



Synergy - Generation Business Unit  
2020 Environmental Works Program– Pinjar Gas Turbine  
Station

April 2020

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## Appendices

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# 1. Introduction

Synergy has engaged GHD to assist with its 2020 Environmental Works Program at Pinjar Gas Turbine Station. As part of these works, Synergy intends to install new groundwater wells and an ancillary access track.

This report relates to land located at 500 Perry Road, Pinjar, and provides the justification for a development application pursuant to the Metropolitan Region Scheme for the works.

## 1.1 Scope of report

This report: has been prepared by GHD for Synergy - Generation Business Unit and may only be used and relied on by Synergy - Generation Business Unit for the purpose agreed between GHD and the Synergy - Generation Business Unit as set out in this report.

GHD otherwise disclaims responsibility to any person other than Synergy - Generation Business Unit arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Synergy - Generation Business Unit and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

## 2. Proposed development

### 2.1 Subject site

The subject site is located at Lot 500 Perry Road, Pinjar and described as Lot 500 on Plan P059628.

The site is improved by the Pinjar Gas Turbine Station. The part of Lot 500 that is proposed for clearing is currently vacant with regards to existing utilities, and the existing groundwater wells are either at capacity or in need of repair.

### 2.2 Description of proposal

This planning report relates to the construction of new groundwater wells and an internal access track and other construction works associated with these wells, which involves the clearing of 461 sqm of vegetation on Bush Forever Area - Site No. 380 as identified in the Metropolitan Region Scheme (MRS). The clearing works comprise 160 sqm in the road reserve and 301 sqm on Lot 500 owned by Synergy. The proposed clearing works represent less than one (1) percent of the total area of Bush Forever Site 380.

The proposed works are considered necessary to ensuring the operational capacity of the power station.

The following proposal plans are included in Appendix A:

- Location plan – Figure 1;
- Proposed Clearance Area for Additional Wells – Figure 2;
- Proposal plan – MRS designations – Figure 3;
- Proposed Clearance Area GW Wells Plan & Sections – Dwg No. 12518936 –C-001 – Figure 4.

### 2.3 Project justification

The power station is located on the Gngara groundwater mound in a P1 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 causing contamination of the groundwater resource, including regular monitoring of a network of monitoring wells. A Synergy instigated review of the monitoring network and data identified a need to expand the monitoring well network to both improve the hydrogeological setting of the Power station and better protect human health and the environment.

The objectives of the project are therefore as follows:

- Improve the understanding of the Power station hydrogeological setting by drilling and logging soil cores adjacent to the site in locations not previously investigated.
- Improve the facility environmental monitoring network by installing additional groundwater wells with safe, off-road access during construction and ongoing monitoring.

Notwithstanding these key objectives, a balanced approach to achieving a suitable facility design that minimises impacts on the environment has been taken. Thus there is only a very minor encroachment into Bush Forever Site 380, as demonstrated in this report.

## 2.4 Consultation – City of Wanneroo

Enquiries by Synergy in March 2020 at the City of Wanneroo in relation to the proposed works, identified that a development application is required to be submitted to the City of Wanneroo. This application will then be referred to the Western Australian Planning Commission (WAPC) for determination.

This advice is based upon the subject site being located within a Bush Forever area and the provisions of Clause 16 (1a) of the MRS.

## 2.5 Bushland values and environmental attributes

### 2.5.1 Vegetation assessment – April 2020

A vegetation assessment of the survey area was completed on 2 April 2020 by GHD. A copy of this assessment is included as Appendix B.

In summary, the assessment identified that the survey area represents the Banksia woodland of the Swan Coastal Plan (SCP) Threatened Ecological Community (TEC) and inferred to represent the Northern *Banksia attenuata* – *B. menziesii* woodlands Priority Ecological Community (PEC). However, it is considered that the proposed development would not have a significant impact on the TEC/PEC due to the size and shape of the proposed clearing and its proximity to Perry Road. The area proposed to be cleared is 0.046 ha of 8001.6 ha of bushland (0.0006%). It would not cause a decline in the ecological functioning of the Banksia woodland TEC/PEC within the larger remnant.

## 2.6 Impact minimisation

The project boundary for the 2020 Pinjar Gas Turbine Station Works, which includes the area impacting on Bush Forever Site 380 was determined by a planning study undertaken by GHD's environmental team.

The installation of groundwater wells and an ancillary access track as currently proposed, is based on the need to improve the environmental monitoring network associated with the power station at the specific locations identified. Hence, the need to develop additional land within Bush Forever Site 380 at Lot 500 Perry Road. As with previous on-site works, every effort will be made to minimise the impact to areas of environmental value. There are no suitable alternative locations available that would require less clearing or have less impact than the locations proposed.

As highlighted by the findings of the most recent vegetation assessment, the proposed area of clearing represents approximately 0.0006 percent of the total area of Bush Forever Site 380. The proposed works will therefore have negligible impact upon the overall environmental viability of the site.

A Clearing principles assessment was completed on 23 April 2020 by GHD. A copy of this assessment is included as Appendix C.

## 2.7 Environmental management plan

All clearing and construction works will be undertaken in line with the existing Environmental Management Plan for the project.

## 3. Planning framework

### 3.1 Metropolitan Region Scheme

Lot 500 Perry Road, Pinjar is reserved Public Purposes – State Energy Commission, under the MRS. The current use of the site as a gas turbine station is consistent with the intent and purpose of the reservation of the land under the MRS. The site is also within a Water Catchment reservation under the MRS and a Bush Forever Area (Bush Forever Site No. 380 – Rosella Road Bushland, Bullsbrook).

Clause 16(1)(a) of the MRS states that development approval is not required where a public authority is undertaking development on reserved land that is owned by or vested in that public authority, where the development is:

- Permitted development that does not involve the clearing of regionally significant vegetation on a site specified as a Bush Forever site in the Bush Forever report published by the Western Australian Planning Commission (WAPC) in December 2000; or
- Expressly authorised under an Act to be commenced or carried out without the approval of the WAPC.

As highlighted in Section 2.2, the proposed works require clearing of vegetation within a Bush Forever Area and therefore requires approval of the WAPC in accordance with the MRS.

### 3.2 City of Wanneroo – District Planning Scheme No. 2

The City of Wanneroo District Planning Scheme No. 2 (DPS 2) reflects the reservation of the site under the MRS. Pursuant to section 6 of the *Planning and Development Act 2005* (PD Act), public works are exempt from the need to obtain approval under a local planning scheme.

### 3.3 State Planning Policies

There are a number of State Planning Policies which apply to the proposed development of the land, namely:

- State Planning Policy No. 2.8 (SPP2.8) - Bushland Policy for the Perth Metropolitan Region;
- State Planning Policy No. 2.2 (SPP2.2) - Gnangara Groundwater Protection Policy;
- State Planning Policy No. 3.7 (SPP3.7) - Planning in Bushfire Prone Areas.

The proposal's compliance with these SPPs is further discussed below.

#### 3.3.1 State Planning Policy No. 2.8 - Bushland Policy for the Perth Metropolitan Region.

The proposed environmental impacts have been assessed against the impact assessment criteria set out in SPP2.8. This assessment is presented below.

