Shire of Katanning
Heart of the Great Southern

# FIRE MANAGEMENT REQUIREMENTS 2016 - 2017

## Please retain this document for your reference

**FIRST AND FINAL NOTICE to all owners and occupiers of land in the Shire of Katanning. This document constitutes the Shire of Katanning Fire Management Requirements (Bush Fire Notice) pursuant to Section 33 of the Bush Fires Act 1954 you are hereby required, on all land owned or occupied by you, as a measure for preventing the spread and extension of a bush fire, to plough, cultivate, scarify, burn, chemically spray or otherwise clear upon the lands Fire Access tracks (fire breaks) in such manner as set out in this notice.**

000
EMERGENCY
For All Emergencies

**HELP STOP ARSON**
**Report suspicious activity to Crime Stoppers on 1800 333 000**

**By order of the Council**
**JULIAN MURPHY**
**CHIEF EXECUTIVE OFFICER**

## DEFINITIONS

## For the purpose of this Notice the following definitions apply:

**Flammable Material:** Material that can be easily ignited, (i.e.- dead or dry grass and crops, leaves, timber, boxes, cartons, paper, plastic and other material or things deemed by an authorised officer to be capable of combustion) but does not include green growing trees, growing bushes or garden plants.

**CBFCO:** Shall mean the Chief Bush Fire Control Officer as appointed by the Shire of Katanning.

**DCBFCO:** Shall mean the Deputy Chief Bush Fire Control Officer as appointed by the Shire of Katanning.

**BFCO:** Shall mean the Bush Fire Control Officer as appointed by the Shire of Katanning.

**DBFCO:** Shall mean the Deputy Bush Fire Control Officer as appointed by the Shire of Katanning.

**CESM:** Shall mean the Community Emergency Services Manager Authorised Officer as appointed by the Shire of Katanning.

**RANGER SERVICES:** Shall mean the Authorised Officer appointed by the Shire of Katanning

**Total Fire Bans (TFB):** Total Fire Bans are the bans imposed by the Minister for Emergency Services or his/her representative on days of severe or catastrophic fire hazards.

**Burning of Garden Refuse:** Means lighting or use of a fire in the open air for the purpose of destroying garden refuse. One cubic metre or less, is referred to as a garden refuse.

**Fire & Rescue District:** The area covering the Katanning town site. Fire & Rescue Services are responsible for all fires within this gazette district. The Shire of Katanning is directly responsible for the issuing of Fire Permits.

**Bare Earth:** Where referred to anywhere in this notice means an area of land which must be kept and maintained void of all material (living or dead) for the whole of the compliance period.

**Risk Mitigation Measures:** Efforts taken to reduce either the probability or consequence of a threat.

**Shire Officer:** As appointed by Council under Section 38 of the Bushfires Act 1954 being the CESM, CBFCO, DCBFCO, BFCO and Ranger.

# SUBURBAN AND RESIDENTIAL BLOCKS

***RESIDENTIAL LOT CLEARING:***
If the area of the land is 2023m² (approximately ½ acre) or less, remove flammable material on the land except living standing trees from the whole of the land by
**1 November 2016** by one of the following methods and with all other associated conditions mentioned above to apply:
ploughing, cultivating, scarifying, chemical spraying, mowing, burning or any other approved method. Mowed grass to be no higher than 150 mm.
Where residential zoned land exceeds 2023m² (approximately ½ acre), in addition to the grass height above, a 2.5 metre wide firebreak immediately inside and along all external boundaries is required.

# RURAL LAND AND SPECIAL RURAL LAND OUTSIDE OF TOWN BOUNDARY

**Boundary firebreaks are not compulsory,**
**However:**

(a) **Firebreaks shall** be installed at least 10 metres wide around the perimeter of any homestead building (excluding isolated non-flammable buildings), haystacks (within 100 metres of any building) or group of structures or installations and are to be cleared to the satisfaction of the Shire Officer. In addition, you may be required to carry out further works which may be deemed necessary by the Shire Officer and specified by way of a separate written notice forwarded to the address as shown on the Shire of Katanning rate records for the land. In some instances naturally occurring features such as rocky outcrops, natural water courses or landscaping such as reticulated gardens, lawns or driveways may be an acceptable substitute for cleared firebreaks. This option must first be discussed with and approved by the Shire Officer.

(b) Landowners can provide firebreaks if they desire, no less than 2.5 metres wide.

(c) All properties within the **Moojebing Heights** subdivision are to ensure compliance with the additional requirements of the Fire Management Plan dated April 2009.

# SPECIAL RURAL WITHIN KATANNING & PINWERNYING TOWNSITES

Must have a 2.5 metre wide bare earth firebreak immediately inside along all external boundaries. Grass to be no higher than 150 mm. Living standing trees, remnant vegetation, maintained gardens and natural bush are exempt. Where multiple blocks of land are grouped together, a perimeter 2.5 metre firebreak encompassing all land will be considered subject to an application for a variation.

**All firebreaks as designated above must be prepared on or before 1 NOVEMBER 2016 or within 14 days of becoming the owner or occupier should this be after that date and maintained clear of flammable material up to and including 30 April 2017.**

**Application to Vary the Above Requirements**

If it is considered to be impracticable for any reason whatsoever to meet requirements as required by this notice, you may apply to the Shire of Katanning no later than **1 October 2016** for permission to provide alternative risk mitigation measures on the land. If permission is not granted by the Shire you must comply with the requirements of this notice.

**If the requirements** of this notice are carried out by burning, such burning must be in accordance with the relevant provisions of the Bush Fires Act.

**The Penalty for failing to comply** with this notice will be in accordance with the Bushfires Act 1954, and a person in default is also liable, whether prosecuted or not, to pay the costs of performing the work directed in this notice if it is not carried out by the owner and/or occupier by the date required by this notice.

**NUISANCE SMOKE**

It is an offence under the Health Act 1911 to create nuisance smoke. If planning to burn, please consider your neighbours, other properties that may be affected and the condition and type of materials to be burnt. It is important to ensure that smoke is not toxic and does not disrupt traffic on roads.

**BURNING OF BUSH AND GRASS ON ANY LAND**

Burning of bush and grass is totally **prohibited** between **1 November and 14 February** inclusive (Prohibited Burning Period). Permits are required between 1 October inclusive and 31 October inclusive and between 15 February and 30 April inclusive (Restricted Burning Periods)

**PERMITS TO BURN**

Under the Bush Fires Act 1954, it is an offence to light fires during the Prohibited and Restricted Burning Times, except in certain circumstances. All burning during the Restricted Burning Period requires a Permit.

**GARDEN REFUSE AND HINTS**

During the Restricted Burning Periods small heaps of garden refuse (up to one cubic meter) may be burnt on the ground between 6.00pm and 11.00 pm, without a permit. A 5 metre wide firebreak must be cleared around the fire and at least one able bodied person must be in attendance at all times. No burning is allowed during the Prohibited Burning Period.

**BURNING IS PROHIBITED ON**

# HAZARD REDUCTION PROGRAM

Autumn to Winter (May-August)

- Tree pruning – remove lower branches, check that power lines are clear. Use a professional contractor
- Reduce fuel levels around the house, clear long grass, leaves, twigs and flammable shrubs.
- Ensure petrol and other flammables are safely stored away from the main dwelling.
- Accommodation providers must make sure all guests are aware of emergency plan, including evacuation routes.

Spring (September – November)

- Move wood piles and stack timber away from the main dwelling.
- Keep grass short
- Install firebreaks in accordance with this Fire Management Requirements.

Summer (November – May)

- Water lawns, trees and shrubs near buildings to keep green.
- Recheck fire-fighting equipment, screens, water supplies and that gutters remain clear.

Long Term precautions

- Make sure that buildings are safe – fit wire screens and shutters, fill gaps into roof/wall spaces, fit fire screens to evaporative air conditioners and have them operable to provide a water supply.
- Give consideration to installing external building sprinkler systems and backup power for emergencies.
- Ensure that access to emergency water supplies has the correct fittings, is unobstructed and trafficable.
- Get basic training in fire-fighting by contacting the Shire of Katanning.

**Hints for Burning**:

- Don't light a fire on a hot or windy day.
- Don't try to burn more than you can control.
- Inform your neighbours.
- Make sure smoke and sparks will not affect neighbours washing or open windows.
- Cut or rake long grass around trees, buildings and fences before burning.
- Burn against wind.
- On a sloping block, burn from the top down.
- Have a hose or spray pack to dampen down fire intensity.
- Extinguish fire by midnight.

**PRIVATE PROPERTY**

Wood and solid fuel barbecues shall only be used where they are enclosed and all flammable material in a 5m radius is cleared. Fire cannot be lit on days of very high, severe, extreme or catastrophic fire danger days.

**BBQ's and INCINERATORS**

Gas and electric barbecues are permitted at any time. Solid fuel barbeques and incinerators are **prohibited on days of VERY HIGH, SEVERE, EXTREME or**

**CATASTROPHIC fire danger days.**

***COMPLIANCE WITH THIS NOTICE IS REQUIRED BY 1 NOVEMBER EACH YEAR AND IS TO BE MAINTAINED UNTIL 30 APRIL EACH YEAR OR AS OTHERWISE GAZETTED***

**Non – compliance** **Complying** **Compliant**

Take notice, that pursuant to section 33(4) of the Bush Fires Act, where the owner or occupier of land who has received this Notice fails or neglects to comply with the requisitions of the Notice within the time specified, the Shire of Katanning may, by its officers, vehicles and machinery as the officers deem fit, enter upon the land and carry out the requisitions of the Notice which have not been complied with and pursuant to section 33(5) of the Bush Fires Act, the amount of costs and expenses incurred may be recovered from you as the owner or occupier of the land. The penalty for failing to comply with this notice is a fine not exceeding $5000 and the person in default is also liable, whether prosecuted or not, to pay the costs of performing the work directed in this Notice if it is not carried out by the owner or occupier by the date required by this Notice. If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the Bush Fires Act.

**CONTRACTORS**

Ray Jones ph 98211 212
Alexander Brown Contractors
ph Tim 9823 1115 or 0418 470 920
Katanning Bobcat Hire
ph Glen & Tracy Watts 98212449
Bouquet Cleaning Services
ph Troy or Suzee 98211 916

The contractors mentioned have lodged their names with this Council for public reference if required. They are not employed as sub-contractors, nor is Council responsible for any works carried out if used in a private capacity.

# FIRE DANGER RATING

- The Fire Danger Rating gives you advice about the level of bushfire threat on any given day. It is based on the forecast weather conditions.
- The higher the rating, the more likely people may die or be injured during a fire.
- Only well prepared, well constructed and actively defended homes may offer any safety up to the category of Extreme.
- Consider in your bushfire survival plan if your actions will change at different Fire Danger Rating categories.
- The Fire Danger Rating is published by the Bureau of Meteorology at www.bom.gov.au and through the media.

**THE SHIRE FALLS UNDER THE BEAUFORT FIRE WEATHER DISTRICT**

**TOTAL FIRE BAN: When a TFB is declared the lighting of any fire in the open air is prohibited. The ban includes all open fires for the purpose of cooking and camping.**

**A Total Fire Ban prohibited other activities, for further information please refer to the DFES Website.**

**TOTAL FIRE BAN PENALTY:** A fine of up to $25,000 or imprisonment for 12 months or both.

# THE HARVEST BAN HOTLINE NUMBER
# ph: 98 219 990

**HARVEST AND VEHICLE MOVEMENT BANS**
The Shire of Katanning may impose a Vehicle Movement and/or Harvest Ban due to dangerous fire weather conditions or if there are bush fires already burning. When imposed, any operation of machinery involved in harvesting crops, or other produce MUST come to a stop.

**ANY BAN WILL BE COMMUNICATED VIA ABC LOCAL RADIO, SMS AND THE BUSH FIRE BRIGADES RADIO NETWORK**

Farmers and personnel from relevant industries may subscribe to the Shire of Katanning SMS Service for the communication of Harvest and Vehicle Movement Ban information. Some activities may continue during a Harvest and Vehicle Movement Ban at sites approved by and registered with the Shire. For more information, please contact the Shire of Katanning or your local FCO.

**REGISTRATION FOR SMS NOTIFICATION OF HARVEST & MOVEMENT BANS**
Telephone your name, organisation and mobile number to the Shire of Katanning, 08 98219999.

Listen to ABC Radio on 558 or 630AM. At the time of printing, broadcasting times are: 10:05am, 12:35pm & 14:05pm. These times are subject to change.

***Regulation 38A – Harvesting, Swathing/Baling of Stubble and Track Chaining*:**
**Conditions:** It is hereby notified for public information that **pursuant** to the power granted under Regulation 38A of the above Act, a person shall not operate or suffer the operation of a grain harvesting machine, or any machine used for swathing, baling or slashing of stubble and track chaining, on any land within the Shire of Katanning except in accordance with the following specified condition:
**Specified condition:** No person shall operate grain harvesting machinery as stated above on any land unless a mobile and operational firefighting unit, having a water capacity of at least **500 litres**, is situated in or immediately adjacent to the paddock where harvesting operations are being conducted.
**Penalties:** An infringement of $250.00. A penalty of up to $5000.00.
The recommended minimum standards for fire unit requirements are based on property size as follows:
(i) 50-1000ha - Light Duty Unit. One tonne utility either 2WD or 4WD.
500 litre water capacity.
(ii) 1000 to 2500ha - Medium Duty Unit. Light truck either 2WD or 4WD.
2500 litre water capacity.
(iii) 2500 + ha - Heavy Duty Unit. 6 tonne capacity truck, preferably diesel.
4000 litre water capacity.
(iv) All units are to be fully operational and ready to go at all times during the prohibited burning period.

# BURNING INFORMATION

## Agricultural Burning

## The following dates are when selected burning may commence under a Permit.

**Canola Windrows from the 1 March**

**Cereal Windrows from the 15 March**

**Chaff Heaps from the 15 March**

**Stubble from the 1 April**

**Before obtaining a Permit the following points need to be addressed.**

**What size is the burn area?**
**What is the location of the burn?**
**What are you burning?**
**Are there breaks in place around the burn area?**

**Notification to neighbor's before burn commences**

## PERMITS TO BURN

Under the Bush Fires Act 1954, it is an offence to light fires during the Prohibited Time.

**During the Restricted Burning Time, permits to burn are required.** These may be obtained from the Local Volunteer Fire Control Officer, for your area or the Shire of Katanning if the property is within the Fire & Rescue District.

| RESTRICTED | PROHIBITED | RESTRICTED |
|---|---|---|
| PERMIT REQUIRED | | PERMIT REQUIRED |
| 1 October to 31 October | 1 November to 14 February | 15 February to 30 April |

## WHEN TO OBTAIN A PERMIT

**1.** For burning of bush, grass and garden waste at any time between 1 October and 31 October inclusive and 15 February and 30 April inclusive.
**2.** For carrying out **protective burning** around dwellings and buildings pursuant to Section 23 of the Bush Fires Act until the 15TH November.
**3.** Sunday burning is discouraged.

**These times may be varied by the Shire of Katanning depending on seasonal conditions. Changes will be publicised in local papers and on the Shire of Katanning website.**

**MAJOR INCIDENTS**
**Information to the community from the Incident Controller will be broadcast regularly on the ABC Radio on 558AM or available on the DFES Website under Alerts and Warnings.**

**WHEN THE FIRE WEATHER FORECAST IS VERY HIGH, SEVERE, EXTREME OR CATASTROPHIC, NO FIRES MAY BE LIT AND ALL PERMITS ARE SUSPENDED**

***Remember this Ratio = 1m of flame height requires 4m of distance to escape radiant heat.**

# BUSH FIRE BRIGADE CONTACT DETAILS

**COMMUNITY EMERGENCY SERVICE MANAGER #**
**CINDY PEARCE: mbl: 0417071567**

**RANGER SERVICES**
**MBL: 0409891645 #**

## VOLUNTEER FIRE BRIGADES

**# Highlights Officers that are able to issue Permits to Burn**

**Katanning Fire & Rescue (Town)**

| | | |
|---|---|---|
| **Captain:** Trevor Watson | 98211950 | 0427080018 |
| **First Lieutenant:** Chris Brooks | | 0429120030 |

**Rural Volunteer Bushfire Brigades**

| | | |
|---|---|---|
| **Chief Bush Fire Control Officer** | | |
| Ian Knapp # | 98 227037 | 0427215635 |
| **Deputy Chief Bushfire Control Officers** | | |
| Geoff Stade# | 98 231533 | 0428211551 |
| Tim Clegg# | 98 235151 | 0427771938 |
| **Chief Fire Weather Officer** | | |
| Richard Marshall # | 98221522 | 0429904130 |
| **Deputy Fire Weather Officers** | | |
| Barry Kowald # | 98211167 | 0407384097 |
| Jeff Baxter | 98214414 | 0428528840 |

**Volunteer Bush Fire Brigades**

| | | |
|---|---|---|
| **Carrolup *FCO's*** | | |
| Geoff Stade # | 98231533 | 0428211551 |
| Matthew Kitchens | 98215336 | 0427976960 |
| Cameron Beeck | 98212068 | 0438925733 |
| ***DFCO's*** | | |
| Ian Coleman # | 98210013 | 0429955778 |
| Alan Wilson | 98211942 | 0427772142 |
| Steve Conning | 98210047 | 0428141565 |
| Chris Quartermaine | 98 214937 | 0427214553 |
| ***DCFWO*** | | |
| Barry Kowald # | 98211167 | 0407384097 |
| **Central *FCO*** | | |
| Kim Kowald # | 98212908 | 0438337708 |
| ***DFCO*** | | |
| Alistair Dusting | | 0417185147 |
| **Badgebup *FCO*** | | |
| Tony Richardson | 98221504 | 0428149545 |
| ***DFCO's*** | | |
| Tim Harris # | 98214889 | 0428580678 |
| Norman Flugge | 98221505 | 0427984446 |
| ***CFWO*** | | |
| Richard Marshall # | 98221522 | 0429904130 |
| **Merrebin *FCO*** | | |
| Greg Garlick # | 98211851 | 0428211851 |
| ***DFCO*** | | |
| Cameron Mills | 98212505 | 0428215040 |

| | | |
|---|---|---|
| Shane Butterworth | 98212709 | 0428212709 |
| Matthew Kerin | 98212062 | 0429376593 |
| ***DCFWO*** | | |
| Jeff Baxter | 98214414 | 0428528840 |

**FIRE CONTROL OFFICER HAS THE AUTHORITY UNDER THE BUSH FIRES ACT 1954 TO HALT ANY ACTIVITY OR OPERATION THAT THEY DEEM AS HAZARDOUS OR LIKELY TO START A FIRE.**

**Fire Attendance**

All Brigade members attending a fire must check the following:

- That adequate protective clothing is worn;
- That any slip – on unit is bolted securely to the tray of the vehicle;
- That the Fire Incident Control is aware of your presence at the fire.

## FIRE PREPAREDNESS

- Prepare. Act. Survive. (Material available from the Shire of Katanning and DFES Websites)
- You are responsible for your own FIRE PROTECTION

## ***The Biggest Penalty Of All***

*Standing in the wreckage of your home knowing the smoldering mess is **your** fault because **you** didn't take proper precautions.*

SHIRE OF KATANNING
16-24 Austral Tce
KATANNING WA 6317
Phone: 98 219999
Fax : 98 219998
Web: www.katanning.wa.gov.au

For additional bush fire safety information, please visit
The Department of Fire and Emergency Services website:
www.dfes.wa.gov.au

**Volunteers make up the Bush Fire Brigades in the Shire of Katanning. Help to provide a**

**safer community by becoming an active member of your brigade. For more information, call your local brigade or the Shire of Katanning. Emergency Services in the Shire are also seeking volunteers for a range of support roles and we welcome your inquiry.**

talis
delivering solutions

Asset Management | Environmental Services | Spatial Intelligence | Waste Management

# Structure Planning: Environmental Investigations

## Katanning

**Prepared for Land Insights**
**November 2014**
**Project Number TE14012**

**Talis Consultants Pty Ltd**
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Leederville WA 6007
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ABN: 85 967 691 321

## DOCUMENT CONTROL

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| 1a | TE14012 – Structure Planning: Environmental Investigations | Joanna Skiba | Andrew Mack |
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| | | | |

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# Executive Summary

A team led by Land Insights has been engaged by the Shire of Katanning (the Shire), to provide Structure Planning services for five sites located within the town of Katanning. These sites comprise:

- O'Callaghan Park;
- Piesse Park;
- Western Australian Meat Marketing Cooperative Ltd (WAMMCO);
- Industrial Expansion Area; and
- Warren Road (DIA 4).

These sites are targeted for the first stage in a Growth Plan for Katanning to include industrial, commercial, residential and rural-residential development. These areas were identified within the recently endorsed Shire of Katanning Local Planning Strategy.

Talis Consultants Pty Ltd (Talis) was engaged by Land Insights to conduct environmental investigation works at the abovementioned sites to determine the suitability of the areas in question for their proposed development and any further investigations that might be required.

The work undertaken by Talis comprised a desktop level assessment coupled with a site inspection of all locations. Talis also utilised the services of Terratree Pty Ltd (Terratree), a specialist ecological consultancy, to assess the flora and fauna values of the areas and Galt Geotechnics Pty Ltd (Galt) to gain an appreciation of the geotechnical suitability of three locations. The intention of the work was to provide a desktop environmental review of the potential constraints and opportunities for each location, advise on the suitability (or otherwise) of the proposed development and provide recommendations for further investigation where required.

Based on the works undertaken it would appear that there are no factors that have been identified at this time that would necessarily and conclusively preclude development at any site. Notwithstanding this comment, Talis has identified a range of site-specific issues that will require further investigation, consideration and assessment before further progress can be made in relation to the final planning of these areas. Of particular note in this regard are the further investigation required to respond to ecological concerns at O'Callaghan and the contamination investigations associated with Piesse Park.

In relation to the preliminary geotechnical investigations carried out at three of the sites; comprising: Piesse Park, WAMMCO and Industrial Expansion, it was considered that each of the sites were geotechnically capable of supporting the proposed landscape and residential development at Piesse Park and light industrial development at WAMMCO and Industrial Expansion site. However, critical to the development of each of the sites is the potentially shallow depth to groundwater. Given the limited groundwater information available for Katanning and in particular for each of the sites, assumptions were made as to the potential depth to groundwater at the site. Further investigations would be required to be conducted to establish whether groundwater is a constraint to development, in addition further detailed geotechnical investigations would be required prior to development of the sites.

From a contamination perspective, there appeared to be no former or current contaminating activities occurring onsite at O'Callaghan, Industrial Expansion and DIA 4. A portion of the Piesse Park site was formerly used as an uncontrolled landfill and has since been classified by the Department of Environment Regulation (DER) as 'Potentially contaminated - investigation required'. Talis recommends additional environmental investigation works are required to determine the extent of the landfill and potential for unacceptable offsite impacts. Any such investigations should be carried out to align with the DER's expectation and guidance (the *Contaminated Sites Management Series*).

In relation to the WAMMCO site, the current landuse associated with the abattoir has the potential for contamination to occur. This will obviously be dependent on the nature of the operations and management measures in place. Given development may occur on adjacent land, further appraisal of this risk should be undertaken through discussions with the WAMMCO operators and assessment of the construction details associated with the site. Notwithstanding this commentary, it would be unlikely that any contamination identified would constrain development of the adjacent land for industrial purposes. In addition to the above, investigations will be required to determine the nature of the soil mounds located within the portion of the site south of Henry Street. There is the potential for buried material at this location to present an unacceptable risk to the environment and/or human health.

It is suggested that adequate separation distances are established to ensure that no unacceptable risks arise from land-use conflicts at Piesse Park, DIA 4 and O'Callaghan. Further consideration will however need to be given to site-specific separation distances at both WAMMCO and the Industrial Expansion Site. This work will need to consider the potential implications of the existing and proposed future industrial land-uses that are being considered at both locations.

From a flora and fauna perspective, none of the sites aside from O'Callaghan are considered to pose a significant constraint to development. The O'Callaghan site is considered to pose a number of constraints to development in this regard due to the native vegetation retained onsite with comparatively high species richness. Given that the native vegetation at the site is known to support fauna species of conservation significance as well as native fauna in general, additional work will be required to determine the potential presence of conservation species onsite. Further degradation would have a significant impact on the fauna communities which would see their habitat significantly limited and may in turn result in a habitat too small to support the fauna as well as increase competition for resources. This is therefore considered a significant constraint to any proposed development. Any proposed impacts to the site would require additional targeted surveys in consultation with the DotE, EPA and DPAW. As with all sites, any clearing of native vegetation will need to be undertaken in accordance with the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Further to this, , given the potential presence of fauna species (e.g. Carnaby's Black Cockatoo) listed under the Federal *Environment Protection and Biodiversity Conservation* Act, 1999 (EPBC), work will need to be undertaken to determine whether a referral pursuant to that Act will be required.

In relation to Piesse Park, WAMMCO, Industrial Expansion and DIA 4 which have previously been cleared of vegetation and are considered to be 'completely degraded', these sites are considered to be limited value as habitats for fauna of conservation significance and therefore not considered to pose a significant constraint to development. However, Eucalypts with large hollows identified at parts of the WAMMCO site and O'Callaghan may

be suitable nesting habitats for Carnaby's Black Cockatoo (protected under the EPBC Act). Proposed vegetation clearance and other disturbance activities within these two areas would require further assessment to determine the impacts in consultation with the relevant state and federal agencies.

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Figure 12: WAMMCO – Surface water

Figure 13: Industrial Expansion – Zoning and site attributes

Figure 14: Industrial Expansion – Surface water

Figure 15: DIA 4 – Zoning and site attributes

Figure 16: DIA 4 – Surface water

# Appendices

Appendix A: Terratree Report

Appendix B: Galt Geotechnics Report

Appendix C: Certificate of Title

Appendix D: Shire of Katanning, Town Planning Scheme

Appendix E: Heritage search

Appendix F: Aurora Environmental Report

Appendix G: Site inspection photographs

# 1 Introduction

## 1.1 Background

A team of consultants led by Land Insights has been engaged by the Shire of Katanning (the Shire), to provide Structure Planning services for five sites located within the Shire of Katanning. These sites comprise:

- O'Callaghan Park;
- Piesse Park;
- Western Australian Meat Marketing Cooperative Ltd (WAMMCO);
- Industrial Expansion Area; and
- Warren Road (DIA 4).

These sites are targeted for the first Stage in a Growth Plan for Katanning to include industrial, commercial, residential and rural-residential developments. These sites were identified within the recently endorsed Shire of Katanning Local Planning Strategy.

Talis Consultants Pty Ltd (Talis) was engaged by Land Insights to conduct preliminary desktop Environmental Investigation work for the abovementioned sites to determine the suitability of the areas in question for their proposed development and identify any further investigations that might be required. In this regard, Talis engaged Terratree Pty Ltd (Terratree) as specialist sub-consultants to address items in the scope of work relating to flora and fauna (provided in **Appendix A**); and Galt Geotechnics (Galt) to conduct geotechnical investigations at three of the sites; comprising Piesse Park, WAMMCO and Industrial Expansion (provided in **Appendix B**).

## 1.2 Objectives

The objectives of this Environmental Investigation were to:

- Identify environmental attributes of each of the five individual sites which could have the potential to represent a constraint or opportunity in relation to the proposed land use/developments;
- Detail the suitability of the land in question for the proposed Structure Plans; and
- Provide recommendations for further work or investigations that may be required.

## 1.3 Scope

To achieve the objectives described above, this Environmental Assessment Report provides contextual information in relation to the Katanning area and then presents findings of the investigation for each of the structure plan areas.

- Section 2: Background
- Section 3: Investigations
  - O'Callaghan Park
  - Piesse Park
  - WAMMCO
  - Industrial Expansion Area
  - DIA 4

- Section 4: Conclusions and Recommendations

# 2 Background

## 2.1 Katanning

Katanning is located inland within the Great Southern region of Western Australia (WA); approximately 285 km south-east of Perth. The townsite has a population of 4,235, with a local government population of 4,706, however, it engages with a wider regional population of 12,500. Based on the diversity of land uses including agriculture, mining, education and other value-adding land uses, the townsite and hinterland may see future growth prospects. (Katanning SuperTown Growth and Implementation Plan (KSGIP), 2012)

The climate in Katanning is considered to be semi-arid (dry) Mediterranean with warm dry summers and cool wet winters. The highest mean maximum temperatures (30.3°C) are recorded in January and lowest in July (14.6°C). Rainfall predominantly occurs during May and September with the mean rainfall between 46.5 mm (September) and 76.6 mm (June), with low rainfall occurring over the warmer months, with the mean rainfall between 14.7 mm (January) and 35.5 mm (October) (Bureau of Meteorology (BOM) website)

From a topographical perspective, Katanning generally sits between 310 and 370 m Australian Height Datum (AHD) (Landgate website).

## 2.2 Katanning SuperTown Growth Implementation Plan

The Regional Centres Development Plan (SuperTowns) initiative was announced by the State Government in July 2011. The idea behind the term 'SuperTown' is to help communities become more desirable places to live, work and invest by creating communities that have access to a range of services, job opportunities, and affordable housing, which is said to have a 'flow-on' benefit to nearby towns and communities. A SuperTown will provide alternative lifestyle for those individuals wanting to leave the larger metropolitan areas and live within regional areas (KSGIP, 2012).

Due to its central location and demonstrated governance ability, Katanning is one of nine towns selected in WA with a potential to become a SuperTown and, will play a key role in the future development of regional WA. This SuperTown Growth Implementation Plan has presented a valuable opportunity to demonstrate growth and crystallise a vision for Katanning, which over the next 30 years will become the Central and Upper Great Southern's regionally significant multicultural SuperTown where people want to live (KSGIP, 2012).

Between November 2011 and February 2012, an intense community and consultation program was undertaken in relation to the Supertown initiative. This consisted of workshops with the Council, community reference group, local government reference group and the community. An ambitious vision has been developed and supported by objectives which reflect the economic community and environmental pillars of sustainability.

According to the KSGIP (2012) the greatest constraint to Katanning's growth opportunities is the towns inability to attract and retain residents. Katanning tends to lose people at key milestones i.e. children going to secondary schools and when higher level of medical assistance is needed. A range of community facilities and services currently exists, however

there is a need to improve the overall visual amenity of the town; create an attractive and vibrant town; be recognised for educational excellence and provide a full suite of medical services.

As identified within the KSGIP (2012) document, the key drivers of the proposed growth plan are to create new, permanent employment opportunities in and around Katanning which are considered to have the potential to increase the population of Katanning by 7,800 people. Whilst not all have been adopted within this structure plan, as per the KSGIP (2012) document, the following opportunities have been identified for Katanning::

- Development of a gold prospect at Jinkas currently being analysed, with construction underway by 2015;
- Development of an agrifood precinct capitalising on the regional sheep saleyard facility and the WAMMCO abattoir which would be boosted by WAMMCO moving to a 7-day program and potentially incorporating a beef chain;
- Migrant transition centre or prison;
- Utilising the National Broadband Network(NBN) Hub located at Katanning and servicing the South West;
- Development of a Regional health campus; and
- Capitalising on multiculturalism and boosting tourism.

Five sites within the Shire of Katanning comprising: O'Callaghan, Piesse Park, WAMMCO, Industrial Expansion and DIA 4 have been targeted for the first stage of the growth plan for the proposed various land use.

## 2.3 Environmental Legislation

In order to understand the implications of development of a parcel of land might have on the land in question and other surrounding land-uses, it is necessary to quantify the existing environment and social considerations (i.e. provide a baseline from which impacts can then be considered).

The environmental implications of any proposal are general considered with respect to both State and Federal legislation. The primary legislation in WA which addresses environmental management is the *Environmental Protection Act 1986* (EP Act), whilst the corresponding Federal legislation is the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which relates specifically to matters of National Environmental Significance (NES). In WA, other legislation to consider in the context of land development includes the following:

- *Contaminated Sites Act 2000;*
- *Aboriginal Heritage Act 1972;*
- *Wildlife Conservation Act 1950;* and
- *Rights in Water and Irrigation Act 1914.*

### 2.3.1 Separation Distances and Buffers

The Environmental Protection Authority's (EPA) current document *Separation distances between Industrial and Sensitive Land Uses Guidance Statement No.3 (GS3)* "*provides advice on the use of the generic separation distances that have been developed…for a range of industrial land uses*" (EPA, 2005).

GS3 is inherently useful as a first port of call in determining what a reasonable buffer or separation distance might look like between an industrial source and sensitive receptor, in the absence of any other studies being undertaken. As noted by the EPA, the Guidance Statement is useful in a range of circumstances, including:

- *to identify the need for specific buffer definition studies where:*
    - *a new industrial land use is proposed near an existing or proposed sensitive land use; or*
    - *a new sensitive land use is proposed near an existing or proposed industrial land use; and*
- *to provide general guidance on separation distances in the absence of site specific technical studies, or, where only an estimation of the area that could be subject to land use conflicts is required.*

It is very clear within the document that site specific technical assessments are likely to provide better quantification as to an appropriate alternate separation distance to those generic distances listed for the range of industries identified.

It recommends that protection of land uses should occur through identification of buffers at the early strategic and structure planning stages of the planning process. These matters should be identified, considered and incorporated into final land-use planning documents which should also leave their mark on any subsequent development or proposal. It further comments that in relation to the development of proposals or projects, sound technical advice and assessment of issues provides the most appropriate guide to separation distances and buffers.

It is also clear within GS3 that it should not be read as a statutory requirement. It recommends that each situation be treated on its merits and site-specific studies are undertaken, either to increase or decrease the generic distances as required. It also offers a word of caution in that the generic distances should also not be utilised where the industry involved is very large, utilises non-typical technology, or in some other way the circumstances are not typical and that in such circumstances, additional studies should be undertaken (EPA 2005).

The distances it promotes are also only useful in circumstances where there is a potential conflict between a source and a sensitive receptor. The principles noted in its text regarding the need for site-specific studies are however important in circumstances where potential conflicts between industrial uses are possible.

# 3 Investigations

## 3.1 O'Callaghan Park

### 3.1.1 Site Overview

#### *3.1.1.1 Site Description*

O'Callaghan Park is located at: Lot 964 Great Southern Highway, Lots 6, 7, 8 and 9 Curlew Street, Lots 14, 16, 18, 19 and 25 Shirley Street and Lot 994 Kierle Street, Katanning within the Shire of Katanning, WA. The site comprises a total area of 61.2 hectares (ha), and is bordered by Kojonup Katanning Road to the north, Great Southern Highway and Mcleod Street to the east, Curlew Street and Shirley Street to the south and Ramsden Street and Kierle Street to the west. The location of the site is shown in **Figure 1** and the general site layout provided in Figure 2b: Piesse Park – site layout

The site was formerly used as a race track with three remnant race track 'ovals' existing at the site. The site is considered vacant, predominantly covered in dense vegetation, with a more sparsely vegetated area within the northern portion and within the central portion of the former race track. A site visit was conducted on 25 September 2014 to help identify any potential environmental or social constraints that may have been present at the site; this is further discussed in Section 2.7.

As shown in **Figure 7**, the surrounding adjacent land was occupied by low density rural/residential properties.

#### *3.1.1.2 Certificate of Title*

A copy of the current Certificate of Title is provided as **Appendix C**. A summary of the details it contains is provided in **Table 1** below:

**Table 1: O'Callaghan Park Certificate of Title Details**

| Land Description | Volume/ Folio | Street Address | Registered Proprietor | Date Registered | Previous Title |
|---|---|---|---|---|---|
| Lot 964 on Deposited Plan 102394 | 170/156 | Lot 964 Great Southern Hwy, Katanning | Katanning Road Board of Austral Terrace, Katanning | 16/08/1951 | This title |
| Lots 6, 7, 8, 9, 14, 16, 17, 18 & 19 on Plan 3271 and Lot 25 on Diagram 16035 | 2067/169 | Lot 6 Curlew St, Lot 7 Curlew St, Lot 8 Curlew St, Lot 9 Curlew St, Lot 14 Shirley St, Lot 16 Shirley St, Lot 17 Shirley St, Lot 18 Shirley St, Lot 19 Shirley St & Lot 25 Shirley St Katanning | Shire of Katanning of Austral Terrace, Katanning | 8/02/1996 | 1140-463 |
| Lot 994 on Deposited Plan 214737 | LR3013/963 | Lot 994 Kierle St, Katanning | Primary Interest Holder: Shire of Katanning | NA | This title |

#### 3.1.1.3 Historical Aerial Photographs

A brief review was undertaken of Landgate's online historical aerial imagery dating back to 1997. It appeared that the site has undergone minimal changes between 2014 and 1997, with the layout of the site effectively consistent between 1997 and 2014. It appeared that the current three ovals (former race tracks) located at the site were in use in 1997, with supporting infrastructure (building) located directly north of the largest race track oval. It appeared that the smaller oval located within the western portion of the site was no longer used by 2001 and the largest central oval was no longer used by 2011 (this was assumed due to tree overgrowth in these areas). The building was also removed at some point between 2003 and 2006. The smaller central oval and dense vegetation located across the site remained unchanged.

#### 3.1.1.4 Proposed Land use

Based on the Katanning SuperTown Growth and Implementation Plan (November 2012), a variety of proposed land uses are planned for the site, including (but not limited to) low density residential, low cost workers, temporary workers, migrant, student and separate mine accommodation.

#### 3.1.1.5 Local Zoning

Under the Shire's Town Planning Scheme No 4 (District Scheme), Map No. 9 the majority of the site is currently zoned as *Recreation and Open Space*. The northern portion of the site is zoned as *Residential*, and the southern portion of the site is zoned as *Rural,* as shown in **Figure 7**. A breakdown of each lot and zoning is provided in **Table 2** below.

**Table 2: O'Callaghan Park - local zoning**

| Zoning | Land description | Site Address |
|---|---|---|
| Residential | Lot 964 on Deposited Plan 102394 | Lot 964 Great Southern Hwy, Katanning |
| Rural | Lots 6, 7, 8, 9, 14, 16, 17, 18 & 19 on Plan 3271 and Lot 25 on Diagram 16035 | Lot 6 Curlew St, Lot 7 Curlew St, Lot 8 Curlew St, Lot 9 Curlew St, Lot 14 Shirley St, Lot 16 Shirley St, Lot 17 Shirley St, Lot 18 Shirley St, Lot 19 Shirley St & Lot 25 Shirley St Katanning |
| Recreation and Open Space | Lot 994 on Deposited Plan 214737 | Lot 994 Kierle St, Katanning |

#### 3.1.1.6 Surrounding land use

The site is currently surrounded by various land uses, with current local zoning showing *Rural* to the north (and some *Residential)*, west and south and *Recreation and Open Space* to the east.

#### 3.1.1.7 Buffers

Approximately 400 m south-east of the site is a site labelled as a brickworks, zoned as *General Industrial.* The EPA GS3 recommends a separation distance of 300-1000 m depending on the size. However, based on current information available (pers comm and

lack of current DER Licence for the site), it is understood that the brickworks is no longer operational, therefore the brickworks buffer does not apply to this site.

A buffer of at least 500 m exists between the site and the numerous small blocks zoned as *General Industrial* and *Light Industrial* to the east of the site. There appeared to be no industry within this area that would require a greater separation distance. In addition, the SuperTown documentation states that a portion of the sites zoned *Light Industrial* are being used for residential purposes (KSGIP, 2012). It does not appear that land use conflicts would arise between the proposed use of the site and surrounding sites.

### 3.1.2 Review of Site Attributes

#### *3.1.2.1 Topography*

Landgate is the statutory authority that maintains the State's official register of land ownership and survey information. Utilising topographical contour geospatial data sourced from Landgate, the site appears to be relatively flat, with the south-western portion of the sight slightly sloping up in a south-westerly direction. The site sits approximately 310 m Australian Height Datum (AHD), as shown in **Figure 7**.

#### *3.1.2.2 Geology*

Based on the Geoscience Australia (2008) map with 1:1,000,000 scale, the site's geology is said to comprise: colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete and reworked laterite, as shown in **Figure 9**.

#### *3.1.2.3 Soil*

Based on the agreed scope of work, no intrusive geotechnical investigations were conducted at this site to identify surface soil types.

#### *3.1.2.4 Acid Sulphate Soils*

Acid Sulphate Soils (ASS) are naturally occurring soils that contain iron sulphide (iron pyrite) minerals that if disturbed by soil excavation, dewatering or drainage, can then oxidise resulting in the release of acidity and potentially causing environmental impacts.

ASS risk mapping geospatial data generated by the Department of Environment and Conservation (DEC) (now known as the Department of Environment Regulation (DER) and Department of Parks and Wildlife (DPaW)) data is not available for the site. However, a review of the CSIRO's Australian Soil Resource Information System (ASRIS) (2014), shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring (**Figure 10**).

### 3.1.3 Ecological Investigations

The following Section provides a summary of results obtained from the environmental study conducted by Terratree for the site. This comprised both a desktop study which comprised the following database searches: DPaW's Threatened and Priority Flora, Threatened Fauna and Ecological Community, WA Herbarium (WAH) Declared Rare and Priority Flora and Department of the Environment's Projected Matters Search Tool, and associated Level 1 flora

and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The complete study has been included in this report as **Appendix A**.

#### *3.1.3.1 Vegetation Condition*

Vegetation condition at the site was assessed in accordance with a vegetation description scale adopted from Keighery (1994). The site vegetation is best described as ranging from 'good' (vegetation structure significantly altered by various signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it) to 'excellent' (vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species).

The native vegetation is primarily low open forest of *Allocasuarina heugeliana* with patches of eucalypts. Much of the native vegetation has been invaded by weeds and is subject to edge effects. Feral herbivores such as rabbits were also evident, however despite the disturbance factors, the vegetation structure was noted to be generally intact, see Figure 06b within **Appendix A**

#### *3.1.3.2 Declared Rare and Priority Flora*

A search was conducted of the WA Herbarium, DPaW database and the Department of the Environment (DotE) Protected Matters Search Tool (PMST) for records of known Threatened and Priority flora within 20 km of the site. A total of 41 significant flora were recorded on the databases. No species of Threatened Flora (Declared Rare Flora) pursuant to the WA *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Federal *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys.

Two flora species listed as Priority 3 by DPaW comprising *Synaphea drummondii* and *Verticordia brevifolia* were recorded at the site. During the survey, the *Synaphea drummondii* was observed 86 times within the central portion of the site, although its distribution appeared to be restricted given it was only found within one part of the survey area and there were no other records for this species within close proximity during the database search. In relation to *Verticordia brevifolia*, this species has a fairly restricted geographical range and was recorded at one location only during the survey. According to the database search, the nearest record for this species is within 1 km of the site, however it is suggested that O'Callaghan may be the actual locality rather than the location of the record (see Figure 06a within **Appendix A**).

#### *3.1.3.3 Declared Rare and Priority Fauna*

A search was conducted of the DPaW database and the DotE PMST for records of known Threatened, Schedule and Priority Fauna within a 20 km radius of the site. The DPaW database returned nine Threatened Fauna species including one that is presumed extinct, seven migratory birds and two other specially protected fauna species. The database also showed one Priority 2 species and six Priority 4 species. The DotE PMST database search returned five Endangered and Vulnerable fauna species, and 10 Invasive fauna species (see **Appendix A**).

Of the species identified, three are considered likely to occur at the site, these include: Carnaby's Black Cockatoo, Red-tailed Phascogale and Rainbow Bee-eater, with an

additional 15 species that are considered to possibly occur at the site (a list is provided in Section 5 of **Appendix A**). Carnaby's Black Cockatoo and Red-tailed Phascogales are listed as Endangered and the Rainbow Bee-eater as Migratory under the Federal EPBC Act 1999. Proposed vegetation clearing and any disturbance activities would require further assessment to determine the impacts to these species in consultation with the relevant State and Federal agencies.

The Carpet Python is one of the 15 additional species identified that is considered to possibly occur at the site and is listed as Specially Protected under Schedule 4 of the *Wildlife Conservation Act* 1950.

#### *3.1.3.4 Threatened and Priority Ecological Communities*

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site (see section 4.1, **Appendix A**).

#### *3.1.3.5 Environmentally Sensitive Areas*

Environmentally Sensitive Areas (ESAs) are declared in *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as areas that cover any and/or all of the following conservation significant areas:

- Declared World Heritage property;
- Register of the National Estate;
- Defined wetland and the area within 50 m of the wetland;
- Area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- Threatened ecological community;
- Bush Forever Site; and
- Areas identified within Environmental Protection Policy areas.

The site is not considered to be an ESA.

#### *3.1.3.6 Ecological Linkages*

Ecological linkages are essentially linear elements within a landscape that provide connectivity between a number of areas of natural vegetation/habitat and facilitate movement of species between these.

The native vegetation at the site is considered to be an 'island habitat' which is isolated from other areas of native vegetation within Katanning (with an exception to the east of the site) which provides an ecological linkage between the site and that area.

The native vegetation at the site is known to support fauna species of conservation significance as well as native fauna in general. Further degradation would have a significant impact on the fauna communities which would see their habitat significantly limited and may in turn result in a habitat too small to support the fauna as well as increase competition for resources.

### 3.1.4 Hydrology and Hydrogeology

#### *3.1.4.1 Groundwater*

Under the *Rights in Water and Irrigation Act 1914*, proclaimed groundwater areas in WA are areas in which licences are required to construct or alter a well and to take groundwater. The site is not located within any proclaimed groundwater area and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow. The nearest groundwater proclaimed area is located approximately 110 km to the west and is associated with the 'Collie Groundwater Area'.

Desktop investigations on groundwater levels were carried out using Department of Water (DoW) historical groundwater contours and Water Information (WIN, 2002) site geospatial datasets. The WIN site database is a State-wide record of surface and groundwater measurements, both quantitative and qualitative taken at monitoring points across the State.

Groundwater contour data did not extend to the subject area and was therefore unusable. WIN site records were not considered extensive enough to give an indication of depth to groundwater. The nearest WIN site (ID:6094934) with recorded groundwater levels is located 500 m to the south east of the site. Static groundwater level at this site was recorded as 10.13 m below ground level (bgl). However, review of the *Shire of Katanning Local Planning Strategy 2013* indicates that "around 60% of the town experiences groundwater within 2 m of the surface".

Additionally, a review of the *Katanning Town Groundwater Program 2003 Drilling Bore Completion and Test Pumping Report* (Global Groundwater, 2004) prepared for the Shire of Katanning showed a groundwater bore (03KC07D) located approximately 200 m north-east of the site, which showed static groundwater level to be approximately 2.936 m bgl in May 2003.

#### *3.1.4.2 Surface Water*

One surface water body, an unnamed minor, non-perennial watercourse was located within the northern portion of the site. The unnamed watercourse flowed in a west to east direction, and partially meandered through the northern portion of the site (as shown in **Figure 11**).

Other than the identified unnamed watercourse, several surface water bodies (man-made dams, water tanks) are located within the vicinity of the site, with the nearest one located at a site adjacent to the south-eastern site boundary.

#### *3.1.4.3 Public Drinking Water Source Areas*

Under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act* 1947 the DoW has the powers necessary to legally define the boundaries of public drinking water source areas (PDWSAs). These are legally defined boundaries with varying Priority Levels (P1, P2 and P3) assigned to ensure that PDWSAs are managed and protected to ensure the availability of reliable, safe, good quality drinking water from either groundwater or surface water sources.

Based on a review of available mapping, the site is located outside of any PDWSAs, with the nearest recorded PDWSA being located approximately 45 km to the south-west and is

defined as a PDWSA with 'Priority Not Assigned'. The nearest assigned PDWSA is the Priority 1 'Harris River Dam Catchment Area' approximately 120 km to the north-west.

#### *3.1.4.4 Surface Water Proclaimed Areas*

Under the *Rights in Water and Irrigation Act 1914*, proclaimed surface water areas in WA are areas in which licences are required to take water from a surface watercourse. Based on a review of available mapping, the site is located outside of any proclaimed surface water areas, with the nearest being approximately 45 km to the southwest associated with the 'Warren River and Tributaries' area.

#### *3.1.4.5 Floodplains*

The DoW prepares floodplain mapping (FPM) to indicate the extent of flooding associated with Average Recurrence Interval (ARI) 100 year flood events. The ARI 100 year flood event is a statistical estimate of the average period in years between the occurrences of a flood of a given size and is roughly equal to a 1% probability of occurring in any given year.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 37 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

### 3.1.5 Contaminated Sites

This section details the results of relevant investigations to ascertain if the site has any registered historical contamination or pollution complaints. The DER currently records information on contaminated sites within WA on a contaminated sites register in accordance with the *Contaminated Sites Act 2003*. All sites of known or suspected contamination reported to DER will be classified under the Act as one of the following categories:

- Report not substantiated;
- Possibly contaminated – investigation required;
- Not contaminated – unrestricted use;
- Contaminated – restricted use;
- Contaminated – remediation required;
- Remediated for restricted use; or
- Decontaminated.

#### *3.1.5.1 DER Contaminated Sites Database*

The DER *Contaminated Sites Database* is a publicly accessible online database that grants access information on sites classified as either:

- Contaminated - remediation required;
- Contaminated - restricted use; or
- Remediated for restricted use.

According to the DER Contaminated Sites Database, the site was not listed, or within the vicinity of sites listed on the database on 19 August 2014. A parcel of land comprising 25 sites classified as *contaminated – restricted use* was located approximately 1.13 km north-east of the site, as shown in **Figure 12**.

### 3.1.6 Social Attributes

#### *3.1.6.1 Aboriginal Heritage*

A search for relevant Aboriginal Heritage was conducted by using the DAA online *Aboriginal Heritage Inquiry System* which incorporates both the Heritage Site Register and the Heritage Survey Database, which lists the following sites:

- Registered Aboriginal Sites;
- Other Heritage Places; and
- Heritage Survey Areas.

Results of the search indicated that the site was not a *Registered Aboriginal Site* or *Other Heritage Place*, nor was it in the direct vicinity of listed sites.

The site was not listed as a *Heritage Survey Area* however, it was in the vicinity of three sites listed as *Heritage Survey Areas*. The two surveys were conducted along the Great Southern Highway located directly adjacent to the north-eastern site boundary (survey report IDs 106482 and 17057) and one survey approximately 220 m north-west of the site (survey report ID 104191) which were associated with underground optic fibre infrastructure installation. The search results are provided in **Appendix E**.

#### *3.1.6.2 Australian Heritage*

An online search of the Australian Government's Department of Environment Heritage Database found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500 m).

#### *3.1.6.3 Local Government Heritage*

An online search of the Heritage Council of WA's (HCWA) database using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site. One site (Residence, 76 Bokarup Street) was listed within the vicinity of the site (<500 m), located approximately 360 m north-east of the site, as shown in **Figure 13.**

### 3.1.7 Site Inspection

A visual inspection of the site was conducted by the Talis staff on 25 September 2014. This incorporated a 'walk-over' across accessible portions of the site, drive around the perimeter of the site as well as an inspection of the surrounding land use. Photographs from Talis' inspection are provided in **Appendix G**, whilst those from Terratree are provided in the Terratree report in **Appendix A**.

The site itself was bordered by Kojonup Katanning Road to the north, Great Southern Highway and Mcleod Street to the east, Curlew Street and Shirley Street to the south and Ramsden Street and Kierle Street to the west. Surrounding the site were predominantly low density rural/residential properties.

The surface of the site was predominantly covered in a range of vegetation with a cleared oval and tracks and heavily disturbed vegetation within the northern portion of the site.

At the time of inspection, one surface water body was identified within the northern portion of the site, which was a non-perennial watercourse meandering offsite, flowing in a west to east direction.

### 3.1.8 Discussion

The subject site is located at: Lot 964 Great Southern Highway, Lots 6, 7, 8 and 9 Curlew Street, Lots 14, 16, 18, 19 and 25 Shirley Street and Lot 994 Kierle Street Katanning, in within the Shire of Katanning WA. Based on a review the Katanning Town Planning Scheme No4 (District Scheme) provided in **Appendix D**, the majority of the site is currently zoned as *Recreation and Open Space,* the northern portion of the site is zoned as *Residential*, and the southern portion of the site is zoned as *Rural.* It is understood that the proposed future land use for the site include (but not limited to) low density residential, low cost workers, temporary workers, migrant, student and separate mine accommodation. It is Talis' understanding that in order to progress development of the residential type developments at the site, a rezoning of the portions of the site that are currently not listed as *Residential*.

In terms of the site itself, a broad assessment suggests that, aside from ecological considerations, there are few environmental constraints that would preclude development of the site for its intended use. From a topographical perspective, the site is relatively flat slightly sloping down towards the south-eastern portion of the site. The majority of the site has been historically used as a race track (together with associated infrastructure) with the southern portion vegetated (see sections 3.1.3.1 above) and the northern portion covered in some vegetation which appears to have had no former use.

There is significant remnant native vegetation retained onsite with a 'good' to 'excellent' condition and a high species richness. No species of Threatened Flora (Declared Rare Flora) pursuant to the WA *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Federal *EPBC* Act were identified at the site. Two Priority flora taxa and one Priority 4 fauna taxon were recorded during Terratree's survey of the site. Based on this, impacts to the flora should be avoided, however where impacts cannot be avoided, consultation with DPaW would be required and clearing would need to be undertaken pursuant to the requirements of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

It was further identified that three Endangered fauna species – Carnaby's Black Cockatoo, Red-tailed Phascogale and the Rainbow bee-eater are likely to occur at the site. These species are protected under the Federal EPBC Act, and any proposed impacts to the site would require additional targeted surveys for the species in consultation with the DotE, EPA and DPaW. It should be noted that under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (NES) (Carnaby's Black Cockatoo, Red-tailed Phascogale and the Rainbow Bee-Eater all fall into this category) require approval from the Australian Government Minister for the Environment (the Minister).

Any proposed disturbances to native vegetation at the site in consultation with DPaW also need to consider the potential impacts to Carpet Python (Schedule 4), Barking Owl (southwest pop, Priority 2), Bush Stone-curlew (Priority 4), Western Rosella (Priority 4), Western Shrike-tit (Priority 4), and White-browed Babbler (Priority 4) which may possibly occur at the site.

Soils have not previously been assessed from an ASS perspective, they have however been mapped by the CSIRO for the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring. Talis therefore suggests that ASS is not an issue that will not require further management in terms of the proposed development of the site. Similarly and based on the desktop investigations and site inspection, there is no reason to suggest that there are any previous potentially contaminating activities that have been undertaken onsite, nor was there any visual evidence of contamination observed. As such, in Talis' opinion, it is unlikely that any further investigation and/or management will be required in terms of contamination.

Talis recommends that appropriate management measures are put in place to control stormwater migration from the site and ensure that dust impacts are managed appropriately during construction and post-development. From a surface water perspective, there is a non-perennial watercourse that runs along the northern portion of the site which extends offsite. Any stormwater not retained onsite should be appropriately managed to ensure that any potential migration of contaminants from the developed site is minimised as far as practicable. Effective stormwater systems need to be designed to adequately manage small, minor and major storm events. A detailed stormwater management plan for the site which would need to include a suitable road drainage network for stormwater run-off from impervious surfaces e.g. roads, parking, roofs etc.

Given the limited groundwater data available for Katanning and in particular no actual groundwater data available for the site itself, groundwater levels for the site will be assumed to be similar to the nearest groundwater well data. The depth to groundwater was measured approximately 200 m north-east in 2003, which was recorded at 2.936 m bgl. It is worth noting that *Allocasurina huegeliana* was identified at the site during the flora and fauna investigations. This species is found in well-drained sandy loam soils and is sensitive to waterlogging, which may suggest that the groundwater table may be relatively deep at this location. However based on this very limited data, groundwater may potentially be considered a constraint to the development of the site given that any development will require a suitable separation distance to be maintained from the base of any proposed structure and the groundwater table itself. Given that no geotechnical or groundwater investigations were conducted at the site itself, it would be recommended to install piezometers or monitoring wells to identify depth to groundwater to identify quantities of fill material required to be imported to the site to raise levels for development.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 37 km to the south and associated with the Gordon River development control area. Given the distance, this site is unlikely to pose any risk to development of the site.

The State Government planning process incorporates consideration of potentially conflicting land uses and ensuring that adequate buffers are established to ensure suitable separation from adjacent land uses are maintained. In terms of the planning process, the O'Callaghan site and its surrounds could be considered sensitive, at least in the context of environmental impacts from conflicting land uses. The site falls outside of any current established industry buffers and therefore it is not considered to pose a constraint to the proposed development of the site.

Finally, in terms of heritage, based on the investigations undertaken by Talis, no Australian Heritage, Registered Aboriginal sites were listed at the site nor within the direct vicinity (<500 m) of the site. One Local Government Heritage site (a residence located at 76 Bokarup Street) was listed within the vicinity of the site, located approximately 360 m north-east of the site, however this is not perceived to be a constraint to the development of the site.

## 3.2 Piesse Park

### 3.2.1 Site Overview

#### *3.2.1.1 Site Description*

Piesse Park is located at: Lot 1 and Lot 3 Synnott Avenue and Lot 1 and Lot 79 Warren Street, Katanning, within the Shire of Katanning, WA. The site comprises an area of 19.6 ha, and is bordered by Synnott Avenue to the north, Taite Terrace, Adam Street and Fredrick Street to the north-east, Clive Street to the south-east, Starling Lane to the south-west and Warren Road to the west. The location of the site is shown in **Figure 1**: Locality Plan and the general site layout shown in **Figure 3b**: Piesse Park – site layout.

A site visit was conducted on 25 September 2014 to help identify any potential environmental or social constraints that may have been present at the site. Based on information provided in an Aurora Environmental (Aurora) letter, a portion of the site was formerly used as an uncontrolled landfill; this is further discussed in Section 3.2.8. The north-eastern portion of the site (north of Synnott Avenue) is currently used as a bowls club with the remainder of the site considered to be a parkland undergoing re-development, with sparse vegetation and located across the site. Several water bodies are located at the site, comprising two man-made lakes currently under construction, the Katanning Town Creek which enters the site from the west and runs along the southern portion of the site, and Piesse Dam which is anecdotally home to several long-neck turtles.

As shown in Figure 14, the surrounding adjacent land is occupied by medium density residential properties and vacant land.

#### *3.2.1.2 Certificate of Title*

A copy of the current Certificate of Title is provided as **Appendix C**. A summary of the details it contains is provided in **Table 3** below:

**Table 3: Piesse Park Certificate of Title Details**

| Land Description | Volume/ Folio | Street Address | Registered Proprietor | Date Registered | Previous Title |
|---|---|---|---|---|---|
| Lot 3 on Diagram 27422 | 1261/665 | Lot 3 Synnott Ave, Katanning | Shire of Katanning of Katanning | 14 June 1962 | 1256-827 |
| Lot 1 on Diagram 26384 | 1383/405 | Lot 1 Synnott Ave, Katanning | Shire of Katanning of 16/24 Austral Terrace, Katanning | 9 December 2013 | 1256-825 |
| Lot 79 on Diagram 13273 | 1878/185 | Lot 79 Warren St | Shire of Katanning of Austral Terrace, Katanning | 3 October 1990 | 1773-815 |
| Lot 1 on Diagram 3847 | 1878/186 | Lot 1 Warren St, Katanning | Shire of Katanning of Austral Terrace, Katanning | 07/04/2011 | 1773-816 |

#### 3.2.1.3 Aerial Photographs

A brief review was undertaken of Landgate's online historical aerial imagery dating back to 1997. The site appeared to be vacant land comprising of grassed areas, sparse vegetation, a watercourse along the southern portion of the site with a west to east orientation with what appeared to be a dam within the eastern portion of the watercourse (this is consistent with the *current* Katanning Town Creek and Piesse Dam). No significant changes were observed at the site between 1997 and 2013. In the 2013 photograph of the site, it appears that the southern portion of the site had been excavated and pooling of water within the excavation was evident. This corresponds with the current lake construction at the site.

#### 3.2.1.4 Proposed Land use

Based on the Katanning SuperTown Growth and Implementation Plan (November 2012), the proposed land use for the site is a mixture of residential development including medium-density housing and potential aged accommodation around a high amenity lake and parkland revitalisation.

#### 3.2.1.5 Local Zoning

Under the Shire of Katanning Town Planning Scheme No 4 (District Scheme), Map No. 7, the majority of the site is currently zoned as *Recreation and Open Space*, with the north-eastern portion of the site currently zoned as *Residential,* and further north-east the site zoned as *Special Use* as shown in **Figure 14 .** A breakdown of each lot and zoning is provided in **Table 4** below.

**Table 4: Piesse Park - local zoning**

| Zoning | Land description | Site Address |
|---|---|---|
| Special Use | Lot 3 on Diagram 27422 | Lot 3 Synnott Ave, Katanning |
| Residential and Recreation and Open Space | Lot 1 on Diagram 26384 | Lot 1 Synnott Ave, Katanning |
| Recreation and Open Space | Lot 79 on Diagram 13273 | Lot 79 Warren St |
| Recreation and Open Space | Lot 1 on Diagram 3847 | Lot 1 Warren St, Katanning |

#### 3.2.1.6 Surrounding land use

The site is currently surrounded by the residential properties and vacant land, with current local zoning showing *Residential* to the north, south, east and west of the site. In addition, there is a site zoned as *Recreation and Open Space* east of the site.

#### 3.2.1.7 Buffers

The site and surrounding land uses are considered sensitive land uses. No industrially zoned areas are located within the vicinity of the site hence it is considered that appropriate buffers are in place resulting in low potential for land use conflicts. However, given a portion of the site was formerly used as an uncontrolled landfill, some consideration is required in relation to this former use to ensure that no conflicting land uses arise.

### 3.2.2 Review of Site Attributes

#### *3.2.2.1 Topography*

Utilising topographical contour geospatial data sourced from Landgate, it was calculated that the north-eastern portion of the site was sloping downward from a north-easterly direction towards a south-westerly direction. The northern half of the site sits between 320 m and 310 m AHD, with southern half of the site being relatively flat, sitting at approximately 310 m AHD, as shown in **Figure 8.**

#### *3.2.2.2 Geology*

Based on Geosience Australia (2008) map with 1:1,000,000 scale, the majority of the site's geology is said to comprise: colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete and reworked laterite, as shown in **Figure 9**.

The Dumbleyung Geology series map 1:250,000 scale indicated the site is underlain by: colluvium and minor alluvium described as 'silt, sand and gravel; generally on slopes adjoining to rock and laterite outcrops' (Galt, 2014).

#### *3.2.2.3 Soil*

Geotechnical investigations were conducted between 1 and 5 September 2014 by Galt. A total of 12 testpits extending to depths between 1 m and 2.5 m below the surface level were installed by Galt. The generalised soil profile of at the site is described as:

- FILL: Clayey SAND/Silty SAND – fine to coarse grained, approximately 15% to 30% non-plastic to high plasticity fines, grey/brown/white/orange brown, locally with some fine to medium grained gravel, trace organics and rootlets, localised refuse[4] (plastic bags), moist to dry, generally stiff to very stiff, locally present from the surface, extending to depths of between 0.4 m and 1.0 m; overlying
- Clayey SAND/Silty SAND/SAND – fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, clayey material is generally soft to stiff, moist to wet, trace organics and rootlets, locally present from the surface, extending to depths of between 0.5 m and 1.2 m; overlying
- Clayey SAND/Sandy CLAY – fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, extending to depths of between 1.0 m and the maximum depth of investigation of 2.5 m; locally overlying
- CLAY – low plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.6 m, extending to the maximum depth of investigation of 2.5 m.

The geotechnical site classification was conducted in accordance with Australian Standard AS2870-2011 "Residential Slabs and Footings". Based on the findings, majority of the site was classified as 'Class M' and was considered "geotechnically capable of supporting the proposed residential subdivision development" (Galt, 2014. A portion of the site formerly used an uncontrolled landfill was classified as 'Class P' and was considered not suitable for

development as residential subdivision however may be used as a landscape area (Galt, 2014). The full geotechnical report is provided in **Appendix B**.

#### *3.2.2.4 Acid Sulphate Soils*

ASS are naturally occurring soils that contain iron sulphide (iron pyrite) minerals that if disturbed by soil excavation, dewatering or drainage, can then oxidise resulting in the release of acidity and potentially causing environmental impacts.

ASS risk mapping geospatial data generated by the DER is not available for the site. However, a review of the CSIRO's ASRIS (2014) data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring (**Figure 10**).

### 3.2.3 Ecological Investigations

The following Section provides a summary of results obtained from the environmental study conducted by Terratree for the site. This comprised both a desktop study which comprised the following database searches: DPaW's Threatened and Priority Flora, Threatened Fauna and Ecological Community, WA Herbarium (WAH) Declared Rare and Priority Flora and Department of the Environment's Projected Matters Search Tool, and associated Level 1 flora and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The complete study has been included in this report as **Appendix A**.

#### *3.2.3.1 Vegetation Condition*

Vegetation condition at the site was assessed in accordance with a scale adopted from Keighery (1994). The site vegetation is best described as being '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 compromising weed or crop species with isolated trees or shrubs.")

The survey area was either bare soil or 'parkland cleared' with isolated trees over mowed grass. The site vegetation is considered to have limited conservational value.

#### *3.2.3.2 Declared Rare and Priority Flora*

A search was conducted of the WA Herbarium, DPAW database and the DotE PMST for records of known Threatened (Declared Rare) Flora within 20 km radius of the site. A total of 41 significant flora were recorded on the databases.

No species of Threatened Flora (Declared Rare Flora) pursuant to the WA *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Commonwealth *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys. As the site is cleared of native vegetation, no flora species of conservation significance were identified at the site (see **Appendix A**).

#### *3.2.3.3 Declared Rare and Priority Fauna*

A search was conducted of the DPAW database and the DotE PMST for records of known Threatened, Schedule and Priority Fauna within a 20 km radius of the site. The DPAW database returned nine Threatened Fauna species including one that is presumed extinct,

seven migratory birds and two other specially protected fauna species. The database also showed one Priority 2 species and six Priority 4 species. The DotE PMST database search returned five Endangered and Vulnerable fauna species, and 10 Invasive fauna species. No fauna species of conservation significance were identified at the site (see **Appendix A**).

#### *3.2.3.4 Threatened and Priority Ecological Communities*

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site (see section 4.1, **Appendix A**).

#### *3.2.3.5 Environmentally Sensitive Areas*

Environmentally Sensitive Areas (ESAs) are declared in *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as areas that cover any and/or all of the following conservation significant areas:

- Declared World Heritage property;
- Register of the National Estate;
- Defined wetland and the area within 50 m of the wetland;
- Area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- Threatened ecological community;
- Bush Forever Site; and
- Areas identified within Environmental Protection Policy areas.

The site is not considered to be an ESA.

#### *3.2.3.6 Ecological Linkages*

Ecological linkages are essentially linear elements within a landscape that provide connectivity between a number of areas of natural vegetation/habitat and facilitate movement of species between these.

Due to the site's historical clearing of the site with limited value as a habitat for fauna of conservation significance, it is considered that there are no ecological linkages of conservation significance of the site.

### 3.2.4 Hydrology and Hydrogeology

#### *3.2.4.1 Groundwater*

Under the *Rights in Water and Irrigation Act 1914*, proclaimed groundwater areas in WA are areas in which licences are required to construct or alter a well and to take groundwater. The site is not located within any proclaimed groundwater area and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow. The nearest groundwater proclaimed area is located approximately 110 km to the west and is associated with the 'Collie Groundwater Area'.

Desktop investigations on groundwater levels were carried out using DoW historical groundwater contours and WIN (2002) site geospatial datasets. The WIN site database is a State-wide record of surface and groundwater measurements, both quantitative and qualitative taken at monitoring points across the State.

Groundwater contour data extent did not extend to the subject area and was therefore unusable. WIN site records were not considered extensive enough to give an indication of depth to groundwater. The nearest WIN site (ID:60912736) with recorded groundwater levels is located approximately 1.3 km to the north of the site. Static groundwater level at this site was recorded as 10 m bgl. However, review of the *Shire of Katanning Local Planning Strategy 2013* indicates that "around 60% of the town experiences groundwater within 2 m of the surface".

Additionally, a review of the Global Groundwater (2004) report prepared for the Shire of Katanning showed a groundwater bore (03KC13D) located within the southern half of the site within the vicinity of the north-eastern boundary, which showed static groundwater level to be above the top of casing standpipe (0.446 m) above ground level, in May 2003. It is believed that the upwelling of groundwater out of the well was caused due to groundwater being under pressuring during gauging, and therefore this is not a true representation of groundwater conditions at the site.

Given the limited groundwater data available for Katanning and in particular reliable groundwater data available for the site itself, groundwater levels are assumed similar to that of recorded in May 2003 at a groundwater well (03KC11D) located approximately 600 m south-west of the site, where depth to groundwater was recorded at 1.963 m bgl. In addition, perched groundwater was also identified at 2.2 m bgl at the site (north of Synnott Avenue) and at 0.5 m bgl at a test pit location directly north of the lake construction during geotechnical investigations conducted by Galt (2014).

#### *3.2.4.2 Surface Water*

The site contains numerous surface water bodies, comprised of two manmade lakes currently under construction, multiple minor drains and multiple major drains. The most significant surface water body present is the degraded Katanning Town Creek which runs through the site along the southern half of the site, and the Piesse Dam which is connected to the creek, as shown in **Figure 15**: Piesse Park – Surface water.

#### *3.2.4.3 Public Drinking Water Source Areas*

Under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947* the DoW has the powers necessary to legally define the boundaries of PDWSAs. These are legally defined boundaries with varying Priority Levels (P1, P2 and P3) assigned to ensure that PDWSAs are managed and protected to ensure the availability of reliable, safe, good quality drinking water from either groundwater or surface water sources.

Based on a review of available mapping, the site is located outside of any PDWSAs, with the nearest recorded PDWSA being located approximately 47 km to the south-west and is defined as a PDWSA with 'Priority Not Assigned'. The nearest priority assigned PDWSA is the Priority 1 'Harris River Dam Catchment Area' approximately 120 km to the north-west.

#### *3.2.4.4 Surface Water Proclaimed Areas*

Under the *Rights in Water and Irrigation Act 1914*, proclaimed surface water areas in WA are areas in which licences are required to take water from a surface watercourse. Based on a review of available mapping, the site is located outside of any proclaimed surface water

areas, with the nearest being approximately 47 km to the south-west associated with the 'Warren River and Tributaries' area.

#### *3.2.4.5 Floodplains*

The DoW prepares FPM to indicate the extent of flooding associated with ARI 100 year flood events. The ARI 100 year flood event is a statistical estimate of the average period in years between the occurrences of a flood of a given size and is roughly equal to a 1% probability of occurring in any given year.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 38 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

### 3.2.5 Contaminated Sites

This section details the results of relevant investigations to ascertain if the site has any registered historical contamination or pollution complaints. The DER currently records information on contaminated sites within WA on a contaminated sites register in accordance with the *Contaminated Sites Act 2003*. All sites of known or suspected contamination reported to DER will be classified under the Act as one of the following categories:

- Report not substantiated;
- Possibly contaminated – investigation required;
- Not contaminated – unrestricted use;
- Contaminated – restricted use;
- Contaminated – remediation required;
- Remediated for restricted use; or
- Decontaminated.

#### *3.2.5.1 DER Contaminated Sites Database*

The DER *Contaminated Sites Database* is a publicly accessible online database that grants access information on sites classified as either:

- Contaminated - remediation required;
- Contaminated - restricted use; or
- Remediated for restricted use.

According to the DER Contaminated Sites Database, the site was not listed, or within the vicinity of sites listed on the database on 19 August 2014. A parcel of land comprising 25 sites classified as *contaminated – restricted use* was located approximately 1,260 m south-east of the site, as shown in **Figure 12.**

It is to be noted following the review of the letter titled *RE: Uncontrolled Fill Management at Lot 1 Synnott Avenue, Katanning* dated 29 January 2014 (Aurora Environmental), the north-eastern portion of the site (as shown in **Figure 14**) was classified by the DER on an unknown date as *Potentially contaminated – investigation required'*, due to the former acceptance of uncontrolled fill at the site. This is further discussed in Section 3.2.8.

### 3.2.6 Social Attributes

#### *3.2.6.1 Aboriginal Heritage*

A search for relevant Aboriginal Heritage was conducted by using the DAA online *Aboriginal Heritage Inquiry System* which incorporates both the Heritage Site Register and the Heritage Survey Database, which lists the following sites:

- Registered Aboriginal Sites;
- Other Heritage Places; and
- Heritage Survey Areas.

Results of the search indicated that the site was not list as a *Registered Aboriginal Site* or *Survey Area*.

The lower portion of the site was listed as *Other Heritage Places* which was associated with the Katanning Town Creek (ID 22816), which also extended offsite, as shown in **Figure 13**. The search results are provided in **Appendix E**: Heritage search.

#### *3.2.6.2 Australian Heritage*

An online search of the Australian Government's Department of Environment Heritage Database found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500 m).

#### *3.2.6.3 Local Government Heritage*

An online search of the HCWA database using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site. One site (Piesse Winery fmr) was listed within the vicinity of the site (<500 m), located approximately 200 m north of the site boundary, as shown in **Figure 13.**

### 3.2.7 Site Inspection

A visual inspection of the site was conducted by the Talis staff on 25 September 2014. This incorporated a 'walk-over' across the site, drive around the perimeter of the site as well as an inspection of the surrounding land uses. Photographs from Talis' inspection are provided in **Appendix G**, whilst those from Terratree are provided in the Terratree report in **Appendix A.**

The site itself was bordered by Synnott Avenue to the north, Taite Terrace, Adam Street and Fredrick Street to the north-east, Clive Street to the south-east, Starling Lane to the south-west and Warren Road to the west. Surrounding the site were predominantly medium density residential properties. There appeared to be no native vegetation onsite aside from a number of isolated trees.

The north-eastern portion of the site (north of Synnott Avenue) was vacant grassed land and further north occupied by a bowls club. The remainder of the site (south of Synnott Avenue); the surface of the site was predominantly covered in vegetation including grasses and trees. At the time of inspection, the site was partially under construction, with a two level man-made lake and associated pipes present. The Katanning Town Creek enters the man-made lake from the north-western portion of the site, which runs along the southern portion of the site, with an overflow into another man-made dam (Piesse Dam), and out through the south-

eastern portion of the site. The Katanning Town Creek was considered to be in poor condition, overgrown with weeds. The north-eastern portion of the site was covered in approximately 300 mm of clay cover which was sourced from the lake construction area (as advised by the Shire personnel). Based on anecdotal information (per comm) long-neck turtles are located within Piesse Dam, and it is therefore likely that Piesse Dam potentially retains some level of environmental sensitivity. Based on the findings of the site inspection, Talis concluded that there would be several constraints to the proposed development.

### 3.2.8 Discussion

The subject site is located at: Lot 1 and Lot 3 Synnott Avenue and Lot 1 and Lot 79 Warren Street Katanning, within the Shire of Katanning WA. Based on a review the Katanning Town Planning Scheme No4 (District Scheme) provided in **Appendix D,** the majority of the site is currently zoned as *Recreation and Open Space*, with the north-eastern portion of the site being zoned Residential and further north-east being zoned *Special Use*. It is understood that the proposed future land use for the site includes residential development including medium-density housing and potential aged accommodation around a high amenity lake and parkland revitalisation. In order to progress with the proposed future land use, it is understood that no rezoning would be required if the potential residential development is developed on the portion of the site zoned as *Residential* and the revitalised park is confined to the portion of the site zoned as *Recreation and Open Space*. If residential development is proposed on the portion of the site currently zoned as *Recreation and Open Space*, rezoning to the more sensitive land use would be required. However, it is to be noted that the portion of the site currently zoned as *Residential*, has been classified by the DER as '*Potentially contaminated – investigation required*'.

A review of the previously mentioned Aurora Environmental letter (January 2014) (provided in **Appendix F**) identified that the residentially zoned portion of the site (Lot 1 Synnott Avenue) has been classified by the DER as *Potentially contaminated – investigation required*. This classification was based on the previous site owners having historically accepted uncontrolled fill material at the site. It is understood that the material received at the site was used for levelling of the surface and was comprised predominantly of clay, silt and sand, however included various other material including bricks, concrete, timber, PVC piping, metal, tiles and asbestos containing materials (ACM) in the form of asbestos-cement sheeting, which is most likely associated with construction and demolition (C&D) waste.

It is further understood that several years ago, the waste material was re-worked, which saw the removal of large bulky items such as concrete, timber, metal and tyres which were removed offsite. Three small stockpiles remained at the site during Aurora's investigation works which were understood to represent material excavated for the removal of the large items, later re-laying and later further abandoned when the owner suspended works. Based on Aurora's observations made during their site visit in December 2013, there was typically a change of approximately 0.5 m in elevation at the edge of the fill material.

Aurora conducted limited sampling for asbestos, which showed two samples taken from the site to contain ACM. The Department of Health (DoH) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (May 2009) recommend 1.0 m capping layer for asbestos identified in public open spaces, however, it is understood that Aurora proposed 0.5 m capping to be obtained from the evaporation pond construction located also at Piesse Park (Lot 1 Warren Road) with an additional 0.15 m top soil and grass. The reduced capping layer was associated with the

increased difficulty in excavating/penetrating compacted clay material compared to sand, which would reduce the potential for casual breaches in the capping layer. Based on further discussion with the Shire during our site inspection on 25 September 2014, it is understood that a capping layer of approximately 300 mm of excavated clay material from the lake construction was placed on top of the surface.

Based on the DER site classification for this portion of the site, this is considered a constraint to the development of the site. Talis recommends additional environmental investigation works to be conducted to prior to development, to determine the suitability of the land in question for its intended use.

In terms of the remainder of the site itself a broad assessment suggests that there are few environmental constraints that would preclude development of the site for its intended use. The site slopes downward from a north-easterly direction towards a south-westerly direction. The northern half of the site sits between 320 m and 310 m AHD, with southern half of the site being relatively flat, sitting at approximately 310 m AHD.

In terms of vegetation, there are no significant concerns from a development perspective. The site has been historically cleared and as a result of this the vegetation condition at the site, as identified by Terratree, is considered completely degraded with limited in value as a habitat for fauna of conservation significance. There is no flora or fauna of conservation significance located at the site. It is considered that the proposed disturbance activities are unlikely to significantly affect migratory species, with the possible exception of the Rainbow Bee-eater which may nest at the site between August and January.

Furthermore, from a flora and fauna perspective, the site is not considered to be suitable to support any Threatened or Vulnerable species, with the potential exception of Carnaby's Black Cockatoo (which is protected by the EPBC Act) in eucalypt (particularly greater than 30 cm DBH). Any disturbances to eucalypts will require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. In addition, any disturbance to eucalypt woodlands is required to consider potential impacts to the following: Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4), Western Shrike-tit (Priority 4) in consultation with DPaW.

Soils have not previously been assessed from an ASS perspective, they have however been mapped by the CSIRO for the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring. Talis therefore suggests that ASS is not an issue that will require further management in terms of the proposed development of the site. Similarly and based on the desktop investigations and site inspection, with the exception of Lot 1 Synnott Avenue, there is no reason to suggest that there are any previous potentially contaminating activities that have been undertaken onsite, nor was there any visual evidence of contamination observed. As such, in Talis' opinion, it is unlikely that any further investigation and/or management will be required in terms of contamination other than those identified for the uncontrolled landfill area.

From a surface water perspective, the Piesse Dam located within the southern portion of the site and the Katanning Town Creek which runs along the southern portion of the site would likely preclude the development of additional residential properties within this area. Piesse Dam is considered locally to be an environment with some significant value, particularly given it is suggested to be inhabited by long-neck turtles. The two man-made lakes which are currently under construction within the vicinity of the creek and dam are obviously a

significant aspect of the park revitalisation project, however such development will need to ensure that the downstream water quality, particularly at Piesse Dam, is not compromised. In relation to the quality of the in-flow water to this system, there was significant work on the Katanning Town Creek that could be undertaken to minimise water quality impacts. Such work should include a rehabilitation plan to minimise weeds, replanting with native species and removal of the sediment within the system. In terms of additional residential development to occur, Talis suggests that the infilling development of the north-eastern portion across Synnott Avenue would be most appropriate. Given that this portion of the site is currently zoned as *Special Use* and is currently used as a bowls facility, further work is likely to be required to determine the previous land-uses in this vicinity before redevelopment is considered.

Appropriate measures will also be required to be taken in relation to mosquito management at the site given that an artificial water body is currently under construction. Mosquitos can be vectors of the Ross River virus and other mosquito-borne diseases. If a water body is being constructed, it should be located, designed and managed to minimise the production of mosquitos to limit the contact between mosquitos and people. The Department of Health (DoH) *Chironomid midget and mosquito risk assessment guide for constructed water bodies* (2007) provides guidance notes to the development of bodies and should be considered in terms of the ongoing development of this site, particularly given the presence of existing and future residential properties in close proximity to the water bodies.

Development of the surrounding area will also need to give consideration to the potential for surface water flows offsite and into the waterbodies onsite. Talis recommends that appropriate management measures are put in place to control stormwater migration from the site and ensure that dust impacts are managed appropriately during construction and post-development. Any stormwater not retained onsite should be appropriately managed to ensure that any potential migration of contaminants from the developed site is minimised as far as practicable. Effective stormwater systems need to be designed to adequately manage small, minor and major storm events.

A review of the geotechnical investigation report identified the material at the site to comprise predominantly sandy clay and clayey sand material with low permeability. This was evident during both Galt's and Talis' site inspections, which proceeded periods of rainfall, with pooling of water visible at various locations across the site, and groundwater perching identified at two test pit locations (Galt, 2014). Based on the preliminary geotechnical investigations, the site (with the exception of Lot 1; former uncontrolled landfill area) has been classified as 'Class M', which is limited to single and double story residential buildings, given appropriate site preparations are adopted as specified in Section 7.4 of the Galt report. The former landfill area has been classified as 'Class P', and is not currently considered suitable for development as a residential subdivision but may be used as a landscape area, consistent with the proposed revitalisation of the park which will be used as *Open Space and Recreation*. As noted previously, further work in this area (investigations and remediation) may also result in an improved geotechnical outcome for this part of the site.

Given the limited groundwater data available for Katanning and in particular reliable groundwater data available for the site itself, groundwater levels are assumed similar to that of recorded in May 2003 at a groundwater well (03KC11D) located approximately 600 m south-west of the site, where depth to groundwater was recorded at 1.963 m bgl. In addition,

perched groundwater was also identified at 2.2 m bgl at the site (north of Synnott Avenue) during geotechnical investigations conducted by Galt (2014). Whilst a shallow groundwater depth may be viewed as a constraint to residential development, additional groundwater investigations would be recommended to identify quantities of fill material required to be imported to the site to raise levels for development. Based on Galt's 2014 preliminary geotechnical investigations, for drainage purposes, the buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness. Further in relation to effluent disposal at the site, Galt did not consider the current underlying clayey material suitable for onsite effluent disposal by percolation; however this could most likely be improved with importation and placement of an adequate thickness granular fill.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 38 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

A review of the surrounding land-uses associated with the site suggests there are no concerns in relation to the potential for land-use conflicts to occur. There appear to be appropriate buffer distances from the nearest industrial land-uses (i.e. at least 800 m from waste water treatment plant, at least 1,000 m from WAMMCO etc) however the presence of the former landfill facility onsite obviously requires some consideration.

Finally, in terms of heritage, based on the investigations undertaken by Talis, no Australian Heritage, Registered Aboriginal sites were listed at the site nor within the direct vicinity (<500 m) of the site. The Katanning Town Creek running along the southern portion of the site listed as *Other Heritage Places* was located at the site. One Local Government Heritage site (known as Piesse Winery fmr) was listed within the vicinity of the site (<500 m), located approximately 200 m north of the site, as shown in **Figure 8.** Given this is across the road, and not directly adjacent to the site boundary, this is not perceived to be a constraint to the development of the site.

## 3.3 WAMMCO

### 3.3.1 Site Overview

#### *3.3.1.1 Site Description*

The WAMMCO site is located at: 27983 Great Southern Highway, Lot 2809 Baker Road, Lot 1 Great Southern Highway and 41 Crosby Street, Katanning with two lots with no street available street addresses, within the Shire of Katanning, WA. The site comprises an area of 366.7 ha, and is bordered by Hassell Street to the east, Crosby Street to the south and Moojebing Road to the west. Henry Street dissects the site into tow, with majority of the site being located to the west of Henry Street, with a minor portion located to the east of Henry Street. The location of the site is shown in **Figure 1**: Locality Plan with the general site layout shown in **Figure 4c**: WAMMCO – site layout**.**

The majority of the site is considered to be agricultural land, with the WAMMCO abattoir and associated infrastructure and dams/waterbodies located centrally within the site. Two large dams and one smaller dam are located within the northern portion of the site. A non-perennial watercourse with a west-east orientation dissects the southern portion of the site, west of Henry Street. One residential property and small dam is also located within the south-

eastern corner of the site, west of Henry Street. The portion of the site, east of Henry Street is predominantly vacant land with a water body and various soil mounds located within this portion of the site.

As shown in **Figure 16** the surrounding land use was low density residential/rural properties and vacant land east and west of the site and medium density residential properties to the south.

#### *3.3.1.2 Certificate of Title*

A copy of the current Certificate of Title is provided as **Appendix C**. A summary of the details it contains is provided as follows:

**Table 5: WAMMCO Certificate of Title Details**

| Land Description | Volume/ Folio | Street Address | Registered Proprietor | Date Registered | Previous Title |
|---|---|---|---|---|---|
| Lot 3 on Diagram 42266 | 566/127A | 27983 Great Southern Hwy, Katanning | Western Australian Meat Marketing Co-Operative Ltd of Level 3, 823 Wellington Street. West Perth | 25/02/2000 | 1300-85 |
| Lot 2809 on Deposited Plan 117098 | 933/102 | Lot 2809 Baker Rd, Katanning | Shire of Katanning of Austral Terrace, Katanning | 07/02/2006 | 339-35 |
| Lot 1 on Diagram 3246 | 1220/961 | Lot 1 Great Southern Hwy, Katanning | Shire of Katanning of Austral Terrace, Katanning | 07/02/2006 | 593-79 |
| Lot 4 on Diagram 60155 | 1759/756 | 41 Crosby St, Katanning | Shire of Katanning of Austral Terrace, Katanning | 07/02/2006 | 726-75 |
| Lot 5 on Diagram 60642 | 2755/506 | No street address information available | Shire of Katanning of 16-24 Austral Terrace, Katanning | 16/10/2010 | 85-197A |
| Lot 6 Diagram 60642 | 2755/507 | No street address information available | Shire of Katanning of 16-24 Austral Terrace, Katanning | 16/10/2010 | 85-197A |

#### *3.3.1.3 Aerial Photographs*

A brief review was undertaken of Landgate's online historical aerial imagery dating back to 1997. It appears that majority of the site had not undergone any visible changes during this time. The abattoir/meatworks buildings and associated water bodies/dams and infrastructure located centrally within the site, the non-perennial watercourse cutting through the site in a west to east direction and undeveloped portions of the site (agricultural land) were consistent between 2014 and 1997. Minor changes were observed within the portion of the site south of Henry Street, where this portion of the site was adjoined to the rest of the site appeared to be vacant land used potentially for agricultural purposes with what appeared to be two dams in the 1997 photograph. In the 2011 photograph, the current Henry Street separated this portion of the site from the remainder of the site and filling of some sort was evident with numerous mounds located within the eastern half of this portion of the site, and only one dam remained at the site, within the south-western portion of the site. No significant

changes were observed between 2011 and 2013 with the exception of some trees visible adjacent to the identified mounds.

