forms part of the Peel-Yalgorup System Ramsar site. The applicant has amended the application area to provide a minimum buffer of 270 metres to Lake Preston (to the west).

Conservation category wetlands are the highest priority wetlands for protection and conservation as they support a high level of ecological functions and attributes (Water and Rivers Commission, 2001). With regard to habitat modification within close proximity to wetlands, the Guideline for the Determination of Wetland Buffer Requirements identifies the following recommended buffers for conservation category wetlands (WAPC, 2005):

- 100 metres for weed infestation;
- 100 metres for bird dependent habitat;
- 6 to 50 metres for firebreaks; and
- 100 metres to minimise edge effects.

In addition to the above, a wetland position statement which specifies a number of management measures for wetland environments notes that the recommended buffer distance between mineral processing operations and wetlands is 200 metres (Water and Rivers Commission, 2001).

With respect to impacts to the water quality of Lake Preston and the Ramsar site, DBCA provided comment on the proposed clearing and advised that "there is an overall increased risk of...erosion, sediment transport and turbidity to the wetland to the west, particularly during large rainfall events" (DBCA, 2018b).

The applicant has advised that the broad drainage pattern across the surrounding unaltered land surface is east to west towards Lake Preston (Lundstrom Environmental Consultants, 2018) and there is the potential for some sedimentation of Lake Preston, should heavy rainfall occur immediately post clearing, prior to the operation of the extractive industry activities. However, noting that the applicant has amended the application area to provide a 270 metre buffer to Lake Preston, the presence of highly permeable sandy soils, and that the applicant will be revegetating portions of the application area and surrounding areas (see Figure 2), any sedimentation that occurs is likely to be short term and minimal.

Groundwater salinity within the application area is mapped as 500 to 1000 milligrams per litre total dissolved solids (considered to be marginal). Noting this, that the application area is in a degraded to completely degraded (Keighery, 1994) condition, and that larger deeper rooted trees occur as scattered individuals across the site, the proposed clearing is not likely to result in a perceptible rise in the water table and thus an increase in groundwater salinity levels, or in the expression of surface water salinity.

Given the above, the proposed clearing may be at variance to 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**

The application area is subject to a moderate annual rainfall of 900 millimetres per annum. As discussed under Principle (g), the application area contains highly permeable sandy soils. Noting this, and that the vegetation within the application area has already undergone significant historical disturbance, including large portions which have been previously parkland cleared, the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance to 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 22 May 2018 with a 21 day period. One public submission has been received in relation to this application, raising concerns regarding impacts to vegetation that comprises a high level of biological diversity and significant habitat for WRP's and Black cockatoos; and how the proposed clearing may impact a conservation area and groundwater and surface water areas. These concerns have been addressed in discussion of clearing principles (a), (b), (h), (g) and (i), above.

The submission concluded that it "strongly objects to the granting of a clearing permit for CPS 8057/1 Lots 4 & 5 Ludlow Road, Myalup. The proposed clearing is at variance to a number of Clearing Principles and is part of a development which should be formally assessed under Part IV of the Environmental Protection Act" (Submission, 2018).

DWER notes that since the submission has been received, the applicant has undertaken a targeted flora survey and floristic analysis of species composition using multiple methods of analyses, whereby it was determined that the proposed clearing is not likely to impact on any flora of conservation significance, threatened ecological communities, and was not likely to impact on the conservation status of any priority ecological communities. The flora survey also determined that the application area is in a degraded to completely degraded (Keighery, 1994) condition and does not contain any native vegetation in a good (Keighery, 1994) condition (Plantecology Consulting, 2018).

The applicant has amended the application area to exclude two tuart trees that contained suitably sized breeding hollows for black cockatoos, exclude vegetation potentially representative of the commonwealth listed Tuart woodland TEC and further amended the application area to provide a minimum 270 metre buffer to Lake Preston and the Peel-Yalgurup System Ramsar site. The applicant has also provided a commitment to revegetating 7.4 hectares of native vegetation within and surrounding the application area.

DBCA provided comment on the impacts associated with the end land use and advised that "the proposed end land use has potential to alter the hydrological regime and create preferred flow-paths of groundwater, which in turn may alter the water quality of water within Lake Preston. There is an increasing salinisation within Lake Preston due largely to decreased freshwater inputs from direct rainfall and the risk of further alteration of freshwater inputs as a result of this mining operation should be modelled to quantify the risk to water balance" (DBCA, 2018b).

