



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9023/1
Permit Holder:	Electricity Generation and Retail Corporation trading as Synergy
Duration of Permit:	From 7 January 2021 to 7 January 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 installation of groundwater monitoring wells and an access track.

2. Land on which clearing is to be done

Locality Lot 500 on Deposited Plan 59628, Pinjar
Perry Road Reserve (PIN – 1262242), Pinjar

3. Clearing authorised

The permit holder must not clear more than 0.035 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:

- (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.

5. Weed and dieback 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* 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 known dieback or weed-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

6. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner from south to north 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">(a) the species composition, structure, and density of the cleared area;(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;(c) the date that the area was cleared;(d) the size of the area cleared (in hectares);(e) the direction of clearing;(f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and(g) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 5.

8. Reporting

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

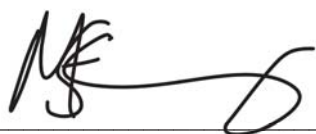
DEFINITIONS

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

Table 2: Definitions

Term	Definition
<i>CEO</i>	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
<i>clearing</i>	has the meaning given under section 3(1) of the <i>EP Act</i> .
<i>condition</i>	a condition to which this clearing permit is subject under section 51H of the <i>EP Act</i> .
<i>dieback</i>	means the effect of <i>Phytophthora</i> species on native vegetation.
<i>EP Act</i>	<i>Environmental Protection Act 1986</i> (WA)
<i>fill</i>	means material used to increase the ground level, or to fill a depression.
<i>mulch</i>	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
<i>native vegetation</i>	has the meaning given under section 3(1) and section 51A of the <i>EP Act</i> .
<i>weeds</i>	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.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

15 December 2020

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

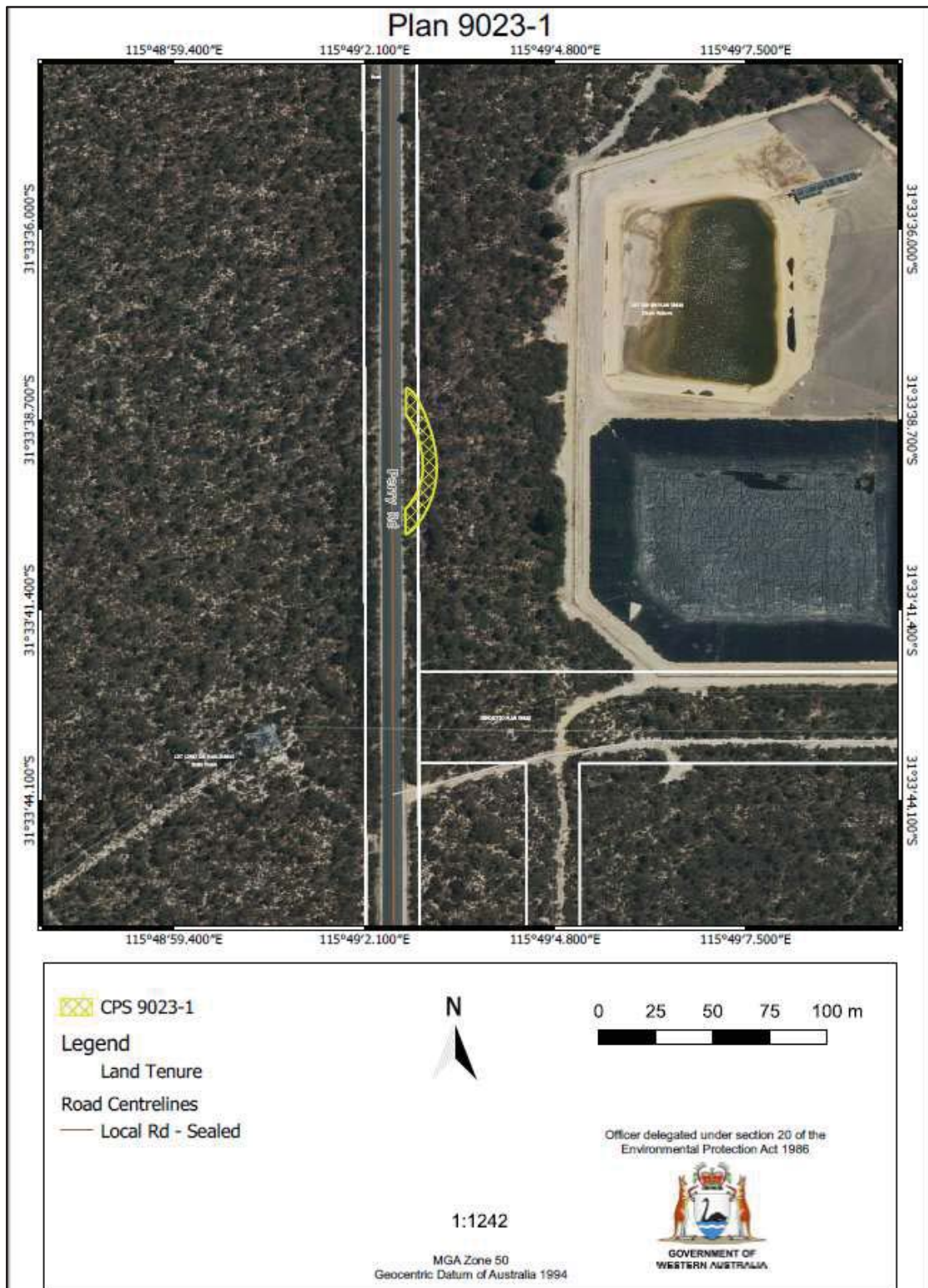


Figure 1: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 9023/1
Permit type:	Purpose Permit
Applicant name:	Electricity Generation and Retail Corporation trading as Synergy
Application received:	25 August 2020
Application area:	0.035 hectares of native vegetation
Purpose of clearing:	Installation of groundwater monitoring wells and an access track.
Method of clearing:	Mechanical
Property:	Lot 500 on Deposited Plan 59628 Perry Road Reserve (PIN – 1262242)
Location (LGA area):	City of Wanneroo
Localities (suburb):	Pinjar

1.2. Description of clearing activities

The proposed clearing is affiliated with the Pinjar Gas Turbine Station. The 0.035 hectares of clearing proposed is required for the construction of two new groundwater monitoring wells, paired in one location, and an ancillary access track required to construct the wells. Proposed clearing is immediately adjacent to Perry Road, and the groundwater monitoring wells are required as a part of a network of monitoring wells to minimise the risk of contamination to the Gngara groundwater resource.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	15 December 2020
Decision area:	0.035 hectares of native vegetation on the east side of Perry Road 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), the findings of a flora and vegetation survey and supporting information (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments, and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the purpose of the clearing to install groundwater wells to monitor the Gngara groundwater resource.

The assessment identified that the proposed clearing will result in the loss of 0.035 hectares of Bush Forever Site 380 (Rosella Road Bushland, Bullsbrook) that includes Banksia Woodland of the Swan Coastal Plain threatened ecological community, providing foraging habitat for the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and habitat for the Priority 4 Quenda (*Isoodon fusciventer*). The proposed clearing also has the potential to result in the introduction and spread of weeds and dieback into adjacent vegetation, which could impact on its habitat quality.

After consideration of the available information and the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that after revegetation, the area remaining cleared will be 0.023 hectares. The proposed clearing is unlikely to have any long-term adverse impacts on the environment. Weed and dieback management practices will mitigate any potential impacts to adjacent vegetation. Slow and directional clearing will allow fauna to move into adjacent native vegetation ahead of the clearing activity.