Criteria	Comment
<b>Site implementation considerations</b>	
These criteria are particularly pertinent to high level strategic planning processes and of limited relevance for development applications. They have not been listed as part of this assessment.	
The existing infrastructure in the Public Purposes Reservation is insufficient to enable safe and effective water catchment. Upgrade works are therefore proposed. To accommodate these works on site and ensure their operational efficiency it is necessary to encroach on a minor part of Bush	



Criteria	Comment
<p>Forever Site 380. The overall protection status and environmental viability of Bush Forever Site 380 will not be altered by the proposed development.</p>	
<p><b>Conservation and design considerations</b></p>	
<p>(ix) Have regard to the conservation values of the subject site and seek to protect the core (highest) conservation values in the following ways—</p> <p>(a) Protect bushland with the highest conservation value, with reference to the site’s bushland values and environmental attributes (to be identified in the statement of environmental effects, where required); and, the selection criteria for regionally significant bushland and site descriptions in Bush Forever (Government of Western Australia, 2000c).</p>	<p>The proposed works involve the clearing of 461 sqm of vegetation within Bush Forever Site 380. This area is currently reserved for Public Purposes – State Energy Commission. Hence, the works are in keeping with the intended use as they support the operation of Pinjar Gas Turbine Station.</p> <p>The area to be cleared reflects only a minor portion of the total Bush Forever Site. The significant majority of Bush Forever Site 380 will continue to be protected for its conservation value through the development restrictions in place (for works close to a power station).</p>
<p>(b) Seek to avoid unacceptable losses, which includes a general presumption against clearing bushland, or other degrading activities, for area’s containing —</p> <ul style="list-style-type: none"> <li>• threatened ecological communities and species listed under the Commonwealth’s <i>Environmental Protection and Biodiversity Act 1999</i>;</li> <li>• an ecological community that has been determined by the Minister for the Environment to be a threatened ecological community, and is referred to in the list of threatened ecological communities maintained by the Chief Executive of the Department principally assisting in the administration of the <i>Conservation and Land Management Act 1984</i>;</li> <li>• threatened and poorly reserved plant communities (preliminary maps, Environmental Protection Authority, 1994);</li> <li>• declared rare flora or specially protected fauna; and, where possible, priority or significant flora or fauna;</li> <li>• lakes or wetlands listed in the <i>Environmental Protection (Swan Coastal Plain Lakes) Policy 1992</i> and the Revised Draft</li> </ul>	<p>The flora and vegetation assessment identified the Banksia woodland of the Swan SCP/TEC to occur within the development application area. This TEC is also representative of State Priority Ecological Community “Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region”. The TEC is represented by vegetation type BaHhBm (which describes the vegetation to be cleared). A total of 461 sqm of this TEC will be cleared under this development application.</p> <p>No declared rare flora, priority flora or fauna species were surveyed in the area subject to this development application.</p>
<p><i>Environmental Protection (Swan Coastal Plain Wetlands) Policy and Regulations 2004</i>, and other significant vegetated wetlands (most notably conservation category wetlands as identified by the Department of Environment’s Geomorphic Wetlands Swan Coastal Plain dataset and recognised Aboriginal sites), and appropriate buffer</p>	<p>No lakes or wetlands are located within the area subject to this development application.</p> <p>Hedde et al. (1980) mapped two vegetation complexes including Bassendean Complex – Central and South, and the Southern River Complex. According to Perth at 3.5 million (Government of WA, 2015) there is currently 26.1% of the Bassendean Complex</p>

Criteria	Comment
<p>and foreshore requirements consistent with other relevant government policies;</p> <ul style="list-style-type: none"> <li>• vegetation complexes where less than 10 per cent of the original extent currently remains (this generally correlates with vegetation on the eastern side of the Swan Coastal Plain portion of the Perth Metropolitan Region); and wetland dependent vegetation fringing creeks, rivers and estuaries and appropriate buffer and foreshore requirements in accordance with other relevant government policies and initiatives.</li> </ul> <p>This general presumption is subject to—</p> <ul style="list-style-type: none"> <li>• on-site verification, where required, of the values, presence, condition and boundaries of bushland and wetland areas—to be prepared as part of the statement of environmental effects, where required, and consistent with guidelines prepared by the Environment Protection Authority (2003b and 2003c), where appropriate;</li> <li>• an assessment of the bushland’s long-term viability, such as size, shape, connectivity and key threatening processes;</li> <li>• consideration of other impact assessment criteria in this appendix and other relevant policy measures in this policy; and</li> <li>• any advice received from key State government agencies with regard to other statutory requirements and policies.</li> </ul>	<p>remaining and 18.4 % of the Southern River Complex remaining.</p>
<p>(x) Seek to adopt and implement any relevant bushland-sensitive design measures (with particular reference to Bush Forever, Practice Notes 5 and 10, Government of Western Australia 2000b), particularly—</p> <ul style="list-style-type: none"> <li>• seek to avoid or minimise any likely adverse impacts (including a review of reasonable alternatives) and maximise the retention of regionally significant bushland, consistent with the requirements of this policy, through best-practice planning, design and management outcomes;</li> <li>• focus development within cleared, degraded and less intact areas of native vegetation and minimise the development “footprint”;</li> <li>• seek to avoid fragmentation of the bushland area and provide for ecological linkages and ‘stepping stones’; and</li> <li>• seek to achieve a viable conservation outcome, with reference to bushland size, shape, connectivity, diversity, representation, development interface and edge effects, key threatening processes, environmental limits and the ability of</li> </ul>	<p>As discussed design processes are intended to avoid and minimise impacts to Bush Forever Site 380.</p> <p>The application is restricted to a minor area of vegetation located within the existing Pinjar Gas Turbine Station and will not result in fragmentation, or significantly impact upon the viability of Bush Forever Site 380.</p>



Criteria	Comment
<p>the conservation area to retain biodiversity values in the long-term.</p>	
<p>(xi) Require long-term protection and management measures for regionally significant bushland identified for protection and management through this process, which include, but are not limited to—</p> <ul style="list-style-type: none"> <li>• a statutory conservation covenant and associated management plan;</li> <li>• the preparation and implementation of an environmental and/or bushland management plan, or similar, to manage the bushland for conservation purposes, which should be linked and enforced through either the local government town planning scheme, a legal agreement and/or conservation covenant;</li> <li>• a management agreement to protect and control use and development within the bushland, to be secured through a legal agreement;</li> <li>• statutory planning controls, including conditions of approval, local government town planning scheme rezoning and scheme provisions, which are designed to protect and manage the bushland area;</li> <li>• setting aside regionally significant bushland as a conservation reserve (usually free of cost) for management by a public body; and/or</li> <li>• land donation to an accredited nature conservation trust</li> </ul>	<p>The long-term protection status of Bush Forever Site 380 will not be altered by the proposed clearing of 461 sqm. This is supported by the vegetation assessment included as Appendix B.</p>
<p><b>Offset considerations</b></p>	
<p>xii) Where a proposal cannot avoid negatively impacting a Bush Forever area, the applicant needs to provide documentation showing how they minimised the impact. If any clearing of native vegetation within the Bush Forever area is to occur, then the applicant needs to provide proposed offset measures (both on-site and off-site), where appropriate and practical, with particular reference to the following site implementation categories—</p> <ul style="list-style-type: none"> <li>• BFA—Bush Forever reserves; or</li> <li>• BFA—Government lands or public infrastructure.</li> </ul> <p>The offset package should provide for a net environmental gain (see Appendix 4 for a breakdown of the offset requirements).</p>	<p>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 or accidental contamination caused by the power station. These wells are essential to ensuring the gas turbine station remains fully compliant with Synergy’s environmental commitments associated the power station operation. The clearing of bushland is necessary to allow for the efficient installation and operation of the groundwater wells and access track.</p> <p>Additionally, the proposed groundwater wells and ancillary access track have been located to minimise the extent of clearing required on Bush Forever Site 380.</p> <p>The works will be subject to a clearing permit, therefore any necessary offsets are most</p>

Criteria	Comment
	appropriately managed through the environmental assessment process.
<b>Other considerations</b>	
(xiii) Take into account any significant issues arising from the statement of environmental effects, where required.	Past environmental surveys and the most recent vegetation assessment have not identified any significant issues in relation to the proposed minimal clearing on Bush Forever Site 380.
(xiv) Have regard to other relevant policy measures within this policy, and other planning and environmental considerations (including fire protection and control requirements and the protection of Aboriginal heritage sites recognised by the Aboriginal Heritage Act 1972).	Other relevant policy measures have been considered in preparing this report. This report demonstrates the proposal's compliance with the regional planning framework.