The applicant provided additional information in the form of an Environmental Management Plan in support of its Extractive Industry Licence application, which specifies a number of management measures that will be undertaken to reduce the risk of the end land use impacting on environmental values. These measures are outlined below (Lundstrom Environmental Consultants, 2018):

- The proposed extraction depth is 6mAHD, which is approximately 4.5 metres above the highest ever water table and as such no groundwater is expected to be intercepted during limestone extraction.
- Though the original land surface will be altered to a final level of 6 mAHD, moderate slopes of 1:6 will remain, which is not dissimilar to slopes occurring naturally within the surrounding landscape.
- The applicant has developed a Weed Management Plan, which includes control methods for two weed species identified within the application area (*Gomphocarpus fruticosus* and *Solanaum linneanum*) declared under the *Biosecurity and Agriculture Management Act 2007*.
- Stormwater management issues are not anticipated for this property due to the high permeability of the land surface.
- No surface water runoff from the working areas will be discharged to the surrounding unaltered landscape as any stormwater runoff will be contained in the base of the extraction area.
- At pit closure the pit floor will be deep ripped and the battered slopes will be revegetated.
- The recommended buffer of at least 200 metres from Lake Preston will be maintained throughout the operational life of the extraction activities.
- The final rehabilitated land surface will be five metres above the maximum winter high groundwater level.
- There will be no storage of fuels, lubricants or other toxic or hazardous chemicals on site.
- Refuelling will take place using a mobile refuelling vehicle which is equipped with a "snap-on snap-off, fast-fill and auto shut-off" facility. Plant will be refuelled each morning, leaving the vehicles almost empty overnight.
- No major servicing, which could lead to fuel and oil spills, will take place on the site. Servicing of any vehicle will take place at least 200 metres from the shore of Lake Preston.
- The Western Australian Water Quality Protection Guidelines No's 6,7,10 and 11 will be adhered to, to prevent hydrocarbons or other contaminants from being spilled into the Peel-Yalgurup System Ramsar Wetland.

- Water cart application over dust prone areas will be undertaken to reduce dust lift off . Crushing and stockpiling activities located in topographic low points with stockpiles arranged such that windbreaks are created to further shield sensitive receptors.
- The applicant committed to revegetating five hectares within the pit perimeter under an existing approval for an adjacent extractive industry operation, and a further 12.9 hectares will be rehabilitated as part of the proposed excavation area giving a total of 18 hectares of revegetated land. The areas planted with native vegetation will have a similar species composition, structure and density to the pre-cleared vegetation types in the area.
- All batters behind the active working face will be contoured to achieve a slope gradient of no more than 1:6. The final rehabilitated pit floor will be at 6 mAHD;
- Stockpiled topsoil/ overburden will be respread over completed areas; and
- The pit floor and batters will be ripped to alleviate compaction, improve filtration, attenuate stormwater runoff and facilitate rapid root penetration.

On 27 March 2020 the Shire of Harvey granted development approval for the proposed extractive Industry (Limestone) at Lots 4 and 5 Ludlow Road, Myalup (Shire of Harvey, 2020). The development approval requires the applicant to comply with the approved plans and management plans submitted to the Shire including the adhering to the measures outlined above.

The subject property is located within the South West Coastal Groundwater Area as proclaimed under the *Rights in Water and Irrigation Act 1914*. Any groundwater abstraction in this proclaimed area is subject to licensing by the department, other than supply from the shallow watertable (superficial aquifer) for domestic and non-intensive stock watering purposes. It is noted that the proponent holds a current groundwater licence (GWL101642).

## 5. Applicant's Submissions

On 4 October 2018, DWER wrote to the applicant to advise that the proposed clearing had the potential to impact on conservation significant flora species, a TEC (*Melaleuca huegelii* - *Melaleuca systema* shrublands on limestone ridges (Gibson et al. 1994 FCT type 26a)), an ecological linkage and a Ramsar listed wetland. The applicant was encouraged to provide follow up flora surveys to determine impacts to conservation significant flora and ecological communities, and provide measures to avoid or minimise impacts to ecological linkage values and the Ramsar wetland.

On 28 November 2018, the applicant provided a copy of a targeted flora and vegetation survey, which determined that the proposed clearing would not impact on the abovementioned TEC, or on any conservation significant flora species. The applicant also provided a revised application area which excludes black cockatoo breeding habitat trees, included a greater buffer to the Ramsar site and Lake Preston (200 metres at its closest point) and provided confirmation of the specific area of revegetation that would occur post extraction (comprises 12.9 hectares).

On 21 December 2018, DWER wrote to the applicant and advised that that based on the preliminary assessment, it is likely that if granted a clearing permit will contain a revegetation condition as per the revegetation proposed, as well as a weed and dieback management condition; however that a decision on the application would be deferred until a copy of the applicant's extractive industry licence from the Shire of Harvey is provided.

On 11 July 2019 the applicant reduced the application area to 8.3 hectares.

