



# Clearing Assessment Report – CPS 818

*We're working for  
Western Australia.*

Collie Lake King (M037) seal  
widening (SLK 69.87 – 86.67) and  
rehabilitation works (SLK 135.7 –  
137.3)

January 2022

EOS 2373

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# Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	<b>Environmental Officer</b>	Draft v1	16/12/2021
Reviewer:	Environmental Officer	Draft v1	25/01/2021

## 1 PURPOSE

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

The CAR outlines the key activities associated with the proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the proposal using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

## 2 SCOPE

### 2.1 Proposal Scope

**Proposal Name:** Collie Lake King (M037) seal widening (SLK 69.87 – 86.67) and rehabilitation works (SLK 135.7 – 137.3)

**Proposal Purpose / Components:** This Proposal is a component of the larger regional safety improvements project being undertaken across the Wheatbelt and other regions.

Main Roads will be widening Collie Lake King (M037) by undertaking low-cost seal widening on the existing cleared formation. The road will be widened approximately 1m either side, to establish a uniform 9 m seal width.

**The proposed clearing undertaking using CPS 818 is:** Four (4) trees.

**The proposed temporary clearing undertaking using CPS 818 is:** None.

**Proposal Location:** The Proposal is located on Collie Lake King (M037) between SLK 69.87 – 86.67 in the Shire of West Arthur (Figure 1). The four trees to be removed occur between SLK 73 and 74.

The Proposal involves a 10 m wide works area from the Brookton Highway road centreline (proposal area) comprising 17.3 ha. The Proposal removes four (4) trees and pruning of two trees immediately adjacent to the proposed new seal.

The Proposal extent is presented in Figure 1.

The following term has been used in this CAR:

- *Proposal area:* This area represents the area of disturbance for the proposed widening and sealing works. The Proposal area comprises 17.3 ha, and the proposal will require removal of four (4) trees.

### 2.2 Assessment Report Scope

The assessment area is confined to a local area of a 20 km from the Proposal area. An area bigger than the Proposal extent due to the various extents of the survey efforts. The assessment area has informed the desktop assessment provided by the following surveys specific to the Proposal:

- Phoenix (2019) Biological Survey
- Western Ecological (2021) Targeted Fauna Survey




**Figure 1** Collie Lake King (M037) Tranche 3 - Low Cost Seal Widening SLK 69.86 - 86.67 and SLK 135.7 - 137.3 Proposal Area

**Legend**  
 Proposal Area

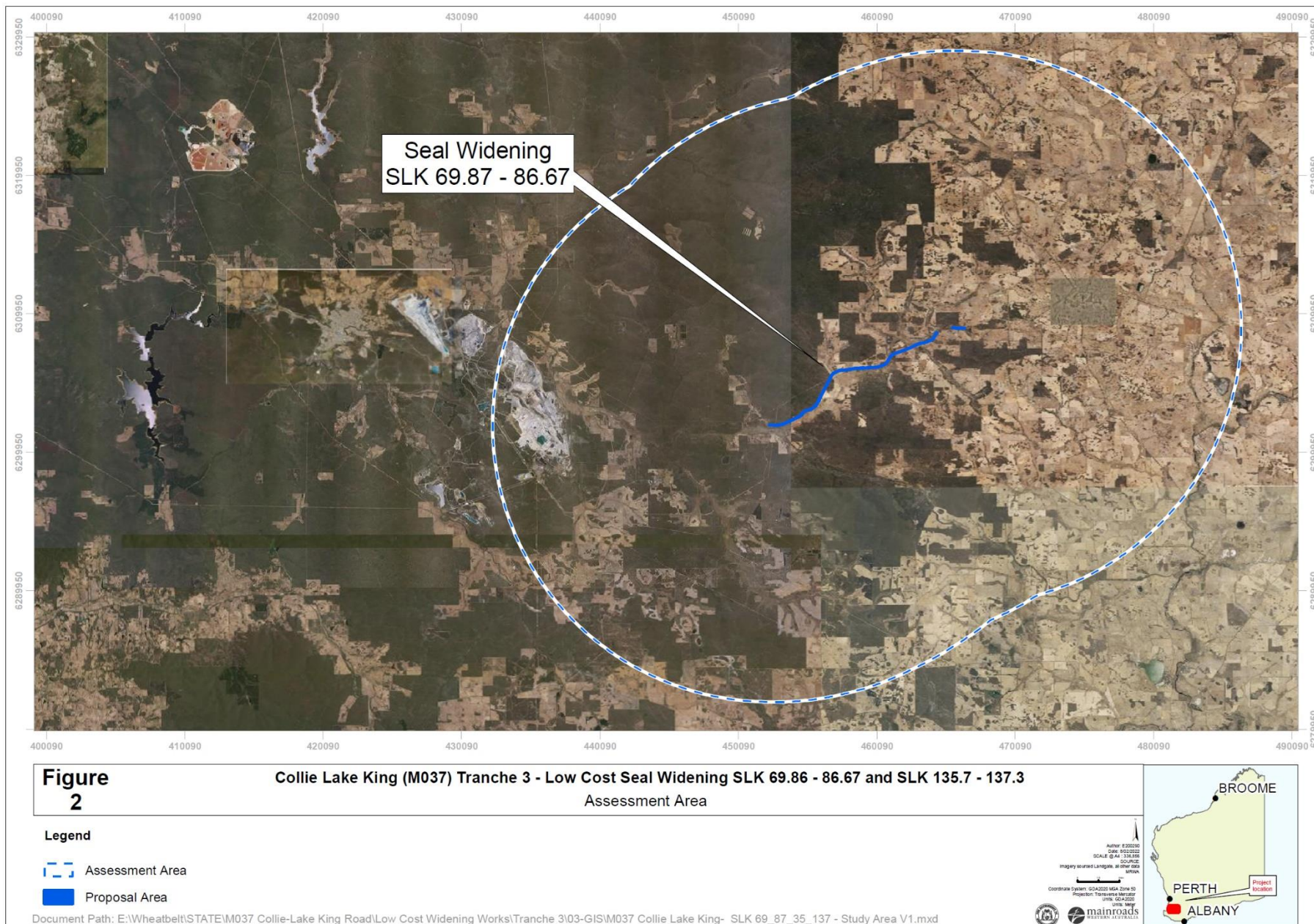
Document Path: E:\Wheatbelt\STATE\M037 Collie-Lake King Road\Low Cost Widening Works\Tranche 3\03-GIS\M037 Collie Lake King- SLK 69\_87\_35\_137 - Proposal Location V1.mxd