#### *3.3.1.4 Proposed Land use*

Based on the Katanning SuperTown Growth and Implementation Plan (November 2012), the proposed land use for the site is limited industrial expansion to facilitate complementary land uses to the WAMMCO facility.

#### *3.3.1.5 Local Zoning*

Under the Shire of Katanning Town Planning Scheme No 4 (District Scheme) Map Nos. 4 and 6, the site is currently zoned as *Special Use Area,* as shown in **Figure 16**.

#### *3.3.1.6 Surrounding land use*

The site is currently surrounded by various land uses, with current local zoning showing *Rural* to the west and east, *Residential* to the south and east, *Recreation and Open Spaces* to the north-east and to the south-east and *Public Purposes* to the north and partially to the east. The WAMMCO abattoir located centrally within the site, and has an industry buffer of 1,000 m to sensitive land-uses as identified in KSGIP (2012) document. Given the proposed future land use of the site is proposed to be complementary to the abattoir and the potential future expansion of the abattoir, a site specific buffer would need to be established for the site given it is not considered to be an environmentally sensitive land use. Potential conflicts may arise between the proposed future land use and residential properties located adjacent to the site.

#### *3.3.1.7 Buffers*

The WAMMCO abattoir located centrally within the site, and based on EPA GS3, has an industry buffer of 1,000 m, which is currently in place and detailed within KSGIP (2012) document. Potential future expansion of the WAMMCO abattoir will have an obvious effect on the buffer (with the required buffer distance between the facility and other sensitive receptors moving with the expansion of the site). However, given that a complementary land use is proposed for the site which is not considered to be a sensitive land use under GS3, a site-specific buffer would be required to be considered depending on the nature of the proposed land-use. In relation to the future development of the site, consideration will be required in relation to providing adequate buffers for noise, dust and odour emissions from the new development and the residential and rural properties adjacent to the site.

### 3.3.2 Review of Site Attributes

#### *3.3.2.1 Topography*

Landgate is the Statutory Authority that maintains the State's official register of land ownership and survey information. Utilising topographical contour geospatial data sourced from Landgate it was calculated that the site is sloping downward from south-westerly to north-easterly direction. The northern extent of the site sits at approximately 350 m AHD, and the southern extent of the site sits at approximately between 320 m and 310 m AHD. The steeper gradients of the land are observed along the north-western portion of the site, and less steep gradient along the eastern portion of the site, as shown in **Figure 8.**

#### 3.3.2.2 Geology

Based on Geosience Australia (2008) map with 1:1,000,000 scale, the majority the site's geology is said to comprise: colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete and reworked laterite.

Additionally, the geology within the northern extent of the site is said to comprise: pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and silicerous duricrusts and reworked products, calcrete, kaolinised rock, gossan and residual ferruginous saprolite.

The geology within the north-western extent of the site is said to comprise: undifferentiated felsic intrusive rocks, including monzogranite, granodiorite, granite, tonalite, quartz monzonite, syenogranite, diorite, monzodiorite, pegmatite, locally metamorphosed, foliated, gneissic, and local abundant mafic and ultramafic inclusions, as shown in **Figure 9.**

The Dumbleyung Geology series map 1:250,000 scale indicated the site is underlain by: colluvium and minor alluvium described as 'silt, sand and gravel; generally on slopes adjoining to rock and laterite outcrops'; laterite described as 'limonite cemented, nodular and massive duricrust; overlies deeply weathered bedrock' and biotite granite and ademellite described as 'medium and coarse, even-grained; locally fioated' (Galt, 2014).

#### 3.3.2.3 Soil

Geotechnical investigations were conducted between 1 and 5 September 2014 by Galt. A total of 30 testpits extending to depths between 0.9 m and 2.5 m below the surface level were installed by Galt. The generalised soil profile of at the site is described as:

- SAND/Clayey SAND/Silty SAND – fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, sand is generally loose, clayey material is generally soft to firm, moist to wet, trace organics and rootlets, present from the surface, extending to depths of between 0.1 m and 0.8 m; overlying
- Clayey SAND/Sandy CLAY – fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, locally laterised, locally present from the surface, extending to depths of between 0.6 m and 1.9 m; locally overlying
- CLAY – low plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.6 m, extending to the maximum depth of investigation of 2.3 m.

The geotechnical site classification was conducted in accordance with Australian Standard AS2870-2011 "Residential Slabs and Footings". Based on the findings, the site was classified as 'Class M' and was considered "geotechnically capable of supporting the proposed light industrial subdivision development" (Galt, 2014). The full geotechnical report is provided in **Appendix B**: Galt Geotechnics Report.

#### 3.3.2.4 Acid Sulphate Soils

ASS are naturally occurring soils that contain iron sulphide (iron pyrite) minerals that if disturbed by soil excavation, dewatering or drainage, can then oxidise resulting in the release of acidity and potentially causing environmental impacts.

ASS risk mapping geospatial data generated by the DER is not available for the site. However, a review of the CSIRO's ASRIS data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring (**Figure 10**).

### 3.3.3 Ecological Investigations

The following Section provides a summary of results obtained from the environmental study conducted by Terratree for the site. This comprised both a desktop study which comprised the following database searches: DPaW's Threatened and Priority Flora, Threatened Fauna and Ecological Community, WA Herbarium (WAH) Declared Rare and Priority Flora and Department of the Environment's Projected Matters Search Tool, and associated Level 1 flora and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The complete study has been included in this report as **Appendix A**.

#### *3.3.3.1 Vegetation Condition*

Vegetation condition at the site was assessed in accordance with a vegetation description scale adopted from Keighery (1994). The site vegetation is best described as being "completely degraded" in that 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 compromising weed or crop species with isolated trees or shrubs.

The site consisted primarily of paddocks with few residual trees planted. Several older remnant eucalypts along Barker Road and to the south-east along the creek contain hollows that may be used by nesting birds and other wildlife. Most of the trees appear to have been planted within the last 30 years and most which are not of local provenance. The vegetation north of Barker Road had been planted since the 1990s and comprised various non-native and Australian species not of local provenance. Some mature native trees were located along the south-western site boundary, with the vegetation being residual and highly disturbed by weeds and edge effects. This area may provide limited habitat value for birds and other fauna.

#### *3.3.3.2 Declared Rare and Priority Flora*

A search was conducted of the WA Herbarium, DPAW database and the DotE PMST for records of known Threatened (Declared Rare) Flora within 20 km radius of the site, a total of 41 significant flora were recorded on the databases.

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Commonwealth *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys. As the site has historically been cleared of native vegetation, no flora species of conservation significance were identified at the site or are likely to occur (see **Appendix A**).

#### 3.3.3.3 Declared Rare and Priority Fauna

A search was conducted of the DPAW database and the DotE PMST for records of known Threatened, Schedule and Priority fauna within a 20 km radius of the site. A total of 32 species of conservation significance were identified within the search area. A complete list is provided in **Appendix A.** An assessment was made as to the suitability of the habitat of the site to support conservation of significant fauna identified the likelihood of the following species to potentially occupy the site: Australian Painted Snipe and Bush Stone-curlew.

In addition, Carnaby's Black Cockatoo generally nest in hollows in live or dead trees. There are a few trees with large hollows at the site along Baker Road and the drainage line within the southern portion of the site which may be suitable for nesting. Given that the Carnaby's Black Cockatoo which is protected under the Federal EPBC Act 1999, therefore proposed vegetation clearing and other disturbance activities would require further assessment to determine the impacts to the species in consultation with the relevant state and federal agencies (**Appendix A**).

#### 3.3.3.4 Threatened and Priority Ecological Communities

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site (see section 4.1, **Appendix A**).

#### 3.3.3.5 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared in *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as areas that cover any and/or all of the following conservation significant areas:

- Declared World Heritage property;
- Register of the National Estate;
- Defined wetland and the area within 50m of the wetland;
- Area covered by vegetation within 50m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- Threatened ecological community;
- Bush Forever Site; and
- Areas identified within Environmental Protection Policy areas.

The site is not considered to be an ESA.

#### 3.3.3.6 Ecological Linkages

Ecological linkages are essentially linear elements within a landscape that provide connectivity between a number of areas of natural vegetation/habitat and facilitate movement of species between these.

Due to the site's historical clearing, it has limited value as a habitat for fauna of conservation significance, and is considered to have no ecological linkages of conservation significance.

### 3.3.4 Hydrology and Hydrogeology

#### *3.3.4.1 Groundwater*

Under the *Rights in Water and Irrigation Act 1914,* proclaimed groundwater areas in WA are areas in which licences are required to construct or alter a well and to take groundwater. The site is not located within any proclaimed groundwater area and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow. The nearest groundwater proclaimed area is located approximately 107 km to the west and is associated with the 'Collie Groundwater Area'.

Desktop investigations on groundwater levels were carried out using DoW historical groundwater contours and WIN (2002) site geospatial datasets. The WIN site database is a State-wide record of surface and groundwater measurements, both quantitative and qualitative taken at monitoring points across the State.

Groundwater contour data extent did not extend to the subject area and was therefore unusable. WIN site records were not considered extensive enough to give an indication of depth to groundwater. The nearest WIN sites (ID:60912739) with recorded groundwater levels is located approximately 1.7 km to the north-east of the site. Static groundwater level at this site was recorded as 0.70 m bgl.

Additionally, a review of the Global Groundwater (2004) report prepared for the Shire of Katanning showed a groundwater bore (03KC12D) located approximately 430 m south east of the site, which showed static groundwater level to be 2.5 m bgl in May 2003.

#### *3.3.4.2 Surface Water*

The site contains numerous surface water bodies, predominantly occurring across the centre and northing portions of the site associated with wastewater from the WAMMCO operations. The site is comprised of multiple unnamed minor non-perennial watercourses, as well as man-made dams, tanks and minor drains associated with rural and industrial land uses occurring on the site. The most significant surface water body that occurs on site is the Katanning Town Creek. The creek runs through the town centre, along the eastern boundary before entering the site in the northern half. The creek appears to be connected to the nearest offsite surface water body (Katanning Catchment Area), which is located directly adjacent to the northern site boundary (see **Figure 12**).

#### *3.3.4.3 Public Drinking Water Source Areas*

Under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947* the DoW has the powers necessary to legally define the boundaries of PDWSAs. These are legally defined boundaries with varying Priority Levels (P1, P2 and P3) assigned to ensure that PDWSAs are managed and protected to ensure the availability of reliable, safe, good quality drinking water from either groundwater or surface water sources.

Based on a review of available mapping, the site is located outside of any PDWSAs, with the nearest recorded PDWSA being located approximately 45 km to the south-west and is defined as a PDWSA with 'Priority Not Assigned'. The nearest priority assigned PDWSA is the Priority 1 'Harris River Dam Catchment Area' approximately 116 km to the north-west. Based on the *Katanning SuperTown Growth and Implementation* document (November 2013), 85%

of Katanning's potable water comes from the Harris River Dam Catchment Area, with the remaining 15% sourced from the Water Corporation Pinweryning Dam Catchment Area located directly adjacent to the northern site boundary.

#### 3.3.4.4 Surface Water Proclaimed Areas

Under the *Rights in Water and Irrigation Act 1914*, proclaimed surface water areas in WA are areas in which licences are required to take water from a surface watercourse. Based on a review of available mapping, the site is located outside of any proclaimed surface water areas, with the nearest being approximately 45 km to the south-west associated with the 'Warren River and Tributaries' area.

#### 3.3.4.5 Floodplains

The DoW prepares FPM to indicate the extent of flooding associated with ARI 100 year flood events. The ARI 100 year flood event is a statistical estimate of the average period in years between the occurrences of a flood of a given size and is roughly equal to a 1% probability of occurring in any given year.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 39 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

### 3.3.5 Contaminated Sites

This section details the results of relevant investigations to ascertain if the site has any registered historical contamination or pollution complaints. The DER currently records information on contaminated sites within WA on a contaminated sites register in accordance with the *Contaminated Sites Act 2003*. All sites of known or suspected contamination reported to DER will be classified under the Act as one of the following categories:

- Report not substantiated;
- Possibly contaminated – investigation required;
- Not contaminated – unrestricted use;
- Contaminated – restricted use;
- Contaminated – remediation required;
- Remediated for restricted use; or
- Decontaminated.

#### 3.3.5.1 DER Contaminated Sites Database

The DER *Contaminated Sites Database* is a publicly accessible online database that grants access information on sites classified as either:

- Contaminated - remediation required;
- Contaminated - restricted use; or
- Remediated for restricted use.

According to the DER Contaminated Sites Database the Site was not listed, or within the vicinity of sites listed on the database on 19 August 2014. A parcel of land comprising 25 sites classified as *contaminated – restricted use* was located approximately 2,230 m south-east of the site, as shown in **Figure 12.**

In addition, whilst the WAMMCO abattoir is not listed on the DER contaminated sites database, the waste water ponds located at the site may be a potential source of contamination.

### 3.3.6 Social Attributes

#### *3.3.6.1 Aboriginal Heritage*

A search for relevant Aboriginal Heritage was conducted by using the DAA online *Aboriginal Heritage Inquiry System* which incorporates both the Heritage Site Register and the Heritage Survey Database, which lists the following sites:

- Registered Aboriginal Sites;
- Other Heritage Places; and
- Heritage Survey Areas

Results of the search indicated that the site was not listed on the database as a *Registered Aboriginal Site, Other Heritage Place* or *Heritage Survey Area*.

The site was in the vicinity of one site listed on the database as *Other Heritage Area*, this was the Katanning Town Creek (ID 22816), which is located approximately 100 m east of the site.

The site was in the vicinity of three sites listed as *Heritage Survey Areas*. The two surveys were conducted along the Great Southern Highway located directly adjacent to the western site boundary (survey report IDs 106482 and 17057) and one site adjacent to the northern site boundary (survey report ID 27384) conducted on and within the vicinity of Pinwernying Dam, as shown in Figure 17. The search results are provided in **Appendix E**.

#### *3.3.6.2 Australian Heritage*

An online search of the Australian Government's Department of Environment Heritage Database found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500 m).

#### *3.3.6.3 Local Government Heritage*

An online search of the Heritage Council of WA's (HCWA) database using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site or within the vicinity (<500 m) of the site.

### 3.3.7 Site Inspection

A visual inspection of the site was conducted by the Talis staff on 25 September 2014. This incorporated a 'walk-over' across accessible portions of the site, drive around the perimeter of the site as well as an inspection of the surrounding land use. Photographs from Talis' inspection are provided in **Appendix G**, whilst those from Terratree are provided in the Terratree report in **Appendix A**.

The site itself was bordered by Hassell Street to the east, Crosby Street to the south and Moojebing Road to the west. Surrounding the site was predominantly medium density residential properties to the south, low density/rural to the east, rural to the west and Water Corporation Catchment Area to the north. During the site inspection, the WAMMCO buildings, associated infrastructure and dams including wastewater dams were located with

the central portion of the site. Talis was unable to gain access to this portion of the site due to potential 'Q Fever' associated with the operations. It appeared that the remainder of the site (the non WAMMCO portion) was predominantly vacant land used for agricultural purposes with wheat plantations evident along the southern half of the site. The portion of the site (to the south of Henry Street) showed evidence of burial of some sort, with raised soil stockpiles located across the eastern portion of this portion of the site.

The surface of the site was predominantly covered in vegetation including grasses, wheat plantations and trees. The Katanning Town Creek runs through the southern-central portion of the site, with a west to east orientation across the site which cuts through Baker Road. During the site inspection, significant odours which appeared to be associated with WAMMCO abattoir were noted along the eastern portion of Baker Road (as shown in **Figure 11**), downwind of the operations. Several culverts were observed along the eastern boundary of the site with some water ponding following periods of rainfall.

Based on the findings of the Site inspection, Talis concluded that there are few constraints associated with the development of the site.

### 3.3.8 Discussion

The subject site is located at 27983 Great Southern Highway, Lot 2809 Baker Road, Lot 1 Great Southern Highway and 41 Crosby Street, Katanning with two lots with no street available street addresses, within the Shire of Katanning, WA. Based on a review the Katanning Town Planning Scheme No4 (District Scheme), the site is currently zoned as *Special Use*. It is understood that the proposed future land use is limited industrial expansion to facilitate complimentary land use to WAMMCO. Based on the Scheme text, the zoning of the land is Special *Use 8*, which allows 'abattoir, water storage, stockyards, skin drying sheds and such other associated uses may be approved by the council in accordance with the scheme'. Talis is therefore of the view that similar land uses would be permitted on the land in question without requirements for rezoning. If industrial development (e.g. light or general) were proposed, re-zoning of the land would likely be required.

In terms of the site itself, a broad assessment suggests that there are few environmental constraints that would preclude development of the site for its intended use. The site slopes down from a south-westerly to north-easterly direction across the northern portion of the site, with the southern portion of the site being relatively flat. With the exception of the WAMMCO meatworks and abattoir located centrally-north within the site and associated infrastructure, the majority of the site appeared to have no former use other than for agriculture and pasture.

Soils have not previously been assessed from an ASS perspective, they have however been mapped by the CSIRO for the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring. Talis therefore suggests that ASS is not an issue that will not require further management in terms of the proposed development of the site.

Based on the desktop investigations and site inspection, there is potential for contamination to have previously occurred/to occur. The DER's *Potentially contaminating activities industries and land uses* (Department of Environment (DoE), 2010) identifies an abattoir as a potentially contaminating industry/land use (location shown in **Figure 16**) Further consideration of the ponds on the WAMMCO site is likely to be required, however these structures are unlikely to have a significant impact on development of the surrounding land.

Further, from a contamination perspective, the buried material (**Figure 16**) observed within the southern portion of the site (south of Henry Street) would need to be further investigated. As such it is in Talis' opinion that further investigations and/or management would be required in terms of contamination. The remainder of the site appeared free from potentially contaminating activities.

In terms of vegetation, there are no significant concerns from a development perspective. The site has been historically cleared for agricultural, rural residential and pastoral purposes and as a result of this the vegetation condition at the site, as identified by Terratree, is considered completely degraded with limited value as a habitat for fauna of conservation significance. There is no flora or fauna of conservation significance located at the site. An assessment was made as to the suitability of the habitat of the site to support conservation of significant fauna identified the likelihood of the following species to potentially occupy the site: Australian Painted Snipe and Bush Stone-curlew. It is considered that the proposed disturbance activities are unlikely to significantly affect migratory species, with the possible exception of the Rainbow Bee-eater which may nest at the site between August and January.

Furthermore, from a flora and fauna perspective, the site is not considered to be suitable to support any Threatened or Vulnerable species, with the potential exception of Carnaby's Black Cockatoo (which is protected by the EPBC Act) in eucalypt (particularly greater than 30 cm DBH). Any disturbances to eucalypts will require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. In addition, any disturbance to eucalypt woodlands is required to consider potential impacts to the following: Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4), and Western Shrike-tit (Priority 4) in consultation with DPaW.

Stormwater management will be required during and post construction which will need to be treated prior to discharge into the Katanning Town Creek. A detailed stormwater management plan for the site which would need to include a suitable road drainage network for stormwater run-off from impervious surfaces e.g. roads, parking, roofs etc. Talis recommends that appropriate management measures are put in place to control stormwater migration from the site and ensure that dust impacts are managed appropriately during construction and post-development. Any stormwater not retained onsite should be appropriately managed to ensure that any potential migration of contaminants from the developed site is minimised as far as practicable. Effective stormwater systems need to be designed to adequately manage small, minor and major storm events.

A review of the geotechnical investigation report identified the material at the site to comprise predominantly sandy clay and clayey sand material with low permeability. This was evident during both Galt's and Talis' site inspections, which proceeded periods of rainfall, with pooling of water visible at various locations across the site, boggy soils at two locations and groundwater perching identified at one test pit location (Galt, 2014). Based on the preliminary geotechnical investigations, the site is geotechnically capable of supporting the proposed 'light industrial subdivision development' (Galt, 2014), however more detailed investigations are required.

Given the limited groundwater data available for Katanning and in particular no actual groundwater data available for the site itself, groundwater levels for the site will be assumed to be similar to the nearest groundwater well data. The depth to groundwater was measured approximately 430 m south-east of the site in 2003, which was recorded at 2.5 m

bgl. Groundwater also has the potential to affect development in relation to the separation distance from the base of any proposed structure and the groundwater table itself. Based on this depth to groundwater this would not be considered as a constraint to the proposed development of the site, however additional groundwater investigations would be required to determine actual groundwater levels at the site. It was also identified during geotechnical investigations carried out at the site by Galt (2014) that perched water was identified within three test pits between 0.5 to 0.6 m depth, with superficial ponding observed across the site; it was considered to be perched groundwater over superficial clayey soils proceeding rainfall events. Whilst a shallow groundwater depth may be viewed as a constraint to industrial development, additional groundwater investigations would be recommended to identify quantities of fill material required to be imported to the site to raise levels for development. Based on Galt's 2014 preliminary geotechnical investigations, for drainage purposes, the buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness. Further in relation to effluent disposal at the site, Galt did not consider the current underlying clayey material suitable for onsite effluent disposal by percolation; however this could most likely be improved with importation and placement of an adequate thickness granular fill.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 39 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

In terms of buffers/separation distances, the WAMMCO site is located to the north-west of the proposed industrial development has a recommended buffer of 1 km from sensitive land uses. Given that the proposed future land use is industrial in nature (a non-sensitive land use), with future potential WAMMCO expansion, consideration of a site-specific assessment of potential impacts (environmental and amenity) should be undertaken. Further to this, appropriate buffers will need to be set between the proposed future land use and existing sensitive land uses (rural, low density and medium density residential properties) which are located within a 1 km radius from the site. Buffers may potentially pose a constraint to the development of the site, in particular the portion of the site located south of Henry Street, and will need to be considered as part of the development of the site to ensure that no unacceptable impacts are realised through the approval of industrial uses.

Finally, in terms of heritage, the investigations undertaken by Talis, no Australian Heritage, Local Government heritage or Registered Aboriginal sites were listed at the site nor within the direct vicinity (<500 m) of the site. One site was listed (the Katanning Town Creek) on the database as Other Heritage Area located approximately 100 m east of the as shown in **Figure 13**

## 3.4 Industrial Expansion Area

### 3.4.1 Site Overview

#### *3.4.1.1 Site Description*

The site is located at Lot 3 Thompson Street, Lot 500 on Deposited Plan 70820 and Lot 501 on Deposited Plan 70820 within the Shire of Katanning, Western Australia (WA). The site comprises an area of 308.9 ha, and is bordered by Katanning Nyabing Road to the north, Depot Road to the east and Quarrel Road to the south and Cullen Street and Arnold Street

to the west. The location of the site is shown in **Figure 1** with the general site layout shown in **Figure 5d**: Industrial Expansion – site layout.

A site visit was conducted on 25 September 2014 to help identify any potential environmental or social constraints that may have been present at the site. The north-eastern portion of the site was occupied by livestock sales yards, a farm was located within the north-western portion of the site with the majority of the site being predominantly vacant land used for agricultural purposes. Several dams associated with the livestock sale yards and the farm are located at the site, with a watercourse running through the site with a north-south orientation. As shown in **Figure 1.** The surrounding land use was medium density residential and smaller commercial/industrial land uses to the west, rural land north and south and a landfill to the east.

#### *3.4.1.2 Certificate of Title*

A copy of the current Certificate of Title is provided as **Appendix C**. A summary of the details it contains is provided as follows:

**Table 6: Industrial Expansion Certificate of Title Details**

| Land Description | Volume/ Folio | Street Address | Registered Proprietor | Date Registered | Previous Title |
|---|---|---|---|---|---|
| Lot 3 on Diagram 13517 | 1101/225 | Lot 3 Thompson St, Katanning | Dol-Kipley Taylot of 10 Hill Way, Katanning; Nurel Taylor of 11 Cassia Court, Katanning; Rupal Taylot of 28 Woodley Road, Bunbury | 25/11/2008 | 1071-118 |
| Lot 500 on Deposited Plan 70820 | LR3160/681 | No street address information available | Primary interest holder: Shire of Katanning of PO Box 130, Katanning | 13/06/2011 | LR3136-796 |
| Lot 501 on Deposited Plan 70820 | LR3160/682 | No street address information available | Primary interest holder: Western Australian Agriculture Authority of 3 Baron-Hay Court, South Perth | 27/06/2008 | LR3136-796 |

#### *3.4.1.3 Historical Aerial Photographs*

A brief review was undertaken of Landgate's online historical aerial imagery dating back to 1997. It appeared that majority site was used as agricultural land from at least 1997 with a residential property located within the north-western portion of the site and a water body (dam) located along the northern boundary of the site. The site was divided into two sections by a potential watercourse surrounded by vegetation (trees). It appeared that vegetation (trees) were located along significant steep ridgelines. The site remained unchanged until sometime between 2011 and 2013 when the *current* stockyards were established within the north-eastern corner of the site.

#### *3.4.1.4 Proposed Land use*

Based on the Katanning SuperTown Growth and Implementation Plan (November 2012), the proposed land use for the site is industrial expansion based around the new sales yards and existing rural service industries.

#### 3.4.1.5 Local Zoning

Under the Shire of Katanning Town Planning Scheme No 4 (District Scheme) Map Nos. 7 and 9 the site is currently zoned as *Rural*, as shown in **Figure 18.**

#### 3.4.1.6 Surrounding Land use

The site is currently surrounded by various land uses with current local zoning showing *General Industrial* and *Light Industrial* to the west and north-west, *Rural* to the north, south-east and south and *Public Purposes* (landfill) to the north-east.

#### 3.4.1.7 Buffers

The landfill has a recommended industry buffer of 500 m, the sales yard 1,000 m from sensitive land uses and the various industrial land uses located within the vicinity of the site have their own industry specific buffers associated with each land use. These are shown in the KSGIP (2012) and are consistent with those identified within EPA GS3.

Given the proposed industrial land use for the site (a non-sensitive land use), these industry-specific buffers do not necessarily apply. However, site specific buffers will need to be considered, both in terms of the impacts from existing land-uses to the site and consideration of the reverse situation for any new industries approved for the subject site (particularly given the rural land uses located to the north and south of the site).

### 3.4.2 Review of Site Attributes

#### 3.4.2.1 Topography

Landgate is the Statutory Authority that maintains the State's official register of land ownership and survey information. Utilising topographical contour geospatial data sourced from Landgate it was calculated that the site is sloping downward with a general north to south direction and additionally sloping downward from a north-easterly to south-westerly direction within the north-eastern portion of the site. The north-eastern extents of the site sit at approximately 330 m AHD and slope down to 310 m AHD within the northern half of the site; the site then gently slopes down from 310 m AHD to approximately 300 m AHD within the southern portion of the site, as shown in **Figure 8**.

#### 3.4.2.2 Geology

Based on Geosience Australia (2008) map with 1:1,000,000 scale, the north and eastern portion of the sites geology is said to comprise: colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete and reworked laterite.

Additionally, the majority of the site's geology is said to comprise: reworked on incised sandy alluvium in older stream channels; lateritised alluvium; alluvial terraces above younger alluvium; alluvial and colluvial outwash deposits not in defined channel systems; sand, silt, gravel, clay and evaporates, as shown in **Figure 9**.

The Dumbleyung Geology series map 1:250,000 scale indicated the site is underlain by: colluvium and minor alluvium described as 'silt, sand and gravel; generally on slopes

adjoining to rock and laterite outcrops' and alluvium described as 'silt and sand in broad valley flats; extensively reworked by present drainage' (Galt, 2014).

#### *3.4.2.3 Soil*

Geotechnical investigations were conducted between 1 and 5 September 2014 by Galt. A total of 20 testpits extending to depths between 1.1 m and 2.5 m below the surface level were installed by Galt. The generalised soil profile of at the site is described as:

- SAND/Clayey SAND/Silty SAND – fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, sand is generally loose, clayey material is generally soft to firm, moist to wet, trace organics and rootlets, present from the surface, extending to depths of between 0.3 m and 0.5 m; overlying
- Clayey SAND/Sandy CLAY – fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, locally laterised, present from as shallow as 0.3 m, extending to depths of between 0.8 m and the maximum depth of investigation of 2.5 m; locally overlying
- CLAY – low plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.8 m, extending to the maximum depth of investigation of 2.5 m.

The geotechnical site classification was conducted in accordance with Australian Standard AS2870-2011 "Residential Slabs and Footings". Based on the findings, the site was classified as 'Class M' and was considered "geotechnically capable of supporting the proposed light industrial subdivision development" (Galt, 2014). The full geotechnical report is provided in **Appendix B**.

#### *3.4.2.4 Acid Sulphate Soils*

ASS are naturally occurring soils that contain iron sulphide (iron pyrite) minerals that if disturbed by soil excavation, dewatering or drainage, can then oxidise resulting in the release of acidity and potentially causing environmental impacts.

ASS risk mapping geospatial data generated by the DER is not available for the site. However, a review of the CSIRO's ASRIS data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring (**Figure 10**).

### 3.4.3 Ecological Investigations

The following Section provides a summary of results obtained from the environmental study conducted by Terratree for the site. This comprised both a desktop study which comprised the following database searches: DPaW's Threatened and Priority Flora, Threatened Fauna and Ecological Community, WA Herbarium (WAH) Declared Rare and Priority Flora and Department of the Environment's Projected Matters Search Tool, and associated Level 1 flora and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The complete study has been included in this report as **Appendix A**.

#### *3.4.3.1 Vegetation Condition*

Vegetation condition at the site was assessed in accordance with a vegetation description scale adopted from Keighery (1994). The site vegetation is best described as being "completely degraded" whereby 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 compromising weed or crop species with isolated trees or shrubs.

A few linear areas of trees were located at the site, which were determined to have been planted within approximately the last 30 years. They are species native to Australia, however not of local provenance. The understory of the trees contains no native vegetation, with limited habitat value. Several bird species were however identified amongst the trees.

#### *3.4.3.2 Declared Rare and Priority Flora*

A search was conducted of the WA Herbarium, DPAW database and the DotE PMST for records of known Threatened (Declared Rare) Flora within 20 km radius of the site, a total of 41 significant flora were recorded on the databases.

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Commonwealth *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys.

The database search indicated that Priority 2 *Banksia acanthopoda* were recorded at two locations adjacent to Katanning-Nyabing Road, within the vicinity of the site, however this was not identified at the site during the survey. Given that the site has historically been cleared of native vegetation, no flora species of conservation significance were identified at the site (see **Appendix A**).

#### *3.4.3.3 Declared Rare and Priority Fauna*

A search was conducted of the DPAW database and the DotE PMST for records of known Threatened, Schedule and Priority fauna within a 20 km radius of the site. A total of 32 species of conservation significance were identified within the search area. A complete list is provided in **Appendix A**.. Given the completely degraded nature of the vegetation at the site, there were no fauna species of conservation significance recorded at the site.

The habitat is not suitable to support any Threatened or Vulnerable species with the exception of potentially the Carnaby's Black Cockatoo within eucalypts. Disturbance to eucalypts, particularly those with a trunk circumference of greater than 30 cm would require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. In addition, it has been noted that any disturbance to eucalypt woodland should consider potential impacts to: Carpet Python (Schedule 4), Barking Owl (southwest pop, Priority 2), Bush Stone-curlew (Priority 4), Western Rosella (Priority 4) and Western Shrike-tit (Priority 4), in consultation with DPaW.

#### *3.4.3.4 Threatened and Priority Ecological Communities*

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site (see section 4.1, **Appendix A**.).

#### 3.4.3.5 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared in *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as areas that cover any and/or all of the following conservation significant areas:

- Declared World Heritage property;
- Register of the National Estate;
- Defined wetland and the area within 50 m of the wetland;
- Area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- Threatened ecological community;
- Bush Forever Site; and
- Areas identified within Environmental Protection Policy areas.

The site is not considered to be an ESA.

#### 3.4.3.6 Ecological Linkages

Ecological linkages are essentially linear elements within a landscape that provide connectivity between a number of areas of natural vegetation/habitat and facilitate movement of species between these.

Due to the site's historical clearing of the site with limited value as a habitat for fauna of conservation significance, it is considered that there are no ecological linkages of conservation significance of the site.

### 3.4.4 Hydrology and Hydrogeology

#### 3.4.4.1 Groundwater

Under the *Rights in Water and Irrigation Act 1914*, proclaimed groundwater areas in WA are areas in which licences are required to construct or alter a well and to take groundwater. The Site is not located within any proclaimed groundwater area and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow. The nearest groundwater proclaimed area is located approximately 112 km to the west and is associated with the 'Collie Groundwater Area'.

Desktop investigations on groundwater levels were carried out using DoW historical groundwater contours and WIN (2002) site geospatial datasets. The WIN site database is a State-wide record of surface and groundwater measurements, both quantitative and qualitative taken at monitoring points across the State.

Groundwater contour data extent did not extend to the subject area and was therefore unusable. WIN site records were not considered extensive enough to give an indication of depth to groundwater. The nearest WIN site (ID:6094934) with recorded groundwater levels is located 1.5 km to the south west of the site. Static groundwater level at this site was recorded as 10.13 m bgl. However, review of the *Shire of Katanning Local Planning Strategy 2013* indicates that "around 60% of the town experiences groundwater within 2 m of the surface".

Additionally, a review of the *Katanning Town Groundwater Program 2003 Drilling Bore Completion and Test Pumping Report* (Global Groundwater, 2004) prepared for the Shire of

Katanning showed a groundwater bore (03KC02D) located approximately 10 m east of the site, which showed static groundwater level to be 1.354 m bgl in May 2003.

#### 3.4.4.2 Surface Water

The site contains numerous surface water bodies, predominantly occurring across the centre and northing portions of the site. The site is comprised of multiple unnamed minor non-perennial watercourses, as well as manmade dams, tanks and minor drains associated with rural and industrial land uses occurring on the site. The most significant surface water body that occurs on site is a minor non-perennial watercourse which runs north-south through the centre of the site.

#### 3.4.4.3 Public Drinking Water Source Areas

Under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947* the DoW has the powers necessary to legally define the boundaries of PDWSAs. These are legally defined boundaries with varying Priority levels (P1, P2 and P3) assigned to ensure that PDWSAs are managed and protected to ensure the availability of reliable, safe, good quality drinking water from either groundwater or surface water sources.

Based on a review of available mapping, the site is located outside of any PDWSAs, with the nearest recorded PDWSA being located approximately 43 km to the south-east and is defined as a PDWSA with 'Priority Not Assigned'. The nearest priority assigned PDWSA is the Priority 1 'Harris River Dam Catchment Area' approximately 122 km to the north-west.

#### 3.4.4.4 Surface Water Proclaimed Areas

Under the *Rights in Water and Irrigation Act 1914,* proclaimed surface water areas in WA are areas in which licences are required to take water from a surface watercourse. Based on a review of available mapping, the Site is located outside of any proclaimed surface water areas, with the nearest being approximately 47 km to the south-west associated with the 'Warren River and Tributaries' area.

#### 3.4.4.5 Floodplains

The DoW prepares FPM to indicate the extent of flooding associated with ARI 100 year flood events. The ARI 100 year flood event is a statistical estimate of the average period in years between the occurrences of a flood of a given size and is roughly equal to a 1% probability of occurring in any given year.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 37 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

### 3.4.5 Contaminated Sites

This section details the results of relevant investigations to ascertain if the site has any registered historical contamination or pollution complaints. The DER currently records information on contaminated sites within WA on a contaminated sites register in accordance

with the *Contaminated Sites Act 2003*. All sites of known or suspected contamination reported to DER will be classified under the Act as one of the following categories:

- Report not substantiated;
- Possibly contaminated – investigation required;
- Not contaminated – unrestricted use;
- Contaminated – restricted use;
- Contaminated – remediation required;
- Remediated for restricted use; or
- Decontaminated.

#### *3.4.5.1 DER Contaminated Sites Database*

The DER *Contaminated Sites Database* is a publicly accessible online database that grants access information on sites classified as either:

- Contaminated - remediation required;
- Contaminated - restricted use; or
- Remediated for restricted use

According to the DER Contaminated Sites Database the site was not listed on the database on 19 August 2014. It was in the vicinity (approximately 280 m east) of a parcel of land comprising 25 sites classified as *contaminated – restricted use,* as shown in **Figure 12.**

### 3.4.6 Social Attributes

#### *3.4.6.1 Aboriginal Heritage*

A search for relevant Aboriginal Heritage was conducted by using the DAA online *Aboriginal Heritage Inquiry System* which incorporates both the Heritage Site Register and the Heritage Survey Database, which lists the following sites:

- Registered Aboriginal Sites;
- Other Heritage Places; and
- Heritage Survey Areas.

Results of the search indicated that a portion of the north western portion of the site (approximately 2,500 $m^2$) was listed on the database as a *Registered Aboriginal Site*, listed as Katanning Camping Grounds (ID4435).

Part of the site was also listed as *Heritage Survey Areas*, which comprises three long narrow channel investigation areas which were (survey report IDs 106010, 106012 and 106986) which were associated with effluent and reuse pipeline installation. These *Heritage Survey Areas* extended offsite, with an additional two survey areas located adjacent to the southern site boundary (survey report IDs 17057 and 106482), as shown in **Figure 13**. The search results are provided in **Appendix D**.

#### *3.4.6.2 Australian Heritage*

An online search of the Australian Government's Department of Environment Heritage Database found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500 m).

#### 3.4.6.3 *Local Government Heritage*

An online search of the Heritage Council of WA's (HCWA) database using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site. One site (Balston Estate) was listed within the vicinity of the site (<500 m), located approximately 350 m north-west of the site, as shown in **Figure 13**.

### 3.4.7 Site Inspection

A visual inspection of the site was conducted by the Talis staff on 25 September 2014. This incorporated a 'walk-over' across the accessible portions of the site, drive around the perimeter of the site as well as an inspection of the surrounding land use. Photographs from Talis' inspection are provided in **Appendix E**, whilst those from Terratree are provided in the Terratree report in **Appendix A.**

The site itself was bordered by Katanning Nyabing Road to the north, Depot Road to the east and Quarrel Road to the south and Cullen Street and Arnold Street to the west. Surrounding the site was a landfill to the east, commercial/industrial to the west and rural/agricultural to the north and south. There appeared to be no cohesive areas of vegetation at the site given that the site has previously been cleared of native vegetation.

The surface of the site within the north-eastern portion where the sales yard is located was predominantly sealed (concrete and asphalt), numerous water tanks and man-made clay lined ponds. A burnt out vehicle was located at the site, south of the sales yard area (**Figure 18).** A farm was also located within the north-western portion of the site. The remainder of the site was used for agricultural purposes and predominantly covered in wheat plantations with minor pastoral area and trees scattered across various locations within the site.

Based on the findings of the Site inspection, Talis concluded that there would be unlikely to be any constraints to the proposed development of the Site.

### 3.4.8 Discussion

The subject site is located at Lot 3 Thompson Street, Katanning, with no address available for two lots comprising Lot 500 on Deposited Plan 70820 and Lot 501 on Deposited Plan 70820 within the Shire of Katanning, Western Australia (WA). Based on a review the Katanning Town Planning Scheme No4 (District Scheme) provided in **Appendix D**, the site is currently zoned as *Rural*. It is understood that the proposed future land use for the site is industrial expansion based around the new sales yards and existing rural service industries. Based on the Scheme text for the zoning, the following 'industry' is not permitted in *Rural* zoned area: industry – general, industry – light and industry – service; industry – rural and industry – noxious are not permitted unless Council has granted planning approval after giving notice in accordance with clause 8.3.1; and industry – cottage and industry – extractive are not permitted unless Council granted permitted approval. Depending on the type of industrial expansion requested, re-zoning may be required.

In terms of the site itself, a broad assessment suggests that there are unlikely to be any environmental constraints that would preclude development of the site for its intended use. The site slopes downward with a general north to south direction and additionally sloping downward from a north-easterly to south-westerly direction within the north-eastern portion of the site. The north-eastern extents of the site sit at approximately 330 m AHD and slope

down to 310 m AHD within the northern half of the site; the site then gently slopes down from 310 m AHD to approximately 300 m AHD within the southern portion of the site.

In terms of vegetation, there are no significant concerns from a development perspective. The site and has been historically cleared for agricultural, pastoral and industrial purposes and as a result of this the vegetation condition at the site, as identified by Terratree, is considered completely degraded with limited in value as a habitat for fauna of conservation significance. There is no flora or fauna of conservation significance located at the site. It was noted that the database search results reported one Priority 2 species (*Banksia acanthopoda*) adjacent to Katanning-Nyabing Road within the northern portion of the site. It is considered that the proposed disturbance activities are unlikely to significantly affect migratory species, with the possible exception of the Rainbow Bee-eater which may nest at the site between August and January.

Furthermore, from a flora and fauna perspective, the site is not considered to be suitable to support any Threatened or Vulnerable species, with the potential exception of Carnaby's Black Cockatoo (which is protected by the EPBC Act) in eucalypt (particularly greater than 30 cm). Any disturbances to eucalypts will require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. In addition, in consultation with DPaW any disturbance to eucalypt woodlands is required to consider potential impacts to the following: Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4), Western Shrike-tit (Priority 4).

Soils have not previously been assessed from an ASS perspective, but have however been mapped by the CSIRO which show the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring. Talis therefore suggests that ASS is not an issue that will require further management in terms of the proposed development of the site. Similarly and base on the desktop investigations and site inspection there is no reason to suggest that there are any previous potentially contaminating activities that have been undertaken on site, nor was there any visual evidence of contamination observed. As such, in Talis' opinion, it is unlikely that any further investigation and/or management will be required in terms of contamination.

In addition, Talis recommends that appropriate management measures are put in place to control stormwater migration from the site and ensure that dust impacts are managed appropriately during construction and post-development. Any stormwater not retained onsite should be appropriately managed to ensure that any potential migration of contaminants from the developed site is minimised as far as practicable in particular to minimise contamination to surface waters.

From a surface water perspective, several surface water bodies, predominantly occurring across the northern portions of the site. The surface water bodies is comprised of multiple unnamed minor non-perennial watercourses, as well as clay lined man-made dams associated with the sales yard, tanks and minor drains associated with rural and industrial land uses occurring on the site. The most significant surface water body that occurs on site is a minor non-perennial watercourse which runs north-south through the centre of the site.

A review of the geotechnical investigation report identified the material at the site to comprise predominantly sandy clay and clayey sand material with low permeability. This was evident during both Galt's and Talis' site inspections, which proceeded periods of rainfall, with pooling of water visible at various locations across the site. Based on the

preliminary geotechnical investigations, the site is geotechnically capable of supporting the proposed 'light industrial subdivision development' (Galt, 2014), however more detailed investigations are required.

Given the limited groundwater data available for Katanning and in particular no actual groundwater data available for the site itself, groundwater levels for the site will be assumed to be similar to the nearest groundwater well data. The depth to groundwater was measured approximately 10 m east of the site in 2003, which was recorded at 1.354 m bgl. Groundwater also has the potential to affect development in relation to the separation distance from the base of any proposed structure and the groundwater table itself. Galt noted perched water at 0.4 bgl at one location and ponding of water at various locations as part of their geotechnical investigations undertaken between 1 and 5 September 2014. Given the limited data available, the shallow depth to groundwater recorded in 2003, groundwater may be considered a constraint however additional groundwater investigations would be required to give an indication as to the quantities of fill material that would be required to be imported to the site to raise levels of the development. Based on Galt's 2014 preliminary geotechnical investigations, for drainage purposes, the buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness. Further in relation to effluent disposal at the site, Galt did not consider the current underlying clayey material suitable for onsite effluent disposal by percolation; however this could most likely be improved with importation and placement of an adequate thickness granular fill.

In terms of buffers/separation distances, the sales yard is located within the north-eastern portion of the site and has a recommended industry buffer of 1 km (as shown in KSGIP (2012) and consistent with EPA GS3). The landfill located east of the site has a recommended buffer of 500 m and the Agricultural Gene Research Facility (AGRF) has an industry buffer of 400 m however potential future expansion buffer may increase to 1 km as per Figure 46 within KSGIP (2012). The eastern portion of the site partially encroaches the landfill buffer, a portion of land, west of the sales yard and south of the sales yard encroaches the sales yard buffer and the site currently is outside of the buffer between the AGRF however future expansion of the AGRF buffer may result in the northern portion of the site being located within its new buffer zone. Given that future land use is similar industrial development (non-sensitive land use), encroachment into the existing buffer may be acceptable as buffers for less sensitive land uses are usually based on a case-by-case basis. As such, the issue of appropriate separation distances (or buffers) will need to be considered during the future development of the subject site. This matter will also require consideration given the nature of the surrounding land-uses, in particular within the southern portion of the site where the adjacent land use is rural. Despite this, buffers are not considered to pose a significant constraint to the development of the site.

Finally, in terms of heritage, the investigations undertaken by Talis search indicated that a portion (approximately 2,500 $m^2$) of the north western portion of the site was listed on the DAA online *Aboriginal Heritage Inquiry System* as a *Registered Aboriginal Site*, listed as Katanning Camping Grounds (ID4435). In Talis' opinion, this would be considered a constraint to development within this portion of the site, and further investigations would be required to determine the exact nature of this site. It should be noted that any disturbance to a registered Aboriginal Heritage Site requires specific approvals to be granted pursuant to the *Aboriginal Heritage Act 1972*.

## 3.5 DIA 4

### 3.5.1 Site Overview

#### *3.5.1.1 Site Description*

DIA 4 is located at 6 and 18 Marmion Street West, 215 Warren Road and Lot 70 Warren Road, Katanning within the Shire of Katanning, Western Australia (WA). The site comprises an area of 59.1 ha, and is bordered by Randford Road to the north, Warren Road to the east, Marmion Street West to the south and Strathfield Road to the west. The location of the site is shown in **Figure 1** with the general site layout shown in **Figure 6e**: DIA4 – site layout

A site visit was conducted on 25 September 2014 to help identify any potential environmental or social constraints that may have been present at the site. The site was considered to be predominantly vacant land with very sparse vegetation used for agricultural purposes with some pastoral use. Two residential properties and an orchid are located within the south-western corner of the site, a residential property located centrally within the site and one within the north-eastern corner.

As shown in **Figure 20** the surrounding land use was low density residential, and vacant land.

#### *3.5.1.2 Certificate of Title*

A copy of the current Certificate of Title is provided as **Appendix C**. A summary of the details it contains is provided as follows:

**Table 7: DIA 4 Certificate of Title Details**

| Land Description | Volume/ Folio | Street Address | Registered Proprietor | Date Registered | Previous Title |
|---|---|---|---|---|---|
| Lot 2 on Diagram 41856 | 529/71A | 18 Marmion St West, Katanning | Gary Richard Quarmby and Nicolee Ann Quarmby | 11/02/2014 | 529-70A |
| Lot 3 on Diagram 41856 | 529/74A | 6 Marmion St West, Katanning | Wendy Margaret Bride of 6 Marmion Street, Katanning | 10/05/2007 | 529-70A |
| Lot 69 on Deposited Plan 222683 | 611/158A | 215 Warren Rd, Katanning | Albert Leslie Crosby and Kathleen Ada Crosby | 30/08/1996 | 1094-256 |
| Lot 70 on Deposited Plan 222683 | 1749/52 | Lot 70 Warren Rd, Katanning | Ashleigh Peter Severin and Tania Joy Severin both of 5 Claude Street, Katanning | 06/10/2011 | 1333-281 |

#### *3.5.1.3 Aerial Photographs*

A brief review was undertaken of Landgate's online historical aerial imagery dating back to 1997. It appears that the site had not undergone significant changes between 2014 and 1997 with the exception of the emergence of dense vegetation (which appears to be an orchard based on aerial photography) () which was first observed adjacent to the residential

property located within the south-western portion of the site in the 2011 aerial photograph, and currently remains onsite. The existing residential buildings located within the south-western portion of the site, centrally at the site and in the north-eastern portion of the site surrounded by what appears to be agricultural land were all observed in the 1997 photograph.

#### *3.5.1.4 Proposed Land use*

Based on the Katanning SuperTown Growth and Implementation Plan (November 2012), the proposed land use for the site is primary residential expansion.

#### *3.5.1.5 Local Zoning*

Under the Shire of Katanning Town Planning Scheme (District Scheme) Map Nos. 5 and 7 the site is currently zoned as *Rural,* as shown in **Figure 20**.

#### *3.5.1.6 Surrounding Land use*

The site is currently surrounded by various land uses, with current local zoning showing *Rural* to the north and west and partially to the east, *Recreation and Open Space* to the north-east, and south-east, *Residential* to the south and *Special* (golf course) north-east and further east.

#### *3.5.1.7 Buffers*

Given that the proposed land use and surrounding land uses are all considered sensitive in nature, with no industrially zoned areas within the vicinity of the site, there is not likely to be any concern in relation to conflicting land uses.

### 3.5.2 Review of Site Attributes

#### *3.5.2.1 Topography*

Landgate is the Statutory Authority that maintains the State's official register of land ownership and survey information. Utilising topographical contour geospatial data sourced from Landgate it was calculated that the site is sloping downward from a north-easterly/easterly to westerly direction. The site sits at approximately 340 m AHD within the north-eastern portion and 320 m along the western extents of the site.

#### *3.5.2.2 Geology*

Based on Geosience Australia (2008) map with 1:1,000,000 scale, majority the sites geology is said to comprise: colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete and reworked laterite.

The geology within the north-eastern portion of the site is said to comprise: undifferentiated felsic intrusive rocks, including monzogranite, granodiorite, granite, tonalite, quartz monzonite, syenogranite, diorite, monzodiorite, pegmatite, locally metamorphosed, foliated, gneissic. Local abundant mafic and ultramafic inclusions.

Additionally, a minor portion of the north-eastern portion of the site, the geology is said to comprise: pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete;

magnesite; ferruginous and silicerous duricrusts and reworked products, calcrete, kaolinised rock, gossan and residual ferruginous saprolite, as shown in **Figure 9.**

#### *3.5.2.3 Soil*

No intrusive geotechnical investigation was conducted at this site.

#### *3.5.2.4 Acid Sulphate Soils*

ASS are naturally occurring soils that contain iron sulphide (iron pyrite) minerals that if disturbed by soil excavation, dewatering or drainage, can then oxidise resulting in the release of acidity and potentially causing environmental impacts.

ASS risk mapping geospatial data generated by the DER is not available for the site. However, a review of the CSIRO's ASRIS data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring (**Figure 10**).

### 3.5.3 Ecological Investigations

The following Section provides a summary of results obtained from the environmental study conducted by Terratree for the site. This comprised both a desktop study which comprised the following database searches: DPaW's Threatened and Priority Flora, Threatened Fauna and Ecological Community, WA Herbarium (WAH) Declared Rare and Priority Flora and Department of the Environment's Projected Matters Search Tool, and associated Level 1 flora and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

#### *3.5.3.1 Vegetation Condition*

Vegetation condition at the site was assessed in accordance with a scale adopted from Keighery (1994). The site vegetation is best described as being "completely degraded" meaning that "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 compromising weed or crop species with isolated trees or shrubs.

The majority of the survey area consisted of paddocks with few isolated trees, few existing structures, an orchard and a dam. A denser area of residual native trees and planted non-native trees surrounded a house within the south-western portion of the site.

#### *3.5.3.2 Declared Rare and Priority Flora*

A search was conducted of the WA Herbarium, DPAW database and the DotE PMST for records of known Threatened (Declared Rare) Flora within 20 km radius of the site, a total of 41 significant flora were recorded on the databases.

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Commonwealth *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys.

The database search indicated that Priority 2 *Banksia acanthopoda* were recorded at two locations adjacent to Katanning-Nyabing Road. Given that the site has historically been cleared of native vegetation, no flora species of conservation significance were identified at the site (see **Appendix A**).

#### 3.5.3.3 Declared Rare and Priority Fauna

A search was conducted of the DPAW database and the DotE PMST for records of known Threatened, Schedule and Priority fauna within a 20 km radius of the site. A total of 32 species of conservation significance were identified within the search area. A complete list is provided in **Appendix A**. Given the completely degraded nature of the vegetation at the site, there were no fauna species of conservation significance recorded at the site.

The habitat is not suitable to support any Threatened or Vulnerable species with the exception of potentially the Carnaby's Black Cockatoo within eucalypts. Disturbance to eucalypts, particularly great than 30 cm DBH would require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. In addition, it has been noted that any disturbance to eucalypt woodland should consider potential impacts to: Carpet Python (Schedule 4), Barking Owl (southwest pop, Priority 2), Bush Stone-curlew (Priority 4), Western Rosella (Priority 4) and Western Shrike-tit (Priority 4), in consultation with DPaW.

#### 3.5.3.4 Threatened and Priority Ecological Communities

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site (see section 4.1, **Appendix A**).

#### 3.5.3.5 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared in *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as areas that cover any and/or all of the following conservation significant areas:

- Declared World Heritage property;
- Register of the National Estate;
- Defined wetland and the area within 50 m of the wetland;
- Area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- Threatened ecological community;
- Bush Forever Site; and
- Areas identified within Environmental Protection Policy areas.

The site is not considered to be an ESA.

#### 3.5.3.6 Ecological Linkages

Ecological linkages are essentially linear elements within a landscape that provide connectivity between a number of areas of natural vegetation/habitat and facilitate movement of species between these.

Due to the site's historical clearing of the site with limited value as a habitat for fauna of conservation significance, it is considered that there are no ecological linkages of conservation significance of the site.

### 3.5.4 Hydrology and Hydrogeology

#### *3.5.4.1 Groundwater*

Under the *Rights in Water and Irrigation Act 1914*, proclaimed groundwater areas in WA are areas in which licences are required to construct or alter a well and to take groundwater. The site is not located within any proclaimed groundwater area and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow. The nearest groundwater proclaimed area is located approximately 110 km to the west and is associated with the 'Collie Groundwater Area'.

Desktop investigations on groundwater levels were carried out using DoW historical groundwater contours and WIN (2002) site geospatial datasets. The WIN site database is a State-wide record of surface and groundwater measurements, both quantitative and qualitative taken at monitoring points across the State.

Groundwater contour data extent did not extend to the subject area and was therefore unusable. WIN site records were not considered extensive enough to give an indication of depth to groundwater. The site had one WIN site bore (ID:60912736) recording for the site. Located in the northeast corner of the site, the static groundwater level at this bore was recorded as 10 m bgl. However, review of the *Shire of Katanning Local Planning Strategy 2013* indicates that "around 60% of the town experiences groundwater within 2 m of the surface".

Additionally, a review of the Global Groundwater (2004) report prepared for the Shire of Katanning showed a groundwater bore (03KC11D) located approximately 1.2 km south-east of the site, where depth to groundwater was recorded at 1.963 m bgl in May 2003.

#### *3.5.4.2 Surface Water*

The site contains numerous surface water bodies, comprised of two unnamed minor non-perennial watercourses, as well as five manmade dams and three tanks associated with rural land uses occurring on the site.

Other than the identified unnamed watercourse, several surface water bodies (man-made dams, water tanks) are located within the vicinity of the site, with the nearest one located adjacent to the eastern site boundary.

#### *3.5.4.3 Public Drinking Water Source Areas*

Under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947* the DoW has the powers necessary to legally define the boundaries of PDWSAs. These are legally defined boundaries with varying Priority levels (P1, P2 and P3) assigned to ensure that PDWSAs are managed and protected to ensure the availability of reliable, safe, good quality drinking water from either groundwater or surface water sources.

Based on a review of available mapping, the site is located outside of any PDWSAs, with the nearest recorded PDWSA being located approximately 42 km to the north-east and is defined as a PDWSA with 'Priority Not Assigned'. The nearest priority assigned PDWSA is the Priority 1 'Harris River Dam Catchment Area' approximately 120 km to the northwest.

#### 3.5.4.4 Surface Water Proclaimed Areas

Under the *Rights in Water and Irrigation Act 1914*, proclaimed surface water areas in WA are areas in which licences are required to take water from a surface watercourse. Based on a review of available mapping, the site is located outside of any proclaimed surface water areas, with the nearest being approximately 47 km to the south-west associated with the 'Warren River and Tributaries' area.

#### 3.5.4.5 Floodplains

The DoW prepares FPM to indicate the extent of flooding associated with ARI 100 year flood events. The ARI 100 year flood event is a statistical estimate of the average period in years between the occurrences of a flood of a given size and is roughly equal to a 1% probability of occurring in any given year.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 39 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

### 3.5.5 Contaminated Sites

This section details the results of relevant investigations to ascertain if the site has any registered historical contamination or pollution complaints. The DER currently records information on contaminated sites within WA on a contaminated sites register in accordance with the *Contaminated Sites Act 2003*. All sites of known or suspected contamination reported to DER will be classified under the Act as one of the following categories:

- Report not substantiated;
- Possibly contaminated – investigation required;
- Not contaminated – unrestricted use;
- Contaminated – restricted use;
- Contaminated – remediation required;
- Remediated for restricted use; or
- Decontaminated.

#### 3.5.5.1 DER Contaminated Sites Database

The DER *Contaminated Sites Database* is a publicly accessible online database that grants access information on sites classified as either:

- Contaminated - remediation required;
- Contaminated - restricted use; or
- Remediated for restricted use.

According to the DER Contaminated Sites Database the Site is not identified as, or within the vicinity of sites listed on the database on 19 August 2014. A parcel of land comprising 25 sites classified as *contaminated – restricted use* was located approximately 2,280 m south-east of the site, as shown in **Figure 12.**

### 3.5.6 Social Attributes

#### *3.5.6.1 Aboriginal Heritage*

A search for relevant Aboriginal Heritage was conducted by using the DAA online *Aboriginal Heritage Inquiry System* which incorporates both the Heritage Site Register and the Heritage Survey Database, which lists the following sites:

- Registered Aboriginal Sites;
- Other Heritage Places; and
- Heritage Survey Areas.

Results of the search indicated that the site was not listed on the database as a *Registered Aboriginal Site, Other Heritage Places,* or *Heritage Survey Area.*

The site was listed within the vicinity of one site listed as *Other Heritage Place*, which was listed for 'Artefacts/Scatter' (ID 5835), located approximately 390 m west of the site, as shown in **Figure 13.** The heritage search results are provided in **Appendix E**.

#### *3.5.6.2 Australian Heritage*

An online search of the Australian Government's Department of Environment Heritage Database found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500 m).

#### *3.5.6.3 Local Government Heritage*

An online search of the Heritage Council of WA's (HCWA) database using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site. One site (Piesse Winery fmr) was listed within the vicinity of the site (<500 m), located approximately 245 m south of the site, as shown in **Figure 13.**

### 3.5.7 Site Inspection

A visual inspection of the site was conducted by the Talis staff on 25 September 2014. This incorporated a 'walk-over' across the accessible portions of the site, drive around the perimeter of the site as well as an inspection of the surrounding land use. Photographs from Talis' inspection are provided in **Appendix G**, whilst those from Terratree are provided in the Terratree report in **Appendix A**.

The site itself was bordered by Randford Road to the north, Warren Road to the east, Marmion Street West to the south and Strathfield Road to the west. A residential property with a tree plantation area was located within the south-western portion with evidence of a minor inert waste stockpile being located within this portion of the site (**Figure 20**). Additional residential properties were located centrally within the site and within the north-eastern portion. Several water bodies were also located centrally and north within the site.

The surface of the site was predominantly used as agricultural land covered with canola flowers and wheat plantations and some pasture within the north-western portion. The land use surrounding the site was rural/rural residential. There appeared to be no cohesive vegetation given that the site has previously been cleared for agricultural, pastoral and residential use.

Based on the findings of the Site inspection, Talis concluded that there would be unlikely to be any constraints to the proposed development of the Site.

### 3.5.8 Discussion

The subject site is located at 6 and 18 Marmion Street West, 215 Warren Road and Lot 70 Warren Road, Katanning. Based on a review the Katanning Town Planning Scheme No4 (District Scheme), the site is currently zoned as *Rural*. It is understood that the proposed future land use for the site is primary residential expansion. Based on the Scheme text for *Rural* zoning, the objective of this zone is 'to ensure the continuation of broad-hectare framing as the principal land use'. If residential expansion and subdivision of the lots is to occur, it is Talis' understanding that the site would be required to be re-zoned.

In terms of the site itself, a broad assessment suggests that there are few, if any environmental constraints that would preclude development of the site for its intended use. The site slightly slopes from the north-east to the south-west however across the large site area, the site can be considered are relatively flat from a topographical perspective.

In terms of vegetation, there are no significant concerns from a development perspective. The site and has been historically cleared for agricultural, rural residential and pastoral purposes and as a result of this the vegetation condition at the site, as identified by Terratree is considered completely degraded with limited in value as a habitat for fauna of conservation significance. There is no flora or fauna of conservation significance located at the site. It is considered that the proposed disturbance activities are unlikely to significantly affect migratory species, with the possible exception of the Rainbow Bee-eater which may nest at the site between August and January.

Furthermore, from a flora and fauna perspective, the site is not considered to be suitable to support any Threatened or Vulnerable species, with the potential exception of Carnaby's Black Cockatoo (which is protected by the EPBC Act) in eucalypt (particularly greater than 30 cm DBH). Any disturbances to eucalypts will require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. In addition, any disturbance to eucalypt woodlands is required to consider potential impacts to the following: Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4), Western Shrike-tit (Priority 4) in consultation with DPaW.

The soils have previously been assessed from an ASS perspective and have been mapped by CSIRO's ASRIS data which shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring. Similarly and based on the desktop investigations and Site inspection, there is no reason to suggest that there are any previous potentially contaminating activities that have been undertaken onsite, nor was there any visual evidence of contamination observed. Although some inert waste was located along the western portion of the site, within the vicinity of the residential property, this waste was not examined in extensive detail and as such not assumed to be potentially contaminating. As such, in Talis' opinion, it is unlikely that any further investigation and/or management will be required in terms of contamination.

Talis recommends that appropriate measures are put in place to control stormwater migration from the site and to ensure that dust impacts are managed appropriately during construction and post development. Effective stormwater systems need to be designed to adequately manage small, minor and major storm events. Stormwater management will

therefore be required during and post construction which will need to be treated prior to discharge. A detailed stormwater management plan for the site which would need to include a suitable road drainage network for stormwater run-off from impervious surfaces e.g. roads, parking, roofs etc.

From a surface water perspective, there are several man-made dams located at the site, with no streams or creeks present. As noted above, any stormwater not retained onsite should be appropriately managed to ensure that any potential migration of contaminants from the developed site is minimised as far as practicable.

Given the limited groundwater data available for Katanning and in particular groundwater data available for the site itself, groundwater levels are assumed similar to that of recorded in May 2003 at a groundwater well located approximately 1.2 km south-east of the site, where depth to groundwater was recorded at 1.963 m bgl in May 2003. Groundwater has the potential to affect development in relation to the separation distance from the base of any proposed structure and the groundwater table itself. Given limited data is available, groundwater investigation would be recommended to identify actual groundwater depth and that a sufficient separation distance between proposed building footings and groundwater exists. However, it can be noted that given that some rural residential development already exists within the site, and a broad assumption can be made that a sufficient separation distance between building footings and groundwater exists at these locations.

A review of geospatial floodplain datasets indicate that no FPM 100 year ARI area is mapped within or immediately surrounding the site. The nearest mapped area is located approximately 39 km to the south associated with the Gordon River development control area, this is unlikely to pose any risk to development of the site.

In terms of separation distances/buffers, given the nature of the existing land-use and that proposed, the potential for land-use conflicts is not considered to pose a constraint to development of the site.

Finally, in terms of heritage, the investigations undertaken by Talis, the site was not listed on the database as a *Registered Aboriginal Site, Other Heritage Places,* or *Heritage Survey Area.* The site was listed within the vicinity of one site listed as *Other Heritage Place*, which was listed for 'Artefacts/Scatter' (ID 5835), located approximately 390 m west of the site, as shown in **Figure 13**. One Local Government heritage site (Piesse Winery fmr) was listed within the vicinity of the site (<500 m), located approximately 245 m south of the site, as shown in **Figure 13.** Given that the listed sites are not directly adjacent to the site itself, these listed sites are not perceived to be a constraint to the development of the site.

# 4 Conclusions and Recommendations

Based on the work undertaken by Talis (and sub-consultants Terratree and Galt), the development of all sites comprising O'Callaghan, Piesse Park, WAMCCO, Industrial Expansion and DIA4 is likely to be able to progress with few issues or constraints although specific considerations exist at each site that will require further attention during the planning phase.

From a flora and fauna perspective, O'Callaghan has the largest constraints for the site would be the significant remnants of native vegetation which is considered to be in 'good' to 'fair' condition, with high species richness. Given that the native vegetation at the site is known to support fauna species of conservation significance as well as native fauna in general, additional work will be required to determine the potential presence of conservation species onsite. Further degradation would have a significant impact on the fauna communities which would see their habitat significantly limited which may in turn result in a habitat too small to support the fauna as well as increase competition for resources. This is therefore considered a significant constraint to the development. Any proposed impacts to the site would require additional targeted surveys in consultation with the DotE, EPA and DPAW. As with all sites, any clearing of native vegetation will need to be undertaken in accordance with the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Further to this, as noted earlier in this document, given the potential presence of fauna species listed under the Federal EPBC Act, work will need to be undertaken to determine whether a referral pursuant to that Act will be required.

In relation to Piesse Park, WAMMCO, Industrial Expansion and DIA 4 which have previously been cleared of vegetation and are considered to be 'completely degraded', these sites are considered to be limited value to habitats for fauna and conservation significance and therefore not considered to pose a significant constraint to development. However, Eucalypts with large hollows identified at parts of the WAMMCO site and O'Callaghan may be suitable nesting habitats for Carnaby's Black Cockatoo (protected under the EPBC Act). Proposed vegetation clearance and other disturbance activities within these two areas would require further assessment to determine the impacts in consultation with the relevant state and federal agencies.

Critical to the development at each of the sites will be the lack of available groundwater data and implications of the potential shallow depth to the water table. Further consideration and potential investigations across all sites will be required to ensure that the development is raised to a suitable height above the maximum groundwater level and that appropriate associated controls are put in place to minimise risks associated with stormwater management.

Further site-specific groundwater investigations and detailed stormwater management plans for each of the sites would be required.

Development at each of the sites with the exception of DIA 4 which have watercourses flowing through them will be required to minimise contamination to the water courses during and post construction, in particular to the Katanning Town Creek located at Piesse Park. In addition it appeared that the Katanning Town Creek was highly degraded during the site inspection, Talis recommends the removal of weeds and sediment in the creek to improve water quality and water flow. Further in relation to development at Piesse Park,

consideration will need to be given to the receiving environment downstream which, based on anecdotal information, holds a range of environmental values including the presence of long-neck turtles located within Piesse Dam.

In relation to potential ASS, no investigations have been conducted across any sites of interest, however, the CISIRO's mapping shows 'Low Probability/Very Low Confidence' of ASS occurring within Katanning. As such, further investigations in this regard are unlikely to be required.

From a contamination perspective, there appeared to be no former or current contaminating activities occurring onsite at O'Callaghan, Industrial Expansion and DIA 4. A portion of the Piesse Park site was formerly used as an uncontrolled landfill and has since been classified by the DER as 'Potentially contaminated - investigation required'. Talis recommends additional environmental investigation works are required to determine the extent of the landfill and potential for unacceptable offsite impacts. Any such investigations should be carried out to align with the DER's expectation and guidance (the *Contaminated Sites Management Series*).

In relation to the WAMMCO, the current landuse associated with the abattoir has the potential for contamination to occur. This will obviously be dependent on the nature of the operations and management measures in place. Given development may occur on adjacent land, further appraisal of this risk should be undertaken through discussions with the WAMMCO operators and assessment of the construction details associated with the site. Notwithstanding this commentary, it would be unlikely that any contamination identified would constrain development of the adjacent land for industrial purposes. In addition to the above, investigations will be required to determine the nature of the soil mounds located within the portion of the site south of Henry Street. There is the potential for buried material at this location to present an unacceptable risk to the environment and/or human health.

In regards to the preliminary geotechnical investigation carried out at Piesse Park, WAMMCO and Industrial Expansion, the sites were classified as 'Class M' which is limited to single and double storey residential buildings, and the portion of Piesse Park that was formerly used as an uncontrolled landfill was 'Class P' which is not suitable for residential development, however is suitable for a landscape area. It is considered that each of the sites are geotechnically suitable for their proposed future development, however it needs to be noted that whilst the geotechnical assessment criteria across the three sites was in accordance with AS2870 (Residential Slabs and Footings), it is not strictly applicable to the proposed development at the WAMMCO and Industrial Expansion sites, and structural designers will need to take this into account.

Geotechnical information also showed that the material at each of these sites was predominantly low permeability clayey sand and sandy clay and for drainage purposes the proposed buildings should be built on a pad of free draining sand at least 300 mm thick. Furthermore, the clayey material was not considered suitable for onsite effluent disposal by percolation, however this may be improved through placement of adequate thickness granular fill.

Based on the work completed by Talis and information currently available, it is suggested that there are adequate separation distances in place to ensure that there are no unacceptable risk that arise from land-use conflicts at Piesse Park, DIA 4 and O'Callaghan. Further consideration will however need to be given to site-specific separation distances at

both WAMMCO and the Industrial Expansion Site. This work will need to consider the potential implications of the existing industrial land-uses on those that are being considered at both locations. Furthermore, each proposed industry will also need to be considered on its own merits to determine whether any unacceptable impacts will result on the existing land-uses, including, but not limited to, residential, rural and industrial uses.

Of note in this regard is the need to consider potential amenity impacts such as odour. As discussed in this report, strong odours were noted within the northern portion of Barker Road at the WAMMCO site during Talis' site inspection, Talis would recommend an odour assessment be conducted at the site to ensure that such impacts are not considered unacceptable from an amenity perspective.

In terms of heritage, a portion of the *Katanning Camping Grounds,* a Registered Aboriginal Heritage Site, encroaches the western part of the Industrial Expansion site. In Talis' opinion, this would be considered a constrained to development within this portion of the site and further investigations would be required. Approvals would need to be sought to disturb this site pursuant to the *Aboriginal Heritage Act 1972*. The Katanning Town Creek located within the lower portion of Piesse Park is also listed as 'Other Heritage Places', however this is not considered to a constrained to development of the site.

In summary, based on the work completed by Talis, it would appear that there are no factors that have been identified at this time that would necessarily and conclusively preclude development at any site. Notwithstanding this comment, Talis has identified a range of site-specific issues that will require further investigation, consideration and assessment before further progress can be made in relation to the final planning of these areas. Of particular note in this regard are the further investigation required to respond to ecological concerns at O'Callaghan and the contamination investigations associated with Piesse Park.

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# Figures

**Figure 1: Locality Plan**

**Figure 2a: O'Callaghan Park – site layout**

**Figure 3b: Piesse Park – site layout**

**Figure 4c: WAMMCO – site layout**

**Figure 5d: Industrial Expansion – site layout**

**Figure 6e: DIA4 – site layout**

**Figure 7: O'Callaghan Park – Zoning and site attributes**

**Figure 8: Topographical contours**

**Figure 9: Surface geology**

**Figure 10: Acid Sulphate soils risk**

**Figure 11: O'Callaghan Park – Surface water**

**Figure 12: Contaminated Sites**

**Figure 13: Aboriginal and European Heritage**

**Figure 14: Piesse Park - Zoning and site attributes**

**Figure 15: Piesse Park – Surface water**

**Figure 16: WAMMCO – Zoning and site attributes**

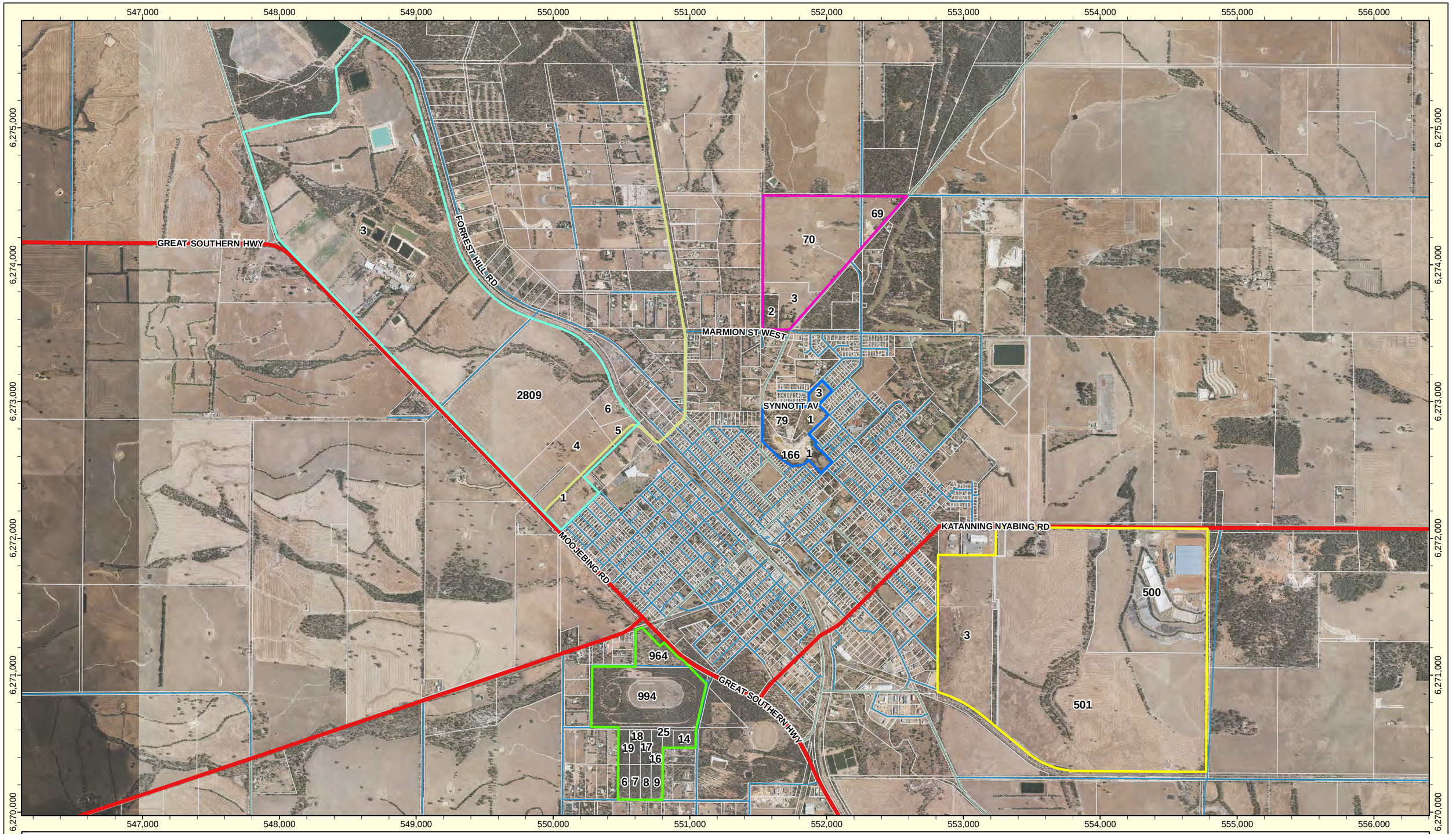
**Figure 17: WAMMCO – Surface water**

**Figure 18: Industrial Expansion – Zoning and site attributes**

**Figure 19: Industrial Expansion – Surface water**

**Figure 20: DIA 4 – Zoning and site attributes**

**Figure 21: DIA 4 – Surface water**




**LEGEND**

- Cadastre
- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO

**Road Network (MRWA)**

- Access Road
- Local Distributor
- Regional Distributor
- Primary Distributor

# SITE LOCALITY

## Katanning Structure Plan Due Diligence

N

0 250 500 1,000 1,500 2,000 2,500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

| | | | | | |
|---|---|---|---|---|---|
| Scale @ A3: | 1:26,000 | Prepared: | R Cullen | Project No: | TE14012 |
| Date: | 17/10/2014 | Checked: | J Botterill | Figure 01 | |
| Revision: | Rev A | Reviewed: | N King | | |

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550,000

551,000

6,271,000

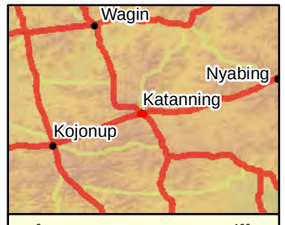
6,271,000

550,000

551,000

**LEGEND**

O'Callaghan Park




# O'CALLAGHAN PARK AERIAL

## Katanning Structure Plan Due Diligence

N

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Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 17/10/2014 | Checked: | J Botterill | Figure 01a | |
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552,000

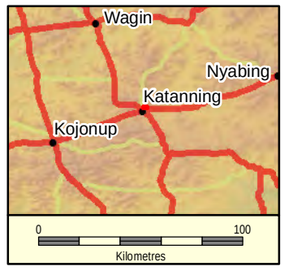
6,273,000

6,273,000

552,000

**LEGEND**

Piesse Park




# PIESSE PARK AERIAL

## Katanning Structure Plan Due Diligence

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 17/10/2014 | Checked: | J Botterill | Figure 01b | |
| Revision: | Rev A | Reviewed: | N King | | |

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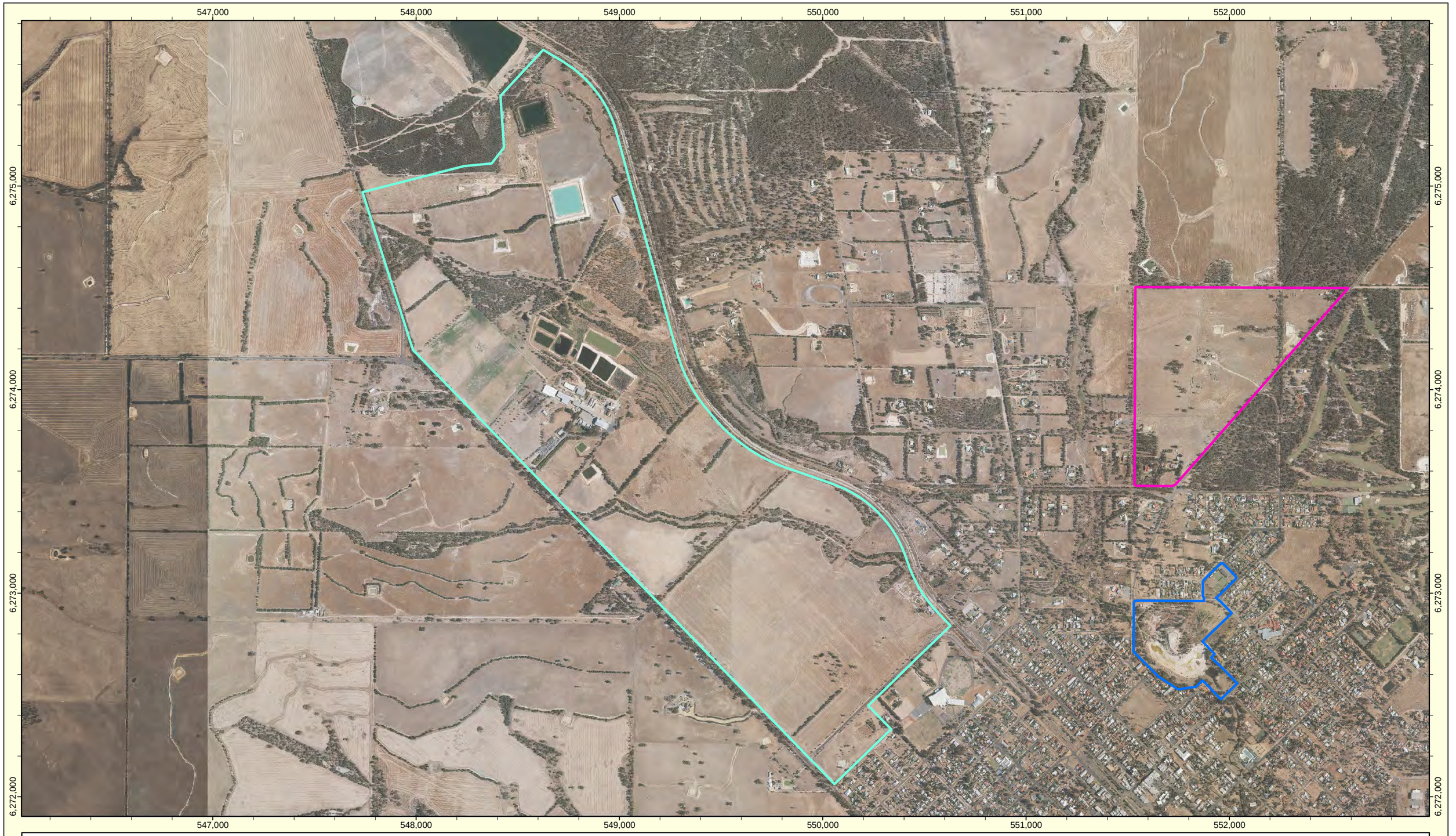
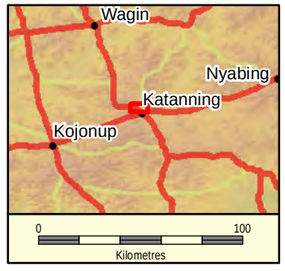



**LEGEND**

- DIA4
- Piesse Park
- WAMMCO




# WAMMCO AERIAL

## Katanning Structure Plan Due Diligence

N

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 17/10/2014 | Checked: | J Botterill | Figure 01c | |
| Revision: | Rev A | Reviewed: | N King | | |

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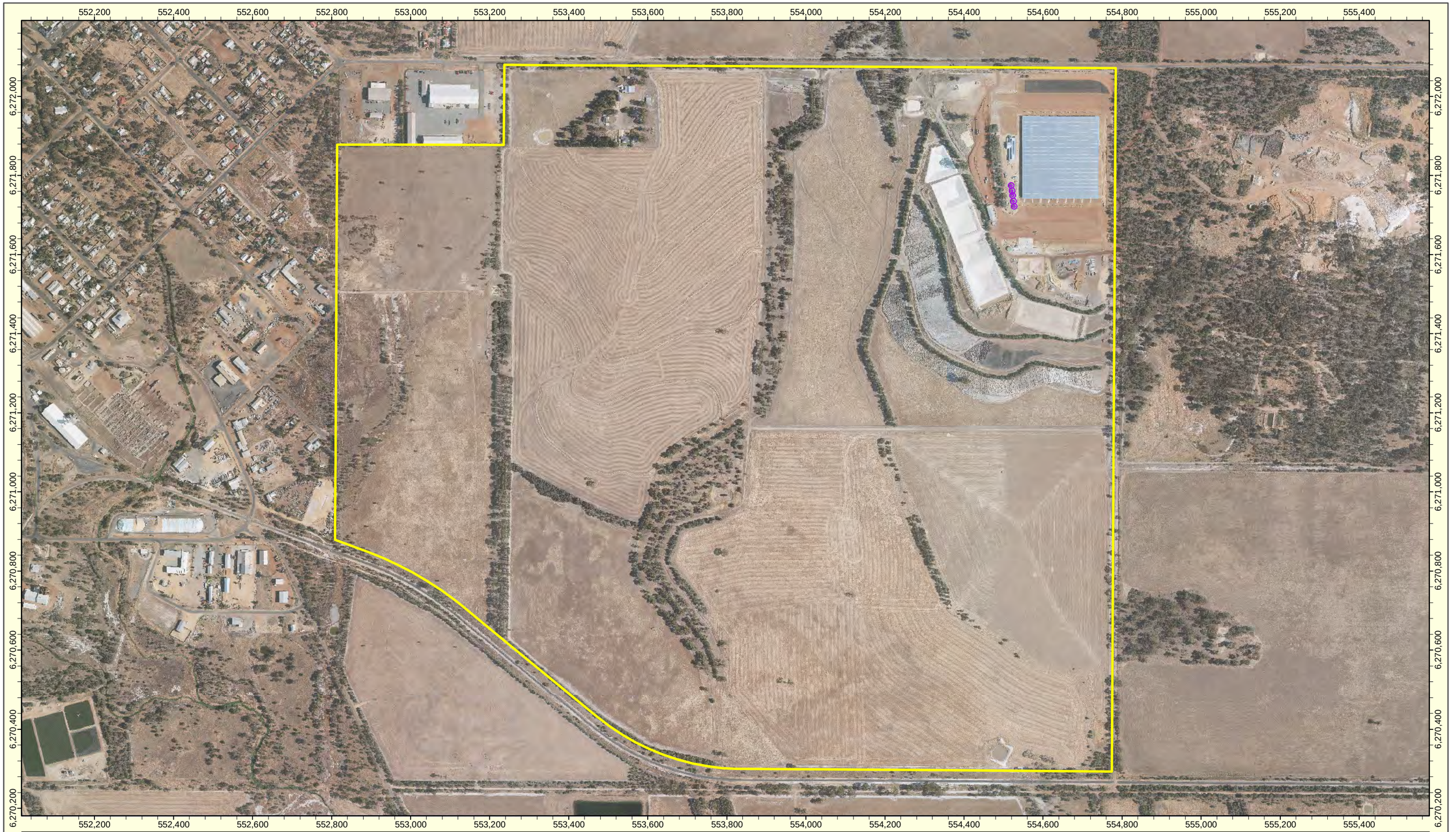
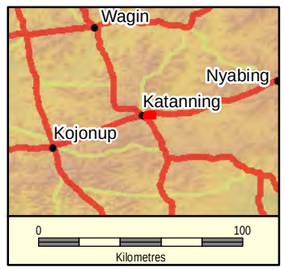



