



## CLEARING PERMIT

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

<b>Purpose Permit number:</b>	CPS 9359/1
<b>Permit Holder:</b>	Covalent Lithium Pty Ltd
<b>Duration of Permit:</b>	From 1 November 2021 to 1 November 2026

The permit holder is authorised to clear native vegetation subject to the following conditions of this permit.

### **PART I – CLEARING AUTHORISED**

#### **1. Clearing authorised (purpose)**

The permit holder is authorised to clear native vegetation for the purpose of the Installation of a powerline and associated infrastructure

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

Lot 272 on Deposited Plan 210719, Southern Cross

Southern Cross Road reserve (PINs 11721926 and 11651185), South Yilgarn

Meranda North Road reserve (PINs 11680244 and 11680245), Holleton and South Yilgarn

#### **3. Clearing authorised**

The permit holder must not clear more than 0.27 hectares of native vegetation within the area cross-hatched yellow in Figure 1 of Schedule 1.

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

#### **4. Avoid, minimise, and reduce impacts and extent of clearing**

In determining the native vegetation authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- avoid the clearing of native vegetation;
- minimise the amount of native vegetation to be cleared; and
- reduce the impact of clearing on any environmental value.

## 5. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known weed-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

## 6. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

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

### 7. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

**Table 1: Records that must be kept**

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ol style="list-style-type: none"><li>(a) the species composition, structure, and density of the cleared area;</li><li>(b) 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;</li><li>(c) the date that the area was cleared;</li><li>(d) the size of the area cleared (in hectares); and</li><li>(e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4;</li><li>(f) actions taken to minimise the risk of the introduction and spread of weeds in accordance with condition 5; and</li><li>(g) directional clearing actions taken in accordance with condition 6.</li></ol>

## 8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 of this permit when requested by the *CEO*.

## DEFINITIONS

In this permit, the terms in Table have the meanings defined.

**Table 2: Definitions**

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
fill	means material used to increase the ground level, or to fill a depression.
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.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

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## END OF CONDITIONS



**Meenu Vitarana**  
**A/MANAGER**  
**NATIVE VEGETATION REGULATION**

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

8 October 2021

# Schedule 1

The boundary of the area authorised to be cleared is shown in Figures 1-2 below.