Author: P20200  
 Date: 19/02/2022  
 Scale: 1:100,000  
 Imagery sourced from Google Earth  
 100m

Coordinate System: GDA2020 MGA Zone 50  
 Projection: Transverse Mercator  
 Units: GDA2020  
 Units: Meters



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## **2.3 Alternatives to clearing**

This proposal is a component of the larger regional safety improvements proposals being undertaken across the Wheatbelt and other regions. The works involve sealing within the existing maintenance zone extending the current bitumen up to 1 m where locations do not meet the 9 m by 9 m road formation. Clearing involves four (4) trees immediately adjacent to the proposed new seal becoming a road user safety hazard if they remain in situ. There are no alternatives to clearing for the road widening and sealing of the existing road formation.

## **2.4 Measures to Avoid, Minimise, Reduce and Manage Project Clearing Impacts**

The design and management measures implemented to avoid and minimise the clearing impacts by the proposal are provided in Table 1.

**Table 1: Measures undertaken to Avoid, Minimise, Reduce and Manage the Project Clearing Impacts**

Design or Management Measure	Discussion and Justification
<b>Steepen batter slopes</b>	<p>The chosen work method of profiling and exsitu stabilisation of the road shoulders will mean that there will be limited intrusion into the adjacent verge, almost all of the work to form and seal the shoulders being able to be done from the roadway. There are no high fills along this road and so there is no benefit in steepening roadside batter slopes.</p>
<b>Installation of safety barriers</b>	<p>For four (4) trees within 9 metres of the road centreline the road formation, seal and traffic lane width does not provide enough shoulder width to accommodate a safety barrier and the required deflection distance, and so these trees will need to be removed both for safety and clearance for construction plant purposes.</p> <p>For trees located 10 metres or more from the road centreline these will be retained.</p> <p>Determinations were made for trees located within 9 metres from the road centreline with the following considerations:</p> <ul style="list-style-type: none"> <li>a) To retain with less than desirable clearance to the trafficked way unprotected;</li> <li>b) To retain with an additionally widened shoulder and install guardrail;</li> <li>c) Reduce the targeted total seal width to 9 metres so as to retain a wider buffer between the edge of the seal and the tree(s).</li> </ul> <p>Factors that will be considered is whether it is an isolated tree or quite a number over a length of road, the latter justifying the cost of the guardrail or the lesser safety benefit of the narrower seal.</p>
<b>Alignment to one side of existing road</b>	<p>Not applicable as the works are largely being undertaken on the existing formation and within the maintenance areas, i.e. there's no realignment or adding of additional traffic lanes involved.</p>
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas</b>	<p>Not applicable as the works are largely being undertaken on the existing formation and within the maintenance areas, i.e. there's no realignment or adding of additional traffic lanes involved.</p>
<b>Installation of kerbing</b>	<p>As the works are for the most part being done on the existing rural open road highway raised formation and within the existing maintenance zone, incorporating kerbing would not provide any material benefit in lessening the construction footprint or avoiding the need to clear four trees, but would significantly add to the cost of the works.</p>



Design or Management Measure	Discussion and Justification
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	The design is already very simple, with works outside of the existing road formation footprint and maintenance zone kept to a minimum.
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	The majority of works are contained to the existing cleared areas, with exception of the four trees that form the proposed clearing area.
<b>Drainage modification</b>	N/A

## 2.5 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the *Environmental Protection Act 1986* (EP Act) and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

Main Roads has considered matters using the below instruments in accordance with s. 51O of the EP Act.

### **Other Legislation of relevance for assessment of clearing and planning/other matters**

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA)
- *Town Planning and Development Act 1928*

### **Environmental Protection Policies**

- *Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992;*
- *Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011*

### **Other Relevant policies and guidance documents:**

- Environmental Offsets Policy (GoWA 2011)
- A guide to the assessment of applications to clear native vegetation (DER 2014)
- Procedure: Native vegetation clearing permits (DWER 2019)
- Environmental Offsets Guidelines (GoWA 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020)
- Approved conservation advice under s. 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Approved Recovery Plans for threatened species
- EPBC Act Referral guidelines for the three threatened black cockatoo species
- Strategic advice - EPA

### 3 SUMMARY OF SURVEYS

The following environmental investigations provide local context for the values within and adjacent to the Proposal Area.

#### 3.1 Biological Survey (70- 87 SLK)

Main Roads Western Australia (Main Roads) commissioned Phoenix (2020) in 2017 to undertake a biological survey for a survey area comprising 19.13 ha parallel to the existing Collie Lake King Road and intersecting the Muja State Forest and the Boolading Nature Reserve to delineate key flora, fauna, soil, groundwater and surface water conservation values. The assessment also involved a government database and literature review of environmental values within 20 km of the survey area to inform the field investigation.

The detailed flora and vegetation survey was conducted across three (3) field trips in 2017 13–15 September, 24–26 October and 16–17 November, and over four field trips in 2018, 19–21 September, 26–28 September, 23–26 October and 19 November. The survey was completed in accordance with the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, primarily by sampling vascular plant species within quadrats and relevés.

A targeted terrestrial fauna survey was undertaken over two field trips, 13–15 September and 10–16 October 2017. Field methods included active searches, avifauna surveys, bat echolocation and audio (bird and frog) recordings, camera trapping and black cockatoo habitat assessments.

Section 3.2.1 contains the summary of the survey.