**LEGEND**

- Industrial Expansion Area




# INDUSTRIAL EXPANSION AREA AERIAL

## Katanning Structure Plan Due Diligence

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Meters

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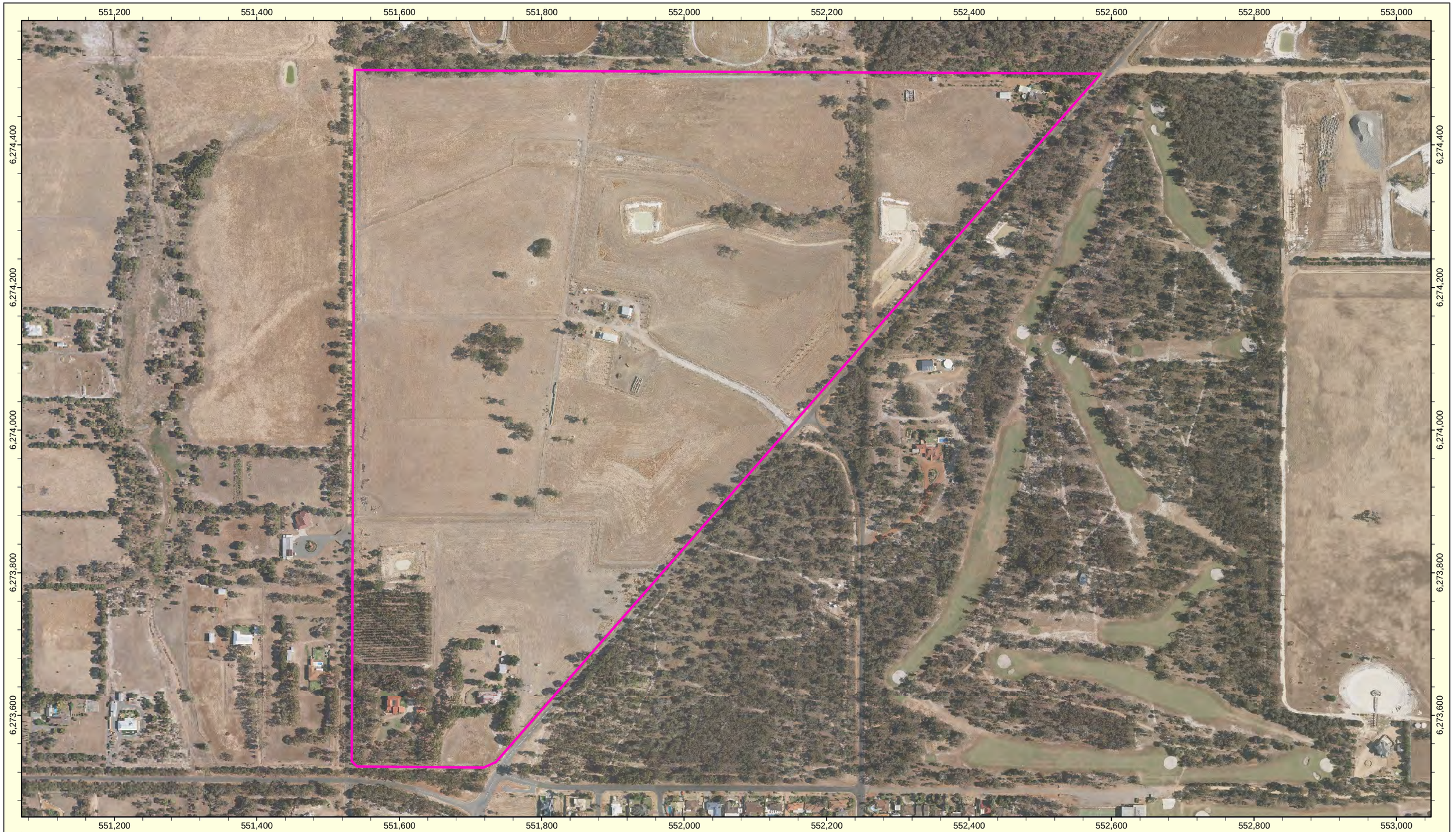


**LEGEND**

DIA4

# DIA4 AERIAL

## Katanning Structure Plan Due Diligence

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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MOOJEBING RD
CLIVE ST
KOJONUP KATANNING RD
KIERLE ST
Former racetrack
JAMES ST
BOND ST
BARKER ST
FERN - WREN L
BLANTYRE ST
BOKARUP ST
FANTAIL L
GOLDEN WHISTLER L
BEACH ST
IBIS L
GRASSBIRD L
BEAUFORT ST
BAY ST
GREAT SOUTHERN HWY
BARCLAY ST
LANGLEY ST
CORNWALL ST
RAMSDEN ST
PROSSER ST
SHIRLEY ST
MCLEOD ST
CURLEW ST
STRICKLAND ST
GULLEY ST
GULLEY ST

549,600 549,800 550,000 550,200 550,400 550,600 550,800 551,000 551,200 551,400 551,600 551,800

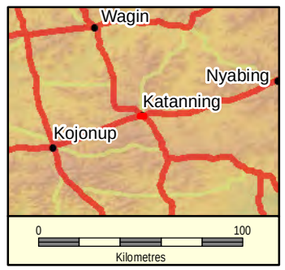
**LEGEND**

- O'Callaghan Park

**Local Planning Scheme - Zones and Reserves**

**ZONE**

- General industrial
- Light industrial
- Public purposes
- Railway
- Recreation and open space
- Residential
- Road
- Rural
- Special rural




# O'CALLAGHAN PARK - ZONING AND SITE ATTRIBUTES

## Katanning Structure Plan Due Diligence

N

0 100 200 400 600

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 17/10/2014 | Checked: | J Botterill | Figure 02 | |
| Revision: | Rev A | Reviewed: | N King | | |

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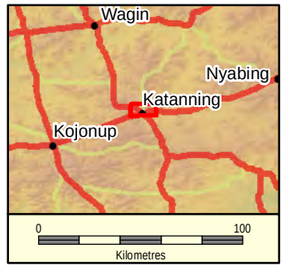
6,275,000 6,274,000 6,273,000 6,272,000 6,271,000 6,270,000

**LEGEND**

- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO
- Topographical contours (mAHD)




# TOPOGRAPHICAL CONTOURS

## Katanning Structure Plan Due Diligence

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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Qrc Czl Ag Czl Czs Czl Ag Ag Qrc Qrc Czl Ag Cza

547,000 548,000 549,000 550,000 551,000 552,000 553,000 554,000 555,000 556,000

## LEGEND

- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO

### Surface Geology (1:1M)

Ag: Undifferentiated felsic intrusive rocks, including monzogranite, granodiorite, granite, tonalite, quartz monzonite, syenogranite, diorite, monzodiorite, pegmatite. Locally metamorphosed, foliated, gneissic. Local abundant mafic and ultramafic inclusions

Cza: Reworked or incised sandy alluvium in older stream channels; lateritised alluvium; alluvial terraces above younger alluvium; alluvial and colluvial outwash deposits not in defined channel systems; sand, silt, gravel, clay, evaporites

Czl: Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite

Czs: Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand

Qrc: Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite

# SURFACE GEOLOGY

## Katanning Structure Plan Due Diligence

N

0 250 500 1,000 1,500 2,000 2,500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 17/10/2014 | Checked: | J Botterill | Figure 04 | |
| Revision: | Rev A | Reviewed: | N King | | |

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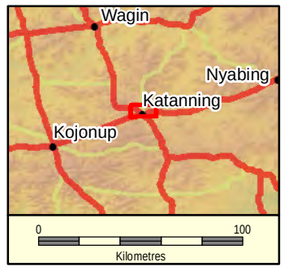
**LEGEND**

- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO

**Australian Atlas of Acid Sulfate Soils**

- An(p4) *High Probability of occurrence (>70% chance of occurrence in mapping unit)*
- Bn(p4) *Low Probability of occurrence (6-70% chance of occurrence in mapping unit)*




# ACID SULFATE SOILS RISK

## Katanning Structure Plan Due Diligence

N

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Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Revision: | Rev A | Reviewed: | N King | | |

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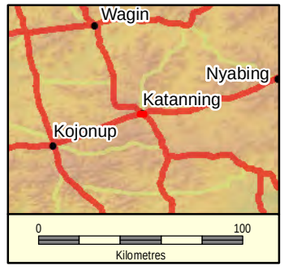
6,271,200 6,271,000 6,270,800 6,270,600 6,270,400 6,270,200

**LEGEND**

- O'Callaghan Park
- Pipeline - above ground, water
- Tank

**Hydrography Type**

- Drain - minor
- Earth Dam
- Watercourse - minor, non-perennial




# O'CALLAGHAN PARK - SURFACE WATER

## Katanning Structure Plan Due Diligence

N

0 100 200 400 600

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Revision: | Rev A | Reviewed: | N King | | |

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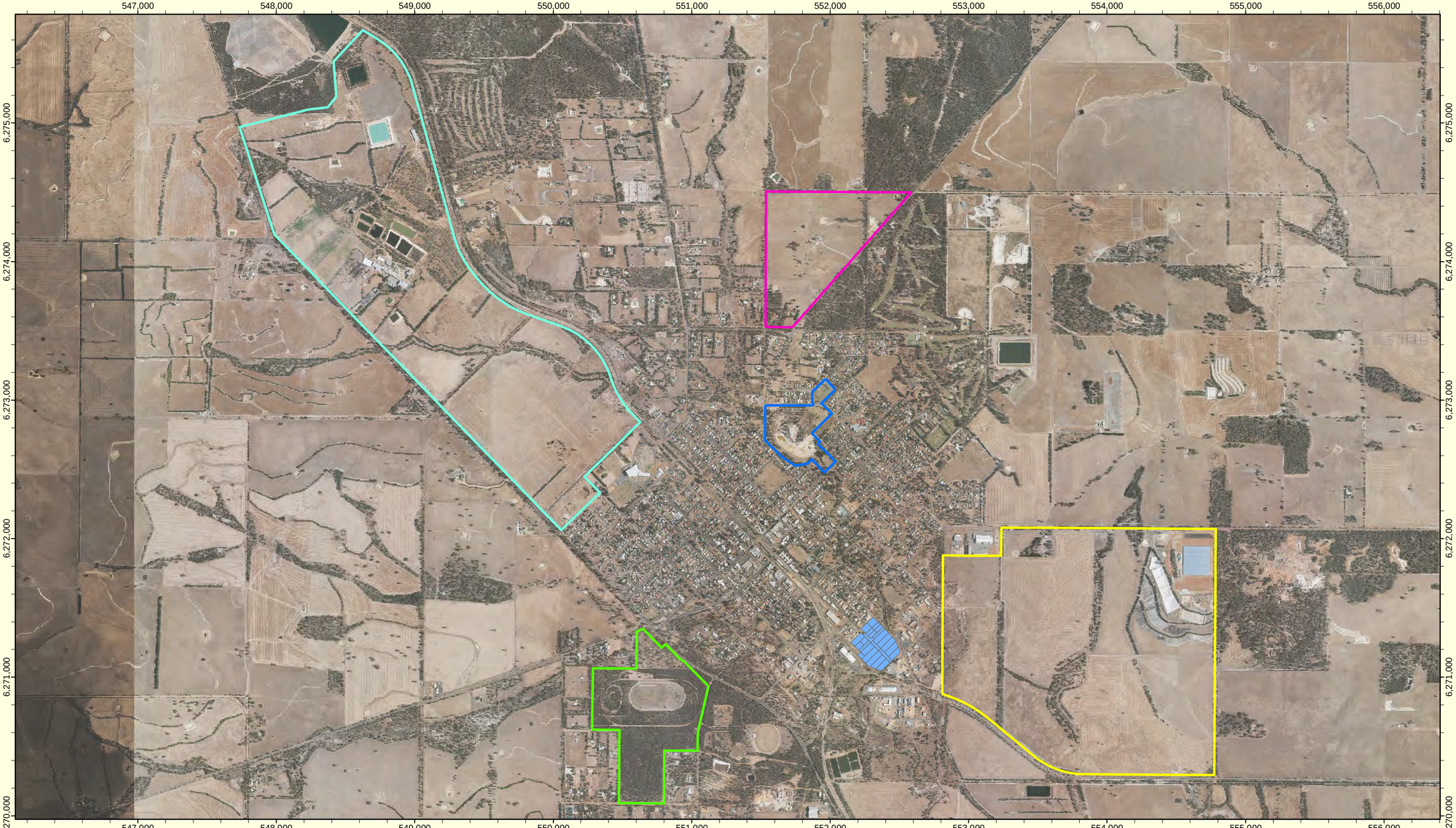
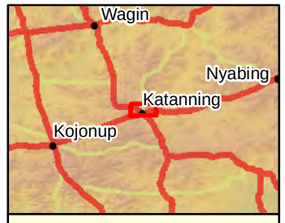


**LEGEND**

- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO

**Contaminated Sites**

- Contaminated - restricted use




# CONTAMINATED SITES

## Katanning Structure Plan Due Diligence

N

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Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Revision: | Rev A | Reviewed: | N King | | |

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106010
106011
4426
106986
4427
4435
106482
22817
4428
17057
104191
106012
105500
105498

## LEGEND

- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO
- Aboriginal Heritage Place
- Aboriginal Survey Area
- State Register of Heritage Places
- Local Government Heritage (<500m vicinity)

# ABORIGINAL AND EUROPEAN HERITAGE

## Katanning Structure Plan Due Diligence

N

0 250 500 1,000 1,500 2,000 2,500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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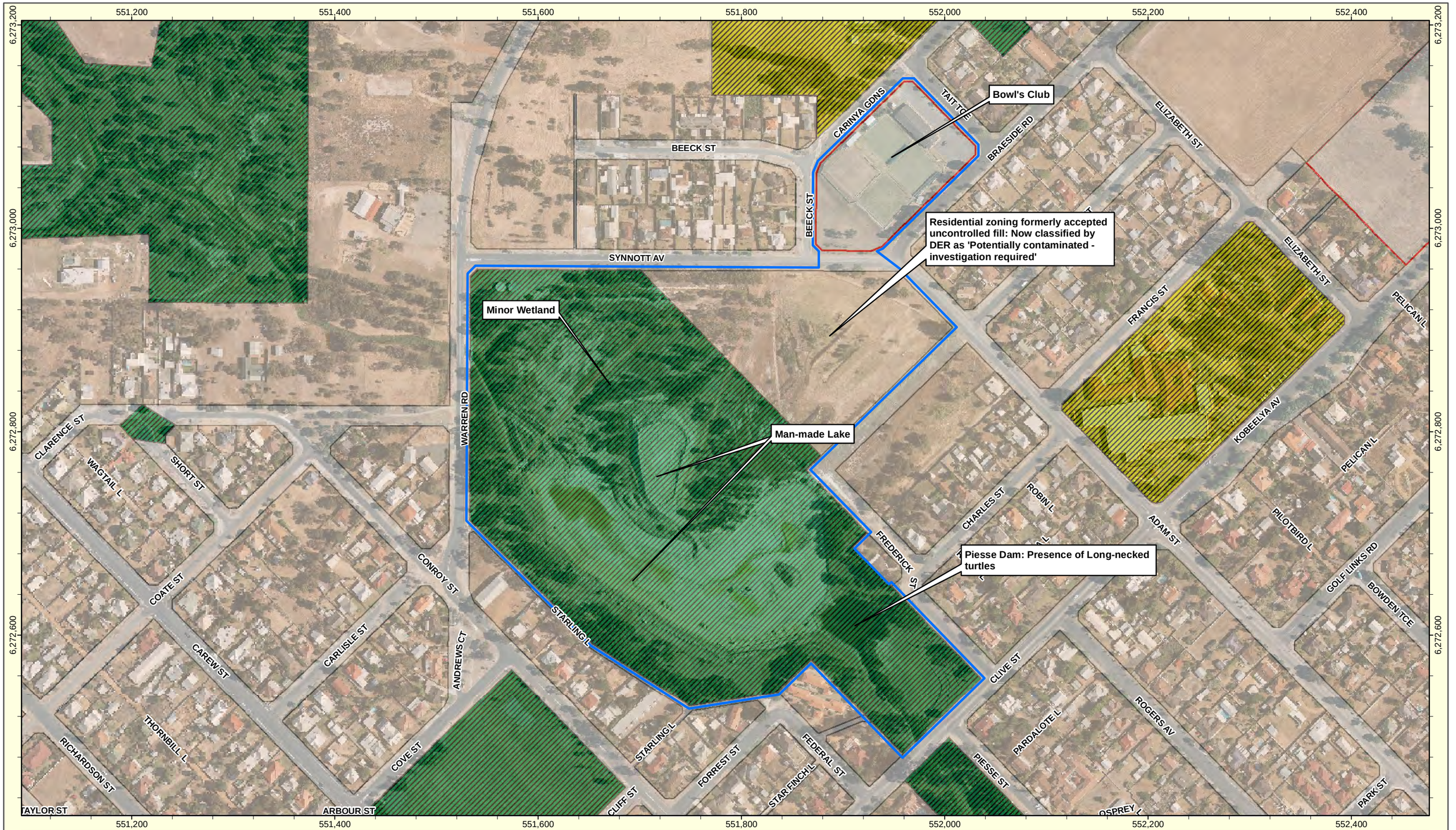
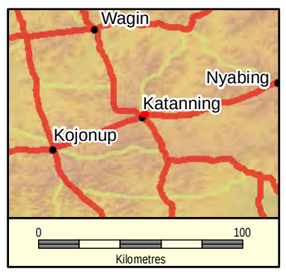



**LEGEND**

- Piesse Park
- **Local Planning Scheme - Zones and Reserves**
- **ZONE**
- Public purposes
- Railway
- Recreation and open space
- Residential
- Road
- Special use




# PIESSE PARK ZONING AND SITE ATTRIBUTES

## Katanning Structure Plan Due Diligence

N

0 50 100 200 300

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

| | | | | | |
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| Scale @ A3: | 1:3,500 | Prepared: | R Cullen | Project No: | TE14012 |
| Date: | 17/10/2014 | Checked: | J Botterill | Figure 09 | |
| Revision: | Rev A | Reviewed: | N King | | |

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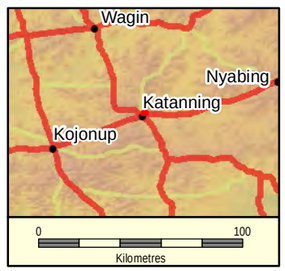
**LEGEND**

- Piesse Park
- **Hydrography Type**
- Drain - major
- Drain - minor
- Earth Dam
- Lake - artificial
- Watercourse - minor, non-perennial
- Rivers (DoW)
- Tank




# PIESSE PARK - SURFACE WATER

## Katanning Structure Plan Due Diligence

N

0 50 100 200 300

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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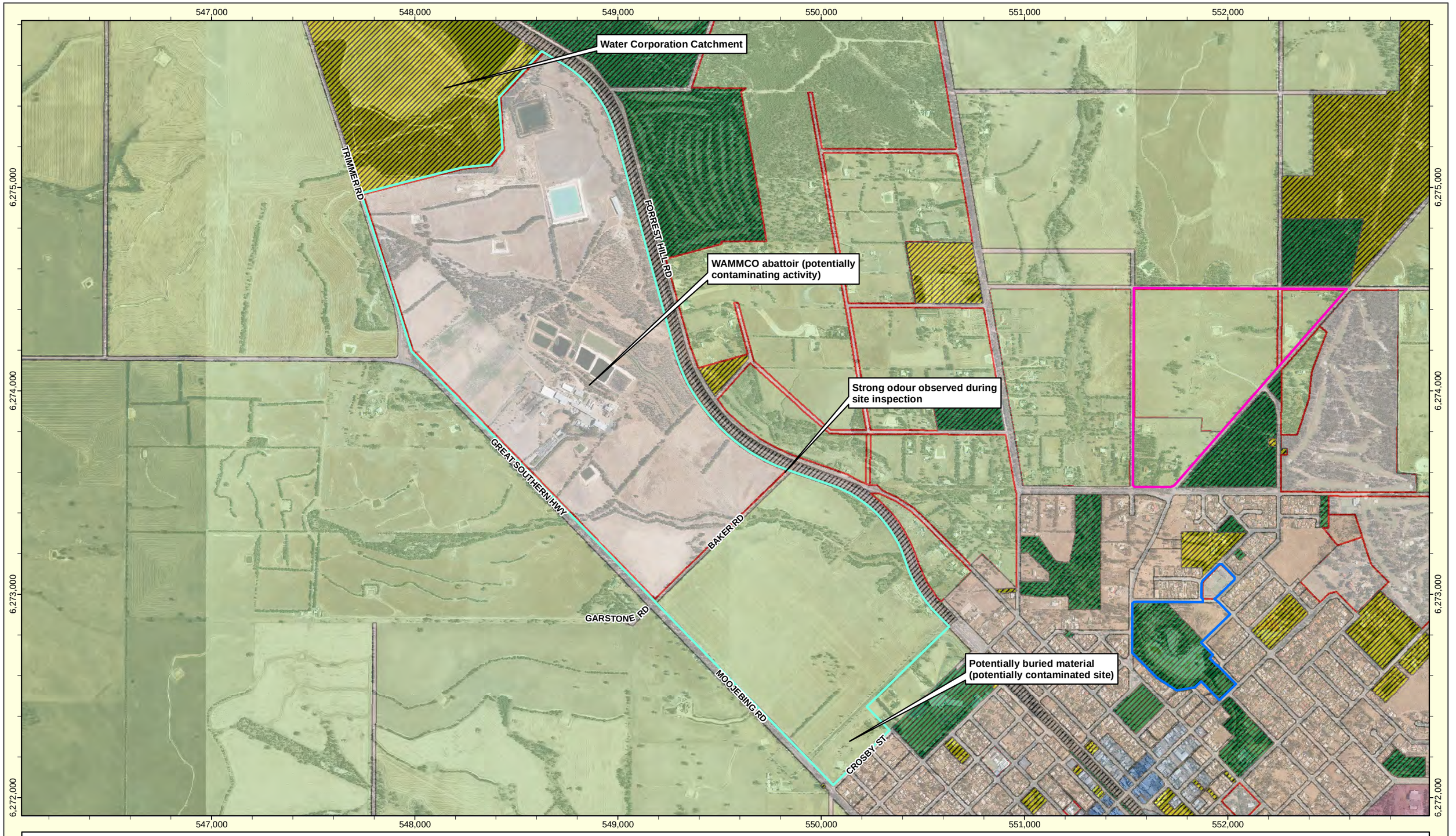


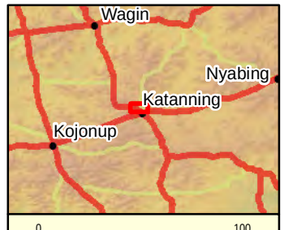

**LEGEND**

- DIA4
- Piesse Park
- WAMMCO

**Local Planning Scheme - Zones and Reserves**

**ZONE**

- Commercial
- Light industrial
- Public purposes
- Railway
- Recreation and open space
- Residential
- Road
- Rural
- Special residential
- Special rural
- Special use
- Town centre




# WAMMCO ZONING AND SITE ATTRIBUTES

## Katanning Structure Plan Due Diligence

N

0 150 300 600 900 1,200 1,500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Revision: | Rev A | Reviewed: | N King | | |

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547,000 548,000 549,000 550,000 551,000 552,000

6,275,000

6,274,000

6,273,000

6,272,000

Katanning Creek

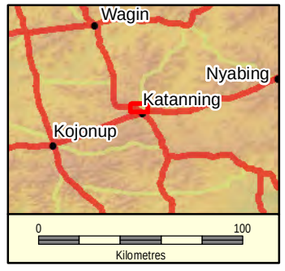
Katanning Creek

**LEGEND**

- DIA4
- Piesse Park
- WAMMCO

**Hydrography Type**

- Dam Wall - carrying road
- Drain - major
- Drain - minor
- Earth Dam
- Flow Direction Arrow
- Lake - artificial
- Water Reservoir
- Watercourse - minor, non-perennial
- Rivers (DoW)
- Spring or Soak
- Tank




# WAMMCO - SURFACE WATER

## Katanning Structure Plan Due Diligence

N

0 200 400 800 1,200 1,600

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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552,200 552,400 552,600 552,800 553,000 553,200 553,400 553,600 553,800 554,000 554,200 554,400 554,600 554,800 555,000 555,200 555,400

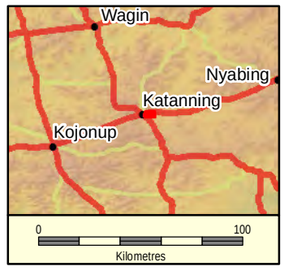
6,272,000 6,271,800 6,271,600 6,271,400 6,271,200 6,271,000 6,270,800 6,270,600 6,270,400 6,270,200

PARK ST
HARRIS ST
PIESSE ST
ROGERS AV
MOORHEN L
ADAM ST
MAGPIE L
KATANNING NYABING RD
KESTREL L
DIJON ST
CONROY ST
JACANA L
CULLEN ST
DROVE ST
ANDERSON ST
DORE ST
DAPING ST
ARNOLD ST
LISLE ST
APPLIN ST
CREEK ST
MARTIN CR
POLICE POOLS RD
QUARREL RD
DEPOT RD

Farm
Sheep sales yard
Landfill
Burnt out vehicle

**LEGEND**

- Industrial Expansion Area
- **Local Planning Scheme - Zones and Reserves**
- **ZONE**
- General industrial
- Light industrial
- Public purposes
- Railway
- Recreation and open space
- Residential
- Road
- Rural
- Special use




# INDUSTRIAL EXPANSION AREA ZONING AND SITE ATTRIBUTES

## Katanning Structure Plan Due Diligence

N

0 100 200 400 600 800
Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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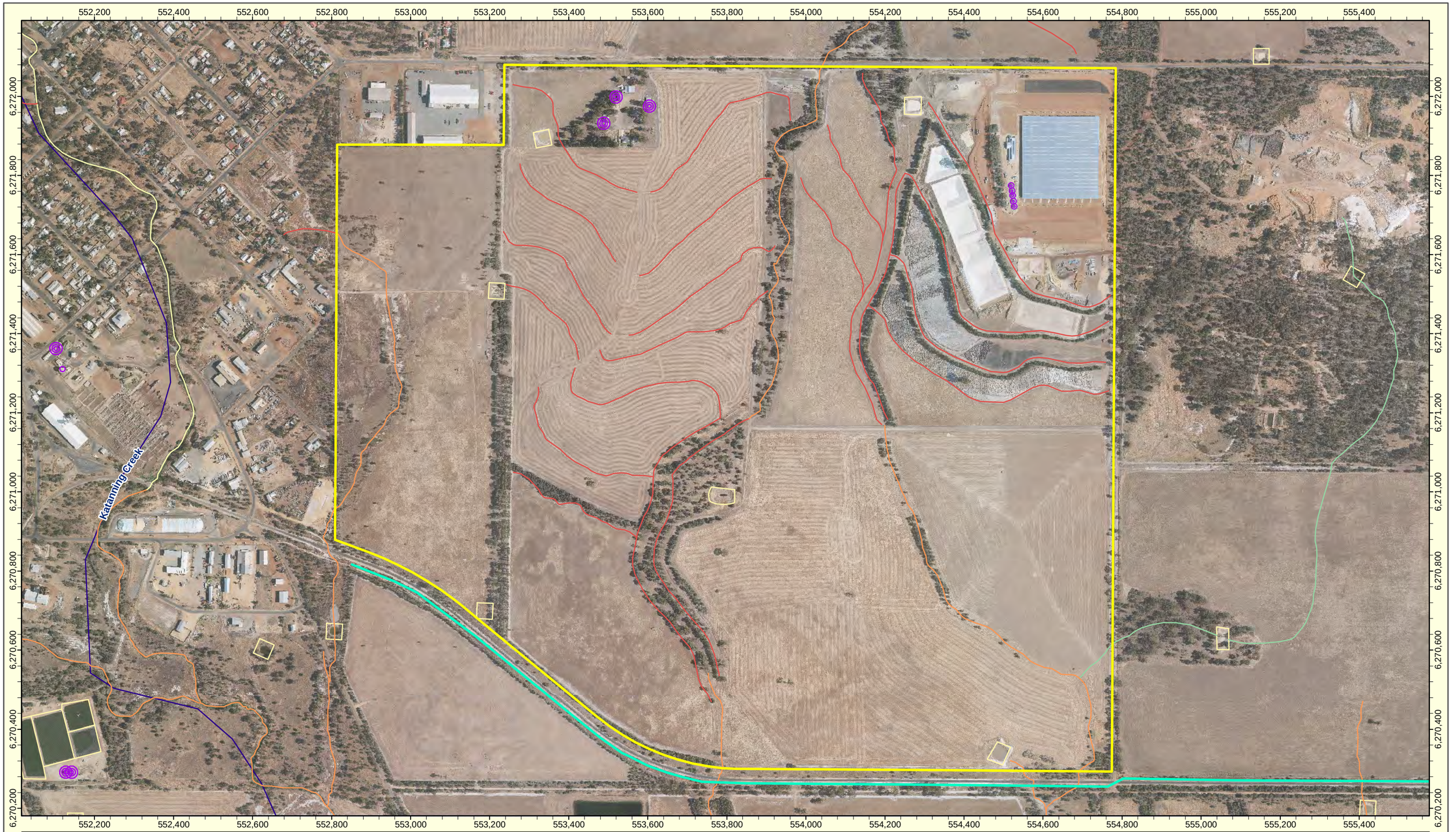
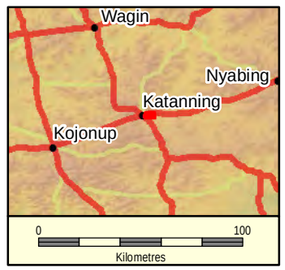



**LEGEND**

- Industrial Expansion Area

**Hydrography Type**

- Drain - major
- Drain - minor
- Earth Dam
- Watercourse - indefinite
- Watercourse - minor, non-perennial
- Rivers (DoW)
- Pipeline - above ground, water
- Tank




# INDUSTRIAL EXPANSION AREA - SURFACE WATER

## Katanning Structure Plan Due Diligence

N

0 100 200 400 600 800

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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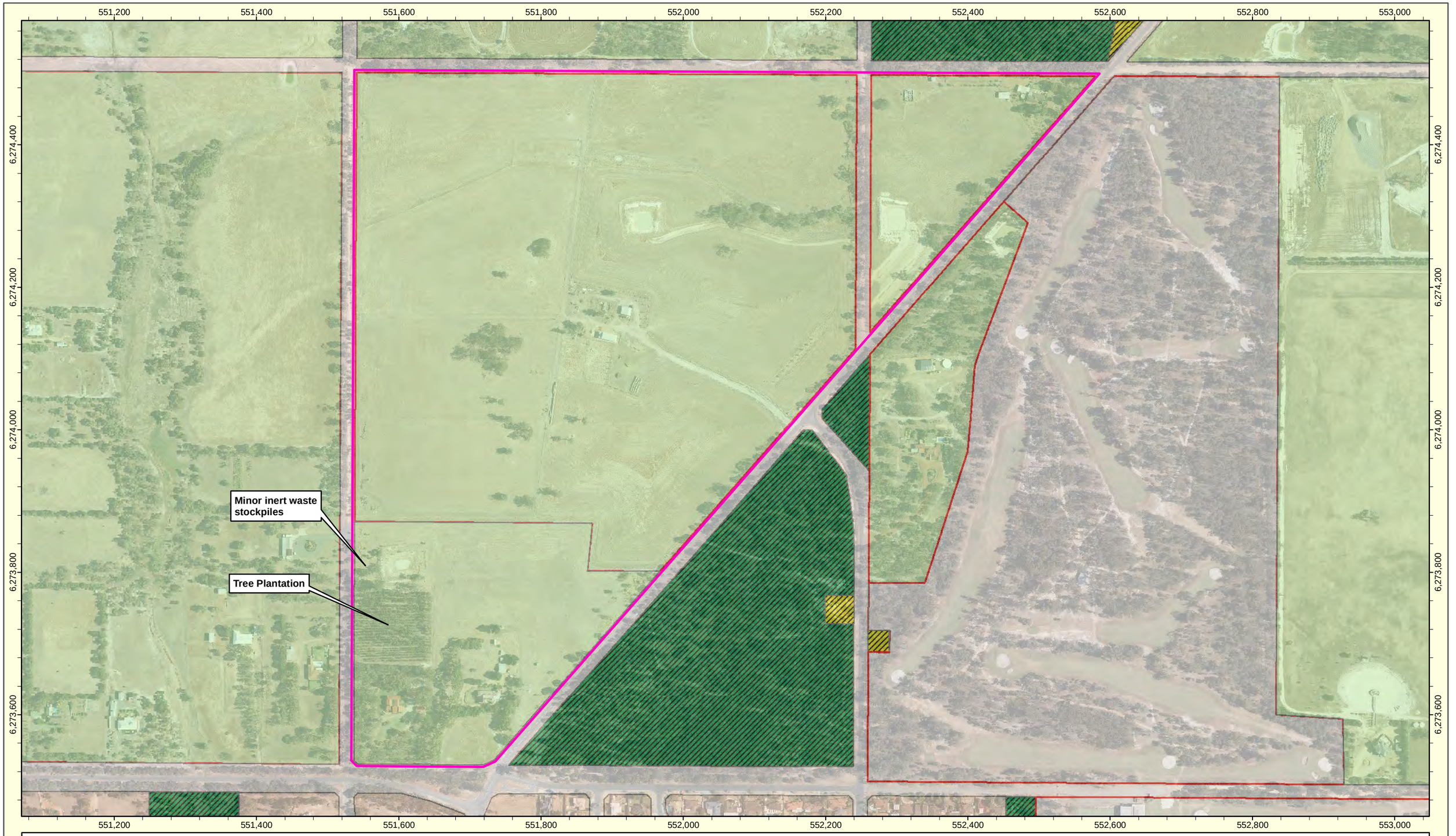
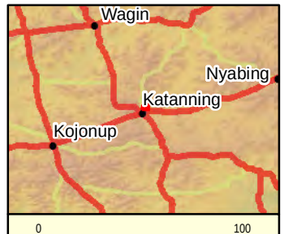



**LEGEND**

- DIA4
- **Local Planning Scheme - Zones and Reserves**
- **ZONE**
- Public purposes
- Recreation and open space
- Residential
- Road
- Rural
- Special rural
- Special use




# DIA4 ZONING AND SITE ATTRIBUTES

## Katanning Structure Plan Due Diligence

N

0 50 100 200 300 400 500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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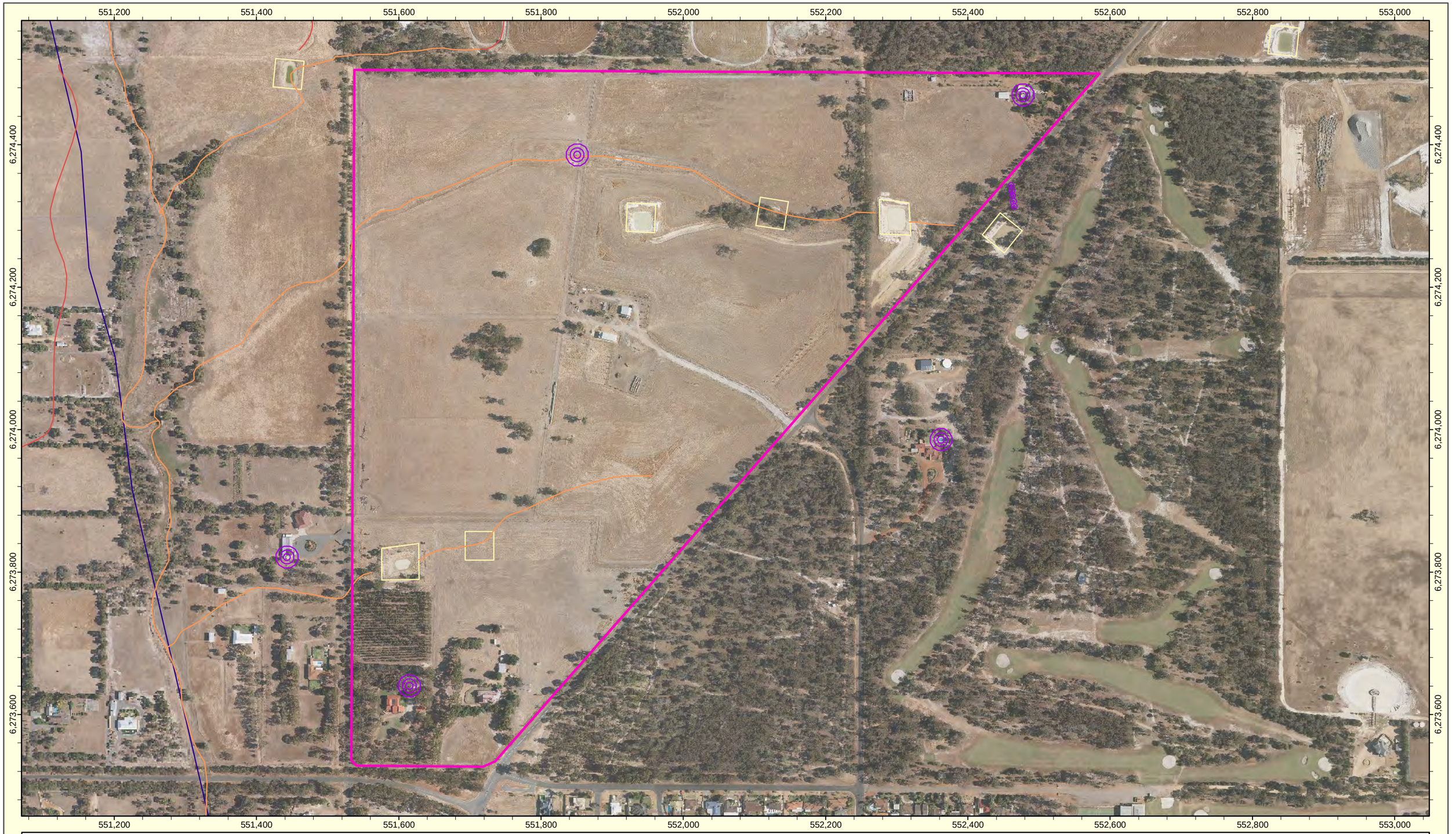


**LEGEND**

- DIA4
- Rivers (DoW)

**Hydrography Type**

- Drain - minor
- Earth Dam
- Watercourse - minor, non-perennial
- Tank

# DIA4 - SURFACE WATER

## Katanning Structure Plan Due Diligence

N

0 50 100 200 300 400 500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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# Appendix A: Terratree Report

# Level 1 Flora and Fauna survey and Targeted Priority Flora survey for Katanning Structure Plan Areas

Prepared for the Shire of Katanning

*Ref: T14010*

ecological assessment & management

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**Document Control**

| Version | Date | Author | Reviewer |
|---|---|---|---|
| Draft | 22/10/2014 | C. McGary | J.Grehan |
| Final | | | |

Author: Joseph Grehan

Principal Ecologist

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*Terratree Pty Ltd*

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# 1 Introduction

The Shire of Katanning commissioned Terratree Pty Ltd (Terratree) to do a Level 1 (EPA, 2004) flora survey, targeted Threatened (Declared Rare) and Priority flora survey and Level 1 fauna survey (habitat assessment) of the following structure plan areas:

- O'Callaghan Park (61.2 ha)
- Piesse Park (19.6 ha)
- WAMMCO (366.7 ha)
- Industrial Expansion Area (308.9 ha)
- DIA 4 (59.1 ha)

The survey areas are located in the Avon Wheatbelt region in and around Katanning and about 285 km southeast of Perth, Western Australia (WA) (**Figure 1**).

## 1.1 Regulatory Context

As part of the regulatory requirement to clear native vegetation within the structure plan areas, proponents are required to conduct various levels of biological surveys, depending of the scale and intensity of the clearing and the potential impacts to flora and fauna.

The surveys were completed in accordance with the surveys descriptions in EPA Guidance Statements 51 and 56 and meet the requirements under Western Australian environmental legislation and regulations. The flora and fauna surveys were integrated and occurred during one site visit. The flora and fauna surveys included the following:

- Vegetation mapping and condition assessment
- Targeted searches for Threatened (Declared Rare) and Priority flora
- Assessment of habitat suitability to support Threatened (Rare or Likely to Become Extinct), Priority, Migratory, Short-Range Endemic and other Specially Protected fauna
- Targeted searches for sign (tracks, scat, burrows and mounds, etc.) of conservation significant fauna

## 1.2 Legislation

Current State and Federal Government legislation relevant to environmental impact assessment and the conservation of biodiversity and in WA includes:

**State:**

- *Environmental Protection Act* (1986)
- *Wildlife Conservation Act* (1950)

**Federal:**

- *Environmental Protection and Biodiversity Conservation Act* (1999) (EBPC Act)

## 1.3 Government Policy and Guidelines

A number of State policies, EPA position statements, EPA guidance statements and relevant environmental guidelines and codes of practice are relevant to environmental impact assessment of development within the structure plan areas

These include:

- *EPA Position Statement No. 2 Environmental Protection of Native Vegetation* (EPA 1999)
- *EPA Position Statement No. 3 Terrestrial Biological Surveys* (EPA 2002a)
- *EPA Position Statement No. 7 Principles of Environmental Protection* (EPA 2002b)

- *EPA Guidance Statement No. 33 Environmental guidance for Planning and Development* (EPA 2008)
- *EPA Guidance Statement No. 20 Sampling of Short Range Endemic Invertebrate Faun*a (EPA 2009)
- *EPA Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys* (EPA 2004a)
- *EPA Guidance Statement No. 56 Terrestrial Fauna Surveys* (EPA 2004b)

## 1.4 Wildlife Conservation Act 1950

All Australian native flora and fauna is protected under the Western Australian *Wildlife Conservation Act*, where flora is defined as any plant (including wildflower, palm, shrub, tree, fern, creeper or vine) which is either native to Western Australia or declared to be flora under the Act, and includes any part of flora and all seed and spores thereof. Any activity in WA that involves taking part of or the whole of a WA native plant may require a licence or permit to do so.

Species and subspecies of flora and fauna may be listed as 'Threatened' pursuant to Schedule 1 of the *Wildlife Conservation Act*. Flora and fauna may be listed as Threatened under federal legislation as well, see section 1.2.4 below.

A flora species may be designated 'Declared Rare' species under subsection 2 of section 23F of the *Wildlife Conservation Act* and it is an offence to 'take' or damage rare flora without Ministerial approval. Section 23F of the Act defines 'to take' as " to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora to cause or permit the same to be done by any means". The WA State Minister for the Environment can declare taxa (species, subspecies or variety) as 'Declared Rare Flora' (DRF) if they are considered to be in danger of extinction, rare or otherwise in need of special protection. At the State level, the term Threatened Flora is now commonly used to refer to DRF regardless of their Commonwealth status.

Flora and fauna taxa acquire a 'Declared Rare' or 'Priority' conservation status when populations are restricted geographically or threatened by local processes (**Table 1**). The Department of Parks and Wildlife (DPaW) recognises these threats and applies regulations towards population protection and species conservation. DPaW enforces regulations under the *Wildlife Conservation Act* to conserve DRF and Priority Flora and protect significant populations.

The list of Threatened flora and fauna is reviewed annually by a scientific panel that assess a taxon's conservation status and ranks them into categories. The Priority Flora and Fauna list is dynamic, as new information becomes available conservation status is reviewed and changes to the listing may result. The categories for Priority Flora and Fauna give an indication of the priority for undertaking further surveys based on the number of known sites, and degree of threat to those populations.

### 1.4.1 Scheduled and Priority Fauna Species

There are four levels of conservation significance provided for fauna under the *Wildlife Conservation Act*. Scheduled species are prioritised and listed as:

- Schedule 1: Fauna that is rare or likely to become extinct (also known as "Threatened Species")
- Schedule 2: Fauna presumed to be extinct
- Schedule 3: Migratory birds protected under an international agreement
- Schedule 4: Other specially protected fauna

DPaW has also produced a supplementary list of 'Priority' fauna, including species that are not scheduled under the *Wildlife Conservation Act*, but for which the DPaW considers require attention (**Table 1**).

DPaW also classifies species into one of five categories developed by the International Union for Conservation of Nature (IUCN): extinct (EX), extinct in the wild (EW), critically endangered (CR), endangered (EN) or vulnerable (VU).

These categories are determined by the total distribution of the species within Australia (and internationally where migratory species are concerned), not just within WA.

**Table 1: Definition of Threatened and Priority Species under the *Wildlife Conservation Act* (DPaW 2013)**

| Conservation Code | Category |
|---|---|
| **T** | **Threatened Flora and Fauna (Extant)**<br>Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such. Threatened Flora are further ranked by the Department according to their level of threat using IUCN Red List criteria:<br>• CR: Critically endangered – considered to be facing an extremely high risk of extinction in the wild;<br>• EN: Endangered – considered to be facing a very high risk of extinction in the wild;<br>• VU: Vulnerable – considered to be facing a high risk of extinction in the wild. |
| **X** | **Threatened – Presumed Extinct Taxa**<br>Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such. Species that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora List under Priorities 1, 2 or 3. |
| **P1** | **Priority One – Poorly Known Taxa**<br>Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verges, urban areas, farmland, active mineral leases etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey. |
| **P2** | **Priority Two – Poorly Known Taxa**<br>Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey. |
| **P3** | **Priority Three – Poorly Known Taxa**<br>Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but need further surveying. |
| **P4** | **Priority Four – Rare, Near Threatened and other taxa in need of monitoring**<br>• Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.<br>• Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.<br>• Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy. |
| **P5** | **Priority Five – Conservation Dependent Species**<br>Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years. |

## 1.5 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) is the Australian Government's key piece of environmental legislation. The EPBC Act protects matters of National Environmental Significance (NES) including, Threatened flora and fauna species, Threatened Ecological Communities and Migratory species protected under international agreements such as the Japan–Australia Migratory Bird Agreement (JAMBA), the China–Australia Migratory Bird Agreement (CAMBA), the Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA) and the Bonn Convention (the Convention on the

Conservation of Migratory Species of Wild Animals). The EPBC Act also protects other NES, such as world heritage properties, national heritage places, wetlands of international importance (designated under the Ramsar Convention) and Commonwealth marine areas, including the Great Barrier Reef Marine Park. Any action likely to have a significant impact on a matters of NES listed under the EPBC Act requires referral to the Commonwealth Department of the Environment (DotE) and potentially the approval of the Commonwealth Minister for the Environment. The EPBC Act states that the proponent must not take an action that is likely to have a significant impact on any matters of NES without approval.

### 1.5.1 Local and Regionally Significant Flora

In addition to flora and fauna taxa being recognised as significant through their Threatened or Priority status, they can also be significant for a number of other reasons. The Environmental Protection Authority (EPA) in Guidance Statement No. 51 – Terrestrial flora and vegetation surveys for environmental impact assessment in WA (EPA 2004a) states that "significant flora" may include taxa that have:

- "a keystone role in a particular habitat for threatened species, or supporting large populations representing a significant proportion of the local regional population of a species;
- relic status;
- anomalous features that indicate a potential new discovery;
- being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- the presence of restricted subspecies, varieties or naturally occurring hybrids;
- local endemism/a restricted distribution; or
- being poorly reserved. "

Similarly, plant communities or vegetation may be considered "significant vegetation" for reasons other than a listing as a Threatened Ecological Community. The EPA (EPA 2004a) states that these reasons include:

- "scarcity;
- unusual species;
- novel combinations of species;
- a role as a refuge;
- a role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species;
- being representative of the range of a unit (particularly, a good local and/or regional example of a unit in 'prime' habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range); or
- a restricted distribution. "

### 1.5.2 Threatened and Priority Ecological Communities

In WA, "Threatened Ecological Communities" (TECs) are defined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee (within DPaW) and are assigned to one of the categories outlined below (**Table 2**). While they are not afforded direct statutory protection at a State level (unlike Threatened flora and fauna under the *Wildlife Conservation Act*) their significance is acknowledged through other State environmental approval processes (i.e. Environmental Impact Assessment process pursuant to Part IV of the *Environmental Protection Act 1986*).

**Table 2: Categories of DPaW Threatened Ecological Communities DEC 2010)**

| Category | Description |
|---|---|
| **PD** | **Presumed Totally Destroyed**<br>An ecological community that has been adequately searched for but for which no representative occurrences have been located. |
| **CE** | **Critically Endangered**<br>An ecological community that has been adequately surveyed and is found to be facing an extremely high |

| | |
|---|---|
| | risk of total destruction in the immediate future |
| **EN** | **Endangered**<br>An ecological community that has been adequately surveyed and is not critically endangered but is facing a very high risk of total destruction in the near future. |
| **VU** | **Vulnerable**<br>An ecological community that has been adequately surveyed and is not critically endangered or endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. |

Selected TECs are also afforded statutory protection at a Federal level as matters of NES pursuant to the EPBC Act. Not all State listed TECs are given Federal protection, only a select few. The EPBC Act provides for the strong protection of TECs, which are listed under section 181 of the EPBC Act, and are defined as "Critically Endangered", "Endangered" or "Vulnerable" under Section 182 of the EPBC Act.

The EPBC Act provides protection for TECs under federal legislation, which is defined as communities that are:

**Critically Endangered** (if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future);
**Endangered** (if, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future); or
**Vulnerable** (if, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium term future).

A community that is not listed as a TEC may be listed as a Priority Ecological Community (PEC). DPaW (DEC 2010) describes a PEC as an ecological community that is under consideration for listing as a TEC, but does not yet meet the criteria or has not been adequately defined. It is placed in either Category 1, 2, or 3 of the PEC list. Ecological communities that are adequately known, and are rare but not threatened, or meet criteria for Near Threatened, or those who have recently been removed from the threatened list, are placed in Priority 4. These ecological communities require monitoring. Conservation dependent ecological communities are placed in Priority 5. Categories and definitions of PEC are listed in **Table 3**.

**Table 3: Categories of Priority Ecological Communities (DEC 2010)**

| Priority Rating | Description |
|---|---|
| **Priority 1** | Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range. |
| **Priority 2** | Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes. |
| **Priority 3** | 1. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:<br>2. Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;<br>3. Communities made up of large, and/or widespread occurrences, which may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.<br>Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes |

| | |
|---|---|
| | exist that could affect them. |
| **Priority 4** | Ecological communities that are adequately known, rare but not threatened or meet criteria for near threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. |
| **Priority 5** | Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years. |

### 1.5.3 Environmentally Sensitive Areas

Under section 51B of the *Environmental Protection Act* the Minister can, by notice, declare an area of the State specified in the notice or an area of the State to be an Environmentally Sensitive Area. ESAs are protected under the *Environmental Protection (Clearing of Native Vegetation) Regulation 2004* and are selected for their environmental values at state or national levels. Some of the reasons for assigning this status include:

- Protection of rare or threatened species of native plants
- Protection of wetlands and water courses
- Protection of sites that have other high conservation, scientific or aesthetic values
- Protection of Aboriginal or European cultural sites

# 2 Existing Environment

## 2.1 Biogeography

The survey area is in the Avon Wheatbelt IBRA bioregion. The Avon Wheatbelt bioregion is a dissected plateau of Tertiary laterite in the Yilgarn Craton. The western subregion is characterised as 'gently undulating landscape of low relief with Proteaceous scrub-heaths, rich in endemic species, on lateritic uplands and derived sandplains. mixed eucalypt, *Allocasuarina huegeliana* and Jam-York Gum woodlands on Quaternary alluvials and eluvials. Within this, is the erosional surface of gently undulating rises to low hills with abrupt breakaways and continuous stream channels that flow in most years. Colluvial processes are active. Soil is formed in colluvium or in-situ weathered rock.' The region includes woodland of Wandoo, York Gum and Salmon Gum with Jam and Casuarina (Beecham, 2001).

Less than 1% of this bioregion is within conservation estate. Otherwise, dry land agriculture and grazing were main enterprise types. The region has been extensively cleared for agriculture and grazed by stock. Consequently, it has numerous environmental issues, Threatened Ecological Communities and species of conservation value. As a transition zone between the south-western forests and the Transitional Rainfall Zone, this region is rich in endemic flora species. Approximately 25% of WA's Declared Rare Flora occurs in the eucalypt woodland of this region (McKenzie *et al.* 2002).

## 2.2 Soils and Landforms

The survey area lies within the Avon province of the western region of the soil landscapes of WA(Tille 2006). The Avon province is described as Laterised plateau (dissected at fringes and with saline drainage lines inland) on deeply weathered mantle and alluvium over granitic rocks of the Yilgarn Craton, and Albany-Fraser Orogen (Tille 2006). This soils and landforms of this province are described by Tille (2006) as:

*Dominated by an undulating plateau, rising from the Southern Ocean coastline in the south-west to 450 m above sea level in the north-east. The north-eastern half is an area of low relief. Here, broad lateritic uplands (typically with extensive sandplain) give way to long gentle slopes formed on the truncated weathering profile. Basement rock outcrops on these slopes in some places. The valley floors are broad with very low gradients. They only carry flows in very wet years and contain chains of salt lakes. A significant change in the landscape occurs west of a line that runs approximately between Moora, Quairading and Katanning known as the Meckering Line. It marks a change from the subdued landscape inland (with palaeochannels on the valley floors) to a more dissected terrain with rejuvenated drainage. West of the Meckering Line the plateau becomes increasingly dissected, initially resulting in a landscape of rounded, moderately to gently inclined rises and low hills. The hills are sometimes capped by lateritic remnants with breakaways, while rock outcrop is more common on the valley slopes than it is to the east. The valley floors become narrower and the drainage lines (although sometimes sluggish) flow in clearly incised courses in the winter months.*

*The sandplains in the north and north-east have Yellow deep sands and Yellow sandy earths, with Red sandy earths, Acid yellow sandy earths and shallow gravels are also present. To the south-east, grey deep sandy duplexes, Deep sandy gravels and duplex sandy gravels replace the deep sands and sandy earths on the lateritic uplands. The long gentle slopes on truncated weathering profile have Alkaline grey shallow sandy duplexes, Alkaline grey deep sandy duplexes, Alkaline grey shallow loamy duplexes and Yellow/brown shallow loamy duplexes. The clayey subsoils are usually sodic and often calcareous, while loamy topsoils are often hardsetting. Where the granitic basement is exposed, Red loamy earths and Yellow/brown shallow sandy duplexes are found. Calcareous loamy earths, Alkaline red shallow loamy duplex, Alkaline grey shallow loamy duplexes, Alkaline grey shallow sandy duplexes, Salt lake soils and Saline wet soils are all found on the valley floors.*

*West of the Meckering Line, Grey deep sandy duplexes are common on sloping terrain. Also present are grey shallow sandy duplexes. Granitic slopes have Brown loamy earths, red deep loamy duplexes and red shallow*

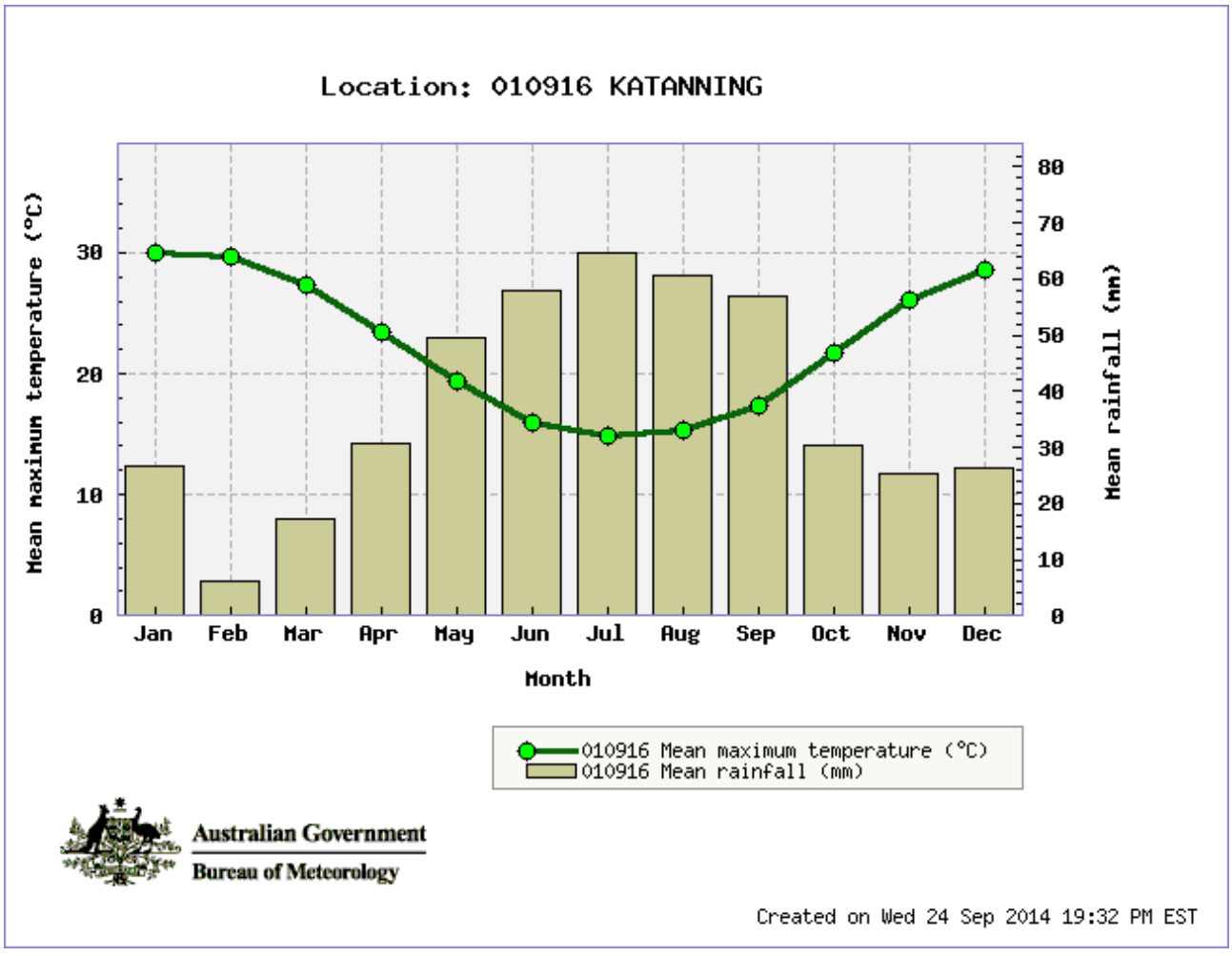
*loamy duplexes. On lateritic caps there are duplex sandy gravels, with Yellow sandy earths occurring on sandplain remnants. Saline wet soils are found on the valley floors along with Brown sandy earths, Yellow/brown deep sandy duplexes and grey shallow sandy duplexes.*

## 2.3 Regional Vegetation

The survey area lies within the Southwest Botanical Province in the Avon Botanical District (Beard 1990). Vegetation in this botanical district is generally comprised of scrub-heath on sandplains, thickets of Acacias and Casuarinas on laterite, York Gum (*Eucalyptus loxophleba*), Salmon Gum (*Eucalyptus salmonophloia*) and Wandoo (*Eucalyptus wandoo*) woodlands on loam soil and samphire communities in areas with elevated salinity. Kwongan heath occupies the elevated areas of laterite and sand. The survey areas are mapped within Beard Vegetation Association Broomehill 1085 - Medium woodland; Wandoo & Blue Mallet (*Eucalyptus gardneri*) (Beard 1975). There is approximately 15.34% of the pre-European extent remaining.

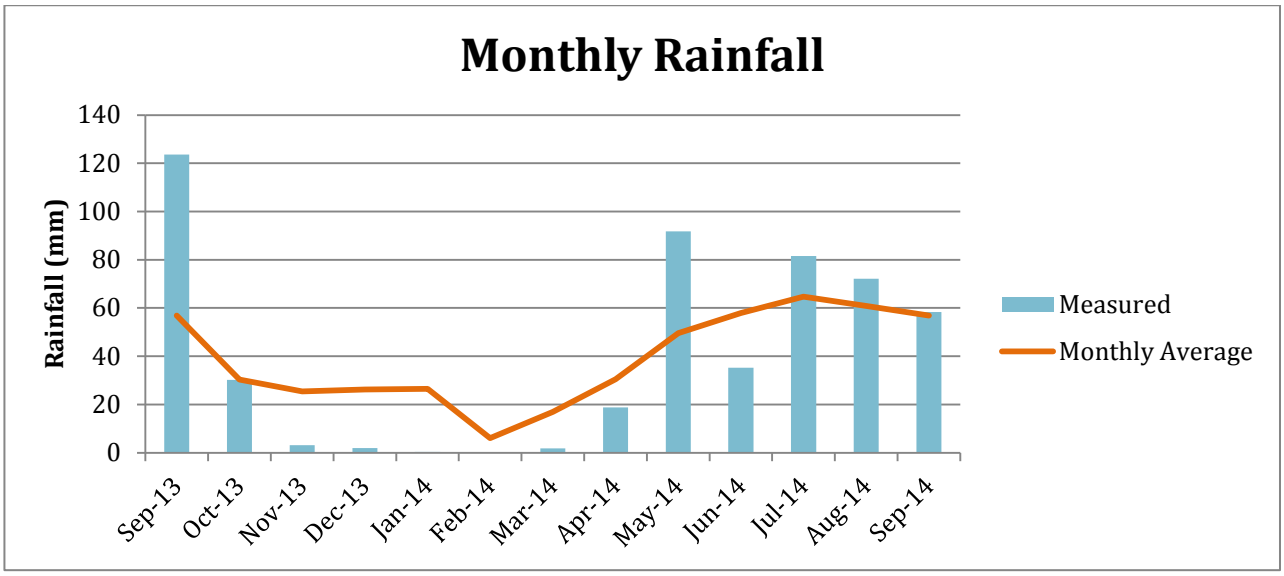
## 2.4 Climate

The climate of the Avon bioregion is semi-arid (dry) warm Mediterranean. The survey area has a dry climate with cool winters and warm summers. Rainfall predominantly occurs between May and September, with low rainfall totals in summer (**Graph 1**). Historical data indicates that the area receives an average of 445.1 mm of rain on an annual basis, with temperatures ranging between -2 and 43 degrees Celsius (Bureau of Meteorology 2014).




**Graph 1: Average monthly rainfall and maximum temperature at Katanning (# 10916) (Bureau of Meteorology 2014)**

Most rain falls in the cooler months of May to September. During winter 2014, this station received average or above-average rainfall except in June, compared to the long-term average.




**Graph 2: Monthly rainfall at Katanning (# 10916; 2013-14) (Bureau of Meteorology 2014)**

# 3 Methods

Terratree was commissioned to undertake a single visit Level 1 flora survey, targeted Threatened (Declared Rare) and Priority flora survey and Level 1 fauna survey (habitat assessment) of the five structure plan areas in accordance with EPA Guidance Statements 51 and 56.

Before field work commenced, searches were requested from DPaW's Threatened and Priority Flora, Threatened Fauna and Ecological Community databases and the Western Australian Herbarium (WAH) Declared Rare and Priority Flora database. These databases were searched using a 20 km buffer around central coordinates of the project areas (reference numbers 01-0914FL, 2014/000336 #4891, 06-0814EC respectively). The Protected Matters Search Tool (Department of the Environment 2014) database was also searched with a 20km buffer around the same central coordinates.

The field surveys were conducted on September 10-12, 2014 by Senior Botanist, Julie Fielder, and Senior Ecologist, Cara McGary. Both staff are qualified and experienced in conducting flora, vegetation and fauna surveys. The field surveys consisted of three components: 1) Relevé-based Level 1 Flora and Vegetation survey for all five structure plan areas; 2) Targeted Threatened and Priority Flora searches of all areas to record locations and numbers of all Threatened and Priority Flora species occurring within areas of native vegetation; and 3) A habitat assessment and Level 1 fauna survey for all five structure plan areas.

## 3.1 Level 1 Flora and Vegetation Survey

Upon reconnaissance of the five structure plan areas, only one survey area, O'Callaghan Park, was found to have native vegetation. The other four survey areas were excluded from full assessment because they were paddocks, pastures or areas that had been revegetated with a combination of non-native plants and species not of local provenance.

A Level 1 survey was carried out in the O'Callaghan Park, totalling 61.2 ha. A total of five relevés were surveyed in the O'Callaghan survey area to represent the vegetation and landforms present. The following landscape description information was recorded in each relevé location:

- coordinates and photographs
- slope and aspect
- landform
- rock type, fragment size and percent cover
- soil type and colour
- vegetation description (NVIS level 5)
- vegetation health and disturbance factors

All vascular plant species observed within each relevé were recorded. All species were collected on initial observation for specimen verification, following which observations were recorded as references to the original specimen for each species. Species were recollected if botanists had any doubt they were identical to previous collections or if better flowering or fruiting material could be obtained. Additional opportunistic collections were made throughout the survey area wherever different species were observed, particularly if they were not recorded inside of relevés.

Vegetation condition was assessed according to the following scale adapted from Keighery (1994):

**Pristine (1)**: Pristine or nearly so, no obvious signs of disturbance.

**Excellent (2)**: Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.

**Very Good (3)**: Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeating fires, the presence of some more aggressive weeds, dieback, logging and grazing.

**Good (4)**: Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

**Degraded (5)**: 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 grazing.

**Completely Degraded (6)**: 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 compromising weed or crop species with isolated trees or shrubs.

### 3.1.1 Mapping

Vegetation community areas were determined based on relevé data and aerial photography. Vegetation communities were digitised using QGIS 2.4 software (QGIS Application Team 2014), by drawing vector polygons over a high-resolution aerial photograph layer.

### 3.1.2 Specimen identification and locations

Following the survey, plant specimens collected were identified in the WA Herbarium by Julie Fielder, Cara McGary and Chris Hancock. Specimens of interest will be lodged in the WA Herbarium.

## 3.2 Targeted Threatened and Priority Flora Search

Descriptions and photographs of Threatened and Priority taxa identified in database searches were compiled from FloraBase (WA Herbarium, 2013) and other resources at the WA Herbarium to produce a 'field guide'. This field guide was used to assist with identifying species in the field for the targeted searches.

The Threatened and Priority Flora searches were conducted by botanists walking along lines spaced 50 m apart through native vegetation, primarily in the O'Callaghan Park survey area. Individual plants or groups of plants were recorded using hand-held GPS units. Where groups of plants were recorded, the location of the approximate centre of the group and number of individuals were recorded.

Specimens were collected to confirm identification whenever a potential Priority species was encountered for the first time, or when high quality flowering or fruiting material was available. Photographs were taken of plants when specimens were collected and descriptive information regarding the soil type and landscape was recorded. The locations of Priority flora were mapped and the coordinates and counts are provided.

## 3.3 Level 1 Fauna Survey

Fauna database search results from DPaW and the Atlas of Living Australia (Atlas of Living Australia 2014) databases were used to develop a guide to fauna that may occur in the survey areas. During the field survey, the survey areas were assessed to determine their suitability to support Threatened (Rare or Likely to Become Extinct), Priority, Migratory, Short-Range Endemic and other Specially Protected fauna. During targeted searches, all vertebrate fauna and sign (tracks, scat, burrows and mounds, etc.) encountered was recorded. Bird surveys were conducted 15 minutes prior to and 30 minutes after sunrise on two mornings at O'Callaghan Park.

## 3.4 Survey Limitations

The potential limitations of the survey, as outline in the EPA Guidance Statement No. 51 (2004a) and No. 56 (2004b) are outlined in **Table 4**.

**Table 4: Potential limitations and discussion of their relevance to the survey**

| Potential Limitation | Discussion |
|---|---|
| Competency/experience of the consultants doing the survey | Both consultants have previous experience working in the Wheatbelt and extensive experience conducting flora and fauna surveys throughout WA |
| Site access | Site access to O'Callaghan Park, Piesse Park, DIA 4 and the Industrial Expansion Area was adequate and uninhibited. Access to the WAMMCO site was prohibited because WAMMCO denied access to the entire area due to zoonotic disease risk to survey personnel. However, this was not an issue for the overall outcomes of the survey, because this survey area has no native vegetation remaining. Vegetated areas have been planted with native species not of local provenance and non-native species within the last 20 years. |
| Sources of information and availability of contextual information (i.e. pre-existing background vs. new material) and biogeographic information for the region | Existing information was adequate. Several fauna, flora and vegetation surveys had been done in and around Katanning. |
| Scope (e.g. what taxa forms, etc., were sampled) | There were no inappropriate limitations on the scope. The survey assessed fauna habitats, vegetation types, targeted priority vascular plant species. |
| Proportion of flora collected and identified (based on sampling, timing and intensity) | The survey occurred in early September, with rainfall at Katanning 26% above average in the month preceding the field survey. Ephemeral species were present, and the majority of plants were in flower. |
| Proportion of fauna identified, recorded and/or collected | The survey intensity was high. The area of native vegetation surveyed was relatively small and traversed at a maximum interval of 50m. All vertebrate fauna (including sign) were recorded, all flora observed in relevés were recorded and collected. Opportunistic collections were made for any flora not represented in the relevés that could not be readily identified in the field. |
| Completeness and further work which might be needed (e.g. was the relevant area fully surveyed) | The relevant portions of the survey areas were completely assessed to scope. Additional surveys may be necessary depending on proposed activities. Targeted fauna surveys may be necessary in O'Callaghan Park if impacts to native vegetation containing *Allocasuarina* are proposed. |
| Taxonomic certainty | There were no significant limitations on taxonomic certainty. Species profiles, descriptions and photographs were compiled from specimens and information available on Florabase, SPRAT profiles, Atlas of Living Australia and resources in the WA Herbarium. These were used for field identification of any species with potential to be a threatened or priority species. Specimens were collected for all potential threatened and priority flora species and all unidentified plants from relevés for identification by a taxonomic expert in the laboratory. |
| Mapping reliability | The vegetation mapping has been based on a Level 1 survey, using relevé data. Current and detailed aerial photography was available for the purposes of mapping. |
| Timing, weather, season, cycle | Timing of the survey, in September, was preceded by above average rainfall, except in June, and was suitable for detecting both ephemeral and perennial species and many plant species were in flower. |
| Disturbances (fire, flood, accidental human intervention etc.) | Four of the survey areas WAMMCO, Piesse Park, DIA 4, and the Industrial Area had been completely disturbed by clearing, agriculture, grazing and weeds. Some areas of the O'Callaghan survey area had |

| Potential Limitation | Discussion |
|---|---|
| | been subject to some kinds of soil disturbing activities in the past; the soil appeared to be ripped in some areas. Weeds, rabbits and cats were also observed in the O'Callaghan Park survey area. |
| Intensity (in retrospect, was the intensity adequate) | The intensity of the Level 1, Targeted Threatened and Priority Flora Search, were adequate for the purpose of the survey. |
| Resources | The field survey, plant identification and reporting were all adequately resourced. |
| Experience levels (e.g. degree of expertise in plant and animal identification to taxon level). | The field survey was carried out by suitably qualified and experienced personnel. Plant identification was done primarily by Chris Hancock and Julie Fielder, who have over ten years of experience in taxonomic identification and have extensive experience identifying flora from the Wheatbelt region. Animal identification in the field was done by Cara McGary who has over four years of experience identifying fauna and fauna habitats in the Southwest and Wheatbelt. |

# 4 Results

## 4.1 Desktop Review

The combined review of databases, survey reports and published literature yielded a total of 73 taxa of conservation significance (41 plants and 32 animals) previously recorded from within 20 km of the survey area. Five species of Threatened and Priority Flora were returned from the DPaW database search (**Table 5**). A search of the WA Herbarium database returned an additional 18 species (**Table 5**). The Protected Matters Search Tool (Department of the Environment 2014) database search returned ten endangered flora species (**Table 5**), and 12 invasive plant species (**Appendix 2**).

**Table 5: Desktop search results – Conservation significant flora taxa recorded in desktop surveys**

| Taxon name and conservation status | Databases [1)] | | | |
|---|---|---|---|---|
| | TPFL | WA Herb | TP List | PMR |
| **Threatened (Declared Rare) Flora** | | | | |
| *Acacia brachypoda* | • | | | |
| *Adenanthos pungens* | | | | • |
| *Banksia oligantha* | | | | • |
| *Caladenia luteola* | • | • | • | |
| *Centrolepis caespitosa* | | | | • |
| *Conostylis drummondii* | | | | • |
| *Darwinia collina* | | | | • |
| *Darwinia oxylepis* | | | | • |
| *Eleocharis keigheryi* | | | • | |
| *Hemigenia ramosissima* | | | | • |
| *Jacksonia velveta* | | | • | |
| *Roycea pycnophylloides* | | | | • |
| *Tribonanthes purpurea* | | • | | • |
| *Verticordia fimbrilepis* subsp. *fimbrilepis* | | • | • | • |
| **Priority 1** | | | | |
| *Banksia lepidorhiza* | | • | • | |
| *Coleanthera coelophylla* | | | • | |
| *Tetratheca applanata* | | | • | |
| **Priority 2** | | | | |
| *Banksia acanthopoda* | • | • | • | |
| *Banksia rufistylis* | • | • | • | |
| *Banksia subpinnatifida* var. *imberbis* | | • | • | |
| *Stylidium exappendiculatum* | | • | | |
| *Synaphea* sp. Woodanilling (G.J. Keighery & N. Gibson 4614) | | | • | |
| *Thysanotus acerosifolius* | | • | | |
| *Thysanotus brevifolius* | | • | | |
| **Priority 3** | | | | |
| *Acacia errabunda* | | | • | |
| *Brachyloma mogin* | | | • | |
| *Eutaxia nanophylla* | | | • | |
| *Frankenia glomerata* | | • | | |
| *Grevillea newbeyi* | | • | | |

| Taxon name and conservation status | Databases [1)] | | | |
|---|---|---|---|---|
| | TPFL | WA Herb | TP List | PMR |
| *Hakea oldfieldii* | | • | • | |
| *Melaleuca pritzelii* | | • | • | |
| *Microseris scapigera* | | | • | |
| *Sphaerolobium validum* | | | • | |
| *Synaphea drummondii* | | • | | |
| *Verticordia brevifolia subsp. brevifolia* | | • | • | |
| **Priority 4** | | | | |
| *Acacia grisea* | | • | • | |
| *Banksia acuminata* | | • | • | |
| *Banksia porrecta* | | • | • | |
| *Caladenia integra* | | • | | |
| *Eucalyptus loxophleba* x *wandoo* | | | • | |
| *Xanthorrhoea brevistyla* | | • | | |

**TPFL:** DPaW Threatened (Declared Rare) and Priority Flora database
**TPList:** Threatened and Priority Flora List
**WAHerb:** Western Australian Herbarium Database
**PMR:** EPBC Act Protected Matters Report

There were no occurrences of Threatened or Priority Ecological Communities within 20km of the project area (06-0814EC). Six state and reserves and two places on the Register of the National Estate (RNE) are located within 20km of the survey areas (**Appendix 2**). However, the survey areas are not located within or near any of these.

DPaW's Threatened Fauna database returned nine Threatened fauna species, including one that is presumed extinct; seven migratory birds and two other specially protected fauna species (**Table 6**). The DPaW database search also returned one Priority 2 species ad six Priority 4 species (**Table 6**). The Protected Matters Search Tool (Department of the Environment 2014) database search returned five Endangered and Vulnerable fauna species (**Table 5**), and 10 invasive fauna species (**Appendix 2**).

**Table 6: Desktop search results – Conservation significant fauna taxa recorded in desktop surveys**

| Taxon name and conservation status | | Conservation Status | | Databases [1)] | |
|---|---|---|---|---|---|
| | | | | DPaW | PMR |
| **Threatened** | | **State** | **Federal** | **Number of Records** | |
| *Bettongia penicillata* subsp. *ogilbyi* | Woylie, Brush-tailed Bettong | CR | EN | 1 | |
| *Calyptorhynchus banksii* subsp. *naso* | Forest Red-tailed Black-Cockatoo | VU | VU | 2 | |
| *Calyptorhynchus baudinii* | Baudin's Cockatoo | EN | VU | 2 | |
| *Calyptorhynchus latirostris* | Carnaby's Cockatoo | EN | EN | 29 | • |
| *Dasyurus geoffroii* | Chuditch, Western Quoll | VU | VU | 4 | • |
| *Leipoa ocellata* | Malleefowl | VU | VU | | • |
| *Macrotis lagotis* | Bilby, Dalgyte | VU | VU | 4 | |
| *Myrmecobius fasciatus* | Numbat, Walpurti | VU | VU | 2 | |
| *Phascogale calura* | Red-tailed Phascogale, Kenngoor | EN | EN | 4 | • |
| *Rostratula australis* | Australian Painted Snipe | EN | EN, M | | • |
| **Presumed Extinct** | | | | | |
| *Onychogalea lunata* | Crescent Nailtail Wallaby, Wurrung | EX | EX | 2 | |

| Taxon name and conservation status | | Conservation Status | | Databases [1)] | |
|---|---|---|---|---|---|
| | | | | DPaW | PMR |
| **Migratory Birds** | | | | | |
| *Actitis hypoleucos* | Common Sandpiper | S3 | | 12 | |
| *Apus pacificus* | Fork-tailed Swift | | M | | • |
| *Ardea alba* | Great Egret, White Egret | | M | | • |
| *Ardea ibis* | Cattle Egret | | M | | • |
| *Calidris acuminata* | Sharp-tailed Sandpiper | S3 | | 1 | |
| *Calidris ruficollis* | Red-necked Stint | S3 | | 2 | |
| *Calidris subminuta* | Long-toed Stint | S3 | | 3 | |
| *Haliaeetus leucogaster* | White-bellied Sea Eagle | | M | | • |
| *Merops ornatus* | Rainbow Bee-eater | S3 | | 38 | • |
| *Plegadis falcinellus* | Glossy Ibis | S3 | | 1 | |
| *Thinornis* (*Charadrius*) *rubricollis* | Hooded Plover | P4 | M | 4 | • |
| *Tringa nebularia* | Common Greenshank | S3 | | 8 | |
| **Schedule 4 Specially Protected Fauna** | | | | | |
| *Falco peregrinus* | (Australian) Peregrine Falcon | S4 | | 14 | |
| *Morelia spilota subsp. imbricata* | Carpet Python | S4 | | 3 | |
| **Priority 2** | | | | | |
| *Ninox connivens subsp. connivens* | Barking Owl (southwest pop) | P2 | | 1 | |
| **Priority 4** | | | | | |
| *Ardeotis australis* | Australian Bustard | P4 | | 2 | |
| *Burhinus grallarius* | Bush Stone-curlew | P4 | | 1 | |
| *Falcunculus frontatus* subsp. *leucogaster* | Western Shrike-tit, Crested Shrike-tit | P4 | | 1 | |
| *Platycercus icterotis* subsp. *xanthogenys* | Western Rosella (inland) | P4 | | 1 | |
| *Pomatostomus superciliosus* subsp. *ashbyi* | White-browed Babbler (western wheatbelt) | P4 | | 1 | |

**DPaW:** DPaW Threatened Fauna Database
**PMR:** EPBC Act Protected Matters Report

## 4.2 Vegetation Survey

Vegetation in DIA4, Industrial Land, Piesse Park and WAMMCO has been cleared and much of it is in cultivation. These four areas are 'Completely Degraded' (Keighery 1994). Although there are a few residual native trees and shrubs in these survey areas, no native vegetation structure remains. The majority of these trees and shrubs have been planted through various planting programmes or are within narrow, degraded roadside reserves.

### 4.2.1 DIA 4

The majority of the DIA4 survey area is paddocks with few isolated trees (**Plates 1-3**). There are a few existing structures, a small orchard and a dam. There is a denser area of residual native trees and planted non-native trees surrounding a house in the south west portion of the survey area (**Figure 2**).

**Plate 1: Paddock with residual trees in the DIA4 Survey Area at photo point DIA 1**

**Plate 2: Paddock with residual trees in the DIA4 Survey Area at photo point DIA 2**

**Plate 3: Paddock with residual trees in the DIA4 Survey Area at photo point DIA 2**

### 4.2.2 Industrial Area

The Industrial Area is primarily cleared paddocks, but also contains a machinery facility, a livestock auction facility, and a few linear areas of trees (**Plates 4-12; Figure 3**). The tree rows were determined to be planted within approximately the last 30 years. They are mostly species native to Australia, but are not of local provenance. The understory is grazed and contains no native vegetation (**Plates 7-9**). The tree rows have limited habitat value, but several bird species were found among them (**Table 9**).

**Plate 4: Paddock with residual trees in the Industrial Area survey area at photo point 1**

**Plate 5: Dam slope with residual trees in the Industrial Area survey area at photo point 1**

**Plate 6: Paddock with residual trees in the Industrial Area survey area at photo point 2**

**Plate 7: Planted trees with grazed non-native groundcover in the Industrial Area survey area at photo point 3**

**Plate 8: Planted trees with grazed non-native groundcover in the Industrial Area survey area at photo point 3**

**Plate 9: Planted trees with grazed non-native groundcover in the Industrial Area survey area at photo point 4**

**Plate 10: Sheep grazing paddock in the Industrial Area survey area at photo point 4**

**Plate 11: Paddock with residual trees in the Industrial Area survey area at photo point 5**

**Plate 12: Machinery yard in the Industrial Area survey area at photo point 5**

### 4.2.3 Piesse Park

Piesse Park has been subject to recent earthworks for creation of a pond and other wetland features (**Plates 13 and 14**). The entire survey area is either bare soil or 'parkland cleared' with isolated trees over mowed grass (**Figure 4**).

**Plate 13: Recent earthworks at Piesse Park at photo point 1**

**Plate 14: Recent earthworks and wetland creation at Piesse Park at photo point 1**

### 4.2.4 WAMMCO

The WAMMCO survey area is primarily paddocks with planted and few residual trees (**Plates 15-17**, **Figure 5**). The drainage line in the southern half of the survey area was walked to determine if there was any native vegetation or trees that could be important as habitat trees. A few of the older remnant eucalypts, along Baker Road and to the southeast along the drainage line, contain hollows that may be used by nesting birds and other wildlife. However, most of the trees in this area appear to have been planted less than 30 years ago and most of these are not of local provenance (**Plates 15 – 17**). The vegetated areas on WAMMCO's property, north of Baker Road could not be accessed. Access was denied by the WAMMCO site manager because of Q fever risk. However, we were able to look at aerial photographs of the property dating back to the early 1990s when the entire property was cleared and supported not trees at all. The site manager informed us that all trees currently on the site have been planted since the 1990s. Our observations from the road indicate that these plantings are various non-native and Australian species not of local provenance. There are some mature native trees in the roadside reserve of the Great Southern Highway along the south-western boundary of the survey area. The vegetation there is residual and highly disturbed by weeds and edge effects, but may provide limited habitat value for birds and other fauna.

**Plate 15: Paddock with planted trees at the WAMMCO survey area - photo point 1**

**Plate 16: Paddock with planted trees at the WAMMCO survey area - photo point 1**

**Plate 17: Residual eucalypt at the WAMMCO survey area along the drainage to the south of Baker Road**

### 4.2.5 O'Callaghan Park

O'Callaghan Park survey area contains primarily native vegetation with a cleared oval and tracks, and a heavily disturbed portion in the north of the survey area. Native vegetation is primarily a low open forest of *Allocasuarina huegeliana* with patches of eucalypts, such as *Eucalyptus wandoo* subsp. *wandoo* mixed in, with a variable shrub layer. Much of O'Callaghan Park's native vegetation has been invaded by weeds and subject to edge effects. In some areas, the soil appears to have been ripped. Feral herbivores, such as rabbits, were also evident. Despite these disturbance factors, the vegetation structure is generally intact , with condition ranging between 'Good' and 'Excellent' (Keighery 1994), and high species richness. Vegetation types recorded during the surveys are provided below in **Table 7** and mapped in **Figure 6b**. Relevé data and photos are provided in **Appendix 1**.

**Table 7: Vegetation Communities recorded in the O'Callaghan survey area**

| Vegetation Code | Vegetation Community Descriptions | Relevé Number |
|---|---|---|
| EwAhLOF/AsDlCaaLSS | *Eucalyptus wandoo* subsp. *wandoo*, *Allocasuarina huegliana* low open forest over *Acacia lasiocarpa* var. *sedifolia*, *Dampiera lindleyi*, *Cryptandra arbutiliflora* subsp. *arbutiliflora* low sparse shurbland | 1 |
| AhLOF/CtS/UaRrOH | *Allocasuarina huegliana* low open forest over *Calytrix tetragona* shrubland over *Ursinia anthemoides, Romulea rosea* open herbland | 2, 3 |
| AhLOF/GcBcLS/MH | *Allocasuarina huegliana* low open forest over *Gastrolobium calycinum, Baeckea crispiflora* low shrubland over mixed herbland | 4 |
| AhELOF/MCH | *Allocasuarina huegliana, Eucalyptus* sp. low open forest over mixed species closed herbland | 5 |
| Cleared | Cleared land with or without non native vegetation and isolated native trees | n/a |

## 4.3 Flora

No Threatened (Declared Rare) Flora was recorded during the survey. Two species of Priority flora were recorded in the O'Callaghan survey area (**Figure 6a**): *Synaphea drummondii* (Priority 3) and *Verticordia brevifolia* subsp. *brevifolia* (Priority 3). The locations of these are provided in **Table 8** below. In addition to the Priority taxa recorded in **Table 8**, two records for *Banksia acanthopoda* (Priority 2) were returned from database searches. Both locations are just off of Katanning-Nyabing Road, very close to the Industrial Area survey area. These locations were checked; however, this species was not found within the survey area.