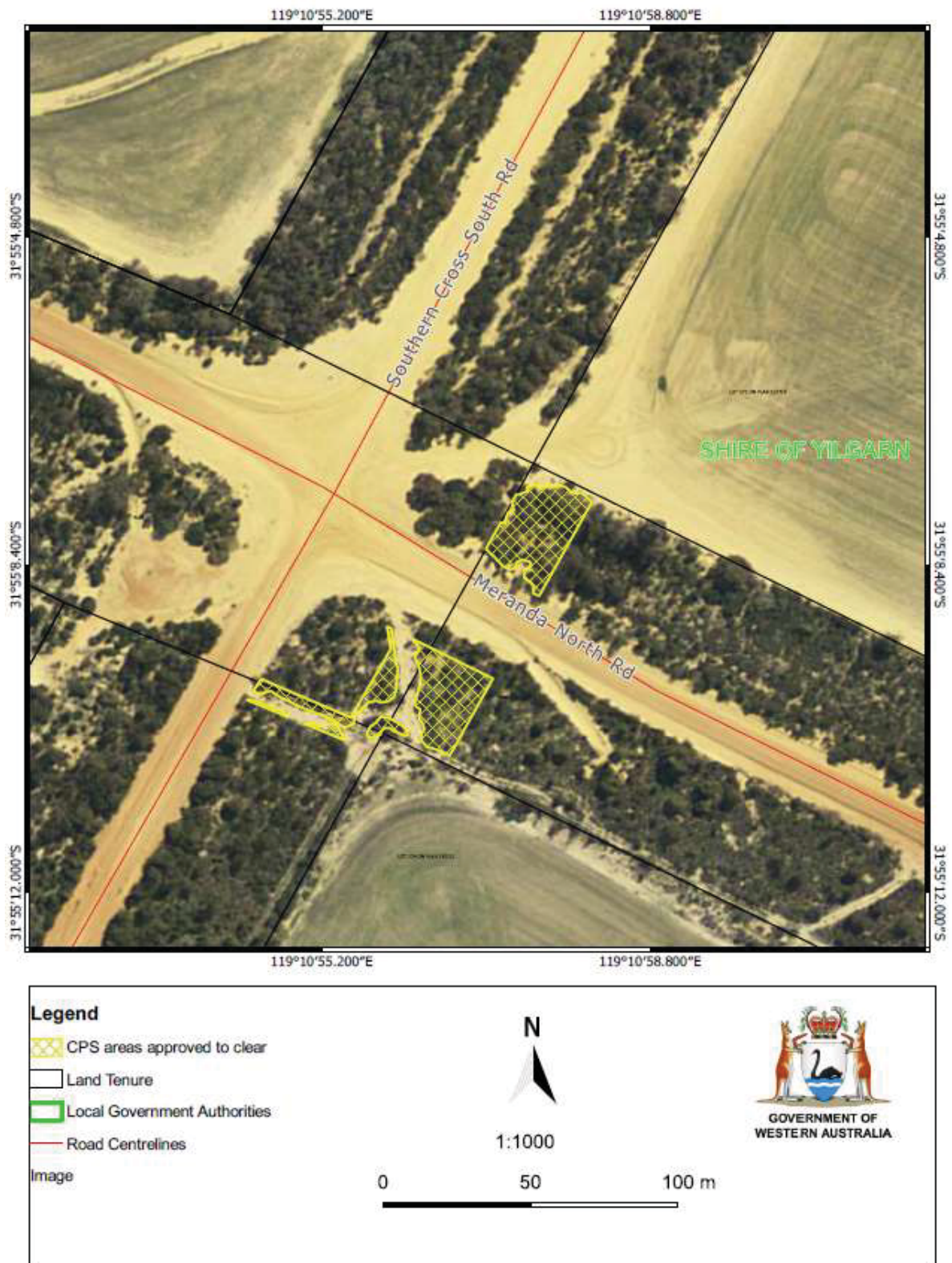


Figure 1: Map of the boundary of the area within which clearing may occur



Figure 2: Map of the boundary of the area within which clearing may occur



# Clearing Permit Decision Report

## 1 Application details and outcome

### 1.1. Permit application details

<b>Permit number:</b>	CPS 9359/1
<b>Permit type:</b>	Purpose permit
<b>Applicant name:</b>	Covalent Lithium Pty Ltd
<b>Application received:</b>	20 July 2021
<b>Application area:</b>	0.27 hectares of native vegetation
<b>Purpose of clearing:</b>	Installation of a powerline and associated infrastructure
<b>Method of clearing:</b>	Mechanical
<b>Property:</b>	Lot 272 on Deposited Plan 210719 Southern Cross Road reserve (PINs 11721926 and 11651185) Meranda North Road reserve (PINs 11680244 and 11680245)
<b>Location (LGA area/s):</b>	Shire of Yilgarn
<b>Localities (suburb/s):</b>	Southern Cross, Holleton and South Yilgarn

### 1.2. Description of clearing activities

The vegetation proposed to be cleared is distributed across two separate areas (see Figures 1 and 2, Section 1.5) to support powerline infrastructure within the area including the powerline, a booster station and an access track.

### 1.3. Decision on application

<b>Decision:</b>	Granted
<b>Decision date:</b>	8 October 2021
<b>Decision area:</b>	0.27 hectares of native vegetation, as depicted in Section 1.5, below.

### 1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1), the findings of a flora and vegetation survey (see Appendix D) and the clearing principles set out in Schedule 5 of the EP Act (see Appendix B).