##### 3.1.1 Summary of Phoenix (2020) Survey

The following summary presents findings applicable to the Proposal area (70 - 87) and immediate local area.

#### Flora and Vegetation

A total of 306 flora species and subspecies representing 49 families and 149 genera were recorded during the field survey. The assemblage included 229 perennial species and 68 annual or short-lived species (and nine unknown lifecycles). The most prominent families recorded were the Fabaceae (32 species), Poaceae (24), Asteraceae (22) and Proteaceae (21). No Threatened species listed under the EPBC Act or BC Act were recorded. Two DBCA listed Priority flora were recorded: *Stylidium lepidum* (Priority 3) comprised of a large population and a separate single plant; and a large population of *Synaphea hians* (Priority 3). The latter confirmed the presence of a previous record for this species in the survey area. None of these Priority 3 species intersect the Proposal Area (70 – 87 SLK).

One Declared Pest, *Moraea flaccida*, was recorded during the survey at two locations/populations. The Proposal Area does not intersect the locations of this Declared Pest.

Cluster Analysis was conducted using floristic data from quadrat and releve data. Based on this classification, 12 vegetation types were characterised and mapped within the survey area. These 12 vegetation types intersect the Proposal Area (between 70 – 87 SLK). The vegetation types assigned comprised seven Eucalyptus spp. woodlands, one *Juncus acutus* subsp. *acutus* sedgeland, one Allocasuarina shrubland, a *Melaleuca viminea* shrubland and a *Casuarina obesa/Hakea prostrata* shrubland.

Based on the analysis, occurrences of “Claypans of the Swan Coastal Plain” TEC also exist within the survey area and are also likely to align with the State listed TECs “Herb rich saline shrublands in clay pans” SCP07 and/or “Herb rich shrublands in clay pans” SCP08. The Claypans TEC is located SLK 72.28 and 77.55, and the proposed trees to be removed is located outside of these occurrences between 73–74 SLK.

## Surface water and wetland communities

Most vegetation along the existing watercourses in the survey area has been cleared. One area of vegetation type Mv, *Melaleuca viminea* shrubland was associated with low lying seasonally inundated areas. This vegetation type possibly represents dampland or sumpland wetland. No wetland communities are within the Proposal Area.

## Fauna and Fauna Habitat

A total of 55 fauna sites were sampled during the field survey representing all broad fauna habitats within native vegetation in the survey area. This comprised 13 opportunistic fauna sites, seven audio recording sites, 13 camera trapping sites and five sites where black cockatoo foraging habitat assessments were completed. The remaining 13 sites were locations of individual species records.

Six broad habitat types were identified within the survey area (Jarrah/Marri/Wandoo woodland, Wandoo woodland, shrubland (seasonally inundated), riparian woodland, She-oak shrubland and scattered native trees in paddock), and two completely cleared/modified habitat types. Apart from the black cockatoo significant habitat, which occurred more widely, survey results suggest significant fauna habitat in the survey area is primarily the Jarrah/Marri/Wandoo woodlands that are part of/adjacent to Muja State Forest and Boolading Nature Reserve and adjacent wetland habitats.

Fifty-six vertebrate fauna species were recorded during the field survey, comprising two frogs, two reptiles, 36 birds and 16 mammals, five of these introduced. A total of six Threatened and Priority vertebrate fauna species were recorded during the survey, including all three Threatened species of black cockatoo and three Priority 4 mammals (Southern Brown Bandicoot, Western Brush Wallaby and Western False Pipistrelle). A further 21 conservation significant fauna species from the desktop review were considered likely to, or to possibly occur in the survey area based on habitats present, current known species distributions and proximity of previous records to the survey area.

Foraging habitat quality for all three black cockatoo species was assessed as high in the survey area. A total of 1,903 significant habitat trees for black cockatoos were recorded during the survey, including 69 that were assessed as having hollows suitable for breeding, a further 68 that were assessed as possibly suitable, and ten with hollows that showed signs of use. Including the results of the current survey and work undertaken in the previous reconnaissance survey, a total of 3,416 significant habitat trees have been recorded in the survey area, including 159 with hollows classified as currently suitable for breeding.

The Southern Brown Bandicoot was recorded through secondary evidence (foraging digging) at a creekline/wetland site adjacent to Boolading Nature Reserve. The wetland habitat in the survey area was considered to be of higher value for the species. The Western Brush Wallaby was directly observed and captured on camera traps in Jarrah/Marri/Wandoo woodland associated with Muja State Forest and Boolading Nature Reserve. The Western False Pipistrelle was detected by acoustic recordings from four sites, also in Jarrah/Marri/Wandoo woodland associated with Muja State Forest and Boolading Nature Reserve. The pattern and timing of call detection shows the bats move through the survey area but is not suggestive of a roost being present.

Several Migratory waterbirds were assessed as 'possibly occurring' due to the presence of wetland habitat in the survey area; however, it is noted that this is marginal habitat for these species. There were nearby desktop records and suitable habitat present for several Threatened mammals in the survey area that were not recorded in the survey, and consequently several were assessed as likely, or to possibly occur. For these species, and several other potentially occurring Priority fauna, the most prospective habitat is the Jarrah/Marri/Wandoo woodland habitats within/adjacent to Muja State Forest and Boolading Nature Reserve.

In summary, apart from the black cockatoo significant habitat, which occurred more widely, survey results suggest significant fauna habitat in the survey area is primarily the Jarrah/Marri/Wandoo woodlands that are part of/adjacent to Muja State Forest and Boolading Nature Reserve and adjacent wetland habitats. Vegetation condition in both of these areas was mostly rated in Excellent condition, and included small areas of habitat in Pristine condition, and was therefore of high habitat value.

## 4 VEGETATION DETAILS

### 4.1.1 Proposal Vegetation Description

The western portion (between 69.87 – 86.67) of the proposal is located within the Jarrah Forest region and northern and southern Jarrah Forest IBRA subregions, which is characterised by a mosaic of cleared agricultural land and remnant native vegetation, including that associated with DBCA managed Muja State Forest.