**Table 8: Locations of Priority Flora in the O'Callaghan survey area**

| Species | Number of plants | Easting (GDA94, Zone 50) | Northing (GDA94, Zone 50) |
|---|---|---|---|
| *Synaphea drummondii* (Priority 3) | 1 | 550698.9 | 6270487 |
| *Synaphea drummondii* (Priority 3) | 1 | 550676 | 6270637 |
| *Synaphea drummondii* (Priority 3) | 1 | 550717 | 6270644 |
| *Synaphea drummondii* (Priority 3) | 1 | 550768.5 | 6270645 |
| *Synaphea drummondii* (Priority 3) | 1 | 550812.4 | 6270640 |
| *Synaphea drummondii* (Priority 3) | 1 | 550836.3 | 6270641 |
| *Synaphea drummondii* (Priority 3) | 1 | 550686.9 | 6270712 |
| *Synaphea drummondii* (Priority 3) | 1 | 550526 | 6270686 |
| *Synaphea drummondii* (Priority 3) | 1 | 550428.8 | 6270707 |
| *Synaphea drummondii* (Priority 3) | 1 | 550421.6 | 6270707 |
| *Synaphea drummondii* (Priority 3) | 1 | 550696.7 | 6270733 |
| *Synaphea drummondii* (Priority 3) | 1 | 550766.6 | 6270736 |
| *Synaphea drummondii* (Priority 3) | 1 | 550767.8 | 6270745 |
| *Synaphea drummondii* (Priority 3) | 1 | 550784.8 | 6270733 |
| *Synaphea drummondii* (Priority 3) | 1 | 550792.7 | 6270746 |
| *Synaphea drummondii* (Priority 3) | 1 | 550953.1 | 6270757 |

| Species | Number of plants | Easting (GDA94, Zone 50) | Northing (GDA94, Zone 50) |
|---|---|---|---|
| *Synaphea drummondii* (Priority 3) | 1 | 550694.3 | 6270656 |
| *Synaphea drummondii* (Priority 3) | 1 | 550651.5 | 6270736 |
| *Synaphea drummondii* (Priority 3) | 1 | 550340.4 | 6270777 |
| *Synaphea drummondii* (Priority 3) | 10 | 550742 | 6270639 |
| *Synaphea drummondii* (Priority 3) | 2 | 550731.7 | 6270641 |
| *Synaphea drummondii* (Priority 3) | 2 | 550791.8 | 6270637 |
| *Synaphea drummondii* (Priority 3) | 2 | 550856.5 | 6270644 |
| *Synaphea drummondii* (Priority 3) | 3 | 550827.7 | 6270591 |
| *Synaphea drummondii* (Priority 3) | 3 | 550716.5 | 6270666 |
| *Synaphea drummondii* (Priority 3) | 4 | 550743.8 | 6270668 |
| *Synaphea drummondii* (Priority 3) | 5 | 550414.2 | 6270696 |
| *Synaphea drummondii* (Priority 3) | 5 | 550763.6 | 6270672 |
| *Synaphea drummondii* (Priority 3) | 6 | 550666.2 | 6270644 |
| *Synaphea drummondii* (Priority 3) | 6 | 550814.4 | 6270661 |
| *Synaphea drummondii* (Priority 3) | 1 | 550688.4 | 6270496 |
| *Synaphea drummondii* (Priority 3) | 1 | 550904.4 | 6270592 |
| *Synaphea drummondii* (Priority 3) | 1 | 550432.5 | 6270635 |
| *Synaphea drummondii* (Priority 3) | 1 | 550891.8 | 6270633 |
| *Synaphea drummondii* (Priority 3) | 1 | 550797.2 | 6270740 |
| *Synaphea drummondii* (Priority 3) | 1 | 550771.2 | 6270506 |
| *Synaphea drummondii* (Priority 3) | 1 | 550719.6 | 6270621 |
| *Synaphea drummondii* (Priority 3) | 1 | 550699.5 | 6270626 |
| *Synaphea drummondii* (Priority 3) | 2 | 550828.9 | 6270558 |
| *Synaphea drummondii* (Priority 3) | 5 | 550707.7 | 6270618 |
| *Synaphea drummondii* (Priority 3) | 1 | 550338.8 | 6270777 |
| *Synaphea drummondii* (Priority 3) | 3 | 550910.6 | 6270600 |
| *Verticordia brevifolia* subsp. *brevifolia* (Priority 3) | 1 | 550896 | 6270633 |

## 4.4 Fauna

A total of 338 vertebrate fauna are known to occur with a 20 km radius of Katanning (DPaW 2014). The vertebrate species listed in **Table 9** were recorded during the surveys by direct observation, call or sign (tracks, scat or remains).

**Table 9: Vertebrate fauna reported in the Katanning survey areas**

| Species | Common Name | Location Recorded |
|---|---|---|
| *Anas superciliosa* | Pacific Black Duck | O'Callaghan Park |
| *Anthochaera carunculata* | Red Wattlebird | Industrial Area, Piesse Park |
| *Barnardius zonarius* | Australian Ringneck | Industrial Area, O'Callaghan Park |
| *Cacatua sanguinea* | Little Corella | Piesse Park |
| *Colluricincla harmonica* | Grey Shrike-thrush | O'Callaghan Park |
| *Coracina novaehollandiae* | Black-faced Cuckoo-shrike | Piesse Park |
| *Corvus orru* | Torresian Crow | Industrial Area, O'Callaghan Park |
| *Cracticus tibicen* | Australian Magpie | Industrial Area, O'Callaghan Park, Piesse Park |
| *Dacelo novaeguineae* | Laughing Kookaburra | Industrial Area |
| *Egretta novaehollandiae* | White-faced Heron | Industrial Area |
| *Elseyornis melanops* | Black-fronted Dotterel | Piesse Park |
| *Eolophus roseicapilla* | Galah | Industrial Area, Piesse Park |
| *Eopsaltria griseogularis* | Western Yellow Robin | O'Callaghan Park |

| | | |
|---|---|---|
| *Felis catus* | Domestic Cat | O'Callaghan Park |
| *Gallus gallus domesticus* | Domestic Chicken | O'Callaghan Park |
| *Gerygone fusca* | Western Gerygone | O'Callaghan Park |
| *Grallina cyanoleuca* | Magpie-lark | Industrial Area |
| *Neobatrachus pelobatoides* | Humming frog | O'Callaghan Park |
| *Hirundo neoxena* | Welcome Swallow | Industrial Area |
| *Lichmera indistincta* | Brown Honeyeater | O'Callaghan Park, Piesse Park |
| *Litoria moorei* | Motorbike Frog | WAMMCO |
| *Macropus fuliginosus* | Grey Kangaroo | O'Callaghan Park |
| *Microeca fascinans* | Jacky Winter | O'Callaghan Park |
| *Ninox novaeseelandiae* | Southern Boobook | O'Callaghan Park |
| *Oreoica gutturalis* | Crested Bellbird | Piesse Park |
| *Oryctolagus cuniculus* | Rabbit | O'Callaghan Park |
| *Ovis aries* | Sheep | O'Callaghan Park |
| *Pachycephala rufiventris* | Rufus Whistler | O'Callaghan Park |
| *Pardalotus rubricatus* | Red-browed Pardalote | Industrial Area |
| *Petroica goodenovii* | Red-capped Robin | O'Callaghan Park |
| *Phaps chalcoptera* | Common Bronzewing | Industrial Area, O'Callaghan Park |
| *Platycercus icterotis* subsp. *xanthogenys* (P4) | Western Rosella | O'Callaghan Park |
| *Rhipidura albiscapa* | Grey Fantail | O'Callaghan Park, Piesse Park |
| *Rhipidura leucophrys* | Willie Wagtail | Industrial Area |
| *Smicrornis brevirostris* | Weebill | O'Callaghan Park |
| *Tadorna tadornoides* | Australian Shelduck | Piesse Park |
| *Tiliqua occipitalis* | Western Bluetongue | O'Callaghan Park |
| *Tiliqua rugosa rugosa* | South-western Bobtail | O'Callaghan Park |
| *Zosterops lateralis* | Silvereye | O'Callaghan Park |

Fauna habitats within the survey areas were assessed to determine their suitability to support the 32 fauna species of conservation significance known to occur in the region. These assessments are presented below in **Table 10**. The assessments are based on habitat associations published by in the Department of Environment's Species Profile and Threats Database (Department of Environment 2014).

**Table 10: Suitability of habitats in the survey areas to support conservation significant fauna**

| Taxon name and conservation status | Habitat suitability | Likelihood to occur |
|---|---|---|
| **Threatened** | | |
| *Bettongia penicillata* subsp. *ogilbyi* Woylie, Brush-tailed Bettong (CR, EN) | Woylie populations are generally isolated to areas where non-native predators are being actively managed. They may persist in *Gastrolobium* thickets. The WA Museum has one record of a Woylie from Katanning dated 1929. | **Unlikely** |
| *Calyptorhynchus banksii* subsp. *naso* Forest Red-tailed Black-Cockatoo (VU, VU) | Generally inhabits Jarrah, Karri and Marri forests, although sometimes found in Wandoo woodland. There are two records from near the project area but one is from 1889 and the other date is unknown. The survey areas are outside the current distribution for this species. However, the survey areas may be visited occasionally for foraging. | **Unlikely** |
| *Calyptorhynchus baudinii* Baudin's Cockatoo (EN, VU) | Occurs mainly in eucalypt forests (especially Jarrah, Marri and Karri), less frequently in Wandoo, Blackbutt, Flooded Gum and Yate woodlands; partly cleared farmlands and urban areas (including roadside trees and house gardens). It forages at all levels of the forest, from the canopy to the | **Unlikely** |

| Taxon name and conservation status | Habitat suitability | Likelihood to occur |
|---|---|---|
| | ground, often feeding in the understorey on proteaceous trees and shrubs, especially banksias, and in orchards. The survey areas are outside the current distribution for this species. However, the survey areas may be visited occasionally for foraging. | |
| *Calyptorhynchus latirostris* Carnaby's Cockatoo (EN, EN) | Mainly occurs in uncleared or remnant native eucalypt woodlands, especially those that contain Salmon Gum and Wandoo, and in shrubland or Kwongan heathland dominated by *Hakea, Banksia* and *Grevillea* species. It is a seasonal visitor to plantations of exotic pines, and sometimes occurs in forests containing Marri, Jarrah or Karri. There are 29 records for this species between 2000 and 2005. This species may use the survey areas for feeding and roosting, but few of the trees in the survey areas are likely to be suitable for breeding habitat (i.e. they lack suitably large hollows et). This species has been observed feeding on Hakea in the survey area on three occasions between 2001 and 2004 (D. Secomb, personal communication). | **Likely** |
| *Dasyurus geoffroii* Chuditch, Western Quoll (VU, VU) | Known to inhabit most kinds of wooded habitat within its current range including eucalypt forest (especially Jarrah), dry woodland and mallee shrublands. The survey area is within the known distribution and there are 4 database records from 1989 and 1990. Potentially suitable habitat is only O'Callaghan Park and may be too small and isolated to support this species. | **Possible** |
| *Leipoa ocellata* Malleefowl (VU, VU) | Occur in semi-arid and arid zones of temperate Australia, where it occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or *Callitris* woodlands, acacia shrublands, broombush (*Melaleuca uncinata*) vegetation or coastal heathlands on sandy or loamy soils. With the exception of O'Callaghan Park, the survey areas lacked suitable habitat for this species. No Malleefowl mounds were recorded during the Targeted flora searches in O'Callaghan Park, which occurred at 40-50m intervals. Because there are no Malleefowl mounds in the O'Callaghan survey area and very limited native vegetation surrounding it, this species is not likely to occur there. | **Unlikely** |
| *Macrotis lagotis* Bilby, Dalgyte (VU, VU) | Occupies open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas. Database records are from the late 1920s and early 1930s in Woodanilling, Marracoona and Broomehill West. The habitats within the survey areas are not suitable to support this species and it has not been recorded in the vicinity for over 80 years. | **Unlikely** |
| *Myrmecobius fasciatus* Numbat, Walpurti (VU, VU) | Remaining populations of the Numbat are in eucalypt forests and woodlands dominated by *Eucalyptus marginata*, *Eucalyptus calophylla* and *Eucalyptus wandoo*. This species has been recorded once from Katanning as recently as 1993; however, eucalypt woodland habitats within the survey areas were very restricted and are unlikely to be suitable to support this species. | **Unlikely** |
| *Phascogale calura* Red-tailed Phascogale, Kenngoor (EN, EN) | Usual habitats include *Allocasuarina* woodlands with hollow-containing eucalypts (e.g. *Eucalyptus wandoo*) and *Gastrolobium* spp. There are four records of this species from Katanning and Woodanilling (1991-1996). Habitat in the O'Callghan Park survey area is suitable for this species and Red-tailed Phascogale have recently been observed immediately adjacent to this survey area (A. Salmond, Personal Communication 2014). | **Likely** |
| *Rostratula australis* Australian Painted Snipe (EN, EN, M) | Generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Potentially suitable habitat is present in Piesse Park and the southern portion of the WAMMCO survey areas, although vegetation may not be dense enough to be considered highly favourable. | **Possible** |

| Taxon name and conservation status | Habitat suitability | Likelihood to occur |
|---|---|---|
| **Presumed Extinct** | | |
| *Onychogalea lunata* Crescent Nailtail Wallaby, Wurrung (EX, EX) | This species was recorded in Katanning in 1896, but is now presumed extinct. | **Unlikely** |
| **Migratory Birds** | | |
| *Actitis hypoleucos* Common Sandpiper (S3) | This species has been recorded in estuaries and deltas of streams, on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The waterbodies at Piesse Park are the only potentially suitable habitat for this species. | **Possible** |
| *Apus pacificus* Fork-tailed Swift (M) | The Fork-tailed Swift is found mostly over inland plains but sometimes above foothills and in coastal and marine areas. They are almost exclusively aerial, flying from less than 1 m to at least 300 m above ground. Because of its wide distribution, this species may use habitats in the survey areas, but the survey areas have no features that are particularly suited for use by this species. | **Unlikely** |
| *Ardea alba* Great Egret, White Egret (M) | Habitats include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs. Suitable habitat is present in all survey areas. | **Possible** |
| *Ardea ibis* Cattle Egret (M) | Occurs in grasslands, wooded lands and terrestrial wetlands; rarely seen in arid and semi-arid regions. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora. High numbers have been observed in moist, low-lying poorly drained pastures with abundant tall grass. It has been recorded on earthen dam walls and ploughed fields and is commonly associated with the habitats of farm animals. Suitable habitat is present in all survey areas except O'Callaghan Park. | **Possible** |
| *Calidris acuminata* Sharp-tailed Sandpiper (S3) | Uses muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in salt-works and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. This may use habitats at Piesse Park and may occasionally use habitats in the survey areas following periods of high precipitation. | **Possible** |
| *Calidris ruficollis* Red-necked Stint (S3) | Mostly found in coastal habitats, but occasionally recorded in salt-works and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland (including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in salt flats) and sometimes use flooded paddocks or damp grasslands. This species may occasionally use the survey areas, but is more common in coastal areas. | **Unlikely** |
| *Calidris subminuta* Long-toed Stint (S3) | This species is found mainly along the coast with few scattered inland records from Esperance to Albany and inland to Lake Cassencarry and Dumbleyung. It occurs in a variety of terrestrial wetlands including shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds; also associated with growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire, less vegetated shores of larger lakes and ponds, reserviors and artificial lakes. This species could use habitats at Piesse Park, but is unlikely to occur at such a great distance from the coast | **Unlikely** |

| Taxon name and conservation status | Habitat suitability | Likelihood to occur |
|---|---|---|
| | or major inland lake systems. This species does not breed in Australia. | |
| *Haliaeetus leucogaster* White-bellied Sea Eagle (M) | Primarily found in coastal habitats and other large areas of open water. The survey areas did not have suitable habitat for this species. | **Unlikely** |
| *Merops ornatus* Rainbow Bee-eater (S3) | Mainly found in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation; usually in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water. There are numerous records of this species from Katanning. All survey areas could be considered suitable for this species. | **Likely** |
| *Plegadis falcinellus* Glossy Ibis (S3) | Habitats for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons. Habitats in the survey areas are unlikely to be suitable for this species. | **Unlikely** |
| *Thinornis* (*Charadrius*) *rubricollis* Hooded Plover (P4, M) | Often recorded on ocean beaches, but they are just as likely to be seen foraging at salt lakes. Suitable habitats for this species were not found within or adjacent to the survey areas. Although this species has been recorded in Katanning (1991, 1995) and Lake Ewlyamartup (2005) | **Unlikely** |
| *Tringa nebularia* Common Greenshank (S3) | Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and salt flats and artificial wetlands (sewage farms and salt-works dams, inundated rice crops and bores), but are generally not found in dry grassland. This species may use habitats at Piesse Park but is unlikely to use habitats in the other survey areas. This species has previously been recorded at Lake Ewlyamarup and Corackin Swamp. | **Possible** |
| **Schedule 4 Specially Protected Fauna** | | |
| *Falco peregrinus* (Australian) Peregrine Falcon (S4) | Found everywhere from woodlands to open grasslands and coastal cliffs – though less frequently in desert regions. It feeds almost entirely on other birds. It also eats rabbits and other moderate sized mammals, bats and reptiles. This species may occur within the habitats in the survey areas and there have been numerous records in and near Katanning since 1990. | **Possible** |
| *Morelia spilota* subsp. *imbricata* Carpet Python (S4) | This subspecies has been recorded in semi-arid coastal and inland habitats consisting of Banksia woodland, eucalypt woodlands and grasslands. Three records (1995-1998) from Katanning were returned from database searches. This species may occur in any of the survey areas, but habitats in O'Callaghan Park are most suitable to support it. | **Possible** |
| **Priority 2** | | |
| *Ninox connivens subsp. connivens* Barking Owl (southwest pop, P2) | Barking Owls are found in open woodlands and the edges of forests, often adjacent to farmland. They prefer woodlands and forests with a high density of large trees and particularly sites with hollows that are used by the owls as well as their prey. Roost sites are often located near waterways or wetlands. This species may roost in trees and forage in any of the survey areas, but habitats in O'Callaghan Park are most suitable to support it. | **Possible** |
| **Priority 4** | | |
| *Ardeotis australis* Australian Bustard (P4) | Found on dry plains, grasslands and in open woodland. This species has been recorded at Katanning (1991) and Moojebing (2002). It may occur in the lightly wooded grassland portions of the survey areas. | **Possible** |
| *Burhinus grallarius* | Occurs in a huge variety of habitats across Australia, mostly in lightly | **Possible** |

| Taxon name and conservation status | Habitat suitability | Likelihood to occur |
|---|---|---|
| Bush Stone-curlew (P4) | wooded areas with thickets, and often along creek lines, sometimes including partly cleared forests. There is one record of this species from Katanning (1991). It may use the wooded creeklines in WAMMCO. Habitats in O'Callaghan are more suitable for this species; however it is a small fragment and quite isolated. | |
| *Falcunculus frontatus* subsp. *leucogaster* Western Shrike-tit, Crested Shrike-tit (P4) | Usually found in eucalypt forests and woodlands, forested gullies and along rivers in drier areas. It is sometimes seen in parks and gardens, on farms with scattered trees, and on pine plantations. Habitats in the O'Callaghan Park and Piesse Park survey areas may be suitable for this species. | **Possible** |
| *Platycercus icterotis* subsp. *xanthogenys* Western Rosella (inland) (P4) | The inland subspecies is found in eucalypt and sheoak woodlands and scrubs, especially those containing Wandoo, Flooded Gum, Salmon Gum, tall mallee and Rock Sheoak (*Allocasuarina huegeliana*). This species was observed during the field survey in O'Callaghan Park. | **Present** |
| *Pomatostomus superciliosus* subsp. *ashbyi* White-browed Babbler (western wheatbelt) (P4) | Found in dry sclerophyll woodlands with a shrubby understorey, mulga, acacias, mallee, *Callitris*, timber, scrub along watercourses and saltbush. There is one record of this species from Ewlyamarup (1987). There is potentially suitable habitat for this species at O'Callaghan Park; however, it may not be extensive enough to support a breeding group. | **Possible** |

# 5 Discussion

## 5.1 Flora of Conservation Significance

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Commonwealth *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys.

Two Priority Flora taxa were recorded in one survey area. These include *Synaphea drummondii* and *Verticordia brevifolia* subsp. *brevifolia*, both listed as Priority 3 by DPaW. Database search results indicate that *Banksia acanthopoda* (Priority 2) has been recorded at two locations just off of Katanning-Nyabing Road, very close to the Industrial Area survey area. However, this species was not found within the survey area.

### 5.1.1 *Synaphea drummondii* (Priority 3)

*Synaphea drummondii* is a low shrub, bearing yellow flowers between July and September. It occurs on sandy soils over laterite (WAH 2014). *Synaphea drummondii* is known from 34 collections (Atlas of Living Australia 2014). It is restricted to the Avon Wheatbelt, Fitzgerald and Western Mallee IBRA subregions within the South-West Province (WAH 2014).

This species has a somewhat limited habitat affinity (sandy soils on laterite); however it does not appear to be limited in distribution. This species was observed 86 times in the central part of the O'Callaghan Park survey area. However, this distribution appears be somewhat restricted, because it was only found in one part of the survey area and there were no other records for this species in close proximity returned through database searches.

**Plate 18: *Synaphea drummondii* (WAH 2014)**

### 5.1.2 *Verticordia brevifolia* subsp. *brevifolia* (Priority 3)

*Verticordia brevifolia* subsp. *brevifolia* is a shrub 0.2 to 0.4 with yellow flowers from October to November. It occurs on gravelly loam and clay, as well as road verges. This taxon has been recorded in the Avon Wheatbelt (P2), Southern Jarrah Forest and Western Mallee IBRA Subregions (WAH 2014). It is mainly distributed from just west of Katanning to west of Jerramungup, south of Dumbleyung and north of Gnowangerup, with one outlier observed between Frankland and Stirling Ranges National Park (Atlas of Living Australia 2014). This species has a fairly restricted geographical range and was recorded in only one location in the O'Callaghan Park survey area. According to the database search results, the nearest record for this species is in the centre of Katanning, within 1 km of the O'Callaghan Park survey area, however this may be the locality, rather than the actual location of the record.

**Plate 19: *Verticordia brevifolia* subsp. *brevifolia* (J. Fielder)**

## 5.2 Fauna of Conservation Significance

The Western Rosella (*Platycercus icterotis* subsp. *xanthogenys,* inland; Priority 4) was the only vertebrate taxon of conservation significance recorded during the surveys. Of the 31 other vertebrate fauna species of conservation significance that have been recorded within 20 km of the survey area, one species is presumed extinct and 12 species are considered unlikely to occur in any of the survey areas because suitable habitat is not present. The following three species are likely to occur in the survey areas: Carnaby's Cockatoo (*Calyptorhynchus latirostris)*, Red-tailed Phascogale (*Phascogale calura*), and Rainbow Bee-eater (*Merops ornatus*). An additional fifteen species may possibly occur in the survey areas, including Chuditch or Western Quoll (*Dasyurus geoffroii*), Australian Painted Snipe (*Rostratula australis*), Common Sandpiper (*Actitis hypoleucos*), Great (White) Egret (*Ardea alba*), Cattle Egret (*Ardea ibis*), Sharp-tailed Sandpiper (*Calidris acuminata*), Long-toed Stint (*Calidris subminuta*), , Common Greenshank (*Tringa nebularia*), (Australian) Peregrine Falcon (*Falco peregrinus*), Carpet Python (*Morelia spilota* subsp. *imbricata*), Barking Owl (southwest pop, *Ninox connivens subsp. connivens*), Australian Bustard (*Ardeotis australis*), Bush Stone-curlew (*Burhinus grallarius*), Western (Crested) Shrike-tit (*Falcunculus frontatus* subsp. *leucogaster*) and White-browed Babbler (western wheatbelt, *Pomatostomus superciliosus* subsp. *ashbyi*).

### 5.2.1 Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*, Endangered)

Carnaby's Black Cockatoo is listed as Endangered under the Commonwealth EPBC Act 1999 and Schedule 1 of the *Wildlife Conservation Act* 1950. This species mainly occurs in uncleared or remnant native Eucalypt woodlands, especially those that contain Salmon Gum and Wandoo, and in shrubland or Kwongan heathland dominated by *Hakea*, *Banksia* and *Grevillea* species. It is a seasonal visitor to plantations of exotic pines, and sometimes occurs in forests containing Marri, Jarrah or Karri (Department of Environment 2014). It forages in native shrubland, Kwongan heathland and woodland dominated by proteaceous plant species such as *Banksia* spp. (including 'dryandra' spp.), *Hakea* spp. and *Grevillea* spp., as well as pine plantations eucalypt woodland and forest that contains foraging species(Department of Environment 2014). Carnaby's Black Cockatoos generally roost in or near riparian environments or natural and artificial permanent water sources. They are known to roost in Flat-topped Yate, Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, introduced eucalypts (for example Blue Gum) and introduced pines (Department of Environment 2014). This species is likely to use the survey areas for feeding and roosting. This species has been observed feeding on Hakea in the O'Callaghan Park survey area on three occasions between 2001 and 2004 (D. Secomb, personal communication).

Carnaby's Black Cockatoo generally breed in woodland or forest, but also breed in former woodland or forest now present as isolated trees. They nest in hollows in live or dead Salmon Gum, Wandoo, Tuart, Jarrah, Flooded gum, York gum, Powderbark, Karri and Marri trees, usually with a DBH of at least 500 mm. For Salmon Gum and Wandoo, suitable DBH is 300 mm (Department of Environment 2014). There are a few trees with large hollows in the WAMMCO survey area along Baker Road and the drainage line the south that may be suitable for nesting; otherwise, habitats in the survey areas may not be suitable for breeding habitat (i.e. they lack suitably large hollows et). This species is likely to occur in the O'Callaghan survey area and may occur in portions of the WAMMCO survey area. Proposed vegetation clearing and other disturbance activities in these areas would require further assessment to determine the impacts to this species in consultation with the relevant state and federal agencies.

### 5.2.2 Red-tailed Phascogale (*Phascogale calura*, Endangered)

The Red-tailed Phascogale is listed as Endangered under the Commonwealth EPBC Act 1999 and Schedule 1 of the *Wildlife Conservation Act* 1950. It is generally associated with *Allocasuarina* woodlands with hollow-containing eucalypts (e.g. *Eucalyptus wandoo*) and *Gastrolobium* spp. They have also been recovered from a variety of other habitats in the Katanning District, including woodland of Swamp Oak (*Casuarina obesa*) over Samphires, Mallee-Scrub and low forest of Moort (*Eucalyptus platypus*) (Department of Environment 2014).

Red-tailed Phascogales populations are highest in habitat that has been unburnt for 20 years or more (Department of Environment 2014). Trees need to be of a sufficient age to provide hollows for nesting in limbs or logs, and grass trees need to have ample skirts to provide cover. A large proportion of nest sites are in highly flammable locations, such as, stands of dead *Allocasuarina* spp. and the skirts and stumps of live and dead grass trees (*Xanthorrhoea* spp.) (Department of Environment 2014).

Remnant Red-tailed Phascogale populations have predominantly survived in areas dominated by dense Rock Sheoak (*Allocasuarina huegeliana*) woodland associated with Wandoo (*Eucalyptus wandoo*). Fire causes high mortality amongst resident Red-tailed Phascogales and populations do not recover for years after fire events (Department of Environment 2014).

The O'Callaghan Park survey area contains suitable habitat to support this species (*Allocasuarina huegeliana* woodland with Wandoo) and a Red-tailed Phascogale was observed at a residence adjacent to this survey area in July 2008 (A. Salmond, personal communication). This species is likely to occur in the O'Callaghan survey area. Proposed vegetation clearing and other disturbance activities in these areas would require further assessment to determine the impacts to this species in consultation with the relevant state and federal agencies.

### 5.2.3 Australian Painted Snipe (*Rostratula australis,* Endangered & Migratory)

The Australian Painted Snipe is listed as Endangered, Marine and Migratory under the Commonwealth EPBC Act 1999 and Endangered under Schedule 1 of the *Wildlife Conservation Act* 1950. This species generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (Department of Environment 2014). Potentially suitable habitat is present in Piesse Park and the southern portion of the WAMMCO survey areas, although vegetation may not be dense enough to be considered highly favourable. Although this species may occasionally use these survey areas, it is unlikely to breed there. Disturbance activities in these two survey areas would be unlikely to significantly impact the conservation status of the species.

### 5.2.4 Chuditch (*Dasyurus geoffroii,* Vulnerable)

The Chuditch, or Western Quoll, is listed as Vulnerable under the Commonwealth EPBC Act 1999 and Schedule 1 of the *Wildlife Conservation Act* 1950. Chuditch currently inhabit most kinds of wooded habitat within its current range including eucalypt forest (especially Jarrah, Eucalyptus marginata), dry woodland and Mallee shrublands. In Jarrah forest, Chuditch populations occur in both moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest. Prior to the initiation widespread fox control programmes, the densest populations of Chuditch have been found in riparian forest. Subsequently, high densities of Chuditch have been observes in upland eucalypt woodland. Chuditch have never been recorded in pure Karri forest (Department of Environment 2014).

The survey areas are within the known distribution and there are 4 database records within 20 km from 1989 and 1990. Potentially suitable habitat is only present in O'Callaghan Park and may be too small and isolated to support this species. Proposed vegetation clearing and other disturbance activities in these areas would require further assessment to determine if the species is present. If present, proposed impacts to this species would require consultation with appropriate state and federal agencies.

### 5.2.5 Rainbow Bee-eater (*Merops ornatus,* Migratory)

The Rainbow Bee-eater is listed as Migratory under the Commonwealth EPBC Act 1999. It occurs in open woodlands and shrublands, including Mallee, and in open forests that are usually dominated by eucalypts, grasslands and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water. It also occurs in inland and coastal sand dune systems, in mangroves in northern Australia, and has been recorded in various other habitat types including heathland, sedgeland, vine forest and vine thicket, and on beaches. It has also been recorded in towns and suburbs, orchards and vineyards, roadside vegetation, quarries and mines or gravel pits (Department of Environment 2014).

The breeding season extends from August to January. Nesting occurs in an enlarged chamber at the end of long burrow or tunnel that is usually in flat or sloping ground, in the banks of rivers, creeks or dams, in roadside cuttings, in the walls of gravel pits or quarries, in mounds of gravel, or in cliff-faces (Department of Environment 2014).

The widespread distribution of the Rainbow Bee-eater, and the variety of habitats that it has been recorded in, indicate that it could potentially occur in any of the survey areas. To avoid impacts, disturbance activities should be scheduled to occur outside of the nesting season. If disturbance activities occur within the breeding season, impacts to active nests should be avoided. Where active nests are present and would be impacted, consultation with the relevant state agencies would be required.

### 5.2.6 Common Sandpiper (*Actitis hypoleucos*, Migratory)

The Common Sandpiper is listed as Migratory under the Commonwealth EPBC Act 1999. This species uses a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools,

billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags (Department of Environment 2014).

Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands (Department of Environment 2014). Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks (Department of Environment 2014).

This species may use banks and waterbodies at Piesse Park. However, this species is unlikely to be significantly impacted by the proposed project.

### 5.2.7 Great (White) Egret (*Ardea alba*, Migratory)

The Great Egret, or White Egret, is listed as Migratory under the Commonwealth EPBC Act 1999. Habitats used by this species include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs. Great Egrets usually nest in colonies and rarely as solitary pairs. In south-western WA, breeding sites are usually located in wooded and shrubby swamps, particularly *Melaleuca* swamps (Department of Environment 2014).

Suitable habitat for this species occurs in all of the survey areas; however suitable breeding habitat is not present in any of the survey areas. While this species may occur in the survey areas, disturbance activities are unlikely to have a significant effect on the species.

### 5.2.8 Cattle Egret (*Ardea ibis*, Migratory)

The Cattle Egret is listed as Migratory under the Commonwealth EPBC Act 1999. It is known to occur in grasslands, wooded lands and terrestrial wetlands; rarely seen in arid and semi-arid regions. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora. High numbers have been observed in moist, low-lying poorly drained pastures with abundant tall grass. It has been recorded on earthen dam walls and ploughed fields and is commonly associated with the habitats of farm animals (Department of Environment 2014). This species breeds in wooded swamps and nesting occurs in trees that are inundated or on small islands.

Suitable habitat is present in all survey areas except O'Callaghan Park. However, no suitable breeding habitat is present in the survey areas. This species is unlikely to be affected by disturbance activities within the survey areas.

### 5.2.9 Sharp-tailed Sandpiper (*Calidris acuminata*, Migratory)

The Sharp-tailed Sandpiper is listed as Migratory under the Commonwealth EPBC Act 1999. It spends the non-breeding season in Australia in the muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs (Department of Environment 2014).

They forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. They also forage among inundated vegetation of saltmarsh, grass or sedges. They also

forage in sewage ponds, and often in hypersaline environments. After rain, they may forage in paddocks of short grass, well away from water. They may forage on coastal mudflats at low tide, and move to freshwater wetlands near the coast to feed at high tide. Occasionally they forage on wet or dry mats of algae and among rotting beachcast seagrass or seaweed, and sometimes they are recorded foraging around the edges of stony wetlands or among rocks in water, and rarely on exposed reef (Department of Environment 2014). Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh. Occasionally, they roost on sandy beaches, stony shores or on rocks in water or in mangroves (Department of Environment 2014).

This may use habitats at Piesse Park and may occasionally use habitats in the survey areas following periods of high precipitation for foraging and roosting. This species is not known to breed in Australia is unlikely to be affected by disturbance activities within the survey areas.

### 5.2.10 Common Greenshank (*Tringa nebularia*, Migratory)

The Common Greenshank is listed as Migratory under the Commonwealth EPBC Act 1999. It spends the non-breeding season in Australia and is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts in pasture, but are generally not found in dry grassland (Department of Environment 2014).

The species is known to forage at edges of wetlands, in soft mud on mudflats, in channels, or in shallows around the edges of water often among pneumatophores of mangroves or other sparse, emergent or fringing vegetation, such as sedges or saltmarsh. It will occasionally feed on exposed seagrass beds (Department of Environment 2014). It roosts and loafs round wetlands, in shallow pools and puddles, or slightly elevated on rocks, sandbanks or small muddy islets. Occasionally the species will perch and roost on stakes. The species is known to have roosted on an inland claypan near Roebuck Bay, WA; this site may be an important roost site for this species at least during the non-breeding season (Department of Environment 2014).

This species may use habitats at Piesse Park but is unlikely to use habitats in the other survey areas. This species has previously been recorded at Lake Ewlyamarup and Corackin Swamp. This species is unlikely to be affected by disturbance activities within the survey areas.

### 5.2.11 Peregrine Falcon (*Falco peregrinus,* Schedule 4)

The Peregrine Falcon, or Australian Peregrine Falcon, is a listed as a Specially Protected species under Schedule 4 of the *Wildlife Conservation Act* 1950. This species is found everywhere from woodlands to open grasslands and coastal cliffs, although less frequently in desert regions. It feeds almost entirely on other birds (Birdlife Australia 2014). It also eats rabbits and other moderate sized mammals, bats and reptiles. Peregrine Falcons typically breed on cliffs and rocky ledges, sometimes on buildings, between August and November (Birdlife Australia 2014). This species may occur within the habitats in the survey areas and there have been numerous records in and near Katanning since 1990. Disturbance activities in the survey areas are unlikely to significantly affect this species.

### 5.2.12 Carpet Python (*Morelia spilota* subsp. *imbricata,* Schedule 4)

The south-western Carpet Python subspecies is listed as Specially Protected under Schedule 4 of the *Wildlife Conservation Act* 1950. This subspecies has been recorded in semi-arid coastal and inland habitats

consisting of *Banksia* woodland, eucalypt woodlands and grasslands. Three records (1995-1998) from Katanning were returned from database searches. This species may occur in any of the survey areas, but habitats in O'Callaghan Park are most suitable to support it. Depending on the nature of proposed impacts in the survey areas, additional attention may be required for this species in consultation with DPaW.

### 5.2.13 Barking Owl (southwest pop, *Ninox connivens subsp. connivens,* Priority 2)

Barking Owls are listed as Priority 2 by DPaW. They are found in open woodlands and the edges of forests, often adjacent to farmland. They prefer woodlands and forests with a high density of large trees, particularly sites with hollows that are used by the owls as well as their prey. Roost sites are often located near waterways or wetlands. This species may roost in trees and forage in any of the survey areas, but habitats in O'Callaghan Park are most suitable to support it. Proposed disturbance activities within the O'Callaghan Park survey area would require consultation with DPaW regarding impacts to this subspecies.

### 5.2.14 Australian Bustard (*Ardeotis australis,* Priority 4)

The Australian Bustard is listed as Priority 4 by DPaW. They are found on dry plains, grasslands and in open woodland. This species may occur in the lightly wooded grassland portions of the survey areas. However, proposed disturbance activities are unlikely to significantly affect this species.

### 5.2.15 Bush Stone-curlew (*Burhinus grallarius,* Priority 4)

The Bush Stone-curlew is listed as Priority 4 by DPaW. This species occurs in a huge variety of habitats across Australia, mostly in lightly wooded country with thickets, and often along creek lines. Sometimes including partly cleared forests. There is one record of this species from Katanning (1991). It may use the wooded creeklines in WAMMCO, but habitats in O'Callaghan Park are more suitable for this species. If disturbance activities are proposed to occur within O'Callaghan Park, additional surveys may be necessary to determine if this species is present. If it is present, then DPaW should be consulted regarding impacts to this species.

### 5.2.16 Western Rosella (*Platycercus icterotis* subsp. *xanthogenys*, Priority 4)

The inland subspecies of the Western Rosella is listed as Priority 4 by DPaW. This subspecies is found in eucalypt and sheoak woodlands and scrubs, especially those containing Wandoo (*E. wandoo*), Flooded Gum, Salmon Gum (*E. salmonophloia*), tall Mallee and Rock Sheoak (*Allocasuarina huegeliana*). Hybrid birds, with characteristics of both the inland and south-western subspecies, are found at the geographical interface between the two subspecies. Suitable habitat for this species is present in the O'Callaghan survey area and two individuals were observed there during this survey. Proposed disturbance activities within the O'Callaghan Park survey area would require consultation with DPaW regarding impacts to this subspecies.

### 5.2.17 Western (Crested) Shrike-tit (*Falcunculus frontatus* subsp. *leucogaster,* Priority 4)

The Crested Shrike-tit is listed as Priority 4 by DPaW. It is found in eucalypt forests and woodlands, forested gullies and along rivers in drier areas. It can also be found in rainforests. It is sometimes seen in parks and gardens, on farms with scattered trees, and on pine plantations. Habitats in the O'Callaghan Park and Piesse Park survey areas may be suitable for this species. Additional survey effort would be required to determine if this species is present. If it is present, then DPaW should be consulted regarding impacts to this species.

### 5.2.18 White-browed Babbler (*Pomatostomus superciliosus* subsp. *ashbyi,* Priority 4).

The White-browed Babbler is listed as Priority 4 by DPaW. This species is found in dry sclerophyll woodlands with a shrubby understorey, mulga, scacias, Mallee, *Callitris*, timber, scrub along watercourses and saltbush. There is one record of this species from Ewlyamarup (1987). There is potentially suitable habitat for this species at O'Callaghan Park; however, it may not be extensive enough to support a breeding group. Consultation with DPaW should occur if habitat disturbance activities are proposed within the O'Callaghan Park survey area.

# 6 Conclusions and Recommendations

The DIA4, Industrial Area, Piesse Park and WAMMCO survey areas had Completely Degraded vegetation and were of limited value as habitat for vertebrate fauna of conservation significance. There were no flora or fauna species of conservation significance recorded in these four survey areas. However, it is important to note that database search results reported that one Priority 2 species, *Banksia acanthopoda,* has been recorded just off of Katanning-Nyabing Road, on the northern boundary of the Industrial Area survey area. Proposed disturbance activities in these four survey areas are unlikely to significantly affect any Migratory species, with the possible exception of the Rainbow Bee-eater, because they may nest in any of the survey areas between August and January. The habitats in these four survey areas are not suitable to support any Threatened or Vulnerable species, except potentially Carnaby's Black Cockatoo in eucalypts. Disturbance to eucalypts, particularly trees of greater than 30 cm DBH, would require targeted surveys, nest tree surveys and consultation with relevant state and federal agencies. Any disturbance proposed to eucalypt woodlands should also consider potential impacts to Carpet Python (Schedule 4), Barking Owl (southwest pop, Priority 2), Bush Stone-curlew (Priority 4), Western Rosella (Priority 4) and Western Shrike-tit (Priority 4), in consultation with DPaW.

The O'Callaghan Park survey area has the highest conservation value of the five survey areas. It is a significant remnant of native vegetation in Good to Excellent condition, with high species richness. Two Priority flora taxa and one Priority 4 fauna taxon were recorded during the surveys. Impacts to Priority flora should be avoided. Where impacts cannot be avoided, the proponent would need to consult with DPaW.

Two Endangered fauna species, Carnaby's Black Cockatoo and Red-tailed Phascogale, are likely to occur in the O'Callaghan Park survey area. These have been recently observed there (A. Salmond and D. Secomb personal communication). Any proposed impacts to this survey area would require additional targeted surveys for these species and consultation with Department of the Environment, the EPA and DPaW. Any proposed disturbance to native vegetation in O'Callaghan Park should also consider potential impacts to Carpet Python (Schedule 4), Barking Owl (southwest pop, Priority 2), Bush Stone-curlew (Priority 4), Western Rosella (Priority 4), Western Shrike-tit (Priority 4), and White-browed Babbler (Priority 4), in consultation with DPaW.

The native vegetation in and adjacent to the O'Callaghan Park is important because of the limited extent of native vegetation in the shire and in the Wheatbelt bioregion. It is adjacent to additional native vegetation to the east, which extends toward the Great Southern Highway (**Figure 6**). This adjacent area was not assessed and appears partially disturbed in aerial photography. However, this combined area of native vegetation is significant because it is effectively an island of habitat from a fauna perspective. In its current state, it is known to support fauna species of conservation significance as well as native fauna in general. Further degradation, or clearing of native vegetation, in this remnant area will disproportionately reduce the capacity to support native fauna in residual habitat. Where native vegetation is contiguous in the landscape, fauna can move away from impacted areas into other suitable habitat nearby. In this case, fauna would be extremely limited in their ability to do this because the remaining habitat surrounding the survey area is so small and isolated. For some species, the remaining habitat area would be too small to support their foraging or home range size. For others, competition for resources would increase to levels unsuitable for conspecific persistence. As such, it should be expected that removal of native vegetation in the survey area would have a significant localised effect on native fauna and would further reduce the representation of native vegetation in the Wheatbelt.

# 7 References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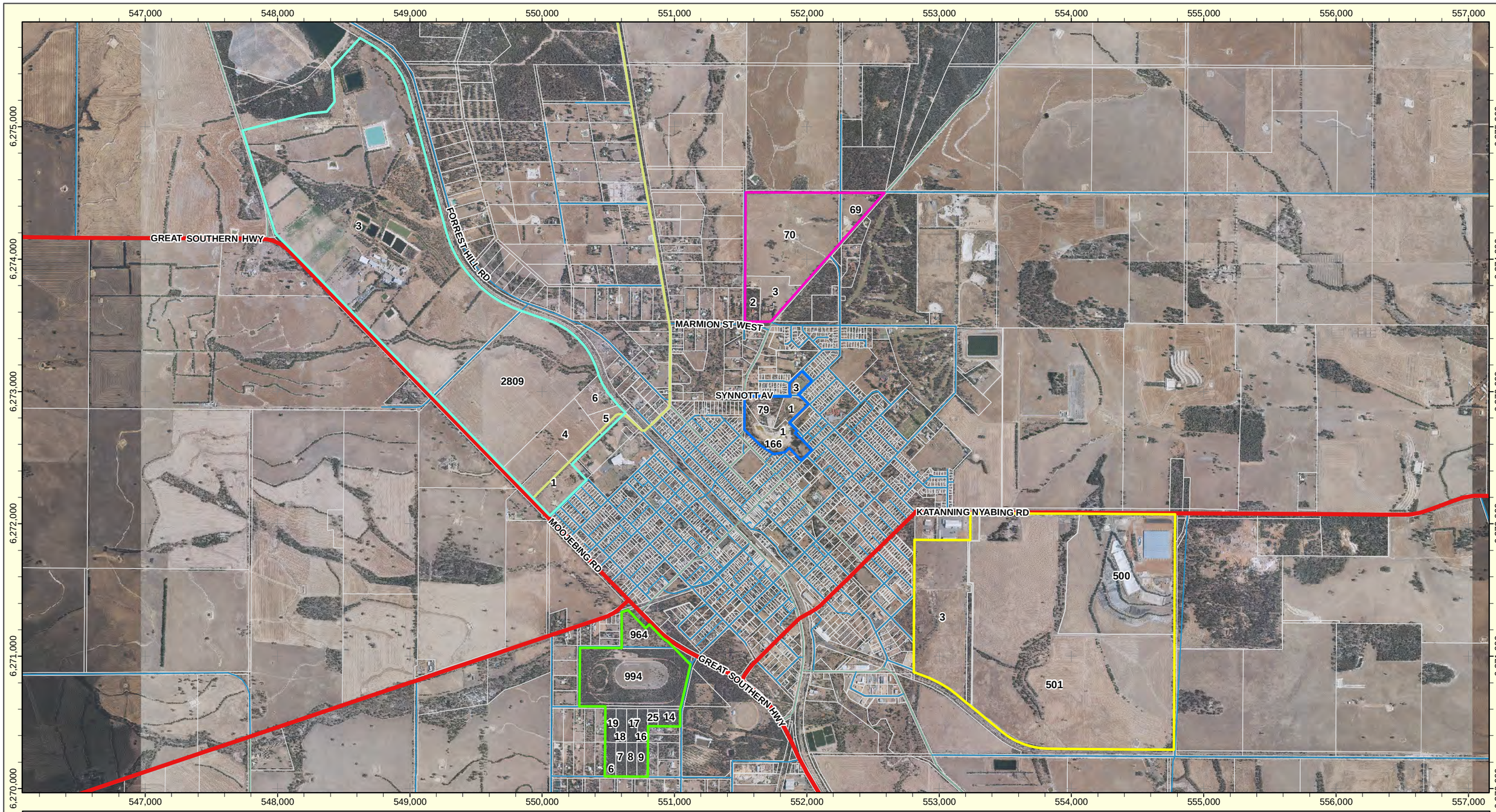
# Figures




**LEGEND**

- DIA4
- Industrial Expansion Area
- O'Callaghan Park
- Piesse Park
- WAMMCO
- Cadastre

**Road network (MRWA)**

- Access Road
- Local Distributor
- Regional Distributor
- Primary Distributor

# PROJECT OVERVIEW

Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

N

0 250 500 1,000 1,500 2,000

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

| | | | |
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| Date: | 24/10/2014 | Checked: | C McGary |
| Revision: | Rev A | Reviewed: | N King |

Terratree

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Figure 01

Project No: TE14012

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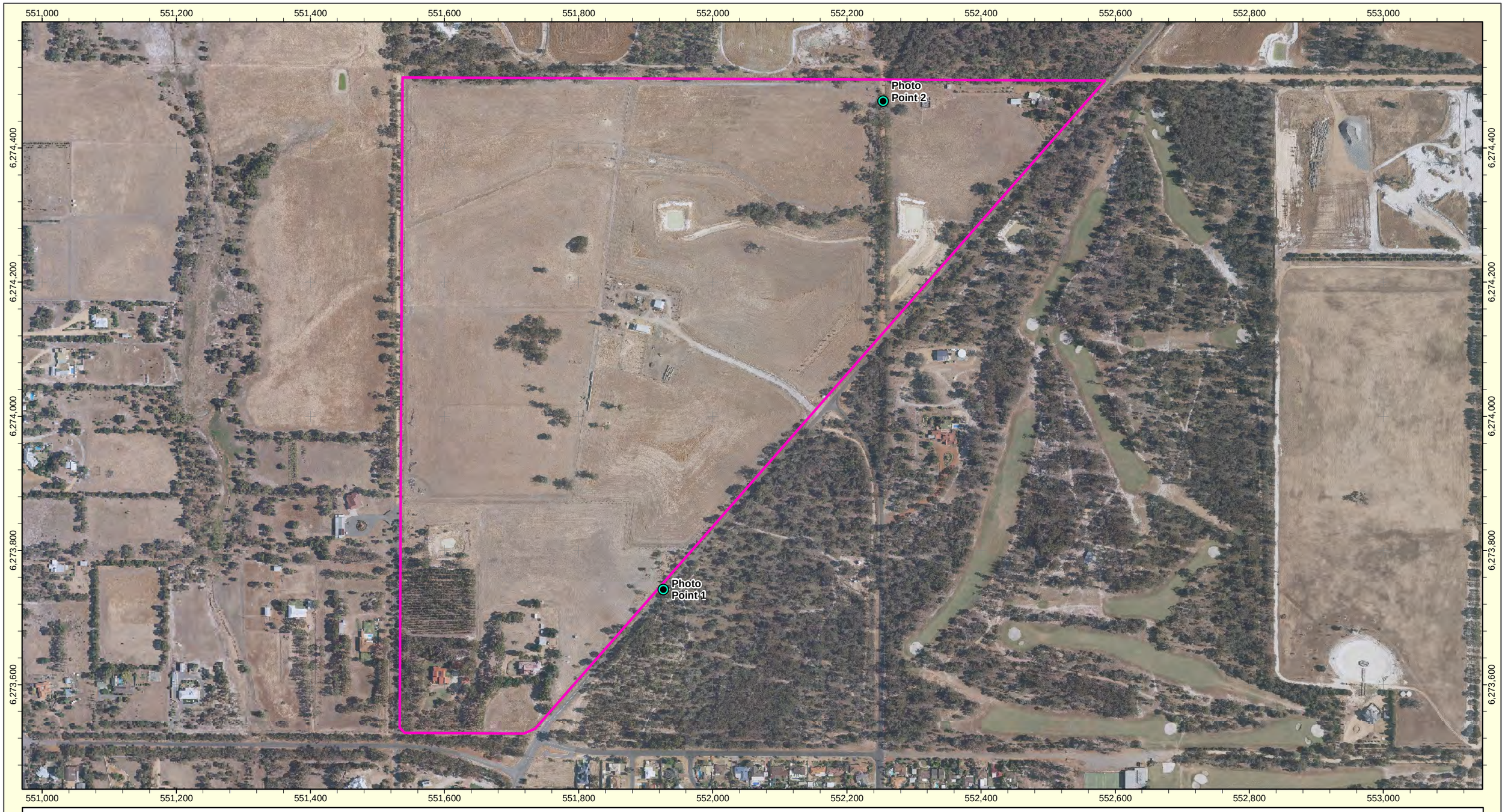
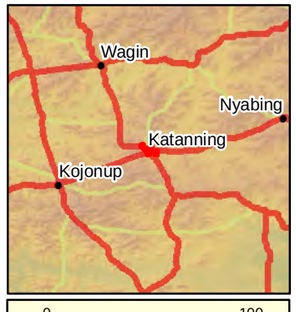



**LEGEND**

- DIA4
- Photo point




0 100
Kilometres

# DIA4 SURVEY AREA

Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

N

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 24/10/2014 | Checked: | C McGary |
| Revision: | Rev A | Reviewed: | N King |

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Figure 02

Project No: TE14012

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552,000 552,500 553,000 553,500 554,000 554,500 555,000 555,500

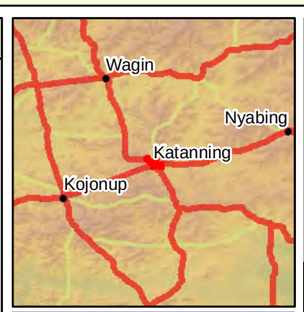
6,272,000
6,271,500
6,271,000
6,270,500

Photo Point 3
Photo Point 5
Photo Point 1
Photo Point 2
Photo Point 4

552,000 552,500 553,000 553,500 554,000 554,500 555,000 555,500

**LEGEND**

- Industrial Expansion Area
- Photo point




# INDUSTRIAL AREA SURVEY AREA

## Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

N

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Scale @ A3: | 1:10,000 | Prepared: | R Cullen |
| Date: | 24/10/2014 | Checked: | C McGary |
| Revision: | Rev A | Reviewed: | N King |

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Figure 03

Project No: TE14012

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551,200 551,400 551,600 551,800 552,000 552,200 552,400

6,273,000

6,272,800

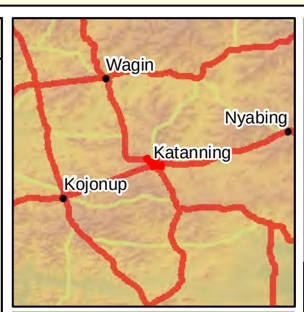
6,272,600

Photo Point 1

551,200 551,400 551,600 551,800 552,000 552,200 552,400

**LEGEND**

- Piesse Park
- Photo point




# PIESSE PARK SURVEY AREA

Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

N

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Meters

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Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 24/10/2014 | Checked: | C McGary |
| Revision: | Rev A | Reviewed: | N King |

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Figure 04

Project No: TE14012

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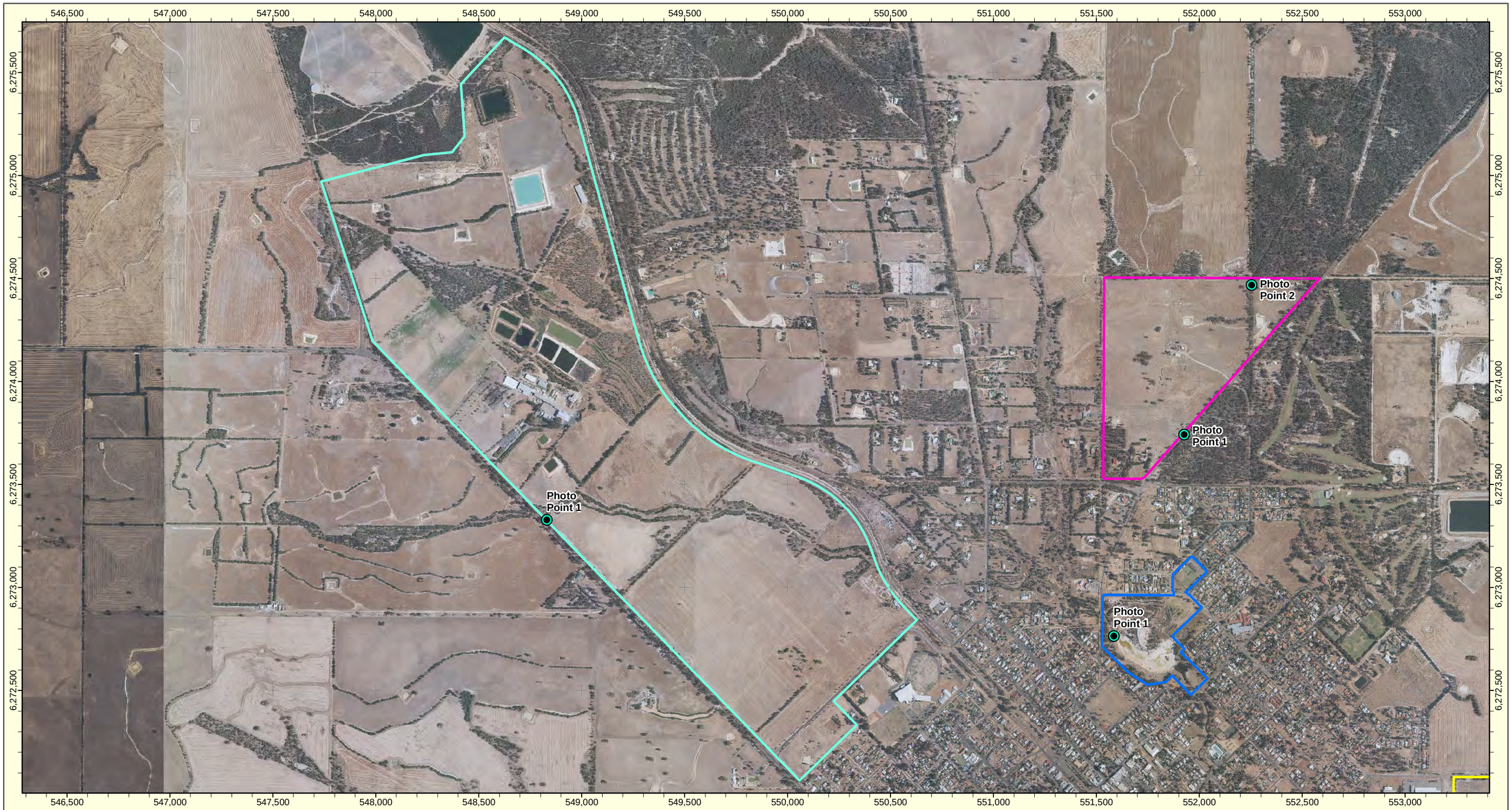


**LEGEND**

- DIA4
- Piesse Park
- WAMMCO
- Photo point

# WAMMCO SURVEY AREA

Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

N

0 150 300 600 900 1,200 1,500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Revision: | Rev A | Reviewed: | N King |

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Figure 05

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6,271,200 6,271,000 6,270,800 6,270,600 6,270,400 6,270,200

**LEGEND**

O'Callaghan Park

**Priority Flora Observations**

*Synaphea drummondii* (Priority 3)

*Verticordia brevifolia* subsp. *brevifolia* (Priority 3)

0 100
Kilometres

# O'CALLAGHAN PARK SURVEY AREA AND PRIORITY FLORA OBSERVATIONS

Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

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Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

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| Date: | 24/10/2014 | Checked: | C McGary |
| Revision: | Rev A | Reviewed: | N King |

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Figure 06a

Project No: TE14012

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6,271,200 6,271,000 6,270,800 6,270,600 6,270,400 6,270,200

**LEGEND**

O'Callaghan Park

**VegCode, VegDesrcip**

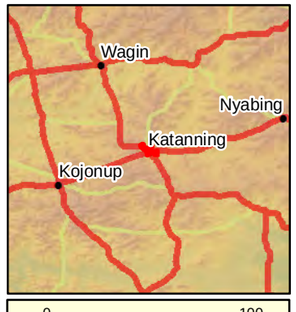
AhELOF/MCH - *Allocasuarina huegliana*, *Eucalyptus* sp. low open forest over mixed species closed herbland

AhLOF/CtS/UaRrOH - *Allocasuarina huegliana* low open forest over *Calytrix tetragona* shrubland over *Ursinia anthemoides*, *Romulea rosea* open herbland

AhLOF/GcBcLS/MH - *Allocasuarina huegliana* low open forest over *Gastrolobium calycinum*, *Baeckea crispiflora* low shrubland over mixed herbland

Cleared - Cleared land with or without non native vegetation and isolated native trees

EwAhLOF/AsDlCaaLSS - *Eucalyptus wandoo* subsp. *wandoo*, *Allocasuarina huegliana* low open forest over *Acacia lasiocarpa* var. *sedifolia*, *Dampiera lindleyi*, *Cryptandra arbutiliflora* subsp. *arbutiliflora* low sparse shrubland




# O'CALLAGHAN PARK VEGETATION MAPPING

Level 1 Flora and Fauna and Targeted Priority Flora survey for Katanning Structure Plan Areas

N

0 50 100 200 300 400 500

Meters

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

| | | | |
|---|---|---|---|
| Scale @ A3: | 1:6,500 | Prepared: | R Cullen |
| Date: | 24/10/2014 | Checked: | C McGary |
| Revision: | Rev A | Reviewed: | N King |

Terratree

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Figure 06b

Project No: TE14012

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# Appendices

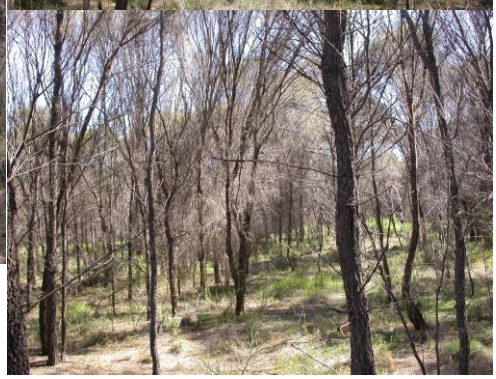
# Appendix 1: Vegetation survey relevés

| | | |
|---|---|---|
| **Relevé Number** 1 (O'Callaghan Park) | Date: 11/9/14 | Waypoint: (GDA94 Zone 50): 550610mE/ 6270526mN |
| **Landform Description** | Flat Plain | |
| **Geology** | Laterite gravels and fine gravels (45%) | |
| **Soil** | Grey sandy clay | |
| **Vegetation Description** | *Eucalyptus wandoo* subsp. *wandoo*, *Allocasuarina huegliana* low open forest over *Acacia lasiocarpa* var. sedifolia, Dampiera lindleyi, Cryptandra arbutiliflora subsp. arbutiliflora low sparse shurbland | |
| **Vegetation Condition** | Excellent – vehicle tracks and some weeds | |
| **Associated species** | *Acacia lasiocarpa* var. *sedifolia*<br>*Acacia microbotrya*<br>*Allocasuarina huegeliana*<br>*Banksia sessilis* var. *sessilis*<br>*Caladenia flava*<br>*Caladenia integra*<br>*Cryptandra arbutiflora* subsp. *arbutiflora*<br>*Dampiera lindleyi*<br>*Dianella revoluta*<br>*Diuris porrifolia*<br>*Dodonaea humifusa*<br>*Drosera glanduligera*<br>*Eucalyptus wandoo* subsp. *wandoo*<br>*Gompholobium marginatum* | *Hakea prostrata*<br>*Jacksonia condensata*<br>*Jacksonia sternbergiana*<br>*Leptospermum erubescens*<br>*Levenhookia pusilla*<br>*Neurachne alopecuroidea*<br>*Phyllangium sulcatum*<br>*Podolepis lessonii*<br>*Pterostylis sargentii*<br>*Rhodanthe laevis*<br>*Romulea rosea*<br>*Schoenus nanus*<br>*Schoenus pleiostemoneus*<br>*Thysanotus manglesianus* |
| **Photos** | | |

| | | |
|---|---|---|
| **Relevé Number** 2 (O'Callaghan Park) | Date: 11/9/14 | Waypoint: (GDA94 Zone 50): 550675mE/ 6270426mN |
| **Landform Description** | Flat Plain | |
| **Geology** | Laterite gravels and fine gravels | |
| **Soil** | Grey sandy clay | |
| **Vegetation Description** | *Allocasuarina huegliana* low open forest over *Calytrix tetragona* shrubland over *Romulea rosea* open herbland | |
| **Vegetation Condition** | Very Good – has some weeds | |
| **Associated species** | *Acacia chamaeleon*<br>*Acacia pycnantha*<br>*Allocasuarina huegeliana*<br>*Arctotheca calendula*<br>*Austrostipa elegantissima*<br>*Bossiaea eriocarpa*<br>*Briza maxima*<br>*Caladenia falcata*<br>*Caladenia flava*<br>*Calytrix tetragona*<br>*Chamaescilla corymbosa var corymbosa*<br>*Dianella revoluta* | *Drosera macrantha subsp. macrantha*<br>**Ehrharta longiflora*<br>*Eucalyptus livida*<br>*Hakea prostrata*<br>*Hypochaeris glabra*<br>*Lysimachus arvensis*<br>*Romulea rosea*<br>*Romulea rosea*<br>*Solanum nigrum*<br>*Sonchus oleraceus*<br>*Thysanotus manglesianus*<br>*Ursinia anthemoides* |
| **Photos** | | |

| | | |
|---|---|---|
| **Relevé Number** 3 (O'Callaghan Park) | Date: 11/9/14 | Waypoint: (GDA94 Zone 50): 550709mE/ 6270225mN |
| **Landform Description** | Plain with hummocky microrelief | |
| **Geology** | Laterite gravels and fine gravels | |
| **Soil** | Grey sandy clay | |
| **Vegetation Description** | *Allocasuarina huegliana* low open forest over *Ursinia anthemoides, Romulea rosea* open herbland | |
| **Vegetation Condition** | Good – degradation from weeds and possibly grazing | |
| **Associated species** | *Allocasuarina huegeliana*<br>*Briza maxima*<br>*Caladenia falcata*<br>*Caladenia flava*<br>*Calytrix tetragona*<br>*Hakea prostrata*<br>*Hypochaeris glabra*<br>*Romulea rosea*<br>*Ursinia anthemoides* | |
| **Photos** | | |

| | | |
|---|---|---|
| **Relevé Number** 4 (O'Callaghan Park) | Date: 12/9/14 | Waypoint: (GDA94 Zone 50): 550940mE/ 6270698mN |
| **Landform Description** | Flat Plain | |
| **Geology** | Laterite gravels (50%) | |
| **Soil** | Grey sandy clay | |
| **Vegetation Description** | *Allocasuarina huegliana* low open forest over *Gastrolobium calycinum, Baeckea crispiflora* low shrubland over mixed herbland | |
| **Vegetation Condition** | Good – has been ripped previously, weeds | |
| **Associated species** | *Allocasuarina huegeliana*<br>*Baeckea crispiflora*<br>*Banksia sessilis* var. *sessilis*<br>*Borya sphaerocephala*<br>*Conostylis pusilla*<br>*Cryptandra nutans*<br>*Dampiera lindleyi*<br>*Daviesia cardiophylla*<br>*Daviesia hakeoides*<br>*Diuris porrifolia* | *Drosera glanduligera*<br>*Drosera subhirtella*<br>*Gastrolobium calycinum*<br>*Gompholobium marginatum*<br>*Haemodorum discolor*<br>*Hakea prostrata*<br>*Opercularia vaginata*<br>*Romulea rosea*<br>*Schoenus nanus* |
| **Photos** | | |

| | | |
|---|---|---|
| **Relevé Number** 5 (O'Callaghan Park) | Date: 12/9/14 | Waypoint: (GDA94 Zone 50): 551042mE/ 6270979mN |
| **Landform Description** | Flat Plain | |
| **Geology** | Laterite gravels and fine gravels | |
| **Soil** | Grey sandy clay | |
| **Vegetation Description** | *Allocasuarina huegliana, Eucalyptus* sp. low open forest over mixed species closed herbland | |
| **Vegetation Condition** | Good – weeds and edge effects | |
| **Associated species** | *Allocasuarina huegeliana*<br>*Agrostocrinum hirsutum*<br>*Baeckea crispiflora*<br>*Blennospora drummondii*<br>*Briza maxima*<br>*Caesia micrantha*<br>*Chamaescilla corymbosa* var. *corymbosa*<br>*Dampiera lindleyi*<br>*Dianella revoluta*<br>*Drosera macrantha subsp. macrantha* | *Eucalyptus sp.*<br>*Gastrolobium calycinum*<br>*Gompholobium marginatum*<br>*Hydrocotyle sp.*<br>*Hypochaeris glabra*<br>*Levenhookia pusilla*<br>*Pterostylis sargentii*<br>*Romulea rosea*<br>*Schoenus pleiostemoneus*<br>*Ursinia anthemoides* |
| **Photos** |  | |

Australian Government

Department of the Environment

# EPBC Act Protected Matters Report

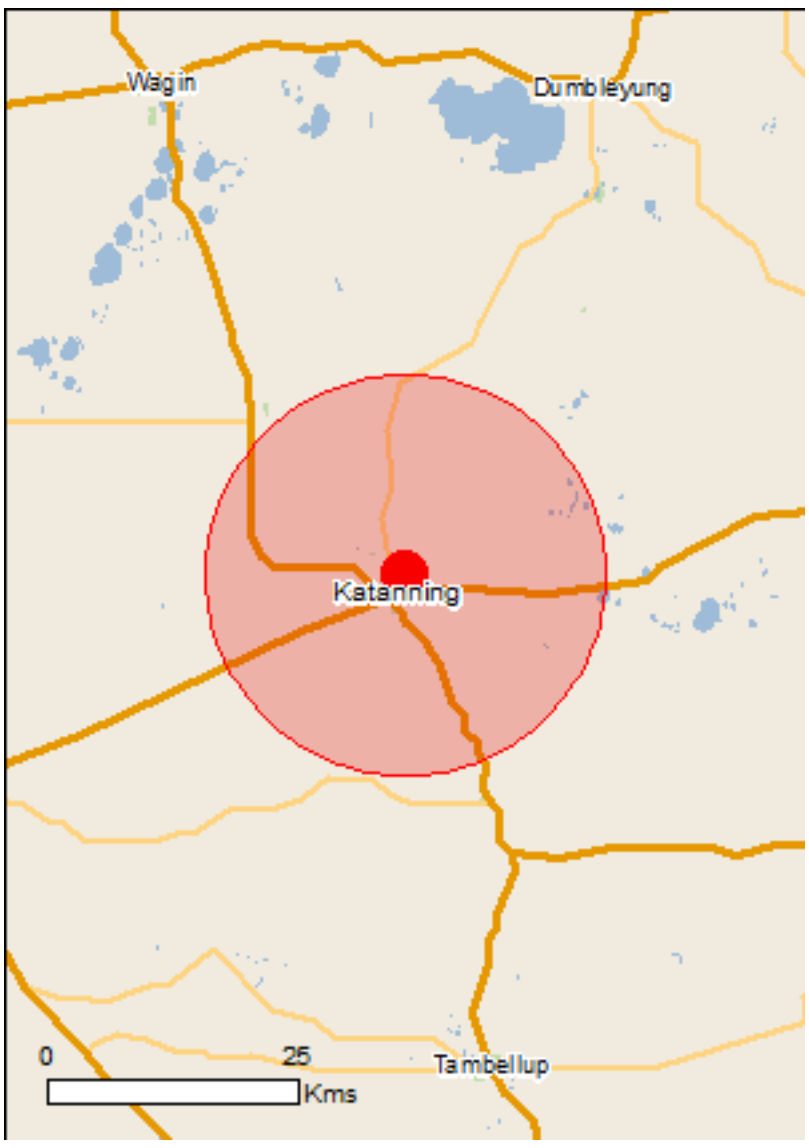
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

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: 13/10/14 19:11:57

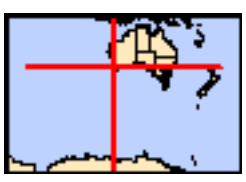

Summary
Details
Matters of NES
Other Matters Protected by the EPBC Act
Extra Information
Caveat
Acknowledgements


This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 20.0Km



# 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.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Areas: | None |
| Listed Threatened Ecological Communities: | None |
| Listed Threatened Species: | 16 |
| Listed Migratory Species: | 6 |

## 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 and the heritage values of a place on the Register of the National Estate.

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.

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.

| | |
|---|---|
| Commonwealth Land: | 2 |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 7 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Commonwealth Reserves Marine | None |

## Extra Information

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

| | |
|---|---|
| Place on the RNE: | 3 |
| State and Territory Reserves: | 6 |
| Regional Forest Agreements: | None |
| Invasive Species: | 22 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

# Details

## Matters of National Environmental Significance

| Listed Threatened Species | | [ Resource Information ] |
|---|---|---|
| Name | Status | Type of Presence |
| Birds | | |
| Calyptorhynchus latirostris | | |
| Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523] | Endangered | Breeding likely to occur within area |
| Leipoa ocellata | | |
| Malleefowl [934] | Vulnerable | Species or species habitat likely to occur within area |
| Rostratula australis | | |
| Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area |
| Mammals | | |
| Dasyurus geoffroii | | |
| Chuditch, Western Quoll [330] | Vulnerable | Species or species habitat known to occur within area |
| Phascogale calura | | |
| Red-tailed Phascogale [316] | Endangered | Species or species habitat known to occur within area |
| Plants | | |
| Adenanthos pungens subsp. effusus | | |
| Sprawling Spiky Adenanthos [10742] | Endangered | Species or species habitat likely to occur within area |
| Adenanthos pungens subsp. pungens | | |
| Spiky Adenanthos [19429] | Vulnerable | Species or species habitat may occur within area |
| Banksia oligantha | | |
| Wagin Banksia [20697] | Endangered | Species or species habitat likely to occur within area |
| Centrolepis caespitosa | | |
| [6393] | Endangered | Species or species habitat likely to occur within area |

| Name | Status | Type of Presence |
|---|---|---|
| Conostylis drummondii<br>Drummond's Conostylis [5885] | Endangered | Species or species habitat likely to occur within area |
| Darwinia collina<br>Yellow Mountain Bell [17296] | Endangered | Species or species habitat likely to occur within area |
| Darwinia oxylepis<br>Gillham's Bell [13188] | Endangered | Species or species habitat may occur within area |
| Hemigenia ramosissima<br>Branched Hemigenia [18568] | Critically Endangered | Species or species habitat likely to occur within area |
| Roycea pycnophylloides<br>Saltmat [21161] | Endangered | Species or species habitat likely to occur within area |
| Tribonanthes purpurea<br>Granite Pink [16244] | Vulnerable | Species or species habitat may occur within area |
| Verticordia fimbrilepis subsp. fimbrilepis<br>Shy Featherflower [24631] | 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 |
|---|---|---|
| Migratory Marine Birds | | |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Migratory Terrestrial Species | | |
| Haliaeetus leucogaster<br>White-bellied Sea-Eagle [943] | | Species or species habitat may occur within area |
| Merops ornatus<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Ardea alba<br>Great Egret, White Egret [59541] | | Breeding known to occur within area |
| Ardea ibis<br>Cattle Egret [59542] | | Species or species habitat likely to occur within area |
| Rostratula benghalensis (sensu lato)<br>Painted Snipe [889] | Endangered* | Species or species habitat likely to occur within area |

# Other Matters Protected by the EPBC Act

## Commonwealth Land [ Resource Information ]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

| Name |
|---|
| Commonwealth Land - |
| Defence - KATANNING TRAINING DEPOT |

## 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 |
|---|---|---|
| Birds | | |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Ardea alba<br>Great Egret, White Egret [59541] | | Breeding known to occur within area |
| Ardea ibis<br>Cattle Egret [59542] | | Species or species habitat likely to occur within area |
| Haliaeetus leucogaster<br>White-bellied Sea-Eagle [943] | | Species or species habitat may occur within area |
| Merops ornatus<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Rostratula benghalensis (sensu lato)<br>Painted Snipe [889] | Endangered* | Species or species habitat likely to occur within area |
| Thinornis rubricollis<br>Hooded Plover [59510] | | Species or species habitat known to occur within area |

# Extra Information

## Places on the RNE [ Resource Information ]

Note that not all Indigenous sites may be listed.

| Name | State | Status |
|---|---|---|
| Natural | | |
| Coblinine River Wetland Complex | WA | Indicative Place |
| Historic | | |
| Fairfield | WA | Indicative Place |
| Roller Flour Mill | WA | Registered |

## State and Territory Reserves [ Resource Information ]

| Name | State |
|---|---|
| Coblinine | WA |
| Johns Well | WA |
| Moojebing | WA |

| Name | State |
|---|---|
| Unnamed WA20987 | WA |
| Unnamed WA5339 | WA |
| Woodanilling | WA |

## 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 Resouces Audit, 2001.

| Name | Status | Type of Presence |
|---|---|---|
| **Birds** | | |
| Anas platyrhynchos<br>Mallard [974] | | Species or species habitat likely to occur within area |
| Columba livia<br>Rock Pigeon, Rock Dove, Domestic Pigeon [803] | | Species or species habitat likely to occur within area |
| Streptopelia senegalensis<br>Laughing Turtle-dove, Laughing Dove [781] | | Species or species habitat likely to occur within area |
| **Mammals** | | |
| Capra hircus<br>Goat [2] | | Species or species habitat likely to occur within area |
| Felis catus<br>Cat, House Cat, Domestic Cat [19] | | Species or species habitat likely to occur within area |
| Mus musculus<br>House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus<br>Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Rattus rattus<br>Black Rat, Ship Rat [84] | | Species or species habitat likely to occur within area |
| Sus scrofa<br>Pig [6] | | Species or species habitat likely to occur within area |
| Vulpes vulpes<br>Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| **Plants** | | |
| Asparagus asparagoides<br>Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473] | | Species or species habitat likely to occur within area |
| Carrichtera annua<br>Ward's Weed [9511] | | Species or species habitat may occur within area |
| Cenchrus ciliaris<br>Buffel-grass, Black Buffel-grass [20213] | | Species or species habitat may occur within area |
| Chrysanthemoides monilifera<br>Bitou Bush, Boneseed [18983] | | Species or species habitat may occur within area |

| Name | Status | Type of Presence |
| --- | --- | --- |
| Chrysanthemoides monilifera subsp. monilifera<br>Boneseed [16905] | | Species or species habitat likely to occur within area |
| Genista monspessulana<br>Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126] | | Species or species habitat likely to occur within area |
| Genista sp. X Genista monspessulana<br>Broom [67538] | | Species or species habitat may occur within area |
| Lycium ferocissimum<br>African Boxthorn, Boxthorn [19235] | | Species or species habitat likely to occur within area |
| Pinus radiata<br>Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780] | | Species or species habitat may occur within area |
| Rubus fruticosus aggregate<br>Blackberry, European Blackberry [68406] | | Species or species habitat likely to occur within area |
| Solanum elaeagnifolium<br>Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323] | | Species or species habitat likely to occur within area |
| Tamarix aphylla<br>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 |

# Coordinates

-33.67833 117.56222

# 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 Heritage and Register of National Estate properties, Wetlands of International 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-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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# Appendix B: Galt Geotechnics Report

# Report on

# PRELIMINARY GEOTECHNICAL STUDY
# PROPOSED RESIDENTIAL DEVELOPMENT
# PIESSE PARK
# KATANNING

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26 September 2014

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Table A1: Summary of Tests

**FIGURES**

Figure 1: Site and Location Plan

**APPENDICES**

APPENDIX A: SITE PHOTOGRAPHS

APPENDIX B: TEST PIT REPORTS

APPENDIX C: DYNAMIC CONE PENETROMETER TEST RESULTS

APPENDIX D: LABORATORY TEST RESULTS

APPENDIX E: UNDERSTANDING YOUR GEOTECHNICAL ENGINEERING REPORT

## 1. INTRODUCTION

This report presents the outcomes of a preliminary geotechnical study by Galt Geotechnics Pty Ltd (Galt) for the proposed residential subdivision at a site designated Piesse Park in Katanning ("the site"). The location of the site relative to the surrounding area is shown on Figure 1, Site and Location Plan.

The investigation was requested by Andrew Mack of Talis Consultants and authorised in a Sub Consultant Agreement dated 19 August 2014.

## 2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

Based on the supplied information, the site is irregular in shape and covers an area of approximately 19 ha. The lots that make up the site comprise:

- **Lot 1 Warren Road** (8.4 ha) – A large lake has been excavated within this lot and covers the majority of the lot. Only a small amount of water was present in this lake at the time of the investigation. This lake feeds a creek that runs through the southeast corner of the lot. A terraced amphitheatre is present towards the southeast corner of the lot. The balance of the lot comprises grassed areas with mature trees and footpaths.
- **Lot 79 Warren Road** (4.6 ha) – This lot comprises cleared grassed areas interspersed with mature trees and shrubs. The remnants of a large soil stockpile (spoil from the excavation of the lake) are present just to the north of the lake.
- **Lot 1 Synnott Avenue** (3.1 ha) – This lot is generally clear with a few trees. Correspondence with a Shire of Katanning (SoK) representative indicates that part of this area was previously used as a tip site to dispose of household waste. This material has been capped with a layer of controlled fill.
- **Lot 1015 Chipper Street** (1.1 ha) – This lot is lower-lying than the rest of the site and was quite boggy at the time of our investigation. The lot is generally clear with only a few mature trees present.
- **Lot 3 Synnott Avenue** (1.6 ha) – This lot currently contains a bowling club including a club building, car park and bowling greens. The balance of the lot to the southwest is clear and grassed, and at a lower elevation than the bowling club.

We understand that this site has been identified as one of five key growth precincts in the Katanning Structure Plans Project. A Development and Landscape Concept plan provided by the Shire of Katanning indicates the site is likely to comprise a residential development alongside landscaped parkland. The parkland will include open grassed areas, a large lake, a carpark, a viewing platform, boardwalks and walkways, and an amphitheatre.

## 3. PROJECT OBJECTIVES

The objectives of the study were to:

- broadly assess subsoil conditions across the site including identification of potential problem areas;
- assess the preliminary site classification in accordance with AS2870 (2011) "Residential Slabs and Footings";
- provide typical measures to improve the site classification to Class A or Class S, if appropriate;
- assess the requirement for subsoil drainage, if applicable;
- provide advice regarding suitable foundation systems;
- assess the potential and extent of any geotechnical problems which may be encountered during and after construction;
- assess geotechnical constraints and hazards to the proposed developments; and
- broadly assess the suitability of the soils at the site for potential on-site effluent disposal; and
- provide advice on any further studies required to fully address the objectives listed above.

## 4. FIELDWORK

Fieldwork for the investigation was conducted from 1 to 5 September 2014 and comprised:

- a walkover of the site;
- excavation of test pits at 12 locations (TP2-01 to TP2-12), extending to depths of between 1.0 m and 2.5 m;
- testing with a dynamic cone penetrometer (DCP) adjacent to each test pit, extending to depths of between 0.5 m and 1.0 m;
- percolation testing for effluent disposal assessment in accordance with Schedule G of the Health Department Regulations, at 3 locations (P2-01 and P2-02), at depths of between 0.2 m and 0.3 m; and
- collection of representative samples from selected test pits for inspection and possible laboratory testing.

**General**

A geotechnical engineer from Galt located the test positions, observed the test pitting, logged the materials encountered in the test pits, collected samples for inspection and possible laboratory testing, and performed the effluent disposal and penetrometer testing.

Photographs of the site are presented in Appendix A, Site Photographs. The test locations are shown on Figure 1, Site and Location Plan and details are summarised in Table A1, Summary of Tests, at the end of the text.

**Test Pits**

Test pits were excavated using a CAT 432D 8 tonne tractor mounted backhoe fitted with a 600 mm wide toothed bucket. The excavator was supplied and operated by Katanning Plant Hire.

Test pit reports are presented in Appendix B, Test Pit Reports, along with the method of soil description and cementation classification, and a list of explanatory notes and abbreviations used on the reports. Photographs of each test pit excavation are included with the test pit reports.

**Dynamic Cone Penetrometer Testing**

DCP tests were carried out adjacent to each test pit. Results of the DCP testing are presented in Appendix C, Dynamic Cone Penetrometer Test Results. The tests were conducted in accordance with test method AS 1289 6.3.2.

**Percolation Testing**

Two percolation tests were carried out at depths of between 0.2 m and 0.3 m below ground in representative areas of the site in accordance with Schedule 8 of the Department of Health Guidelines[1]. Tests were conducted in hand dug 0.3 m by 0.3 m square holes which was pre-soaked with 0.2 m head of water for about 30 minutes. The results of the percolation tests are summarised in Table 1.

**Table 1: Summary of Percolation Tests**

| Test Number | Rate (minutes to drop 25 mm) | Rate (mm/min) |
|---|---|---|
| P2-01 | 18.5 | 1.35 |
| P2-02 | >60 | <0.42 |

[1] Department of Health (1974), Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974, Department of Health, Health Act 1911

## 5. LABORATORY TESTING

Laboratory testing on soil samples was undertaken by Mining & Civil Geotest in their NATA accredited laboratory and comprised determination of:

- particle size distribution on 4 samples; and
- Atterberg limits and linear shrinkage on 4 samples.

Laboratory test results along with the test methods followed are presented in Appendix D, Laboratory Test Results and are summarised in Table 2, Summary of Laboratory Test Results.

**Table 2: Summary of Laboratory Test Results**

| Test Pit | Depth (m) | % Gravel | % Sand | % Fines | LL (%) | PI (%) | LS (%) |
|---|---|---|---|---|---|---|---|
| TP2-03 | 1.0 – 1.2 | 10 | 40 | 50 | 51 | 23 | 5.0 |
| TP2-06 | 1.2 – 1.4 | 0 | 45 | 55 | 28 | 18 | 13.0 |
| TP2-09 | 0.3 – 0.5 | 1 | 33 | 66 | 66 | 46 | 17.0 |
| TP2-12 | 0.7 – 0.9 | 3 | 56 | 41 | 38 | 27 | 8.0 |

LL: Liquid Limit PI: Plasticity Index LS: Linear Shrinkage
NO: Not Obtainable NP: Non-Plastic

## 6. SITE CONDITIONS

### 6.1 Geology

The Dumbleyung sheet of the 1:250,000 scale Geology series map indicates that the area is underlain by colluvium and minor alluvium described as *"silt, sand and gravel; generally on slopes adjoining rock and laterite outcrops"*.

Our investigation found that the site is underlain by clayey sand to sandy clay. Fill material (including uncontrolled fill) was also encountered across the site.

### 6.2 Subsurface Conditions

Based on the materials encountered within the test pits, the soils appear to be relatively consistent across the site and general site conditions can be summarised as comprising:

- FILL: Clayey SAND/Silty SAND (SC/SM), fine to coarse grained, approximately 15% to 30% non-plastic to high plasticity fines, grey/brown/white/orange brown, locally with some fine to medium grained gravel, trace organics and rootlets, localised refuse[3] (plastic bags), moist to dry, generally stiff to very stiff, locally present from the surface, extending to depths of between 0.4 m and 1.0 m; overlying
- Clayey SAND/Silty SAND/SAND (SC/SM/SP), fine to coarse grained, approximately 3% to 20% non-plastic to high plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, clayey material is generally soft to stiff, moist to wet, trace organics and rootlets, locally present from the surface, extending to depths of between 0.5 m and 1.2 m; overlying
- Clayey SAND/Sandy CLAY (SC/CI), fine to coarse grained sand, generally low to medium plasticity clay fines, locally high plasticity, pale brown to orange brown mottled grey, trace to some fine grained gravel, generally firm to hard, locally soft, moist to dry, locally present from surface[4], extending to depths of between 1.0 m and the maximum depth of investigation of 2.5 m; locally overlying

- Sandy CLAY (CI), medium to high plasticity, white locally mottled grey and red-brown, 30 to 40% fine to medium grained sand, trace quartz, locally present from as shallow as 0.6 m, extending to the maximum depth of investigation of 2.5 m.

**Notes**

1. Six of the test pits were terminated in very stiff to hard clayey material due to backhoe refusal or very slow progress.
2. Fill material was encountered within eight of the test pits.
3. Correspondence with personnel at the Shire of Katanning indicated that part of the site was originally used as a tip to dispose of household waste and that this material was capped with a layer of controlled fill. This uncontrolled fill was encountered within one test pit (TP2-04) towards the north of the site.
4. An area of material with elevated fines and high plasticity was encountered at the surface of the lower lying area in the vicinity of TP2-09. This material was generally in a soft state at the surface becoming firm with depth.

## 6.3 Groundwater

We are not aware of any publicly available information regarding the groundwater levels in the area.

Perched water was encountered within two of the test pits (TP2-01 and TP2-07) at depths of between 0.5 m and 0.8 m. Surficial ponding water was also observed at various locations around the site. We consider that the surficial water observed in these locations is likely to be perched groundwater over the surficial clayey soils. We note that rainfall had occurred in the area in the days preceding and during the fieldwork.

# 7. GEOTECHNICAL ASSESSMENT

## 7.1 Preliminary Site Classification

We consider that the site is geotechnically capable of supporting the proposed residential subdivision development.

We have assessed the site classification in accordance with AS2870-2011 “Residential Slabs and Footings”. We consider that a preliminary site classification of “Class M” is appropriate provided that the site preparation recommendations in Section 7.4 are adopted (this excludes the former tip area – see below).

**Note**: AS2870 is limited to single and double storey residential buildings and is not strictly applicable for the proposed development. This must be taken into account by the structural designers.

Improvement of the site to “Class S” is possible with importation and placement of inert granular fill to produce a total thickness of about 1.2 m of inert fill overlying clayey material below building footprints. This would require the importation of about 1.2 m of fill.

Improvement of the site to “Class A” is possible with importation and placement of inert sand fill to produce a total thickness of about 3.0 m of inert fill overlying clayey material below building footprints. This would require the importation of about 3.0 m of fill.

**Tip Area**

Uncontrolled fill containing general household waste was encountered in an isolated area in the northern part of the site. This material has been capped with a layer of Clayey SAND. In its current state, we consider a preliminary site classification of "Class P" is applicable to the area containing uncontrolled fill.