### 3.3.2 State Planning Policy No. 2.2 – Gngangara Groundwater Protection Policy

SPP2 aims to ensure that development and land use changes in the policy area do not detrimentally impact upon the groundwater resource. Consistent with SPP2, part of Lot 500 is affected by a Water Catchments reservation under the MRS. SPP2 identifies the subject land as a Priority 1 (P1) – Public Drinking Water Source Area.

The proposed works are considered compatible with the intent of P1 Areas as the proposed works will improve groundwater monitoring capability through the installation of the groundwater wells in areas that are otherwise not covered.

### 3.3.3 Planning Policy No. 3.7 – Planning in Bushfire Prone Areas

SPP3.7 provides the foundation for land use planning to address bushfire risk management on lives, property and infrastructure. It applies to higher order strategic planning processes and development applications in designated bushfire prone areas.

The subject site is located within a designated bushfire prone area. SPP 3.7 recommends against approving vulnerable or high-risk land uses within areas of extreme bushfire hazard levels, or where bushfire attack levels (BAL) of BAL-40 or BAL-FZ (flame zone) apply.

The proposed groundwater wells and access track do not involve a new significant development within the bushfire prone area that require consideration of a new bushfire risk.

It is considered that, based on the nature of the proposed development, a BAL assessment as encouraged by SPP3.7 will not provide any benefit to inform the development application. On this basis, a BAL assessment has not been undertaken. Furthermore, the proposed works are based upon the specific design requirements for groundwater wells and therefore will not be influenced in design or location by the outcomes of a BAL assessment.

## 4. **Conclusion**

While the proposed works involve the clearing of 461 sqm of vegetation or less than one (1) percent of the total area of Bush Forever Area - Site No. 380, the proposed development will result in a net environmental benefit as it will achieve the following environmental outcomes:

- Improve the understanding of the Power station hydrogeological setting by drilling and logging soil cores adjacent to the site in locations not previously investigated.
- Improve the facility environmental monitoring network by installing additional groundwater wells with safe, off-road access during construction and ongoing monitoring.

Furthermore, the most recent vegetation assessment for the proposed clearing on Bush Forever Site 380 identified that the associated clearing would not have a significant impact on the Banksia woodland TEC/PEC. This is due to the size and shape of the proposed clearing (i.e. less than one (1) percent of bushland) and its proximity to Perry Road. Hence, the proposed area to be cleared would not cause a decline in the ecological functioning of the Banksia woodland TEC/PEC within the larger remnant.

Relevantly, the proposal facilitates the ongoing development of Lot 500 Perry Road in accordance with its primary reservation under the MRS for the purpose of Public Purposes – State Energy Commission. As outlined in this report, the proposal also complies with broader planning framework, including relevant State planning policies.

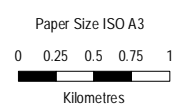
On the basis of the information set out in this report approval for the construction of new groundwater wells and an internal access track and other construction works associated with these wells on Lot 500 .Perry Road, Pinjar, is requested.

# Appendices

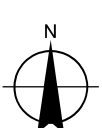
# Appendix A – Site plans



- Legend
- Power Station
  - Major Town
  - Major Road
  - Minor Road



Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 50



Synergy  
 Pinjar Power Station

Site Location

Project No. 12518936  
 Revision No. 0  
 Date 24/04/2020

FIGURE 1





Legend

- Proposed wells
- Groundwater Monitoring Bore
- Site Boundary Lot 500
- Clearance Area

387,765, 6,507,658

387,772, 6,507,650

387,765, 6,507,644

387,778, 6,507,623

387,771, 6,507,623

Proposed Wells  
387,774, 6,507,623

Bore 15  
387,824, 6,507,623

387,765, 6,507,605

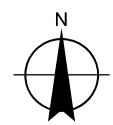
Clearance Area  
461m<sup>2</sup>

387,766, 6,507,593

387,772, 6,507,600



Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 50



SYNERGY  
PINJAR POWER STATION

PROPOSED CLEARANCE AREA  
FOR ADDITIONAL GW WELLS

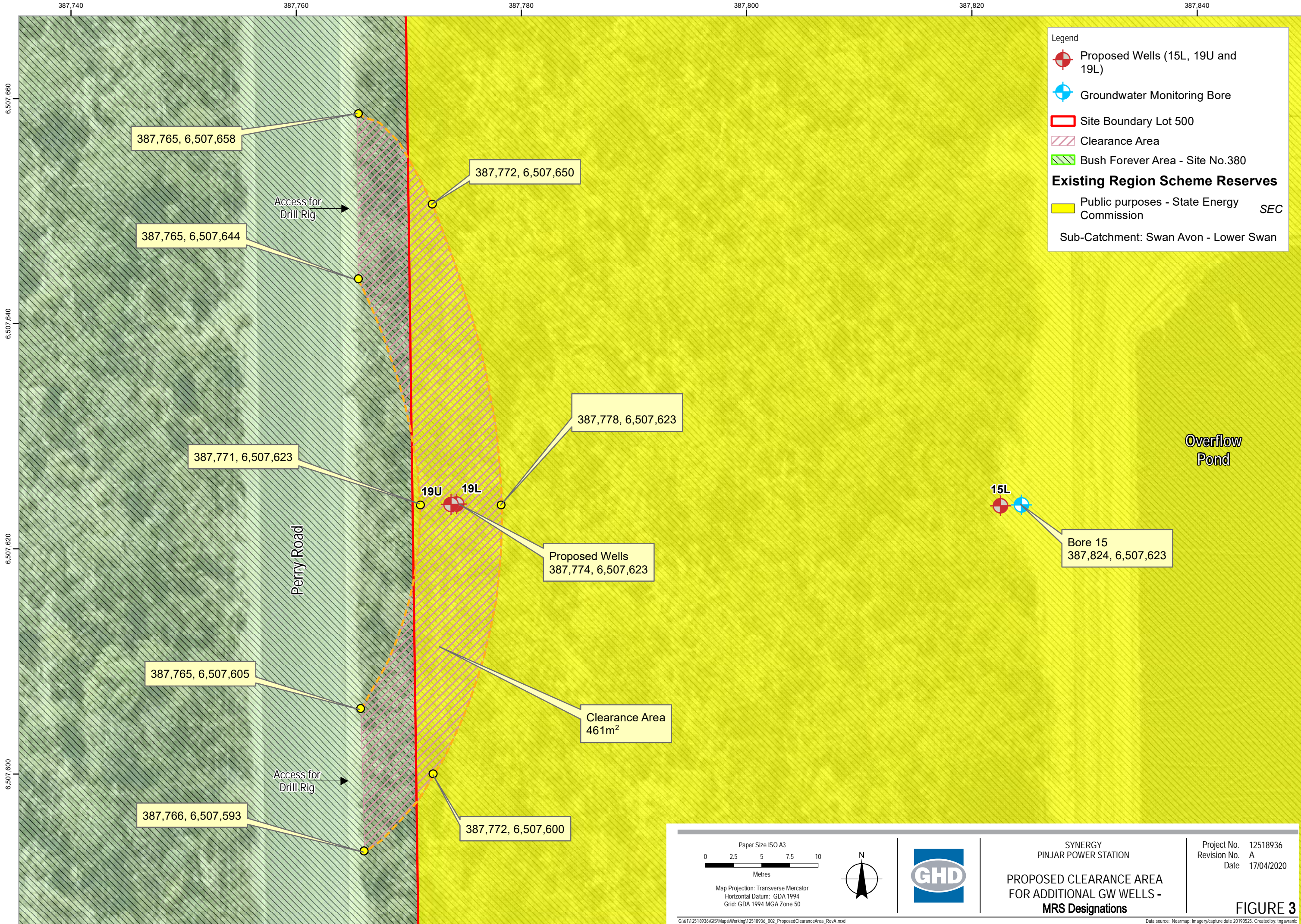
Project No. 61-12518936  
Revision No. Rev0  
Date 21/01/2020