In the local context, the proposal area is situated within a road reserve (of various width) surrounded by cleared areas and remnant vegetation.

The proposal involves clearing of four (4) isolated trees between 73 – 74 SLK. The trees comprise of one potential Suitable DBH Tree (Marri) and three smaller trees that do not meet DBH requirements (one wandoo, and two potentially jarrah).



**Plate 1:** Tree removal at SLK 73.50 RHS, one tree (jarrah) potential Suitable DBH Tree



**Plate 2:** Tree removal at SLK 73.80 RHS, three isolated trees (jarrah), potential jarrah and wandoo

**Table 2: Summary of Mapped Pre-European Vegetation Associations in proposal area between SLK 73.50 – 73.80 (where clearing is proposed)**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
<b>Vegetation Association 3</b> described as Mainly jarrah and marri <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i>	Clearing of four (4) isolated trees for seal widening on Collie Lake King	Excellent (Phoenix 2020)	Vegetation description and condition determined from biological survey (Phoenix 2020) in accordance with EPA guidelines.

Source: Adapted from +

**Table 3: Summary of Mapped Pre-European Vegetation Associations in proposal area between SLK 73.50 – 73.80 (where clearing is proposed)**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 3</b>	<b>Statewide</b>	2,661,404.62	1,803,437.48	67.76	81.50
	<b>IBRA Bioregion</b> Jarrah Forest	2,390,591.54	1,604,101.56	67.10	81.00
	<b>IBRA Sub-region</b> Southern Jarrah Forest	1,482,491.85	880,655.65	59.40	78.50
	<b>Local Government Authority</b> Shire of West Arthur	98,993.88	51,072.96	51.59	50.55

## 5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the proposed clearing of four isolated trees (up to 0.04 ha) due to proximity to the new seal on Collie Lake King is not expected to have a significant impact on the environment, the proposal was assessed against the ten Clearing Principles (Environmental Protection Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER’s ‘A Guide to the Assessment of Applications to Clear Native Vegetation’ and other relevant CPS Decision Reports prepared by DWER.

The assessment has determined that the proposed clearing is ‘not at variance’ with the Clearing Principles.

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

<b>Proposed clearing is not at variance to this Principle</b>
<p>The proposed clearing involves the removal of four (4) isolated trees between SLK 73 - 74 that will be located immediately adjacent to the new seal on Collie Lake King, becoming a hazard to road user safety. The proposed trees for removal are part of roadside vegetation immediately adjacent to Collie Lake King Road mapped by Phoenix (2020) as EwEm (woodland) in excellent condition.</p> <p>There are no State-listed or EPBC Act-listed Threatened Ecological Communities to be cleared in the Proposal Area. ‘Claypans of the Swan Coastal Plain’ Threatened Ecological Community (Claypan TEC) has been identified outside of the existing maintenance zone of Collie Lake King. Less than 0.001 ha of the Proposal Area has been mapped as ‘Claypans of the Swan Coastal Plain’ Threatened Ecological Community (Claypan TEC) at SLK 72.28 and 77.55.</p> <p>Actual clearing based on the scope of works involve the removal of the following trees:</p> <ul style="list-style-type: none"> <li>• RHS one tree at SLK 73.50 (approximate diameter at breast height (DBH) of 573 mm)</li> <li>• RHS three trees at SLK 73.80 (one at 477 mm DBH, and two trees at 255 mm DBH).</li> </ul> <p>These trees are located over 1 km from the Claypan TEC locations and no direct or indirect impacts are anticipated.</p> <p>No Threatened flora species listed under the EPBC Act or BC Act were recorded within the Proposal Area and none are considered likely or possible to occur.</p> <p>Records for three priority flora species occur adjacent to the Proposal Area identified by Ecoedge (2021):</p> <ul style="list-style-type: none"> <li>• Priority 3 species <i>Blennospora doliiformis</i> was quite common in claypan vegetation between 61.45 SLK and 61.75 SLK</li> <li>• Priority 3 species <i>Meionectes tenuifolia</i></li> <li>• Priority 3 species <i>Stylidium rhipidium</i></li> <li>• Priority 3 species <i>Stylidium lepidum</i> (approximately 36 m south from the Proposal Area at SLK 77.45)</li> <li>• Priority 3 species <i>Synaphia hians</i> (approximately 154 individuals at SLK 70.15 outside of the Proposal Area)</li> </ul> <p>None of these Priority flora species are located within the Proposal Area and will not be removed as part of the proposed clearing. Given the minor amount of clearing and negligible understorey present where the trees are to be removed (see Plate 1 and 2), no impacts to Priority species are anticipated.</p> <p>A targeted terrestrial fauna survey was completed by Phoenix (2019) between 70 – 87 SLK.</p> <p>A total of 56 vertebrate fauna species were recorded within the Phoenix (2019) survey area (between 70 – 87 SLK) during the field survey. This included two frogs, two reptiles, 36 birds and 16 mammals. The following conservation significant fauna species were recorded within the Proposal Area:</p>



- Baudin’s Cockatoo (*Calyptorhynchus baudinii*; Endangered under the EPBC Act and BC Act)
- Carnaby’s Cockatoo (*Calyptorhynchus latirostris*; Endangered under the EPBC Act and BC Act)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; Vulnerable under the EPBC Act and BC Act)
- Western Brush Wallaby (*Macropus irma*; DBCA Priority 4)
- Western False Pipistrelle (*Falsistrellus mackenziei*; DBCA Priority 4)
- Western Rosella (*Platycercus icterotis xanthogenys*, DBCA Priority 4)
- Southern Brown Bandicoot (*Isodon obesulus fusciventer*; DBCA Priority 4).