The assessment identified that the proposed clearing may result in:

- impacts to local ecological linkages
- impacts to small fauna species transient across the application area, and

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on local ecological linkages and the quality of the surrounded vegetation and can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise and reduce the impacts and extent of clearing,
- directional clearing to avoid impacts to small fauna species which may transient across the application area, and
- take hygiene steps to minimise the risk of the introduction and spread of weeds

### 1.5. Site map

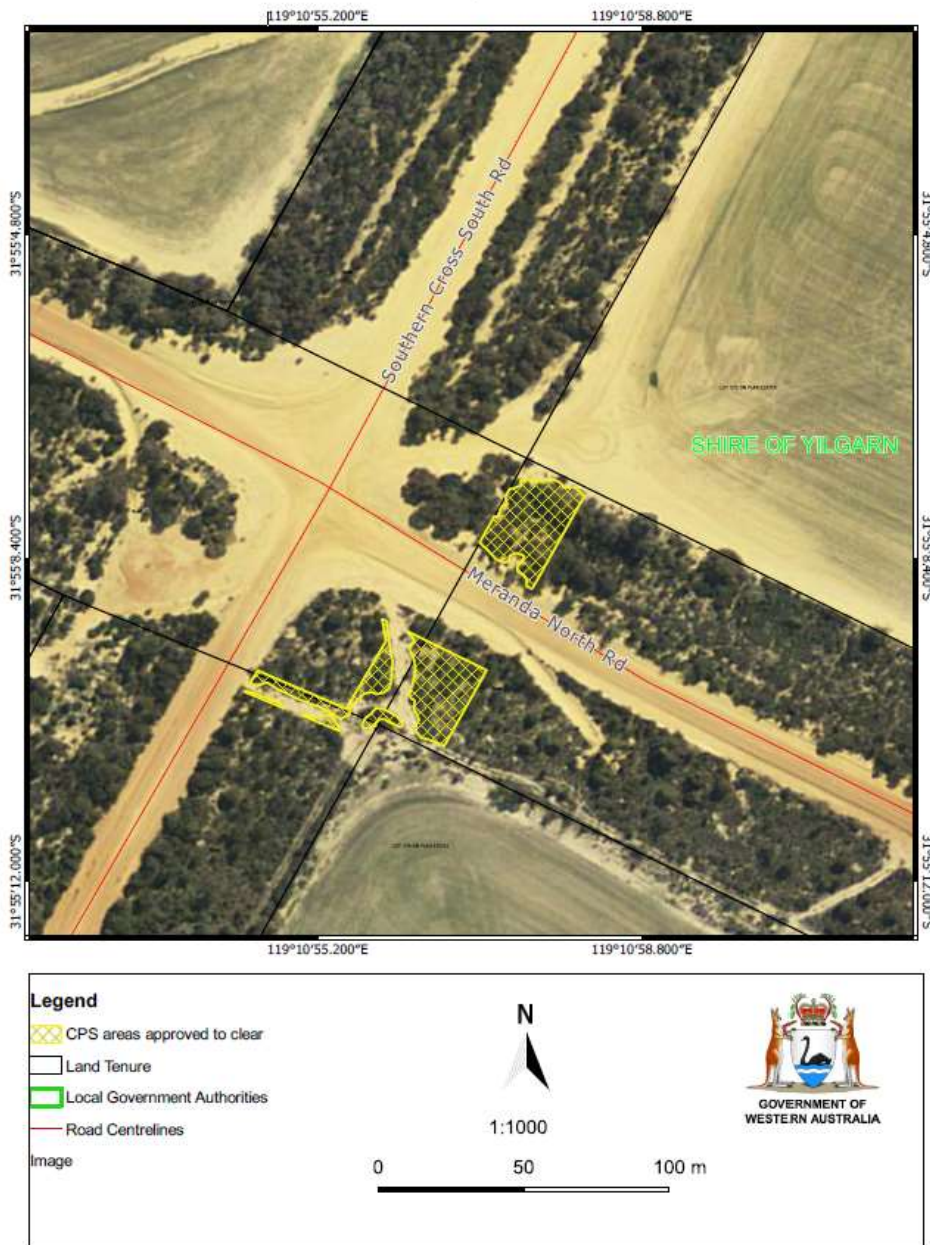


Figure 1 Map of the southern application area (crosshatched yellow)



Figure 2 Map of the northern application area (crosshatched yellow)

## 2 Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)



- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)

### 3 Detailed assessment of application

#### 3.1. Avoidance and mitigation measures

The applicant advised that the powerline route was designed to minimise the need for native vegetation clearing.