FIGURE 2

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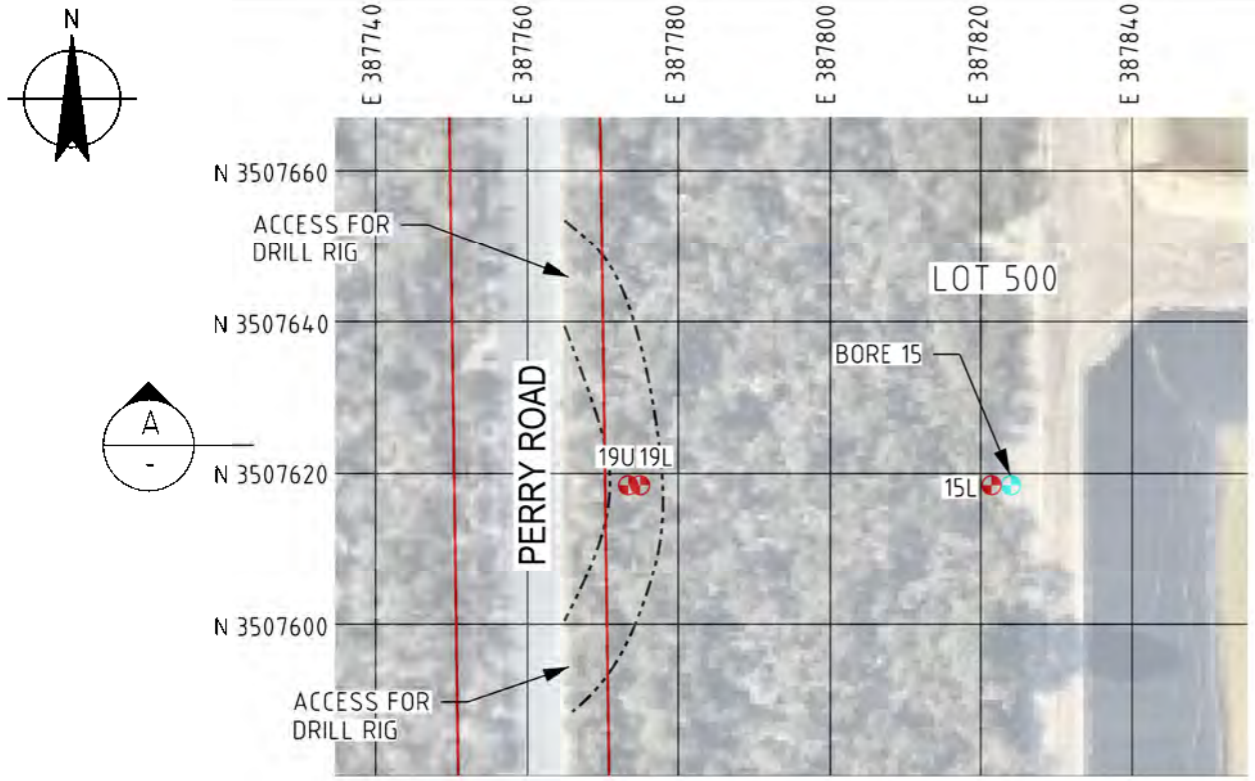
Data source: . Created by: dib01