In addition, the following species were identified in biological surveys as possibly or likely to occur:

- Chuditch (*Dasyurus geoffroii*; Vulnerable under the EPBC Act and BC Act)
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*; Conservation Dependent under the BC Act)
- Darling Range Ctenotus (*Ctenotus delli*; DBCA Priority 4)
- Tammar Wallaby (*Notamacropus eugenii derbianus*; DBCA Priority 4)
- Letterwinged Kite (*Elanus scriptus*), DBCA Priority 4

Some possibly/ likely to occur species identified by Phoenix (2019) were excluded from this assessment if there was no suitable habitat present within the Proposal Area, and known records were more than 10 km from the Proposal Area.

A number of introduced species were recorded during the surveys (Western Ecological 2021; Phoenix 2020).

Vegetation within the proposal area is potentially suitable for these species, however the likelihood of these species using this vegetation is considered low, as discussed in principle (b).

Given the minor amount of clearing (four isolated trees), lack of understorey present and that the clearing area is unlikely to contain conservation significant flora or fauna or comprise of a threatened or priority ecological community, the proposed clearing is not considered to be at variance to this Principle.

**Methodology**

- DBCA (2020)
- DotE (2015)
- Phoenix (2020)
- GIS Database:
  - Wheatbelt TEC
  - Remnant Vegetation
  - Threatened and Priority Fauna

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.**

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

**Comment**

The following conservation significant fauna species were recorded within the Proposal Area:

- Baudin’s Cockatoo (*Calyptorhynchus baudinii*; Endangered under the EPBC Act and BC Act)
- Carnaby’s Cockatoo (*Calyptorhynchus latirostris*; Endangered under the EPBC Act and BC Act)

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; Vulnerable under the EPBC Act and BC Act)
- Western Brush Wallaby (*Macropus irma*; DBCA Priority 4)
- Western False Pipistrelle (*Falsistrellus mackenziei*; DBCA Priority 4)
- Western Rosella (*Platycercus icterotis xanthogenys*, DBCA Priority 4)
- Southern Brown Bandicoot (*Isodon obesulus fusciventer*; DBCA Priority 4).

The following species were identified in biological surveys as possibly or likely to occur:

- Chuditch (*Dasyurus geoffroii*; Vulnerable under the EPBC Act and BC Act)
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- Darling Range Ctenotus (*Ctenotus delli*; DBCA Priority 4)
- Tammar Wallaby (*Notamacropus eugenii derbianus*; DBCA Priority 4)
- Letterwinged Kite (*Elanus scriptus*), DBCA Priority 4

Some possibly/ likely to occur species identified by Phoenix (2020) were excluded from this assessment if there was no suitable habitat present within the Proposal Area, and known records were more than 10 km from the Proposal Area.

### **Black Cockatoos**

The Proposal Area and surrounds represents roosting, nesting and foraging habitat for all three Threatened black cockatoo species, Carnaby's Cockatoo, FTRBC and Baudin's Cockatoo . Black cockatoos were recorded by Phoenix (2019) and Western Ecological (2021) from remnant woodland, including Muja State Forest and more isolated remnants within and outside of the Proposal Area. Several direct sightings, audio recordings and food scrap records were observed for all three species of black cockatoo, indicating three species are all actively utilising the Proposal Area and surrounds as foraging habitat. The FRTBC was observed at the far eastern end of the Proposal Area foraging on the ground, and foraging evidence in the form of chewed Marri nuts was present and at the western end of the Proposal Area (Western Ecological 2021).

The four native trees to be cleared are all considered to comprise high quality foraging habitat for black cockatoo species and one of these trees (at SLK 73.5) is also a potential DBH tree.

According to the black cockatoo observational data supplied by DBCA, there are no known breeding or roosting sites for any of the three black cockatoo species within 12 km of the survey area and the closest known roost site is approximately 35 to 40 km to the west-southwest. Threatened and Priority Fauna database output (DBCA 2017c) point source data shows just one record of Baudin's Cockatoo "breeding behaviour" from a "community survey" approximately 40 km NNE of the survey area in 2001 (Pheonix 2021).

Given the above, and extensive areas of high quality foraging habitat in areas adjacent to the proposal, the removal of four native trees is unlikely to have a significant impact on any black cockatoo species.

### **Woylie (*Bettongia penicillate ogilbyi*)**

Woylie (*Bettongia penicillate ogilbyi*) was identified by Phoenix (2020) as possibly occurring, and by Western Ecological (2021) as unlikely to occur within the Proposal Area.

Western Ecological (2021) filtered DBCA threatened fauna database records for Woylie and identified 102 records remained (from 2010-2017), all from monitoring programmes (Western Shield Programme) associated with reintroduced populations in Muja State Forest (Batalling and Centaur Forest block). This population has declined significantly, with an estimate of 8,984 individuals in 2001 down to 242 individuals in 2010 (Woinarski et al. 2014, Western Ecological 2021).

Given the Woylie's dramatic decline in the local area, lack of a dense understorey within the Proposal Area and its location adjacent to a relatively busy road, this species is considered unlikely to be reliant on habitat present in the Proposal Area.

No further assessment required.

**Western Quoll, *Dasyurus geoffroii***

This species was identified by Phoenix (2020) as likely to occur and by Western Ecological (2021) as possibly occurring within the Proposal Area due to the presence of suitable habitat (Jarrah/Marri/Wandoo woodland)– especially in Muja State Forest and Boolading Nature Reserve. Nearby relatively recent records also exist adjacent to the Proposal Area, however, despite extensive camera trapping effort by Phoenix (2019) this species was not recorded.

Chuditch may utilise the Jarrah/Marri/Wandoo woodland present adjacent to the Proposal Area, however these habitats are not present within the Proposal Area.

There are large areas of remnant vegetation in the local area that will provide higher quality habitat, which directly adjoins the Proposal Area, and various patches of native vegetation in proximity to Collie Lake King.

The removal of four isolated trees are unlikely to result in a significant adverse impact to this species.

No further assessment required.