With the management measures specified above, the clearing of 0.035 hectares of Bush Forever, Banksia Woodland and Carnaby's foraging habitat will not result in a significant residual impact and an offset is not required.

The Delegated Officer decided to grant a clearing permit subject to conditions to take hygiene steps to minimise the risk of the introduction and spread of weeds and fauna management.

1.5. Site map

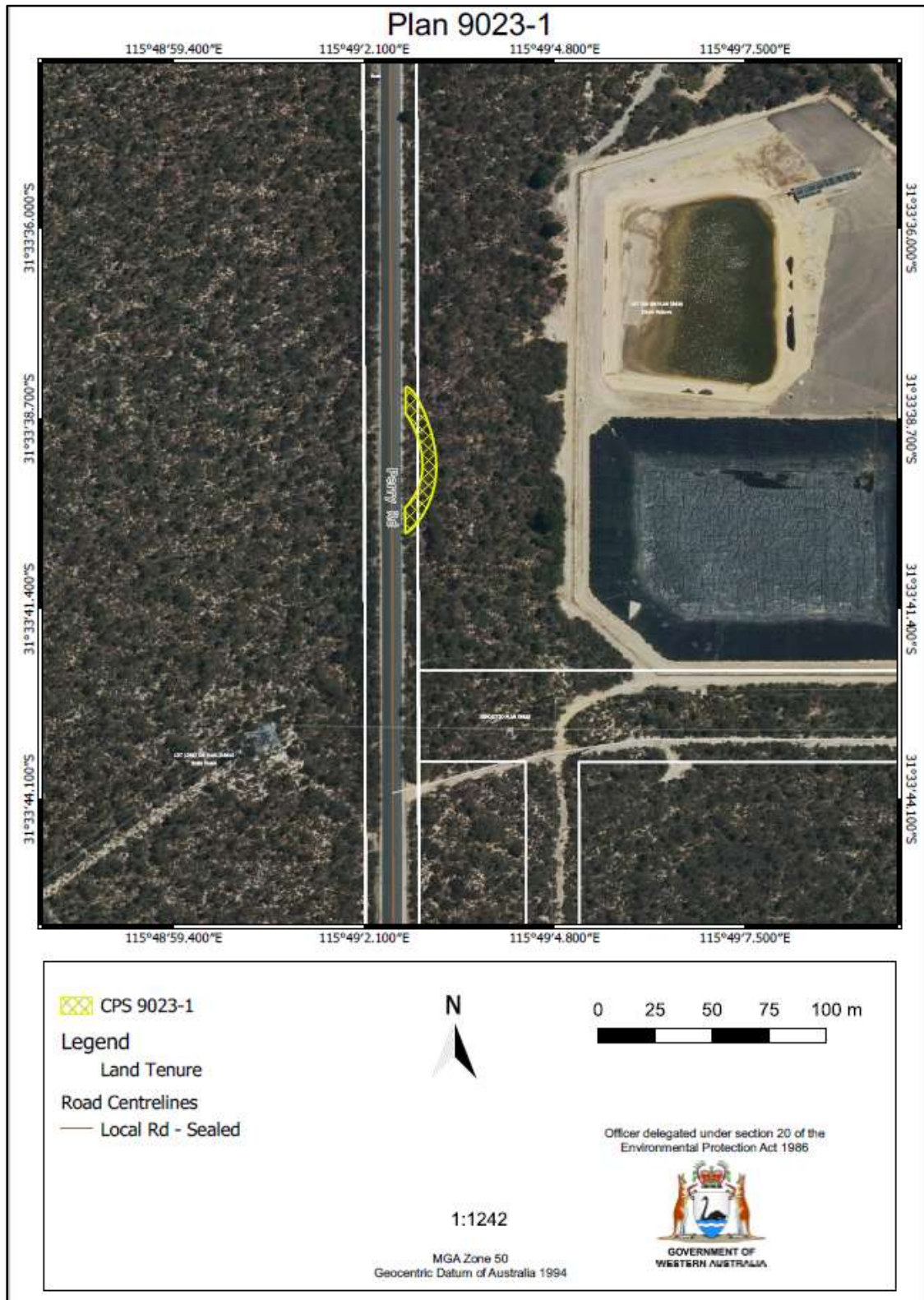


Figure 1. Map of area approved to clear. The area cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

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 3), 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; and
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER October 2019)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Electricity Generation and Retail Corporation, trading as Synergy, operate the Pinjar Gas Turbine Station. The power station is located on the Gngara groundwater mound in a Priority 1 groundwater protection area in close proximity to the Water Corporation's production borefield used to supply drinking water to the greater Perth area. As such, the power station is designed and operated with stringent environmental management measures to minimise the risk of contamination of the groundwater resource, including the ongoing monitoring of a network of monitoring wells. A Synergy instigated review identified a need to expand the monitoring well network to improve the hydrogeological setting of the power station, and to better protect human health and the environment. Existing groundwater wells are either at capacity or in need of repair and Synergy proposes to install two new groundwater wells (19U and 19L) at the same location two metres apart (at differing depths) supported by an ancillary access track (GHD 2020). The proposed development will improve the understanding of the power station hydrogeological setting by drilling and logging soil cores adjacent to the Pinjar Gas Turbine Station in locations not previously investigated, and improve the facility's environmental monitoring network by installing additional groundwater wells.

A number of alternatives were considered, and the clearing footprint has been minimised as far as possible. The semi-circular configuration of the access track off Perry Road (**Figure 1**) has several advantages. A drilling rig would normally require a 20 metre by 20 metre footprint to turn around at a dead end. The semi-circular configuration avoids this requirement with the drilling rig (at three metres by six metres) not requiring to be turned around. Being immediately adjacent to Perry Road also avoids additional clearing required to access a more distant site. The semi-circle design also facilitates access for ongoing monitoring at a frequency of eight to twelve times per year, as well as ongoing maintenance of the infrastructure. In addition, Perry Road supports heavy trucks and has a 90 kilometre per hour speed limit, so reversing onto the road is not considered safe. Alternatives would also clear more vegetation in Excellent condition, as opposed to Good condition, due to the vegetation adjacent to Perry Road exhibiting signs of edge effects with weeds dominating the understorey (Synergy 2020a).

An original clearing area of 0.0461 hectares, as advocated in GHD (2020), has been reduced to the proposed 0.035 hectares by reducing the width of the access track required for heavy vehicle usage from eight metres down to six metres; that is a 25 per cent reduction.

All clearing and construction works will be undertaken in line with the existing Environmental Management Plan for the project. After the initial clearing required for heavy vehicles, the access track will be revegetated to a track width of four metres to facilitate access by light vehicles only. This will result in a final cleared area of 0.023 hectares. Observations of similar clearing within Lot 500 has shown that natural regeneration usually occurs. However, on completion of the drilling works Synergy will undertake brushing along the edges of the access track to facilitate this natural regeneration. Monthly inspections of the revegetation of the access track will be incorporated into Synergy's existing monthly environmental inspections of the Pinjar Gas Turbine Station (Synergy 2020c).