The applicant noted that a small amount of regrowth may occur within the application area post-clearing but predominately it will need to be maintained as clear, to meet compliance with Western Power's minimum clearance distances between vegetation and powerlines.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

#### 3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the proposed clearing presents a risk to fauna values and significant remnant vegetation, and that these required further consideration. The consideration of impacts to these values, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

##### 3.2.1. Biological values (fauna) - Clearing Principle (b)

###### Assessment

According to available databases, there are 36 records of malleefowl (*Leipoa ocellata*) within the local area. The species is listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* and under the *Biodiversity Conservation Act 2016*. Records of this species within the local area have been limited to larger remnants of vegetation, with none recorded within the road reserves along which the application occurs. While the vegetation within the application area may provide some habitat for the species it more likely to be utilised as a corridor for dispersal across the landscape. The clearing of up to 0.27 hectares of vegetation within the roadside is not considered to have a significant impact on the species.

Carnaby's Cockatoo and Peregrine falcon have both been recorded once within the local area. Noting the vegetation types recorded within the application area and the habitat requirements of these species, it is considered that the application area does not provide suitable habitat for these species. The vegetation types within the application area may contain some foraging habitat for Carnaby's Cockatoo due to the presence of some hakea and eucalypt species within the application area but this value is not considered to be high. According to available databases, there are no mapped cockatoo breeding location within the local area and the application area is on the eastern extent of the mapped Carnaby's breeding distribution. The application area may provide habitat for small fauna species including reptiles although no records of conservation significant reptiles have been found within the available databases. However other small reptiles species are likely to be transient across the application area.

###### Conclusion

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Avoidance and minimisation
- Directional clearing to avoid impacts to small fauna species which may transient across the application area

##### 3.2.2. Environmental value: significant remnant vegetation - Principle (e)

###### Assessment

According to available databases, the local area retains approximately 27 per cent remnant vegetation and the mapped vegetation type retains 76.6 per cent of its pre-European extent within the five IBRA regions it has been mapped within and 31.85 per cent within the Avon Wheatbelt IBRA region in which the application area is located. The representation of the vegetation type with the IBRA region is greater than the National Objectives and Targets for Biodiversity Conservation 2001-2005.

While the local area retains less than 30 per cent remnant vegetation, consideration has been given to the value of the application area in context of the surrounding vegetation. It is noted that the vegetation within the application area and the surrounding areas were found to be in excellent (Keighery, 1994) condition. The application area was not found to comprise a high level of biodiversity or comprise the whole or part of a significant habitat for fauna indigenous to Western Australia or include or be necessary for the continued existence of rare flora.

The linkage values within the roadside remnants contained within the application area have been considered. Noting that a large portion of the application area is located at an intersection, the proposed clearing does not significantly impact on the local linkage values and that linkage values still remain. The potential for introduction of weeds to the remaining remnant vegetation was considered given the excellent condition of the vegetation surrounding the application area.

#### Conclusion

Based on the above assessment, the proposed clearing will result in minor impacts to local ecological linkages and has potential to degrade the remaining roadside vegetation by the introduction of weeds.

For the reasons set out above, it is considered that the impacts of the proposed clearing on ecological linkage does not constitute a significant residual impact. A permit to clear contains a condition for avoidance and minimisation and a weed management.

### **3.3. Relevant planning instruments and other matters**

The Shire of Yligarn advised DWER that local government approvals are not required. The Shire did not have any objections to the proposed clearing and has provided authority to access the road reserve for the proposed works.