This area of the site is not suitable for development as a residential subdivision but may be used as landscaped areas, provided there are no environmental issues. We understand that no infrastructure is proposed within this area and that the area will be utilised as an open grassed area.

## 7.2 Shallow Footings

Buildings may be founded on shallow footings and on-ground slabs. Shallow footings may be designed assuming a maximum allowable bearing pressure of up to 180 kPa for footings with a minimum embedment depth of 0.5 m and a minimum plan dimension of 1 m. Settlements of footings will depend on the applied bearing pressures, however large settlements (>15 mm) for any given footing size are not anticipated (including differential settlements). These parameters assume that the site preparation measures outlined in Section 7.4 are followed.

We must be consulted for further advice on specific structures once details of these are available.

## 7.3 Excavations

Based on the soil profile encountered, we expect that shallow (1 m deep) excavations on site will be readily achievable using conventional earthmoving equipment (i.e. with a 10 tonne or larger excavator). Most of the test pits (excavated with an 8 tonne backhoe fitted with a toothed bucket) extended to more than 1.5 m depth.

Where deeper excavations are required, the use of a larger excavator (say 20+ tonne weight range, equipped with a 1 m rock bucket) will be prudent. We did not observe any granitic rock in our test pits, however it can be expected to underlie the clay.

Care must be exercised during excavations and appropriate safety measures adopted where necessary. Excavations must be battered at slopes no steeper than 1V:1H for temporary slopes and 1V:2H for permanent slopes in clayey soils. Even at these slope angles erosion and rilling may occur.

A geotechnical engineer must be consulted where there is any doubt regarding the stability or safety of unsupported excavations.

## 7.4 Site Preparation

Clayey soils can perform poorly (with respect to bearing capacity, settlement under load and trafficability) when wet. The following site preparation measures are aimed at minimising adverse effects and at improvement of the site in preparation for construction of on-ground slabs, shallow footings (including retaining wall footings) and pavements. Landscaped areas will not require this preparation.

Localised soft zones were present on the site, mainly in low-lying areas of the site where standing water had been present over the winter months (e.g. around TP2-09). These areas are not likely to be traffickable by construction equipment when wet, however we expect the clay strength to improve during the drier months. We recommend that the site is earthworked in the drier months (see below), however if it is not, then soft areas may need to be over-excavated to the level of underlying firm to stiff clay soil (which can be trafficked by construction machinery).

The following site preparation measures must be followed:

- Remove trees, vegetation and topsoil (100 mm topsoil strip will be adequate, or as otherwise necessary to remove all roots) from the site, including grubbing out of roots.
- Where any soft zones are present which do not respond to drying-out and compaction, over-excavate them to expose the underlying firm to stiff (or stiffer) clayey soils which can be trafficked by construction equipment.
- Shape the surface of the site such that run-off is directed away from buildings and does not pond adjacent to footings or pavements.
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas).
- Moisture condition exposed soil and proof compact to the level of compaction specified in Section 7.5 to a depth of at least 0.3 m below the surface.
- Where fill is required to build up levels, use approved fill as specified in Section 7.6, placed and compacted in layers of no greater than 300 mm loose thickness.

It is strongly recommended that earthworks on this site be done in drier months of the year (November to April). Given the clayey nature of the subsurface soils, we anticipate that construction difficulties may be encountered if earthworks are undertaken during the wetter times of the year. Heaving and rutting of the clayey soils may occur during wet periods. Furthermore, the base of any excavation will soften if water is allowed to pond.

Additionally, compaction and trafficking of the site must NOT be attempted when the site is wet (i.e. following rainfall or if the site has been over-wetted during moisture conditioning). It will be necessary to let the site dry out or trim wet soil off to expose underlying drier material. Attempting to traffic or compact the wet clayey soils is likely to result in soil disturbance and significant softening of the clayey soils.

## 7.5 Compaction

### 7.5.1 General

Over-excavation and replacement of loose materials must be carried out where the minimum density cannot be achieved.

Fill must be placed in horizontal layers of not greater than 0.3 m loose thickness. Each layer must be compacted by suitable compaction equipment, and carefully controlled to ensure even compaction over the full area and depth of each layer.

**TESTING**

After compaction, verify that the required level of compaction has been achieved by testing within any fill and to a minimum depth of 0.9 m below foundations.

- on each lift of fill at the rate of 1 test per 500 $m^3$;
- at each spread footing location;
- at 7.5 m centres below on-ground slabs; and
- at 10 m centres on pavement subgrades.

### 7.5.2 Clayey Soils

Clayey soils comprise clay and any sand or gravel with more than 10% clay fines (that is, including most of the materials encountered on site). Clayey soils, where used as fill, must be moisture conditioned and compacted to a

minimum dry density ratio of 95% SMDD (standard maximum dry density, AS1289.5.1.1). Compaction control must be done with the nuclear density gauge in accordance with AS1289.5.8.1.

Realistically compaction control using the NDG can only be conducted to about 0.45 m depth. Compaction control of soils containing greater than 5% fines below this depth is best conducted using a dynamic cone penetrometer (DCP) in accordance with AS1289.5.3.2. We can advise on developing an on-site calibration to determine the site-specific blow count required to achieve the minimum dry density ratio, if required.

### 7.5.3 Sand Soils

Approved granular fill must be compacted using suitable compaction equipment to achieve a dry density ratio of at least 95% of maximum modified dry density (MMDD) as determined in accordance with AS 1289 5.2.1.

If sand is used as fill, a Perth sand penetrometer (PSP) may be used for compaction control. We consider that the following blow counts to correspond to a dry density ratio of 95% MMDD:

- 0-150 mm: SET
- 150-450 mm: 10
- 450-750 mm: 12
- 750-1050 mm: 13 (or 750-900 mm: 7)

If difficulty arises in achieving the specified PSP blow counts, then a calibration must be established between PSP blow count and the *in situ* density. This will allow confirmation of the blow count required to achieve the required density ratio.

**Note:** Use of the PSP is not appropriate for gravelly soils and where the fines content of the sand exceeds about 5%. In such cases, density testing must be done using a nuclear density gauge in accordance with AS1289.5.8.1-2007.

## 7.6 Approved Fill

Imported granular fill must comply with the material requirements as stated in AS3798 (2007), "Guidelines on Earthworks for Commercial and Residential Developments". Any organic-rich sand or sand containing significant proportions of fines (material less than 0.075 mm in size) must not be used.

The opportunity to use any site-derived sand for structural fill is limited. However, we consider that the in-situ clayey material can potentially be used as structural fill, provided that the material is suitably moisture conditioned and compacted, as described in Section 7.5.2.

## 7.7 Subsoil Drainage

Perched and ponding water were encountered during our investigation. Due to the low permeability of the clayey subsurface soils, rainfall runoff is expected to pond on the ground surface during the wetter parts of the year. This may cause difficulties during construction in the way of:

- heaving and rutting of saturated clayey soils when trafficked; and
- softening of clayey soils when water is allowed to pond at the base of excavations.

We therefore recommend that earthworks are carried out in the summer months, even though summer earthworks has its own issues, such as dust control and rapid drying out of soils.

We also suggest that the area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.

Subsoil drains may also be used around the perimeter of buildings (or in a network below lots to communal drainage) to facilitate drainage away from the structure. However, we note that this method of drainage will not be as effective as elevating the proposed buildings with free draining sand fill above the clayey subgrade.

## 7.8 Effluent Disposal

The percolation test results within the **upper fill material** range between 18 minutes and greater than 60 minutes for water to fall 25 mm when testing was carried out in accordance with Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1972, Schedule 8.

We consider the underlying clayey material unsuitable for onsite effluent disposal by percolation (but this could probably be improved with importation and placement of an adequate thickness of granular fill).

# 8. FURTHER STUDIES

The work carried out to date was intended to provide a general assessment of the site. Detailed investigations must be carried out prior to development to confirm the site classification. These should address the following issues:

- heave potential of the clay;
- presence of groundwater;
- excavatability;
- presence and nature of waste materials (e.g. within uncontrolled fill area);
- presence of any contamination within the uncontrolled fill area; and
- allowable bearing capacity and estimated settlements for shallow foundations.

On this site, investigations would generally comprise test pits and standard soils testing such as:

- particle size distribution,
- Atterberg limits and linear shrinkage;
- maximum dry density and moisture determinations;
- California bearing ratio (CBR); and
- shrink-swell index.

## 9. CLOSURE

We draw your attention to Appendix E of this report, Understanding Your Geotechnical Engineering Report. The information provided within is intended to inform you as to what your realistic expectations of this report should be. Guidance is also provided on how to minimise risks associated with groundworks for this project. This information is provided not to reduce the level of responsibility accepted by Galt, but to ensure that all parties who rely on this report are aware of the responsibilities each assumes in so doing.

**GALT GEOTECHNICS PTY LTD**

Rick Piovesan CPEng

Geotechnical Engineer

James Harris

Geotechnical Engineer

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# Tables



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ABN: 73 292 586 155

**Table A1: Summary of Tests**

| Test Names | Test Depth (m) | Depth to Groundwater (m) | Reason for Termination | Stratigraphy |
|---|---|---|---|---|
| TP2-01 | 2.2 | 2.2 (P)[1] | Slow progress | FILL: Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP2-02 | 1.8 | GNE[2] | Slow progress | Silty/Clayey SAND overlying Clayey SAND |
| TP2-03 | 2.5 | GNE | Target depth | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP2-04 | 2.5 | GNE | Target depth | UNCONTROLLED FILL overlying Clayey SAND overlying Sandy CLAY |
| TP2-05 | 2.5 | GNE | Target depth | FILL: Clayey SAND overlying SAND overlying Clayey SAND |
| TP2-06 | 2.5 | GNE | Target depth | FILL: Clayey Gravelly SAND overlying Sandy CLAY |
| TP2-07 | 1.0 | 0.5 (P) | Slow progress | Silty SAND overlying Clayey SAND |
| TP2-08 | 2.5 | GNE | Target depth | FILL: Clayey SAND overlying Clayey SAND |
| TP2-09 | 2.0 | GNE | Slow progress | Sandy CLAY |
| TP2-10 | 2.0 | GNE | Slow progress | FILL: Silty/Clayey SAND overlying Clayey SAND |
| TP2-11 | 2.5 | GNE | Target depth | FILL: Clayey SAND overlying Clayey SAND |
| TP2-12 | 2.1 | GNE | Slow progress | FILL: Clayey SAND overlying Clayey SAND |

**Notes**
1. Perched groundwater
2. GNE: Groundwater not encountered



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# Figures



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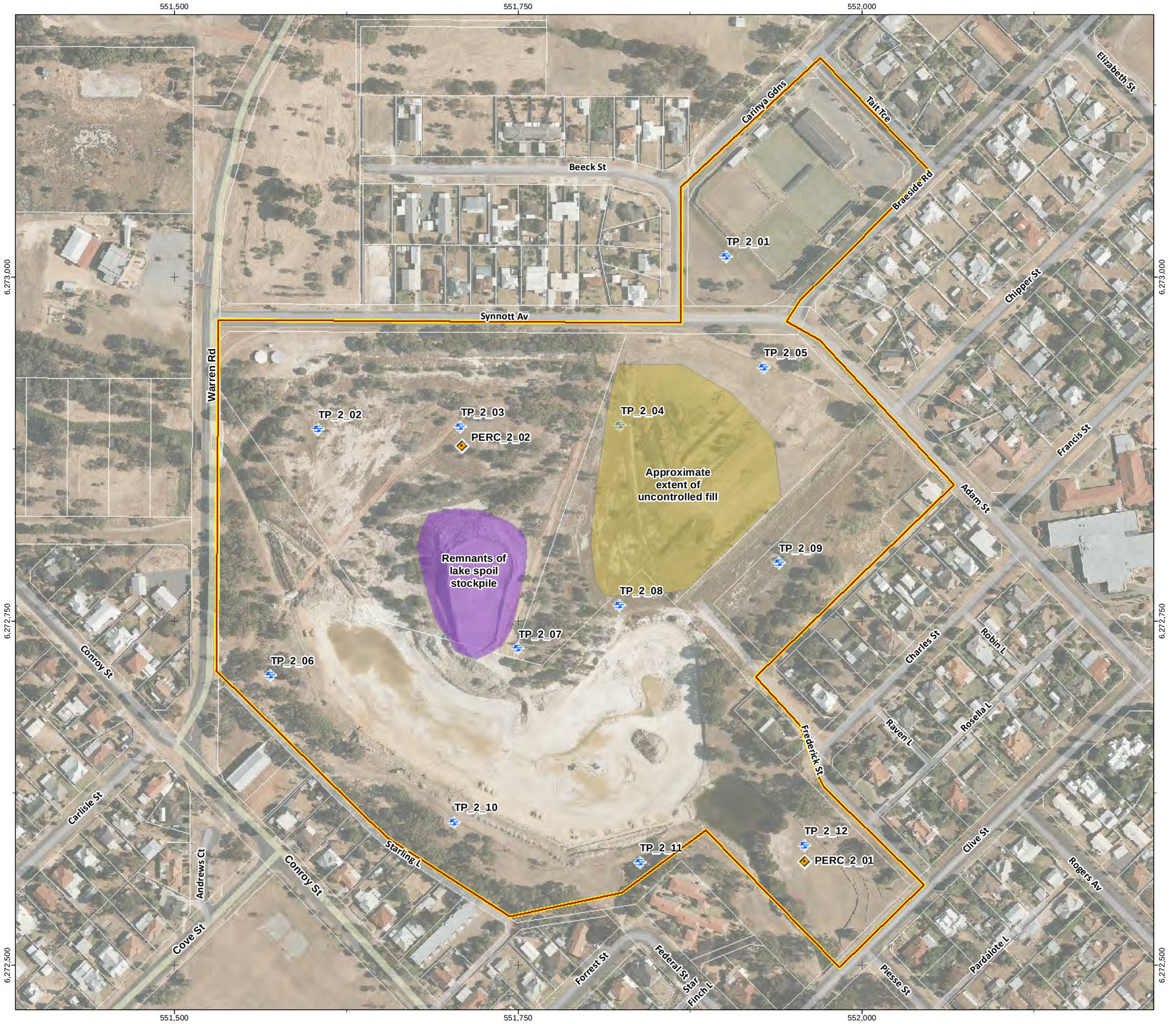


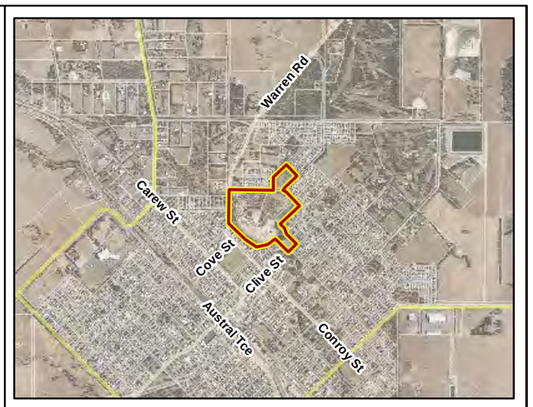


**Legend**

- Site Boundary
- Percolation Test
- Test Pit

N

0 40 80 120 160 200

Meters

| | | |
|---|---|---|
| SCALE | 1:2,750 | (A3) |
| DRAWN | DAC | |
| DATE DRAWN | 26/09/2014 | |
| CHECKED | JH | |
| DATE CHECKED | 26/09/2014 | |
| PROJECTION | GDA 1994 MGA Zone 50 | |

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| | |
|---|---|
| CLIENT | **TALIS CONSULTANTS** |
| PROJECT | PROPOSED RESIDENTIAL DEVELOPMENT |
| LOCATION | PIESE PARK<br>KATANNING |
| TITLE | SITE & LOCATION PLAN |

| Job No | Fig No | Rev |
|---|---|---|
| J1401161-02 | FIGURE 1 | **A** |

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# Appendix A: Site Photographs



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**Photograph 1: Looking south from TP2-04 across capped uncontrolled fill area**

**Photograph 2: Backhoe operating at TP2-04 location**

Photograph 3: Looking southwest from near TP2-08 across excavated lake

Photograph 4: Looking northeast across lower lying area near TP2-09

**Photograph 5: Creek running through southern end of site**

**Photograph 6: Looking east from TP2-07 location**

# Appendix B: Test Pit Reports



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# TEST PIT: TP2-01

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551901 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273015 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | | | | | SM | FILL: Silty SAND, fine to coarse grained, brown, 15-20% silt fines, trace rootlets | M | F | |
| | | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, grey-brown, 15-25% low to medium plasticity fines | W | | |
| | F-H | | 1.0 | | | | | | CI | Sandy CLAY: low to medium plasticity fines, grey mottled orange-brown, 20-30% fine grained sand | M | St - VSt | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.20 m<br>Slow progress<br>Groundwater encountered at 0.8m | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-02

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551604 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272890 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 – 0.5 | | | | | | SM / SC | Silty SAND/Clayey SAND: fine to coarse grained, grey-brown, 10-15% low plasticity fines, trace rootlets | M | F - St | |
| | F-H | | 0.5 – 1.5 | | | | | | SC | Clayey SAND: fine to coarse grained, pale brown-grey, 20-30% low to medium plasticity fines, trace fine grained gravel | D | St - VSt | |
| | | | 1.5 – 3.0 | | | | | | | Hole terminated at 1.80 m<br>Slow progress<br>Groundwater not encounted | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP2-03

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551708 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272891 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM | Silty SAND: fine to coarse grained, brown, 20-30% silt fines, trace rootlets | M | MD | |
| | | | 0.5 | | | | | | | | | | |
| | F | | | | | | | | SC | Clayey SAND: fine to coarse grained, grey, 20-30% low to medium plasticity fines, | | F | |
| | | | 1.0 | | B(TP2-03-01) | | | | | | | | |
| | F-H | | 1.5 | | | | | | CI | Sandy CLAY: medium to high plasticity, white, 40% fine to coarse grained sand, trace quartz | | St - VSt | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encountered | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP2-04

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551824 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272892 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | FILL: Clayey SAND, fine to medium grained, pale brown, low to medium plasticity fines | M | St - VSt | |
| | | | 0.5 | | | | | | | As above, brown, trace refuse (plastic bags) | | | |
| | | | 1.0 | | | | | | SC | Clayey SAND: fine to medium grained, brown, low to medium plasticity fines, trace fine grained gravel | | | |
| | F | | 1.5 | | | | | | CL-CI | Sandy CLAY: medium plasticity, white, 30-40% fine to coarse grained sand, trace quartz | D | VSt | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP2-05

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551928 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272935 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | FILL: Clayey SAND, fine to coarse grained, grey/brown/white, medium to high plasticity fines, trace rootlets (possible fill) | M | St - VSt | |
| | | | 0.5 | | | | | | SP | SAND, fine to coarse grained, dark grey becoming grey, with some clay fines | | | |
| | F-H | | 1.0 | | B(TP2-05-01) | | | | SC | Clayey SAND: fine to coarse grained, orange mottled grey, 40% medium plasticity fines, trace fine grained gravel | D | VSt | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP2-06

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551605 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272758 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | H | | 0.0 – 0.5 | | | | | | SC | FILL: Clayey Gravelly SAND, fine to coarse grained, brown, low to medium plasticity fines, fine to medium grained gravel, trace rootlets, trace asphalt fragments | D | D - VD | |
| BH | E | | 0.5 – 2.5 | | B(TP2-06-01) | | | | CI | Sandy CLAY: medium plasticity, grey, 30-40% fine grained sand | M | F - St | |
| | | | 2.5 – 3.0 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-07

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551717 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272747 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, 25-30% silt fines, trace roots/rootlets | M | MD | |
| | F-H | | 0.5 | | B(TP2-07-01) | | | | SC | Clayey SAND: fine to coarse grained, orange mottled grey, 20-40% medium to high plasticity fines, trace fine grained gravel, highly desiccated below 0.7 m | W<br>D | F<br>H | |
| | | | 1.0 | | | | | | | Hole terminated at 1.00 m<br>Slow progress on hard clay<br>Groundwater encountered at 0.5m | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-08

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551823 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272762 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E-F | | 0.0 – 1.0 | | | | | | SC | FILL: Clayey SAND, fine to coarse grained, grey/orange/brown, low to high plasticity fines, trace rootlets, trace fine grained gravel at surface (possibly fill) | M | | |
| | F-H | | 1.0 – 2.5 | | | | | | SC | Clayey SAND: fine to medium grained, grey, medium plasticity fines, clay content increasing with depth to Sandy CLAY | D | | |
| | | | 2.5 – 3.0 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-09

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551939 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272792 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP2-09-01) | | | | CI | Sandy CLAY: fine to coarse grained sand, medium to high plasticity fines, dark grey becoming grey, trace rootlets | M | S | |
| | | | 0.5 | | | | | | | | | F | |
| | F | | 1.0 | | | | | | CI | Sandy CLAY: high plasticity, white, 30-40% fine to coarse grained sand, trace quartz | | St - VSt | |
| | H | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 2.00 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-10

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551703 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272604 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC-SM | FILL: Silty SAND/Clayey SAND, fine to coarse grained, brown/grey/orange, 20-30% low plasticity fines, trace rootlets/roots | | St | |
| | | | 0.5 | | | | | | | | | | |
| | F | | 1.0 | | | | | | SC | Clayey SAND: fine to coarse grained, pale brown locally mottled orange, medium plasticity fines, trace fine grained gravel | M | F - S | |
| | | | 1.5 | | | | | | | | | St - VSt | |
| | H | | 2.0 | | | | | | | | D | H | |
| | | | | | | | | | | Hole terminated at 2.00 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-11

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551833 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272634 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | FILL: Clayey SAND, fine to coarse grained, grey/brown, 20-30% low to medium plasticity fines, trace fine grained gravel, trace rootlets | M | St | |
| | | | 0.5 | | | | | | | | | | |
| | | | 1.0 | | | | | | SC | Clayey SAND: fine to coarse grained, grey, 20-30% medium plasticity fines | | F - St | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP2-12

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 551957 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272587 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Piesse Park - Proposed Residential Development | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, brown, 15-30% low to medium plasticity fines, trace rootlets (possibly fill) | D | F - St | |
| | F | | 0.5 | | B(TP2-12-01) | | | | SC | Clayey SAND: fine to coarse grained, brown, 30-40% low to medium plasticity fines | M | St | |
| | | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | As above, becoming orange-brown | | | |
| | H | | 2.0 | | | | | | | | D | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.10 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_002.GPJ <<DrawingFile>> 25/09/2014 16:16 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# Appendix C: Dynamic Cone Penetrometer Test Results



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2/39 Flynn St, WEMBLEY WA 6014

ABN: 73 292 586 155

**DYNAMIC CONE PENETROMETER FIELD TEST DATA**
**(AS12896.3.2)**

| | | | |
|---|---|---|---|
| **Client:** | Talis Consultants | **Job No:** | J1401161 |
| **Project:** | Proposed Residential Subdivision | **Date:** | 1 September 2014 |
| **Location:** | Piese Park, Katanning | **Engineer:** | JH |

| Test No: | DCP01 | DCP02 | DCP03 | DCP04 | DCP05 | DCP06 | DCP07 | DCP08 | DCP09 |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP2-01 | TP2-02 | TP2-03 | TP2-04 | TP2-05 | TP2-06 | TP2-07 | TP2-08 | TP2-09 |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | - | - | - | - | - | - |
| 100-200 | 2 | 2 | 2 | 2 | 5 | 3 | 3 | 2 | 2 |
| 200-300 | 1 | 3 | 1 | 2 | 8 | 5 | 5 | 1 | 0 |
| 300-400 | 2 | 3 | 2 | 3 | 7 | 5 | 3 | 3 | 1 |
| 400-500 | 2 | 4 | 2 | 4 | 8 | 2HB | 5 | 4 | 1 |
| 500-600 | 2 | 3 | 2 | 4 | 4 | | 3 | 3 | 2 |
| 600-700 | 2 | 3 | 2 | 4 | 4 | | 3 | 4 | 2 |
| 700-800 | 3 | 5 | 3 | 5 | 5 | | 2 | 3 | 4 |
| 800-900 | 3 | 5 | 2 | 5 | 6 | | 2HB | 4 | 5 |
| 900-1000 | | | | | | | | | 6 |

| Test No: | DCP10 | DCP11 | DCP12 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP2-10 | TP2-11 | TP2-12 | | | | | | |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | | | | | | |
| 100-200 | 3 | 3 | 5 | | | | | | |
| 200-300 | 3 | 7 | 10 | | | | | | |
| 300-400 | 2 | 7 | 6 | | | | | | |
| 400-500 | 2 | 7 | 3 | | | | | | |
| 500-600 | 2 | 8 | 4 | | | | | | |
| 600-700 | 1 | 5 | 3 | | | | | | |
| 700-800 | 1 | 5 | 4 | | | | | | |
| 800-900 | 1 | 4 | 4 | | | | | | |
| 900-1000 | 2 | | | | | | | | |

| Test No: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | | | | | | | | | |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | | | | | | | | | |
| 100-200 | | | | | | | | | |
| 200-300 | | | | | | | | | |
| 300-400 | | | | | | | | | |
| 400-500 | | | | | | | | | |
| 500-600 | | | | | | | | | |
| 600-700 | | | | | | | | | |
| 700-800 | | | | | | | | | |
| 800-900 | | | | | | | | | |
| 900-1000 | | | | | | | | | |

| Test No: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | | | | | | | | | |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | | | | | | | | | |
| 100-200 | | | | | | | | | |
| 200-300 | | | | | | | | | |
| 300-400 | | | | | | | | | |
| 400-500 | | | | | | | | | |
| 500-600 | | | | | | | | | |
| 600-700 | | | | | | | | | |
| 700-800 | | | | | | | | | |
| 800-900 | | | | | | | | | |
| 900-1000 | | | | | | | | | |

Dynamic Cone Penetrometer tests done in accordance with AS 1289.6.3.2
HB: Hammer bounce (refusal)
HW: Penetration due to hammer weight only
R: Refusal

# Appendix D: Laboratory Test Results



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2/39 Flynn St, WEMBLEY WA 6014
ABN: 73 292 586 155

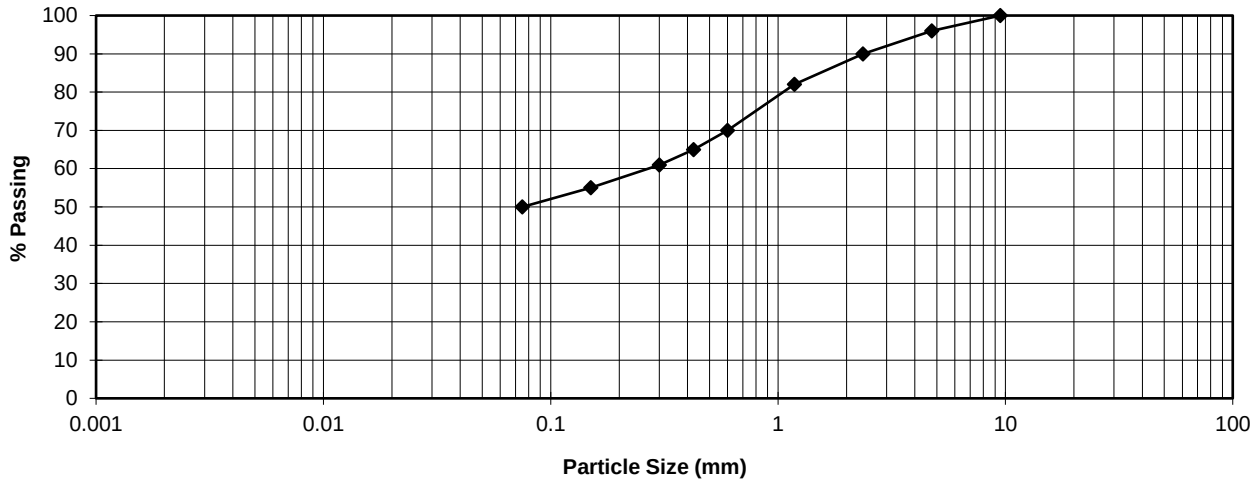
# Particle Size Distribution & Plasticity Index tests

**Mining & Civil**
**Geotest Pty Ltd**
**unit1/1 Pusey Road, Jandakot, WA 6164**
**Ph (08) 9414 8022 Fax (08) 9414 8011**
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3404 |
| **Sample No:** | P14/3404 |
| **Issue Date:** | 20 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Piese Park, Katanning

Sample location: TP2-03
Sample Depth (m): 1.0-1.2




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 96 |
| 2.36 | 90 |
| 1.18 | 82 |
| 0.600 | 70 |
| 0.425 | 65 |
| 0.300 | 61 |
| 0.150 | 55 |
| 0.075 | 50 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 51 | % |
| **Plastic limit 3.2.1** | 28 | % |
| **Plasticity index 3.3.1** | 23 | % |
| **Linear shrinkage 3.4.1** | 5.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Approved signature

Matthew van Herk
AS PSDPI May 2009

# Particle Size Distribution & Plasticity Index tests

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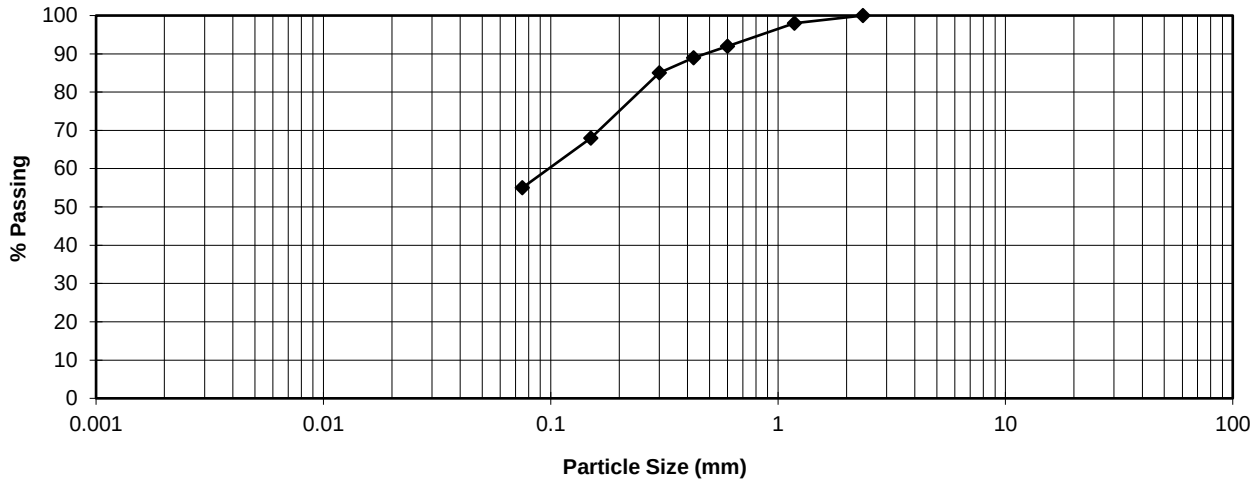
**Ph (08) 9414 8022 Fax (08) 9414 8011**
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3405 |
| **Sample No:** | P14/3405 |
| **Issue Date:** | 20 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Piese Park, Katanning

Sample location: TP2-06
Sample Depth (m): 1.2 - 1.4




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | |
| 2.36 | 100 |
| 1.18 | 98 |
| 0.600 | 92 |
| 0.425 | 89 |
| 0.300 | 85 |
| 0.150 | 68 |
| 0.075 | 55 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 28 | % |
| **Plastic limit 3.2.1** | 10 | % |
| **Plasticity index 3.3.1** | 18 | % |
| **Linear shrinkage 3.4.1** | 13.0 | % |

**Cracked** ☐
**Curled** ☑

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Matthew van Herk

# Particle Size Distribution & Plasticity Index tests

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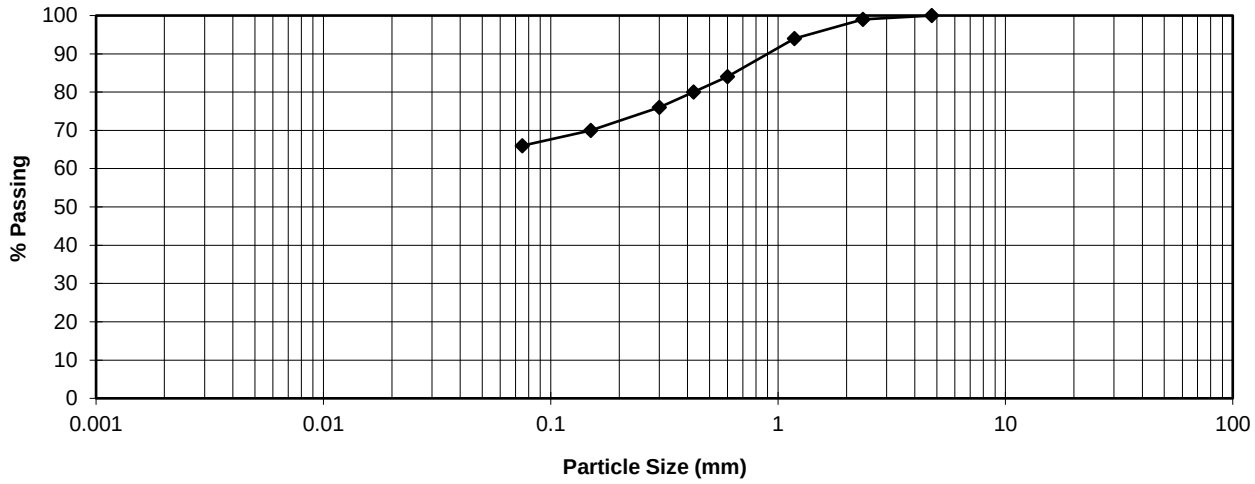
**Ph (08) 9414 8022 Fax (08) 9414 8011**
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3406 |
| **Sample No:** | P14/3406 |
| **Issue Date:** | 20 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Piese Park, Katanning

Sample location: TP2-09
Sample Depth (m): 0.3-0.5




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 99 |
| 1.18 | 94 |
| 0.600 | 84 |
| 0.425 | 80 |
| 0.300 | 76 |
| 0.150 | 70 |
| 0.075 | 66 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 66 | % |
| **Plastic limit 3.2.1** | 20 | % |
| **Plasticity index 3.3.1** | 46 | % |
| **Linear shrinkage 3.4.1** | 17.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Approved signature

Matthew van Herk

# Particle Size Distribution & Plasticity Index tests

**Mining &**
**Civil**
**Geotest Pty Ltd**
**unit1/1 Pusey Road, Jandakot, WA 6164**
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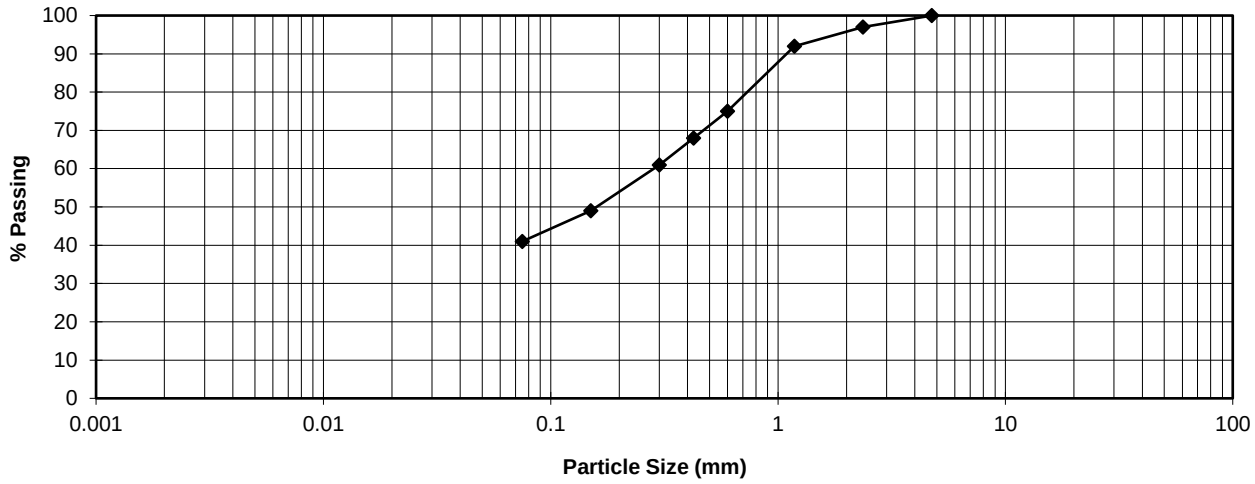
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3407 |
| **Sample No:** | P14/3407 |
| **Issue Date:** | 20 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Piese Park, Katanning

Sample location: TP2-12
Sample Depth (m): 0.7-0.9




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 97 |
| 1.18 | 92 |
| 0.600 | 75 |
| 0.425 | 68 |
| 0.300 | 61 |
| 0.150 | 49 |
| 0.075 | 41 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 38 | % |
| **Plastic limit 3.2.1** | 11 | % |
| **Plasticity index 3.3.1** | 27 | % |
| **Linear shrinkage 3.4.1** | 8.0 | % |

**Cracked** ☐
**Curled** ☑

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

NATA
WORLD RECOGNISED ACCREDITATION

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Matthew van Herk
AS PSDPI May 2009

# Appendix E: Understanding Your Geotechnical Engineering Report



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# UNDERSTANDING YOUR GEOTECHNICAL ENGINEERING REPORT

GALT FORM PMP11 Rev1

## 1. EXPECTATIONS OF A GEOTECHNICAL ENGINEERING REPORT

This document has been prepared to clarify what is and is not provided in your geotechnical report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with geotechnical conditions.

Geotechnical engineering is a less exact science than other engineering disciplines. We include this information to help you understand where our responsibilities as geotechnical engineers begin and end, to help the client recognise his responsibilities and risks. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of geotechnical problems and we can help you to manage your risk.

## 2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following :

- The project objectives as we understood them and as described in this report;
- the specific site mentioned in this report; and
- the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this geotechnical report if any of the following conditions apply:

- the report was not written for you;
- the report was not written for the site specific to your development;
- the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your geotechnical engineering report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the design team and by being able to review work produced by other members of the design team which relies on geotechnical information provided in our report.

## 3. GEOTECHNICAL ENGINEERING LOGS

Our reports often include logs of intrusive and non-intrusive geotechnical investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

## 4. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party as a consequence of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

## 5. CHANGE IN SUBSURFACE CONDITIONS

The geotechnical recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including as a result of anthropogenic events (such as construction on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

## 6. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use engineering judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from engineering judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

## 7. ENVIRONMENTAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not included. The investigation techniques used by us in developing our report differ from those for an environmental investigation. Our report was not prepared with environmental considerations in mind and it is the client's responsibility to satisfy himself that environmental considerations have been taken into account for the site. If you require guidance on how to proceed on evaluating environmental risk at the site, we can provide further information and contacts.

# Report on

# PRELIMINARY GEOTECHNICAL STUDY
# PROPOSED INDUSTRIAL DEVELOPMENT
# WAMMCO SITE
# KATANNING

**Submitted to:**

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J1401161 003 R Rev0

26 September 2014

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## 1. INTRODUCTION

This report presents the outcomes of a preliminary geotechnical study by Galt Geotechnics Pty Ltd (Galt) for the proposed industrial subdivision at a site designated WAMMCO (West Australian Meat Marketing Co-operative) in Katanning ("the site"). The location of the site relative to the surrounding area is shown on Figure 1, Site and Location Plan.

The investigation was requested by Andrew Mack of Talis Consultants and authorised in a Sub Consultant Agreement dated 19 August 2014.

## 2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

Based on the supplied information, the site is irregular in shape and covers an area of about 392 ha. The lots that make up the site comprise:

- **Lot 1 Great Southern Highway** (12 ha) – Shire land. This lot is bisected by Henry Street which runs southwest to northeast. Part of the lot is currently under crop. The balance of the site is clear and grassed. A small dam is also present on the lot.
- **41 Crosby Street** (19 ha) – Shire land. The majority of this lot is currently under crop.
- **5 and 6 Hassell Street** (8 ha) – Shire land. This lot is generally clear and grassed. A vacated residential building is present on the lot.
- **Lot 2809 Baker Road** (77 ha) – Shire land. The majority of this lot is currently under crop. A clear area to the east is low lying and quite boggy at the time of investigation.
- **27983 Great Southern Highway** (250 ha) – WAMMCO. The bulk of the lot comprises clear, grassed pastoral land. Several paddocks were under crop during our investigation. Office and warehouse buildings are present towards the centre of the lot. Several dams are present across the lot.
- **53 Trimmer Road** (26 ha) – Shire land. Currently heavily vegetated with mature trees. A few tracks cut across the lot.

A creek line runs through the site from west to east bisecting the site. Also, Baker road cuts the site into two with WAMMCO land to the north of Baker Road and Shire owned land to the south.

We understand that this site has been identified as one of five key growth precincts in the Katanning Structure Plans Project. Light industrial development is proposed for the site.

## 3. PROJECT OBJECTIVES

The objectives of the study were to:

- broadly assess subsoil conditions across the site including identification of potential problem areas;
- assess the preliminary site classification in accordance with AS2870 (2011) "Residential Slabs and Footings";
- provide typical measures to improve the site classification to Class A or Class S, if appropriate;
- assess the requirement for subsoil drainage, if applicable;
- provide advice regarding suitable foundation systems;
- assess the potential and extent of any geotechnical problems which may be encountered during and after construction;
- assess geotechnical constraints and hazards to the proposed developments; and
- broadly assess the suitability of the soils at the site for potential on-site effluent disposal; and
- provide advice on any further studies required to fully address the objectives listed above.

## 4. FIELDWORK

Fieldwork for the investigation was conducted from 1 to 5 September 2014 and comprised:

- a walkover of the site;
- excavation of test pits at 30 locations (TP3-01, TP3-03, TP3-05, TP3-07 to TP3-11, TP3-16, TP3-19 to TP3-32, TP3-34 to TP3-40), extending to depths of between 0.9 m and 2.5 m;
- testing with a dynamic cone penetrometer (DCP) adjacent to each test pit, extending to depths of between 0.5 m and 0.9 m;
- percolation testing for effluent disposal assessment in accordance with the Health Department Regulations, at 4 locations (P3-01 to P3-04), at depths of between 0.3 m and 0.4 m; and
- collection of representative samples from selected test pits for inspection and possible laboratory testing.

**General**

A geotechnical engineer from Galt located the test positions, observed the test pitting, logged the materials encountered in the test pits, collected samples for inspection and possible laboratory testing, and performed the percolation testing and penetrometer testing.

**Note:** Ten proposed test pits (TP3-02, TP3-04, TP3-06, TP3-12 to TP3-15, TP3-17, TP3-18 and TP3-33) could not be excavated due to access constraints, such as fields under crop, boggy conditions or existing WAMMCO infrastructure.

Photographs of the site are presented in Appendix A, Site Photographs. The test locations are shown on Figure 1, Site and Location Plan and details are summarised in Table A1, Summary of Tests, at the end of text.

**Test Pits**

Test pits were excavated using a CAT 432D 8 tonne tractor mounted backhoe fitted with a 600 mm wide toothed bucket. The excavator was supplied and operated by Katanning Plant Hire.

Test pit reports are presented in Appendix B, Test Pit Reports, along with the method of soil description and cementation classification, and a list of explanatory notes and abbreviations used on the reports. Photographs of each test pit excavation are included with the test pit reports.

**Dynamic Cone Penetrometer Testing**

DCP tests were carried out adjacent to each test pit. Results of the DCP testing are presented in Appendix C, Dynamic Cone Penetrometer Test Results. The tests were conducted in accordance with test method AS 1289 6.3.2.

**Percolation Testing**

Two percolation tests were carried out at depths of between 0.25 m and 0.3 m below ground in representative areas of the site in accordance with Schedule 8 of the Department of Health Guidelines[1]. Tests were conducted in hand dug 0.3 m by 0.3 m square holes which was pre-soaked with 0.2 m head of water for about 30 minutes. The results of the percolation tests are summarised in Table 1.

[1] Department of Health (1974), Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974, Department of Health, Health Act 1911

**Table 1: Summary of Percolation Tests**

| Test Number | | Rate (minutes to drop 25 mm) | Rate (mm/min) |
|---|---|---|---|
| P3-01 | 1 | 35.5 | 0.7 |
| P3-02 | 1 | 23.5 | 1.0 |
| P3-03 | 1 | 4 | 6.2 |
| | 2 | 5 | 5 |
| | 3 | 5.5 | 4.5 |
| P3-04 | 1 | 36 | 0.7 |

## 5. LABORATORY TESTING

Laboratory testing on soil samples was undertaken by Mining & Civil Geotest in their NATA accredited laboratory and comprised determination of:

- particle size distribution on 12 samples; and
- Atterberg limits and linear shrinkage on 12 samples.

Laboratory test results along with the test methods followed are presented in Appendix D, Laboratory Test Results and are summarised in Table 2, Summary of Laboratory Test Results.

**Table 2: Summary of Laboratory Test Results**

| Test Pit | Depth (m) | % Gravel | % Sand | % Fines | LL (%) | PI (%) | LS (%) |
|---|---|---|---|---|---|---|---|
| TP3-26 | 0.5 – 0.7 | 2 | 56 | 42 | 34 | 18 | 9.0 |
| TP3-27 | 0.1 – 0.3 | 1 | 80 | 19 | NO | NP | 0.0 |
| TP3-27 | 0.8 – 1.0 | 1 | 40 | 59 | 36 | 21 | 9.5 |
| TP3-32 | 0.1 – 0.3 | 1 | 81 | 18 | NO | NP | 0.0 |
| TP3-32 | 0.8 – 1.0 | 1 | 62 | 37 | 28 | 14 | 5.0 |
| TP3-35 | 0.1 – 0.3 | 35 | 55 | 10 | NO | NP | 0.0 |
| TP3-35 | 0.5 – 0.7 | 3 | 46 | 51 | 40 | 22 | 8.0 |
| TP3-35 | 1.1 – 1.2 | 1 | 32 | 67 | 54 | 34 | 11.0 |
| TP3-37 | 0.5 – 0.7 | 0 | 51 | 49 | 30 | 13 | 3.0 |
| TP3-37 | 1.3 – 1.5 | 0 | 32 | 68 | 55 | 17 | 7.0 |
| TP3-38 | 0.1 – 0.3 | 2 | 76 | 22 | NO | NP | 0.0 |
| TP3-40 | 0.6 – 0.8 | 0 | 49 | 51 | 37 | 22 | 8.0 |

LL: Liquid Limit PI: Plasticity Index LS: Linear Shrinkage
NO: Not Obtainable NP: Non-Plastic

# 6. SITE CONDITIONS

## 6.1 Geology

The Dumbleyung sheet of the 1:250,000 scale Geology series map indicates that the area is underlain by:

- colluvium and minor alluvium described as *"silt, sand and gravel; generally on slopes adjoining rock and laterite outcrops"*;
- laterite described as *"limonite cemented, nodular and massive duricrust; overlies deeply weathered bedrock"*; and
- biotite granite and ademellite described as *"medium and coarse, even-grained; locally foliated".*

Our investigation found that the site is underlain by sandy clay to clayey sand.

## 6.2 Subsurface Conditions

Based on the materials encountered within the test pits, the soils appear to be relatively consistent across the site and general site conditions can be summarised as comprising:

- SAND/Clayey SAND/Silty SAND (SP/SC/SM), fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, sand is generally loose, clayey material is generally soft to firm, moist to wet, trace organics and rootlets, present from the surface, extending to depths of between 0.1 m and 0.8 m; overlying
- Clayey SAND/Sandy CLAY (SC/CI), fine to coarse grained sand, low to medium plasticity clay fines (locally high plasticity), generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, locally laterised, locally present from the surface, extending to depths of between 0.6 m and 1.9 m; locally overlying
- Sandy CLAY (CI/CH), medium to high plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, stiff to hard, locally present from as shallow as 0.6 m, extending to the maximum depth of investigation of 2.3 m.

All of the test pits were terminated in very stiff to hard clayey material due to backhoe refusal or very slow progress.

## 6.3 Groundwater

We are not aware of any publicly available information regarding the groundwater levels in the area.

Perched water was encountered within three of the test pits at depths of between 0.5 m and 0.6 m. Surficial ponding water was also observed at various locations around the site. We consider that the surficial water observed in these locations is likely to be perched groundwater over the surficial clayey soils. We note that rainfall had occurred in the area in the days preceding and during the fieldwork.

# 7. GEOTECHNICAL ASSESSMENT

## 7.1 Preliminary Site Classification

We consider that the site is geotechnically capable of supporting the proposed light industrial subdivision development.

We have assessed the site classification in accordance with AS2870-2011 "Residential Slabs and Footings". We consider that a preliminary site classification of "Class M" is appropriate provided that the site preparation recommendations in Section 7.4 are adopted.

**Note**: AS2870 is limited to single and double storey residential buildings and is not strictly applicable for the proposed development. This must be taken into account by the structural designers.

Improvement of the site to "Class S" is possible with importation and placement of inert granular fill to produce a total thickness of about 1.2 m of inert fill overlying clayey material below building footprints. This would require the importation of about 1.2 m of fill.

Improvement of the site to "Class A" is possible with importation and placement of inert granular fill to produce a total thickness of about 3.0 m of inert fill overlying clayey material below building footprints. This would require the importation of about 3.0 m of fill.

## 7.2 Shallow Footings

Buildings may be founded on shallow footings and on-ground slabs. Shallow footings may be designed assuming a maximum allowable bearing pressure of up to 180 kPa for footings with a minimum embedment depth of 0.5 m and a minimum plan dimension of 1 m. Settlements of footings will depend on the applied bearing pressures, however large settlements (>15 mm) for any given footing size are not anticipated (including differential settlements). This assumes that the site preparation measures outlined in Section 7.4 have been followed.

We must be consulted for further advice on specific structures once details of these are available.

## 7.3 Excavations

Based on the soil profile encountered, we expect that shallow (1 m deep) excavations on site will be readily achievable using conventional earthmoving equipment (i.e. with a 10 tonne or larger excavator). Most of the test pits (excavated with an 8 tonne backhoe fitted with a toothed bucket) extended to more than 1.5 m depth.

Where deeper excavations are required, the use of a larger excavator (say 20+ tonne weight range, equipped with a 1 m rock bucket) will be prudent. We did not observe any granitic rock in our test pits, however it can be expected to underlie the clay.

Care must be exercised during excavations and appropriate safety measures adopted where necessary. Excavations must be battered at slopes no steeper than 1V:1H for temporary slopes and 1V:2H for permanent slopes in clayey soils. Even at these slope angles erosion and rilling may occur.

A geotechnical engineer must be consulted where there is any doubt regarding the stability or safety of unsupported excavations.

## 7.4 Site Preparation

Clayey soils can perform poorly (with respect to bearing capacity, settlement under load and traffickability) when wet. The following site preparation measures are aimed at minimising adverse effects and at improvement of the site in preparation for construction of on-ground slabs, shallow footings (including retaining wall footings) and pavements. Landscaped areas will not require this preparation.

The follow site preparation measures must be followed:

- Remove trees, vegetation and topsoil (100 mm topsoil strip will be adequate, or as otherwise necessary to remove all roots) from the site, including grubbing out of roots.
- Shape the surface of the site such that run-off is directed away from buildings and does not pond adjacent to footings or pavements.
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas).
- Moisture condition exposed soil and proof compact to the level of compaction specified in Section 7.5 to a depth of at least 0.3 m below the surface.
- Where fill is required to build up levels, use approved fill as specified in Section 7.6, placed and compacted in layers of no greater than 300 mm loose thickness.

It is strongly recommended that earthworks on this site be done in drier months of the year (November to April). Given the clayey nature of the subsurface soils, we anticipate that construction difficulties may be encountered if earthworks are undertaken during the wetter times of the year. Heaving and rutting of the clayey soils may occur during wet periods. Furthermore, the base of any excavation will soften if water is allowed to pond.

Additionally, compaction and trafficking of the site must NOT be attempted when the site is wet (i.e. following rainfall or if the site has been over-wetted during moisture conditioning). It will be necessary to let the site dry out or trim wet soil off to expose underlying drier material. Attempting to traffic or compact the wet clayey soils is likely to result in soil disturbance and significant softening of the clayey soils.

## 7.5 Compaction

### 7.5.1 General

Over-excavation and replacement of loose materials must be carried out where the minimum density cannot be achieved.

Fill must be placed in horizontal layers of not greater than 0.3 m loose thickness. Each layer must be compacted by suitable compaction equipment, and carefully controlled to ensure even compaction over the full area and depth of each layer.

**TESTING**

After compaction, verify that the required level of compaction has been achieved by testing within any fill and to a minimum depth of 0.9 m below foundations.

- on each lift of fill at the rate of 1 test per 500 $m^3$;
- at each spread footing location;
- at 7.5 m centres below on-ground slabs; and
- at 10 m centres on pavement subgrades.

### 7.5.2 Clayey Soils

Clayey soils comprise clay and any sand or gravel with more than 10% clay fines (that is, including most of the materials encountered on site). Clayey soils, where used as fill, must be moisture conditioned and compacted to a minimum dry density ratio of 95% SMDD (standard maximum dry density, AS1289.5.1.1). Compaction control must be done with the nuclear density gauge in accordance with AS1289.5.8.1.

Realistically compaction control using the NDG can only be conducted to about 0.45 m depth. Compaction control of soils containing greater than 5% fines below this depth is best conducted using a dynamic cone penetrometer (DCP) in accordance with AS1289.5.3.2. We can advise on developing an on-site calibration to determine the site-specific blow count required to achieve the minimum dry density ratio, if required.

### 7.5.3 Sand Soils

Approved granular fill must be compacted using suitable compaction equipment to achieve a dry density ratio of at least 95% of maximum modified dry density (MMDD) as determined in accordance with AS 1289 5.2.1.

If sand is used as fill, a Perth sand penetrometer (PSP) may be used for compaction control. We consider that the following blow counts to correspond to a dry density ratio of 95% MMDD:

- 0-150 mm: SET
- 150-450 mm: 10
- 450-750 mm: 12
- 750-1050 mm: 13 (or 750-900 mm: 7)

If difficulty arises in achieving the specified PSP blow counts, then a calibration must be established between PSP blow count and the *in situ* density. This will allow confirmation of the blow count required to achieve the required density ratio.

**Note:** Use of the PSP is not appropriate for gravelly soils and where the fines content of the sand exceeds about 5%. In such cases, density testing must be done using a nuclear density gauge in accordance with AS1289.5.8.1-2007.

## 7.6 Approved Fill

Imported granular fill must comply with the material requirements as stated in AS3798 (2007), "Guidelines on Earthworks for Commercial and Residential Developments". Any organic-rich sand or sand containing significant proportions of fines (material less than 0.075 mm in size) must not be used.

The opportunity to use any site-derived sand for structural fill is limited. However, we consider that the in-situ clayey material can potentially be used as structural fill, provided that the material is suitably moisture conditioned and compacted, as described in Section 7.5.2.

## 7.7 Subsoil Drainage

Perched and ponding water were encountered during our investigation. Due to the low permeability of the clayey subsurface soils, rainfall runoff is expected to pond on the ground surface during the wetter parts of the year. This may cause difficulties during construction in the way of:

- heaving and rutting of saturated clayey soils when trafficked; and
- softening of clayey soils when water is allowed to pond at the base of excavations.

We therefore recommend that earthworks are carried out in the summer months, even though summer earthworks has its own issues such as dust control and rapid drying out of soils.

We also suggest that the area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.

Subsoil drains may also be used around the perimeter of buildings to facilitate drainage away from the structure. However, we note that this method of drainage will not be as effective as elevating the proposed buildings with free draining sand fill above the clayey subgrade.

## 7.8 Effluent Disposal

The percolation test results within the **upper sandy material** range between 5 minutes and 36 minutes for water to fall 25 mm when testing was carried out in accordance with Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1972, Schedule 8.

We consider the underlying clayey material unsuitable for onsite effluent disposal by percolation (but could probably be improved with importation and placement of an adequate thickness of granular fill).

# 8. ADDITIONAL INVESTIGATION

The work carried out to date was intended to provide a general assessment of the site. Detailed investigations must be carried out prior to development to confirm the site classification. These should address the following issues:

- heave potential of the clay;
- presence of groundwater;
- excavatability; and
- allowable bearing capacity and estimated settlements for shallow foundations.

On this site, investigations would generally comprise test pits and standard soils testing such as:

- particle size distribution,
- Atterberg limits and linear shrinkage;
- maximum dry density and moisture determinations;
- California bearing ratio (CBR); and
- shrink-swell index.

We note that a significant portion of the site could not be investigated due to existing WAMMCO infrastructure and boggy conditions.

## 9. CLOSURE

We draw your attention to Appendix E of this report, Understanding Your Geotechnical Engineering Report. The information provided within is intended to inform you as to what your realistic expectations of this report should be. Guidance is also provided on how to minimise risks associated with groundworks for this project. This information is provided not to reduce the level of responsibility accepted by Galt, but to ensure that all parties who rely on this report are aware of the responsibilities each assumes in so doing.

**GALT GEOTECHNICS PTY LTD**

Rick Piovesan CPEng

Geotechnical Engineer

James Harris

Geotechnical Engineer

O:\Jobs\2014\J1401161 - Talis SI Katanning\03 Correspondence\J1401161 003 R Rev0 - WAMMCO.docx

# Tables



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**Table A1: Summary of Tests**

| Test Names | Test Depth (m) | Depth to Groundwater (m) | Reason for Termination | Stratigraphy |
|---|---|---|---|---|
| TP3-01 | 1.8 | GNE[1] | Refusal | Silty SAND overlying Clayey SAND/Sandy CLAY |
| *TP3-02* | *Not completed due to dense vegetation* | | | |
| TP3-03 | 1.5 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| *TP3-04* | *Not completed due to boggy conditions* | | | |
| TP3-05 | 0.9 | GNE | Refusal | Clayey SAND/Sand CLAY |
| *TP3-06* | *Not completed due to boggy conditions* | | | |
| TP3-07 | 1.5 | 0.6 (P)[2] | Slow progress | Silty CLAY overlying Clayey SAND |
| TP3-08 | 1.5 | GNE | Refusal | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-09 | 1.1 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| TP3-10 | 1.4 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| TP3-11 | 1.5 | GNE | Refusal | Clayey SAND overlying Sandy CLAY |
| *TP3-12* | *Not completed due to existing WAMMCO infrastructure* | | | |
| *TP3-13* | *Not completed due to existing WAMMCO infrastructure* | | | |
| *TP3-14* | *Not completed due to existing WAMMCO infrastructure* | | | |
| *TP3-15* | *Not completed due to existing WAMMCO infrastructure* | | | |
| TP3-16 | 0.9 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| *TP3-17* | *Not completed due to existing WAMMCO infrastructure* | | | |
| *TP3-18* | *Not completed due to existing WAMMCO infrastructure* | | | |
| TP3-19 | 1.1 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| TP3-20 | 1.9 | GNE | Refusal | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-21 | 1.1 | GNE | Refusal | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-22 | 2.0 | GNE | Refusal | Silty SAND overlying Clayey SAND |

| Test Names | Test Depth (m) | Depth to Groundwater (m) | Reason for Termination | Stratigraphy |
|---|---|---|---|---|
| TP3-23 | 1.5 | GNE | Refusal | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-24 | 1.6 | GNE | Slow progress | Silty SAND overlying Clayey SAND |
| TP3-25 | 1.6 | GNE | Slow progress | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-26 | 1.5 | GNE | Refusal | SAND overlying Clayey SAND |
| TP3-27 | 1.7 | GNE | Refusal | Silty SAND overlying Sandy CLAY |
| TP3-28 | 1.3 | GNE | Slow progress | Clayey Gravelly SAND overlying Clayey SAND |
| TP3-29 | 1.9 | 0.5 (P) | Slow progress | Silty SAND overlying Clayey SAND |
| TP3-30 | 1.5 | GNE | Refusal | SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-31 | 1.7 | GNE | Refusal | Gravelly Clayey SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-32 | 1.5 | GNE | Slow progress | Silty SAND overlying Clayey SAND |
| *TP3-33* | *Not completed due to boggy conditions* | | | |
| TP3-34 | 1.9 | GNE | Refusal | Clayey SAND overlying Sandy CLAY/Clayey SAND |
| TP3-35 | 1.3 | 0.3 (P) | Refusal | Gravelly SAND overlying SANDY CLAY |
| TP3-36 | 1.7 | GNE | Refusal | Clayey SAND overlying Sandy CLAY |
| TP3-37 | 2.3 | GNE | Slow progress | SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-38 | 1.6 | GNE | Refusal | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP3-39 | 1.5 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| TP3-40 | 2.0 | 0.5 (P) | Slow progress | Silty SAND overlying Sandy CLAY |

**Notes**
1. GNE: groundwater not encountered
2. Perched groundwater



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ABN: 73 292 586 155

# Figures



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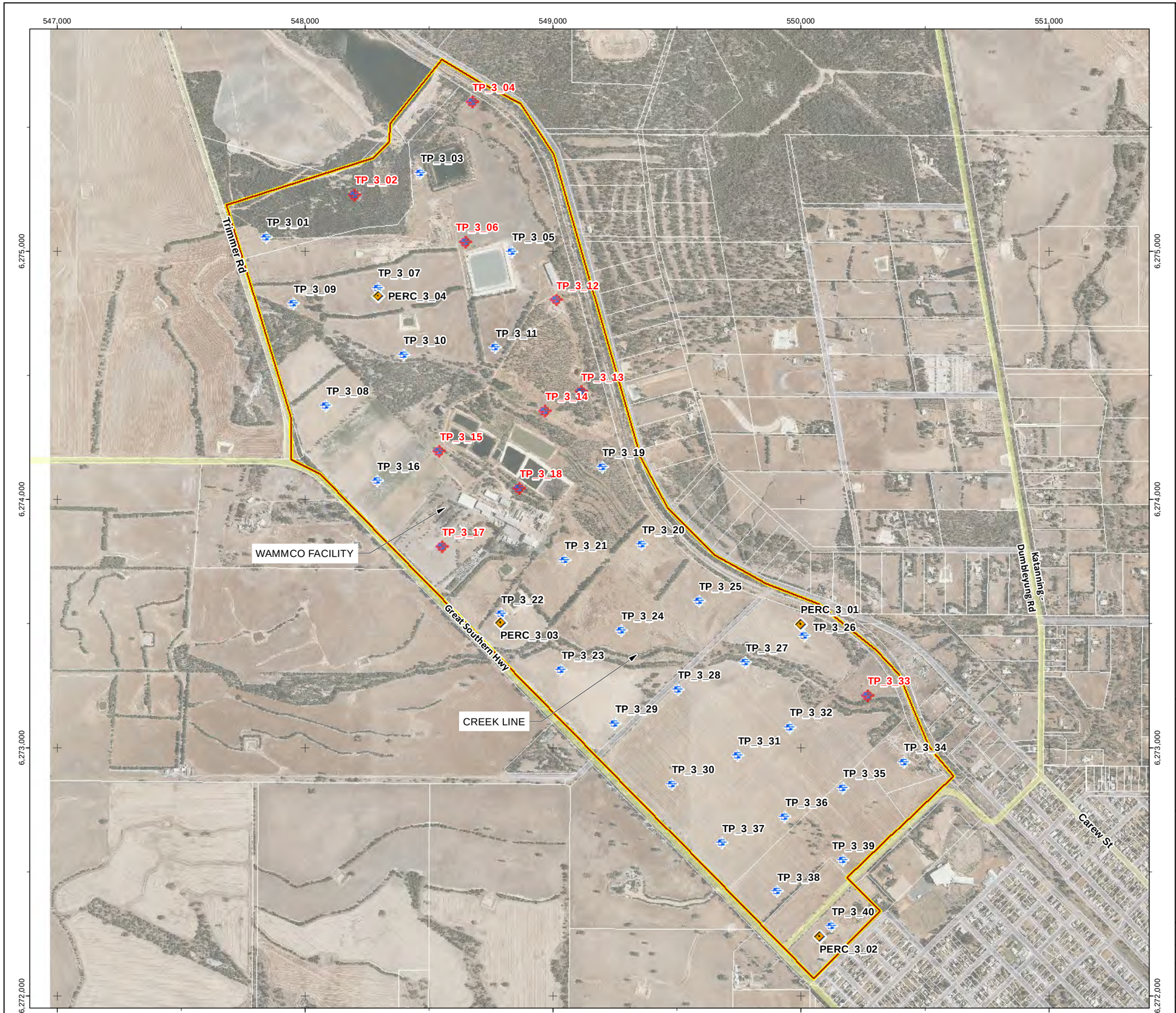
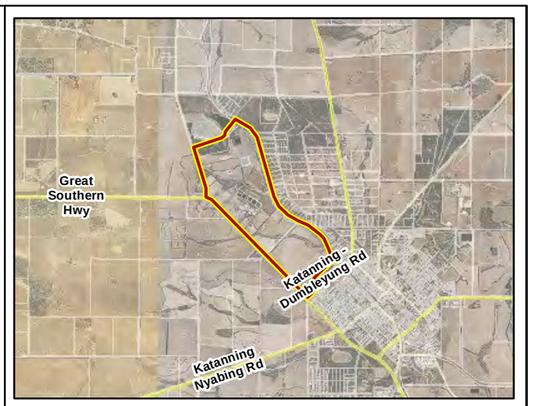
ABN: 73 292 586 155



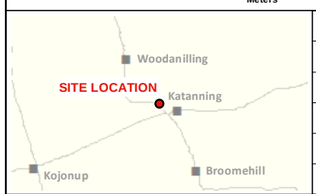




## Legend

- Site Boundary
- Percolation Test
- Test Pit
- Test Pit (Not excavated)

N

0 240 480 720 960 1200
Meters




| | | |
|---|---|---|
| SCALE | 1:15,000 | (A3) |
| DRAWN | DAC | |
| DATE DRAWN | 26/09/2014 | |
| CHECKED | JH | |
| DATE CHECKED | 26/09/2014 | |
| PROJECTION | GDA 1994 MGA Zone 50 | |

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| | |
|---|---|
| CLIENT | TALIS CONSULTANTS |
| PROJECT | PROPOSED INDUSTRIAL DEVELOPMENT |
| LOCATION | WAMMCO KATANNING |
| TITLE | SITE & LOCATION PLAN |
| Job No | J1401161-03 |
| Fig No | FIGURE 1 |
| Rev | A |

O:\Jobs\2014\J1401161 - Talis SI Katanning\09 GIS\04 MXD\J1401161-003.mxd (DamonClark) 26/09/2014 4:06:39 PM

# Appendix A: Site Photographs



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ABN: 73 292 586 155

Photograph 1: Looking northeast from TP3-40 location

Photograph 2: Backhoe excavating at TP3-22 location

**Photograph 3: Trees present in the vicinity of TP3-19**

**Photograph 4: Looking southeast from TP3-36 location**

**Photograph 5: Percolation testing at P3-01**

**Photograph 6: Vacated rural-residential property on Hassell Street**

# Appendix B: Test Pit Reports



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ABN: 73 292 586 155

# TEST PIT: TP3-01

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 547840 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6275059 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics, with some fine grained rounded gravel | M | L - MD | |
| | F | | 0.5 | | | | | | SC / CI | Clayey SAND/Sandy CLAY: fine to medium grained sand, low to medium plasticity fines, pale brown locally mottled orange-brown | D | St | |
| | | | 1.0 | | | | | | | | | VSt - H | |
| | H | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.80 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_003.GPJ <<DrawingFile>> 26/09/2014 15:35 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP3-03

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548462 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6275318 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM | Silty SAND: fine to coarse grained, 15-20% fines, trace rootlets | | L | |
| | F | | | | | | | | | Clayey SAND: fine to coarse grained, 30-40% low to medium plasticity fines, with some fine grained sand, laterised, orange-brown locally mottled red-brown | M | F | |
| | H | | 0.5 | | | | | | SC | | D | St - VSt | |
| | | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Slow progress on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_003.GPJ <<DrawingFile>> 26/09/2014 15:35 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP3-05

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548893 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6275147 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E-F | | 0.0 | | | | | | SC / CI | Clayey SAND/Sandy CLAY: fine to medium grained sand, low to medium plasticity fines, brown, trace fine grained gravel, trace organics/rootlets in top | M | F | |
| | H | | 0.5 | | | | | | | As above, dessicated | D | VSt | |
| | | | 1.0 | | | | | | | Hole terminated at 0.90 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-07

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548290 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274855 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | F | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% fine to medium plasticity fines | W | | |
| | H | | 1.0 | | | | | | | | D | VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Slow progress<br>Groundwater encountered at 0.6m | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-08

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 547950 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274790 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, pale brown mottled orange-brown, 30-40% low to medium plasticity fines, trace fine grained gravel | | St - VSt | |
| | F-H | | 1.0 | | | | | | Cl | Sandy CLAY: medium plasticity, white mottled red-brown, 30-40% fine grained sand, trace quartz | D | VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_003.GPJ <<DrawingFile>> 26/09/2014 15:36 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP3-09

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548081 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274379 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to medium grained, grey mottled orange-brown, low to medium plasticity fines, trace fine grained gravel | D | H | |
| | H | | 1.0 | | | | | | | | | | |
| | | | 1.10 | | | | | | | Hole terminated at 1.10 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-10

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548393 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274584 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | | | | | | | | Clayey SAND: fine to medium grained, grey mottled orange-brown, 30-40% low plasticity fines, trace fine grained gravel | | F | |
| | H | | 0.5 | | | | | | SC | | D | VSt | |
| | | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.40 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-11

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548765 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274612 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Clayey SAND: fine to medium grained, grey mottled orange-brown, 30-40% low plasticity fines, trace fine grained gravel | D | MD | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange mottled grey, 30-40% low to medium plasticity fines increasing with depth | | St - VSt | |
| | H | | 1.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity fines, white mottled orange-brown | | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_003.GPJ <<DrawingFile>> 26/09/2014 15:36 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP3-16

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548287 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274077 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | | | 0.5 | | | | | | | As above, with some fine to medium grained rounded gravel | | | |
| | H | | | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled red-brown, 30-40% low to medium plasticity fines, laterised, locally weakly to well cemented | D | H | |
| | | | 1.0 | | | | | | | Hole terminated at 0.90 m<br>Refusal on laterite<br>Groundwater not encounted | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-19

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549195 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6274133 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM | Silty SAND: fine to coarse grained, dark grey, 15-20% fines, trace rootlets/organics | M | L | |
| | | | | | | | | | | | | F | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown, 30-40% low to medium plasticity fines, with some fine to medium grained gravel, locally laterised | D | VSt - H | |
| | | | 1.0 | | | | | | | | | | |
| | | | | | | | | | | Hole terminated at 1.10 m<br>Refusal on laterised material<br>Groundwater not encounted | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-20

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549355 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273821 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown, 30-40% low to medium plasticity fines, trace fine grained gravel | D | VSt | |
| | | | 1.0 | | | | | | CI | Sandy CLAY: medium plasticity, pale grey stained red-brown, 30-40% fine to medium grained sand, trace fine grained gravel | | | |
| | H | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.90 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-21



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549043 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273759 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | | F | |
| | F-H | | 1.0 | | | | | | Cl | Sandy CLAY: medium plasticity, white stained red-brown (residual soil) | D | VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.10 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-22

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 548787 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273540 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 – 0.5 | | | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, 15-20% non-plastic/low plasticity fines, trace rootlets and organics | M | L / MD | |
| | F / H | | 1.0 – 1.5 | | | | | | SC | Clayey SAND: fine to medium grained, pale orange-brown mottled grey, 30-40% low to medium plasticity fines | D | St - VSt | |
| | | | 2.0 | | | | | | | Hole terminated at 2.00 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 – 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-23

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549030 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273315 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM | Silty SAND: fine to coarse grained, grey, 15-20% non-plastic fines, trace rootlets/organics | | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to medium grained, orange-brown, 30-40% low to medium plasticity fines increasing with depth | M | St - VSt | |
| | H | | 1.0 | | | | | | Cl | Sandy CLAY: medium plasticity fines, pale brown mottled grey, 30-40% fine to medium grained sand | D | H | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on weathered rock<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-24

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549271 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273474 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | D | VSt - H | |
| | H | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.60 m<br>Slow progress on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-25

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549585 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273592 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | | VSt | |
| | F-H | | 1.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity, white stained orange-brown, 30-40% fine to coarse grained sand, trace quartz (residual soil) | D | VSt - H | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.60 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-26

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 550010 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273452 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some (20%) fine to coarse grained rounded gravel, with some (~10%) low plasticity fines, trace rootlets/organics | W | L | |
| | F | | 0.5 | | B(TP3-26-01) | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace gravel | M | St | Slow seepage through test pit wall |
| | H | | 1.0 | | | | | | | | | St - VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater encountered at 0.3m | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-27

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549773 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273345 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP3-27-01) | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, with non-plastic fines, trace rootlets/roots/organics | | L | |
| | | | 0.5 | | | | | | | Sandy CLAY: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace fine grained gravel | M | | |
| | F | | | | B(TP3-27-02) | | | | CL-CI | | | VSt | |
| | | | 1.0 | | | | | | | As above, decrease in moisture content | D | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.70 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-28

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549500 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273237 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey Gravelly SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, fine grained rounded gravel., trace rootlets/organics | | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace fine grained iron cemented gravel, locally stained red-brown | M | St - VSt | |
| | H | | 1.0 | | | | | | | | D | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.30 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-29

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549246 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273099 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM | Silty SAND: fine to medium grained, dark grey, 15-20% fines | M | | |
| | | | | | | | | | SC | Clayey SAND: fine to coarse grained, grey, 15-20% low to medium plasticity fines | M - W | F | |
| | F | Perched water | 0.5 | | | | | | | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | M | VSt | |
| | | | 1.0 | | | | | | SC | | | | |
| | H | | 1.5 | | | | | | | | D | VSt - H | |
| | | | 2.0 | | | | | | | Hole terminated at 1.90 m<br>Slow progress<br>Groundwater encountered at 0.5m | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-30

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549475 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272857 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some (~10%) low plasticity fines, trace rootlets/organics | | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to medium grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | M | St - VSt | |
| | | | 1.0 | | | | | | | | D | VSt - H | |
| | | | 1.5 | | | | | | Cl | Sandy CLAY: medium plasticity, white mottled brown, 30-40% fine grained sand, trace quartz | | | |
| | | | | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-31

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549741 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272970 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Gravelly Clayey SAND: fine to coarse grained, dark grey becoming grey, fine to medium grained rounded gravel, 10-20% low plasticity fines, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, locally stained red-brown, 30-40% low to medium plasticity fines, trace fine grained rounded gravel (iron cemented) | D | VSt | |
| | H | | 1.5 | | | | | | CI | Sandy CLAY: medium plasticity, white stained red-brown, trace quartz, trace fine grained gravel | | H | |
| | | | 2.0 | | | | | | | Hole terminated at 1.70 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-32

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549951 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6273085 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP3-32-01) | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, with some (~20%) non-plastic fines, trace rootlets/organics | M | L | |
| | F | | 0.5 | | B(TP3-32-02) | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace fine grained gravel | M | St - VSt | |
| | H | | 1.0 | | | | | | | | D | VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-34

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 550411 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272944 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, trace rootlets/organics | | L | |
| | F | | 0.5 | | B(TP3-34-01) | | | | SC / CI | Clayey SAND/Sandy CLAY: fine to medium grained sand, low to medium plasticity fines, orange-brown, trace fine grained gravel | M | F - St | |
| | | | 1.0 | | | | | | | | | | |
| | H | | 1.5 | | | | | | | | D | St - VSt | |
| | | | 2.0 | | | | | | | Hole terminated at 1.90 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-35

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 550166 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272839 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | B(TP3-35-01) | | | | SP | Gravelly SAND: fine to coarse grained, dark grey becoming grey, 25-30% fine grained rounded gravel, with some low plasticity fines, trace rootlets/organics | M<br>W | L | |
| | F-H | | 0.5 | | B(TP3-35-02) | | | | CI | Sandy CLAY: medium plasticity, orange-brown mottled grey, 40-50% fine to coarse grained sand, trace fine grained gravel | M | F<br>VSt | |
| | | | 1.0 | | B(TP3-35-03) | | | | CI-CH | Sandy CLAY: medium to high plasticity, white stained red-brown, trace fine grained gravel, trace quartz | D | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.30 m<br>Refusal on stiff clay<br>Groundwater encountered at 0.3m | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-36

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549932 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272724 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, trace rootlets/organics | M | F | |
| | F | | 0.5 | | B(TP3-36-01) | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | | | |
| | H | | 1.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity, white mottled orange-brown, trace quartz, 30-40% fine grained sand | D | VSt | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.70 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-37

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549678 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272616 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some (~10%) low plasticity fines, trace rootlets/organics | M | L | |
| | F | | 0.5 | | B(TP3-37-01) | | | | SC | Clayey SAND: fine to coarse grained, pale brown mottled grey, 40-50% low to medium plasticity fines | | St | |
| | F-H | | 1.0 | | B(TP3-37-02) | | | | CI-CH | Sandy CLAY: medium to high plasticity, white locally mottled orange-brown, 30-40% fine grained sand, trace quartz | D | VSt | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.30 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-38

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 549901 m | **Contractor:** | Kat Plant Hire | **Date:** | 04/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272421 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP3-38-01) | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, with (~20%) non-plastic silt fines, trace rootlets/organics | M | L | |
| | F | | 0.5 | | B(TP3-38-02) | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace fine grained gravel | | St - VSt | |
| | F-H | | 1.0 | | | | | | | | D | | |
| | | | 1.5 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity white mottled grey, 30-40% fine grained sand, trace quartz | | VSt | |
| | | | | | | | | | | Hole terminated at 1.60 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-39

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 550164 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272548 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, dark grey, 15-20% low to medium plasticity fines, trace rootlets/organics | M | F - St | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown, 30-40% low to medium plasticity fines | D | VSt - H | |
| | | | 1.0 | | | | | | | As above, becoming mottled grey | | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP3-40

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 550120 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6272283 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | WAMMCO Light Industrial Subdivision | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 25/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** | 0.7 m **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, trace rootlets | M - W | L | |
| | F | | 0.5 | | B(TP3-40-01) | | | | CL-CI | Sandy CLAY: low to medium plasticity fines, pale brown mottled grey and orange, 20-30% fine grained sand | M | | |
| | F-H | | 1.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity, white, 30-40% fine grained sand, trace quartz (residual soil) | D | VSt | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 2.00 m<br>Slow progress<br>Groundwater encountered at 0.5m | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_003.GPJ <<DrawingFile>> 26/09/2014 15:37 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# Appendix C: Dynamic Cone Penetrometer Test Results



www.galtgeo.com.au
2/39 Flynn St, WEMBLEY WA 6014

ABN: 73 292 586 155

**DYNAMIC CONE PENETROMETER FIELD TEST DATA**
**(AS12896.3.2)**

| | | | |
|---|---|---|---|
| **Client:** | Talis Consultants | **Job No:** | J1401161 |
| **Project:** | Proposed Light Industrial Subdivision | **Date:** | 2, 3 and 4 September 2014 |
| **Location:** | WAMMCO, Katanning | **Engineer:** | JH |

| Test No: | DCP01 | DCP02 | DCP03 | DCP04 | DCP05 | DCP06 | DCP07 | DCP08 | DCP09 |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP3-01 | TP3-03 | TP3-05 | TP3-07 | TP3-08 | TP3-09 | TP3-10 | TP3-11 | TP3-16 |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | - | - | - | - | - | - |
| 100-200 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 1 |
| 200-300 | 2 | 4 | 3 | 3 | 1 | 2 | 2 | 2 | 2 |
| 300-400 | 3 | 7 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| 400-500 | 5 | 7 | 3 | 3 | 10 | 12 | 4 | 4 | 2 |
| 500-600 | 5 | 8 | 6 | 3 | 3HB | 12R | 9 | 4 | 2 |
| 600-700 | 8HB | 6 | 9 | 6 | | | 10HB | 5 | 4 |
| 700-800 | | 7 | 8HB | 8 | | | | 5 | 9 |
| 800-900 | | 8 | | 10 | | | | 7 | 10HB |
| 900-1000 | | | | | | | | | |

| Test No: | DCP10 | DCP11 | DCP12 | DCP13 | DCP14 | DCP15 | DCP16 | DCP17 | DCP18 |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP3-19 | TP3-20 | TP3-21 | TP3-22 | TP3-23 | TP3-24 | TP3-25 | TP3-26 | TP3-27 |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | - | - | - | - | - | - |
| 100-200 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 200-300 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 |
| 300-400 | 4 | 5 | 3 | 1 | 4 | 3 | 3 | 3 | 2 |
| 400-500 | 8 | 11 | 4 | 2 | 6 | 8 | 4 | 5 | 2 |
| 500-600 | 10HB | 11 | 6 | 2 | 9 | 5HB | 8 | 4 | 5 |
| 600-700 | | 7 | 6 | 2 | 10HB | | 7 | 5 | 4 |
| 700-800 | | 8 | 8HB | 3 | | | 7 | 4 | 5 |
| 800-900 | | 7 | | 3 | | | 7 | 5 | 7 |
| 900-1000 | | | | | | | | | |

| Test No: | DCP19 | DCP20 | DCP21 | DCP22 | DCP23 | DCP24 | DCP25 | DCP26 | DCP27 |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP3-28 | TP3-29 | TP3-30 | TP3-31 | TP3-32 | TP3-34 | TP3-35 | TP3-36 | TP3-37 |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | - | - | - | - | - | - |
| 100-200 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 200-300 | 1 | 1 | 2 | 1 | 2 | 4 | 3 | 1 | 2 |
| 300-400 | 1 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 4 |
| 400-500 | 1 | 7 | 5 | 5 | 2 | 4 | 8 | 2 | 3 |
| 500-600 | 5 | 4HB | 7 | 10HB | 3 | 4 | 10HB | 3 | 3 |
| 600-700 | 8HB | | 6 | | 5 | 6 | | 2 | 4 |
| 700-800 | | | 7 | | 7 | 5 | | 3 | 3 |
| 800-900 | | | 8 | | 8 | 6 | | 6 | 4 |
| 900-1000 | | | | | | | | | |

| Test No: | DCP28 | DCP29 | DCP30 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP3-38 | TP3-39 | TP3-40 | | | | | | |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | | | | | | |
| 100-200 | 1 | 3 | 1 | | | | | | |
| 200-300 | 1 | 2 | 1 | | | | | | |
| 300-400 | 2 | 5 | 2 | | | | | | |
| 400-500 | 5 | 13HB | 3 | | | | | | |
| 500-600 | 6 | | 3 | | | | | | |
| 600-700 | 5 | | 6 | | | | | | |
| 700-800 | 6 | | 7 | | | | | | |
| 800-900 | 5 | | 7 | | | | | | |
| 900-1000 | | | | | | | | | |

Dynamic Cone Penetrometer tests done in accordance with AS 1289.6.3.2
HB: Hammer bounce (refusal)
HW: Penetration due to hammer weight only
R: Refusal

# Appendix D: Laboratory Test Results



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ABN: 73 292 586 155

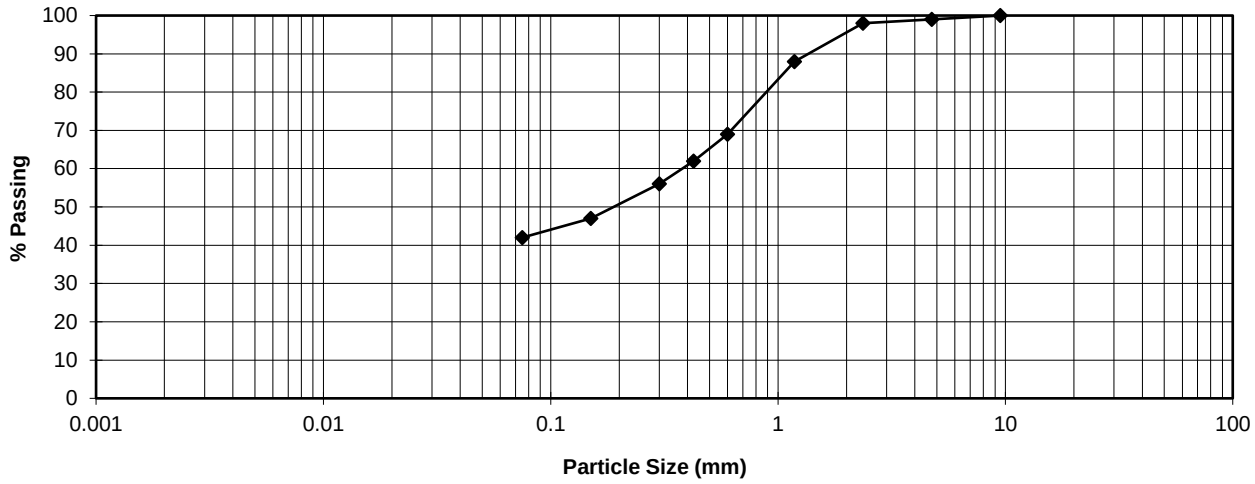
# Particle Size Distribution & Plasticity Index tests

**Mining & Civil**
**Geotest Pty Ltd**
**unit1/1 Pusey Road, Jandakot, WA 6164**
**Ph (08) 9414 8022 Fax (08) 9414 8011**
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3416 |
| **Sample No:** | P14/3416 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-26
Sample Depth (m): 0.5-0.7




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 99 |
| 2.36 | 98 |
| 1.18 | 88 |
| 0.600 | 69 |
| 0.425 | 62 |
| 0.300 | 56 |
| 0.150 | 47 |
| 0.075 | 42 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 34 | % |
| **Plastic limit 3.2.1** | 16 | % |
| **Plasticity index 3.3.1** | 18 | % |
| **Linear shrinkage 3.4.1** | 9.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Matthew van Herk
AS PSDPI May 2009