The application area was selected to minimise possible clearing as alternative sites require a larger footprint clearing due to the requirement of a longer access track, associated drilling pad and a turnaround area. There are no suitable alternative locations available that would require less clearing, or have less impact, than the location proposed (Synergy 2020a). 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 environmental impacts

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 impacts of the proposed clearing present a risk to biological values and conservation areas. The consideration of these impacts, 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. Environmental value: biological values (biodiversity) – Clearing Principle (a)

Assessment: A vegetation assessment of the application area was completed on 2 April 2020 by GHD (2020). The vegetation over the application area is described as a Banksia Woodland of: *Banksia menziesii*, *Banksia attenuata* and *Banksia ilicifolia* woodland over *Kunzea glabrescens* and *Xanthorrhoea preissii* tall to mid open shrubland over *Mesomelaena pseudostygia*, *Lyginia barbata* and *Lyginia imberbis* sedgeland.

The application area is located immediately adjacent to Perry Road and vegetation condition was assessed by GHD (2020) as Good (Keighery 1994) in areas directly adjacent to Perry Road and Excellent for the vegetation further east. The vegetation in Good condition showed signs of edge effects from Perry Road in the form of common bushland weeds that had out-competed lower stratum native species in dominance (GHD 2020).

The application area is not mapped regionally as the Banksia Woodland of the Swan Coastal Plain, however, this ecological community is mapped immediately to the west and east of the application area. An assessment by GHD (2020) determined that the vegetation present over the application area is representative of the Banksia Woodland of the Swan Coastal Plain Threatened Ecological Communities (TEC) listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and listed as a Priority 3(iii) Priority Ecological Communities (PEC) by the Department of Biodiversity, Conservation and Attractions (DBCA) (Appendix D).

The community is also inferred to represent the Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands ('floristic community type 23b') listed as a Priority 3(i) PEC by the DBCA. This community is 'inferred' only as a statistical FCT analysis was not undertaken by GHD (2020). The Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands forms a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC. These woodlands occur in the Bassendean system from Melaleuca Park to Gingin, and occur in reasonably extensive Banksia woodlands north of Perth (DBCA 2020).

Eleven Priority flora taxa have been recorded within ten kilometres of the application area with three species within five kilometres; *Adenanthos cygnorum* subsp. *chamaephyton* (P3), *Pithocarpa corymbulosa* (P3) and *Styphelia filifolia* (P3) (GHD 2020). These species were not recorded by GHD (2020), however it is acknowledged that the survey was not conducted at an optimal time in respect to seasonality (GHD 2020).

The proposed clearing of 0.035 hectares of native vegetation is located on the edge of a remnant approximately 8,000 hectares in size (Bush Forever Site 380 - Rosella Road Bushland, Bullsbrook) (Government of Western Australia 2000). The proposed clearing is located within a degraded portion of native vegetation adjacent to an existing road. The clearing represents less than 0.0006 per cent of the Bush Forever Site 380 area, and the loss of this vegetation would not cause a decline in the ecological functioning of the Banksia Woodland of the Swan Coastal Plain ecological community.

Given that the vegetation type recorded in the application area extends over a large area, it is likely that any Priority flora recorded in the local area will occur in surrounding vegetation. Additionally, the application area is located in close proximity to State Forest vested in the Conservation and Parks Commission with suitable habitat, and any Priority flora species are likely to extend into conservation reserves in the local area.

Proposed clearing will involve the clearing of native vegetation in an area of high biodiversity. However, the proposed clearing area is minor and located on the edge of a large remnant adjacent to Perry Road. Adjacent vegetation is susceptible to Dieback disease (*Phytophthora* species) (Barber *et al.* 2013) and the introduction and spread of environmental weeds. The implementation of dieback and weed management strategies during construction will mitigate impacts to adjacent vegetation.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is not going to significantly impact on this environmental value.

Conditions: Weed and dieback management measures will mitigate impacts to adjacent vegetation.

3.2.2. Environmental value: Fauna habitat – Clearing Principle (b)

Assessment: Eleven birds and five mammals of conservation significance have been recorded within ten kilometres of the application area. Seven birds are wetland species and unlikely to occur. Of the Threatened mammals all are 'critical weight range' (CWR) mammals (with a weight between 35 grams and 5,500 grams) whose distribution and

abundance have declined severely, most likely due to fox and feral cat predation (Burbidge and McKenzie 1989) and are unlikely to occur in areas where fox and/or cat control is not being implemented. The Priority 4 Quenda (*Isodon fusciventer*) may occur in any areas of dense vegetation (van Dyck *et al.* 2008).

Of the remaining birds the specially protected Peregrine Falcon (*Falco peregrinus*) and migratory Fork-tailed Swift (*Apus pacificus*) may overfly the application area without utilising the habitat present. The application area is also within the modelled distribution of two species of black cockatoo known from the Perth metropolitan area; The Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the Vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*). No records of the Forest Red-tailed Black Cockatoo are known from the local area, and its preferred eucalypt woodland/forest habitat is not present. In contrast 167 records of Carnaby's Cockatoo are known from the local area, with records within 500 metres of the application area.

Black cockatoo habitat can be considered in terms of breeding, roosting and foraging habitat (Commonwealth of Australia 2017; DPAW 2013). No breeding habitat, in the form of tree hollows, is present over the application area (GHD 2020). Night roosts tend to be located in the largest trees within a particular area and in close proximity to both a water supply and a food supply (DAWE 2020; DSEWPaC 2012). A night roost utilised by Carnaby's Cockatoo is located within a pine plantation approximately 1.8 kilometres to the north-west of the application area. It is unlikely that the application area itself offers night-roosting habitat due to the lack of tall trees.

The Banksia Woodland identified within the application area offers foraging habitat for Carnaby's Cockatoo. Large foraging areas for Carnaby's Cockatoo have been mapped predominantly to the east of the application area, however, the application area has not been included within this mapping (Commonwealth of Australia 2017; DPAW 2011; EPA 2019).

Of the 0.035 hectares proposed for clearing, 0.012 hectares will be revegetated equating to a permanent loss of 0.023 hectares of Banksia Woodland providing potential habitat for the Priority 4 Quenda, and a feeding resource for the Endangered Carnaby's Cockatoo.

In the local context, large areas of native vegetation surround the application area, with over 61.5 per cent of native vegetation cover within ten kilometres of the application area, or over 19,000 hectares. The vast majority of this vegetation has also been mapped as Carnaby's Cockatoo feeding areas, with much of it located within protected conservation tenure (Section 3.2.3).

While vegetation within the application area is considered suitable habitat for the Priority 4 Quenda, and a feeding resource for the Endangered Carnaby's Cockatoos the proposed clearing area is minor and located on the edge of a large remnant. The application area does not comprise the whole, or a part of, nor is it necessary for the maintenance of a significant habitat for fauna, and very large areas of similar habitat in the same or better condition are present within the local area. The adjacent vegetation is susceptible to Dieback disease (*Phytophthora* species) (Barber, *et al.* 2013) and weed invasion which the clearing process may exacerbate.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is not going to significantly impact on this environmental value.

Conditions: To mitigate potential impacts from clearing, the following conditions will be added to the permit:

- Weed and dieback management measures to mitigate impacts to adjacent vegetation.
- Slow and directional clearing to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

3.2.3. Environmental value: Conservation areas – Clearing Principle (h)

Assessment: The application area comprises 0.014 hectares within the Perry Road reserve (PIN 1262242) and 0.021 hectares within Reserve R 50389. The Perry Road reserve is vested in the Shire of Wanneroo, and Reserve R 50389 is a C Class reserve with Electricity Generation and Retail Corporation (Synergy) being the responsible agency, with the purpose of Power Station and Ancillary Services.