**FIGURE 3**



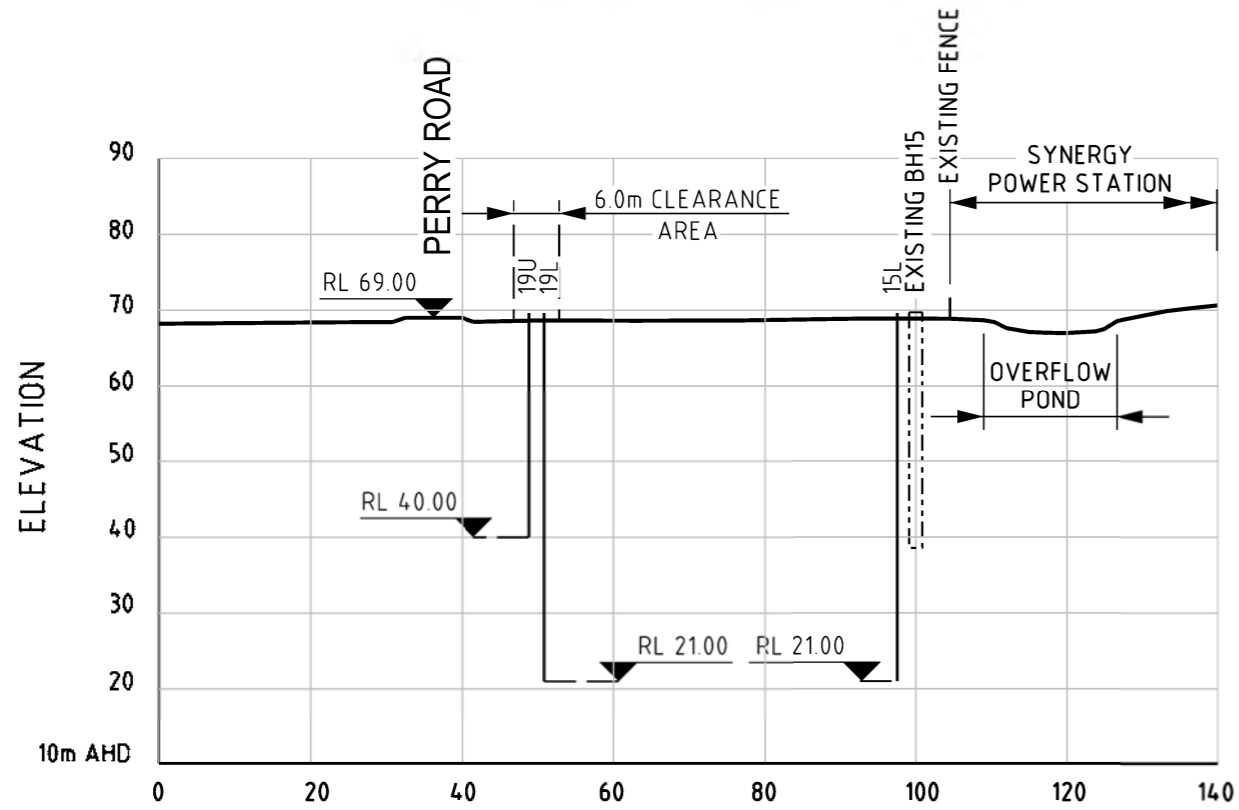


**NOTES:**

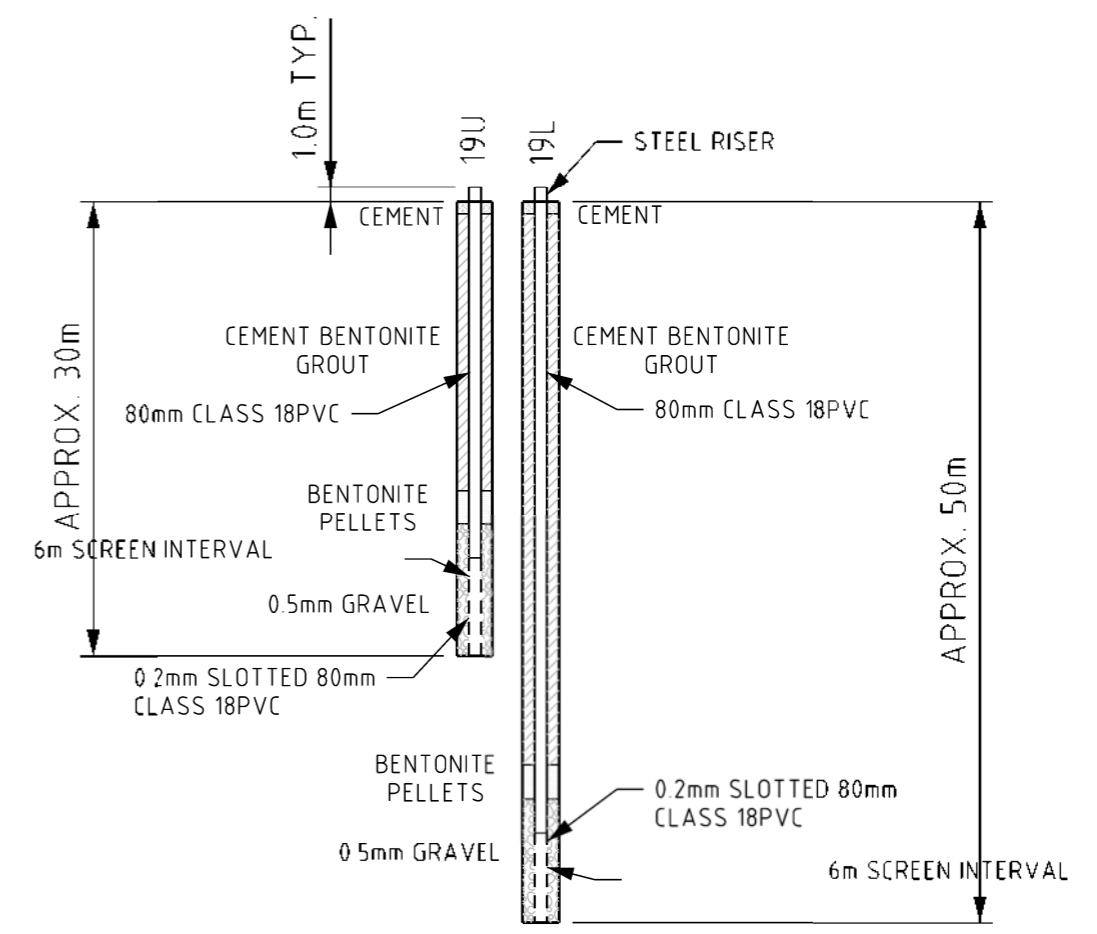
- HORIZONTAL GRID: MGA ZONE 50.  
VERTICAL DATUM: AHD.

**LEGEND:**

- EXISTING BORE
- PROPOSED WELL



SECTION A  
SCALE 1 : 1000



TYPICAL STANDPIPE MONITORING BORE PAIR  
N.T.S.  
NOTE SLOT AND GRAVEL SIZE TO BE CONFIRMED AT TIME OF DRILLING

No.	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	ISSUED FOR CLIENT REVIEW		EH			08.04.20



<b>DO NOT SCALE</b>	Drawn	E. HARRIS	Designer	J. CHAIGNEAU	Client <b>SYNERGY PINJAR POWER STATION</b>
	Drafting Check		Design Check		
Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.	Approved (Project Director)		Date	24.03.20	Title <b>PROPOSED CLEARANCE AREA GW WELLS PLAN AND SECTIONS</b>
Scale	1:2000	This Drawing must not be used for construction without signed as Approved		Original Size <b>A3</b>	
Drawing No: <b>12518936-C-001</b>					Rev: <b>A</b>

# Appendix B – Vegetation assessment memorandum (April 2020)



# Memorandum

07 April 2020

To Synergy - Generation Business Unit

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Copy to

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From Angela Benkovic

Tel +61 8 62228361

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Subject Lot 500 Perry Road, Vegetation Assessment

Job no. 12518936

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## 1 Introduction

### 1.1 Background

Synergy seeks to install new groundwater wells and an access track to the wells on and adjacent to the existing Pinjar gas turbine station. The proposed area is located on Lot 500 Perry Road, Pinjar and vested as Public Purposes – State Energy Commission (Reserve), Bush Forever Area – Site No. 380 (Rosella Road Bushland, Bullsbrook) and Water Catchments.

The proposed clearing is 0.046 hectares (ha); 0.016 ha in the road reserve and 0.030 ha on land owned by Synergy. To support the development application and clearing permit application Synergy required a senior botanist to undertake a vegetation survey of the survey area. The purpose of the survey was to identify vegetation types, map the vegetation condition and determine the conservation values of the survey area.

### 1.2 Limitations

This memorandum has been prepared by GHD for Synergy and may only be used and relied on by Synergy for the purpose agreed between GHD and the Synergy as set out in section 1.1 of this memorandum.

GHD otherwise disclaims responsibility to any person other than Synergy arising in connection with this memorandum. GHD also excludes implied warranties and conditions, to the extent legally permissible. The services undertaken by GHD in connection with preparing this memorandum were limited to those specifically detailed in the memorandum and are subject to the scope limitations set out in the memorandum.

The opinions, conclusions and any recommendations in this memorandum are based on conditions encountered and information reviewed at the date of preparation of the memorandum. GHD has no responsibility or obligation to update this memorandum to account for events or changes occurring subsequent to the date that the memorandum was prepared.

The opinions, conclusions and any recommendations in this memorandum are based on assumptions made by GHD described in this memorandum. GHD disclaims liability arising from any of the assumptions being incorrect.

12518936-8375-21/12518936-MEM-VegetationMemo.docx



# Memorandum

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this memorandum are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this memorandum.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this memorandum. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this memorandum if the site conditions change.

## 2 Field survey methodology

A vegetation assessment of the survey area was completed on 2 April 2020 by GHD Senior Botanist Angela Benkovic. The field survey was undertaken to verify the information obtained from aerial imagery and characterise the vegetation types and vegetation condition within the survey area. Using this information an assessment to determine the conservation values of the area was performed.

The survey methodology employed included assessing the survey area on foot to describe and map vegetation type and condition through visual observation and photo points. Data was captured on a Samsung tablet using relevés. A relevé is a low intensity survey technique used for gathering information within an unmarked area. Data collected within each relevé included location, vegetation structure, list of dominant flora species, soil type, landform, vegetation condition and any disturbances. The proportion of flora identified (limited to dominant flora taxa) was considered sufficient for the purpose of the survey.

The out of season survey methodology employed for the vegetation assessment was undertaken with reference to the EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016). The recommended timing for vegetation surveys in the South West Botanical Province is spring (EPA 2016). While this survey was conducted out of season it is considered appropriate for the purposes of identifying vegetation type, mapping the vegetation condition and determining the conservation values of the survey area. The Senior Botanist undertaking the survey, Angela Benkovic, has over 12 years' experience in undertaking flora and vegetation surveys and assessment on the Swan Coastal Plain.

### 2.1 Vegetation type

The vegetation type was described based on structure, dominant taxa and cover characteristics. The broad vegetation type description is consistent with National Vegetation Information System (NVIS) Level IV or V, where the dominant species for the three traditional strata (upper, mid and ground) are used to describe the association (NVIS Technical Working Group 2017).

### 2.2 Vegetation condition





# Memorandum

The vegetation condition was assessed and mapped in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces of WA (devised by Keighery (1994) and adapted by EPA (2016)).