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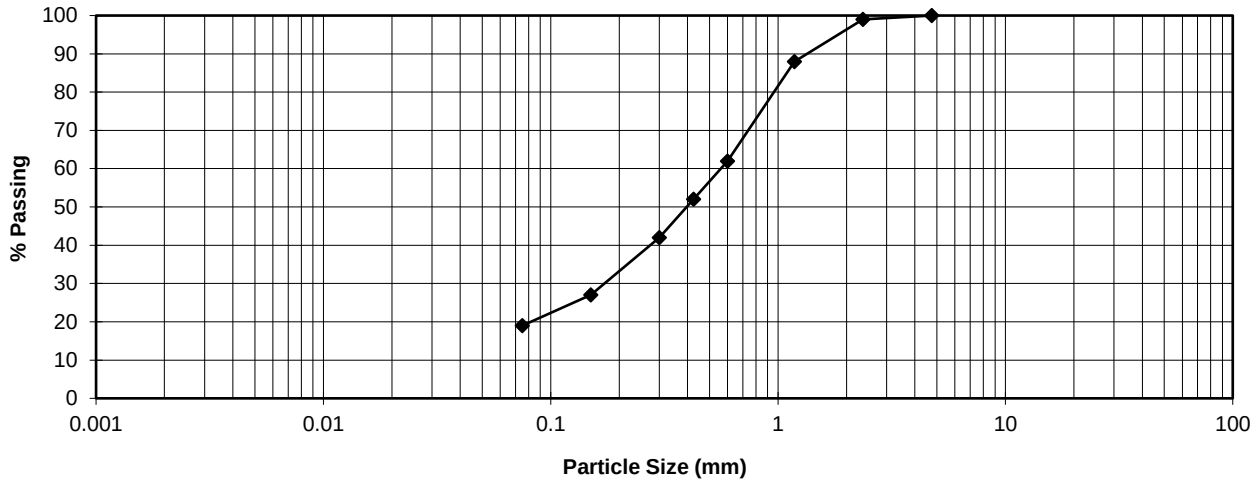
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3417 |
| **Sample No:** | P14/3417 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-27
Sample Depth (m): 0.1-0.3




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 99 |
| 1.18 | 88 |
| 0.600 | 62 |
| 0.425 | 52 |
| 0.300 | 42 |
| 0.150 | 27 |
| 0.075 | 19 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
**Curled** ☐

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Sampling Procedure: Tested as received

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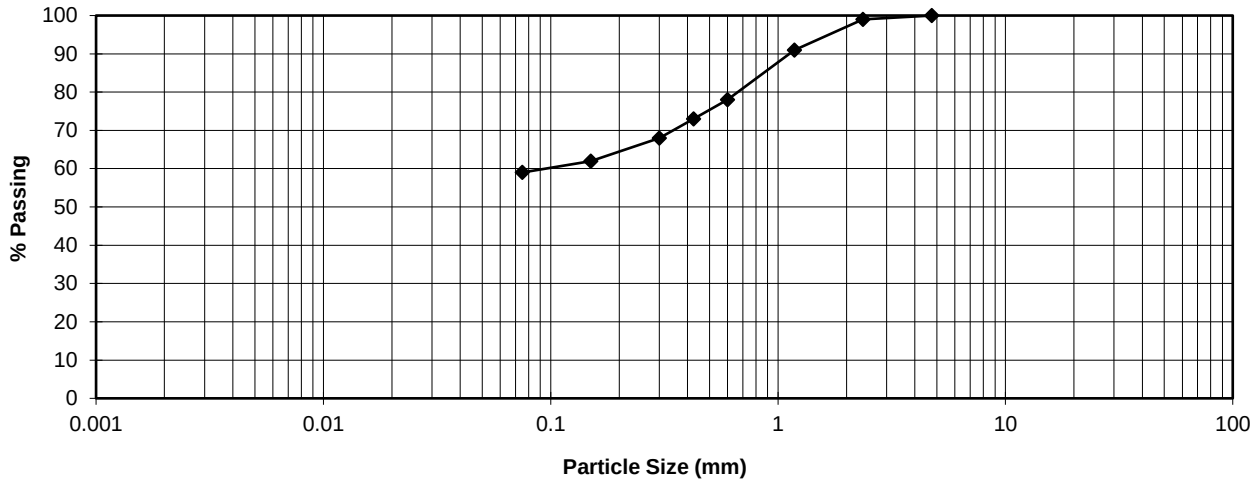
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3418 |
| **Sample No:** | P14/3418 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-27
Sample Depth (m): 0.8-1.0




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 99 |
| 1.18 | 91 |
| 0.600 | 78 |
| 0.425 | 73 |
| 0.300 | 68 |
| 0.150 | 62 |
| 0.075 | 59 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 36 | % |
| **Plastic limit 3.2.1** | 15 | % |
| **Plasticity index 3.3.1** | 21 | % |
| **Linear shrinkage 3.4.1** | 9.5 | % |

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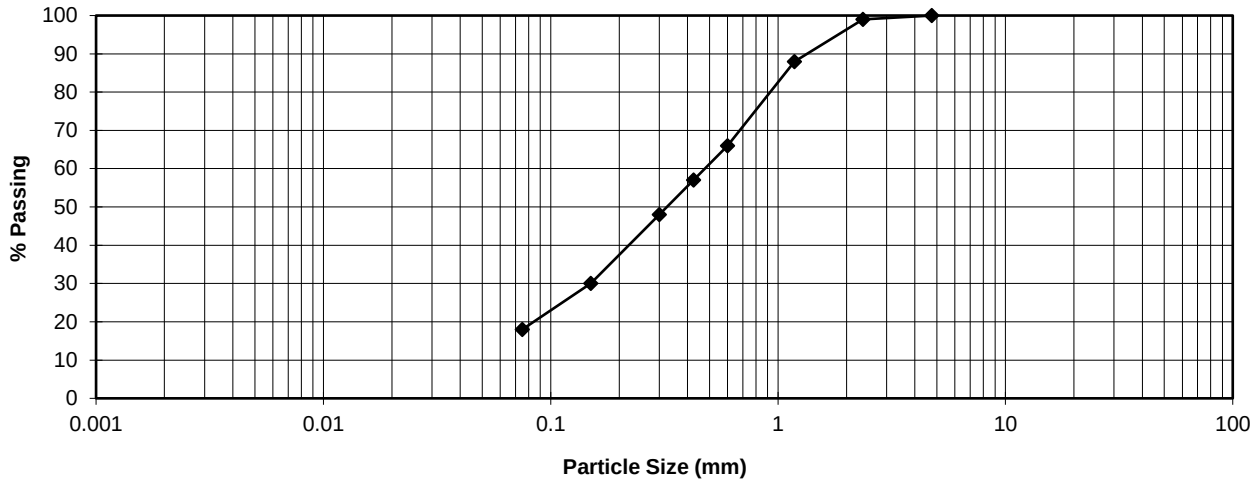
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3419 |
| **Sample No:** | P14/3419 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-32
Sample Depth (m): 0.1-0.3




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 99 |
| 1.18 | 88 |
| 0.600 | 66 |
| 0.425 | 57 |
| 0.300 | 48 |
| 0.150 | 30 |
| 0.075 | 18 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
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Sampling Procedure: Tested as received

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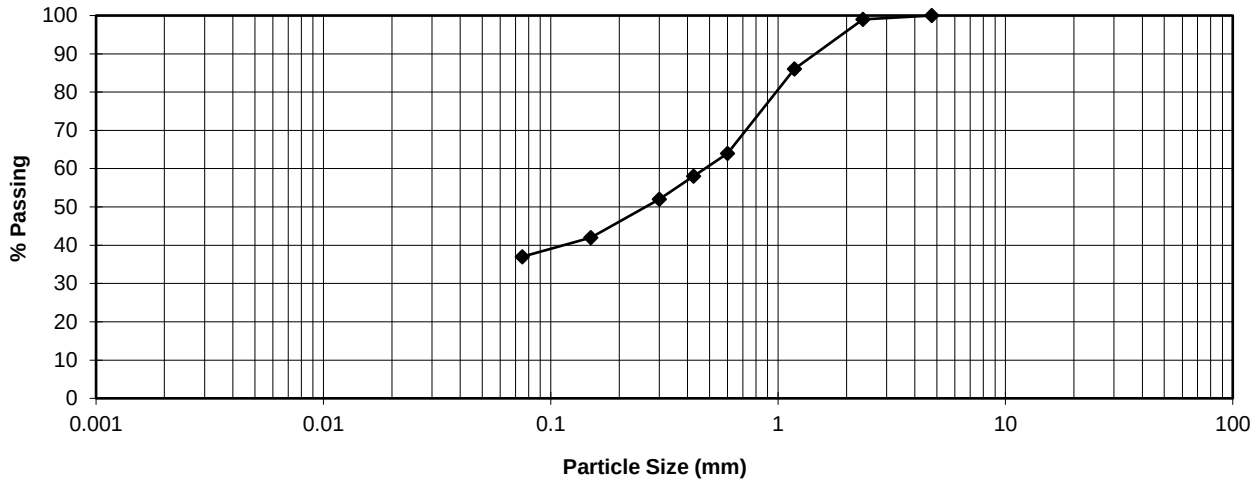
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3420 |
| **Sample No:** | P14/3420 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-32
Sample Depth (m): 0.8-1.0




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 99 |
| 1.18 | 86 |
| 0.600 | 64 |
| 0.425 | 58 |
| 0.300 | 52 |
| 0.150 | 42 |
| 0.075 | 37 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 28 | % |
| **Plastic limit 3.2.1** | 14 | % |
| **Plasticity index 3.3.1** | 14 | % |
| **Linear shrinkage 3.4.1** | 5.0 | % |

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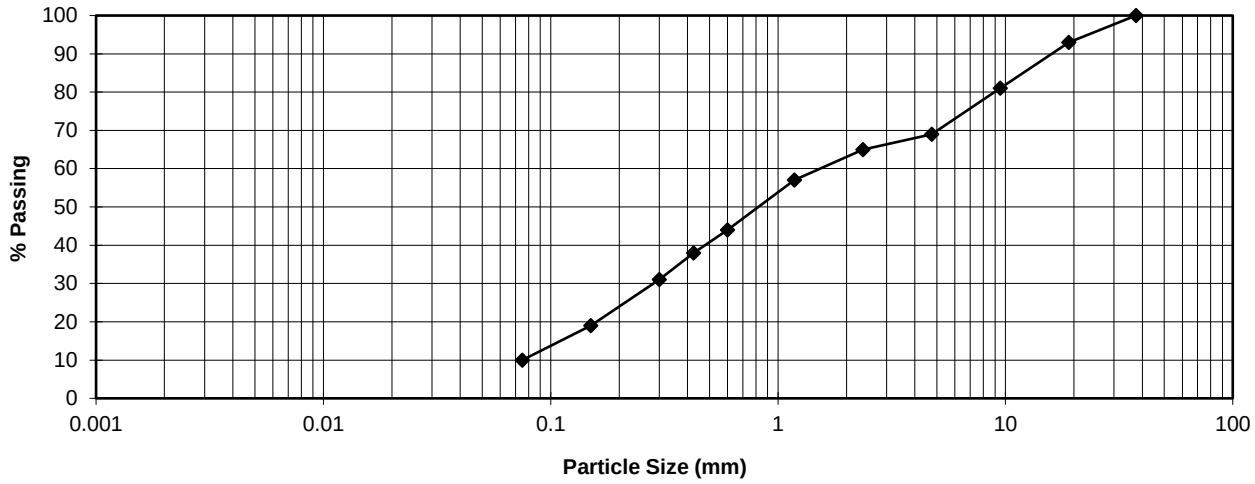
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3421 |
| **Sample No:** | P14/3421 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-35
Sample Depth (m): 0.1-0.3




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | 100 |
| 19.0 | 93 |
| 9.5 | 81 |
| 4.75 | 69 |
| 2.36 | 65 |
| 1.18 | 57 |
| 0.600 | 44 |
| 0.425 | 38 |
| 0.300 | 31 |
| 0.150 | 19 |
| 0.075 | 10 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
**Curled** ☐

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AS PSDPI May 2009

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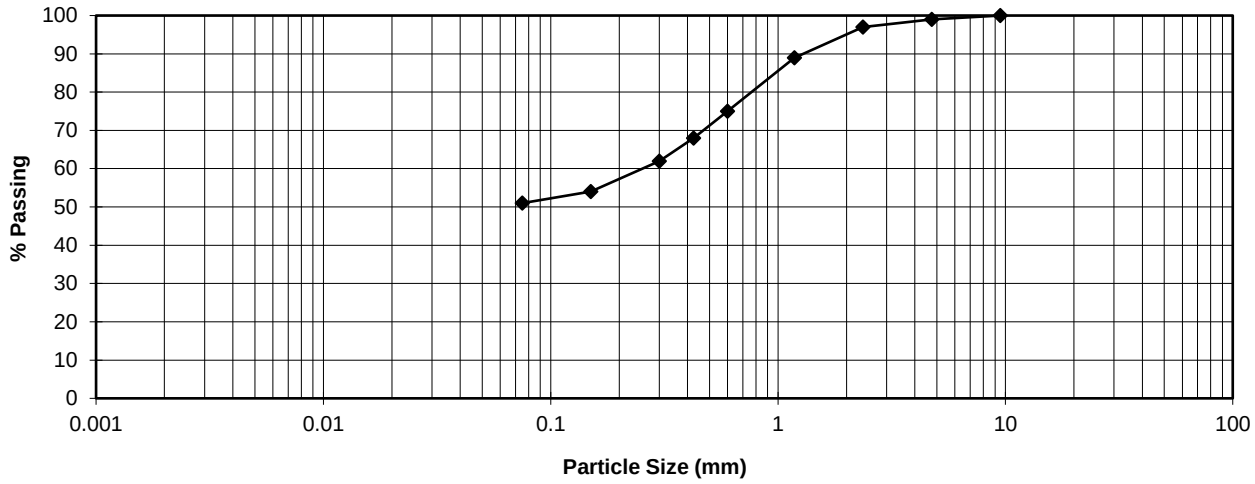
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3422 |
| **Sample No:** | P14/3422 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-35
Sample Depth (m): 0.5-0.7




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 99 |
| 2.36 | 97 |
| 1.18 | 89 |
| 0.600 | 75 |
| 0.425 | 68 |
| 0.300 | 62 |
| 0.150 | 54 |
| 0.075 | 51 |

**Plasticity index tests**

| **AS 1289** | | |
|---|---|---|
| **Liquid limit 3.1.1** | 40 | % |
| **Plastic limit 3.2.1** | 18 | % |
| **Plasticity index 3.3.1** | 22 | % |
| **Linear shrinkage 3.4.1** | 8.0 | % |

**Cracked** ☑
**Curled** ☑

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AS PSDPI May 2009

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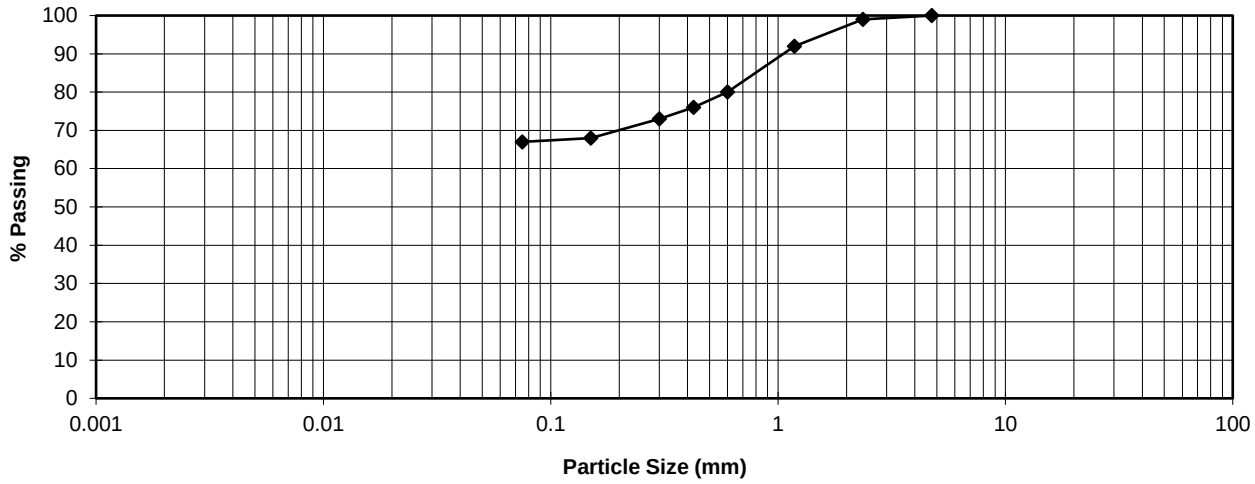
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3423 |
| **Sample No:** | P14/3423 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-35
Sample Depth (m): 1.1-1.2




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 99 |
| 1.18 | 92 |
| 0.600 | 80 |
| 0.425 | 76 |
| 0.300 | 73 |
| 0.150 | 68 |
| 0.075 | 67 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 54 | % |
| **Plastic limit 3.2.1** | 20 | % |
| **Plasticity index 3.3.1** | 34 | % |
| **Linear shrinkage 3.4.1** | 11.0 | % |

**Cracked** ☐
**Curled** ☑

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Sampling Procedure: Tested as received

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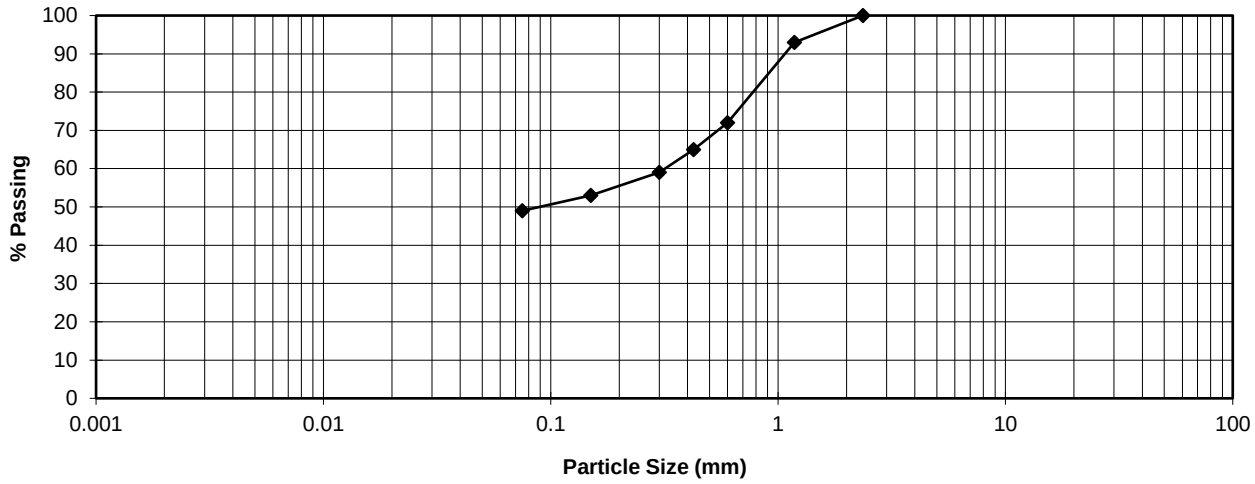
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3424 |
| **Sample No:** | P14/3424 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-37
Sample Depth (m): 0.5-0.7




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | |
| 2.36 | 100 |
| 1.18 | 93 |
| 0.600 | 72 |
| 0.425 | 65 |
| 0.300 | 59 |
| 0.150 | 53 |
| 0.075 | 49 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 30 | % |
| **Plastic limit 3.2.1** | 17 | % |
| **Plasticity index 3.3.1** | 13 | % |
| **Linear shrinkage 3.4.1** | 3.0 | % |

**Cracked** ☐
**Curled** ☑

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Approved signature

Matthew van Herk
AS PSDPI May 2009

# Particle Size Distribution & Plasticity Index tests

**Mining & Civil**
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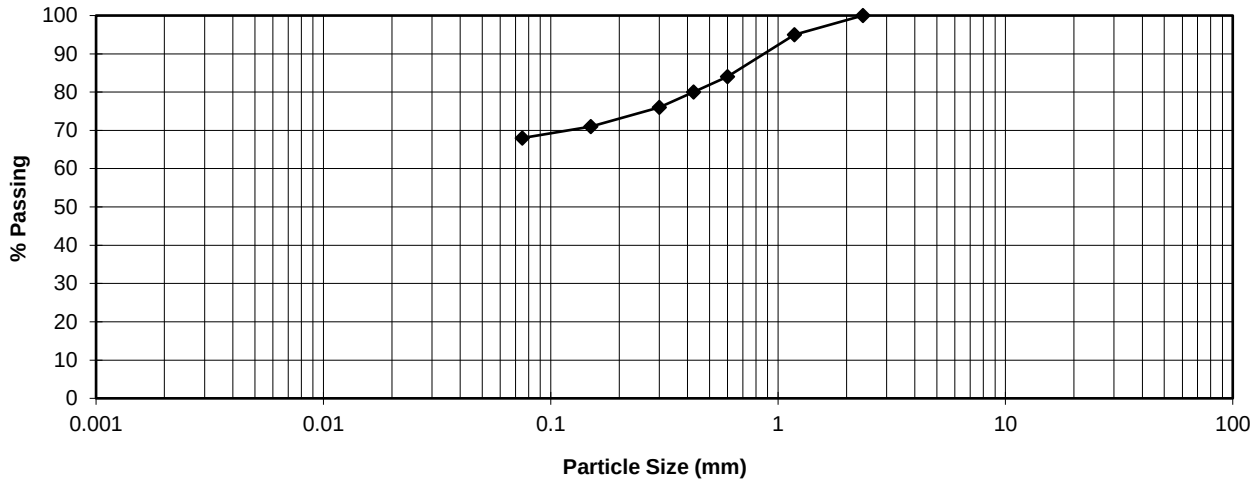
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3425 |
| **Sample No:** | P14/3425 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-37
Sample Depth (m): 1.3-1.5




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | |
| 2.36 | 100 |
| 1.18 | 95 |
| 0.600 | 84 |
| 0.425 | 80 |
| 0.300 | 76 |
| 0.150 | 71 |
| 0.075 | 68 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 55 | % |
| **Plastic limit 3.2.1** | 38 | % |
| **Plasticity index 3.3.1** | 17 | % |
| **Linear shrinkage 3.4.1** | 7.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

NATA WORLD RECOGNISED ACCREDITATION

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Matthew van Herk

# Particle Size Distribution & Plasticity Index tests

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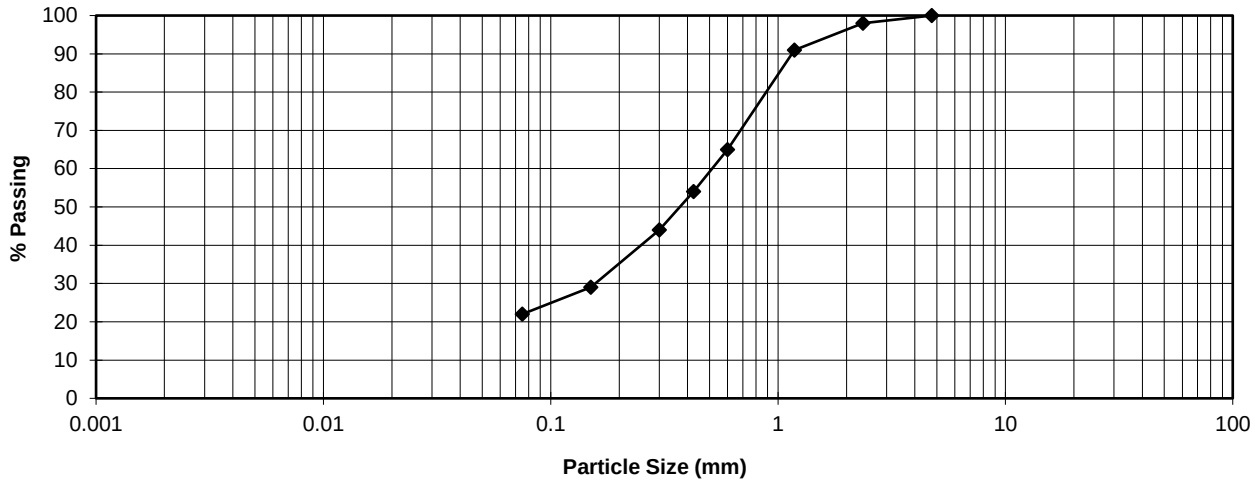
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3426 |
| **Sample No:** | P14/3426 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-38
Sample Depth (m): 0.1-0.3




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 98 |
| 1.18 | 91 |
| 0.600 | 65 |
| 0.425 | 54 |
| 0.300 | 44 |
| 0.150 | 29 |
| 0.075 | 22 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Matthew van Herk
AS PSDPI May 2009

# Particle Size Distribution & Plasticity Index tests

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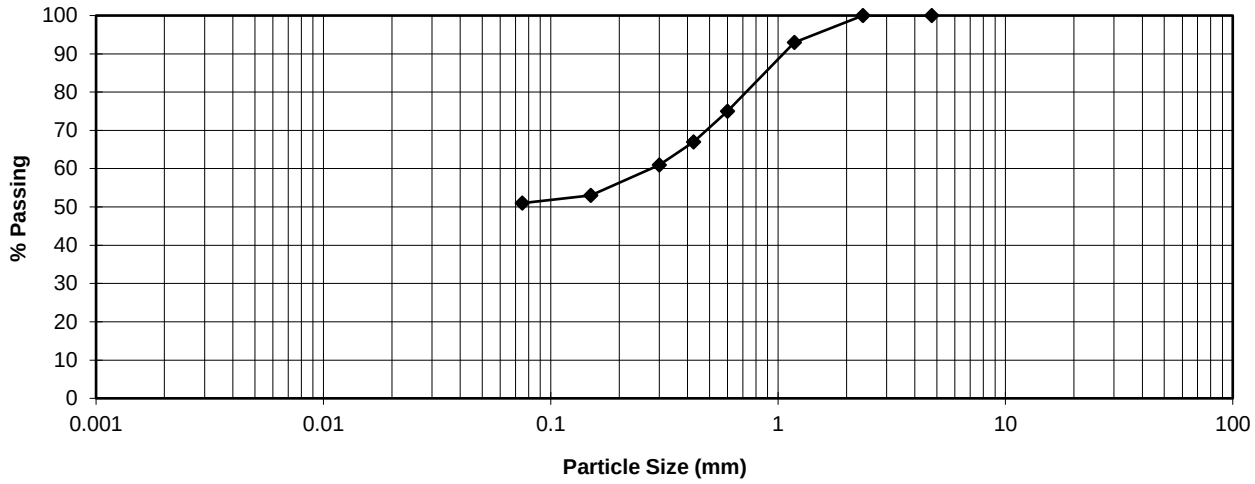
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3427 |
| **Sample No:** | P14/3427 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: WAMMCO, Katanning

Sample location: TP3-40
Sample Depth (m): 0.6-0.8




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 100 |
| 1.18 | 93 |
| 0.600 | 75 |
| 0.425 | 67 |
| 0.300 | 61 |
| 0.150 | 53 |
| 0.075 | 51 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 37 | % |
| **Plastic limit 3.2.1** | 15 | % |
| **Plasticity index 3.3.1** | 22 | % |
| **Linear shrinkage 3.4.1** | 8.0 | % |

**Cracked** ☐
**Curled** ☑

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

NATA
WORLD RECOGNISED ACCREDITATION

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Matthew van Herk
AS PSDPI May 2009

# Appendix E: Understanding Your Geotechnical Engineering Report



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# UNDERSTANDING YOUR GEOTECHNICAL ENGINEERING REPORT

GALT FORM PMP11 Rev1

## 1. EXPECTATIONS OF A GEOTECHNICAL ENGINEERING REPORT

This document has been prepared to clarify what is and is not provided in your geotechnical report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with geotechnical conditions.

Geotechnical engineering is a less exact science than other engineering disciplines. We include this information to help you understand where our responsibilities as geotechnical engineers begin and end, to help the client recognise his responsibilities and risks. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of geotechnical problems and we can help you to manage your risk.

## 2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following :

- The project objectives as we understood them and as described in this report;
- the specific site mentioned in this report; and
- the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this geotechnical report if any of the following conditions apply:

- the report was not written for you;
- the report was not written for the site specific to your development;
- the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your geotechnical engineering report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the design team and by being able to review work produced by other members of the design team which relies on geotechnical information provided in our report.

## 3. GEOTECHNICAL ENGINEERING LOGS

Our reports often include logs of intrusive and non-intrusive geotechnical investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

## 4. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party as a consequence of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

## 5. CHANGE IN SUBSURFACE CONDITIONS

The geotechnical recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including as a result of anthropogenic events (such as construction on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

## 6. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use engineering judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from engineering judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

## 7. ENVIRONMENTAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not included. The investigation techniques used by us in developing our report differ from those for an environmental investigation. Our report was not prepared with environmental considerations in mind and it is the client's responsibility to satisfy himself that environmental considerations have been taken into account for the site. If you require guidance on how to proceed on evaluating environmental risk at the site, we can provide further information and contacts.

# Report on

# PRELIMINARY GEOTECHNICAL STUDY
# PROPOSED INDUSTRIAL DEVELOPMENT
# THE INDUSTRIAL AREA
# KATANNING

**Submitted to:**

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J1401161 001 R Rev0

26 September 2014

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**FIGURES**

Figure 1: Site and Location Plan

**APPENDICES**

APPENDIX A: SITE PHOTOGRAPHS

APPENDIX B: TEST PIT REPORTS

APPENDIX C: DYNAMIC CONE PENETROMETER TEST RESULTS

APPENDIX D: LABORATORY TEST RESULTS

APPENDIX E: UNDERSTANDING YOUR GEOTECHNICAL ENGINEERING REPORT

## 1. INTRODUCTION

This report presents the outcomes of a preliminary geotechnical study by Galt Geotechnics Pty Ltd (Galt) for the proposed light industrial subdivision development at a site designated The Industrial Area in Katanning ("the site"). The location of the site relative to the surrounding area is shown on Figure 1, Site and Location Plan.

The investigation was requested by Andrew Mack of Talis Consultants and authorised in a Sub Consultant Agreement dated 19 August 2014.

## 2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

Based on the supplied information, the site is irregular in shape and covers an area of about 315 ha. The lots that make up the site comprise:

- **Lot 3 Thomson Street** (43 ha) – privately owned land. Generally clear and under pasture with some fences and other farming related infrastructure;
- **76 Drove Street** (2.2 ha) – Shire land. Currently vegetated with mature trees and shrubbery;
- **Lot 500** (73 ha) – Shire land. Contains the recently developed Katanning Saleyards in the northeast corner. Numerous large dams are present across the site and several large stockpiles of clayey material (sourced from the creation of a lake at Piesse Park) are present towards the east of the site. The balance of the lot is generally clear.
- **Lot 501** (196 ha) – Shire land. Currently being used by the Department of Food and Agriculture WA (DAFWA). The majority of the lot is currently under crop with a small portion to the southwest clear and under pasture.

A creek runs through the site from north to south, bisecting the site.

We understand that this site has been identified as one of five key growth precincts in the Katanning Structure Plans Project. Light industrial development is proposed for this site.

## 3. PROJECT OBJECTIVES

The objectives of the study were to:

- broadly assess subsoil conditions across the site including identification of potential problem areas;
- assess the preliminary site classification in accordance with AS2870 (2011) "Residential Slabs and Footings";
- provide typical measures to improve the site classification to Class A or Class S, if appropriate;
- assess the requirement for subsoil drainage, if applicable;
- provide advice regarding suitable foundation systems;
- assess the potential and extent of any geotechnical problems which may be encountered during and after construction;
- assess geotechnical constraints and hazards to the proposed developments; and
- broadly assess the suitability of the soils at the site for potential on-site effluent disposal; and
- provide advice on any further studies required to fully address the objectives listed above.

## 4. FIELDWORK

Fieldwork for the investigation was conducted from 1 to 5 September 2014 and comprised:

- a walkover of the site;
- excavation of test pits at 20 locations (TP1-01 to TP1-05, TP1-07 to TP1-09, TP1-11, TP1-12, TP1-14, TP1-15, TP1-17 to TP1-23 and TP1-27), extending to depths of between 1.1 m and 2.5 m;
- testing with a dynamic cone penetrometer adjacent to each test pit, extending to depths of between 0.4 m and 1.0 m;
- percolation testing for effluent disposal assessment in accordance with the Health Department Regulations, at 3 locations (P1-01 to P1-03), at depths of between 0.2 m and 0.4 m; and
- collection of representative samples from selected test pits for inspection and possible laboratory testing.

### General

A geotechnical engineer from Galt located the test positions, observed the test pitting, logged the materials encountered in the test pits, collected samples for inspection and possible laboratory testing, and performed the percolation testing and penetrometer testing.

**Note:** Ten proposed test pits (TP1-06, TP1-10, TP1-13, TP1-16, TP1-24 to TP1-26 and TP1-28 to TP1-30) could not be excavated due to access constraints, such as fields under crop or the newly constructed Katanning saleyard.

Photographs of the site are presented in Appendix A, Site Photographs. The test locations are shown on Figure 1, Site and Location Plan and details are summarised in Table A1, Summary of Tests, at the end of text.

### Test Pits

Test pits were excavated using a CAT 432D 8 tonne tractor mounted backhoe fitted with a 600 mm wide toothed bucket. The excavator was supplied and operated by Katanning Plant Hire.

Test pit reports are presented in Appendix B, Test Pit Reports, along with the method of soil description and cementation classification, and a list of explanatory notes and abbreviations used on the reports. Photographs of each test pit excavation are included with the test pit reports.

### Dynamic Cone Penetrometer Testing

DCP tests were carried out adjacent to each test pit. Results of the DCP testing are presented in Appendix C, Dynamic Cone Penetrometer Test Results. The tests were conducted in accordance with test method AS 1289 6.3.2.

### Percolation Testing

Two percolation tests were carried out at depths of between 0.25 m and 0.3 m below ground in representative areas of the site in accordance with Schedule 8 of the Department of Health Guidelines[1]. Tests were conducted in hand dug 0.3 m by 0.3 m square holes which was pre-soaked with 0.2 m head of water for about 30 minutes. The results of the percolation tests are summarised in Table 1.

[1] Department of Health (1974), Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974, Department of Health, Health Act 1911

**Table 1: Summary of Percolation Tests**

| Test Number | | Rate (minutes to drop 25 mm) | Rate (mm/min) |
|---|---|---|---|
| P1-01 | 1 | 7 | 3.6 |
| | 2 | 11.5 | 2.2 |
| | 3 | 12.5 | 2 |
| P1-02 | 1 | 32 | 0.8 |
| P1-03 | 1 | 6 | 4.2 |
| | 2 | 7.5 | 3.3 |
| | 3 | 8 | 3.1 |

## 5. LABORATORY TESTING

Laboratory testing on soil samples was undertaken by Mining & Civil Geotest in their NATA accredited laboratory and comprised determination of:

- particle size distribution on 8 samples; and
- Atterberg limits and linear shrinkage on 8 samples.

Laboratory test results along with the test methods followed are presented in Appendix D, Laboratory Test Results and are summarised in Table 2, Summary of Laboratory Test Results.

**Table 2: Summary of Laboratory Test Results**

| Test Pit | Depth (m) | % Gravel | % Sand | % Fines | LL (%) | PI (%) | LS (%) |
|---|---|---|---|---|---|---|---|
| TP1-05 | 0.2 – 0.4 | 22 | 67 | 11 | NO | NP | 0.0 |
| TP1-05[1] | 0.7 – 0.9 | 7 | 32 | 61 | 43 | 24 | 8.0 |
| TP1-19 | 0.1 – 0.2 | 5 | 86 | 9 | NO | NP | 0.0 |
| TP1-19[1] | 0.4 – 0.5 | 20 | 41 | 39 | NO | NP | 0.0 |
| TP1-21 | 0.1 – 0.3 | 16 | 76 | 8 | NO | NP | 0.0 |
| TP1-21[1] | 0.5 – 0.7 | 2 | 62 | 36 | 32 | 20 | 9.5 |
| TP1-22 | 0.1 – 0.3 | 4 | 80 | 14 | NO | NP | 0.0 |
| TP1-27 | 0.3 – 0.5 | 22 | 49 | 29 | 43 | 30 | 14.5 |

LL: Liquid Limit PI: Plasticity Index LS: Linear Shrinkage
NO: Not Obtainable NP: Non-Plastic

**Note:** 1 – Material of size greater than the 9.5 mm sieve was not retained for testing on these samples.

We note that there are some discrepancies between the field logs and laboratory testing. This is likely due to the presence of variably cemented material within the clayey material and is indicative of the variable nature of the material across the site.

# 6. SITE CONDITIONS

## 6.1 Geology

The Dumbleyung sheet of the 1:250,000 scale Geology series map indicates that the area is underlain by:

- colluvium and minor alluvium described as *"silt, sand and gravel; generally on slopes adjoining rock and laterite outcrops"*; and
- alluvium described as *"silt and sand in broad valley flats; extensively reworked by present drainage".*

Our investigation found that the site is underlain by sandy clay to clayey sand.

## 6.2 Subsurface Conditions

Based on the materials encountered within the test pits, the soils appear to be relatively consistent across the site and general site conditions can be summarised as comprising:

- SAND/Clayey SAND/Silty SAND (SP/SC/SM), fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, sand is generally loose, clayey material is generally soft to firm, moist to wet, trace organics and rootlets, present from the surface, extending to depths of between 0.3 m and 0.5 m; overlying
- Clayey SAND/Sandy CLAY (SC/CI), fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, locally laterised, present from as shallow as 0.3 m, extending to depths of between 0.8 m and the maximum depth of investigation of 2.5 m; locally overlying
- Sandy CLAY (CI/CH), medium to high plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.8 m, extending to the maximum depth of investigation of 2.5 m.

**Notes** 1. Seventeen of the test pits were terminated in very stiff to hard clayey material due to backhoe refusal or very slow progress.

2 Several large stockpiles of clayey material (sourced from the creation of a lake at Piesse Park) are present towards the east of the site.

## 6.3 Groundwater

We are not aware of any publicly available information regarding the groundwater levels in the area.

Perched water was encountered within one of the test pits (TP1-01) at a depth of 0.4 m. Surficial ponding water was also observed at various locations around the site. We consider that the surficial water observed in these locations is likely to be perched groundwater over the surficial clayey soils. We note that rainfall had occurred in the area in the days preceding and during the fieldwork.

# 7. GEOTECHNICAL ASSESSMENT

## 7.1 Preliminary Site Classification

We consider that the site is geotechnically capable of supporting the proposed light industrial subdivision development.

We have assessed the site classification in accordance with AS2870-2011 "Residential Slabs and Footings". We consider that a preliminary site classification of "Class M" is appropriate provided that the site preparation recommendations in Section 7.4 are adopted.

**Note**: AS2870 is limited to single and double storey residential buildings and is not strictly applicable for the proposed development. This must be taken into account by the structural designers.

Improvement of the site to "Class S" is possible with importation and placement of inert granular fill to produce a total thickness of about 1.2 m of inert fill overlying clayey material below building footprints. This would require the importation of about 1.2 m of fill.

Improvement of the site to "Class A" is possible with importation and placement of inert sand fill to produce a total thickness of about 3.0 m of inert fill overlying clayey material below building footprints. This would require the importation of about 3.0 m of fill.

## 7.2 Shallow Footings

Buildings may be founded on shallow footings and on-ground slabs. Shallow footings may be designed assuming a maximum allowable bearing pressure of up to 180 kPa for footings with a minimum embedment depth of 0.5 m and a minimum plan dimension of 1 m. Settlements of footings will depend on the applied bearing pressures, however large settlements (>15 mm) for any given footing size are not anticipated (including differential settlements). The site preparation measures outlined in 7.4 must be adopted to use shallow footings.

We must be consulted for further advice on specific structures once details of these are available.

## 7.3 Excavations

Based on the soil profile encountered, we expect that shallow (1 m deep) excavations on site will be readily achievable using conventional earthmoving equipment (i.e. with a 10 tonne or larger excavator). Most of the test pits (excavated with an 8 tonne backhoe fitted with a toothed bucket) extended to more than 1.5 m depth.

Where deeper excavations are required, the use of a larger excavator (say 20+ tonne weight range, equipped with a 1 m rock bucket) will be prudent. We did not observe any granitic rock in our test pits, however it can be expected to underlie the clay at depth.

Care must be exercised during excavations and appropriate safety measures adopted where necessary. Excavations must be battered at slopes no steeper than 1V:1H for temporary slopes and 1V:2H for permanent slopes in clayey soils. Even at these slope angles erosion and rilling may occur.

A geotechnical engineer must be consulted where there is any doubt regarding the stability or safety of unsupported excavations.

## 7.4 Site Preparation

Clayey soils can perform poorly (with respect to bearing capacity, settlement under load and trafficability) when wet. The following site preparation measures are aimed at minimising adverse effects and at improvement of the site in preparation for construction of on-ground slabs, shallow footings (including retaining wall footings) and pavements. Landscaped areas will not require this preparation.

The follow site preparation measures must be followed:

- Remove trees, vegetation and topsoil (100 mm topsoil strip will be adequate, or as otherwise necessary to remove all roots) from the site, including grubbing out of roots.
- Shape the surface of the site such that run-off is directed away from buildings and does not pond adjacent to footings or pavements.
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas).
- Moisture condition exposed soil and proof compact to the level of compaction specified in Section 7.5 to a depth of at least 0.3 m below the surface.
- Where fill is required to build up levels, use approved fill as specified in Section 7.6, placed and compacted in layers of no greater than 300 mm loose thickness.

It is strongly recommended that earthworks on this site be done in drier months of the year (November to April). Given the clayey nature of the subsurface soils, we anticipate that construction difficulties may be encountered if earthworks are undertaken during the wetter times of the year. Heaving and rutting of the clayey soils may occur during wet periods. Furthermore, the base of any excavation will soften if water is allowed to pond.

Additionally, compaction and trafficking of the site must NOT be attempted when the site is wet (i.e. following rainfall or if the site has been over-wetted during moisture conditioning). It will be necessary to let the site dry out or trim wet soil off to expose underlying drier material. Attempting to traffic or compact the wet clayey soils is likely to result in soil disturbance and significant softening of the clayey soils.

## 7.5 Compaction

### 7.5.1 General

Over-excavation and replacement of loose materials must be carried out where the minimum density cannot be achieved.

Fill must be placed in horizontal layers of not greater than 0.3 m loose thickness. Each layer must be compacted by suitable compaction equipment, and carefully controlled to ensure even compaction over the full area and depth of each layer.

**TESTING**

After compaction, verify that the required level of compaction has been achieved by testing within any fill and to a minimum depth of 0.9 m below foundations.

- on each lift of fill at the rate of 1 test per 500 $m^3$;
- at each spread footing location;
- at 7.5 m centres below on-ground slabs; and
- at 10 m centres on pavement subgrades.

### 7.5.2 Clayey Soils

Clayey soils comprise clay and any sand or gravel with more than 10% clay fines (that is, including most of the materials encountered on site). Clayey soils, where used as fill, must be moisture conditioned and compacted to a minimum dry density ratio of 95% SMDD (standard maximum dry density, AS1289.5.1.1). Compaction control must be done with the nuclear density gauge in accordance with AS1289.5.8.1.

Realistically compaction control using the NDG can only be conducted to about 0.45 m depth. Compaction control of soils containing greater than 5% fines below this depth is best conducted using a dynamic cone penetrometer (DCP) in

accordance with AS1289.5.3.2. We can advise on developing an on-site calibration to determine the site-specific blow count required to achieve the minimum dry density ratio, if required.

### 7.5.3 Sand Soils

Approved granular fill must be compacted using suitable compaction equipment to achieve a dry density ratio of at least 95% of maximum modified dry density (MMDD) as determined in accordance with AS 1289 5.2.1.

If sand is used as fill, a Perth sand penetrometer (PSP) may be used for compaction control. We consider that the following blow counts to correspond to a dry density ratio of 95% MMDD:

- 0-150 mm: SET
- 150-450 mm: 10
- 450-750 mm: 12
- 750-1050 mm: 13 (or 750-900 mm: 7)

If difficulty arises in achieving the specified PSP blow counts, then a calibration must be established between PSP blow count and the *in situ* density. This will allow confirmation of the blow count required to achieve the required density ratio.

**Note:** Use of the PSP is not appropriate for gravelly soils and where the fines content of the sand exceeds about 5%. In such cases, density testing must be done using a nuclear density gauge in accordance with AS1289.5.8.1-2007.

## 7.6 Approved Fill

Imported granular fill must comply with the material requirements as stated in AS3798 (2007), "Guidelines on Earthworks for Commercial and Residential Developments". Any organic-rich sand or sand containing significant proportions of fines (material less than 0.075 mm in size) must not be used.

The opportunity to use any site-derived sand for structural fill is limited. However, we consider that the in-situ clayey material can potentially be used as structural fill, provided that the material is suitably moisture conditioned and compacted, as described in Section 7.5.2.

## 7.7 Subsoil Drainage

Perched and ponding water were encountered during our investigation. Due to the low permeability of the clayey subsurface soils, rainfall runoff is expected to pond on the ground surface during the wetter parts of the year. This may cause difficulties during construction in the way of:

- heaving and rutting of saturated clayey soils when trafficked; and
- softening of clayey soils when water is allowed to pond at the base of excavations.

We therefore recommend that earthworks are carried out in the summer months, even though summer earthworks has its own issues such as dust control and rapid drying out of soils.

We also suggest that the area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.

Subsoil drains may also be used around the perimeter of buildings to facilitate drainage away from the structure. However, we note that this method of drainage will not be as effective as elevating the proposed buildings with free draining sand fill above the clayey subgrade.

## 7.8 Effluent Disposal

The percolation test results within the **upper sandy material** range between 7 minutes and 32 minutes for water to fall 25 mm when testing was carried out in accordance with Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1972, Schedule 8.

We consider the underlying clayey material unsuitable for onsite effluent disposal by percolation (but could probably be improved with importation and placement of an adequate thickness of granular fill).

# 8. FURTHER STUDIES

The work carried out to date was intended to provide a general assessment of the site. Detailed investigations must be carried out prior to development to confirm the site classification. These should address the following issues:

- heave potential of the clay;
- presence of groundwater;
- excavatability;
- presence and nature of stockpiled materials (e.g. south of existing saleyard); and
- allowable bearing capacity and estimated settlements for shallow foundations.

On this site, investigations would generally comprise test pits and standard soils testing such as:

- particle size distribution,
- Atterberg limits and linear shrinkage;
- maximum dry density and moisture determinations;
- California bearing ratio (CBR); and
- shrink-swell index.

We note that a significant portion of the site could not be investigated due to areas under cultivation, the saleyards etc.

## 9. CLOSURE

We draw your attention to Appendix E of this report, Understanding Your Geotechnical Engineering Report. The information provided within is intended to inform you as to what your realistic expectations of this report should be. Guidance is also provided on how to minimise risks associated with groundworks for this project. This information is provided not to reduce the level of responsibility accepted by Galt, but to ensure that all parties who rely on this report are aware of the responsibilities each assumes in so doing.

**GALT GEOTECHNICS PTY LTD**

Rick Piovesan CPEng

Geotechnical Engineer

James Harris

Geotechnical Engineer

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# Tables



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**Table A1: Summary of Tests**

| Test Names | Test Depth (m) | Depth to Groundwater (m) | Reason for Termination | Stratigraphy |
|---|---|---|---|---|
| TP01 | 2.5 | 0.4 (P)[1] | Target depth | SAND overlying Clayey SAND |
| TP02 | 2.5 | GNE[2] | Target depth | Clayey SAND overlying Sandy CLAY |
| TP03 | 1.9 | GNE | Refusal | Clayey Gravelly SAND overlying Clayey SAND |
| TP04 | 1.3 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| TP05 | 1.7 | GNE | Slow progress | SAND overlying Clayey SAND |
| *TP06* | *Not completed due to presence of Katanning Saleyard* | | | |
| TP07 | 1.1 | GNE | Refusal | Silty SAND overlying Clayey SAND/Sandy CLAY overlying Sandy CLAY |
| TP08 | 2.5 | GNE | Target depth | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| TP09 | 1.9 | GNE | Refusal | Silty SAND overlying Clayey SAND overlying Sandy CLAY |
| *TP10* | *Not completed due to presence of crops* | | | |
| TP11 | 1.6 | GNE | Refusal | Silty/Clayey SAND overlying Clayey SAND |
| TP12 | 1.4 | GNE | Refusal | SAND overlying Clayey SAND |
| *TP13* | *Not completed due to presence of Katanning Saleyard* | | | |
| TP14 | 0.9 | GNE | Refusal | Silty SAND overlying Clayey SAND |
| TP15 | 1.1 | GNE | Refusal | Clayey SAND overlying Sandy CLAY |
| *TP16* | *Not completed due to presence of crops* | | | |
| TP17 | 1.1 | GNE | Refusal | SAND overlying Clayey SAND |
| TP18 | 1.2 | GNE | Refusal | SAND overlying Clayey SAND |
| TP19 | 1.4 | GNE | Refusal | SAND overlying Clayey SAND/Sandy CLAY |
| TP20 | 1.7 | GNE | Refusal | Silty/Clayey SAND overlying Clayey SAND |
| TP21 | 2.2 | GNE | Slow progress | Silty/Clayey SAND overlying Clayey SAND overlying Sandy CLAY |
| TP22 | 1.5 | GNE | Refusal | Silty SAND overlying Clayey SAND |

| Test Names | Test Depth (m) | Depth to Groundwater (m) | Reason for Termination | Stratigraphy |
|---|---|---|---|---|
| TP23 | 2.2 | GNE | Refusal | Clayey SAND overlying Sandy CLAY |
| *TP24* | *Not completed due to presence of crops* | | | |
| *TP25* | *Not completed due to presence of crops* | | | |
| *TP26* | *Not completed due to presence of crops* | | | |
| TP27 | 1.5 | GNE | Refusal | Clayey SAND |
| *TP28* | *Not completed due to presence of crops* | | | |
| *TP29* | *Not completed due to presence of crops* | | | |
| *TP30* | *Not completed due to presence of crops* | | | |

**Notes**
1. Perched groundwater
2. GNE: groundwater not encountered



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# Figures



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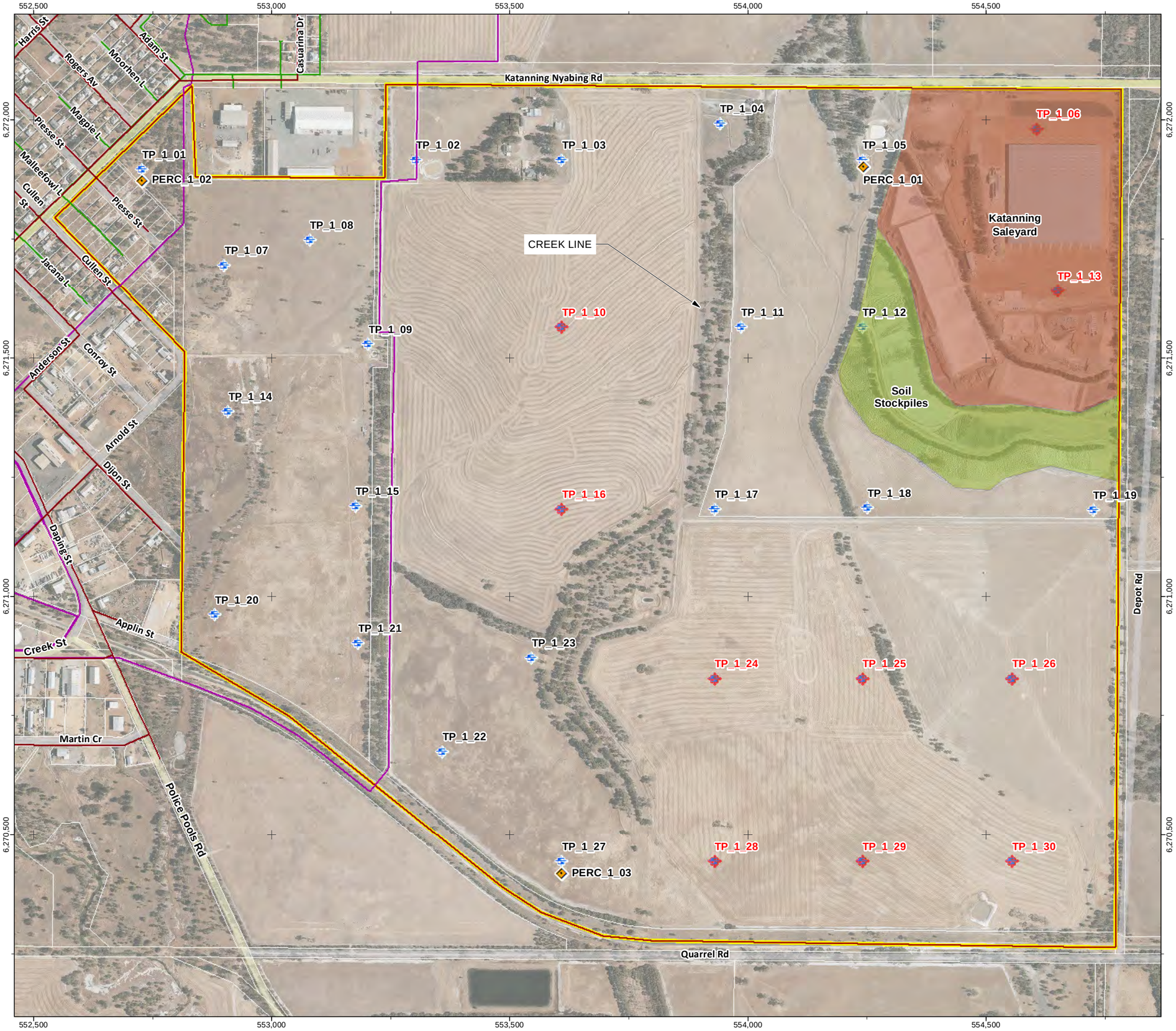

**Legend**

- Site Boundary
- Percolation Test
- Test Pit
- Test Pit (Not excavated)

N

0 130 260 390 520 650
Meters

| | | |
|---|---|---|
| SCALE | 1:8,000 | (A3) |
| DRAWN | DAC | |
| DATE DRAWN | 26/09/2014 | |
| CHECKED | JH | |
| DATE CHECKED | 26/09/2014 | |
| PROJECTION | GDA 1994 MGA Zone 50 | |

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| | |
|---|---|
| CLIENT | **TALIS CONSULTANTS** |
| PROJECT | PROPOSED INDUSTRIAL DEVELOPMENT |
| LOCATION | THE INDUSTRIAL AREA KATANNING |
| TITLE | SITE & LOCATION PLAN |

| Job No | Fig No | Rev |
|---|---|---|
| J1401161-01 | FIGURE 1 | **A** |

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# Appendix A: Site Photographs



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Photograph 1: Looking south from TP1-05

Photograph 2: Stockpiled clayey material from Piesse Park

Photograph 3: Looking west towards existing DAFWA property from TP1-03

Photograph 4: Existing dam on the site

Photograph 5: Ponding water near stockpiles

Photograph 6: Newly developed Katanning Saleyard in northeast corner of site

# Appendix B: Test Pit Reports



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# TEST PIT: TP1-01

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 552726 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271897 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | Perched water | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some non-plastic/low plasticity fines, trace rootlets and organics | M | L | |
| | | | | | | | | | | | W | | |
| | | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace fine grained gravel | M | St - VSt | |
| | | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | | D | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater encountered at 0.4m | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-02

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553301 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271917 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, dark grey becoming grey, 20-30% low to medium plasticity fines, trace rootlets/organics | | F | |
| | F | | 0.5 | | B(TP1-02-01) | | | | CL-CI | Sandy CLAY: low to medium plasticity, grey, 30-40% fine to medium grained sand | M | St - VSt | |
| | | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | | | | |
| | F | | 2.0 | | | | | | CL | CLAY: low plasticity, white mottled grey, trace fine grained sand, trace quartz | D | VSt | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-03

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553608 m | **Contractor:** | Kat Plant Hire | **Date:** | 02/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271917 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey Gravelly SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, 20-30% fine grained rounded gravel, trace rootlets/organics | D | F | Test pit adjacent to large trees (very dry) |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, pale brown, 30-40% low to medium plasticity fines, trace fine grained gravel, highly desiccated | | VSt | |
| | | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.90 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-04

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553928 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271917 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, with some fine grained rounded gravel, trace rootlets/organics | M | F | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, with some fine grained rounded gravel | | F - St | |
| | H | | 1.0 | | | | | | | As above, locally laterised | D | VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.30 m<br>Refusal on laterised material<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-05

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 554239 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271917 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP1-05-01) | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some non-plastic fines, with some fine grained gravel, trace rootlets | M | L - MD | |
| | F | | 0.5 | | B(TP1-05-02) | | | | CI | Sandy CLAY: medium plasticity, pale brown mottled grey, 30-40% fine to medium grained sand, with some moderately iron-cemented gravel | D - M | VSt | |
| | H | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.70 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-07

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 552841 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271614 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, grey, 20-30% low to medium plasticity fines, trace rootlets/organics | M | F | |
| | F | | 0.5 | | B(TP1-07-01) | | | | SC / CI | Clayey SAND/Sandy CLAY: fine to coarse grained sand, low to medium plasticity fines, orange-brown mottled grey, trace fine grained gravel | | St - VSt | |
| | H | | 1.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity, white, 30-40% fine grained sand, trace quartz (residual soil) | D | VSt - H | |
| | | | 1.5 | | | | | | | Hole terminated at 1.10 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-08

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553078 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271749 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | | F | |
| | | | 0.5 | | | | | | | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | M | | |
| | F | | 1.0 | | | | | | SC | | | St | |
| | | | 1.5 | | | | | | | | D | | |
| | | | 2.0 | | | | | | CL-CI | Sandy CLAY: low to medium plasticity, 30-40% fine to medium grained sand, white, trace quartz | | St - VSt | |
| | | | 2.5 | | | | | | | Hole terminated at 2.50 m<br>Target depth<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-09

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553201 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271530 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | F | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | | St | |
| | F-H | | 1.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity, white mottled grey, 30-40% fine grained sand, trace quartz | D | VSt | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.90 m<br>Refusal on stiff clay<br>Groundwater 0 | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-11

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553928 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271566 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 15-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | L | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines | | St - VSt | |
| | H | | 1.0 | | | | | | | | D | | |
| | | | 1.5 | | | | | | | Hole terminated at 1.60 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-12

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 554239 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271566 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some low plasticity fines, trace fine grained gravel, trace rootlets and rootlets up to ?mm | M | L | |
| | F | | 0.5 | | | | | | | Clayey SAND: fine to medium grained, pale brown mottled grey, 30-40% low to medium plasticity fines | | St | |
| | H-VH | | 1.0 | | | | | | SC | As above, laterised | D | H | |
| | | | 1.5 | | | | | | | Hole terminated at 1.40 m<br>Refusal on laterite<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-14

Sheet 1 OF 1

**Job Number:** J1401161
**Client:** Talis Consultants
**Project:** Proposed Industrial Site
**Location:** Katanning

**Contractor:** Kat Plant Hire
**Machine:** CAT 432D
**Operator:** Graham
**Bucket:** 600 mm toothed
**Width:** 0.7 m **Length:** 3 m

**Date:** 03/09/2014
**Logged:** JH
**Checked Date:** 24/09/2014
**Checked By:** RP

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | DEPTH RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty SAND/Clayey SAND: fine to coarse grained, 10-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | F | |
| | F-H | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, 30-40% low to medium plasticity fines, orange-brown mottled grey | D | St | |
| | | | 1.0 | | | | | | | Hole terminated at 0.90 m<br>Refusal on stiff clay<br>Groundwater not encounted | | VSt - H | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-15

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553174 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271191 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, trace rootlets/organics | M | F | |
| | F-H | | 0.5 | | | | | | CL-CI | Sandy CLAY: low to medium plasticity, pale brown mottled grey, 30-40% fine to medium grained sand | D | St - VSt | |
| | | | 1.0 | | | | | | | Hole terminated at 1.10 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-17

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553928 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271184 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some low plasticity fines, trace fine grained gravel, trace rootlets | M | L - MD | |
| | H | | 0.5 | | | | | | SC | Clayey SAND: fine to medium grained, pale brown mottled grey, 30-40% low to medium plasticity fines, laterised | D | St / H | |
| | | | 1.0 | | | | | | | Hole terminated at 1.10 m<br>Refusal on laterite<br>Groundwater not encounted | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-18

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 554249 m | **Contractor:** | Kat Plant Hire | **Date:** | 01/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6271186 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with some low plasticity fines, trace fine grained gravel, trace rootlets, with some fine grained gravel | M | MD | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to medium grained, pale brown mottled grey, 30-40% low to medium plasticity fines | | F | |
| | H | | 1.0 | | | | | | | As above, laterised, very weakly to moderately cemented | D | VSt - H | |
| | | | 1.5 | | | | | | | Hole terminated at 1.20 m<br>Refusal on laterite<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-19

Sheet 1 OF 1

**Job Number:** J1401161
**Client:** Talis Consultants
**Project:** Proposed Industrial Site
**Location:** Katanning

**Contractor:** Kat Plant Hire
**Machine:** CAT 432D
**Operator:** Graham
**Bucket:** 600 mm toothed
**Width:** 0.7 m **Length:** 3 m

**Date:** 01/09/2014
**Logged:** JH
**Checked Date:** 24/09/2014
**Checked By:** RP

| Excavation | | | | | Sampling | | | Field Material Description | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | DEPTH RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP1-19-01) | | | | SP | SAND: fine to coarse grained, dark grey becoming grey, with sone non-plastic fines, trace fine grained gravel, trace rootlets | M | L | |
| | F | | 0.5 | | B(TP1-19-02) | | | | SC / CI | | | F | |
| | H | | 1.0 | | | | | | | | D | VSt | |
| | | | 1.5 | | | | | | | Hole terminated at 1.40 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-20

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 552878 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6270962 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 10-20% low plasticity fines, dark grey becoming grey, trace rootlets/organics | M | F | |
| | F | | 0.5 | | | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, trace fine grained gravel | D | VSt | |
| | H | | 1.0 | | | | | | | | | | |
| | | | 1.5 | | | | | | | | | | |
| | | | 2.0 | | | | | | | Hole terminated at 1.70 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-21

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553179 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6270903 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP1-21-01) | | | | SM / SC | Silty/Clayey SAND: fine to coarse grained, 10-15% low plasticity fines, dark grey becoming grey | M | F | |
| | F | | 0.5 | | B(TP1-21-01) | | | | SC | Clayey SAND: fine to coarse grained, orange-brown mottled grey, 30-40% low to medium plasticity fines, with some moderately iron-cemented fine to coarse grained gravel | | | |
| | | | 1.0 | | | | | | | Sandy CLAY: medium to high plasticity, pale grey/white mottled brown, 30-40% fine to medium grained sand | D | VSt | |
| | H | | 1.5 | | | | | | CI-CH | | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | Hole terminated at 2.20 m<br>Slow progress<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-22

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553357 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6270675 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | B(TP1-22-01) | | | | SM | Silty SAND: fine to coarse grained, dark grey becoming grey, 15-20% non-plastic fines, trace rootlets/organics | M | F | |
| | H | | 0.5 | | | | | | | Clayey SAND: fine to coarse grained, orange-brown mottled grey, locally stained red-brown, 30-40% low to medium plasticity fines, trace fine grained gravel | | St | |
| | F-H | | 1.0 | | | | | | SC | As above, decrease in moisture content | D | VSt - H | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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# TEST PIT: TP1-23

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553544 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6270872 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | E | | 0.0 | | | | | | SC | Clayey SAND: fine to coarse grained, dark grey becoming grey, 15-20% low plasticity fines, trace rootlets/organics in top 100 mm | M | F | |
| | | | 0.5 | | | | | | | Sandy CLAY: low to medium plasticity, grey, 30-40% fine grained sand, fine grained gravel | | | |
| | F | | 1.0 | | | | | | CL-CI | | | F - St | |
| | | | 1.5 | | B(TP1-23-01) | | | | | | D | | |
| | F-H | | 2.0 | | | | | | CI-CH | Sandy CLAY: medium to high plasticity, white, 30-40% fine grained sand, trace quartz | | St | |
| | | | 2.5 | | | | | | | Hole terminated at 2.20 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_001.GPJ <<DrawingFile>> 25/09/2014 16:27 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# TEST PIT: TP1-27

Sheet 1 OF 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Number:** | J1401161 | **Easting:** | 553608 m | **Contractor:** | Kat Plant Hire | **Date:** | 03/09/2014 |
| **Client:** | Talis Consultants | **Northing:** | 6270445 m | **Machine:** | CAT 432D | **Logged:** | JH |
| **Project:** | Proposed Industrial Site | **Datum:** | MGA94 Zone 50 | **Operator:** | Graham | **Checked Date:** | 24/09/2014 |
| **Location:** | Katanning | | | **Bucket:** | 600 mm toothed | **Checked By:** | RP |
| | | | | **Width:** 0.7 m | **Length:** 3 m | | |

| Excavation | | | | | Sampling | | | Field Material Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | EXCAVATION RESISTANCE | WATER | DEPTH (metres) | *DEPTH* RL | SAMPLE OR FIELD TEST | ACID SULPHATE SAMPLE | RECOVERED | GRAPHIC LOG | USCS SYMBOL | SOIL/ROCK MATERIAL DESCRIPTION | MOISTURE CONDITION | CONSISTENCY DENSITY | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| BH | F | | 0.0 | | B(TP1-27-01) | | | | SC | Clayey SAND: fine to coarse grained, grey-brown, 30-40% medium to high plasticity fines, trace rootlets, with some (~20%) fine to medium grained gravel | M | F | |
| | | | 0.5 | | | | | | | | | St | |
| | H | | 1.0 | | | | | | | As above, becoming pale brown/white, decrease in moisture content | | VSt - H | |
| | | | 1.5 | | | | | | | Hole terminated at 1.50 m<br>Refusal on stiff clay<br>Groundwater not encounted | | | |
| | | | 2.0 | | | | | | | | | | |
| | | | 2.5 | | | | | | | | | | |
| | | | 3.0 | | | | | | | | | | |

**Sketch & Other Observations**

**Comments:**

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION J1401161_001.GPJ <<DrawingFile>> 25/09/2014 16:27 8.30.003 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

# Appendix C: Dynamic Cone Penetrometer Test Results



www.galtgeo.com.au
2/39 Flynn St, WEMBLEY WA 6014

ABN: 73 292 586 155

**DYNAMIC CONE PENETROMETER FIELD TEST DATA**
**(AS12896.3.2)**

| | | | |
|---|---|---|---|
| **Client:** | Talis Consultants | **Job No:** | J1401161 |
| **Project:** | Proposed Light Industrial Subdivision | **Date:** | 1 and 3 September 2014 |
| **Location:** | Industrial Area, Katanning | **Engineer:** | JH |

| Test No: | DCP01 | DCP02 | DCP03 | DCP04 | DCP05 | DCP06 | DCP07 | DCP08 | DCP09 |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP1-01 | TP1-02 | TP1-03 | TP1-04 | TP1-05 | TP1-07 | TP1-08 | TP1-09 | TP1-11 |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | - | - | - | - | - | - |
| 100-200 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 2 |
| 200-300 | 2 | 2 | 5 | 3 | 2 | 4 | 1 | 2 | 1 |
| 300-400 | 2 | 4 | 7 | 2 | 10HB | 4 | 3 | 5 | 2 |
| 400-500 | 4 | 5 | 8 | 2 | | 8 | 5 | 4 | 4 |
| 500-600 | 5 | 6 | 5 | 3 | | 5HB | 5 | 4 | 6HB |
| 600-700 | 5 | 10R | 5HB | 4 | | | 4 | 4 | |
| 700-800 | 4 | | | 4 | | | 4 | 5 | |
| 800-900 | 5 | | | 4 | | | 4 | 7 | |
| 900-1000 | | | | | | | | | |

| Test No: | DCP10 | DCP11 | DCP12 | DCP13 | DCP14 | DCP15 | DCP16 | DCP17 | DCP18 |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP1-12 | TP1-14 | TP1-15 | TP1-17 | TP1-18 | TP1-19 | TP1-20 | TP1-21 | TP1-22 |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | - | - | - | - | - | - | - |
| 100-200 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 1 |
| 200-300 | 1 | 1 | 2 | 2 | 5 | 1 | 2 | 2 | 1 |
| 300-400 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| 400-500 | 4 | 5 | 2 | 3 | 5HB | 1 | 3 | 4 | 6 |
| 500-600 | 6HB | 4 | 4 | 6 | | 2 | 6 | 8 | 8HB |
| 600-700 | | 4 | 5 | 10HB | | 3 | 6 | 8 | |
| 700-800 | | 5 | 4 | | | 4 | 8HB | 8 | |
| 800-900 | | 8 | 5 | | | 4 | | 8 | |
| 900-1000 | | | | | | 4 | | | |

| Test No: | DCP19 | DCP20 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | TP1-23 | TP1-27 | | | | | | | |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | - | - | | | | | | | |
| 100-200 | 1 | 1 | | | | | | | |
| 200-300 | 1 | 2 | | | | | | | |
| 300-400 | 2 | 2 | | | | | | | |
| 400-500 | 3 | 3 | | | | | | | |
| 500-600 | 3 | 2 | | | | | | | |
| 600-700 | 3 | 6 | | | | | | | |
| 700-800 | 3 | 7R | | | | | | | |
| 800-900 | 4 | | | | | | | | |
| 900-1000 | | | | | | | | | |

| Test No: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | | | | | | | | | |
| **Depth (mm)** | **N° of Penetrometer Blows per 100 mm Depth Interval** | | | | | | | | |
| 0-100 | | | | | | | | | |
| 100-200 | | | | | | | | | |
| 200-300 | | | | | | | | | |
| 300-400 | | | | | | | | | |
| 400-500 | | | | | | | | | |
| 500-600 | | | | | | | | | |
| 600-700 | | | | | | | | | |
| 700-800 | | | | | | | | | |
| 800-900 | | | | | | | | | |
| 900-1000 | | | | | | | | | |

Dynamic Cone Penetrometer tests done in accordance with AS 1289.6.3.2
HB: Hammer bounce (refusal)
HW: Penetration due to hammer weight only
R: Refusal

# Appendix D: Laboratory Test Results



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ABN: 73 292 586 155

# Particle Size Distribution & Plasticity Index tests

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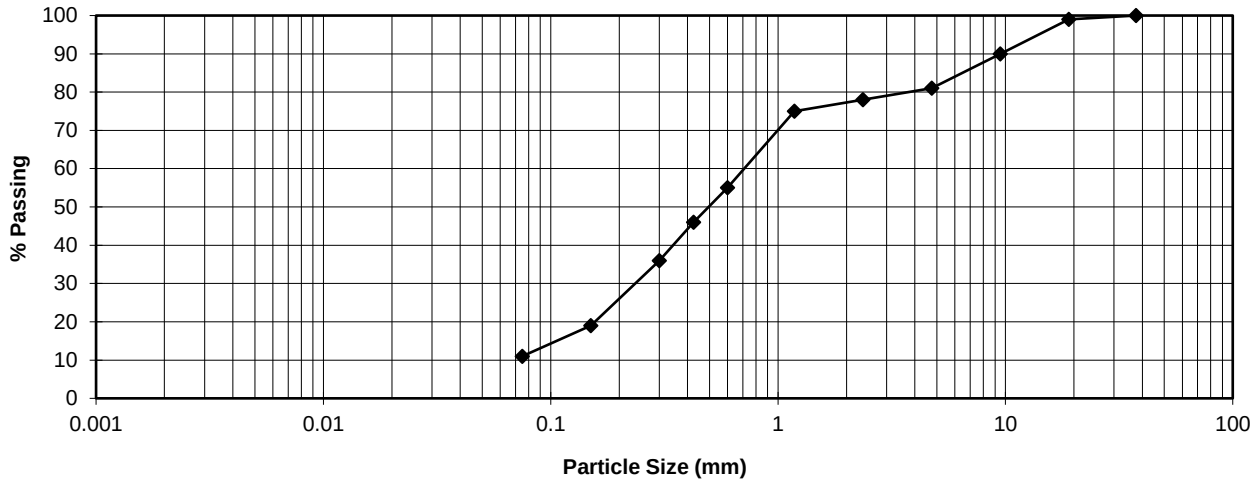
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3408 |
| **Sample No:** | P14/3408 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-5
Sample Depth (m): 0.2-0.4




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | 100 |
| 19.0 | 99 |
| 9.5 | 90 |
| 4.75 | 81 |
| 2.36 | 78 |
| 1.18 | 75 |
| 0.600 | 55 |
| 0.425 | 46 |
| 0.300 | 36 |
| 0.150 | 19 |
| 0.075 | 11 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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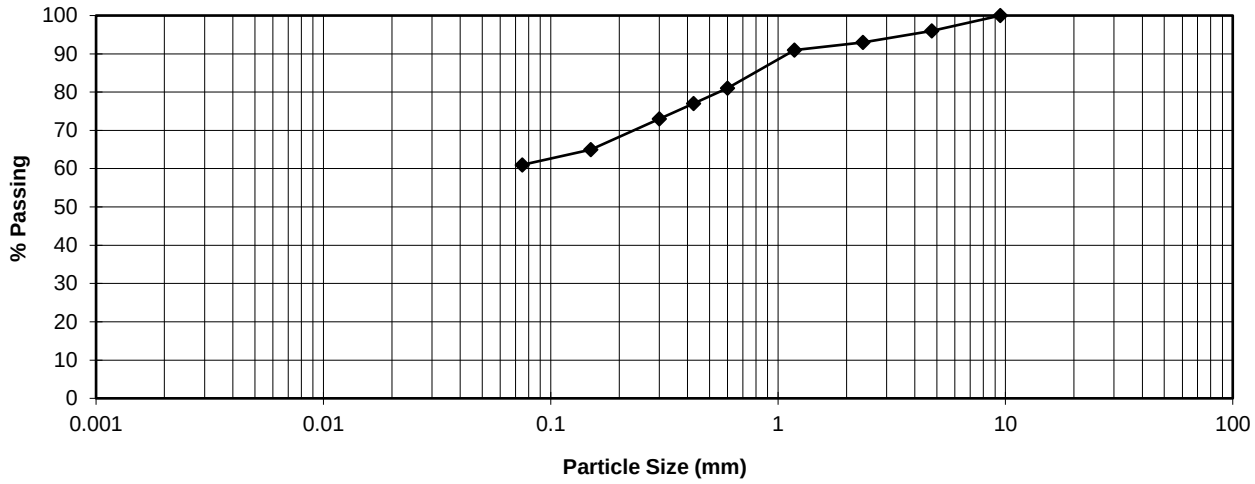
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3409 |
| **Sample No:** | P14/3409 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-5
Sample Depth (m): 0.7-0.9




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 96 |
| 2.36 | 93 |
| 1.18 | 91 |
| 0.600 | 81 |
| 0.425 | 77 |
| 0.300 | 73 |
| 0.150 | 65 |
| 0.075 | 61 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 43 | % |
| **Plastic limit 3.2.1** | 19 | % |
| **Plasticity index 3.3.1** | 24 | % |
| **Linear shrinkage 3.4.1** | 8.0 | % |

**Cracked** ☐
**Curled** ☑

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Sampling Procedure: Tested as received

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AS PSDPI May 2009

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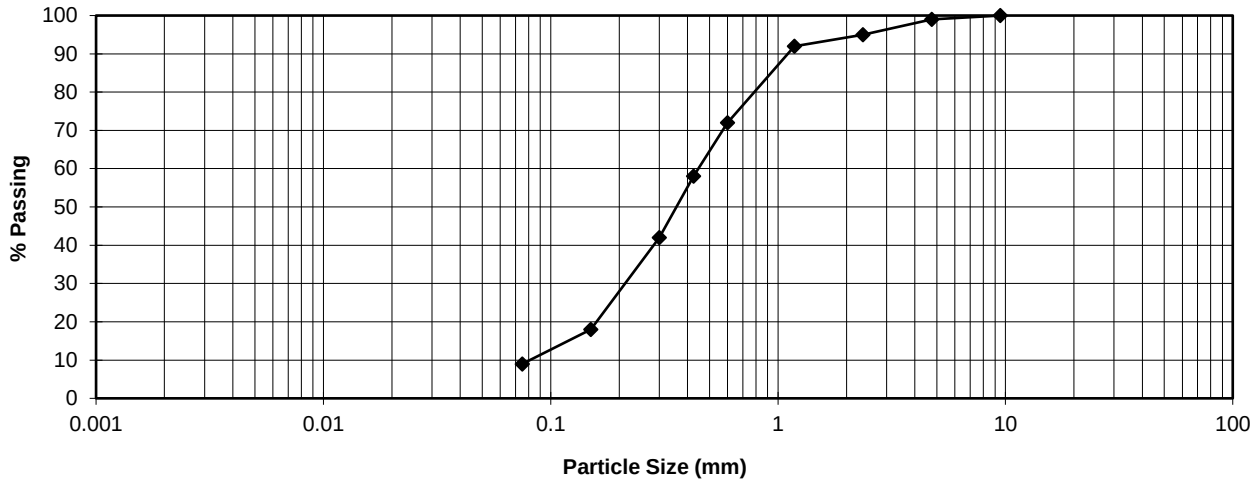
| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3410 |
| **Sample No:** | P14/3410 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-19
Sample Depth (m): 0.1-0.2




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 99 |
| 2.36 | 95 |
| 1.18 | 92 |
| 0.600 | 72 |
| 0.425 | 58 |
| 0.300 | 42 |
| 0.150 | 18 |
| 0.075 | 9 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

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**Curled** ☐

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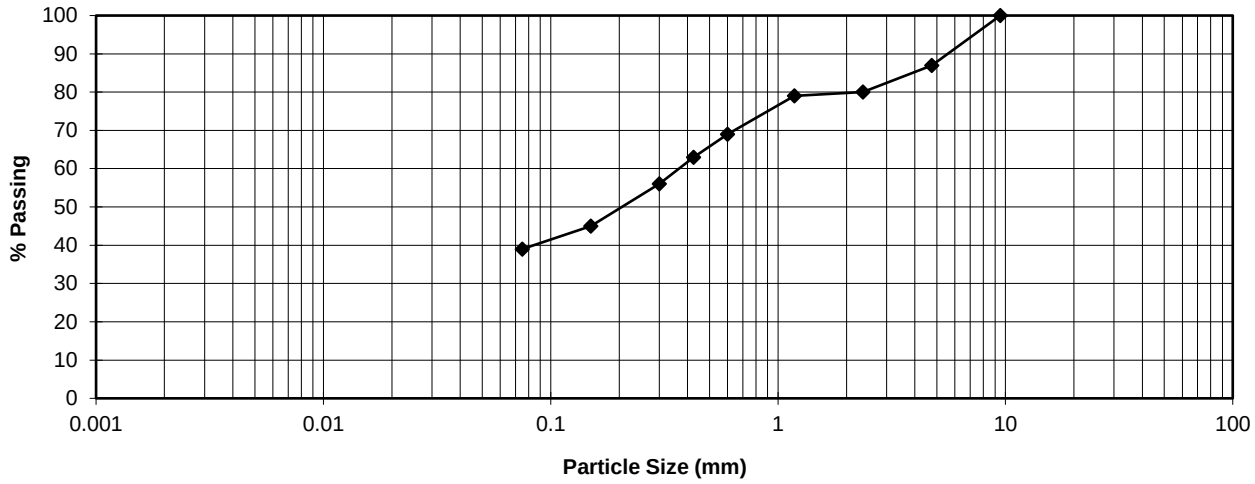
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3411 |
| **Sample No:** | P14/3411 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-19
Sample Depth (m): 0.4-0.5




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 87 |
| 2.36 | 80 |
| 1.18 | 79 |
| 0.600 | 69 |
| 0.425 | 63 |
| 0.300 | 56 |
| 0.150 | 45 |
| 0.075 | 39 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

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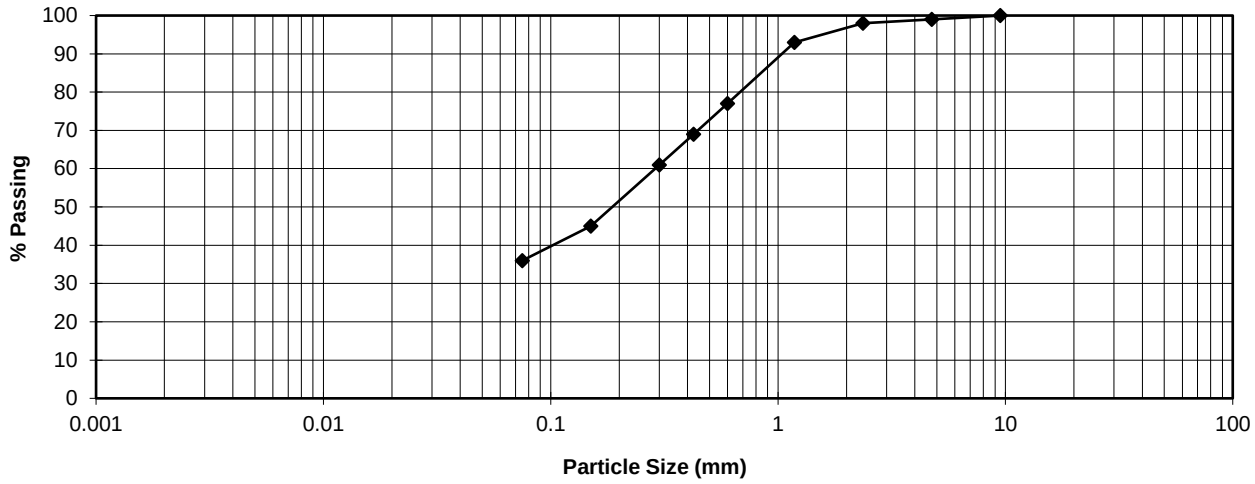
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3412 |
| **Sample No:** | P14/3412 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-21
Sample Depth (m): 0.5-0.7




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 99 |
| 2.36 | 98 |
| 1.18 | 93 |
| 0.600 | 77 |
| 0.425 | 69 |
| 0.300 | 61 |
| 0.150 | 45 |
| 0.075 | 36 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 32 | % |
| **Plastic limit 3.2.1** | 12 | % |
| **Plasticity index 3.3.1** | 20 | % |
| **Linear shrinkage 3.4.1** | 9.5 | % |

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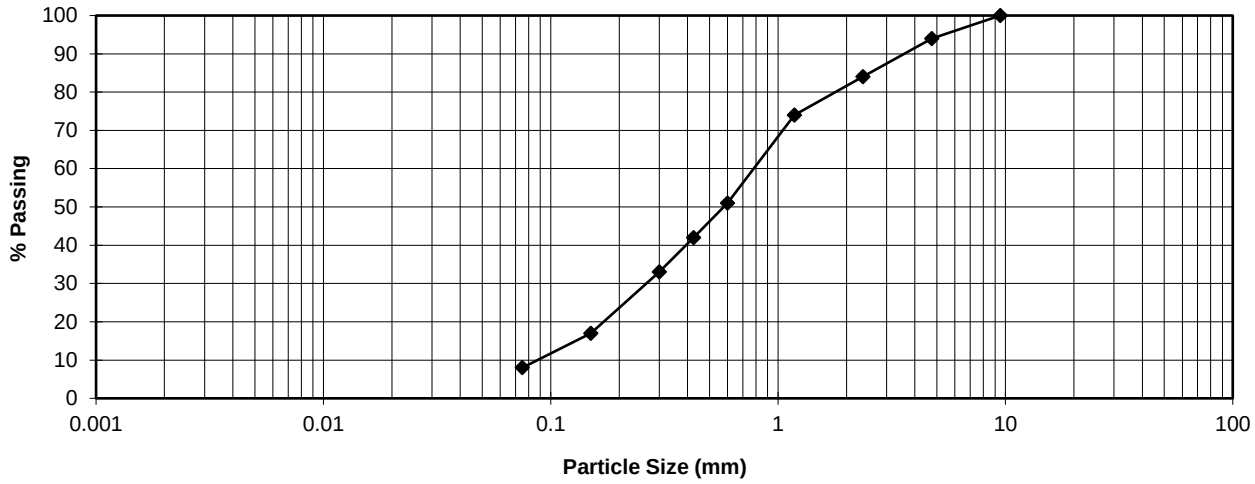
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3413 |
| **Sample No:** | P14/3413 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-21
Sample Depth (m): 0.1-0.3




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | 100 |
| 4.75 | 94 |
| 2.36 | 84 |
| 1.18 | 74 |
| 0.600 | 51 |
| 0.425 | 42 |
| 0.300 | 33 |
| 0.150 | 17 |
| 0.075 | 8 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
**Curled** ☐

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AS PSDPI May 2009

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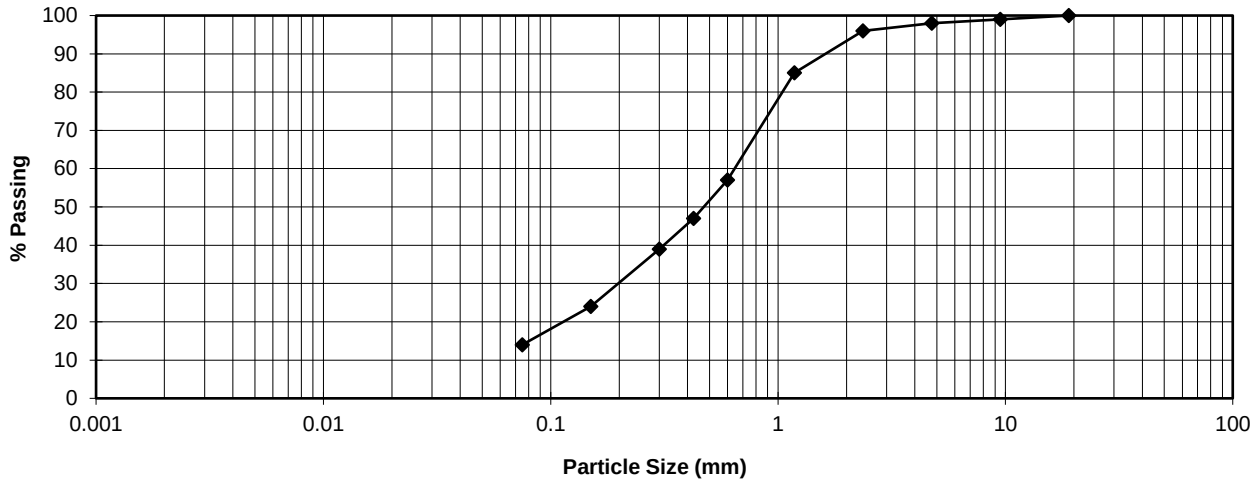
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3414 |
| **Sample No:** | P14/3414 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-22
Sample Depth (m): 0.1-0.3




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | 100 |
| 9.5 | 99 |
| 4.75 | 98 |
| 2.36 | 96 |
| 1.18 | 85 |
| 0.600 | 57 |
| 0.425 | 47 |
| 0.300 | 39 |
| 0.150 | 24 |
| 0.075 | 14 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | SIC | % |
| **Plastic limit 3.2.1** | NP | % |
| **Plasticity index 3.3.1** | NP | % |
| **Linear shrinkage 3.4.1** | *0.0 | % |

**Cracked** ☐
**Curled** ☐

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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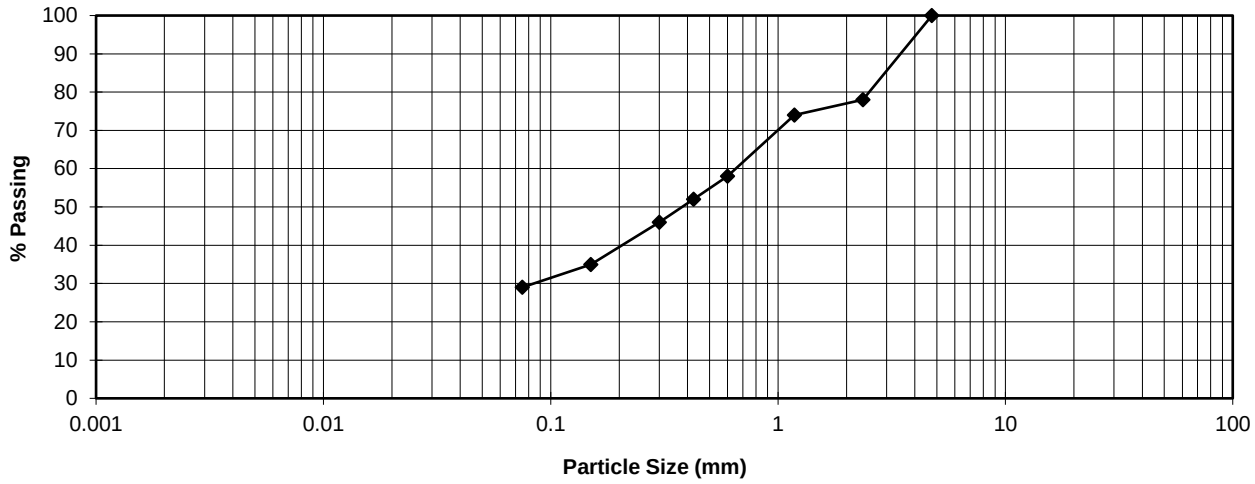
**Email: matt@mcgeotest.com.au**

| | |
|---|---|
| **Job No:** | 60083 |
| **Report No:** | 60083-P14/3415 |
| **Sample No:** | P14/3415 |
| **Issue Date:** | 22 September 2014 |

Client: Galt Geotechnics (J1401161)
Project: Proposed Residential and Industrial Subdivisions
Location: Industrial Area, Katanning

Sample location: TP1-27
Sample Depth (m): 0.3-0.5




**SIEVE ANALYSIS AS 1289.3.6.1**

| Sieve Size (mm) | % Passing |
|---|---|
| 75.0 | |
| 37.5 | |
| 19.0 | |
| 9.5 | |
| 4.75 | 100 |
| 2.36 | 78 |
| 1.18 | 74 |
| 0.600 | 58 |
| 0.425 | 52 |
| 0.300 | 46 |
| 0.150 | 35 |
| 0.075 | 29 |

**Plasticity index tests**
**AS 1289**

| | | |
|---|---|---|
| **Liquid limit 3.1.1** | 43 | % |
| **Plastic limit 3.2.1** | 13 | % |
| **Plasticity index 3.3.1** | 30 | % |
| **Linear shrinkage 3.4.1** | 14.5 | % |

**Cracked** ☐
**Curled** ☑

**Client Address: 2/39 Flynn Street, Wembley WA**

Sampling Procedure: Tested as received

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Approved signature

Matthew van Herk

# Appendix E: Understanding Your Geotechnical Engineering Report



www.galtgeo.com.au
2/39 Flynn St, WEMBLEY WA 6014
ABN: 73 292 586 155

# UNDERSTANDING YOUR GEOTECHNICAL ENGINEERING REPORT

GALT FORM PMP11 Rev1

## 1. EXPECTATIONS OF A GEOTECHNICAL ENGINEERING REPORT

This document has been prepared to clarify what is and is not provided in your geotechnical report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with geotechnical conditions.