The application area, including the Perry Road reserve and R 50389, is also located wholly within Bush Forever Site 380 (Rosella Road Bushland, Bullsbrook) (Government of Western Australia 2000). Bush Forever Site 380 incorporates over 8,000 hectares of bushland incorporating large components of the Gngangara-Moore River State Forest (State Forest 65), as well as the Department of Defence RAAF Base Pearce (Mucchea) Air Weapons Range, and Yeal Nature Reserve (Government of Western Australia 2000).

State Forest 65 is vested in the Conservation and Parks Commission and managed by the DBCA, and is located approximately 18 metres away from the application area, immediately west of the Perry Road reserve. State Forest 65 dominates the local area to the west, east and north. The contiguous Yeal Nature Reserve is located approximately 6.9 kilometres to the north-east of the application area.

The application area and DBCA managed lands (State Forest 65) are separated by Perry Road. The proposed clearing is minimal and will not likely impact DBCA managed lands.

In the local context, the application area is located within Bush Forever Site 380, but on the edge of a large vegetation remnant. The applicant has reduced the area required, with the clearing area minimal and representing approximately 0.0005 per cent of the total area of Bush Forever Site 380. Of the 0.035 hectares proposed for clearing 0.012 hectares will be revegetated. The proposed clearing is unlikely to impact Bush Forever Site 380 or sever any ecological connectivity. However, there is potential that the proposed clearing activities could result in the introduction or spread of weeds and/or dieback into adjacent vegetation, which could impact on habitat quality.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is not going to significantly impact on this environmental value.

Conditions: Weed and dieback management measures will mitigate potential impacts from clearing to adjacent vegetation.

3.3. Relevant planning instruments and other matters

The application was advertised on the DWER website for a 21 day public comment period on 22 October 2020. No public submissions were received in relation to this application.

A portion of the application area (0.014) hectares is located within the Perry Road reserve (PIN 1262242). The Shire of Wanneroo is the public authority that manages this portion of the application area and has provided the applicant with the authority to access (Synergy 2020b).

The application area comprises 0.021 hectares within Lot 500 on Deposited Plan 59628 (Reserve R 50389). Lot 500 is reserved for Public Purposes – State Energy Commission, under the Metropolitan Region Scheme (MRS), and subject to a Management Order. Reserve R 50389 is a 'C Class' reserve with the Electricity Generation and Retail Corporation (Synergy) being the responsible agency, with the purpose of Power Station and Ancillary Services, and a land use of Electricity Generation. The current use of Lot 500 as a gas turbine station is consistent with the intent and purpose of the reservation of the land under the MRS.

Proposed clearing is within a Bush Forever Area (Bush Forever Site No. 380 – Rosella Road Bushland, Bullsbrook). Proposed clearing therefore requires approval of the Western Australian Planning Commission (WAPC), in accordance with the MRS. Conditional development approval from WAPC (DA2020/503) has been obtained by the applicant (Synergy 2020a). The applicant has provided the WAPC approval to the City of Wanneroo who has advised that no further development application was required (Synergy 2020a). The City of Wanneroo has also advised DWER that it does not object to the removal of the 0.035 hectares of native vegetation (City of Wanneroo 2020).

State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region (SPP 2.8) sets out that proposals and decision making in respect of Bush Forever areas should support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision is consistent with the overall purpose and intent of the existing Crown reserve or can be reasonably justified with regard to wider environmental, social, economic or recreational needs (clause 5.1.2.1(i)(e)).

SPP 2.8 also sets out that unavoidable adverse impacts on regionally significant bushland within a Bush Forever area should be offset at a ratio of at least 1:1 in habitat hectares. GHD (2020) provide an assessment of the proposed clearing against the impact assessment criteria set out in SPP 2.8. With regard to the extent of the proposed clearing, the composition and condition of the vegetation, and the applicant's proposed revegetation of unused portions it is considered that the proposed clearing will not result in fragmentation or sever any ecological connectivity, nor significantly impact upon the viability of Bush Forever Site 380. On this basis it is considered that the proposed clearing does not constitute a significant residual impact, and that an offset is not required.

The Pinjar Gas Turbine Station is located on the Gngangara groundwater mound and in close proximity to the Water Corporation's production borefield used to supply drinking water to the greater Perth area. As such, the power station is designed and operated with stringent environmental management measures to minimise the risk of causing contamination of the groundwater resource, including regular monitoring of a network of monitoring wells. The proposed groundwater wells and access track are designed to improve the existing groundwater monitoring network, and lower the risks to human health and the environment posed by any un-intended contamination. The wells are required to ensuring the gas turbine station remains fully compliant with Synergy's environmental commitments associated the power station operation. The clearing of native vegetation is necessary to allow for the installation and operation of the groundwater wells and associated access. Proposed clearing is therefore consistent with the overall purpose and intent of Reserve R 50389, and in keeping with the intended use as they support the operation of the Pinjar Gas Turbine Station.

Proposed clearing is located within the Gngangara Groundwater area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) and within the Gngangara Underground Water Pollution Control Area (Priority 1) Public Drinking Water Supply Area (PDWSA), and also partially within a wellhead protection zone (DWER 2020a). Advice from the Water Source Protection Planning team of DWER was received. The Water Source Protection Planning team considers that given that the clearing is relatively minor, and the purpose is to install groundwater monitoring bores that will better protect the drinking water source, the team has no objection to the clearing (DWER 2020a). However, the applicant should refer to best management practices when undertaking the clearing and bore installation including Water Quality Protection Notes 10 (Contaminant spills), 30 (Groundwater monitoring bores) and 56 (Tanks for fuel and chemical storage near sensitive water resources) available from the DWER website (DWER 2020a).

Synergy has a groundwater abstraction licence under 5C of the RIWI Act, and a groundwater monitoring program as part of its Environmental Management System (EMS). The new wells will be added to this groundwater monitoring program. Advice from the DWER Program Manager: Swan-Avon was received. No additional permitting is required under the RIWI Act due to a monitoring well exemption whereby a licence to construct a well is not required if the development is within the water table (non-artesian) aquifer, and the well is required for monitoring water level and water quality (DWER 2020b)

Proposed clearing is also located within a Water Catchments reservation under the MRS. *State Planning Policy No. 2.2 – Gngangara Groundwater Protection Policy* (SPP 2.2) aims to ensure that development and land-use changes in the policy area do not detrimentally impact upon the groundwater resource. The new wells will act as 'sentinel wells' providing early warning of any potential contamination risk on the nearby Water Corporation drinking water supply bores, as well as confirming the hydrogeological setting of the site which is critical to assessing and understanding the groundwater risk. The proposed works are therefore considered compatible with the intent of PDWSA and the Water Catchments reservation as the new wells will improve groundwater monitoring capability in areas that are otherwise not covered.

The application area is located within the registered Native Title boundaries of the Whadjuk People (WAD242/2011), and associated Whadjuk People Indigenous Land Use Agreement (ILUA) (3130). Three Native Title claims have been filed; Swan River People 2 (WAD24/2011), Single Noongar Claim (Area 1) (WAD6006/2003), and Single Noongar Claim Group Compensation Claim (WAD580/2019). No Aboriginal Heritage Places (Registered Sites or Other Heritage Place) have been identified in the local 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.

Appendix A – Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix B.