**Red-tailed phascogale, *Phascogale calura***

Many records for this species (between 2000 and 2012) occur near the eastern end of the Proposal Area towards Wagin (Western Ecological 2021). There is also some potential habitat adjacent to the Proposal Area, particularly in the section that runs through Mount Latham, as there is Wandoo, Rock Sheoak and Marri in proximity to one another and some small hollows present in these Eucalypts that could be used to den in (Western Ecological 2021). And there are two records in the DBCA threatened fauna database from 1992 and 2007 with the locality given as Mount Latham. However, there were no sightings or secondary evidence recorded during the targeted fauna survey by Western Ecological (2021).

Proposal aims to widen the existing formation and will disturb vegetation immediately adjacent to Collie Lake King. The Red-tailed phascogale is likely to be restricted to refugia in the otherwise cleared landscape and the vegetation proposed to be removed/ disturbed is not expected to support a permanent population due to the lack of recent records and scarcity of quality habitat. This species is also unlikely to use the Proposal Area as a corridor to move through the landscape because the vegetation lacks a vegetated understorey.

The removal of four (4) isolated trees with no suitable hollows is not expected to result in a significant adverse impact to the species.

**Southwestern Brushtailed Phascogale (*Phascogale tapoatafa wambenger*) Species of special conservation interest (conservation dependent fauna)**

This species was identified by Phoenix (2019) as likely to occur, and by Western Ecological (2021) as possible to occur, within the Proposal Area. A dead specimen recorded in 2005 between SLK 70 - 87 and persists at Muja Coal Mine (Phoenix 2019). The species was specifically targeted by Phoenix (2019) with camera traps but was not recorded. In south-west WA this species has been recorded in dry sclerophyll forests and open woodlands that contain hollow-bearing trees. Records less common in high rainfall areas. Occurs in high densities in the Collie River basin (Phoenix 2019).

Western Ecological (2021) filtered through the Wambenger records from the DBCA threatened fauna database, and identified 10 records from between 2011-2017. Nearly all these 10 records were from monitoring programmes associated with reintroduced populations in Muja State Forest (Batalling and Centaur Forest block). One record is about 2 km to the south west of the Western Ecological (2021) survey area.

Suitable habitat in which the Wambenger could forage and trees with potentially suitable sized hollows to den is present adjacent to the Proposal Area, however, the proposed removal of up to 0.001 ha of roadside vegetation, and removal of four trees adjacent to Northam Pithara Road is not expected to cause any adverse significant impacts to the species.

**Southern Brown Bandicoot, *Isoodon obesulus fusciventer*) Priority 4**

This species was identified by Phoenix (2020) as recorded, with secondary evidence (diggings) identified in wetland habitat associated with Boolading Nature Reserve. Closest previous record approximately 7 km south of Proposal Area. This species is mostly found in sandy soil, in scrubby, often swampy, vegetation with dense cover up to 1 m high. Often feeds in adjacent forest and woodland, particularly where frequent burns occur and in areas of pasture and cropland lying close to dense cover.

There is shrubland fauna habitat in the nearby the Proposal Area that has a relatively dense cover of vegetation in which it could potentially shelter and nearby to this there are areas of Eucalypt woodland that have been burnt in the recent past. Suitable habitat is also associated with creeklines and wetlands (Phoenix 2020).

The proposed clearing of four (4) isolated trees in roadside vegetation is not expected to cause any significant impact to this species.

#### **Tammar Wallaby (*Macropus eugenii derbianus*) Priority 4**

This species was identified by Phoenix (2019) as likely to occur, and by Western Ecological (2021) as possible to occur, within the Proposal Area due to the presence of suitable habitat, particularly with habitat associated with Muja State Forest Boolading Nature Reserve. Closest record is 9.5 km north of the Proposal Area (between SLK 70 – 87) from within the Muja State Forest associated with the Western Shield Programme. No records exist between SLK 135.7 – 137.3. This species was previously distributed throughout most of the south-west of WA. Now confined to a handful of islands and mainland sites (Phoenix 2019). Tammar Wallabies feed in open grassy habitat at night and shelter under shrubs during the day (Phoenix 2019). The proposed clearing of four isolated trees is not expected to cause any significant impact to this species.

#### **Western Brush Wallaby (*Macropus irma*) Priority 4**

This species was identified by Phoenix (2019) as recorded within the Proposal Area (between SLK 70 – 87) through direct observation and records from multiple camera traps in remnants associated with Muja State Forest and Boolading Nature Reserve. This species was also identified as possible to occur by Western Ecological (2021) based on records from monitoring associated with translocated populations in Muja State Forest as part of the Western Shield Programme; however, no suitable habitat exists for this species between SLK 135.7 to 137.3 in the Proposal Area.

This species feeds on a wide range of plants in dense bushland and tends to avoid more open habitats. Prefers open forest or woodland, and seasonally-wet flats with low grasses and open scrubby thickets (Phoenix 2019). There are limited open grassy sections nearby the Proposal Area for the Western Brush Wallaby to forage and can be identified as suitable habitat. However, the proposed removal of four isolated trees beside a relatively busy road is not expected to cause any significant impact to this species.

#### **Letterwinged Kite (*Elanus scriptus*) Priority 4**

This species was identified by Phoenix (2020) as possibly occurring as an occasional visitor post survey based on suitable habitat in the Proposal Area (as this species uses a variety of terrestrial habitats to forage and nest). It was later assessed by Western Ecological (2021) as unlikely to occur based on six records of in the DBCA threatened fauna database at the same coordinates and locality (Bowelling) from the years 1977-1981. Closest record is 8.5 km south of survey area from 1981 (Phoenix 2019). The species is irruptive with a fluctuating range, depending on prey abundance. They are mostly found in the eastern Australian arid zone. The certainty of the records is given as moderately certain and they were sightings. Given the Letter-winged Kite is a nocturnal hunter and could easily be confused with the Black-shouldered Kite and the database records are at least 40 years old, this species is considered Unlikely to occur in the Proposal Area (Western Ecological 2021).

The proposed clearing of four (4) isolated trees is not expected to cause any significant impact to this species.