## 3 Results

### 3.1 Vegetation type and condition

One vegetation type and cleared areas were identified and described in the survey area. The vegetation type was mapped as *Banksia* woodland, described as:

*Banksia menziesii*, *B. attenuata* and *B. ilicifolia* woodland over *Kunzea glabrescens* and *Xanthorrhoea preissii* tall to mid open shrubland over *Mesomelaena pseudostygia*, *Lyginia barbata* and *L. imberbis* sedgeland (Plate 1)

The vegetation condition within the project area was Good in areas directly adjacent to Perry Road and Excellent for the vegetation further east of the road. The vegetation in Good condition showed signs of edge effects from Perry Road in the form of common bushland weeds that had out competed the lower stratum native species in dominance cover. Vegetation in excellent condition had minimal to no weed invasion with a very diverse suite of native species in the understorey that was intact.



**Plate 1 Banksia woodland**



## 3.2 Conservation Significant Communities

Based on the results of the desktop searches, dominant species, landform features, Gibson *et al.* (1994) plot locations and field observations the survey area is considered likely to support two conservation significant ecological communities; Banksia Woodlands of the Swan Coastal Plain (SCP) Threatened Ecological Community (TEC) and the Northern *Banksia attenuata* - *Banksia menziesii* woodlands Priority 3 Priority Ecological Community (PEC).

### ***Banksia Woodlands of the Swan Coastal Plain***

The Banksia woodlands of the SCP was listed in September 2016 as an Endangered TEC under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) The Commonwealth TEC encompasses a number of Floristic Community Types (FCTs), some of which are also listed as State TECs/PECs. The Northern *Banksia attenuata* – *B. menziesii* woodlands (FCT23b) is listed as a sub-community of the Commonwealth TEC due to key structural features as detailed by the Threatened Species Scientific Community (TSSC) (2016). The Northern *Banksia attenuata* – *B. menziesii* woodlands is also listed as a Priority 3 PEC by the Department of Biodiversity Conservation and Attractions (DBCA). The TSSC (2016) provides criteria and guidance for determining whether the TEC is present, including but not limited to:

- The canopy is most commonly dominated or co-dominated by *Banksia attenuata* (and/or *B. menziesii*).
- The understorey is a species rich mix of sclerophyllous shrubs, graminoides and forbs
- High endemism and considerable localised variation in species composition across its range
- Minimum patch size and condition requirements.

The vegetation within the survey area was assessed as meeting the key diagnostic characteristics for the Banksia woodlands of the SCP TEC (Table 1)

**Table 1 Banksia woodland of the SCP TEC patch assessment**

<b>Banksia TEC patch criteria</b>	<b>Criteria compliance</b>
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>Desmocladus</i>



# Memorandum

Banksia TEC patch criteria	Criteria compliance
	<i>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	<p>Meets the key diagnostic characteristics of the Banksia woodland of the SCP TEC due to the following:</p> <p>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>.</p> <p>The survey area is part of a larger bush land remnant, Bush Forever Site 380, which is 8001.6 ha</p>

The field assessment also determined that the Northern *Banksia attenuata* – *B. menziesii* woodlands PEC was likely to be represented by the survey area, inferred as statistical FCT analysis was not undertaken. This PEC is described as being centred on the Bassendean system north of Perth between Regans Ford and Wanneroo. Typical or common trees in the community are *Banksia attenuata* and *B. menziesii*. Other common species include *Eremaea pauciflora*, *Bossiaea eriocarpa*, *Petrophile linearis*, *Anigozanthos humilis*, *Lomandra hermaphrodita* and *Lyginia barbata*. The difference between the Banksia TEC and Banksia PEC is that the PEC has no minimum condition or patch size thresholds.



## Memorandum

#### 4 Conclusion

While the survey area represents the Banksia woodland of the SCP TEC and inferred to represent the Northern *Banksia attenuata* – *B. menziesii* woodlands PEC it is considered that the proposed development would not have a significant impact on the TEC/PEC due to the size and shape of the proposed clearing and its proximity to Perry Road. The area proposed to be cleared is 0.046 ha of 8001.6 ha of bushland (0.0006%). It would not cause a decline in the ecological functioning of the Banksia woodland TEC/PEC within the larger remnant.

Regards

A handwritten signature in black ink, appearing to read 'Benkovic', is written in a cursive style.

**Angela Benkovic**

Botanist



# Memorandum

## 5 References

Environmental Protection Authority (EPA) 2016, Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment, Perth, Environmental Protection Authority.

Gibson, N, Keighery, BJ, Keighery, GJ, Burbridge, AH and Lyons, MN 1994, *A Floristic Survey of the Southern Swan Coastal Plain*, Perth, Unpublished Report for the Australian Heritage Commission prepared by Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc).

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

NVIS Technical Working Group 2017. Australian Vegetation Attribute Manual: National Vegetation Information System, Version 7.0, Department of the Environment and Energy, Canberra

Threatened Species Scientific Community 2016, *Environmental Protection and Biodiversity Conservation Act 1999 Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain Ecological Community*, Department of the Environment and Energy, Canberra. Available at:

<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf>

# Appendix C – Principles assessment memorandum (April 2020)





# Memorandum

23 April 2020

To Leanne Salter-Jones, A/Environment Lead Sustainability Business Unit, Synergy

Copy to Melanie Kenny, Patrick Dunne

From Anya Robinson Tel +61 8 6222 8833  
Environmental Consultant  
GHD

Subject Clearing Principles Assessment of Proposed Clearing at Lot 500 Perry Road, Pinjar Western Australia Job no. 12518936

## 1 Introduction and background

Synergy seeks to install new groundwater wells and an access track to the wells on and adjacent to the existing Pinjar gas turbine station (the Project). The Project is located on Lot 500 Perry Road, Pinjar and vested as public Purposes – State Energy Commission (Reserve), Bush Forever Area – Site No. 380 (Rosella Road Bushland, Bullsbrook) and Water Catchments. The proposed clearing area is 0.036 hectares (ha) of a 0.046 ha development envelope (the Project area). Of this, 0.016 ha is located in the road reserve and 0.030 ha on land owned by Synergy.

To support a native vegetation clearing permit (NVCP) application, GHD completed an assessment of the Project against the Ten Clearing Principles as outlined in Schedule 5 of the *Environmental Protection Act 1986* (EP Act). The Ten Clearing Principles aim to ensure that potential impacts resulting from removal of native vegetation can be assessed holistically. GHD have also completed a likelihood of occurrence assessment against the nine Matters of National Environmental Significance (MNES) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and identified potential impacts and associated minimisation strategies relating to the Project.

## 2 Outcome of assessments

### 2.1 Assessment against the ten clearing principles

An assessment of the Project against the Ten Clearing Principles (Attachment 1) concluded the proposed clearing may be at variance with principle (a).

Principle (a) states “Native vegetation should not be cleared if it comprises a high level of biological diversity”. The Project occurs within Bush Forever Site No. 380 and is known to contain a TEC (*Banksia* woodlands) (GoWA 2020, GHD 2020). NatureMap searches also identified three Priority 3 flora taxa that are likely to occur within the Project area (Department of Biodiversity, Conservation and Attractions [DBCAs] 2007). Based on these findings, the Project may be at variance with Principle (a).

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# Memorandum

The Project is considered unlikely to be at variance to the remaining principles.

## 2.2 Assessment against identified Matters of National Environmental Significance

The likelihood of occurrence assessment against the nine MNES identified one MNES that occurs within the Project area, and two MNES that may occur within the Project area. There was one Threatened Ecological Community (TEC) identified within the Project area (GHD 2020), which included the EPBC Act Listed Banksia Woodlands of the Swan Coastal Plain (SCP) TEC. A desktop review of the Protected Matters Search Tool (PMST) also identified 15 Listed Threatened Species and eight Listed Migratory Species that may occur in the Project area (Department of Agriculture, Water and the Environment [DWAE] 2020). The PMST search results are included as Attachment 2.

A summary of results from the likelihood of occurrence assessment of the MNES is provided in Table 1.