1. Site summary

Site characteristic	Details
Local context	<p>The application area is situated within the Swan Coastal Plain (SWA) bioregion of Thackway and Cresswell (1995), and the Perth subregion (SWA02).</p> <p>The proposed 0.035 hectares of clearing proposed is affiliated with the Pinjar Gas Turbine Station and required for the construction of two new groundwater monitoring wells. Proposed clearing is immediately adjacent to, and east of, Perry Road and entails a six metre access track off Perry Road for approximately 60 metres in length. The application area is located approximately 45 kilometres north of Perth within Bush Forever Site 380 (Rosella Road Bushland, Bullsbrook).</p> <p>Spatial data indicates that the local area (ten kilometre radius of the proposed clearing area) retains over 60 per cent of the original native vegetation cover.</p>
Landform and climate	<p>The application is located within the Bassendean Dunal System of gently undulating dunes made up of well-bleached white-grey sands. The climate of the area is warm and temperate. The winter months have higher rainfall than summer months with an annual rainfall of approximately 755 millimetres (BOM 2020).</p>
Vegetation description Heddle et al. (1980)	<p>The application area has been mapped by Heddle <i>et al.</i> (1980) as updated by Webb <i>et al.</i> (2016) as the Karrakatta Complex-North (System 6 ID 47) described as:</p> <ul style="list-style-type: none"> Predominantly low open forest and low woodland of <i>Banksia</i> species, <i>Eucalyptus todtiana</i> (Pricklybark), less consistently open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus todtiana</i> (Pricklybark) - <i>Banksia</i> species. <p>A vegetation assessment of the application area was completed on 2 April 2020 by GHD (2020) with the vegetation over the application area described as a <i>Banksia</i> Woodland of: <i>Banksia menziesii</i>, <i>Banksia attenuata</i> and <i>Banksia ilicifolia</i> woodland over <i>Kunzea glabrescens</i> and <i>Xanthorrhoea preissii</i> tall to mid open shrubland over <i>Mesomelaena pseudostygia</i>, <i>Lyginia barbata</i> and <i>Lyginia imberbis</i> sedgeland (Appendix D).</p>
Vegetation condition (Keighery 1994)	<p>The vegetation condition over the application area was assessed by GHD (2020) as Good in areas directly adjacent to Perry Road and Excellent for the vegetation further east of the road.</p> <p>The full Keighery condition rating scale is provided in Appendix C.</p>
Conservation areas	<p>The entire application area is located wholly within Bush Forever Site 380 ('Rosella Road Bushland, Bullsbrook') (Government of Western Australia 2000). The Gngangara -Moore River State Forest vested in the Conservation and Parks Commission and managed by the Department of Biodiversity, Conservation and Attractions (DBCA) is located approximately 18 metres to the west, immediately adjacent to the Perry Road reserve.</p>
Environmentally sensitive areas	<p>The entire application area is located within an Environmentally Sensitive Area (ESA)</p>
Ecological linkages	<p>The application area is not located in a recognised formal ecological linkage. The Gngangara Mound Ecological Linkage of Brown <i>et al.</i> (2009), and Sonneman and Brown (2008) is mapped approximately 430 metres to the west.</p>

Site characteristic	Details																																								
Soil description (Schoknecht, et al. 2004)	The application area is located on the well-drained Bassendean sands (Jandakot phase) of the Swan Coastal Plain (212Bs_Ja), consisting of grey sands over pale yellow sands generally underlain by humic and iron podsols. Because of their age, any chemicals (e.g. calcium carbonate) have long since leached out.																																								
Land degradation risk (DPIRD 2017)	<p>Land degradation risk ratings mapped over the application area are provided in the table below (DPIRD 2017).</p> <table border="1"> <thead> <tr> <th>Aspect</th> <th colspan="3">Hazard rating</th> </tr> </thead> <tbody> <tr> <td>Wind Erosion</td> <td>High</td> <td>(H1)</td> <td>50-70% of mapped unit has a high to extreme risk</td> </tr> <tr> <td>Water Erosion</td> <td>Low</td> <td>(L1)</td> <td><3% of mapped unit has a high to extreme risk</td> </tr> <tr> <td>Salinity</td> <td>Low</td> <td>(L1)</td> <td><3% of mapped unit has a high to extreme risk</td> </tr> <tr> <td>Phosphorus export</td> <td>High</td> <td>(H2)</td> <td>>70% of mapped unit has a high to extreme risk</td> </tr> <tr> <td>Acid Sulphate Soils</td> <td colspan="2">Moderate to Low</td> <td>(Class 2)</td> </tr> <tr> <th>Aspect</th> <th colspan="3">Hazard rating</th> </tr> <tr> <td>Flood Risk</td> <td>Low</td> <td>(L1)</td> <td><3% of mapped unit has a high to extreme risk</td> </tr> <tr> <td>Water-logging</td> <td>Low</td> <td>(L1)</td> <td><3% of mapped unit has a high to extreme risk</td> </tr> <tr> <td>Floodplains</td> <td colspan="3">None in the vicinity</td> </tr> </tbody> </table>	Aspect	Hazard rating			Wind Erosion	High	(H1)	50-70% of mapped unit has a high to extreme risk	Water Erosion	Low	(L1)	<3% of mapped unit has a high to extreme risk	Salinity	Low	(L1)	<3% of mapped unit has a high to extreme risk	Phosphorus export	High	(H2)	>70% of mapped unit has a high to extreme risk	Acid Sulphate Soils	Moderate to Low		(Class 2)	Aspect	Hazard rating			Flood Risk	Low	(L1)	<3% of mapped unit has a high to extreme risk	Water-logging	Low	(L1)	<3% of mapped unit has a high to extreme risk	Floodplains	None in the vicinity		
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Floodplains	None in the vicinity																																								
Waterbodies	There are no wetlands or watercourses within the vicinity of the application area with the closest Geomorphic Wetland located approximately 1.8 kilometres to the west (conservation category dampland - UFI 7936), and the closest mapped watercourse over 4.5 kilometres distant.																																								
Hydrogeography	<table border="1"> <tbody> <tr> <td>Division</td> <td>South West</td> </tr> <tr> <td>Basin</td> <td>Swan Coastal</td> </tr> <tr> <td>Catchment</td> <td>Swan Avon-Lower Swan</td> </tr> <tr> <td>Metropolitan Region Scheme (MRS)</td> <td>Water Catchment reservation</td> </tr> </tbody> </table> <p>Rights in Water and Irrigation Act 1914</p> <table border="1"> <tbody> <tr> <td>Surface water areas and irrigation districts</td> <td>None within 10 kms</td> </tr> <tr> <td>Rivers</td> <td>None within 10 kms</td> </tr> <tr> <td>Groundwater areas</td> <td>Located within the proclaimed Gnangara Groundwater area (Draft)</td> </tr> </tbody> </table> <p>Country Areas Water Supply Act 1947</p> <table border="1"> <tbody> <tr> <td>Clearing control catchments</td> <td>None within 10 kms</td> </tr> </tbody> </table> <p>Other</p> <table border="1"> <tbody> <tr> <td>Public Drinking Water Supply Area (PDWSA)</td> <td>Located within the Gnangara Underground Water Pollution Control Area (Priority 1)</td> </tr> </tbody> </table>	Division	South West	Basin	Swan Coastal	Catchment	Swan Avon-Lower Swan	Metropolitan Region Scheme (MRS)	Water Catchment reservation	Surface water areas and irrigation districts	None within 10 kms	Rivers	None within 10 kms	Groundwater areas	Located within the proclaimed Gnangara Groundwater area (Draft)	Clearing control catchments	None within 10 kms	Public Drinking Water Supply Area (PDWSA)	Located within the Gnangara Underground Water Pollution Control Area (Priority 1)																						
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2. Vegetation extent

2a) Regional vegetation mapping (Government of Western Australia 2019a and 2019b)

Factor		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 (%)
Swan Coastal Plain Bioregion	SWA	1,501,222	579,814	38.6	153,955	10.26
Karrakatta Complex-North	Veg Type 47	44,273	19,976	45.1	12,501	28.2

2b) Remnant vegetation within ten kilometres of the application area

Remnant Vegetation	Hectares (ha)	Remaining %
Total Area (10 km radius)	31,546	
Remnant vegetation remaining	19,065	60.4 %

3. Ecological communities, flora, and fauna

3a) Conservation significant ecological communities

No Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for the Environment have been mapped within the immediate vicinity of the application area. The closest mapped TEC is the Endangered SCP26a (*Melaleuca huegelii* - *Melaleuca systena* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson *et al.* (1994)), mapped approximately 8.2 kilometres to the south-west.