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

**End**

## Appendix A. Site characteristics

### A.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of a tract of roadside native vegetation in the intensive land use zone of Western Australia. It is surrounded by agricultural properties. The proposed clearing area contributes to a local linkage.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 27 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>There are no mapped ecological links intersected by the proposed clearing. Vegetation within the road reserves forms local linkages between larger remnants within the local landscape.</p>
Conservation areas	<p>The Neendojer Rock Nature Reserve is located approximately four kilometers to the west of the application area.</p>
Vegetation description	<p>Vegetation survey (Western Botanical, 2021) indicate the vegetation within the proposed clearing area consists of two vegetation types:</p> <ul style="list-style-type: none"> <li>• Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite</li> </ul> <p>Open <i>Hakea invaginata</i>, <i>H. meisneriana</i> Heath over <i>Ecdiocollea monostachya</i>, <i>Lepidosperma diurnum</i>, L. aff. <i>lyonsii</i> (G. &amp; S. Cockerton WB40492) and <i>Lepidobolus preissianus</i> subsp. <i>volubilis</i> Sedgeland (a minor portion of the application area).</p> <p>The full survey descriptions and maps are available in Appendix D.</p> <p>The surveyed vegetation types are largely consistent with the mapped vegetation type:</p> <ul style="list-style-type: none"> <li>• Beard 1413, which is described as Wattle, casuarina and teatree acacia-allocauarina-melaleuca alliance (Shepherd et al, 2001).</li> </ul> <p>The mapped vegetation type retain approximately 76 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Vegetation survey (Western Botanical, 2021) indicate the vegetation within the proposed clearing area is in excellent (Keighery, 1994) condition, described as:</p> <p>Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix C. The full survey descriptions and mapping are available in Appendix D.</p>
Climate and landform	<p>The application area is estimated to be at 440-450 AHD within a flat landscape. The annual average rainfall is estimated to be 299 millimetres.</p>
Soil description	<p>The soil is mapped as Tandegon 1 subsystem which is described as Crestal and upper slope sandplain with weakly expressed, weakly indurated breakaways and colluvial backslopes comprising gravelly yellow sands, earths and gravels with Tammar and Kwongan heath.</p>
Land degradation risk	<p>The mapped soil type has a low risk for categories of land degradation except for subsurface acidification which has a high risk and wind erosion which has a moderate risk.</p>
Waterbodies	<p>The desktop assessment and aerial imagery indicated that a minor, non-perennial watercourses is within 60 meters of the southern portion of the application.</p>

Characteristic	Details
Hydrogeography	The application is within the Westonia Groundwater Area. The mapped groundwater salinity is 14000-35000 milligrams of total dissolved solids per litre.
Flora	Five flora records in local area, nearest record located approximately 1.4 kilometres from the application area, a priority 4 (P4) species <i>Banksia shanklandiorum</i> . This record was located within vegetation in the road reserve.
Ecological communities	The application area occurs between mapped locations of the ecological community 'Eucalypt woodlands of the Western Australian Wheatbelt'
Fauna	There are 38 records of conservation significant fauna within the local area. Of these records, 36 are occurrences of Malleefowl with the remaining two records being of Peregrine falcon and Carnaby's Cockatoo.

## A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Avon Wheatbelt	9,517,109.95	1,761,187.42	18.51	174,980.68	1.84
Vegetation complex					
Beard vegetation association 1413 *	1,679,916.32	1,286,855.48	76.60	222,015.35	13.22
Beard vegetation association 1413 * within Avon Wheatbelt IBRA region	546,675.55	174,102.84	31.85	12,762.36	2.33
Post clearing					
Beard vegetation association 1413 * within Avon Wheatbelt IBRA region			31.84		
Local area					
10km radius			27.48	-	-

\*Government of Western Australia (2019a)

### A.3. Land degradation risk table

Risk categories	Tandegon 1 subsystem
Wind erosion	30-50% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	>70% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of map unit has a moderate to high salinity risk or is presently saline
Water logging	<3% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	<3% of map unit has a high to extreme phosphorus export risk

### Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u> The area proposed to be cleared does not contain locally or regionally significant flora, fauna, habitats, assemblages of plants.</p>	Not likely to be at variance	No
<p><u>Principle (b):</u> "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."</p> <p><u>Assessment:</u> The area proposed to be cleared is not likely to contain significant habitat for conservation significant fauna. Conservation significant fauna recorded within the local area is limited to malleefowl and Carnaby's cockatoo.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act. A targeted survey (Western Botanical, 2021) noted no conservation significant flora species were located within the application area.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> "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> <p><u>Assessment:</u> The area proposed to be cleared does not contain species that can indicate a threatened ecological community (Western Botanical, 2021)</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> "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> <p><u>Assessment:</u> The extent of the mapped vegetation type is consistent with the national objectives and targets for biodiversity conservation in Australia. The</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
vegetation proposed to be cleared is considered to be part of a significant ecological linkage in the local area.		
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u> Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
<b>Environmental value: land and water resources</b>		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>Given no water courses or wetlands are recorded as intersecting the application area, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality. The vegetation within the application is not considered to be growing in associated with a watercourse or wetland.</p>	Not at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The mapped soils are not susceptible to water erosion, water logging, phosphorus export risk, flood risk or salinity but have a moderate risk of wind erosion. Noting the extent of the application area and the condition of the vegetation surrounding it, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u> Given no water courses, wetlands or Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> <i>The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</i></p> <p>Given no water courses or wetlands are recorded within 50 meters the application area, and the soil type within the area is sandy, the proposed clearing is unlikely to contribute to waterlogging.</p>	Not likely to be at variance	No

**Appendix C. Vegetation condition rating scale**

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation’s ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

**Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)**

<b>Condition</b>	<b>Description</b>
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Plate 3. **S1** *Allocasuarina spinosissima* Shrubland with emergent *Eucalyptus burracoppinensis* and *E. leptopoda* subsp. *leptopoda mallee*





**Plate 4. S2 *Allocasuarina acutivalvis* Shrubland with emergent *Eucalyptus burracoppinensis* and *E. leptopoda* subsp. *leptopoda* mallee from the road surface**



**Plate 5. S2 *Allocasuarina acutivalvis* Shrubland with emergent *Eucalyptus burracoppinensis* and *E. leptopoda* subsp. *leptopoda* mallee**



14



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### H1 Heath Community

The H1 Heath community is described as Tall Heath of *Melaleuca cordata* 1m, *Hakea erecta* 1.2m, *Hakea invaginata* 1.5m *H. cygnus* subsp. *cygnus* 1.5m. and a range of Myrtaceae spp., PFC 10% over a sedgeland of *Ecdiocola monostachya*, *Lepidobolus preissianus* subsp. *volubilis* and *Lepidosperma* spp., PFC 30%, Plate 8. Soil is a yellow clayey sand with laterite gravel at shallow depth, Plate 8, Table 5.