**Table 1 Summary of identified Matters of National Environmental Significance**

<b>MNES</b>	<b>Assessment summary</b>
Listed Threatened Species and Ecological Communities	<p>One EPBC Listed TEC was identified in the Project area, the <i>Banksia</i> Woodlands of the SCP TEC (GHD 2020).</p> <p>The PMST identified 15 species may occur within a 1 km buffer of the clearing area. Of these, eight are considered likely based on suitable habitat. The remaining seven may occur in the Project area.</p>
Listed Migratory Species	<p>The PMST identified eight migratory species that may occur within a 1 km buffer of the clearing area. Of these, one is considered likely. The remaining seven may occur in the Project area.</p>
World Heritage Properties	<p>None were identified within a 1 km buffer of the Project area.</p>
National Heritage Place	<p>None were identified within a 1 km buffer of the Project area.</p>
Wetlands of International Importance	<p>None were identified within a 1 km buffer of the Project area.</p>
Great Barrier Reef Marine Park	<p>Not relevant to the Project area.</p>
Commonwealth Marine Area	<p>Not relevant to the Project area.</p>
Nuclear actions	<p>Not relevant to the proposed Project.</p>



# Memorandum

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Water resource related to coal seam gas or large coal mining      Not relevant to the proposed Project.

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While the MNES assessment identified TECs and species that were listed as Vulnerable, Endangered and Critically Endangered it is considered that the Project would not have a significant impact on the identified TECs and species due to the size and shape of the proposed clearing and its proximity to Perry Road.

## 2.3 Clearing impacts and recommendations for minimisation

Potential impacts, management measures and outcomes specific to the context and size of the Project area were identified (Table 2).

**Table 2 Potential impacts and impact minimisation strategies**

Potential Impact	Management Measures	Predicted Outcomes
<ul style="list-style-type: none"><li>• Loss of TEC and Priority and Threatened Flora</li><li>• Dust generation impacting surrounding vegetation during clearing</li><li>• Introduction and spread of invasive plant species and diseases (i.e. phytophthora dieback) to surrounding vegetation during clearing</li><li>• Loss and disturbance of fauna and fauna habitat</li></ul>	<ul style="list-style-type: none"><li>• Design Project area to minimise disturbance to TEC and Priority and Threatened Flora by taking advantage of previously cleared or naturally sparse areas</li><li>• Dust suppression, including use of water during clearing</li><li>• Remove or sterilise mud and soil from footwear, equipment and vehicles before entry</li><li>• Implement soft starts and clear vegetation in one direction</li></ul>	<ul style="list-style-type: none"><li>• Loss of TEC and Priority and Threatened Flora minimised</li><li>• Dust generation minimised</li><li>• Prevention of further spread of invasive species and dieback</li><li>• Mobile animals are able to vacate the area</li></ul>

## 3 Limitations

This memorandum has been prepared by GHD for Synergy and may only be used and relied on by Synergy for the purpose agreed between GHD and Synergy. GHD otherwise disclaims responsibility



# Memorandum

to any person other than Synergy arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

GHD considered the results of the technical studies completed as part of broader commission to identify potential project impacts on clearing of native vegetation. The assessment against the Ten Clearing Principles was undertaken for the project to determine the significance of the impacts. The limitations and assumptions outlined in the vegetation assessment memorandum (GHD 2020) also apply to this letter.

Regards

*A Robinson*

**Anya Robinson**

Environmental Consultant



# Memorandum

## 4 References

Department of Agriculture, Water and the Environment (DAWE) 2020, *Environmental Protection and Biodiversity Conservation Act 1999 Protected Matters Search Tool Results*, retrieved April 2020, from

<http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf>

Department of Biodiversity, Conservation and Attractions (DBCA) 2007, *NatureMap: Mapping Western Australia's Biodiversity*, retrieved April 2020, from

<https://naturemap.dpaw.wa.gov.au/default.aspx>

GHD Pty Ltd (GHD) (2020), *Vegetation Assessment*, unpublished memorandum prepared for Synergy, April 2020. Perth, Australia.

Government of Western Australia (GoWA) 2020, *Data WA*, retrieved April 2020, from

<https://data.wa.gov.au/>.

Hedde, EM, Loneragan. OW and Havel JJ 1980, Vegetation Complexes of the Darling System, Western Australia, in Atlas of Natural Resources, Darling System Western Australia, Department of Conservation and Environment.

Webb A, Kinloch J, Keighery G & Pitt G. (2016). The extension of vegetation complex mapping to landform boundaries within the Swan Coastal Plain landform and forested region of southwest Western Australia.



# Memorandum

## Attachment 1 – Ten Clearing Principle Assessment

### Assessment against the ten clearing principles

Principle	Assessment	Outcome
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p>The clearing area is 0.036 ha of the 0.046 ha Project area and falls within Bush Forever Site No. 380 (Rosella Road Bushland, Bullsbrook). The Project site is situated in the South West Botanical Province of WA within the Swan Coastal Plain (SCP) bioregion and the Perth subregion as described by the Interim Biogeographic Region of WA (IBRA).</p> <p><i>Banksia</i> woodlands was the only vegetation type identified in the Project area (GHD 2020). This vegetation type is representative of the <i>Banksia</i> woodlands of the SCP Threatened Ecological Community (TEC), which is listed as an Endangered under the <i>Environmental Protection and Biodiversity Act 1999</i> (EPBC 1999). This vegetation is also presentative of the Northern <i>Banksia attenuata</i> – <i>Banksia menziesii</i> woodlands Priority Ecological Community (PEC), listed as Priority 3 by the Department of Biodiversity, Conservation and Attractions (DBCA) (GHD 2020).</p> <p>Vegetation condition within the Project area ranged from 'Good' (0.0065 ha) in areas directly adjacent to Perry Road and 'Excellent' (0.0296 ha) for the vegetation further east of the road. 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 cover (GHD 2020).</p> <p>Searches of the NatureMap database identified the presence of three Priority 3 flora taxa within a 5 km buffer of the Project area. This total included <i>Adenanthos cygnorum</i> subsp. <i>Chamaephyton</i>, <i>Pithocarpa corymbulosa</i> and <i>Styphelia filifolia</i>.</p> <p>The proposed clearing area comprises <i>Banksia</i> woodland which provides fauna habitat. It is likely this habitat is well represented in the local area given the extent of native vegetation adjacent to the Project in Bush Forever Site No. 380.</p> <p>The Proposal will involve the clearing of native vegetation in an area of high biological diversity. However, the proposed clearing area is small and is located on edge of Bush Forever Site No. 380, close to Perry Road.</p>	The proposed clearing may be at variance to this principle.



# Memorandum

Principle	Assessment	Outcome
(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	<p><i>Banksia</i> woodland was identified as a broad fauna habitat within the Project area (GHD 2020). The Project area is surrounded by Yeal Nature Reserve and Gnangara-Moore River State Forest to the north and Yanchep National Park to the west representing a connected landscape at local and regional scales that would be minimally affected by the Project. The area proposed to be cleared is 0.036 ha of 8001.6 ha of bushland (0.0004%).</p> <p>Searches of the NatureMap database identified the presence of three Priority 3 flora taxa within a 5 km buffer of the Project area. This total included <i>Adenanthos cygnorum</i> subsp. <i>Chamaephyton</i>, <i>Pithocarpa corymbulosa</i> and <i>Styphelia filifolia</i>.</p> <p>The Project lies within the modelled distribution of Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo. A total of 0.036 ha of foraging habitat for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo will be cleared. The clearing area represents less than &lt;0.01% of available Black Cockatoo foraging habitat remaining within the local area.</p> <p>While vegetation within the Project area is considered suitable habitat for a range of species, it does not provide significant habitat for any native fauna species or species of conservation significance. Similar habitat in the same or better condition is present in the local area.</p> <p>The proposed clearing area does not comprise the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.</p>	The proposed clearing is unlikely to be at variance to this principle.
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	Searches of the NatureMap database identified no Declared Rare (Threatened) flora taxa within a 5 km buffer of the Project area.	The proposed clearing is unlikely to be at variance to this principle.
(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of,	No State listed TECs were recorded within the proposed clearing area (GHD 2020).	The proposed clearing is not at variance to this principle.