On 9 March 2020 a DWER officer contacted the applicant and advised that a portion of the application area may be representative of the Commonwealth listed Tuart Woodlands TEC that had been listed on 4 July 2019. It was advised that further information regarding the vegetation type and condition of the adjacent vegetation is required to determine the presence of this TEC.

On 9 March 2020, the applicant amended the application and reduced the application area to 7.4 hectares of native vegetation and removed the vegetation type 'Tuart Woodland' from the application area.

On 20 March 2020, DWER wrote to the applicant advising that a decision on the application would be deferred until a copy of the applicant's extractive industry licence from the Shire of Harvey is provided.

On 30 March 2020, the applicant provided a copy of its development approval for the proposed Extractive Industry (Limestone) at Lots 4 and 5 Ludlow Road, Myalup.

On 31 March 2020, the applicant advised that it intends to revegetate an area 7.4 hectares in size (Figure 2).

## 6. References

- Armstrong, K., Woinarski, J. & Burbidge, A.A. 2017. *Falsistrellus mackenziei*. *The IUCN Red List of Threatened Species* 2017: e.T17348A22128228. <http://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T17348A22128228.en>. Downloaded on 30 November 2018.
- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2012) EPBC Act referral guidelines for three threatened black cockatoo species, Canberra.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2018a) Flora Advice for Clearing Permit Application CPS 8057/1 received 13 September 2018 (DER Ref A1725256).
- Department of Biodiversity, Conservation and Attractions (DBCA) (2018b) Wetlands Advice for Clearing Permit Application CPS 8057/1 received 19 September 2018 (DER Ref A1725264).



Department of Biodiversity, Conservation and Attractions (DBCA) (2018c) Regional Advice for Clearing Permit Application CPS 8057/1 received 18 September 2018 (DER Ref A1725263).

Department of Biodiversity, Conservation and Attractions (DBCA) (2007- ) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife, Perth, Western Australia. URL: <http://naturemap.dpaw.wa.gov.au/>. Accessed November 2018.

Department of Environment Conservation (2012) Fauna Profile: Brush-tailed Phascogale (*Phascogale tapoatafa*). Department of Environment Conservation, Western Australia.

Department of Water and Environmental Regulation (2018) Site Inspection Report for Clearing Permit Application CPS 8057/1. Site inspection undertaken 1 August 2018. Department of Environment Regulation, Western Australia (DWER Ref A1725445).

Government of Western Australia. (2019a). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth

Government of Western Australia. (2019b). 2018 South West Vegetation Complex Statistics. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. <https://catalogue.data.wa.gov.au/dataset/dbca>.

Harewood G. (2018) Fauna Assessment. CPS 8057/1, Lot 4 and 5 Ludlow Road, Myalup. DWER Ref A1750527).

Hedde, 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

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Lundstrom Environmental Consultants (2018b) Extractive industry Licence Application and Environmental Management Plan, Lot 4 and 5 Ludlow Road, Myalup, Shire of Harvey. (DWER Ref A1749861).

Lunstrom Environmental Consultation (2018b) Flora and Vegetation Environmental Values Survey. Prepared for B & J Catalan Pty Ltd Lot 4 Ludlow Road, Myalup. Shire of Harvey

Plantecology Consulting (2018) 1816 Ludlow Road TEC and Priority Flora Survey. DWER Ref A1749933.

Shire of Harvey (2020) Notice of determination on application for development approval. Planning and Development Act 2005. Shire of Harvey, District Planning Scheme No. 1. Western Australia. DWER Ref: A1882471

Submission (2018) Direct Interest Submission received in relation to Clearing Permit Application CPS 8057/1 on Valentine, L.E. and Stock, W. (2008) Food Resources of Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) in the Gnarara Sustainability Strategy Study Area. Edith Cowan University and Department of Environment and Conservation. December 2008.

Western Australian Herbarium (1998- ) FloraBase - The Western Australian Flora. Department of Parks and Wildlife. <http://florabase.dpaw.wa.gov.au/> (Accessed November 2018).

Water and Rivers Commission (2001) Position Statement: Wetlands, Water and Rivers Commission, Perth.

Western Australian Planning Commission (2005) Guidelines for the Determination of Wetland Buffer Requirements. Albert Facey House, 469 Wellington Street, Perth Western Australia 6000.

#### GIS Databases:

- Hydrography, linear
- Hydrography, hierarchy
- Wetlands, Swan Coastal Plain
- Parks and Wildlife tenure
- Hedde Vegetation Complexes
- Pre-European vegetation
- SAC bio datasets accessed November 2018
- Aboriginal sites register system
- Town Planning Scheme Zones
- Rainfall, Mean Annual