Geotechnical engineering is a less exact science than other engineering disciplines. We include this information to help you understand where our responsibilities as geotechnical engineers begin and end, to help the client recognise his responsibilities and risks. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of geotechnical problems and we can help you to manage your risk.

## 2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following :

- The project objectives as we understood them and as described in this report;
- the specific site mentioned in this report; and
- the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this geotechnical report if any of the following conditions apply:

- the report was not written for you;
- the report was not written for the site specific to your development;
- the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your geotechnical engineering report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the design team and by being able to review work produced by other members of the design team which relies on geotechnical information provided in our report.

## 3. GEOTECHNICAL ENGINEERING LOGS

Our reports often include logs of intrusive and non-intrusive geotechnical investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

## 4. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party as a consequence of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

## 5. CHANGE IN SUBSURFACE CONDITIONS

The geotechnical recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including as a result of anthropogenic events (such as construction on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

## 6. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use engineering judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from engineering judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

## 7. ENVIRONMENTAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not included. The investigation techniques used by us in developing our report differ from those for an environmental investigation. Our report was not prepared with environmental considerations in mind and it is the client's responsibility to satisfy himself that environmental considerations have been taken into account for the site. If you require guidance on how to proceed on evaluating environmental risk at the site, we can provide further information and contacts.

# Appendix C: Certificate of Title

WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 3/D13517 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 2 | 27/3/2008 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1101 FOLIO 225

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 3 ON DIAGRAM 13517

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

DOL-KIPLEY TAYLOT OF 10 HILL WAY, KATANNING
NUREL TAYLOR OF 11 CASSIA COURT, KATANNING
RAPAL TAYLOT OF 28 WOODLEY ROAD, BUNBURY
AS JOINT TENANTS

(T K782071 ) REGISTERED 25 NOVEMBER 2008

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. *K782072 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 25.11.2008.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**
The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1101-225 (3/D13517).
PREVIOUS TITLE: 1071-118.
PROPERTY STREET ADDRESS: LOT 3 THOMSON ST, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: A000001A PENDING SURVEY - PLAN 54975.
NOTE 2: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING K782072

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 1/D3246 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 22/2/2006 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1220 FOLIO 961

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 1 ON DIAGRAM 3246

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF AUSTRAL TERRACE, KATANNING
(T J614616 ) REGISTERED 7 FEBRUARY 2006

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. TITLE EXCLUDES THE LAND SHOWN ON LA PLAN 16248.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1220-961 (1/D3246).
PREVIOUS TITLE: 593-79.
PROPERTY STREET ADDRESS: LOT 1 GREAT SOUTHERN HWY, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 3/D27422 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| N/A | N/A |

# RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 1261 FOLIO 665

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 3 ON DIAGRAM 27422

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF KATANNING

(T T10486/1962) REGISTERED 14 JUNE 1962

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1261-665 (3/D27422).
PREVIOUS TITLE: 1256-827.
PROPERTY STREET ADDRESS: LOT 3 SYNNOTT AV, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 1/D26384 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 4 | 30/12/2013 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1383 FOLIO 405

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 1 ON DIAGRAM 26384

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF 16-24 AUSTRAL TERRACE, KATANNING
(T M488501 ) REGISTERED 9 DECEMBER 2013

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. T4765/1911 EASEMENT BENEFIT SEE TRANSFER 4765/1911. AS TO KATANNING LOTS 421 AND 422 ONLY. REGISTERED 23.8.1911.
   - A62/1929 SURRENDER AS TO VOL 936 FOL 15. REGISTERED 15.10.1929.
   - A63/1929 SURRENDER. AS TO VOL 821 FOL 170. REGISTERED 15.10.1929.
   - A839944 SURRENDER. AS TO VOL 566 FOL 127A. REGISTERED 21.6.1974.
   - K414332 SURRENDERED AS TO VOL1861 FOL 703 ONLY REGISTERED 16.11.2007.
2. *L616393 MEMORIAL. CONTAMINATED SITES ACT 2003 REGISTERED 3.5.2011.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1383-405 (1/D26384).
PREVIOUS TITLE: 1256-825.
PROPERTY STREET ADDRESS: LOT 1 SYNNOTT AV, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 964/DP102394 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| N/A | N/A |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 170 FOLIO 156

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 964 ON DEPOSITED PLAN 102394

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

KATANNING ROAD BOARD OF AUSTRAL TERRACE, KATANNING
(T T16841/1951) REGISTERED 16 AUGUST 1951

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. TITLE EXCLUDES THE LAND SHOWN ON O.P. 16247.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 170-156 (964/DP102394).
PREVIOUS TITLE: This Title.
PROPERTY STREET ADDRESS: LOT 964 GREAT SOUTHERN HWY, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF KOJONUP LOCATION 964 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 964 ON DEPOSITED PLAN 102394 ON 08-JUL-02 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 70/DP222683 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 2/12/2002 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1749 FOLIO 52

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 70 ON DEPOSITED PLAN 222683

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

ASHLEIGH PETER SEVERIN
TANIA JOY SEVERIN
BOTH OF 5 CLAUDE STREET, KATANNING
AS JOINT TENANTS

(T L751655 ) REGISTERED 6 OCTOBER 2011

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE.
2. *L751656 MORTGAGE TO BANK OF WESTERN AUSTRALIA LTD REGISTERED 6.10.2011.
3. *L867797 CAVEAT BY EDWARD JAMES BRIDE LODGED 27.2.2012.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1749-52 (70/DP222683).
PREVIOUS TITLE: 1333-281.
PROPERTY STREET ADDRESS: LOT 70 WARREN RD, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF KATANNING AGRICULTURAL AREA LOT 70 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 70 ON DEPOSITED PLAN 222683 ON 18-SEP-02 TO ENABLE ISSUE OF A DIGITAL

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CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.

NOTE 3: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING L751656

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 4/D60155 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 22/2/2006 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1759 FOLIO 756

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 4 ON DIAGRAM 60155

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF AUSTRAL TERRACE, KATANNING
(T J614616 ) REGISTERED 7 FEBRUARY 2006

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | 1759-756 (4/D60155). |
| PREVIOUS TITLE: | 726-75. |
| PROPERTY STREET ADDRESS: | 41 CROSBY ST, KATANNING. |
| LOCAL GOVERNMENT AREA: | SHIRE OF KATANNING. |

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 79/D13273 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 11/1/2008 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1878 FOLIO 185

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 79 ON DIAGRAM 13273

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF AUSTRAL TERRACE, KATANNING
(A E458779 ) REGISTERED 3 OCTOBER 1990

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. T4765/1911 EASEMENT BENEFIT SEE TRANSFER 4765/1911. AS TO KATANNING LOT 421 ONLY. REGISTERED 23.8.1911.

| | |
|---|---|
| A62/1929 | SURRENDER. AS TO VOL 936 FOL 15. REGISTERED 15.10.1929. |
| A63/1929 | SURRENDER. AS TO VOL 821 FOL 170. REGISTERED 15.10.1929. |
| A650095 | SURRENDER. AS TO VOL 566 FOL 127A. REGISTERED 6.4.1973. |
| A650096 | SURRENDER. AS TO VOL 566 FOL 128A. REGISTERED 6.4.1973. |
| D538930 | SURRENDER. AS TO VOL 1672 FOL 3. REGISTERED 17.8.1987. |
| E458778 | SURRENDER. AS TO VOL 1861 FOL 710 AND VOL 1773 FOL 817. REGISTERED 3.10.1990. |
| K414331 | SURRENDERED AS TO VOL 1861 FOL 703 ONLY REGISTERED 16.11.2007. |

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1878-185 (79/D13273).
PREVIOUS TITLE: 1773-815.
PROPERTY STREET ADDRESS: LOT 79 WARREN RD, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: K284724 CORRECTION MADE ON ORIGINAL CERTIFICATE OF TITLE - BUT NOT SHOWN ON

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 1/D3847 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 11/1/2008 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1878 FOLIO 186

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 1 ON DIAGRAM 3847

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF AUSTRAL TERRACE, KATANNING
(T L597145 ) REGISTERED 7 APRIL 2011

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 1878 FOL 186.
2. T4765/1911 EASEMENT BENEFIT SEE TRANSFER 4765/1911. REGISTERED 23.8.1911.
   - A60/1929 SURRENDER. AS TO VOL 821 FOL 170. REGISTERED 15.10.1929.
   - A61/1929 SURRENDER. AS TO VOL 936 FOL 15. REGISTERED 15.10.1929.
   - A650095 SURRENDER. AS TO VOL 566 FOL 127A. REGISTERED 6.4.1973.
   - A650096 SURRENDER. AS TO VOL 566 FOL 128A. REGISTERED 6.4.1973.
   - D538930 SURRENDER.AS TO VOL 1672 FOL 3. REGISTERED 17.8.1987.
   - E458778 SURRENDER. AS TO VOL 1861 FOL 710 AND VOL 1773 FOL 817. REGISTERED 3.10.1990.
   - K414331 SURRENDERED AS TO VOL 1861 FOL 703 ONLY REGISTERED 16.11.2007.
3. T14267/1929 EASEMENT BENEFIT SEE TRANSFER 14267/1929. REGISTERED 1.1.1929.
4. *L597145 THE PORTION OF LOT 80 ON DIAGRAM 32304 HEREIN INCLUDED IN VOLUME 2767 FOLIO 613 REGISTERED 7.4.2011.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1878-186 (1/D3847).

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RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: 1/D3847 VOLUME/FOLIO: 1878-186 PAGE 2

PREVIOUS TITLE: 1773-816.
PROPERTY STREET ADDRESS: LOT 1 WARREN RD, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: L597146 PARTIALLY CANCELLED TITLE - DUPLICATE TITLE NOT ISSUED

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| N/A | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| N/A | N/A |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 2067 FOLIO 169

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**THIS IS A MULTI-LOT TITLE**

**LAND DESCRIPTION:**

LOTS 6, 7, 8, 9, 14, 16, 17, 18 & 19 ON PLAN 3271
LOT 25 ON DIAGRAM 16035

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF AUSTRAL TERRACE, KATANNING
(A G096804 ) REGISTERED 8 FEBRUARY 1996

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | 2067-169 (25/D16035) , 2067-169 (14/P3271) , 2067-169 (16/P3271) , 2067-169 (17/P3271) , 2067-169 (18/P3271) , 2067-169 (19/P3271) , 2067-169 (6/P3271) , 2067-169 (7/P3271) , 2067-169 (8/P3271) , 2067-169 (9/P3271). |
| PREVIOUS TITLE: | 1140-463. |
| PROPERTY STREET ADDRESS: | LOT 6 CURLEW ST, KATANNING (6/P3271).<br>LOT 7 CURLEW ST, KATANNING (7/P3271).<br>LOT 8 CURLEW ST, KATANNING (8/P3271).<br>LOT 9 CURLEW ST, KATANNING (9/P3271).<br>LOT 14 SHIRLEY ST, KATANNING (14/P3271).<br>LOT 16 SHIRLEY ST, KATANNING (16/P3271).<br>LOT 17 SHIRLEY ST, KATANNING (17/P3271).<br>LOT 18 SHIRLEY ST, KATANNING (18/P3271).<br>LOT 19 SHIRLEY ST, KATANNING (19/P3271). |

END OF PAGE 1 - CONTINUED OVER

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RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: N/A VOLUME/FOLIO: 2067-169 PAGE 2

LOT 25 SHIRLEY ST, KATANNING (25/D16035).

LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 5/D60642 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 18/11/2010 |

# RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 2755 FOLIO 506

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 5 ON DIAGRAM 60642

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF 16-24 AUSTRAL TERRACE, KATANNING
(AF L480575 ) REGISTERED 16 NOVEMBER 2010

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | D60642. |
| PREVIOUS TITLE: | 85-197A. |
| PROPERTY STREET ADDRESS: | NO STREET ADDRESS INFORMATION AVAILABLE. |
| LOCAL GOVERNMENT AREA: | SHIRE OF KATANNING. |

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 6/D60642 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 18/11/2010 |

# RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 2755 FOLIO 507

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 6 ON DIAGRAM 60642

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF 16-24 AUSTRAL TERRACE, KATANNING
(AF L480575 ) REGISTERED 16 NOVEMBER 2010

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | D60642. |
| PREVIOUS TITLE: | 85-197A. |
| PROPERTY STREET ADDRESS: | NO STREET ADDRESS INFORMATION AVAILABLE. |
| LOCAL GOVERNMENT AREA: | SHIRE OF KATANNING. |

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 2/D41856 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| N/A | N/A |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 529 FOLIO 71A

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 2 ON DIAGRAM 41856

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

GARY RICHARD QUARMBY
NICOLEE ANN QUARMBY
BOTH OF 18 MARMION STREET, KATANNING
AS JOINT TENANTS

(T M546884 ) REGISTERED 11 FEBRUARY 2014

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. *M546885 MORTGAGE TO WESTPAC BANKING CORPORATION REGISTERED 11.2.2014.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 529-71A (2/D41856).
PREVIOUS TITLE: 529-70A.
PROPERTY STREET ADDRESS: 18 MARMION ST WEST, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M546885

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 3/D41856 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 2/6/2007 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 529 FOLIO 74A

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 3 ON DIAGRAM 41856

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

WENDY MARGARET BRIDE OF 6 MARMION STREET, KATANNING
(T K186410 ) REGISTERED 10 MAY 2007

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. K186411 MORTGAGE TO WESTPAC BANKING CORPORATION REGISTERED 10.5.2007.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 529-74A (3/D41856).
PREVIOUS TITLE: 529-70A.
PROPERTY STREET ADDRESS: 6 MARMION ST WEST, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 3/D42266 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 2 | 4/10/2011 |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 566 FOLIO 127A

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 3 ON DIAGRAM 42266

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

WESTERN AUSTRALIAN MEAT MARKETING CO-OPERATIVE LTD OF LEVEL 3, 823 WELLINGTON STREET, WEST PERTH

(T H372595 ) REGISTERED 25 FEBRUARY 2000

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. TITLE EXCLUDES THE LAND SHOWN ON OP 16249.
2. L744820 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 28.9.2011.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | 566-127A (3/D42266). |
| PREVIOUS TITLE: | 1300-85. |
| PROPERTY STREET ADDRESS: | 27983 GREAT SOUTHERN HWY, KATANNING. |
| LOCAL GOVERNMENT AREA: | SHIRE OF KATANNING. |

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 69/DP222683 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| N/A | N/A |

# RECORD OF CERTIFICATE OF TITLE

VOLUME 611 FOLIO 158A

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 69 ON DEPOSITED PLAN 222683

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

ALBERT LESLIE CROSBY
KATHLEEN ADA CROSBY
BOTH OF KATANNING
AS JOINT TENANTS

(T G269140 ) REGISTERED 30 AUGUST 1996

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 611-158A (69/DP222683).
PREVIOUS TITLE: 1094-256.
PROPERTY STREET ADDRESS: 215 WARREN RD, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF KATANNING AGRICULTURAL AREA LOT 69 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 69 ON DEPOSITED PLAN 222683 ON 03-JUN-02 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| **2809/DP117098** | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| **1** | **22/2/2006** |

# RECORD OF CERTIFICATE OF TITLE

VOLUME **933** FOLIO **102**

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 2809 ON DEPOSITED PLAN 117098

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

SHIRE OF KATANNING OF AUSTRAL TERRACE, KATANNING
(T J614616 ) REGISTERED 7 FEBRUARY 2006

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. TITLE EXCLUDES THE LAND SHOWN ON O.P. 16248.
2. TITLE EXCLUDES THE LAND SHOWN ON O.P. 16249.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 933-102 (2809/DP117098).
PREVIOUS TITLE: 339-35.
PROPERTY STREET ADDRESS: LOT 2809 BAKER RD, KATANNING.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF KOJONUP LOCATION 2809 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 2809 ON DEPOSITED PLAN 117098 ON 28-JUN-02 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| **994/DP214737** | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| **N/A** | **N/A** |

VOLUME **LR3013** FOLIO **963**

# RECORD OF QUALIFIED CERTIFICATE OF CROWN LAND TITLE

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

**NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 994 ON DEPOSITED PLAN 214737

**STATUS ORDER AND PRIMARY INTEREST HOLDER:**
(FIRST SCHEDULE)

**STATUS ORDER/INTEREST:** RESERVE UNDER MANAGEMENT ORDER

**PRIMARY INTEREST HOLDER:** SHIRE OF KATANNING

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. RESERVE 21820 FOR THE PURPOSE OF GREATER SPORTS GROUND & AERIAL LANDING GROUND MANAGEMENT ORDER. CONTAINS CONDITIONS TO BE OBSERVED. WITH POWER TO LEASE FOR ANY TERM NOT EXCEEDING 21 YEARS, SUBJECT TO THE CONSENT OF THE MINISTER FOR LANDS.

Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

----------END OF CERTIFICATE OF CROWN LAND TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | DP214737. |
| PREVIOUS TITLE: | THIS TITLE. |
| PROPERTY STREET ADDRESS: | LOT 994 KIERLE ST, KATANNING. |
| LOCAL GOVERNMENT AREA: | SHIRE OF KATANNING. |
| RESPONSIBLE AGENCY: | DEPARTMENT OF LANDS (SLSD). |

NOTE 1: L238489 CORRESPONDENCE FILE 03228-1989-01RO

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| 500/DP70820 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| N/A | N/A |

VOLUME LR3160 FOLIO 681

# RECORD OF QUALIFIED CERTIFICATE OF CROWN LAND TITLE

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

**NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 500 ON DEPOSITED PLAN 70820

**STATUS ORDER AND PRIMARY INTEREST HOLDER:**
(FIRST SCHEDULE)

**STATUS ORDER/INTEREST:** RESERVE UNDER MANAGEMENT ORDER

**PRIMARY INTEREST HOLDER:** SHIRE OF KATANNING OF PO BOX 130, KATANNING
(XE L651580 ) REGISTERED 13 JUNE 2011

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. L651579 RESERVE 50922 FOR THE PURPOSE OF SALESYARD REGISTERED 13.6.2011.
L651580 MANAGEMENT ORDER. CONTAINS CONDITIONS TO BE OBSERVED. REGISTERED 13.6.2011.

Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

----------END OF CERTIFICATE OF CROWN LAND TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP70820.
PREVIOUS TITLE: LR3136-796.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.
RESPONSIBLE AGENCY: DEPARTMENT OF LANDS (SLSD).

NOTE 1: L651579 CORRESPONDENCE FILE 00255-2011-01RO

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WESTERN AUSTRALIA

| REGISTER NUMBER | |
|---|---|
| **501/DP70820** | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| **N/A** | **N/A** |

VOLUME **LR3160** FOLIO **682**

# RECORD OF QUALIFIED CERTIFICATE OF CROWN LAND TITLE

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

**NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

**LAND DESCRIPTION:**

LOT 501 ON DEPOSITED PLAN 70820

**STATUS ORDER AND PRIMARY INTEREST HOLDER:**
(FIRST SCHEDULE)

**STATUS ORDER/INTEREST:** RESERVE UNDER MANAGEMENT ORDER

**PRIMARY INTEREST HOLDER:** WESTERN AUSTRALIAN AGRICULTURE AUTHORITY OF 3 BARON-HAY COURT, SOUTH PERTH

(XE K639730 ) REGISTERED 27 JUNE 2008

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

1. L630250 EASEMENT TO WATER CORPORATION FOR SEWERAGE PURPOSES. SEE DEPOSITED PLAN 70820 AS CREATED ON DEPOSITED PLAN 49445 REGISTERED 18.5.2011.
2. L651578 PART RESERVE 37952 FOR THE PURPOSE OF AGRICULTURAL RESEARCH STATION REGISTERED 13.6.2011.

K639730 MANAGEMENT ORDER. CONTAINS CONDITIONS TO BE OBSERVED. REGISTERED 27.6.2008.

Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

----------END OF CERTIFICATE OF CROWN LAND TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP70820.
PREVIOUS TITLE: LR3136-796.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.

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ORIGINAL CERTIFICATE OF CROWN LAND TITLE
QUALIFIED

REGISTER NUMBER: 501/DP70820 VOLUME/FOLIO: LR3160-682 PAGE 2

LOCAL GOVERNMENT AREA: SHIRE OF KATANNING.
RESPONSIBLE AGENCY: DEPARTMENT OF AGRICULTURE AND FOOD.

NOTE 1: J692063 CORRESPONDENCE FILE 01029-1982-03RO

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# Appendix D: Shire of Katanning, Town Planning Scheme

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# SHIRE OF KATANNING

## TOWN PLANNING SCHEME NO. 4

*Updated to include amd 10 gg 1/10/13*

**DISCLAIMER**

This is a copy of the Town Planning Scheme produced from an electronic version of the Scheme held and maintained by the Department of Planning. Whilst all care has been taken to accurately portray the current Scheme provisions, no responsibility shall be taken for any omissions or errors in this documentation.

Consultation with the respective Local Government Authority should be made to view a legal version of the Scheme.

Please advise the Department of Planning of any errors or omissions in this document.

**Prepared by the Department of Planning**

**Original Town Planning Scheme Gazettal Date: 9 January 1998**

# SHIRE OF KATANNING TPS 4 - TEXT AMENDMENTS

| AMDT NO | GAZETTAL DATE | UPDATED | | DETAILS |
|---|---|---|---|---|
| | | WHEN | BY | |
| 4 | 24/9/04 | 23/9/04 | DH | Schedule 2 – deleting :Lots 5, A85 and A86 Amherst Street, Katanning" and inserting therein "Lots 85 and 86 Amherst Street, Katanning". |
| 5 | 9/12/05 | 17/1/06 | DH | Arrangement of Scheme Text:<br>- changing heading of clause 1.8 from 'Interpretations' to 'Definitions'.<br>- under heading 'Schedules' changing heading for Schedule 1 from 'Interpretations' to 'Definitions' and deleting Schedules 6 to 9 inclusive and inserting therein:<br>"6 Exempted Advertisements<br>7 Form of Application for Planning Approval<br>8 Additional information for Advertisements<br>9 Notice of Public Advertisement of Planning Proposal<br>10 Notice of Determination on Application for Planning Approval<br>- substituting "clause" for "sub-clause" wherever the term occurs in the Scheme.<br>- substituting "Residential Design Codes" for "Residential Planning Codes" wherever the tern occurs in the Scheme.<br>- changing heading for clause 1.8 and Schedule 1 from 'Interpretations' to 'Definitions'.<br>Part 3 – modifying clause 3.2.2.<br>Part 3 – deleting and replacing clauses 3.2.3, 3.2.4 and 3.2.5.<br>Zoning Table – deleting and substituting new zoning table.<br>Part 8 – modifying clause 8.1.2.<br>Part 8 – deleting and replacing clause 8.5.<br>Part 9 – deleting clause 9.7 and substituting with new clause "9.7 Delegation".<br>Schedule 1 – deleting definitions for "aquaculture", "feedlot", "industry-noxious", "motor vehicle and marine sales", "piggery", "poultry farm", "showroom", and "veterinary hospital".<br>Schedule 1 – inserting definitions "agriculture-extensive", "agroforestry", "ancillary tourist use", "animal husbandry-intensive", "aquaculture", "bed and breakfast", "farm supply centre", "home business", "home office", "incidental use", "industry-mining", "industry-noxious", "motor vehicle, boat or caravan sales", "plantation", "predominant use", "premises", "rural home business", "substantially commenced", "showroom", "telecommunications infrastructure", "trade display" and "veterinary centre".<br>Schedule 2 – deleting schedule 2 and substituting.<br>Schedules – deleting Schedules 6 – 9 inclusive and substituting where necessary. |
| 7 | 21/11/06 | 27/11/06 | DH | Table of Contents - adding in numeric order "3.4 Additional Use" and "Schedule 11 - Additional Use".<br>Part 3 - adding new Clause "3.4 Additional use".<br>Schedules - Adding new schedule "Schedule 11 - Additional Uses". |
| 8 | 28/8/07 | 6/9/07 | DH | Schedule 2 - deleting Special Use area "SU 9". |
| 9 | 22/1/13 | 11/2/13 | NM | Deleted clause 6.6.4. |
| 10 | 1/10/13 | 8/10/13 | NM | Modified Group Dwelling within Table 1.<br>Replaced Clause 6.1.4. |
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# SHIRE OF KATANNING

# TOWN PLANNING SCHEME NO. 4

THE KATANNING SHIRE COUNCIL, UNDER AND BY VIRTUE OF THE POWERS CONFERRED UPON IT IN THAT BEHALF BY THE TOWN PLANNING AND DEVELOPMENT ACT 1928 (AS AMENDED), HEREBY MAKES THE FOLLOWING TOWN PLANNING SCHEME FOR THE PURPOSES LAID DOWN IN THE ACT.

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# PART I - PRELIMINARY

## 1.1 CITATION:

This Town Planning Scheme may be cited as the Shire of Katanning Town Planning Scheme No. 4 hereinafter called "the Scheme" and shall come into operation on the publication of the Scheme in the *Government Gazette*.

## 1.2 RESPONSIBLE AUTHORITY:

The Authority responsible for implementing the Scheme is the Council of the Shire of Katanning hereinafter called "the Council".

## 1.3 SCHEME AREA:

The Scheme applies to the whole of the land within the Municipal District of the Shire of Katanning hereinafter called "the Scheme Area".

## 1.4 REVOCATION:

The Shire of Katanning Town Planning Scheme No. 3 published in the *Government Gazette* of 14 October 1988 and all amendments thereto is hereby revoked.

## 1.5 CONTENTS OF SCHEME:

The Scheme comprises:

a) this Scheme Text
b) the Scheme Map.

## 1.6 ARRANGEMENT OF SCHEME TEXT:

The Scheme Text is divided into the following parts:

PART 1 - PRELIMINARY
PART 2 - RESERVES
PART 3 - ZONES
PART 4 - NON-CONFORMING USES
PART 5 - HERITAGE - PRECINCTS AND PLACES OF CULTURAL SIGNIFICANCE
PART 6 - ZONES - OBJECTIVES AND DEVELOPMENT REQUIREMENTS
PART 7 - GENERAL DEVELOPMENT REQUIREMENTS
PART 8 - PLANNING APPROVAL
PART 9 - ADMINISTRATION
SCHEDULES

## 1.7 SCHEME OBJECTIVES:

The objectives of the Scheme are:

a) to zone the Scheme Area for the purposes described in the Scheme;

b) to secure the amenity health and convenience of the Scheme Area and the residents thereof;

c) to make provisions as to the nature and location of buildings and the size of lots when used for certain purposes;

d) to make provisions for industrial development close to the town of Katanning;

e) the preservation of heritage places;

f) to make provision for the protection and management of the natural environment within the Scheme Area; and

g) to make provision for other matters necessary or incidental to Town Planning and housing.

**1.8 DEFINITIONS:**

1.8.1 Except as provided in clauses 1.8.2 and 1.8.3 the words and expressions of the Scheme have their normal and common meaning.

1.8.2 In the Scheme unless the context otherwise requires, or unless it is otherwise provided herein, words and expressions have the respective meanings given to them in Schedule 1 and the Residential Design Codes. *AMD 5 GG 9/12/05*

1.8.3 Where a word or term is defined in the Residential Design Codes then notwithstanding anything else in the Scheme that word or term when used in respect of residential development has the meaning given to it in the Residential Design Codes. *AMD 5 GG 9/12/05*

# PART II - RESERVES

## 2.1 SCHEME RESERVES:

The land shown as Scheme Reserves on the Scheme Map, hereinafter called "Reserves", are lands reserved under the Scheme for the purposes shown on the Scheme Map and are listed hereunder.

PUBLIC PURPOSE
RECREATION AND OPEN SPACE
RAILWAY
ROAD

## 2.2 MATTERS TO BE CONSIDERED BY THE COUNCIL:

Where an application for planning approval is made with respect to land within a reserve, the Council shall have regard to the ultimate purpose intended for the reserve and the Council shall, in the case of land reserved for the purposes of a public authority, confer with that authority before granting its consent.

## 2.3 COMPENSATION:

2.3.1 Where the Council refuses planning approval for the development of a reserve on the ground that the land is reserved for local authority purposes or for the purposes shown on the Scheme Map, or grants consent subject to conditions that are unacceptable to the applicant the owner of the land may, if the land is injuriously affected thereby, claim compensation for such injurious affection.

2.3.2 Claims for such compensation shall be lodged at the office of the Council not later than six months after the date of the decision of the Council refusing planning approval or granting it subject to conditions that are unacceptable to the applicant.

2.3.3 In lieu of paying compensation the Council may purchase the land affected by such decision of the Council at a price representing the unaffected value of the land at the time of refusal of planning approval or of the grant of consent subject to conditions that are unacceptable to the applicant.

# PART III - ZONES

## 3.1 ZONES

3.1.1 There are hereby created the several zones set out hereunder:

RESIDENTIAL
SPECIAL RESIDENTIAL
TOWN CENTRE
COMMERCIAL
LIGHT INDUSTRIAL
GENERAL INDUSTRIAL
SPECIAL RURAL
RURAL
SPECIAL USE

3.1.2 The zones are delineated and depicted in the Scheme Map according to the legend thereon.

## 3.2 ZONING TABLE:

*AMD 5 GG 9/12/05*

3.2.1 The Zoning Table indicates, subject to the provisions of the Scheme, the several uses permitted in the Scheme Area in the various zones, such uses being determined by cross reference between the list of uses on the left hand side of the Zoning Table and the list of zones at the top of the Zoning Table.

3.2.2 The symbols used in the cross reference in the Zoning Table have the following meaning:

"P" means that the use is permitted by the Scheme.

"AA" means that the use is not permitted unless the Council has granted planning approval.

"SA" means that the use is not permitted unless the Council has granted planning approval after giving notice in accordance with clause 8.3.1.

“X” means a use that is not permitted by the Scheme.

3.2.3 A change in the use of land from one use to another is permitted if:

(a) the Council has exercised its discretion by granting planning approval;

(b) the change is to a use which is designated with the symbol “P” in the cross reference to that zone in the Zoning Table and the proposed use complies with all the relevant development standards and any requirements of the Scheme;

(c) the change is an extension of a use within the boundary of the lot which does not change the predominant use of the lot; or

(d) the change is to an incidental use that does not change the predominant use of the land.

Note:
1. The planning approval of the Council is required for the development of land in addition to any approval granted for the use of land. In normal circumstances one application is made for both the use and development of land.

2. The Council will not refuse a ‘P’ use because of the unsuitability of the use for the zone but may impose conditions on the use of the land to comply with any relevant development standards or requirements of the Scheme, and may refuse or impose conditions on any development of the land.

3. In considering an “AA” or “SA” use, the Council will have regard to the matters set out in clause 8.5.

4. The Council must refuse to approve any "X" use of the land. Approval to an "X" use of land may only proceed by way of an amendment to the Scheme.

3.2.4 Where a specific use is mentioned in the Zoning Table, it is deemed to be excluded from the general terms used to describe any other use.

3.2.5 If a person proposes to carry out on land any use that is not specifically mentioned in the Zoning Table and cannot reasonably be determined as falling within the type, class or genus of activity of any other use category the Council may:

(a) determine that the use is consistent with the objectives of the particular zone and is therefore permitted;

(b) determine that the use may be consistent with the objectives of the particular zone and thereafter follow the advertising procedures of clause 8.3 in considering an application for planning approval; or

(c) determine that the use is not consistent with the objectives of the particular zone and is therefore not permitted.

**3.3 SPECIAL USE ZONES:**

No person shall use any land or any building or structure in a Special Use Zone, except for the purpose specified against the description of such land in Schedule 2 to the Scheme.

# TABLE 1 - ZONING TABLE

*AMD 5 GG 9/12/05*

| | USES | RESIDENTIAL | SPECIAL RESIDENTIAL | TOWN CENTRE | COMMERCIAL | LIGHT INDUSTRIAL | GENERAL INDUSTRIAL | SPECIAL RURAL | RURAL |
|---|---|---|---|---|---|---|---|---|---|
| 1 | aged or dependent persons' dwelling | AA | X | X | X | X | X | X | X |
| 2 | agriculture-extensive | X | X | X | X | X | X | X | P |
| 3 | agroforestry | X | X | X | X | X | X | X | P |
| 4 | ancillary accommodation | AA | AA | X | X | X | X | AA | AA |
| 5 | ancillary tourist use | X | SA | AA | SA | SA | X | SA | AA |
| 6 | animal husbandry – intensive | X | X | X | X | X | X | X | SA |
| 7 | caretaker's dwelling | X | X | AA | AA | AA | AA | X | AA |
| 8 | civic building | AA | X | AA | AA | AA | X | X | X |
| 9 | club premises | X | X | AA | AA | X | X | X | AA |
| 10 | consulting rooms | SA | X | P | AA | X | X | X | X |
| 11 | education establishment | SA | X | SA | AA | X | X | X | AA |
| 12 | farm supply centre | X | X | X | AA | P | P | X | X |
| 13 | fuel depot | X | X | X | X | AA | P | X | X |
| 14 | grouped dwelling *AMD 10 GG 1/10/13* | P | X | AA | AA | X | X | X | P |
| 15 | home business | SA | SA | AA | AA | X | X | SA | AA |
| 16 | home occupation | AA | AA | X | X | X | X | AA | AA |
| 17 | hotel | X | X | AA | SA | X | X | X | X |
| 18 | industry – cottage | SA | AA | X | X | X | X | AA | AA |
| 19 | industry – extractive | X | X | X | X | X | X | X | AA |
| 20 | industry – general | X | X | X | X | X | AA | X | X |
| 21 | industry – light | X | X | X | X | P | P | X | X |
| 22 | industry – noxious | X | X | X | X | X | SA | X | SA |
| 23 | industry – rural | X | X | X | X | X | SA | X | SA |
| 24 | industry – service | X | X | X | AA | P | P | X | X |
| 25 | intensive agriculture | X | X | X | X | X | X | X | AA |
| 26 | local shop | SA | X | P | AA | AA | AA | X | X |
| 27 | motel | SA | X | AA | AA | X | X | X | X |
| 28 | motor vehicle, boat or caravan sales | X | X | AA | P | P | P | X | X |
| 29 | motor vehicle repair | X | X | X | SA | P | P | X | X |
| 30 | office | X | X | P | P | AA | X | X | X |
| 31 | plantation | X | X | X | X | X | X | X | AA |
| 32 | plant nursery | SA | X | X | SA | P | AA | SA | SA |
| 33 | public recreation | P | P | P | P | P | P | P | P |
| 34 | public utility | AA | AA | AA | AA | AA | AA | AA | AA |
| 35 | residential building | AA | X | AA | AA | X | X | X | SA |
| 36 | restaurant | X | X | P | AA | X | X | X | AA |
| 37 | restricted premises | X | X | SA | X | SA | X | X | X |
| 38 | rural home business | X | X | X | X | X | X | SA | AA |
| 39 | rural pursuit | X | X | X | X | X | X | SA | P |
| 40 | service station | X | X | SA | SA | P | AA | X | SA |
| 41 | shop | X | X | P | SA | X | X | X | X |
| 42 | single house | P | P | AA | AA | X | X | P | P |
| 43 | take-away food outlet | X | X | AA | AA | X | X | X | X |
| 44 | tavern | X | X | AA | SA | X | X | X | X |
| 45 | transport depot | X | X | X | X | P | P | X | SA |
| 46 | veterinary centre | X | X | SA | AA | P | AA | AA | AA |

## 3.4 ADDITIONAL USE

*AMD 7 GG 21/11/06*

Despite anything contained in the Zoning Table, the land specified in Schedule 11 may be used for the specific use or uses that are listed in addition to any uses permissible in the zone in which the land is situated subject to the conditions set out in Schedule 11 with respect to that land.

Note: An Additional Use is a land use that is permitted on a specific portion of land in addition to the uses already permissible in that zone that applies to the land.

# PART IV - NON-CONFORMING USES

## 4.1 NON-CONFORMING USE RIGHTS:

No provision of the Scheme shall prevent:

a) the continued use of any land or building for the purpose for which it was being lawfully used at the gazettal date of the Scheme; or

b) the carrying out of any development thereon for which, immediately prior to that time, a permit or permits, lawfully required to authorise the development to be carried out, were duly obtained and are current.

## 4.2 EXTENSION OF NON-CONFORMING USE:

A person shall not alter or extend a non-conforming use or erect alter or extend a building used in conjunction with a non-conforming use without first having applied for and obtained the planning approval of the Council under the Scheme and unless in conformity with any other provisions and requirements contained in the Scheme.

## 4.3 CHANGE OF NON-CONFORMING USE:

Notwithstanding anything contained in the Zoning Table the Council may grant its planning approval to the change of use of any land from a non-conforming use to another use if the proposed use is, in the opinion of the Council, less detrimental to the amenity of the locality than the non-conforming use and is, in the opinion of the Council, closer to the intended uses of the zone.

## 4.4 DISCONTINUANCE OF NON-CONFORMING USE:

4.4.1 When a non-conforming use of any land or building has been discontinued for a period of six months or more such land or building shall not thereafter be used otherwise than in conformity with the provisions of the Scheme.

4.4.2 The Council may effect the discontinuance of a non-conforming use by the purchase of the affected property, or by the payment of compensation to the occupier of that property, and may enter into an agreement with the owner for that purpose.

## 4.5 DESTRUCTION OF BUILDINGS:

If any building is, at the gazettal date, being used for a non-conforming use, and is subsequently destroyed or damaged to an extent of 75% or more of its value the land on which the building is built shall not thereafter be used otherwise than in conformity with the Scheme, and the building shall not be repaired, rebuilt, altered or added to for the purpose of being used for a non-conforming use or in a manner or position not permitted by the Scheme.

# PART V - HERITAGE - PRECINCTS AND PLACES OF CULTURAL SIGNIFICANCE

## 5.1 PURPOSE AND INTENT:

The purpose and intent of the heritage provisions are:

a) to facilitate the conservation of places of heritage value;

b) to ensure as far as possible that development occurs with due regard to heritage values.

## 5.2 HERITAGE LIST

5.2.1 The Council shall establish and maintain a Heritage List of buildings, objects, structures and places considered by the Council to be of heritage significance and worthy of conservation.

5.2.2 For the purposes of this part, the Heritage List means the Municipal Inventory, as amended from time to time, prepared by the Council pursuant to Section 45 of the *Heritage of Western Australia Act 1990 (as amended)*, *or* such parts thereof as described in the Heritage List.

5.2.3 The Council shall keep copies of the Heritage List with the Scheme documents for public inspection during normal office hours.

## 5.3 DESIGNATION OF HERITAGE PRECINCTS

5.3.1 The Council may designate an area of land to be a Heritage Precinct where, in the opinion of the Council, special planning control is needed to conserve and enhance the heritage values and character of the area.

5.3.2 The Council shall adopt for each Heritage Precinct a policy statement which shall comprise:

a) a map showing the boundaries of the precinct;

b) a list of any buildings, objects, structures or places of heritage significance; and

c) objectives and guidelines for the conservation of the precinct.

5.3.3 The Council shall keep a copy of the policy statement for any designated Heritage Precinct with the Scheme documents for public inspection during normal office hours.

5.3.4 The procedure to be followed by the Council in designating a Heritage Precinct shall be as follows:

a) the Council shall notify in writing each owner of land affected by the proposal;

b) the Council shall advertise the proposal by way of a notice in a newspaper circulating in the district, by the erection of a sign in a prominent location in the area affected by the proposal, and by such other methods as the Council consider necessary to ensure widespread notice of the proposal, describing the area subject of the proposal;

c) the Council shall invite submissions on the proposal within 28 days of the date specified in the notice referred to in paragraphs (a) and (b) above;

d) the Council shall carry out such other consultations as it thinks fit;

e) the Council shall consider any submissions made and resolve to designate the Heritage Precinct with or without modification or reject the proposal after consideration of submissions; and

f) the Council shall forward notice of its decision to the Heritage Council of WA.

5.3.5 The Council may modify or may cancel a Heritage Precinct or any policy statement which relates to it by following the procedure set out in clause 5.3.4.

## 5.4 APPLICATIONS FOR PLANNING APPROVAL

5.4.1 In dealing with any matters which may affect a Heritage Precinct or individual entry on the Heritage List, including any application for planning approval, the Council shall have regard to any heritage policy of the Council.

5.4.2 The Council may, in considering any application that may affect a Heritage Precinct or individual entry on the Heritage List, solicit the views of the Heritage Council of WA, and those of any other relevant bodies, and take those views into account when determining the application.

5.4.3 Notwithstanding any existing assessment on record, the Council may require a heritage assessment to be carried out prior to the approval for any development proposed in a Heritage Precinct or individual entry listed on the Heritage List.

## 5.5 FORMALITIES OF APPLICATION

5.5.1 In addition to the application formalities prescribed in clause 5.4 and any formalities or requirements associated with applications for planning approval contained in any other provision of the Scheme, the Council may require an applicant for planning approval, where the proposed development may affect a place of cultural heritage significance or a Heritage Precinct, to provide one or more of the following to assist the Council in its determination of the application:

a) street elevations drawn to a scale not smaller than 1:100 showing the proposed development and the whole of the existing development on each lot immediately adjoining the land the subject of the application, and drawn as one continuous elevation;

b) in addition to a site plan, a plan of the proposed development site showing existing and proposed ground levels over the whole of the land the subject of the application, and the location, type and height of all existing structures and of all existing vegetation exceeding 2 metres in height, and marking any existing structures and vegetation proposed to be removed; such plan shall be drawn to the same scale as the site plan;

c) a detailed schedule of all finishes, including materials and colours of the proposed development, and unless the Council exempts the applicant from the requirement or any part of it, the finishes of the existing developments on the subject lot and on each lot immediately adjoining the subject lot; and

d) any other information which the Council indicates that it considers relevant.

## 5.6 VARIATIONS TO SCHEME PROVISIONS

5.6.1 Where desirable to facilitate the conservation of a place, area, building, object or structure of heritage value, or to enhance or preserve heritage values, the Council may vary any provision of the Scheme provided that, where in the opinion of the Council the variation of a provision is likely to affect any owners or occupiers in the general locality or adjoining the site which is the subject of consideration for variation, the Council shall:

a) consult the affected parties by following one or more of the provisions dealing with advertising pursuant to clause 8.3.3; and

b) have regard to any expressed views prior to making its decision to grant the variation.

5.6.2 In granting variations under clause 5.6.1 the Council may enter into a heritage agreement under Part 4 of the *Heritage of Western Australia Act 1990 (as amended)* with an owner who would benefit from the variation. The agreement may specify the owner's obligations and contain memorials noted on relevant Certificates of Title.

# PART VI - ZONES - OBJECTIVES AND REQUIREMENTS

## 6.1 RESIDENTIAL ZONE

6.1.1 Objectives

a) to retain the single house as the predominant form of residential development in the town.

b) to provide for lifestyle choice in and around the town with a range of residential densities.

c) to allow for the establishment of non-residential uses subject to local amenities not being adversely affected.

d) to achieve a high standard of residential development.

6.1.2 Residential Development: Residential Design Codes *AMD 5 GG 9/12/05*

6.1.2.1 For the purpose of the Scheme "Residential Design Codes" means the Residential Design Codes set out in Appendix 2 to the Statement of Planning Policy No. 1, together with any amendments thereto (hereinafter called the "R Codes"). *AMD 5 GG 9/12/05*

6.1.2.2 A copy of the R Codes, as amended, shall be kept and made available for public inspection at the offices of the Council.

6.1.2.3 Unless otherwise provided for in the Scheme the development of land for any of the residential purposes dealt with by the R Codes shall conform to the provisions of those Codes.

6.1.3 Site Requirements: In accordance with the R Codes.

6.1.4 Development Requirements:

In areas shown on the Scheme Map with a density code of R12.5/25, the Council may permit a development density of up to R25 where the development would be connected to the reticulated sewerage system. *AMD 10 GG 1/10/13*

## 6.2 SPECIAL RESIDENTIAL ZONE

6.2.1 Objectives

a) to provide for larger residential lots for lifestyle choice.

b) to allow for the keeping of animals under stipulated conditions.

c) to achieve a high standard of residential development on lots generally in the range of 2000 square metres to 9999 square metres.

6.2.2 Site Requirements: The following minimum building setbacks shall apply:

Front : 15.0m
Rear : 15.0m
Side : 10.0m

6.2.3 Development Requirements

a) in addition to a building licence, the Council's planning approval is required for all development including a single house and such application shall be made in writing and be subject to the provisions of clause 8.2 of the Scheme.

b) not more than one (1) dwelling per lot shall be erected but the Council may at its discretion, approve ancillary accommodation.

c) in addition to other provisions of the Scheme that may affect it, any land that is included in a Special Residential zone shall be subject to those provisions as may be specifically set out against it in Schedule 3.

d) except as may otherwise be provided for in Schedule 3, the minimum lot size should be no less than 2000$m^2$ or effective lot frontages not less than 20 metres; and building envelopes shall be confined to a maximum area of 20% of the lot area.

e) in order to conserve the rural environment or features of natural beauty all trees shall be retained unless their removal is authorized by the Council.

f) in order to enhance the rural amenity of the land in areas the Council considers deficient in tree cover it may require as a condition of any planning approval the planting of such trees and/or groups of trees and species as specified by the Council.

g) keeping of stock is subject to approval of the Council and shall be prohibited on lots of less than 8000 square metres.

h) any person who keeps stock or who uses any land for the exercise or training of stock shall be responsible for appropriate measures to prevent noise, odour, or dust pollution or soil erosion to the satisfaction of the Council. With the intention of preventing overstocking, and any other practice detrimental to the amenity of a Special Residential zone, the Council may take any action which in the opinion of the Council is necessary to reduce or eliminate adverse effects on the environment caused wholly or partly by the stocking of animals and any costs incurred by the Council in taking such action shall be recoverable by the Council from the landowner.

## 6.3 TOWN CENTRE ZONE

6.3.1 Objectives

a) to ensure the town centre remains the principal place for business and administration within the District.

b) to encourage a high standard of development including buildings, landscaping, and car parking.

c) to ensure adequate provision is made for car parking to service development in the town centre.

6.3.2 Site Requirements: At the discretion of the Council, which may be guided by the following:

a) lot size and frontage should generally be consistent with existing lots in the vicinity and capable of supporting development which complies with provisions of the Scheme;

b) setbacks are to comply with the Building Code of Australia, and the Council will encourage building to the front boundary where this will be consistent with existing development on adjoining lots fronting the same street.

6.3.3 Development Requirements

6.3.3.1 Development shall not exceed two storeys in height except where the Council considers that particular circumstances may warrant an exception being made and provided such development will not affect local amenity and will enhance the character of the town centre.

6.3.3.2 In considering an application for planning approval for a proposed development (including additions and alterations to existing development) in the town centre the Council shall have regard to the following:

a) the colour and texture of external building materials; the Council may require the building facade and side walls to be constructed in masonry;

b) building size, height, bulk, roof pitch;

c) setback and location of the building on its lot;

d) architectural style and design details of the building;

e) function of the building;

f) relationship to surrounding development; and

g) other characteristics considered by the Council to be relevant.

6.3.3.3 Landscaping shall complement the appearance of the proposed development and the town centre.

6.3.3.4 The layout of car parking provided in accordance with the provisions of clause 7.1 of the Scheme shall have regard for traffic circulation in existing car parking areas and shall be integrated with any existing and adjoining car park.

## 6.4 COMMERCIAL ZONE

6.4.1 Objectives

a) to provide for a range of commercial uses which complement the town centre.

b) to exclude retail shopping which should be located within the town centre.

c) to achieve a high standard of development and presentation including buildings, landscaping, and car parking.

6.4.2 Site Requirements

6.4.2.1 At the discretion of the Council which may be guided by the following:

a) lot size and frontage should generally be consistent with existing lots in the vicinity and capable of supporting development which complies with provisions of the Scheme;

b) setbacks are to comply with the Building Code of Australia, and the Council will encourage building to the front boundary where this will be consistent with existing development on adjoining lots fronting the same street.

6.4.2.2 Notwithstanding the provisions of clause 6.4.2.1, for a lot in the Commercial zone which abuts a lot in the Residential zone setbacks shall comply with the Residential Planning Code applicable to the abutting lot.

6.4.3 Development Requirements

6.4.3.1 Development shall not exceed two storeys in height except where the Council considers that particular circumstances may warrant an exception being made and provided such development will not affect local amenity and will enhance the character of the town centre.

6.4.3.2 In considering an application for planning approval for a proposed development (including additions and alterations to existing development) in the town centre the Council shall have regard to the following:

a) the colour and texture of external building materials; the Council may require the building facade and side walls to a building depth of three metres to be constructed in masonry;

b) building size, height, bulk, roof pitch;

c) setback and location of the building on its lot;

d) architectural style and design details of the building;

e) function of the building;

f) relationship to surrounding development; and

g) other characteristics considered by the Council to be relevant.

6.4.3.3 Landscaping shall be provided to complement the appearance of the proposed development and the town centre.

6.4.3.4 The layout of car parking provided in accordance with the provisions of clause 7.1 of the Scheme shall have regard for traffic circulation in existing car parking areas and shall be integrated with any existing and adjoining car park.

## 6.5 LIGHT INDUSTRIAL ZONE

6.5.1 Objectives

a) to encourage appropriate light industrial development with diverse employment opportunities.

b) to provide for light industry to support development in the District.

6.5.2 Site Requirements: The following minimum building setbacks shall apply:

Front : 7.5m
Rear : 7.5m
Side : 5.0m on one side

6.5.3 Development Requirements:

The first five metres of the front setback on any lot shall be landscaped to the satisfaction of the Council. Where a lot has frontage to two streets the Council may vary the landscaping requirement only where the setback is reduced in which case the whole of the setback so reduced shall be landscaped to the satisfaction of the Council.

## 6.6 GENERAL INDUSTRIAL ZONE

6.6.1 Objectives

a) to make provision for industries which require larger sites, and by the nature of the industrial activity should be isolated from residential development.

b) to encourage manufacture using produce from the District.

c) to provide for employment opportunities for residents of the District.

d) to take advantage of the attributes of location, availability of services, and transport facilities servicing the District.

6.6.2 Site Requirements: The following minimum building setbacks shall apply:

Front : 20.0m
Rear : 20.0m
Side : 15.0m on one side

6.6.3 Development Requirements

6.6.3.1 The first five metres of the front setback on any lot shall be landscaped to the satisfaction of the Council. Where a lot has frontage to two streets the Council may vary the landscaping requirement only where the setback is reduced in which case the whole of the setback so reduced shall be landscaped to the satisfaction of the Council.

6.6.3.2 Provision shall be made to the satisfaction of the Council for the control of emissions from the site. Without limiting the generality of this clause, this shall include the control of liquid wastes, odour, dust, or smoke. The Council may seek advice from any public authority before determining an application for development on any site.

## 6.7 SPECIAL RURAL ZONES

6.7.1 Objectives

a) to select areas wherein closer subdivision will be permitted to provide for such uses as hobby farms, horse breeding, rural-residential retreats.

b) to make provision for retention of the rural landscape and amenity in a manner consistent with the orderly and proper planning of such areas.

6.7.2 General Provisions

a) before making provision for a Special Rural Zone, the Council will require the owner(s) of the land to prepare a submission supporting the creation of the Special Rural Zone and such submission shall include:

(i) a statement as to the purpose or intent for which the zone is being created and the reasons for selecting the particular area the subject of the proposed zone.

(ii) a plan or plans showing contours at such intervals as to adequately depict the land form of the area and physical features such as existing buildings, rock outcrops, trees or groups of trees, creeks, wells and significant improvements.

(iii) information regarding the method whereby it is proposed to provide a potable water supply to each lot.

(iv) in the absence of a Rural Strategy, it will be the responsibility of each applicant for rezoning to Special Rural to prepare a land suitability and capability assessment to the satisfaction of both the Council and the Commission.

b) the Scheme provisions for a specific Special Rural Zone shall include a plan of subdivision showing, amongst other things:

(i) the proposed subdivision including lot sizes and dimensions.

(ii) areas to be set aside for public open space, pedestrian accessways, horse trails, community facilities, etc. as may be considered appropriate.

(iii) those physical features it is intended to conserve.

c) in addition to the plan of subdivision, the Scheme provisions for a specific Special Rural Zone shall specify:

(i) any facilities which the purchasers of the lots will be required to provide (eg. their own potable water supply, liquid or solid waste disposal, etc).

(ii) proposals for the control of land uses and development which will ensure that the purpose of intent of the zone and the rural environment and amenities are not impaired.

(iii) any special provisions appropriate to secure the objectives of the zone.

d) the provisions for controlling subdivision and development in specific Special Rural Zones shall be as laid down in Schedule 4 and future subdivision will generally accord with the plan of subdivision for the specified area certified by the Chief Executive Officer.

6.7.3 Site Requirements: The following minimum building setbacks shall apply:

Front : 15.0m
Rear : 10.0m
Side : 10.0m

6.7.4 Development Requirements

6.7.4.1 Development in a Special Rural Zone shall comply with the following:

a) in addition to a building licence, the Council's planning approval is required for all development including a single house and such application shall be made in writing to the Council and be subject to the provisions of clause 8.2 of the Scheme.

b) not more than one dwelling per lot shall be erected but the Council may, at its discretion, approve ancillary accommodation.

c) in order to conserve the rural environment or features of natural beauty all trees shall be retained unless their removal is authorized by the Council.

d) in order to enhance the rural amenity of the land in areas the Council considers deficient in tree cover it may require as a condition of any planning approval the planting of such trees and/or groups of trees and species as specified by the Council.

e) any person who keeps an animal or animals or who uses any land for the exercise or training of an animal or animals shall be responsible for appropriate measures to prevent noise, odour, or dust pollution or soil erosion to the satisfaction of the Council. With the intention of preventing overstocking, erosion and any other practice detrimental to the amenity of a special rural zone, the Council may take any action which in the opinion of the Council is necessary to reduce or eliminate adverse effects on the environment caused wholly or partly by the stocking of animals and any costs incurred by the Council in taking

such action shall be recoverable by the Council from the landowner.

6.7.4.2 In considering an application for planning approval for a proposed development (including additions and alterations to existing development) the Council shall have regard to the following:

a) the colour and texture of external building materials;

b) building size, height, bulk, roof pitch;

c) setback and location of the building on its lot;

d) architectural style and design details of the building;

e) relationship to surrounding development;

f) provision to be made for bush fire control; and

g) other characteristics considered by the Council to be relevant; and

## 6.8 RURAL ZONE

6.8.1 Objectives

a) to ensure the continuation of broad-hectare farming as the principal landuse in the District and encouraging where appropriate the retention and expansion of agricultural activities.

b) to consider non-rural uses where they can be shown to be of benefit to the District and not detrimental to the natural resources or the environment.

c) to allow for facilities for tourists and travellers, and for recreation uses.

6.8.2 Site Requirements: The following minimum building setbacks shall apply:

Front : 50.0m
Rear : 15.0m
Side : 15.0m

6.8.3 Subdivision:

Having regard to the prime agricultural importance of land in the zone the Council will only recommend to the Commission support for further subdivision of existing lots where:

a) the lots have already been physically divided by significant natural or man-made features which preclude the continued operation of a farming property as a single unit (unless adjoining land could be similarly subdivided and thereby, by the process of precedent, lead to an undesirable pattern of land use in the area or in lots too small for uses compatible with the prevailing use in the area or in ribbon development alongside roads);

b) the lots are for farm build-up purposes;

c) the lots are for specific uses such as recreation facilities and public utilities; or

d) the lots are required for the establishment of uses ancillary to the rural use of the land or are required for the travelling public and tourists.

6.8.4 Feedlots:

In considering an application for development of a feedlot in the Scheme Area the Council shall have regard to Guidelines for Environmental Protection as set out in the “National Guidelines for Beef Cattle Feedlots in Australia” published by the Standing Committee on

Agriculture Report No. 47 and shall determine an application in accordance with the Scheme.

## 6.9 SPECIAL USE ZONES

6.9.1 Statement of Intent:

Special Use zones will apply where the Council wants to have specific landuse control and/or development requirements. This may be on land where a mix of landuses is appropriate but which are not readily captured by the terms of a specific zone.

6.9.2 Development Requirements:

The Council shall determine development requirements and building setbacks which shall be shown in Schedule 2 having regard to the provisions of the Scheme and:

a) the nature and extent of the proposed development;

b) the Building Code of Australia;

c) the nature of existing developments and building setbacks thereto on adjoining lots;

d) the zoning in the Scheme of adjoining lots; and

e) orderly and proper planning in the locality, and the maintenance of local amenities.

# PART VII - GENERAL DEVELOPMENT REQUIREMENTS

## 7.1 CAR PARKING REQUIREMENTS:

7.1.1 A person shall not develop or use any land or erect use or adapt any building for the purpose indicated in Schedule 5 unless car parking spaces as specified in Schedule 5 are provided and such spaces are constructed and maintained in accordance with the Scheme.

7.1.2 When considering any development application, the Council shall have regard to and may impose conditions on the provision of car parking spaces and the details of locating and designing the required spaces, landscaping, and pedestrian spaces on the lot. In particular, the Council shall take into account and may impose conditions concerning:

a) the proportion of car spaces to be roofed or covered;

b) the means of access to each car space and the adequacy of any vehicle manoeuvering area;

c) the location of the car spaces on the site and their effect on the amenity of adjoining development, including the potential effect if those spaces should later be roofed or covered;

d) the extent to which car spaces are located within required building setback areas;

e) the locations of proposed public footpaths, vehicular crossing, or private footpaths within the lot, and the effect on both pedestrian and vehicular traffic movement and safety;

f) the suitability and adequacy of proposed screening or landscaping; and

g) the suitability and adequacy of elevated structural decks for development and service as a proportion of the required area for landscaping and pedestrian space.

7.1.3 The parking spaces shall measure not less than the dimensions as shown in Schedule 5 for the type of parking layout adopted, except that the Council may exercise absolute discretion to vary the number or dimension of spaces where to do so would allow for retention of existing vegetation worthy of such retention.

7.1.4 Parking bays shall be serviced by all necessary accessways, and the parking area shall be surfaced to the satisfaction of the Council.

7.1.5 Where the Council so decides, it may accept cash payment in lieu of the provision of parking spaces but only subject to the following requirements:

a) the cash-in-lieu payment shall not be less than the estimated cost to the owner or developer of providing and constructing the parking spaces required by the Scheme plus the value, as determined by the Valuer General or a Licensed Valuer appointed by the Council, of that area of the land which would have been occupied by the parking spaces.

b) payments made under this clause shall be paid into a parking fund to be used for the provision of public car parking facilities. The Council may use this fund to provide public parking facilities anywhere within reasonable proximity to the subject land in respect of which a cash-in-lieu arrangement is made.

## 7.2 DISCRETION TO MODIFY DEVELOPMENT STANDARDS:

7.2.1 Clause 7.2.2 shall not apply to:

a) development in respect of which the Residential Design Codes apply under this Scheme, or *AMD 5 GG 9/12/05*

b) development on land abutting an unconstructed road, or

d) development on a lot which does not have frontage to a constructed road.

7.2.2 Subject to clause 7.2.1, if a development the subject of an application for planning approval does not comply with a standard prescribed by the Scheme with respect to minimum lot sizes, building height, setbacks, site coverage, car parking, landscaping and related matters, the Council may, notwithstanding that non-compliance, approve the application unconditionally or subject to such conditions as the Council thinks fit. The power conferred by this clause may only be exercised if the Council is satisfied that:

a) approval of the proposed development would be consistent with the orderly and proper planning of the locality and the preservation of the amenities of the locality;

b) the non-compliance will not have any adverse effect upon the occupiers or users of the development or the inhabitants of the locality or upon the likely future development of the locality.

**7.3 DEVELOPMENT LIMITED BY LIQUID WASTE DISPOSAL:**

Notwithstanding anything elsewhere appearing in the Scheme, the Council may refuse to issue planning applicable for any development if in the opinion of the Council adequate provision is not made or cannot reasonably be made for the disposal of liquid wastes from the development.

**7.4 SUPPLY OF POTABLE WATER:**

As a condition of the issue of a building licence each dwelling shall be provided with a supply of potable water either from a reticulated system, or an underground bore, or a rainwater-storage system with a minimum capacity of 92,000 litres to the satisfaction of the Council. The Council may consult with Agriculture Western Australia to determine roof catchment area required for an adequate rainwater storage system.

**7.5 LAND LIABLE TO FLOODING:**

Notwithstanding anything elsewhere appearing in the Scheme development of land defined by the Council as being liable to flooding or inundation shall be subject to the following:

a) in addition to a building licence, the Council's planning approval is required for all development including permitted ("P") uses and such application shall be made in accordance with the provisions of the Scheme.

b) in determining an application for planning approval the Council shall consult with the Water Authority of Western Australia.

c) development which includes a building or structure shall not be permitted unless in accordance with recommendations of the Water and Rivers Commission.

**7.6 TRANSPORTED DWELLINGS:**

7.6.1 Within the Scheme Area a building shall not be placed on a lot and occupied as a dwelling following transportation as a whole or as parts of a building unless in the opinion of the Council, such building is in a satisfactory condition and will not detrimentally affect the amenity of the area; or the building has been specifically constructed as a transportable dwelling.

7.6.2 An applicant for a building licence for a transported dwelling may be required by the Council to enter into a contract and provide a bond to reinstate the building to an acceptable standard of presentation within a period of twelve months from the issue of a building licence for such a dwelling.

**7.7 DEVELOPMENT OF LOTS ABUTTING UNCONSTRUCTED ROADS:**

Notwithstanding anything elsewhere appearing in the Scheme where an application for planning approval is made in respect of land abutting an unconstructed road or a lot which does not have frontage to a constructed road the Council may either:

a) refuse the application until the road has been constructed or access by means of a constructed road is provided as the case may be; or

b) approve the application subject to a condition requiring the applicant to pay a sum of money in or towards payment of the cost or estimated cost of construction of the road or part thereof and any other conditions it thinks fit to impose; or

c) require such other arrangements are made for permanent access as shall be to the satisfaction of the Council.

**7.8 HOME OCCUPATION:**

7.8.1 An approval to conduct a home occupation is issued to a specific occupier of a particular parcel of land, it shall not be transferred or assigned to any other person, and shall not be transferred from the land in respect of which it was granted. Should there be a change of the occupier of the land in respect of which a home occupation approval is issued the approval is cancelled.

7.8.2 If, in the opinion of the Council, a home occupation is causing a nuisance or annoyance to owners or occupiers of land in the locality the Council may:

a) revoke the approval; or

b) require the occupier of the land in respect of which the home occupation approval is issued to implement those measures specified by the Council and which in the opinion of the Council will remove the nuisance or annoyance.

**7.9 USE OF SETBACK AREAS**

7.9.1 No person shall in any zone use the land between a street alignment and the distance that buildings are required to be set back from such street alignment for any purpose other than one or more of the following:

a) a means of access;

b) the daily parking of vehicles;

c) the loading and unloading of vehicles; or

d) landscaping which only in the Town Centre and Commercial Zones and then only with the specific approval of Council may include an awning, pergola, or similar structure and when in front of a take away food outlet or restaurant may provide for alfresco dining.

7.9.2 The setback area shall not be used for the parking of vehicles which are being wrecked or repaired, nor for the stacking or storage of fuel, raw materials, products or by-products, or waste of manufacture.

**7.10 RADIO MASTS, TELEVISION ANTENNAE, AND SATELLITE DISHES:**

Radio masts, television antennae, and satellite dishes whether used for commercial or domestic purposes shall be located or positioned on land or buildings so that the Council is satisfied there

will not be adverse impacts on local amenities.

## 7.11 CONTROL OF ADVERTISEMENTS

7.11.1 Power to Control Advertisements:

a) for the purpose of the Scheme, the erection, placement and display of advertisements and the use of land or buildings for that purpose is development within the definition of the Act requiring, except as otherwise provided, the prior approval of the Council. Such planning approval is required in addition to any licence pursuant to the Council's Signs, Hoarding and Bill Posting Bylaws.

b) applications for the Council's approval pursuant to this clause shall be submitted in accordance with the provisions of the Scheme and shall be accompanied by a completed Additional Information Sheet in the form required by the Council giving details of the advertisement(s) to be erected, placed or displayed on the land.

7.11.2 Existing Advertisements:

Advertisements which:

a) were lawfully erected, placed or displayed prior to the approval of this Scheme; or

b) may be erected, placed or displayed pursuant to a licence or other approval granted by the Council prior to the approval of this Scheme, hereinafter in this part referred to as "existing advertisements", may except as otherwise provided, continue to be displayed or be erected and displayed in accordance with the licence or approval as appropriate.

7.11.3 Consideration of Applications:

Without limiting the generality of the matters which may be taken into account when making a decision upon an application for consent to erect, place or display an advertisement, the Council shall examine each such application in the light of the objectives of the Scheme and with particular reference to the character and amenity of the locality within which it is to be displayed, including its historic or landscape significance and traffic safety, and the amenity of adjacent areas which may be affected.

7.11.4 Exemptions from the Requirement to Obtain Consent:

Subject to the provisions of the Main Roads (Control of Signs) Regulations 1983 and notwithstanding the provisions of clause 7.11.1 paragraph (a) the Council's prior consent is not required in respect of those advertisements listed in Schedule 6 which for the purpose of this clause are referred to as "exempted advertisements". The exemptions listed in Schedule 6 do not apply to places, buildings, conservation areas or landscape protection zones which are either:

a) listed by the National Trust; or

b) listed on the register of the National Estate; or

c) included in the Heritage List; or

d) in a Heritage Precinct.

7.11.5 Discontinuance:

Notwithstanding the scheme objectives and clause 7.11.4 where the Council can demonstrate exceptional circumstances which cause an exempted or existing advertisement to seriously conflict with the objectives of the Scheme, it may by notice in writing (giving clear reasons) require the advertiser to remove, relocate, adapt, or

otherwise modify the advertisement within a period of time specified in the notice.

7.11.6 Derelict or Poorly Maintained Signs:

Where in the opinion of the Council, an advertisement has been permitted to deteriorate to a point where it conflicts with the objectives of the Scheme or it ceases to be effective for the purpose for which it was erected or displayed, the Council may by notice in writing require the advertiser to:

a) repair, repaint or otherwise restore the advertisement to a standard specified by the Council in the notice, or

b) remove the advertisement.

7.11.7 Notices:

a) "the advertiser" shall be interpreted as any one or any group comprised of the landowner, occupier, or licensee.

b) any notice served in exceptional circumstances pursuant to clause 7.11.5 or pursuant to clause 7.11.6 shall be served upon the advertiser and shall specify:

(i) the advertisement(s) the subject of the notice;

(ii) full details of the action or alternative courses of action to be taken by the advertiser to comply with the notice;

(iii) the period, not being less than 60 days, within which the action specified shall be completed by the advertiser.

c) any person upon whom a notice is served pursuant to this clause may appeal in accordance with Part V of the Act, and where any such appeal is lodged the effect of the notice shall be suspended until the decision to uphold, quash or vary the notice is known and, shall thereafter have effect according to that decision.

7.11.8 Scheme to Prevail:

Where the provisions of this clause are found to be at variance with the provisions of the Council's Signs, Hoarding and Bill Posting Bylaws, the provisions of the Scheme shall prevail.

7.11.9 Enforcement and Penalties:

The offences and penalties provisions specified in the Scheme apply to the advertiser in this clause.

# PART VIII - PLANNING APPROVAL

## 8.1 DEVELOPMENT OF LAND

*AMD 5 GG 9/12/05*

8.1.1 Subject to clause 8.1.2 a person shall not commence or carry out development of any land zoned or reserved under the Scheme without first having applied for and obtained the planning approval of the Council under the Scheme.

8.1.2 The planning approval of the Council is not required for the following development of land:

a) the use of land in a reserve, where such land is held by the Council or vested in a public authority;

(i) for the purpose for which the land is reserved under the Scheme; or

(ii) in the case of land vested in a public authority, for any purpose for which such land may be lawfully used by that authority.

b) except as otherwise provided in the Scheme;

(i) the use of land which is a permitted (“P”) use in the zone in which that land is situated provided it does not involve the carrying out of any building or other works.

(ii) the erection on a lot of a single house including ancillary outbuildings in a zone where the use is a permitted ("P") use in the zone in which that land is situated.

(iii) the erection of a boundary fence.

c) the carrying out of any works on, in, over or under a street or road by a public authority acting pursuant to the provisions of any Act.

d) the carrying out of works for the maintenance, improvement or other alteration of any building, being works which affect only the interior of the building or which do not materially affect the external appearance of the building.

e) the carrying out of works urgently necessary for public safety or for the safety or security of plant or equipment or for the maintenance of essential services.

f) home office.

## 8.2 APPLICATION FOR PLANNING APPROVAL:

Every application for planning approval shall be made in the form prescribed in Schedule 7 and shall be accompanied by such plans and other information as is required by the Scheme.

8.2.1 Unless the Council waives any particular requirement every application for planning approval shall be accompanied by:

a) a plan or plans to a scale of not less than 1:500 showing:

(i) street names, lot number(s), north point and the dimensions of the site;

(ii) the location and proposed use of the site, including any existing building to be retained and proposed buildings to be erected on the site;

(iii) the existing and proposed means of access for pedestrians and vehicles to and from the site;

(iv) the location, number, dimensions, and layout of all car parking spaces intended to be provided;

(v) the location and dimensions of any area proposed to be provided for the loading and unloading of vehicles carrying goods or commodities to and from the site and the means of access to and from those areas;

(vi) the location, dimensions and design of any open storage or trade display area and particulars of the manner in which it is proposed to develop the same;

(vii) the nature and extent of any open space and landscaping proposed for the site.

b) plans, elevations and sections of any building proposed to be erected or altered and of any building it is intended to retain.

c) any other plan or information that the Council may reasonably require to enable the application to be determined.

**8.3 ADVERTISING OF APPLICATIONS:**

8.3.1 Where an application is made for planning approval to commence or carry out development which involves an "SA" use the Council shall not grant planning approval to that application unless notice of the application is first given in accordance with the provisions of clause 8.3.3.

8.3.2 Where an application is made for planning approval to commence or carry out development which involves an "AA" use, or for any other development which requires the planning approval of the Council, the Council may give notice of the application in accordance with the provisions of clause 8.3.3.

8.3.3 Where the Council is required or decides to give notice of an application for planning approval the Council shall cause one or more of the following to be carried out:

a) notice of the proposed development to be served on the owners and occupiers of land within an area determined by the Council as likely to be affected by the granting of planning approval stating that submissions may be made to the Council within twenty-one days of the service of such notice;

b) notice of the proposed development to be published in a newspaper circulating in the Scheme Area stating that submissions may be made to the Council within twenty-one days from the publication thereof;

c) a sign or signs displaying notice of the proposed development to be erected in a conspicuous position on the land for a period of twenty-one days from the date of publication of the notice referred to in paragraph (b) of this clause.

8.3.4 The Notice referred to in clause 8.3.3 paragraphs (a) and (b) shall be in the form contained in Schedule 8 with such modifications as circumstances require.

8.3.5 After expiration of twenty-one days from the serving of notice of the proposed development, the publication of notice or the erection of a sign or signs, whichever is the later, the Council shall consider and determine the application.

**8.4 CONSULTATION WITH OTHER AUTHORITIES:**

8.4.1 In determining any application for planning approval the Council may consult with any other statutory, public, or planning authority and with any other party it considers appropriate.

8.4.2 In the case of land reserved under the Scheme for the purposes of a public authority, the Council shall consult that authority before making its determination.

## 8.5 MATTERS TO BE CONSIDERED BY THE COUNCIL:

The Council in considering an application for planning approval is to have due regard to such of the following matters as are in the opinion of the Council relevant to the use or development the subject of the application:

(a) the aims and provisions of the Scheme and any other relevant town planning schemes operating within the Scheme Area;

(b) the requirements of orderly and proper planning including any relevant proposed new town planning scheme or amendment, or region scheme or amendment, which has been granted consent for public submissions to be sought;

(c) any approved Statement of Planning Policy of the Commission;

(d) any approved Environmental Protection Policy under the *Environmental Protection Act 1986;*

(e) any relevant policy or strategy of the Commission or any relevant planning policy adopted by the Government of the State;

(f) any Local Planning Policy adopted by the Council under clause 9.6, any heritage policy statement for a designated area adopted under clause 5.3.2, and any other plan or guideline adopted by the Council under the Scheme;

(g) in the case of land reserved under the Scheme, the ultimate purpose intended for the reserve;

(h) the conservation of any place that has been entered in the Register within the meaning of the *Heritage of Western Australia Act 1990* or which is included in the Heritage List under clause 5.2, and the effect of the proposal on the character or appearance of a heritage area;

(i) the compatibility of a use or development with its setting;

(j) any social issues that have an effect on the amenity of the locality;

(k) the cultural significance of any place or area affected by the development;

(l) the likely effect of the proposal on the natural environment and any means that are proposed to protect or to mitigate impacts on the natural environment;

(m) whether the land to which that application relates is unsuitable for the proposal by reason of it being, or likely to be, subject to flooding, tidal inundation, subsidence, landslip, bush fire, or any other risk;

(n) the preservation of the amenity of the locality;

(o) the relationship of the proposal to develop on adjoining land or on other land in the locality but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the proposal;

(p) whether proposed means of access to and egress from the site are adequate and whether adequate provision has been made for the loading, unloading, manoeuvring, and parking of vehicles;

(q) the amount of traffic likely to be generated by the proposal, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;

(r) whether public transport services are necessary and, if so, whether they are available and adequate for the proposal;

(s) whether public utility services are necessary and, if so, whether they are available and adequate for the proposal;

(t) whether adequate provision has been made for access for pedestrians and cyclists (including end of trip storage, toilet and shower facilities);

(u) whether adequate provision has been made for access by disabled persons;

(v) whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;

(w) whether the proposal is likely to cause soil erosion or land degradation;

(x) the potential loss of any community service or benefit resulting from the planning approval;

(y) any relevant submission received on the application;

(z) the comments or submissions received from any authority consulted under clause 8.4;

(za) the need to protect Aboriginal sites of significance as required under the *Aboriginal Heritage Act 1972;*

(zb) potential impacts of noise, dust light, risk and other pollutants on surrounding land uses; and

(zc) any other planning consideration the Council considers relevant.

**8.6 DETERMINATION OF APPLICATION**

8.6.1 In determining any application for planning approval the Council may:

a) grant its approval with or without conditions; or

b) refuse to grant its approval.

8.6.2 The Council shall convey its decision to the applicant in the form prescribed in Schedule 9 to the Scheme.

8.6.3 Where the Council grants planning approval, that approval:

a) continues in force for two years, or such other period as specified in the approval, after the date on which the application is approved; and

b) lapses if the development has not substantially commenced before the expiration of that period.

8.6.4 Where the Council grants planning approval, the Council may impose conditions limiting the period of time for which the development is permitted.

**8.7 DEEMED REFUSAL**

8.7.1 Subject to clause 8.7.2, an application for planning approval shall be deemed to have been refused where a decision in respect of that application is not conveyed to the applicant by the Council within 60 days of the receipt of it by the Council, or within such further time as agreed between the applicant and the Council.

8.7.2 An application for planning approval which is subject of a notice under clause 8.3.3 shall be deemed refused where a decision in respect of that application is not conveyed to the applicant by the Council within 90 days of the receipt of it by the Council, or within such further time as agreed between the applicant and the Council.

8.7.3 Notwithstanding that an application for planning approval may be deemed to have been refused under clauses 8.7.1 or 8.7.2, the Council may issue a decision in respect of the application at any time after the expiry of the 60 day or 90 day period specified in those clauses, and that decision shall be regarded as being valid.

## 8.8 APPROVAL OF EXISTING DEVELOPMENT

8.8.1 The Council may grant approval to a development already commenced or carried out regardless of when it commenced or was carried out. Such approval shall have the same effect for all purposes as if it had been given prior to the commencement or carrying out of the development, but provided that the development complies with the provisions of the Scheme as to all matters other than the provisions requiring the Council's approval prior to the commencement of development.

8.8.2 The application to the Council for approval under clause 8.8.1 shall be made on the form prescribed in Schedule 7.

8.8.3 A development which was not permissible under the Scheme at the time it was commenced or carried out may be approved if at the time of approval under this clause it is permissible.

8.8.4 The approval by the Council of an existing development shall not affect the power of the Council to take appropriate action for a breach of the Scheme or the Act in respect of the commencement of the development without approval.

# PART IX - ADMINISTRATION

## 9.1 POWERS OF THE SCHEME:

In implementing the Scheme the Council has, in addition to all other powers vested in it, the following powers:

a) the Council may enter into any agreement with any owner, occupier or other person having an interest in land affected by the provisions of the Scheme in respect of any matters pertaining to the Scheme.

b) the Council may acquire any land or buildings within the district pursuant to the provisions of the Scheme or the Act.

c) the Council may deal with or dispose of any land which it has acquired pursuant to the Scheme or the Act in accordance with law and for such purpose may make such agreements with other owners as it considers fit.

d) an officer of the Council, authorised by the Council for the purpose, may at all reasonable times enter any building or land for the purpose of ascertaining whether the provisions of the Scheme are being served.

e) the Council may require a proponent for planning approval to pay the costs of the advertising of the proposal under clause 8.3 of the Scheme.

## 9.2 OFFENCES

9.2.1 A person shall not erect, alter or add to or commence to erect, alter or add to a building or use or change the use of any land, building or part of a building for any purpose:

a) otherwise than in accordance with the provisions of the Scheme;

b) unless all consents required by the Scheme have been granted and issued;

c) unless all conditions imposed upon the grant and issue of any approval required by the Scheme have been and continue to be complied with; and

d) unless all standards laid down and all requirements prescribed by the Scheme or determined by the Council pursuant to the Scheme with respect to that building or that use of that part have been and continue to be complied with.

9.2.2 A person who fails to comply with any of the provisions of the Scheme is guilty of an offence and without prejudice to any other remedy given herein is liable to the penalties prescribed by the Act.

## 9.3 NOTICE FOR REMOVAL OF CERTAIN BUILDINGS

9.3.1 Twenty eight (28) days written notice is hereby prescribed as the notice to be given pursuant to Section 10 of the Act.

9.3.2 The Council may recover expenses under Section 10(2) of the Act in a Court of competent jurisdiction.

## 9.4 COMPENSATION:

Except where otherwise provided in the Scheme, the time limit for the making of claims for compensation pursuant to Section 11 of the Act is six (6) months after the date of publication of the Scheme in the *Government Gazette*.

## 9.5 RIGHTS OF APPEAL:

An applicant aggrieved by a decision of the Council in respect of the exercise of a discretionary power under the Scheme may appeal in accordance with Part V of the Act and the rules and regulations made pursuant to the Act.

## 9.6 PLANNING POLICIES

9.6.1 The Council may prepare a planning policy (hereinafter called "a Policy") which may make a provision for any matter related to the planning or development of the Scheme Area and which may be prepared so as to apply:

a) generally or in a particular class of matter or in particular classes of matters; and

b) throughout the Scheme Area or in one or more parts of the Scheme Area;

and may amend or add to or rescind a Policy so prepared.

9.6.2 A Policy shall become operative only after the following procedures have been completed:

a) the Council having prepared and adopted a draft Policy shall publish a notice once a week for two consecutive weeks in a local newspaper circulating within the Scheme Area giving details of where the draft Policy may be inspected, and in what form and during what period (being not less than 21 days) submissions may be made.

b) policies which the Council considers may be inconsistent with other provisions of the Scheme or with State and regional planning policies are to be submitted to the Commission for consideration and advice.

c) the Council shall review the draft Policy in the light of any submissions made and advice received and shall then resolve either to finally adopt the draft Policy with or without modification, or not to proceed with the draft Policy.

d) following final adoption of a Policy, notification of the final adoption shall be published once in a newspaper circulating within the Scheme Area.

9.6.3 The Council shall keep copies of any Policy with the Scheme documents for public inspection during normal office hours.

9.6.4 An amendment or addition to a Policy may be made after the Policy has become operative and shall be made in the same manner as provided for the making of a Policy in clause 9.6.2.

9.6.5 A Policy may be rescinded by:

a) preparation and final adoption of a new Policy pursuant to this clause, specifically worded to supersede an existing Policy; and

b) publication of a formal notice of rescission by the Council twice in a newspaper circulating in the Scheme Area.

9.6.6 A Policy shall not bind the Council in respect of any application for planning approval but the Council shall have due regard to the provisions of the Policy and the objectives which the Policy is designed to achieve before making its decision.

9.6.7 Any Policy prepared under this clause shall be consistent with the Scheme and where any inconsistency arises the Scheme shall prevail.

## 9.7 DELEGATION

*AMD 5 GG 9/12/05*

9.7.1 The Council may, in writing and either generally or as otherwise provided by the instrument of delegation, delegate to a committee or the CEO, within the meaning of those expressions under the *Local Government Act 1995,* the exercise of any of its powers or the discharge of any of its duties under the Scheme, other than this power of delegation.

9.7.2 The CEO may delegate to any employee of the Council the exercise of any of the CEO's powers or the discharge of any of the CEO's duties under clause 9.7.1.

9.7.3 The exercise of the power of delegation under clause 9.7.1 requires a decision of an absolute majority as if the power had been exercised under the *Local Government Act 1995.*

9.7.4 Sections 5.45 and 5.46 of the *Local government Act 1995* and the regulations referred to in section 5.46 apply to a delegation made under this clause as if the delegation were a delegation under Division 4 of Part 5 of that Act.

# SCHEDULE 1 - DEFINTIIONS

abattoir: means land and buildings used for the slaughter of animals for human consumption and the treatment of carcasses, offal and by-products.

absolute majority: has the same meaning given to it in the *Local Government Act 1960 (as amended)*.

Act: means the *Town Planning and Development Act, 1928 (as amended).*

advertisement: means any word, letter, model, sign, placard, board, notice device or representation, whether illuminated or not, in the nature of, and employed wholly or partly for the purposes of, advertisement, announcement or direction, and includes any hoarding or similar structure used, or adapted for use, for the display of advertisements.

agriculture – extensive: means premises used for the raising of stock or crops but does not include intensive agriculture or animal husbandry – intensive; *AMD 5 GG 9/12/05*

agroforestry: means land used commercially for tree production and agriculture where trees are planted in blocks of more than one hectare; *AMD 5 GG 9/12/05*

amusement facility: means land and buildings, open to the public, used for not more than two amusement machines where such use is incidental to the predominant use.

amusement machine: means any machine, game or device whether mechanical or electronic or a combination of both operated by one or more players for amusement and recreation.

amusement parlour: means any land or building, open to the public, where the predominant use is amusement by amusement machines and where there are more than two amusement machines operating within the premises.

ancillary tourist use: means premises used for: *AMD 5 GG 9/12/05*

(a) recreation or entertainment,

(b) consumption of food and / or beverages,

(c) the sale of produce,

(d) the sale of arts and crafts, and / or,

(e) conducting excursions for tourists,

where such use is incidental to and directly related to the predominant use of the land;

animal husbandry – intensive: means premises used for keeping, rearing or fattening of pigs, poultry (for either egg or meat production), rabbits (for either meat or fur production) and other livestock in feedlots; *AMD 5 GG 9/12/05*

aquaculture: has the same meaning given to the term in the *Fish Resources Management Act 1994; AMD 5 GG 9/12/05*

battle-axe lot: means a lot having access to a public road by means of an access strip included in the Certificate of Title of that lot.

bed and breakfast: means a dwelling, used by a resident of the dwelling, to provide accommodation for persons away from their normal place of residence on a short-term commercial basis and includes the provision of breakfast; *AMD 5 GG 9/12/05*

Builder's storage yard: means any land or buildings used for the storage of building material, pipes, or other similar items related to any trade; and may include manufacture, assembly and dismantling processes incidental to the predominant use.