#### Plate 8. H1 Heath community looking eastwards

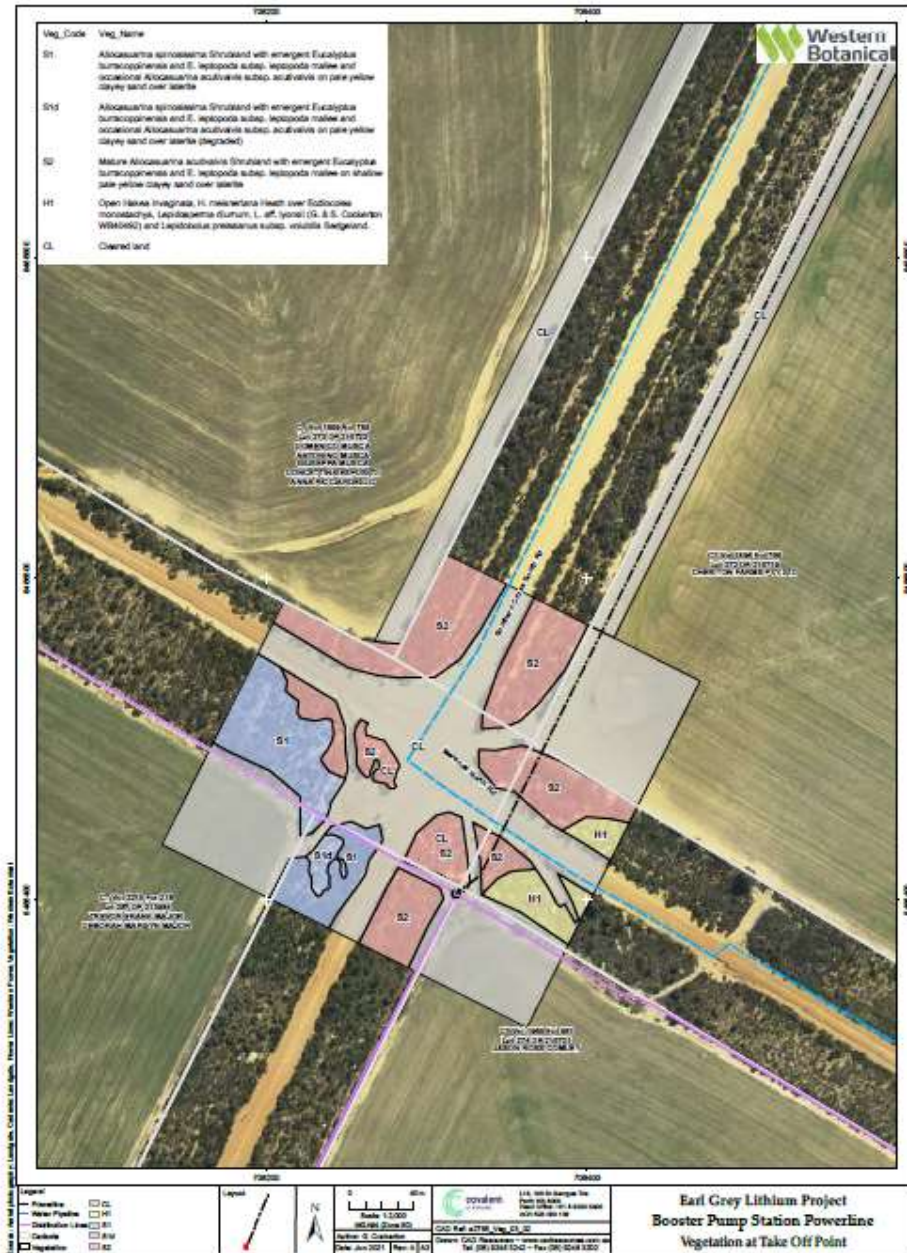


A species – sites matrix for the Southern Study Area is presented in Table 5.

Figure 6. Southern Study Area – Crossing over the Hyden – Southern Cross Road



Figure 7. Southern Study Area – Take off Point



VegUnit	Veg_Code	area m2	area ha
Cleared land	CL	182.542	
Cleared land	CL	39.335	
Cleared land	CL	0.547	
<b>Total</b>		<b>222.424</b>	<b>0.0222424</b>
Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite	S2	388.785	
Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite	S2	168.94	
Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite	S2	592.948	
Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite	S2	10.371	
Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite	S2	742.916	
Mature <i>Allocasuarina acutivalvis</i> Shrubland with emergent <i>Eucalyptus burracoppinensis</i> and <i>E. leptopoda</i> subsp. <i>leptopoda</i> mallee on shallow pale yellow clayey sand over laterite	S2	549.207	
<b>Total</b>		<b>2453.17</b>	<b>0.2453167</b>
Open <i>Hakea invaginata</i> , <i>H. meisneriana</i> Heath over <i>Ecdiocola monostachya</i> , <i>Lepidosperma diurnum</i> , <i>L. aff. lyonsii</i> (G. & S. Cockerton WB40492) and <i>Lepidobolus preissianus</i> subsp. <i>volubilis</i> Sedgeland.	H1	66.397	0.0066397
<b>Total</b>			<b>0.2741988</b>

Table 1: Vegetation types within the application area (extracted from Western Botanical, 2021)

## Appendix E. Sources of information

### E.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://www.data.wa.gov.au)):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)

- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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