The vegetation assessment of the application area by GHD (2020) described the vegetation as a Banksia Woodland.

GHD (2020) determined that this community:

- Represents the Banksia woodland of the Swan Coastal Plain:
 - listed as an Endangered TEC under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and
 - listed as a Priority 3(iii) Priority Ecological Communities (PEC) by DBCA.
- Is inferred to represent the Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands ('floristic community type 23b') listed as a Priority 3(i) PEC by the DBCA. This community is 'inferred', as a statistical FCT analysis was not undertaken by GHD (2020). The Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands forms a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC Act listed TEC.

3b) Conservation significant flora

Two Threatened flora taxa, and 11 Priority flora taxa have been recorded within ten kilometres of the application area.

Threatened flora taxon	Status	No. of Records	Closest Record (m)
<i>Melaleuca</i> sp. Wanneroo (G.J. Keighery 16705)	EN	4	9,491
<i>Eucalyptus argutifolia</i>	VU	4	9,355

Priority flora taxon	Status	No. of Records	Closest Record (m)
<i>Baeckea</i> sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1	1	8,088
<i>Acacia benthamii</i>	P2	1	7,876
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	P3	2	1,760
<i>Cyathochaeta teretifolia</i>	P3	1	9,562
<i>Pithocarpa corymbulosa</i>	P3	1	6,149
<i>Stylidium maritimum</i>	P3	2	7,535
<i>Styphelia filifolia</i>	P3	1	4,408
<i>Hibbertia helianthemoides</i>	P4	1	7,077
<i>Jacksonia sericea</i>	P4	1	9,012
<i>Stylidium longitubum</i>	P4	2	8,598
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	P4	2	8,788

3c) Conservation significant fauna

Eleven birds and five mammals of conservation significance have been recorded within ten kilometres of the application area.

Common Name	Taxon	Status	No. of Records	Closest Record (m)
BIRDS				
Carnaby's Cockatoo	<i>Calyptorhynchus latirostris</i>	EN	167	385
Curlew Sandpiper	<i>Calidris ferruginea</i>	CR	1	6,671
Australasian Bittern	<i>Botaurus poiciloptilus</i>	EN	3	6,671
White-Tailed Black Cockatoo	<i>Calyptorhynchus</i> sp. 'white-tailed'	EN	20	6,671
Fork-tailed Swift	<i>Apus pacificus</i>	IA	2	6,671
Red-necked Stint	<i>Calidris ruficollis</i>	IA	2	6,671
Bar-tailed Godwit	<i>Limosa lapponica</i>	IA	1	6,671
Glossy Ibis	<i>Plegadis falcinellus</i>	IA	3	6,671
Common Greenshank	<i>Tringa nebularia</i>	IA	1	6,671
Peregrine Falcon	<i>Falco peregrinus</i>	OS	6	6,671
Blue-billed Duck	<i>Oxyura australis</i>	P4	13	6,671
MAMMALS				
Woylie	<i>Bettongia penicillata ogilbyi</i>	CR	1	8,029
Black-flanked Rock-wallaby	<i>Petrogale lateralis lateralis</i>	EN	1	8,029
Boodie (inland)	<i>Bettongia lesueur graii</i>	EX	1	8,029
Quenda	<i>Isodon fusciventer</i>	P4	1	8,029
Chuditch	<i>Dasyurus geoffroii</i>	VU	1	8,029

Appendix B – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Environmental value: biological values		
<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 vegetation of the application area represents the Banksia woodland of the Swan Coastal Plain community. The vegetation is inferred to represent the Swan Coastal Plain <i>Banksia attenuata</i>-<i>Banksia menziesii</i> woodlands listed as a Priority 3(i) PEC by the DBCA. Two Threatened flora taxa, and 11 Priority flora taxa have been recorded within ten kilometres of the application area.</p>	May be at variance	Yes Refer to Section 3.2.1
<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> Eleven birds and five mammals of conservation significance have been recorded within ten kilometres of the application area. Banksia Woodland offers foraging habitat for the Endangered Carnaby’s Cockatoo (<i>Calyptorhynchus latirostris</i>).</p>	May be at variance	Yes Refer to Section 3.2.2
<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> No Threatened flora taxa have been recorded within nine kilometres of the application area. <i>Eucalyptus argutifolia</i> and <i>Melaleuca</i> sp. Wanneroo (G.J. Keighery 16705) were not recorded by GHD (2020). Due to the small size of the application area and separation distance to known records, the application area is unlikely to include, or be necessary for the continued existence of Threatened flora.</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> No Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for the Environment have been mapped within the immediate vicinity of the application area. No State listed TECs were recorded within the application area (GHD 2020).</p>	Not at variance	No
Environmental values: significant remnant vegetation and conservation areas		
<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 national objectives and targets for biodiversity conservation in Australia has a target to prevent the clearance of ecological communities with an extent below 30 per cent of that present prior to the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001).</p> <p>The proposed clearing area intersects the Karrakatta complex-North. Vegetation of the application area is broadly consistent with the Karrakatta complex-North. The Karrakatta complex-North retains over 19,950 hectares, or over 45 per cent of its original extent within the Swan Coastal Plain (Government of Western Australia 2019b). Over 61 per cent of native vegetation is retained within the local area, the majority of which is within lands protected for conservation. The 0.035 hectares of native vegetation proposed to be cleared is not considered</p>	Not at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
significant as a remnant of native vegetation within an area that has been extensively cleared.		
<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> The entire application area is located wholly within Bush Forever Site 380 of the Rosella Road Bushland, Bullsbrook (Government of Western Australia 2000b). The Gngangara-Moore River State Forest vested in the Conservation and Parks Commission and managed by the DBCA is located approximately 15 metres to the west, immediately adjacent to the Perry road reserve.</p>	May be at variance	Yes Refer to Section 3.2.3
Environmental values: land and water resources		
<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> There are no wetlands or watercourses within the vicinity of the application area. Vegetation described by GHD (2020) does not represent riparian vegetation. The native vegetation proposed to be cleared is not growing in, or in association with, an environment 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 soils of the application area consist of the well-drained Bassendean sands (Jandakot phase) of the Swan Coastal Plain (212Bs_Ja). The Bassendean sands (Jandakot phase) are rated at a high risk of wind erosion and phosphorous export. The topography of the application area is predominantly flat and proposed clearing is minimal and, as such, no large exposed areas will be exposed to wind erosion. Soils will not be excavated at depth and no nutrients will be released as a component of the clearing. Noting the topography, soils, and minor extent of application area, the proposed clearing is not likely to cause appreciable land degradation.</p>	Not 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> The application area is located in the Swan-Avon / Lower Swan catchment with the Swan Coastal Basin. There are no wetlands or watercourses within the vicinity of the application area. Proposed clearing is located within the Gngangara Groundwater area (Draft) proclaimed under the RIWI Act and also located within the Gngangara Underground Water Pollution Control Area (Priority 1) PDWSA. Proposed clearing of native vegetation is minimal and is unlikely to cause any deterioration in the quality of surface or underground water.</p>	Not 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> The topography of the application area is predominantly flat, soils are well-drained, and there are no wetlands or watercourses within the vicinity. Flood risk is rated as low (L1) with risk of water-logging also rated as low (L1) (DPIRD 2017). The minor clearing proposed is unlikely to cause, or exacerbate, the incidence or intensity of flooding.</p>	Not 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.