# Memorandum

Principle	Assessment	Outcome
a threatened ecological community.		
(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	<p>Regional vegetation complex mapping has been completed by Heddle et al. (1980) with updates from Webb et al. (2016) based on major landform boundaries on the Swan Coastal Plain (SCP) and forested region of the south-west of Western Australia. The proposed clearing area intersects the Karrakatta complex-North, which has greater than 45% of its pre-European extent remaining within the SCP bioregion, but less than 20% of its pre-European extent remaining within the City of Wanneroo. The clearing of up to 0.036 ha would result in less than 0.01% loss of this complex within the City of Wanneroo.</p> <p>The Project area is surrounded by State Forest to the north and west and represents a connected landscape at local and regional scales.</p>	The proposed clearing is unlikely to be at variance to this principle.
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	<p>There are no Internationally (RAMSAR) and Nationally Important wetlands or watercourses within the project area (DAWE 2020, GoWA 2020).</p> <p>The vegetation within the proposed clearing area does not grow in, or in association with, an environment associated with a watercourse or wetland.</p>	The proposed clearing is unlikely to be at variance to this principle.
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	<p>The topography of the Project area is predominantly flat. The Project area occurs within an area mapped as having low water and wind erosion risk (GoWA 2020).</p> <p>The clearing area is minimal and as such, appreciable land degradation is not likely.</p>	The proposed clearing is unlikely to be at variance to this principle.
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any	<p>The west side of the Project area is adjacent to State Forest managed by DBCA. The Project area and the DBCA managed lands are separated by Perry Road.</p> <p>The clearing area is minimal and as such, impact to adjacent or nearby conservation areas are not likely.</p>	The proposed clearing is unlikely to be at variance to this principle.



# Memorandum

Principle	Assessment	Outcome
adjacent or nearby conservation area.		
(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.	<p>There are no Internationally (RAMSAR) and Nationally Important wetlands or watercourses within or adjacent to the Project. The Project area lies within a proclaimed Groundwater Area under the <i>Rights in Water and Irrigation Act 1914</i>.</p> <p>The vegetation present within the Project area occurs on flat topography and its removal is not likely to impact on surface water flows. Desktop assessment identified no water erosion risk within the Project area (GoWA 2020).</p> <p>The clearing area is minimal and as such, impact to surface water quality are not likely.</p>	The proposed clearing is unlikely to be at variance to this principle.
(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	The minimal amount of clearing required for the Project would have no significant impact on the natural surface and groundwater processes. The Project is not likely to cause, or exacerbate, the incidence or intensity of flooding.	The proposed clearing is unlikely to be at variance to this principle.



# Memorandum

## Attachment 2 - Matters of National Environmental Significance Report

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# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/04/20 14:25:28

[Summary](#)

[Details](#)

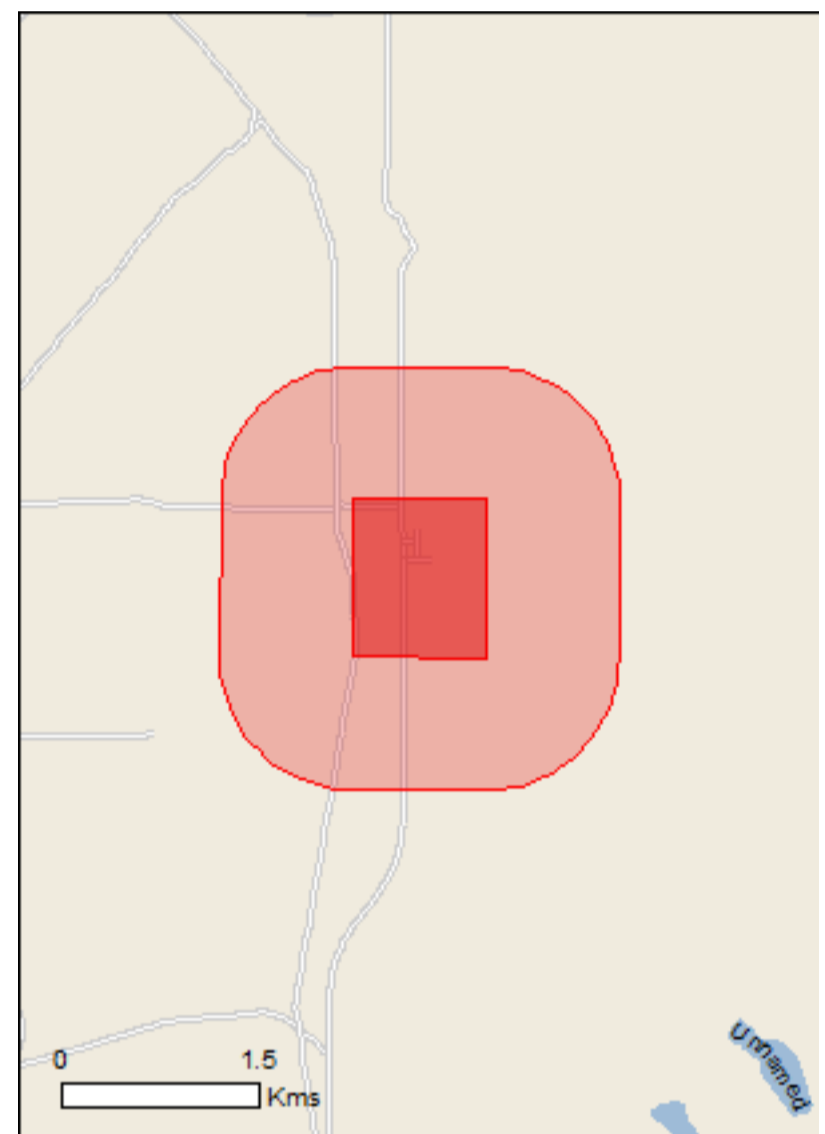
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

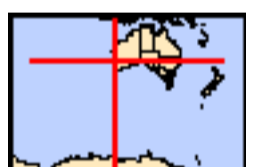
[Acknowledgements](#)



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[Coordinates](#)

[Buffer: 1.0Km](#)





# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	15
<a href="#">Listed Migratory Species:</a>	8

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	13
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	33
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community likely to occur within area
<a href="#">Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
------	--------	------------------

#### Birds

<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

#### Fish

<a href="#">Galaxiella nigrostriata</a> Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area
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#### Insects

<a href="#">Hesperocolletes douglasi</a> Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area
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#### Mammals

<a href="#">Dasyurus geoffroi</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
--	------------	--

Name	Status	Type of Presence
<b>Plants</b>		
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
<a href="#">Anigozanthos viridis subsp. terraspectans</a> Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Lepidosperma rostratum</a> Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area

### Listed Migratory Species

[ [Resource Information](#) ]

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area

## Other Matters Protected by the EPBC Act

### Listed Marine Species [\[ Resource Information \]](#)

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

## Extra Information

### Invasive Species [\[ Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
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Name	Status	Type of Presence
<b>Birds</b>		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur



Name	Status	Type of Presence within area
<b>Plants</b>		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
<b>Reptiles</b>		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-31.554312 115.814092,-31.554312 115.823147,-31.563454 115.823061,-31.563418 115.813963,-31.554312 115.814092,-31.554312 115.814092

# Acknowledgements

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- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
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- [-Tasmanian Herbarium](#)
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- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
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