#### **Western False Pipistrelle (*Falsistrellus mackenziei*) Priority 4**

This species was identified by Phoenix (2020) as recorded from four sites, and was identified by Western Ecological (2021) as likely to occur in the Proposal Area. There have been no previous records within 40km of the Proposal Area (between SLK 70 – 87). Majority of records from mature Karri forest, but also recorded from wetter stands of Jarrah and Tuart, and woodland on the Swan Coastal Plain (Phoenix 2019). In spite of

<p>a number of searches in suitable habitat over a number of years, there have been no records north of Collie in the Jarrah Forest or north of Mandurah on the coastal plain (Western Ecological 2021).</p> <p>The proposed clearing four (4) isolated trees is not expected to cause any significant impact to this species. While the proposal area may provide some habitat value for fauna, including for conservation significant species, given the small amount of clearing adjacent to an existing road and extent of native vegetation adjacent to the proposal area, the proposed clearing is not likely to form significant habitat for fauna.</p> <p>There are no formal ecological linkages intersecting the Proposal Area. The removal of four isolated trees immediately adjacent to the existing road formation (between SLK 73-74) will not result in a gap in the canopy that would result in fragmentation of any existing linkage. Furthermore, there is no groundcover or understory vegetation being removed as part of the Proposal and therefore, the movement of terrestrial fauna will continue, if present.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this principle.</p>
<p><b>Methodology</b>                  EPA (2016, 2020)                  DBCA (2020)                  Phoenix (2020)                  GIS Database:</p> <ul style="list-style-type: none"> <li>- Wheatbelt TEC</li> <li>- Remnant Vegetation</li> <li>- Threatened and Priority Fauna</li> </ul>

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

<p><b>Proposal is not at variance to this Principle</b></p>
<p><b>Comment</b></p> <p>The proposal area was traversed on foot along transects to record the distribution and abundance of any of the significant plant species. No Commonwealth or State-listed Threatened flora were found during the detailed flora and vegetation survey (Ecoedge 2021). The balance of the species identified in the desktop searches by Ecoedge (2021) were assigned a 'Low' or 'Very Low' likelihood of occurrence within the survey area.</p> <p>Given the minor amount of clearing, and negligible understorey associated with trees to be removed, no rare flora species are considered likely or possible to occur.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this principle.</p>
<p><b>Methodology</b>                  DAWE (2020)                  GIS Database:</p> <ul style="list-style-type: none"> <li>- Threatened and Priority (DBCA)</li> <li>- Threatened and Priority (WA Herbarium)</li> </ul>

**(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

<p><b>Proposed clearing is not at variance to this Principle</b></p>
<p><b>Comment</b></p>

According to available databases, no TECs listed under the BC Act are known to occur within the proposal area (GIS Database). None of the vegetation types recorded in the Proposal Area represent a state listed TEC (Phoenix 2020).

Based on the above, the proposed clearing is not at variance to this Principle.

**Methodology**

GIS Database:

- Threatened and Priority Ecological Communities (Buffered)

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

<p><b>Proposed clearing is at variance to this Principle</b></p>
<p><b>Comment</b></p> <p>The four (4) isolated trees to be removed are located within the Jarrah IBRA region, of which approximately 81% of pre-European vegetation extent remains in State (Government of Western Australia 2019). At a local scale, between 50 - 81% of remnant vegetation remains at a bioregion, subregion and local government authority level (Government of Western Australia 2019).</p> <p>The proposed clearing of the four trees has been broadly mapped as the following pre-European vegetation association (as outlined in Table 2):</p> <p>3: Medium forest; jarrah-marri</p> <p>The National Objectives and Targets for Biodiversity Conservation recognise that the retention of 30 per cent or more of the pre-clearing extent of each ecological community is necessary if Australia’s biological diversity is to be protected (Commonwealth of Australia 2001). With regard to the broad vegetation association mapped at the proposed clearing locations (between SLK 73-74), vegetation associations has more than 30% being retained across all levels.</p> <p>The four (4) trees to be removed occur immediately adjacent to the maintenance zone as the location of these areas are in proximity to the new seal for Collie Lake King and; therefore, a hazard to road user safety. There are also large areas of remnant vegetation located outside of the proposal area (based on aerial imagery). As such, the proposed clearing will not significantly diminish any vegetation corridors or linkages between larger patches of native vegetation across the landscape.</p> <p>The proposal area is not considered to support significant remnant vegetation within an extensively cleared landscape. Based on the above, the proposed clearing is not likely to be at variance to this Principle.</p>
<p><b>Methodology</b></p> <p>Aerial photography                  Ecologia (2021)                  EPA (2016)                  Government of Western Australia (2019)</p>

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

<b>Proposed clearing is not variance to this Principle</b>
<p><b>Comment</b></p> <p>Several minor non-perennial watercourses intersect the proposal area (GIS Database). These watercourses are only expected to flow following significant rainfall events. There is no clearing of vegetation within the proposal area formally mapped as riparian vegetation (Ecoedge 2021). The area proposed to be cleared is minor in scale and nature, with the clearing proposed not expected to impact the values of these watercourses.</p> <p>Based on the above, the proposed clearing is at variance to this principle.</p>
<p><b>Methodology</b></p> <p>Ecoedge (2021) DWER and DBCA shapefiles</p>