Measuring Vegetation Condition for the South West and Interzone Botanical Province (Keighery, 1994)

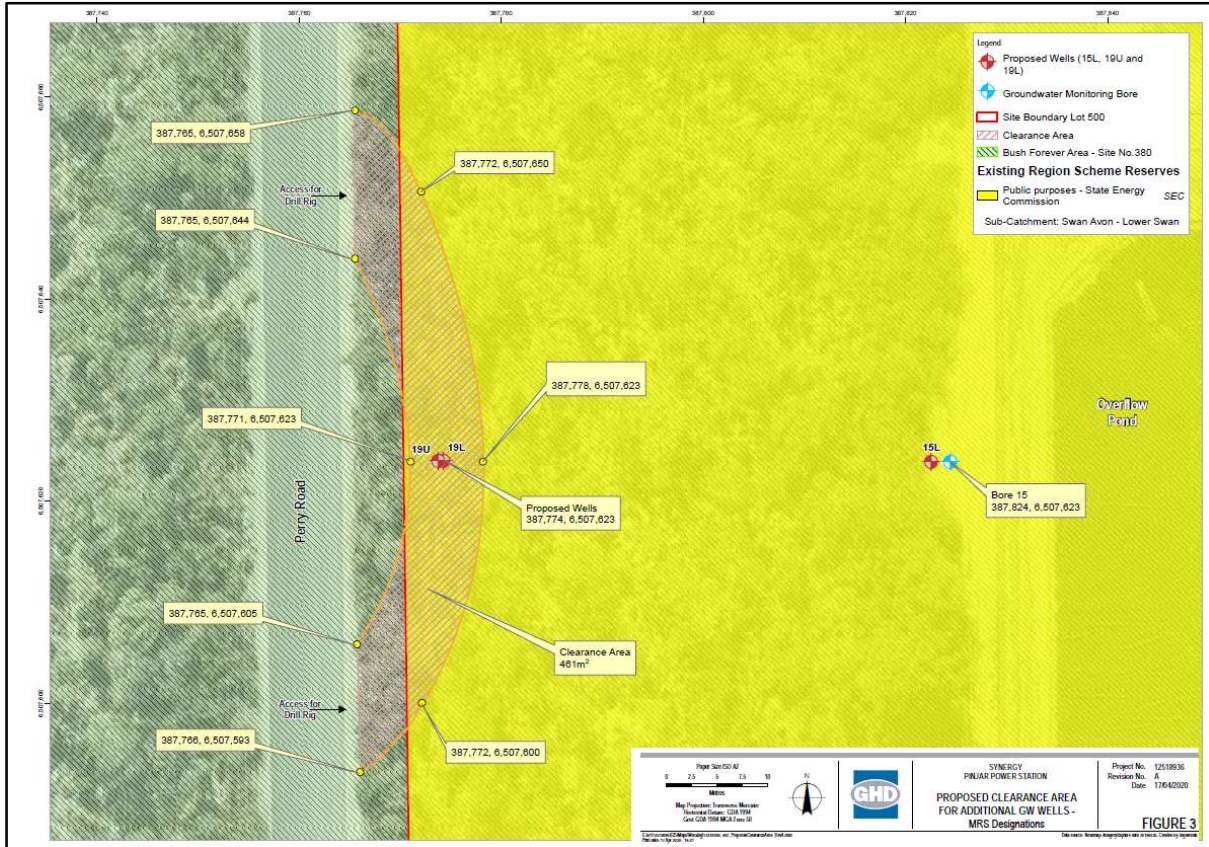
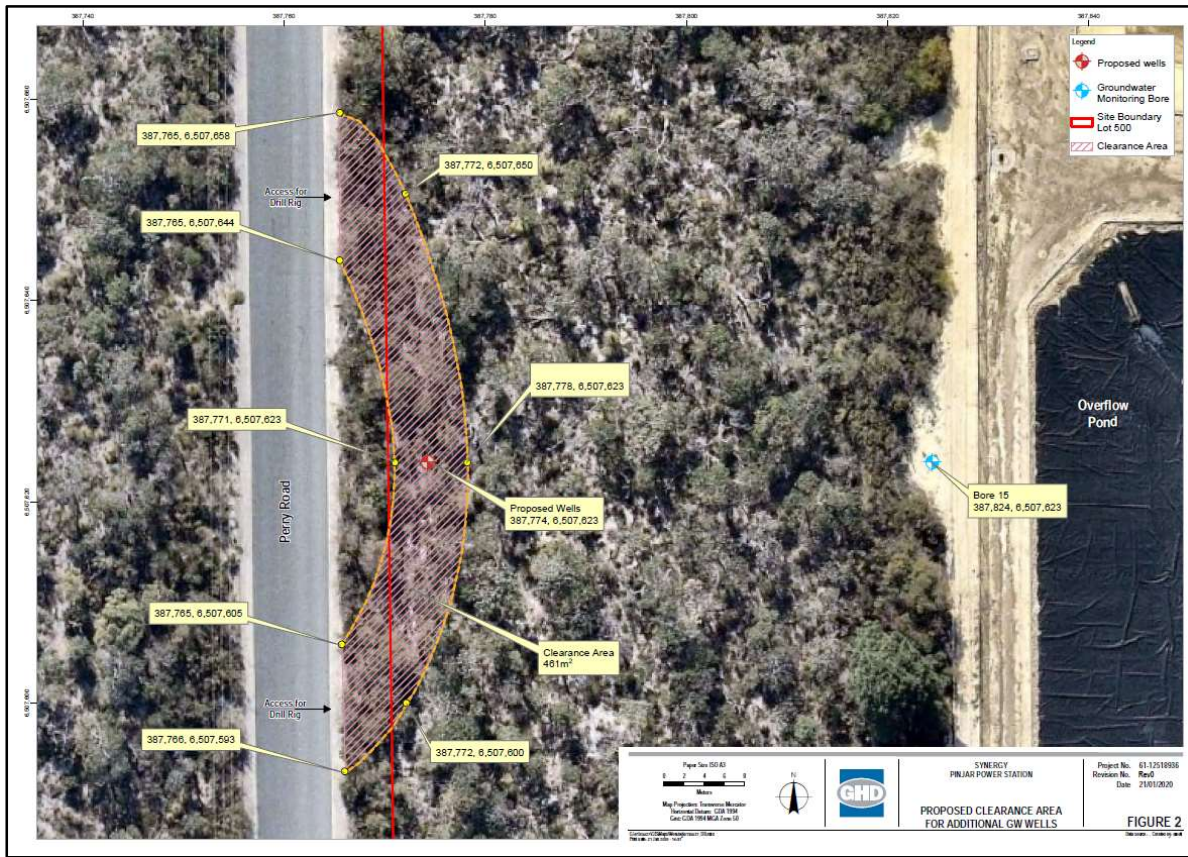
Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very Good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance 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.