**(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment</b></p> <p>Topography ranges in elevations across undulating plains, plains, seasonally wet areas, hill slopes and tops, and drainage lines (Phoenix 2020; GIS Database).</p> <p>A variety of soils have been recorded in the proposal area (Phoenix 2020):</p> <ul style="list-style-type: none"> <li>• JZ2 – Dissected plateau having a gentle to moderately undulating relief, and with broad swampy drainage-ways and basins. Lateritic gravels and block laterite: the chief soils are ironstone gravels with sandy and earthy matrices. Leached sands occur in drainage-ways and basins.</li> <li>• NZ2 – Shallow swampy flat valley floors: chief soils are sandy acidic gley soils and hard acidic gley soils.</li> <li>• Tf3 – Low hilly to hilly terrain in valleys that are frequently narrow and have short fairly steep pediments, along with breakaways, mesas, and occasional granite tors. Chief soils are hard acidic yellow mottled soils and sandy acidic yellow mottled soils containig moderate to large amounts of ironstone gravels in their surface horizons.</li> </ul> <p>Natural Resource Management Soil Systems and CSIRO Acid Sulphate Soils risk mapping indicates the soils of the proposal area have generally moderate risk of land degradation. High Probability of ASS occurrence are located at <u>two locations</u> SLKs 68.8 to 75.25; SLK 76.90 to 81.10. As the proposed works will not require dewatering below the groundwater table or excavation works; it is not expected that ASS will be encountered as part of the tree removal process.</p> <p>Moderate risk of wind erosion 10-30% of the map unit having high to extreme wind erosion risk (GIS Database).</p> <p>Flood risk is less than 3% of the map unit.</p> <p>Phosphorous export risk ranges between 50-70% of the map unit having high to extreme phosphorous export risk; and 10-30% of the map unit having high to extreme phosphorous export risk.</p> <p>Salinity risk also ranges from less than 3% of map unit has a moderate to high salinity risk or is presently saline and 50-70% of map unit has a moderate to high salinity risk or is presently saline.</p> <p>Waterlogging risk also ranges between less than 3% - 70% of map unit having a moderate to very high waterlogging risk.</p>



Given the linear nature of the clearing and sealing of areas for road construction, its location adjacent to an existing road and that the presence of bare soils will be minimal due to the construction of the road, the proposed clearing is not likely to cause appreciable land degradation.

Standard erosion and dust management control measures will be implemented during construction to reduce the incidence of wind erosion.

Based on the above, the proposed clearing is not at variance to this principle.

- Methodology**
- Phoenix (2020)
  - Contours – WB North 25k-100k
  - CSIRO Acid Sulphate Soils risk mapping
  - Nature Resource Management SLIP soil systems

**(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 at variance to this Principle**

**Comment**

A number of historic anomalies in the existing cadastral mapping occur along Collie Lake King. This resulted in some locations within the Proposal Area intersecting DBCA managed land (Muja State Forest and Boolading Nature Reserve), and easement and railway reserve.

DBCA has confirmed that a DAS application is not necessary in this case as there is no nature reserve within the road reserve and there will be no impacts to Muja State Forest and Boolading Nature Reserve based on the scope of works in this location.

There are no Environmentally Sensitive Areas within the Proposal Area.

The implementation of a Construction Environmental Management Plan (CEMP) will manage indirect impacts to the reserves. The CEMP will include management controls to prevent the introduction and spread of weeds, hydrocarbon spills or leaks, prevent soil erosion and ensure clearing is contained in the Proposal Area.

The proposed clearing of four isolated trees will not impact on any linkages between Muja State Forest and Boolading Nature Reserve with other patches of remnant vegetation in the local area.

Based on the above, the proposed clearing is not at variance to this principle.

- Methodology**
- GIS Database:
- DBCA Managed Lands

**(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 at variance to this Principle**

**Comment**

Numerous minor non-perennial watercourses are located in the Proposal Area. The proposed clearing will only impact four trees that are not associated with the watercourse. As such, proposal activities are not expected to impact on surface water flows or quality.

The proposal area does not occur within a Public Drinking Water Source Area (GIS Database). The proposed linear clearing of four (trees) along an existing major road is not likely to alter groundwater quality in the area.

Based on the above, the proposed clearing is not likely to be at variance to this principle.
<p><b>Methodology</b></p> <p>GIS Database:</p> <ul style="list-style-type: none"> <li>- Hydrology South</li> <li>- PDWSAs</li> </ul>

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

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment</b></p> <p>The Proposal aims to clear four (4) trees across approximately 20km stretch of road. The removal of such a small area of vegetation makes it unlikely that the incidence or intensity of flooding will increase. NRM SLIP identifies that the majority of the proposal area has less 3% risk of flooding at the tree clearing locations between SLK 73-74.</p> <p>The minor and linear nature of the clearing is not expected to result in excessive levels of surface runoff that would increase the intensity or incidence of flooding.</p> <p>Based on the above, the proposed clearing is not at variance to this principle.</p>
<p><b>Methodology</b></p> <p>GIS Database:</p> <ul style="list-style-type: none"> <li>- Natural Resource Management SLIP soil systems</li> </ul>

## 6 ADDITIONAL ACTIONS REQUIRED

Table 5 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

**Table 5. Summary of Additional Management Actions Required by CPS 818**

Impact of Clearing	Yes/No or NA	Further Action Required
<b>1.</b> The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	<b>No</b>	No further action required.
<b>2.</b> Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.	<b>No</b>	No further action required.
<b>3.</b> The project involves clearing for temporary works (as defined by CPS 818).	<b>No</b>	No further action required.
<b>4 a.</b> Project is within Region that: <ul style="list-style-type: none"> <li>- Has rainfall greater than 400mm and</li> <li>- Is South of the 26<sup>th</sup> parallel and</li> <li>- Works are in 'Other than dry conditions' and</li> <li>- Works have potential for <b>uninfested</b> areas to be impacted</li> </ul>	<b>No</b>	Proceed with standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists. No dieback infested material will be used adjacent to Muja National Park.
<b>4b.</b> Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?	<b>No</b>	No further action required.
<b>5.</b> Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback	<b>No</b>	No further action required.
<b>6.</b> The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition	<b>No</b>	The proposal includes implementation of a CEMP, which will prevent the spread of weeds to adjacent areas of native vegetation. As the surrounding vegetation has been mapped in some areas in Good or better condition, herbicide treatment will occur once every year for five years after clearing activities for the proposal have finished. Records of annual weed control must be recorded in EOS Compliance Tab

## **7 STAKEHOLDER CONSULTATION**

Stakeholder consultation is not required as the proposed clearing of four (4) trees is not likely to be 'at variance' with the Clearing Principles.

## **8 VEGETATION MANAGEMENT**

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum.

## 9 REFERENCES

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