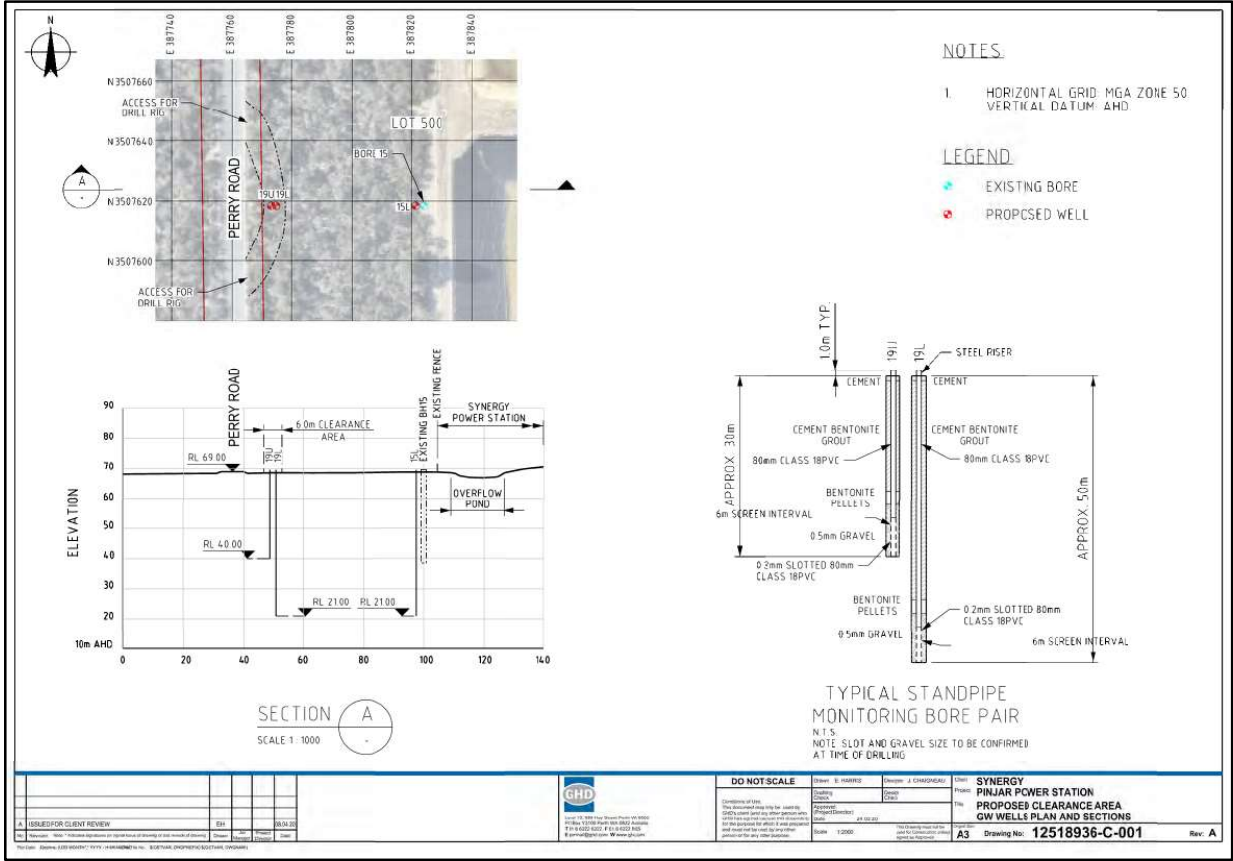
Appendix D – Biological survey information excerpts (GHD 2020)



Banksia TEC patch criteria	Criteria compliance
Location, soil and landform	Located within the SCP on Bassendean sands that are well drained
Structure	The canopy is dominated by a woodland of <i>Banksia menziesii</i> and <i>B. attenuata</i> and contained a species rich layer of sclerophyllous shrubs, such as: <i>Xanthorrhoea preissii</i> , <i>Bossiaea eriocarpa</i> , <i>Hakea ruscifolia</i> , <i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i> , <i>Petrophile macrostachya</i> , <i>P. linearis</i> and <i>Conostephium pendulum</i> . Additionally the ground cover comprised of a suite of sedges and herbs, such as: <i>Lyginia barbata</i> , <i>L. imberbis</i> , <i>Mesomelaena pseudostygia</i> , <i>Desmocladius flexuosus</i> , <i>Lomandra hermaphrodita</i> and <i>Alexgeorgea nitens</i> .
Size of patch within survey area (ha) and does the patch occur outside the survey area	The size of the patch within the survey area is 0.046 ha. However the Banksia woodland within the survey area is part of Bush Forever Site 380, which is 8001.6 ha
Summary of patch and whether it meets the TSSC criteria to be the TEC	Meets the key diagnostic characteristics of the Banksia woodland of the SCP TEC due to the following: The Banksia woodland patch is located on the Bassendean sands and is dominated by a canopy of <i>Banksia menziesii</i> and <i>B. attenuata</i> . The native species recorded within the understorey included: <i>Xanthorrhoea preissii</i> , <i>Bossiaea eriocarpa</i> , <i>Hakea ruscifolia</i> , <i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i> , <i>Petrophile macrostachya</i> , <i>P. linearis</i> and <i>Conostephium pendulum</i> , <i>Lyginia barbata</i> , <i>L. imberbis</i> , <i>Mesomelaena pseudostygia</i> , <i>Desmocladius flexuosus</i> , <i>Lomandra hermaphrodita</i> and <i>Alexgeorgea nitens</i> . The survey area is part of a larger bush land remnant, Bush Forever Site 380, which is 8001.6 ha

Figure 1 Banksia woodland of the Swan Coastal Plain





REVISIONS 1. SUBMITTED FOR CLIENT REVIEW 2. REVISED TO REFLECT COMMENTS FROM CLIENT 3. REVISED TO REFLECT COMMENTS FROM CLIENT 4. REVISED TO REFLECT COMMENTS FROM CLIENT 5. REVISED TO REFLECT COMMENTS FROM CLIENT		<p>GHD 100 St. Albans Street, Brisbane QLD 4000 Australia T +61 7 559 99200 F +61 7 559 99201 www.ghd.com.au</p>	DO NOT SCALE Drawn: E. HARRIS Checked: J. CHANDRASEKAR Project: PBAJAR POWER STATION Drawing No: 12518936-C-001 Scale: 1:2000	SYNERGY PBAJAR POWER STATION PROPOSED CLEARANCE AREA GW WELLS PLAN AND SECTIONS A3 Drawing No: 12518936-C-001 Rev: A
Project: PBAJAR POWER STATION Drawing No: 12518936-C-001 Rev: A			Date: 20/12/2020 Scale: 1:2000	Rev: A

Appendix E – References and databases

1. References

- Barber, P.A., Paap, T., Burgess, T.I., Dunstan, W., Hardy, G E St. (2013) A diverse range of *Phytophthora* species are associated with dying urban trees. *Urban Forestry and Urban Greening*: 12 (2013) Pp569–575. Published by Elsevier GmbH. Barber, P.A., Paap, T., Burgess, T.I., Dunstan, W., Hardy, G E St. (2013) A diverse range of *Phytophthora* species are associated with dying urban trees. *Urban Forestry and Urban Greening*: 12 (2013) Pp569–575. Published by Elsevier GmbH.
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2. GIS datasets

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

- 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)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Regional Parks (DBCA-026)
- Soil and Landscape Mapping – Best Available

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)