Building Code of Australia: means the *Building Code of Australia 1988 (as amended)*.

building envelope: means an area of land within a lot marked on a plan within which all buildings on the lot must be contained.

camping area: means land used for the lodging of persons in tents or other temporary shelter.

caravan park: means an area of land specifically set aside for the parking of caravans and park homes or for the erection of camps on bays or tent sites allocated for that purpose.

caretaker's dwelling: means a building used as a dwelling by a person having the care of the building, plant, equipment or grounds associated with an industry, business, office or recreation area carried on or existing on the same site.

civic building: means a building designed, used or intended to be used by a public authority or the Council as offices or for administrative or other like purpose.

civic use: means land and buildings used by a public authority or the Council, for administrative, recreational or other purpose.

club premises: means land and buildings used or designed for use by a legally constituted club or association or other body of persons united by a common interest whether such building or premises be licensed under the provisions of the *Liquor Licensing Act, 1988 (as amended)* or not and which building or premises are not otherwise classified under the provisions of the Scheme.

commercial vehicle: means a vehicle whether licensed or not and which is used in conjunction with a trade or profession and shall include trailers, tractors and their attachments, buses and earthmoving machines whether self propelled or not but shall not include a passenger car derivative as defined by the *Vehicle Sales Regulations 1976 (as amended),* a van, utility or light truck which is rated by the manufacture as being suitable to carry loads of up to 1.5 tonnes.

Commission: means the Western Australian Planning Commission constituted under the *Western Australian Planning Commission Act 1985 (as amended).*

conservation: means, in relation to any place or heritage precinct, the management of that place or precinct in a manner that will:

a) enable the cultural heritage significance of that place or precinct to be retained; and

b) yield the greatest sustainable benefit for the present community without diminishing the cultural heritage significance of that place or precinct, and may include the preservation, stabilization, protection, restoration, reconstruction, adaptation and maintenance of that place or precinct in accordance with relevant professional standards, and the provision of an appropriate visual setting.

constructed road: means a track that has been graded and stabilised within a gazetted road reserve.

consulting rooms: means a building (other than a hospital or medical centre) used by practitioners who are legally qualified medical practitioners or dentists, physiotherapists, chiropractors or persons ordinarily associated with a practitioner in the prevention or treatment of physical or mental injuries or ailments, and the practitioners may be of the one profession or any combination of professions or practices.

cultural heritage significance: means, in relation to a place or heritage precinct, the relative value which that place or precinct has in terms of its aesthetic, historic, scientific or social significance, for the present community and future generations.

curtilage: in relation to a dwelling means the yard of the dwelling, or an area in the immediate vicinity of the dwelling on the same lot used for purposes ancillary to the dwelling. The curtilage shall not include the area located between the street frontage of the lot and the dwelling thereon except with the special approval of the Council. The term shall a like meaning in relation to land around buildings other than dwellings.

development: shall have the same meaning given to it in and for the purposes of the Act but shall also include in relation to any building, object, structure or place entered in the Heritage List or contained within a heritage precinct, any act or thing that:

a) is likely to change the character of the place or the external appearance of any building; or

b) would constitute an irreversible alteration to the fabric of any building.

District: means the Municipal District of the Shire of Katanning.

dog kennels: means land and buildings used for the boarding and breeding of dogs where such premises are registered or required to be registered by the Council; and may include the sale of dogs where such use is incidental to the predominant use.

education establishment: means a school or other educational centre, but does not include a reformatory.

facade: means the exposed faces of a building towards roads or open space or the frontal outward appearance of the building.

farm supply centre: means the use of premises for the supply of vegetable seed, fertilizers, agricultural chemicals, stock foods, tractors, farm equipment, implements or components, or irrigation equipment; *AMD 5 GG 9/12/05*

feedlot: *DELETED BY AMD 5 GG 9/12/05*

fuel depot: means any land or building used for the storage and sale in bulk of solid, liquid, or gaseous fuel, but does not include a service station and specifically excludes the sale by retail into the final users vehicle of such fuel from the premises.

gazettal date: means the date of which notice of the Minister's approval of this Scheme is published in the *Government Gazette*.

gross floor area: shall have the same meaning as "floor area" in the *Building Code of Australia 1988 (as amended)*.

heritage precinct: means a precinct of heritage value having a distinctive nature, which may contain elements of only minor individual significance but heightened collective significance, and within whose boundaries controls may be necessary to retain and enhance its character.

heritage list: means the Municipal Inventory, as amended from time to time, prepared by the Council pursuant to Section 45 of the *Heritage of Western Australia Act 1990 (as amended)*, or such parts thereof as described in the Heritage List.

hobby farm: means the use of land for the agistment of horses, the growing of vegetables, fruit and flowers and the keeping of domestic poultry for private use only and not for commercial purposes or sale and shall include any buildings normally associated therewith.

home business: means a business, service or profession carried out in a dwelling or on land around a dwelling by an occupier of the dwelling which: *AMD 5 GG 9/12/05*

(a) does not employ more than 2 people not members of the occupier's household;

(b) will not cause injury to or adversely affect the amenity of the neighbourhood;

(c) does not occupy an area greater than 50 square metres;

(d) does not involve the retail sale, display or hire of goods of any nature;

(e) in relation to vehicles and parking, does not result in traffic difficulties as a result of the inadequacy of parking or an increase in traffic volumes in the neighbourhood, and does not involve the presence, use or calling of a vehicle more than 3.5 tonnes tare weight; and

(f) does not involve the use of an essential service of greater capacity than normally required in the zone;

home occupation: means a business or activity carried out within a dwelling or the curtilage of a dwelling by a person resident therein or within a domestic outbuilding by a person resident in the dwelling to which it is appurtenant that:

a) entails the conduct of a business, office, a workshop only, and does not entail the retail sale or display of goods of any nature;

b) does not cause injury to or prejudicially affect the amenity of the neighbourhood;

c) does not detract from the residential appearance of the dwelling or domestic outbuilding;

d) does not entail employment of any person not a member of the occupier's household;

e) does not occupy an area greater than $20m^2$;

f) does not display a sign exceeding $0.2m^2$ in area;

g) in the opinion of the Council is compatible with the principal uses to which land in the zone in which it is located may be put;

h) will not result in the requirement for a greater number of parking facilities than normally reserved for a single dwelling, and will not result in a substantial increase in the amount of vehicular traffic in the vicinity;

i) does not entail the presence, parking, and garaging of a vehicle of more than two (2) tonnes tare weight.

home office: means a home occupation limited to a business carried out solely within a dwelling by a resident of the dwelling but which does not:

(a) entail clients or customers travelling to and from the dwelling;

(b) involve any advertising signs on the premises; or

(c) require any external change to the appearance of the dwelling;

hotel: means any land or building providing accommodation for the public the subject of a hotel licence granted under the provisions of the *Liquor Licensing Act 1988 (as amended)* and may include a betting agency operated in accordance with the *Totalisator Agency Betting Board Act 1960 (as amended)*, but does not include a motel, tavern, or boarding house the subject of a limited hotel licence or other licence granted under that Act.

incidental use: means a use of premises which is ancillary and subordinate to the predominant use:
*AMD 5 GG 9/12/05*

industry: means the carrying out of any process in the course of trade or business for gain, for and incidental to one or more of the following:

a) the winning, processing or treatment of minerals;

b) the making, altering, repairing, or ornamentation, painting, finishing, cleaning, packing, or canning or adapting for sale, or the breaking up or demolition of any article or part of an article;

c) the generation of electricity or the production of gas;

d) the manufacture of edible goods,

and includes, when carried out on land upon which the process is carried out and in connection

with that process, the storage of goods, any work of administration or accounting, or the wholesaling of, or the incidental sale of goods resulting from the process, and the use of land for the amenity of persons engaged in the process; but does not include:

(i) the carrying out of agriculture,

(ii) on-site work on buildings or land,

(iii) in the case of edible goods the preparation of food for retail sale from the premises.

industry - cottage: means a business, professional service, trade or light industry producing arts and craft goods which cannot be carried out under the provisions relating to a "home occupation" and which in the opinion of the Council:

a) does not cause injury to or prejudicially affect the amenity of the neighbourhood;

b) where operated in a Residential Zone, does not entail the employment of any person other than a member of the occupier's household;

c) is conducted in an outbuilding which is compatible within the principal uses to which land in the zone in which it is located may be put;

d) does not occupy an area greater than $50m^2$;

e) does not display a sign exceeding $0.2m^2$ in area.

industry - extractive: means an industry which involves:

a) the extraction of sand, gravel, clay, turf, soil, rock, stone, minerals, or similar substance from the land, and also the storage, treatment, or manufacture of products from those materials when the manufacture is carried out on the land from which any of the materials so used is extracted or on land adjacent thereto, and the storage of such materials or products;

b) the production of salt by the evaporation of salt water.

industry - general: means an industry other than a cottage, extractive, hazardous, light, noxious, rural, or service industry.

industry - hazardous: means an industry which, when in operation and when all measures proposed to minimize its impact on the locality have been employed (including measures to isolate the industry from existing or likely future development on other land in the locality), would pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment. Examples of such industry include oil refineries and chemical plants but would generally exclude light, rural, or service industries.

industry - light: means an industry:

a) in which the processes carried on, the machinery used, and the goods and commodities carried to and from the premises will not cause any injury to, or will not adversely affect the amenity of the locality by reason of the emission of light, noise, electrical interference, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, wastewater or other waste products; and

b) the establishment of which will not or the conduct of which does not impose an undue load on any existing or projected service for the supply or provision of water, electricity, sewerage facilities, or any other like services.

industry – mining: means land used commercially to extract minerals from the land; *AMD 5 GG 9/12/05*

industry - noxious: means an industry which is an offensive trade within the meaning of Schedule 2 of the *Health Act 1911* but where an offensive trade is also included as a category of prescribed premises set out in Schedule 1 of the Environmental Protection Regulations, Schedule 2 of the

*Health Act 1911* prevails and includes a landfill site, but does not include a fish shop, dry cleaning premises, laundromat, piggery, poultry farm or rabbit farm. *AMD 5 GG 9/12/05*

industry - rural: means an industry handling, treating, processing, or packing primary products grown, reared, or produced in the locality, and a workshop servicing plant or equipment used for rural purposes in the locality.

industry - service: means a light industry carried out on land or in buildings which may have a retail shop front and from which goods manufactured on the premises may be sold; or land and buildings having a retail shop front and used as a depot for receiving goods to be serviced.

intensive agriculture: means the use of land for the purposes of trade, commercial reward or gain, including such buildings and earthworks normally associated with the following:

a) the production of grapes, vegetables, flowers, exotic and native plants, fruit and nuts;

b) the establishment and operation of plant and fruit nurseries;

c) the development of land for irrigated fodder production and irrigated pasture (including turf farms;

d) the development of land for the keeping, rearing or fattening of rabbits (for either meat, or fur production), and other livestock in feedlots;

e) dairy milking sheds;

f) the development of land for the keeping, rearing or fattening of other livestock above those stocking rates recommended by the Department of Agriculture in consultation with surrounding farmers for the applicable pasture type;

g) aquaculture.

land: shall have the same meaning given to it in and for the purpose of the Act.

local shop: means a building or part of a building wherein the only goods offered for sales are foodstuffs, toiletries, stationery or goods of a similar domestic nature intended for day to day consumption or use by persons living or working in the locality of the shop.

lodging house: shall have the same meaning as is given to it in and for the purposes of the *Health Act, 1911 (as amended)*.

lot: shall have the same meaning given to it in and for the purposes of the Act and "allotment" has the same meaning.

market: means land and buildings used for a fair, a farmer's or producers' market, or a swap-meet in which the business or selling carried on or the entertainment provided is by independent operators or stall-holders carrying on their business or activities independently of the market operator save for the payment where appropriate of a fee or rental.

medical centre: means a building (other than a hospital) that contains or is designed to contain facilities not only for the practitioner or practitioners mentioned under the interpretation of consulting rooms but also for ancillary services such as chemists, pathologists and radiologists.

motel: means land and buildings used or intended to be used to accommodate patrons in a manner similar to a hotel or boarding house but in which special provision is made for the accommodation of patrons with motor vehicles and to which a licence under the *Liquor Licensing Act 1988 (as amended)* has been granted.

motor vehicle and marine sales: *AMD 5 GG 9/12/05*

motor vehicle, boat or caravan sales: means premises used to sell or hire motor vehicles, boats or caravans; *AMD 5 GG 9/12/05*

motor vehicle repair: means land and buildings used for the mechanical repair and overhaul of motor vehicles including tyre recapping, retreading, panel beating, spray painting and chassis re-shaping.

nett lettable area (NLA): means the area of all floors confined within the internal finished surfaces of permanent walls but excludes the following areas:

a) all stairs, toilets, cleaners cupboards, lift shafts and motor rooms, escalators, tea rooms and plant rooms, and other service areas;

b) lobbies between lifts facing other lifts serving the same floor;

c) areas set aside as public space or thoroughfares and not for the exclusive use of occupiers of the floor or building;

d) areas set aside for the provision of facilities or services to the floor or building where such facilities are not for the exclusive use of occupiers of the floor or building.

non-conforming use: means any use of land or building which was lawful immediately prior to the coming into operation of the scheme, but is not in conformity with the provisions of the Scheme.

office: means a building or part of a building used for the conduct of administration, the practice of a profession, the carrying on of agencies, a post office, bank, building society, insurance office, estate agency, typist and secretarial service, or services of a similar nature, and where not conducted on the site thereof, the administration of or the accounting in connection with a commercial or industrial undertaking.

owner: in relation to any land includes the Crown and every person who jointly or severally whether at law or in equity:

a) is entitled to the land for an estate in fee simple in possession; or

b) is a person to whom the Crown has lawfully contracted to grant the fee simple of the land; or

c) is a lessor or licensee from the Crown; or

d) is entitled to receive or is in receipt of, or if the land were let to a tenant, would be entitled to receive the rents and profits thereof, whether as a beneficial owner, trustee, mortgagee in possession, or otherwise.

piggery: *DELETED BY AMD 5 GG 9/12/05*

place: means an area of land sufficiently identified by survey, description or otherwise as to be readily ascertainable, and includes:

a) an area of land situated in the bed of any watercourse or lake;

b) any works or buildings situated there, their contents relevant to the purpose of the Scheme, and such of their immediate surroundings as may be required for the purposes of the conservation of those works or buildings; and

c) as much of the land beneath the place as is required for the purposes of its conservation.

plantation: has the same meaning as in the *Code of Practice for Timber Plantations in Western Australia (1997)* published by the Department of Conservation and Land Management and the Australian Forest Growers; *AMD 5 GG 9/12/05*

plant nursery: means any land or buildings used for the propagation, rearing, and sale of plants and the storage and sale of products associated with horticultural and garden decor.

potable water: means water in which the level of physical, chemical and bacteriological constituents do not exceed the maximum permissible levels set out in "International Standards for Drinking

Water" published by the World Health Organization.

poultry farm: *DELETED BY AMD 5 GG 9/12/05*

predominant use: means the primary use of premises to which all other uses carried out on the land or buildings are subordinate, incidental or ancillary; *AMD 5 GG 9/12/05*

premises: means land or buildings; *AMD 5 GG 9/12/05*

private recreation: means land used for parks, gardens, playgrounds, sports arenas, or other grounds for recreation which are not normally open to the public without charge.

produce store: means any land or buildings wherein fodders, fertilisers and grain are displayed and offered for sale.

public amusement: means land and buildings used for the amusement or entertainment of the public, with or without charge.

public authority: shall have the same meaning given to it in and for the purposes of the Act.

public recreation: means land used for a public park, public gardens, playground or other grounds for recreation which are normally open to the public without charge.

public utility: means any work or undertaking constructed or maintained by a public authority or the Council as may be required to provide water, sewerage, electricity, gas, drainage, communications or other similar services.

public worship: means land and buildings used for the religious activities of a church but does not include an institution for primary, secondary, or higher education, or a residential training institution.

restaurant: means a building wherein food is prepared for sale and consumption within the building and the expression shall include a licensed restaurant.

restoration: means any work or process on at or in respect of a building structure or place which wholly or partly brings back the building structure or place to its original condition or which reinstates its historic or natural character either by rebuilding or repairing its fabric or by removing accretions or additions.

restricted premises: means any land or building, part or parts thereof, used or designed to be used primarily for the sale of retail or wholesale, or the offer for hire, loan or exchange, or the exhibition, display or delivery of:

a) publications that are classified as restricted publications pursuant to the *Indecent Publications and Articles Act 1902 (as amended)*; or

b) materials, compounds, preparations or articles which are used or intended to be used primarily in or in connection with any form of sexual behaviour or activity.

retail: means the sale or hire of products, goods or services to the public generally in small quantities and from a shop, showroom, or take-away food outlet.

rural home business: means a business, service, or profession carried out in a dwelling or on land around a dwelling by an occupier of the dwelling which: *AMD 5 GG 9/12/05*

(a) does not employ more than 2 people not members of the occupier's household;

(b) will not cause injury to or adversely affect the amenity of the neighbourhood;

(c) does not occupy an area greater than 200 square metres;

(d) does not involve the retail sale, display, or hire of goods of any nature;

(e) in relation to vehicles and parking, does not result in traffic difficulties as a result of the

inadequacy of parking or an increase in traffic volumes in the neighbourhood, and does not involve the presence, use or calling of more than 3 vehicles, with vehicles not being more than 25 tonnes gross weight; and

(f) does not involve the use of an essential service of greater capacity than normally required in the zone.

rural pursuit: means the use of land for any of the purposes set out hereunder and shall include such buildings normally associated therewith:

a) the rearing or agistment of goats, sheep, cattle or beasts of burden;

b) the stabling, agistment or training of horses;

c) the growing of trees, plants, shrubs, or flowers for replanting in domestic, commercial, or industrial gardens;

d) the sale of produce grown solely on the lot;

but does not include intensive agriculture.

salvage yard: means any land or buildings used for the storage and sale of materials salvaged from the erection, demolition, dismantling or renovating of, or fire or flood damage to structures including (but without limiting the generality of the foregoing) buildings, machinery, vehicles and boats.

schedule: means a schedule to the Scheme.

service station: means land and buildings used for the supply of petroleum products and motor vehicle accessories and for carrying out greasing, tyre repairs and minor mechanical repairs and may include a cafeteria, restaurant or shop incidental to the primary use; but does not include transport depot, panel beating, spray painting, major repair to motor vehicles, or wrecking of vehicles.

shop: means any building wherein goods are kept, exposed or offered for sale by retail, or within which services of a personal nature are provided (including a hairdresser, beauty therapist or manicurist) but does not include a showroom, fast food outlet or any other premises specifically defined elsewhere in the Scheme.

short-stay accommodation: means the occupation of a chalet, caravan, camp, or any other form of accommodation approved by the Council, by persons for a period of not more than a total of three months in any one twelve month period.

showroom: means premises used to display, sell by wholesale or retail, or hire, automotive parts and accessories, camping equipment, electrical light fittings, equestrian supplies, floor coverings, furnishings, furniture, household appliances, party supplies, swimming pools or goods of a bulky nature; *AMD 5 GG 9/12/05*

stable: means any land, building, or structure used for the housing, keeping, and feeding of horses, asses, or mules and associated activities.

stockyards: means any land, building or other structure used for holding and/or sale of animal stock.

substantially commenced: means that work or development the subject of planning approval has been begun by the performance of some substantial part of that work or development; *AMD 5 GG 9/12/05*

take-away food outlet: means any land or buildings used for the preparation, sale and serving of food to customers in a form ready to be eaten without further preparation primarily off the premises.

tavern: means land and buildings the subject of a Tavern License granted under the provisions of the *Liquor Licensing Act, 1988 (as amended)*.

telecommunications infrastructure: means land used to accommodate any part of the infrastructure of a telecommunications network and includes any line, equipment, apparatus, tower, antenna, tunnel, duct, hole, pit or other structure used, or for use in or in connection with, a telecommunications

network; *AMD 5 GG 9/12/05*

trade display: means premises used for the display of trade goods and equipment for the purpose of advertisement; *AMD 5 GG 9/12/05*

transport depot: means land and buildings used for the garaging of motor vehicles used or intended to be used for carrying goods or persons for hire or reward or for any consideration, or for the transfer of goods or persons from one such motor vehicle to another of such motor vehicle and includes maintenance, management and repair of the vehicles used, but not of other vehicles.

veterinary centre: means premises used to diagnose animal diseases or disorders, to surgically or medically treat animals, or for the prevention of animal diseases or disorders; *AMD5GG9/12/05*

veterinary hospital: *DELETED BY AMD 5 GG 9/12/05*

zone: means a portion of the Scheme area shown on the Scheme Map by distinctive colouring, patterns, symbols, hatching, or edging for the purpose of indicating the restrictions imposed by the Scheme on the erection and use of buildings or for the use of land, but does not include reserved land.

# SCHEDULE 2 - SPECIAL USE ZONES

*AMD 4 GG 24/9/04; 5 GG 9/12/05*

| No. | PARTICULARS OF LAND | SPECIAL USE |
|---|---|---|
| *SU* 1. | Lots 38 and 43 Amherst, Avon, and Beaufort Streets, Katanning | Church, private education establishment |
| *SU* 2. | Lots 85 and 86 Amherst Street, Katanning<br><br>*AMD 4 GG 24/9/04* | Private club premises and such other associated uses as may be approved by the Council in accordance with the Scheme. |
| *SU* 3. | Lot 3 Tait Terrace, Braeside Road, Synnott Avenue, and Carinyah Gardens, Katanning | Private club and recreation |
| *SU* 4. | Part Lot 131 Kobeelya Avenue, Brownie Street, Katanning | Church, private education establishment, conference facilities, hostel and such other associated uses as may be approved by the Council in accordance with the Scheme |
| *SU* 5. | Lot 2, 130, and 4 Round Drive, Katanning | Private club and recreation, and golf course |
| *SU* 6. | Lot 10 and Ptn Location 1619 Round Drive, Katanning | Private gun club |
| *SU* 7. | Lot 412 Dijon Street, Katanning | Community centre and such other associated uses as may be approved by the Council in accordance with the Scheme. |
| *SU* 8. | Part Lot 3 Great Southern Highway and Trimmer Road, Katanning | Abattoir, water storage, stockyards, skin drying sheds and such other associated uses as may be approved by the Council in accordance with the Scheme |
| ~~*SU* 9.~~ | ~~Location 964 Great Southern Highway/Kojonup Road/Kierle Street, Katanning~~<br><br>*DELETED BY AMD 8 GG 28/8/07* | ~~Short-stay accommodation/caravan park/motel and such other associated uses as may be approved by the Council in accordance with the Scheme~~ |

# SCHEDULE 3 - SPECIAL RESIDENTIAL ZONE

In addition to the requirements for land within the zone set out in clause 6.2 the following more particular requirements shall apply to the localities in the Schedule.

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Lot 3 of Katanning Agricultural Area Lot 54 | 1 The minimum lot size should be no less than 4000 square metres. Subdivision shall generally be in accordance with the Subdivision Guide Plan certified by the Chief Executive Officer.<br><br>2 Dwellings and all ancillary buildings shall be constructed of non-reflective material (with the exception of glazed areas) and shall comprise either timber, stone, rammed earth, brick or steel construction and shall be of colour(s) and textures which are essentially natural and earthy. All such materials shall be to the satisfaction of the Council and shall be compatible with the rural character of the locality.<br><br>3 Dwellings shall be restricted to a maximum height of 9.0 metres and ancillary buildings shall be restricted to a maximum height of 5.0 metres. The height of buildings shall be measured vertically from the mean natural surface of that part of the land contained within the boundaries of the building.<br><br>4 Radio mast, TV antenna, and satellite dish shall be located such that they do not detract from the local visual amenity or cause offence to neighbouring properties.<br><br>5 No clearing of vegetation shall occur within any lot except for the following:<br><br>a) Clearing to comply with the requirements of the *Bush Fires Act 1954 (as amended)*<br><br>b) Clearing within the approved Building Envelope as may be reasonably required to construct an approved building and curtilage thereto.<br><br>c) Clearing to gain vehicular access to the curtilage of an approved dwelling or any other clearing which may be approved by the Council<br><br>6 At the time of application for planning approval for a dwelling, each lot owner will be required to plant, and maintain for a period of two years, 20 trees capable of growing to at least three metres in height.<br><br>7 Each lot shall be required to be serviced with a reticulated water supply, underground power, and telecommunications. The provision of these services shall be the responsibility of the subdivider. |

# SCHEDULE 3 - SPECIAL RESIDENTIAL ZONE (Cont'd)

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Lot 3 of Katanning Agricultural Area Lot 54<br>(Cont'd) | 8 a) The disposal of liquid and/or solid wastes shall be carried out by the installation of an Aerobic Treatment Unit (ATU) or similar system, to the satisfaction of the Council and the Health Department of Western Australia.<br><br>b) No dwelling shall be occupied without the prior approval and installation of such a disposal system.<br><br>9 The keeping and rearing of stock shall not be permitted within the subdivision on any lot less than 8000 square metres in area.<br><br>10 Boundary fencing shall comprise non-electrified stock proof wire or ring-lock fencing to a maximum height of 1.2 metres above the natural surface of the land, with posts being a split jarrah, or treated pine. Internal fencing for courtyards, swimming pools or tennis courts, etc shall comprise materials other than asbestos cement, tyres or corrugated iron.<br><br>11 Low fuel areas (areas clear of all flammable material with the exception of live trees) shall be maintained around all buildings for a minimum distance of 20 metres or such greater distance as the Council may consider reasonable having regard for the slope of the land and the general vegetation cover of the surrounding land.<br><br>12 A building envelope, with an area that is no greater than 20% of the lot area must be approved by the Council and identified on a plan for each lot within the subdivision. No development shall occur on any lot unless a building envelope has been identified and approved by the Council.<br><br>13 The Council will not permit secondhand relocated/or transported dwellings or ancillary buildings to be located on any lot within the subdivision. New transportable dwellings and/or ancillary buildings may be permitted subject to the provisions of the Scheme.<br><br>14 No dams or lakes shall be created on any lot without the prior approval of the Council.<br><br>15 All land and buildings shall be kept in a clean and tidy condition. |

# SCHEDULE 4 - SPECIAL RURAL ZONES

In addition to the requirements for land within the zone set out in clause 6.7 the following more particular requirements shall apply to the localities in the Schedule.

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Land within the Pinwernying Townsite and North Katanning Townsite Areas bounded by Forrest Road, Carew Street, Dumbleyung Road, Marmion Road, Warren Road, Van Zuilecom Road, Ranford Road, Dumbleyung Road, Climie Road, and Brooking Road, Katanning. | Notwithstanding the provisions of clause 6.7.3 of the Scheme the front setback to Dumbleyung Road shall be not less than 30.0 metres. The minimum lot size should be no less than 2.0 hectares. |
| Land bounded by Kojonup Road, Ramsden Street, Shirley Street, McLeod Street, Moore Street, railway reserve, Gully Street, Mills Street, and Prosser Street, Katanning. | The Council will not recommend to the Commission support for further subdivision, but this shall not preclude the Council recommending to the Commission support for a rationalisation of lot boundaries provided no additional lots are created and the resultant lot sizes and shapes are to the satisfaction of the Council. the minimum lot size should be no less than 2.0 hectares. |
| Pt Katanning Agricultural Area Lot 70 | 1. The minimum lot size should be no less than 1.0 hectare. Subdivision shall generally be in accordance with the Subdivision guide Plan certified by the Chief Executive Officer.<br><br>2. Dwellings and all ancillary buildings shall be constructed of non-reflective material (with the exception of glazed areas) and shall comprise either timber, stone, rammed earth, brick or steel construction and shall be of colour(s) and textures which are essentially natural and earthy. All such materials shall be to the satisfaction of the Council and shall be compatible with the rural character of the locality.<br><br>3. Dwellings and all ancillary buildings shall be restricted to a maximum 7.5 metres height measured vertically from the mean natural surface of that part of land contained within the boundaries of the building.<br><br>4. No clearing of vegetation shall occur within any lot except for the following:<br><br>a) Clearing to comply with the requirements of the *Bush Fires Act 1954 (as amended).*<br><br>b) Clearing within an area of 1000m$^2$ containing the dwelling, as may be reasonably required to construct an approved building and curtilage thereto.<br><br>c) Clearing to gain vehicular access to the curtilage of an approved dwelling or any other clearing which may be approved by Council. |

# SCHEDULE 4 - SPECIAL RURAL ZONES (Cont'd)

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Pt Katanning Agricultural Area Lot 70 (Cont'd) | 5. Low fuel areas (areas clear of all flammable material with the exception of live trees) shall be maintained around all buildings for a minimum distance as the Council may consider reasonable having regard for the slope of the land and the general vegetation cover of the surrounding land.<br><br>6. At the time of application for planning approval for a dwelling the owner will be required to plant and maintain for a period of two years 30 trees capable of growing to at least 3 metres in height.<br><br>7. Each lot shall be serviced with a reticulated water supply, electricity and telecommunications. The provisions of these services shall be the responsibility of the subdivider.<br><br>8. a) The disposal of liquid wastes shall be carried out by the installation of an effluent disposal system approved by the Council and the Health Department of Western Australia.<br><br>b) Effluent disposal areas shall be set back a minimum of 30 metres from any water course or dam or as otherwise approved by the Council.<br><br>c) Effluent disposal systems must be designed to the satisfaction of the Council to overcome potential problems associated with high water tables, average conditions, deep bleached sands or similar constraints of the particular site on which they are to be installed.<br><br>d) No dwelling shall be occupied without the prior approval and installation of such a disposal system.<br><br>9. The keeping and rearing of stock shall be permitted for domestic purpose only and shall not exceed one horse or one cow, or two sheep or goats. Stock for agricultural purposes may be kept and reared on land prior to subdivision in accordance with the Plan of Subdivision referred to in Item 1 of this part of the Schedule.<br><br>10. Any fence, other than a fence which may be required by the Council to be erected around a swimming pool, shall comprise non-electrified stock proof wire or ring-lock fencing to a maximum height of 1.2 metres above the natural surface of the land, with posts being split jarrah or treated pine.<br><br>11. No dam or artificial lake shall be created on any lot without the prior approval of the Council. |

# SCHEDULE 4 - SPECIAL RURAL ZONES (Cont'd)

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Lots E41 and E42 of Pt Kojonup Location 256 and Kojonup Locations 2979 and 304. | 1. The minimum lot size should be no less than 1.0 hectare. Subdivision shall generally be in accordance with the Subdivision Guide Plan certified by the Chief Executive Officer.<br><br>2. Dwellings and all ancillary buildings shall be constructed of non-reflective material be constructed of non-reflective material (with the exception of glazed areas) and shall comprise either timber, stone, rammed earth, brick or steel construction and shall be of colour(s) and textures which are essentially natural and earthy. All such materials shall be to the satisfaction of the Council and shall be compatible with the rural character of the locality.<br><br>3. Dwellings and all ancillary buildings shall be restricted to a maximum 7.5 metres height measured vertically from the mean natural surface of that part of land contained within the boundaries of the building.<br><br>4. No clearing of vegetation shall occur within any lot except for the following:<br><br>a) Clearing to comply with the requirements of the *Bush Fires Act 1954 (as amended).*<br><br>b) Clearing within an area of 1000$m^2$ containing the dwelling, as may be reasonably required to construct an approved building and curtilage thereto.<br><br>c) Clearing to gain vehicular access to the curtilage of an approved dwelling or any other clearing which may be approved by Council.<br><br>5. Low fuel areas (areas clear of all flammable material with the exception of live trees) shall be maintained around all buildings for a minimum distance of 20 metres or such greater distance as the Council may consider reasonable having regard for the slope of the land and the general vegetation cover of the surrounding land.<br><br>6. At the time of application for planning approval for a dwelling the owner will be required to plant and maintain for a period of two years 50 trees capable of growing to at least 3 metres in height.<br><br>7. The Council may request the Commission to impose conditions at the time of subdivision for the provision of power and telecommunications. |

# SCHEDULE 4 - SPECIAL RURAL ZONES (Cont'd)

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Lots E41 and E42 of Pt Kojonup Location 256 and Kojonup Locations 2979 and 304.<br>(Cont'd) | 8. Each dwelling shall be provided with a supply of potable water, in the form of a water tank with a minimum capacity of 135 kilolitres and shall be linked to a suitable rainfall catchment with a surface area of not less than 150m$^2$. Any auxiliary holding tanks which may be required shall not exceed a capacity of 10 kilolitres. Water supply tanks are to be fitted with camlock fittings providing access to 25 per cent of the tank capacity for bush fire fighting purposes.<br><br>9. a) The disposal of liquid wastes shall be carried out by the installation of an effluent disposal system approved by the Council and the Health Department of Western Australia.<br><br>b) Effluent disposal areas shall be set back a minimum of 30 metres from any water course or dam or as otherwise approved by the Council.<br><br>c) Effluent disposal systems must be designed to the satisfaction of the Council to overcome potential problems associated with high water tables, average conditions, deep bleached sands or similar constraints of the particular site on which they are to be installed.<br><br>d) No dwelling shall be occupied without the prior approval and installation of such a disposal system.<br><br>10. The keeping and rearing of stock shall be permitted for domestic purpose only and shall not exceed one horse or one cow, or two sheep or goats. Stock, for agricultural purposes, may be kept and reared on land prior to subdivision in accordance with the Plan of Subdivision referred to in Item 1 of this part of the Schedule.<br><br>11. Stocks may be permitted on all lots provided that this does not require the removal of vegetation and that stock numbers are maintained at levels in accordance with the standards of good husbandry to the satisfaction of Agriculture WA.<br><br>12. Any fence, other than a fence which may be required by the Council to be erected around a swimming pool, shall comprise non-electrified stock proof wire or ring-lock fencing to a maximum height of 1.2 metres above the natural surface of the land, with posts being a split jarrah or treated pine. |

## SCHEDULE 4- SPECIAL RURAL ZONES (Cont'd)

| PARTICULARS OF LAND | REQUIREMENTS |
|---|---|
| Lots E41 and E42 of PI Kojonup Location 256 and Kojonup Locations 2979 and 304. (Cont'd) | 13. No dam or artificial lake shall be created on any lot without the prior approval of the Council. |

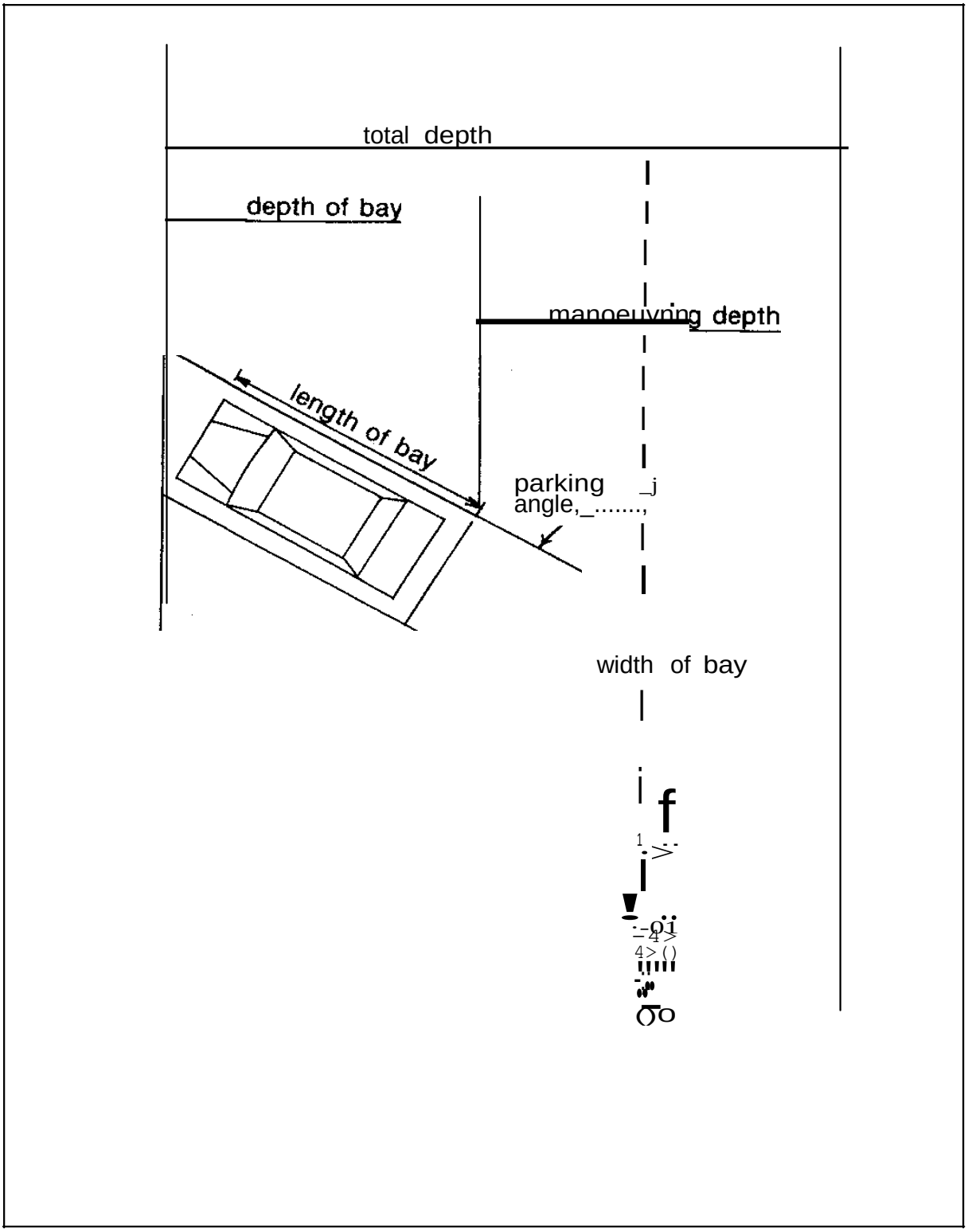
# SCHEDULE 5 - CAR PARKING REQUIREMENTS

| USE | | NUMBER OF PARKING SPACES |
|---|---|---|
| 1 | SHOPPING | Six (6) spaces for every 100 square metres of Nett Lettable Area (NLA).<br><br>**Notes:**<br><br>(i) Parking bays for the vehicles of disabled persons shall be provided in all shopping centres in the ratio of 1 bay for 100 car parking spaces. such bays will be clearly marked "DISABLED DRIVER ONLY". |
| 2 | HOTEL, MOTEL, TAVERN, CLUB, PRIVATE HOTEL, LODGING HOUSE, RESTAURANT, NIGHTCLUB, PLACE OF PUBLIC ASSEMBLY | Where applicable to the particular use:<br><br>Thirty-four (34) spaces for every 100 square metres of drinking area other than public lounge drinking areas;<br><br>One (1) space for every four (4) seats which an eating area is designed to provide, or twenty-five (25) spaces for every 100 square metres of eating area or part thereof, whichever produces the greater number of parking spaces;<br><br>One (1) space for every bedroom;<br><br>One (1) space for every six (6) seats provided or capable of being provided in assembly areas, or twenty-two (22) spaces for every 100 square metres of assembly area, whichever produces the greater number of car parking spaces;<br><br>Twenty-two (22) spaces for every 100 square metres of beer garden or outdoor drinking area. |
| 3 | OFFICE | Five (5) spaces for every 100 square metres of NLA. |
| 4 | HEALTH CENTRE, CLINIC, CONSULTING ROOMS | Four (4) space for every consulting room up to two (2) such rooms and two (2) for every additional consulting room. |
| 5 | WAREHOUSE, SHOWROOM, INDUSTRY, WITH THE EXCEPTION OF A FACTORY UNIT BUILDING | Four (4) spaces for up to the first 200 square metres of NLA and thereafter one (1) space for every additional 100 square metres of NLA or part thereof. |
| 6 | FACTORY UNIT BUILDING | As prescribed for warehouse, or two (2) spaces for every factory unit, whichever produces the greater number of car parking spaces. |
| 7 | VETERINARY HOSPITAL, CLINIC, OR SURGERY | Four (4) spaces for every 100 square metres of NLA |
| 8 | PLANT NURSERY | A minimum of twelve (12) spaces plus any additional spaces as may be determined by the Council taking into account the specific nature and extent of the development. |
| 9 | DWELLINGS | As set out in the Residential Design Codes.<br>*AMD 5 GG 9/12/05* |

# MINIMUM DIMENSIONS OF PARKING SPACES

| Parking Angle | Width of Bay (Metres) | Length of Bay (Metres) | Depth of Bay (Metres) | Minimum Manoeuvring (Metres) | Total (Metres) |
|---|---|---|---|---|---|
| 90° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.4<br>5.4<br>5.4 | 6.0<br>5.9<br>5.8 | 11.4<br>11.3<br>11.2 |
| 75° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.9<br>5.9<br>6.0 | 5.4<br>5.3<br>4.8 | 11.3<br>11.2<br>10.8 |
| 60° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.9<br>6.0<br>6.0 | 5.2<br>5.0<br>4.8 | 11.1<br>11.0<br>10.8 |
| 45° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.9<br>6.0<br>6.0 | 4.0<br>3.6<br>3.3 | 9.9<br>9.6<br>9.3 |
| 30° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 4.8<br>4.8<br>4.8 | 3.3<br>3.3<br>3.3 | 8.1<br>8.1<br>8.1 |
| 0°<br>(Parallel<br>Parking) | 3.0<br>3.0<br>3.0 | 6.7<br>6.7<br>6.7 | 3.0<br>3.0<br>3.0 | 3.0<br>3.0<br>3.0 | 6.0<br>6.0<br>6.0 |
| **TWO WAY ACCESS** | | | | | |
| 90° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.4<br>5.4<br>5.4 | 6.0<br>6.0<br>6.0 | 11.4<br>11.4<br>11.4 |
| 75° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.9<br>6.0<br>6.0 | 6.0<br>6.0<br>6.0 | 11.9<br>11.9<br>12.0 |
| 60° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.9<br>6.0<br>6.0 | 6.0<br>6.0<br>6.0 | 11.9<br>12.0<br>12.0 |
| 45° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 5.9<br>6.0<br>6.0 | 6.0<br>6.0<br>60 | 11.9<br>12.0<br>12.0 |
| 30° | 2.4<br>2.6<br>2.7 | 5.4<br>5.4<br>5.4 | 4.4<br>4.4<br>4.4 | 6.0<br>6.0<br>6.0 | 10.4<br>10.4<br>10.4 |
| 0°<br>(Parallel<br>Parking) | 3.0<br>3.0<br>3.0 | 6.7<br>6.7<br>6.7 | 3.0<br>3.0<br>3.0 | 6.0<br>6.0<br>6.0 | 9.0<br>9.0<br>9.0 |

# LAYOUT OF PARKING BAYS



# SCHEDULE 6 - EXEMPTED ADVERTISEMENTS

*AMD 5 GG 9/12/05*

| LAND USE AND/OR DEVELOPMENT | EXEMPTED SIGN TYPE AND NUMBER (includes the change of posters or poster signs and applies to non-illuminated signs unless otherwise stated) | MAXIMUM AREA |
|---|---|---|
| Dwellings | One professional nameplate as appropriate | $0.2m^2$ |
| Home Business or Home Occupation | One advertisement describing the nature of the home business or home occupation | $0.2m^2$ |
| Places of Worship, Meeting Halls and Places of Public Assembly | One advertisement detailing the function and/or the activities of the institution concerned. | $0.2m^2$ |
| Cinemas, Theatres and Drive-in Theatres | Two signs (illuminated or non-illuminated) detailing the entertainment being presented from time to time at the venue upon which the signs are displayed. | Each advertisement sign not to exceed $5m^2$ |
| Shops, Showrooms and other uses appropriate to a Shopping Area | All advertisements affixed to the building below the top of the awning or, in the absence of an awning, below a line measured at 5 metres from the ground floor level of the building subject to compliance with the requirements of the Signs Hoarding and Bill Posting Local Laws | Not Applicable |
| Industrial and Warehouse Premises | A maximum of four advertisements applied to or affixed to the walls of the building but not including signs which project above the eaves or the ridge of the roof of the building, and excluding signs projecting from a building and excluding signs which are connected to a pole, wall, or other building.<br><br>A maximum of two freestanding advertisement signs not exceeding 5 metres in height above ground level. | Total area of such advertisements are not to exceed $15m^2$<br><br>Maximum permissible total area is not to exceed $10m^2$ and individual advertisement signs are not to exceed $6m^2$. |
| Showroom, racecourses, major racing tracks, sports stadia, major sporting grounds and complexes | All signs provided that, in each case, the advertisement is not visible from outside the complex or facility concerned either from other private land or from public places and streets. | Not Applicable |
| Public Places and Reserves | Advertisement signs (illuminated and non-illuminated) relating to the functions of Government, a public authority or local government excluding those of a promotional nature constructed or exhibited by, or on behalf of any such body, and<br><br>Advertisement signs (illuminated and non-illuminated) required for the management or control of traffic on any public road, car park, cycleway, railway or waterway where such advertisement has been constructed or exhibited by or at the direction of a Government department, public authority or the local government, and<br><br>Advertisement signs (illuminated and non-illuminated) required to be exhibited by or pursuant to any statute or regulation or the like made pursuant to powers contained within a Statute provided that any such advertisement is constructed and/or exhibited strictly in accordance with the requirements specified therein. | Not Applicable<br><br>Not Applicable<br><br>Not Applicable |
| Railway Property and Reserves | Advertisement signs exhibited on such land provided that each such advertisement is directed only at persons at or upon railway station. | No sign is to exceed $2m^2$ in area. |

# SCHEDULE 6 – EXEMPTED ADVERTISEMENTS (Cont'd)

| LAND USE AND/OR DEVELOPMENT | EXEMPTED SIGN TYPE AND NUMBER (includes the change of posters or poster signs and applies to non-illuminated signs unless otherwise stated) | MAXIMUM AREA |
|---|---|---|
| Advertisements within Buildings | All advertisements placed or displayed within buildings, which cannot ordinarily be seen by a person outside of those buildings. | Not Applicable |
| All classes of buildings other than single family dwellings | One advertisement sign containing the name, number and address of the building, the purpose for which the building is used or the name and address of the managing agent thereof. | 0.2m$^2$ |
| **TEMPORARY SIGNS** | **EXEMPTED SIGN TYPE AND NUMBER (All non-illuminated unless otherwise stated)** | **MAXIMUM AREA** |
| Building Construction Sites (advertisement signs displayed only for the duration of the construction) as follows: | | |
| (a) Dwellings | One advertisement per street frontage containing details of the project and the contractors undertaking the construction work. | 2m$^2$ |
| (b) Multiple dwellings, shops, commercial and industrial properties | One sign as for (a) above | 5m$^2$ |
| (c) Large development or redevelopment projects involving shopping centres, office or other buildings exceeding three (3) storeys in height | One sign as for (a) above<br>One additional sign showing the name of the project builder. | 10m$^2$<br>5m$^2$ |
| Sales of goods or livestock | One sign per lot displayed for a period not exceeding 3 months advertising the sale of goods or livestock upon any land or within any building upon which the sign is exhibited provided that the land is not normally used for that purpose. | 2m$^2$ |
| Property transactions<br>Advertisement signs displayed for the duration of the period over which property transactions are offered and negotiated as follows: | | |
| (a) Dwellings | One sign per street frontage for each property relating to the Sale, leasing or impending auction of the property at or upon which the sign is or the signs are displayed. | Each sign is not to exceed an area of 2m$^2$ |
| (b) Multiple dwellings, shops, commercial and industrial properties | One sign as for (a) above. | Each sign is not to exceed an area of 5m$^2$ |
| (c) Large properties comprised of shopping centre, buildings in excess of four (4) storeys and rural properties in excess of five (5) hectares. | One sign as for (a) above. | Each sign is not to exceed an area of 10m$^2$ |
| Display Homes<br>Advertisement signs displayed for the period over which homes are on display for public inspection. | (a) One sign for each dwelling on display. | 2m$^2$ |

# SCHEDULE 6 – EXEMPTED ADVERTISEMENTS (Cont'd)

| TEMPORARY SIGNS | EXEMPTED SIGN TYPE AND NUMBER (All non-illuminated unless otherwise stated) | MAXIMUM AREA |
|---|---|---|
| | (b) In addition to (a) above one sign for each group of dwellings displayed by a single project builder giving details of the project building company and details of the range of dwellings on display. | $5m^2$ |

# SCHEDULE 7 – FORM OF APPLICATION FOR PLANNING APPROVAL

*AMD 5 GG 9/12/05*

## APPLICATION FOR PLANNING APPROVAL

**OWNER DETAILS:**

Name .....

Address..... Post Code.....

Phone (work) ..... (home) .....Fax ..... E-Mail .....

Contact Person ..... ..... ..... .....

Signature ..... .....Date..... .....

Signature ..... .....Date..... .....

***The signature of the landowner(s) is required on all applications. This application will not proceed without that signature.***

---

**APPLICANT DETAILS:**

Name ..... ..... ..... .....

Address..... ..... ..... Post Code.....

Phone (work) ..... (home) .....Fax ..... E-Mail .....

Contact Person for correspondence ..... ..... ..... .....

Signature ..... ..... ..... Date.....

---

**PROPERTY DETAILS:**

Lot No ..... House/Street No. ..... Location No. .....

Diagram or Plan No. ..... Certificate of Title No. ..... Folio .....

Diagram or Plan No. ..... Certificate of Title No. ..... Folio .....

Title Encumbrances (eg, easements, restrictive covenants)..... .....

Street Name..... Suburb.....

Nearest Street Intersection..... .....

---

Existing Building/Land Use ..... .....

Description of proposed development and/or use..... .....

..... .....

Nature of any existing buildings and/or use..... .....

..... .....

Approximate cost of proposed development ..... .....

Estimated time of completion..... .....

| **OFFICE USE ONLY** |
|---|
| Acceptance Officer's Initials.....Date Received ..... |
| Council's Reference No. ..... |
| |

# SCHEDULE 8 – ADDITIONAL INFORMATION FOR ADVERTISEMENTS

*AMD 5 GG 9/12/05*

**ADDITIONAL INFORMATION FOR ADVERTISEMENTS**

(NOTE: TO BE COMPLETED IN ADDITION TO THE APPLICATION FOR PLANNING APPROVAL FORM)

1. Description of property upon which advertisement is to be displayed including full details of its proposed position within that property:

   .....

   .....

2. Details of Proposed Sign:

   (a) Type of structure on which advertisement is to be erected (i.e. freestanding, wall mounted, other):

   .....

   (b) Height: ..... Width: ..... Depth: .....

   (d) Height above ground level - (to top of advertisement):..... .....

   - (to the underside):..... .....

   (e) Materials to be used ..... .....

   Illuminated: Yes/No If yes, state whether steady, moving, flashing, alternating, digital, animated or scintillating and state intensity of light source:

   .....

3. Period of time for which advertisement is required:..... .....

4. Details of signs (if any) to be removed if this application is approved:

   ..... .....

   ..... .....

   ..... .....

   ..... .....

Note: This application should be supported by a photograph or photographs of the premises showing superimposed thereon the proposed position for the advertisement and those advertisements to be removed detailed in 4 above.

Signature of Advertiser(s):
(if different from landowners)

..... .....

Date:

# SCHEDULE 9 – NOTICE OF PUBLIC ADVERTISEMENT OF PLANNING PROPOSAL

**Town Planning and Development Act 1928**

**SHIRE OF KATANNING**

**TOWN PLANNING SCHEME NO. 4**

**NOTICE OF PUBLIC ADVERTISEMENT OF PLANNING PROPOSAL**

The Council has received an application to use and/or develop land for the following purpose and public comments are invited.

LOT NO. ..... STREET..... .....
SUBURB ..... ..... .....
PROPOSAL..... ..... .....
..... ..... .....
..... ..... .....

Details of the proposal are available for inspection at the Council office. Comments on the proposal may be submitted to the Council in writing on or before the .....day of.....

.....
CHIEF EXECUTIVE OFFICER

.....
DATE

# SCHEDULE 10 - NOTICE OF DETERMINATION ON APPLICATION FOR PLANNING APPROVAL

*AMD 5 GG 9/12/05*

**Town Planning and Development Act 1928**

**SHIRE OF KATANNING**

**TOWN PLANNING SCHEME NO. 4**

**NOTICE OF DETERMINATION ON APPLICATION FOR PLANNING APPROVAL**

LOCATION: .....

LOT: ..... PLAN/DIAGRAM: .....

VOL: NO:..... FOLIO NO: .....

Application Date: ..... Received on: .....

Description of proposed development:.....

.....

The application for planning approval is:

- ❑ granted subject to the following conditions:
- ❑ refused for the following reason(s):

CONDITIONS /REASONS FOR REFUSAL:

.....

.....

.....

.....

.....

.....

**Note 1:** **If the development the subject of this approval is not substantially commenced within a period of 2 years, or such other period as specified in the approval after the date of the determination, the approval will lapse and be of no further effect.**

**Note 2:** **Where an approval has so lapsed, no development is to be carried out without the further approval of the Council having first been sought and obtained.**

**Note 3:** **If an applicant is aggrieved by this determination there is a right of appeal under Part V of the Town Planning and Development Act 1928. An appeal must be lodged within 60 days of the Council's determination.**

..... .....

CHIEF EXECUTIVE OFFICE DATE

# SCHEDULE 11 - ADDITIONAL USES

| No. | Description of Land | Additional use | Conditions |
|---|---|---|---|
| *A* 1 | Part of Lot 201 Warren Road, Katanning<br><br>*AMD 7 GG 21/11/06* | Micro brewery & associated commercial elements; casual & formal outdoor recreation area, outdoor formal function, toilet facilities, caretaker's residence, related parking plus other associated/related tourism uses which Council may approve. | Planning approval from the Council is required for all development.<br><br>Development plans shall have regard for the amenity of, and potential impacts upon, residential and other sensitive uses in the locality. |

**ADOPTION**

Adopted by Resolution of the Council of the Shire of Katanning at the meeting of the Council held on the sixth day of December 1995.

.....
PRESIDENT

.....
CHIEF EXECUTIVE OFFICER

**FINAL APPROVAL**

1 Adopted by Resolution of the Council of the Shire of Katanning at the meeting of the Council held on the 12th day of February 1997 and pursuant to that Resolution the Seal of the Municipality was hereunto affixed in the presence of:

.....
PRESIDENT

.....
CHIEF EXECUTIVE OFFICER

This Scheme Text is to be read in conjunction with the approved maps of the Scheme described in clause 1.5 of the Scheme and to which formal approval was given by the Minister for Planning on the date shown below.

2 RECOMMENDED/SUBMITTED FOR FINAL APPROVAL

.....
CHAIRPERSON OF THE WESTERN AUSTRALIAN PLANNING COMMISSION

.....
DATE

3 FINAL APPROVAL GRANTED

.....
MINISTER FOR PLANNING

.....
DATE 27 NOVEMBER 1997

# Appendix E: Heritage search

## Search Criteria

1 Heritage Surveys containing 1 Survey Areas in Shapefile - OCallaghanPark (2)

## Disclaimer

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## Survey Report 17057

**Title** Report on the Archaeological Component of the Aboriginal Site Survey of the Perth to Adelaide Optic Fibre Cable Route - Ceduna to Eastern Goldfields, Eastern Goldfields to South Coastal Ans South Coastal to South Western Sections. April 1990.

**Authors** Quartermaine G

**Lead Consultant** Gary Quartermaine

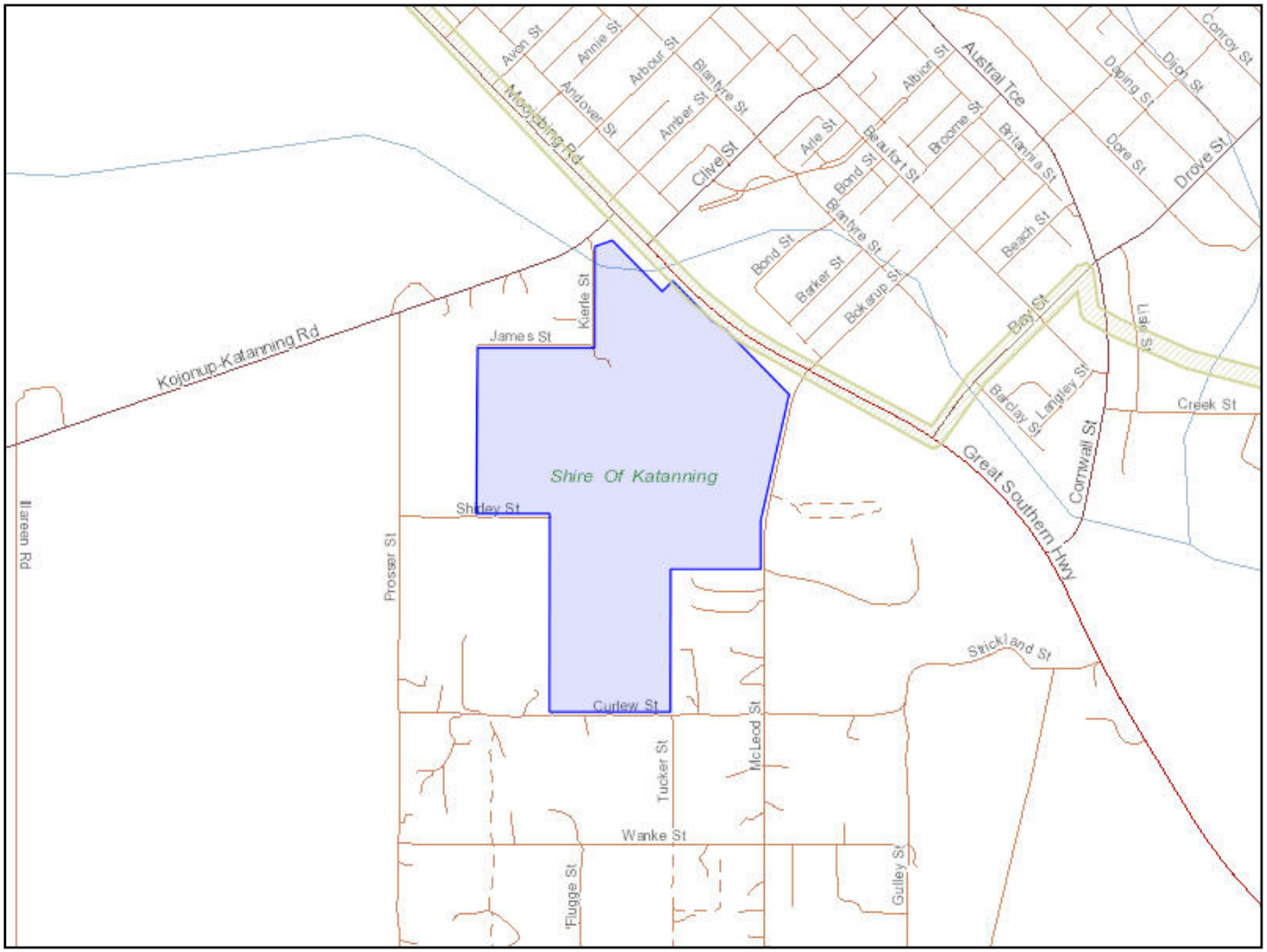
**Survey Types** Archaeological

### Related Survey Areas for Survey Report 17057

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Archaeological | Perth to Adelaide Optic Fibre Cable Route - Ceduna to Eastern Goldfields - WA border to Cocklebiddy, 280km. Eastern Goldfields to South Coastal - Balladonia to Jerramungup with an alternative route through Norseman, 540km plus 400km. And South Coastal to South Western - Ongerup to Collie, 270km. The route follows the railway reserve from Collie to Duranillin, minor roads to Katanning, railway reserve to Nyabing, roads to Jerramungup, the South Coast Highway to Esperance, roads and tracks t... | Unreliable | Field and Desktop |

# Aboriginal Heritage Inquiry System

Heritage Survey Database




## Legend

### Selected Heritage Surveys

- Heritage Survey
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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## Search Criteria

No Registered Aboriginal Sites in Shapefile - OCallaghanPark

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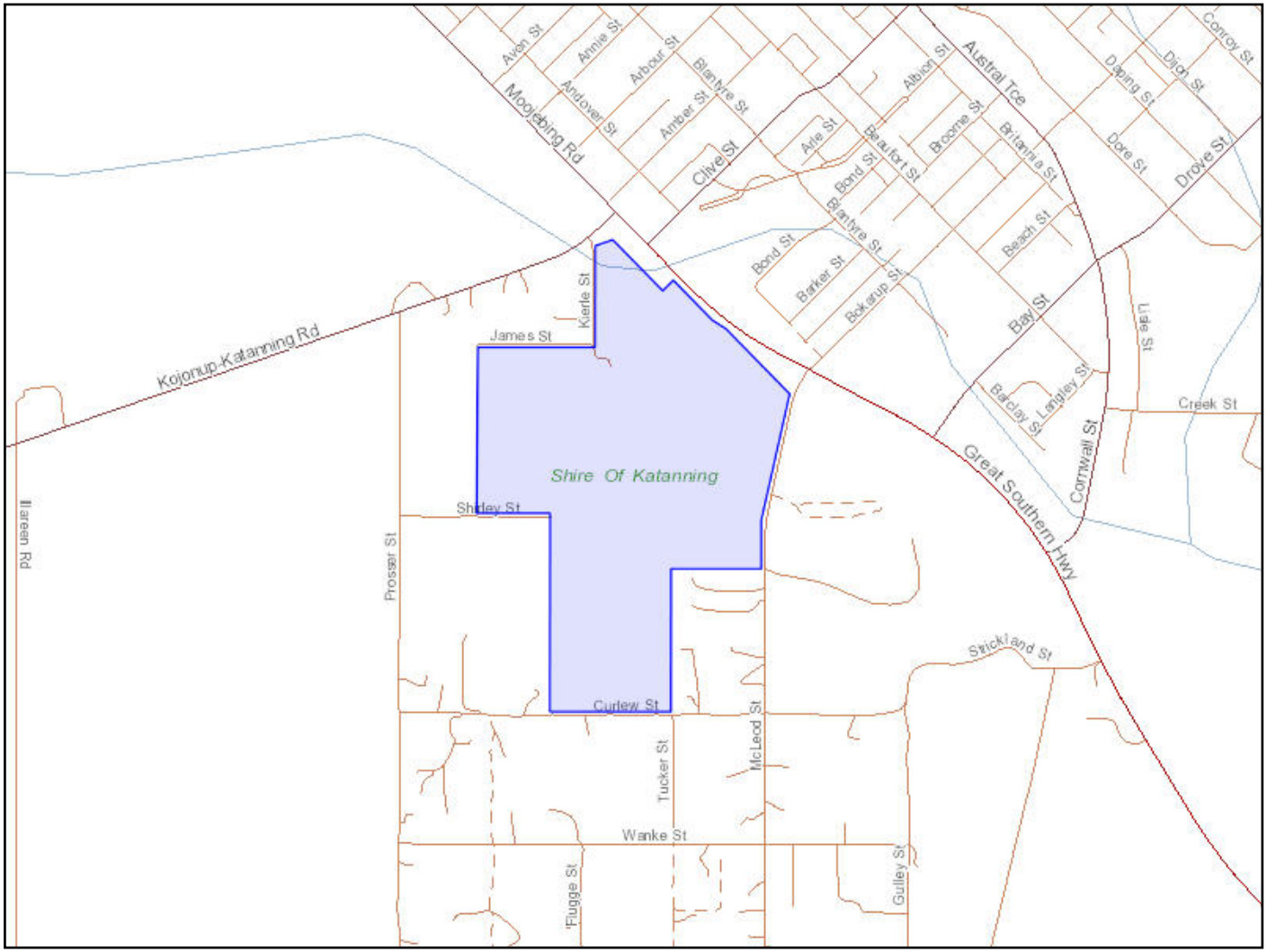
## List of Registered Aboriginal Sites with Map

No Results

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database

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**Selected Heritage Sites**

- Registered Sites
- Aboriginal Community Occupied
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- Town
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## Search Criteria

No Other Heritage Places in Shapefile - OCallaghanPark (3)

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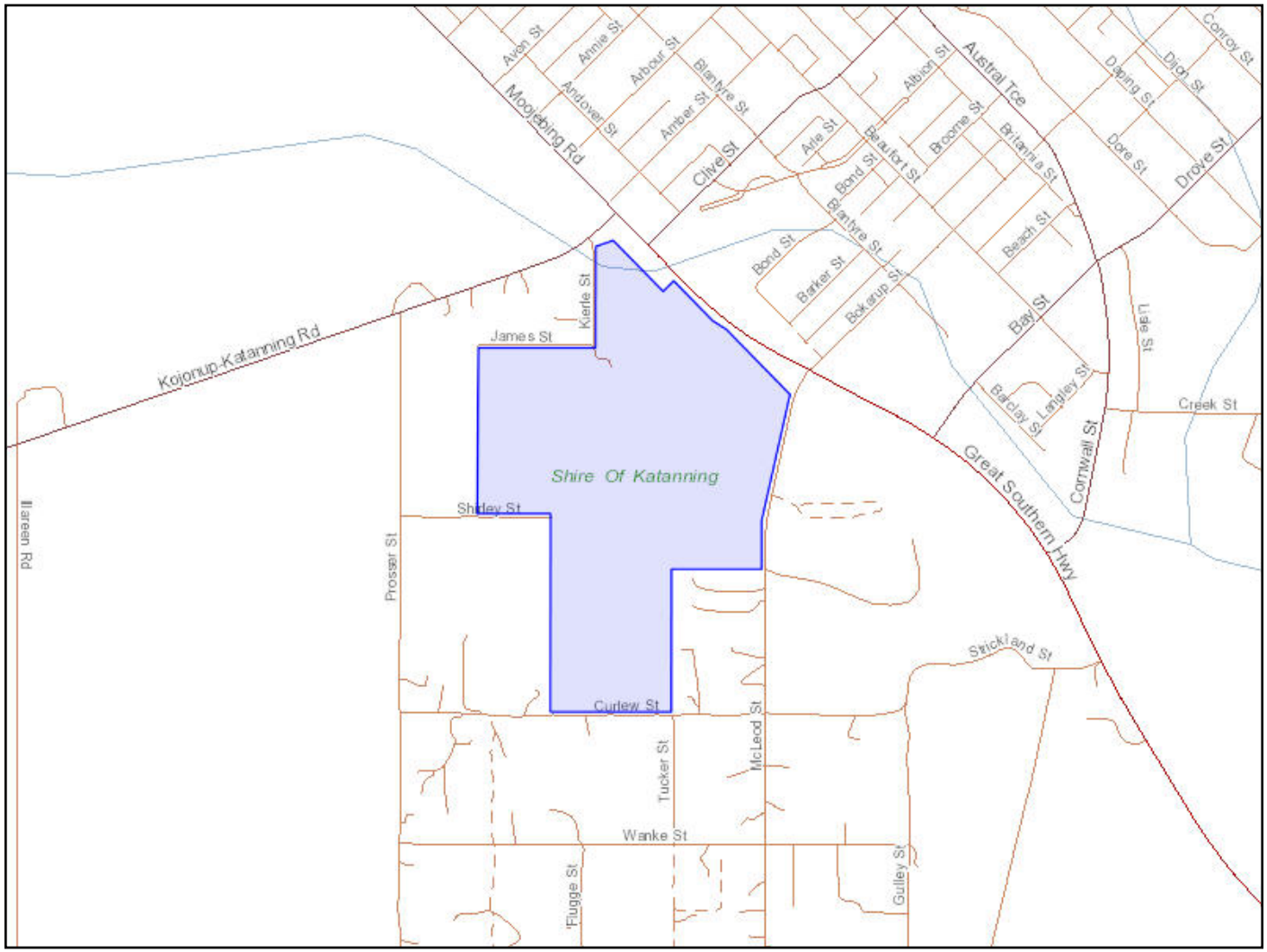


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**Selected Heritage Places**

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No Survey Areas in Shapefile - PiessePark (2)

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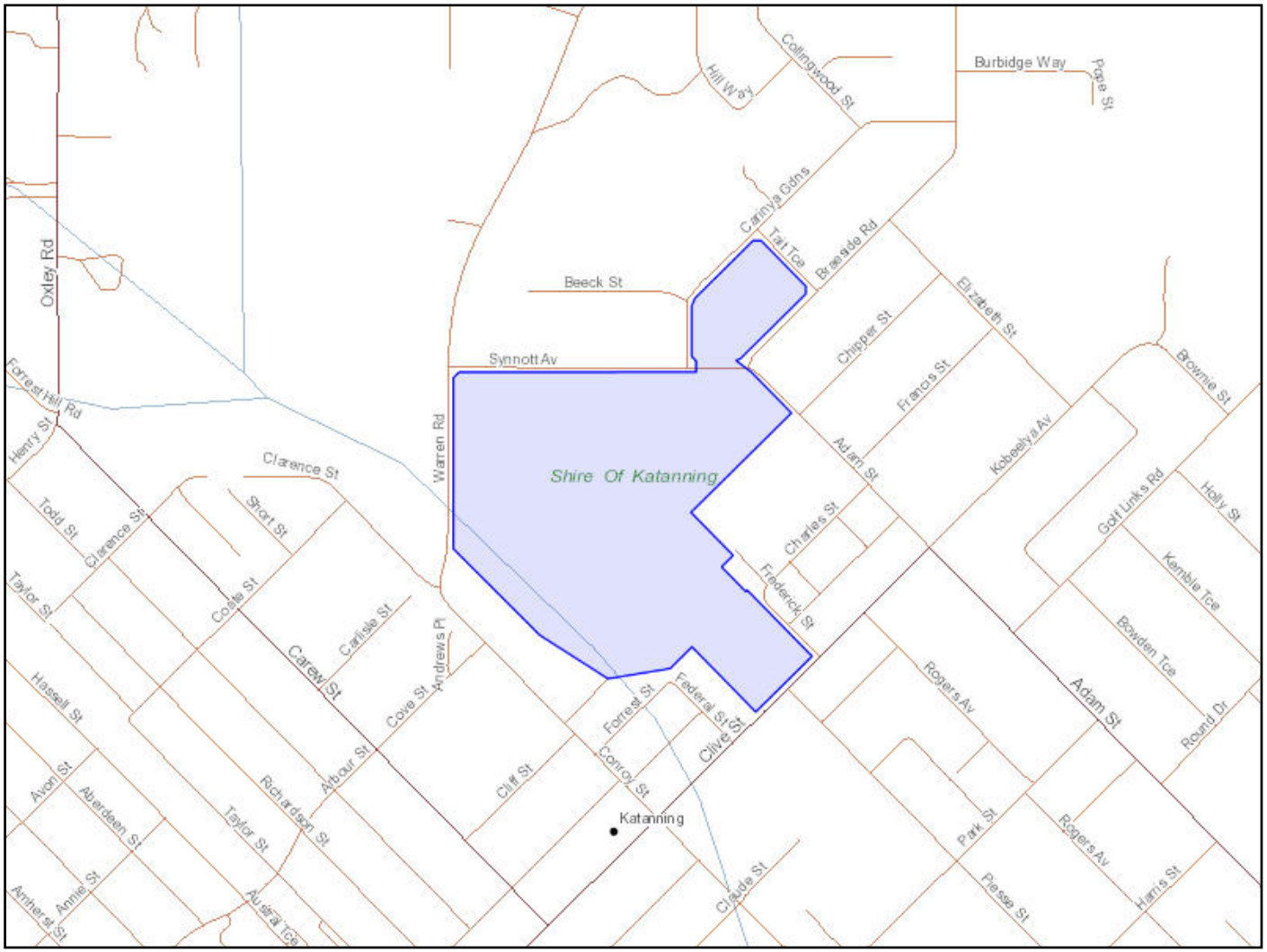


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No Registered Aboriginal Sites in Shapefile - PiessePark

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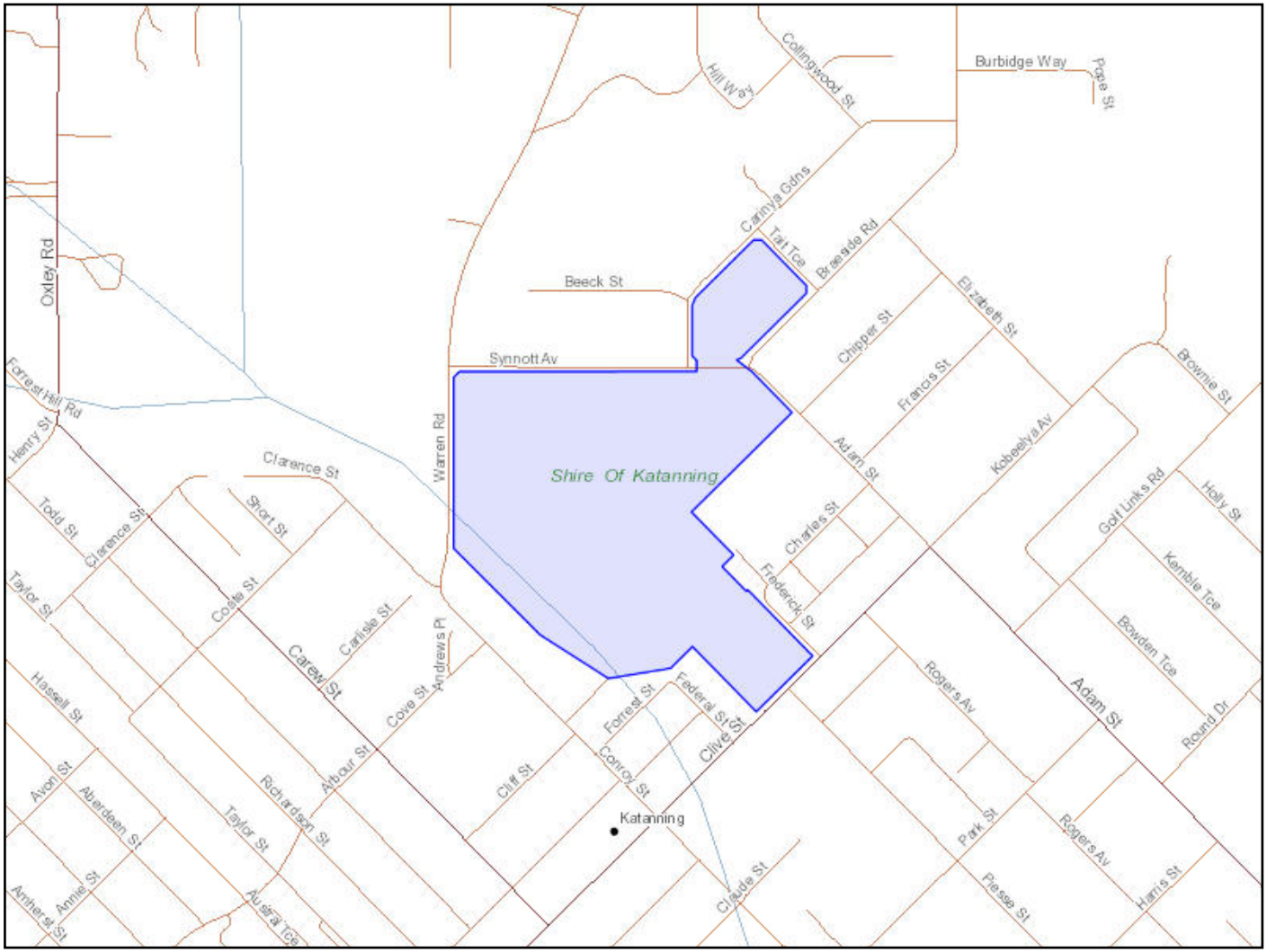


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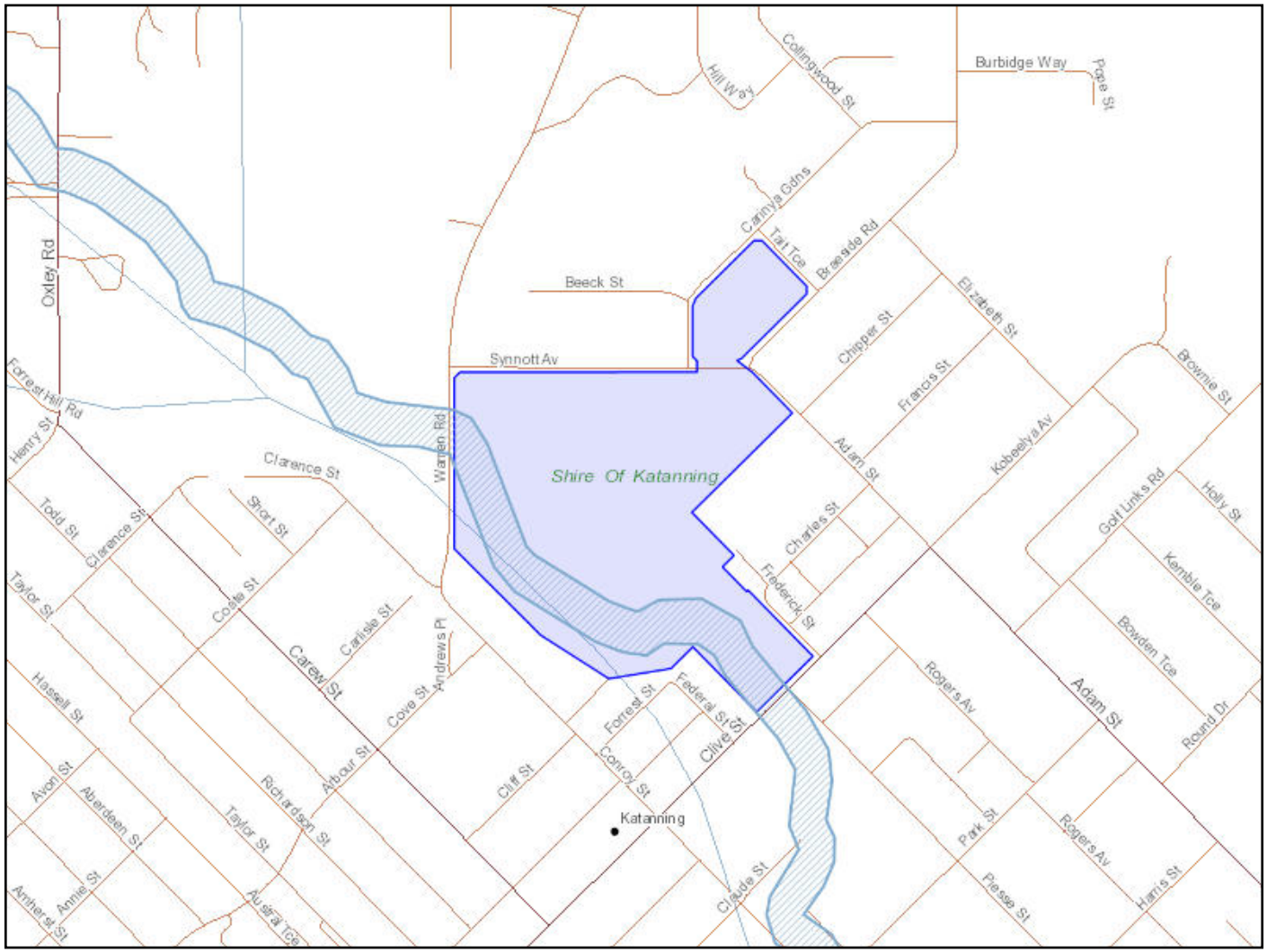
## List of Other Heritage Places with Map

| ID | Place Name | File Restricted | Boundary Restricted | Restrictions | Status | Type | Knowledge Holders | Coordinates | Legacy ID |
|---|---|---|---|---|---|---|---|---|---|
| 22816 | Katanning Town Creek | No | No | No Gender Restrictions | Lodged | | *Registered Knowledge Holder names available from DAA | 551363mE 6272240mN Zone 50 [Unreliable] | |

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database




## Legend

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- Other Heritage Places
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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## Search Criteria

3 Heritage Surveys containing 3 Survey Areas in Shapefile - WAMMCO (3)

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| Unreliable | Boundaries captured from submitted maps georeferenced to an accuracy exceeding 250m. |
| Indeterminate | Surveys submitted with insufficient information to allow boundary capture. |

## Survey Report 17057

**Title** Report on the Archaeological Component of the Aboriginal Site Survey of the Perth to Adelaide Optic Fibre Cable Route - Ceduna to Eastern Goldfields, Eastern Goldfields to South Coastal Ans South Coastal to South Western Sections. April 1990.

**Authors** Quartermaine G

**Lead Consultant** Gary Quartermaine

**Survey Types** Archaeological

### Related Survey Areas for Survey Report 17057

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Archaeological | Perth to Adelaide Optic Fibre Cable Route - Ceduna to Eastern Goldfields - WA border to Cocklebiddy, 280km. Eastern Goldfields to South Coastal - Balladonia to Jerramungup with an alternative route through Norseman, 540km plus 400km. And South Coastal to South Western - Ongerup to Collie, 270km. The route follows the railway reserve from Collie to Duranillin, minor roads to Katanning, railway reserve to Nyabing, roads to Jerramungup, the South Coast Highway to Esperance, roads and tracks t... | Unreliable | Field and Desktop |

## Survey Report 27384

**Title** Site Avoidance Survey Report of the Pinwernuing Dam for the Water Corporation, Katanning, Western Australia

**Authors** Lafrentz, Damien

**Lead Consultant**

**Survey Types** Archaeological & Ethnographic

### Related Survey Areas for Survey Report 27384

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Archaeological & Ethnographic | Pinwernying Dam is located in Katanning, approximately 300 km south east of Perth. | Good | Field and Desktop |

## Survey Report 106482

**Title** Report on an ethnographic survey of the proposed Perth to Adelaide optic fibre cable route

**Authors** O'Connor, R

**Lead Consultant** R. O'Connor

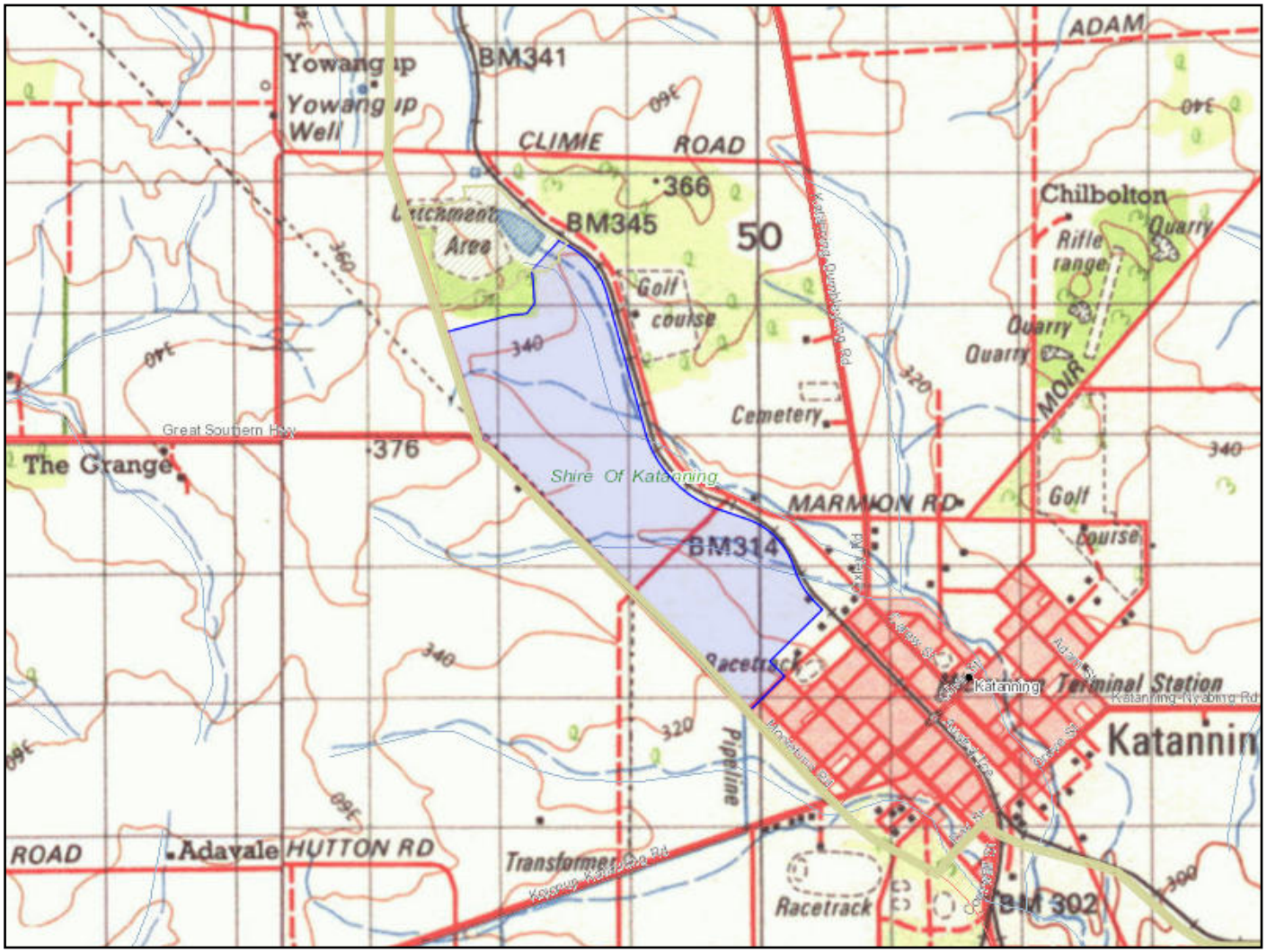
**Survey Types** Ethnographic

### Related Survey Areas for Survey Report 106482

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Ethnographic | Proposed Perth to Adelaide optic fibre cable route.The proposed route follows the railway reserve from Collie to Duramillin, minor roads to Katanning, railway reserve to Nyabing, roads to Jerramungup, the South Coast Highway to Esperance, roads and tracks to Balladonia, and the Eyre Highway to Eucla. The route is located up to 90m from the centreline of these roads and railway lines as shown in Map 1. | Unreliable | Field and Desktop |

# Aboriginal Heritage Inquiry System

Heritage Survey Database




## Legend

### Selected Heritage Surveys

- Heritage Survey
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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## Search Criteria

No Registered Aboriginal Sites in Shapefile - WAMMCO (2)

## Disclaimer

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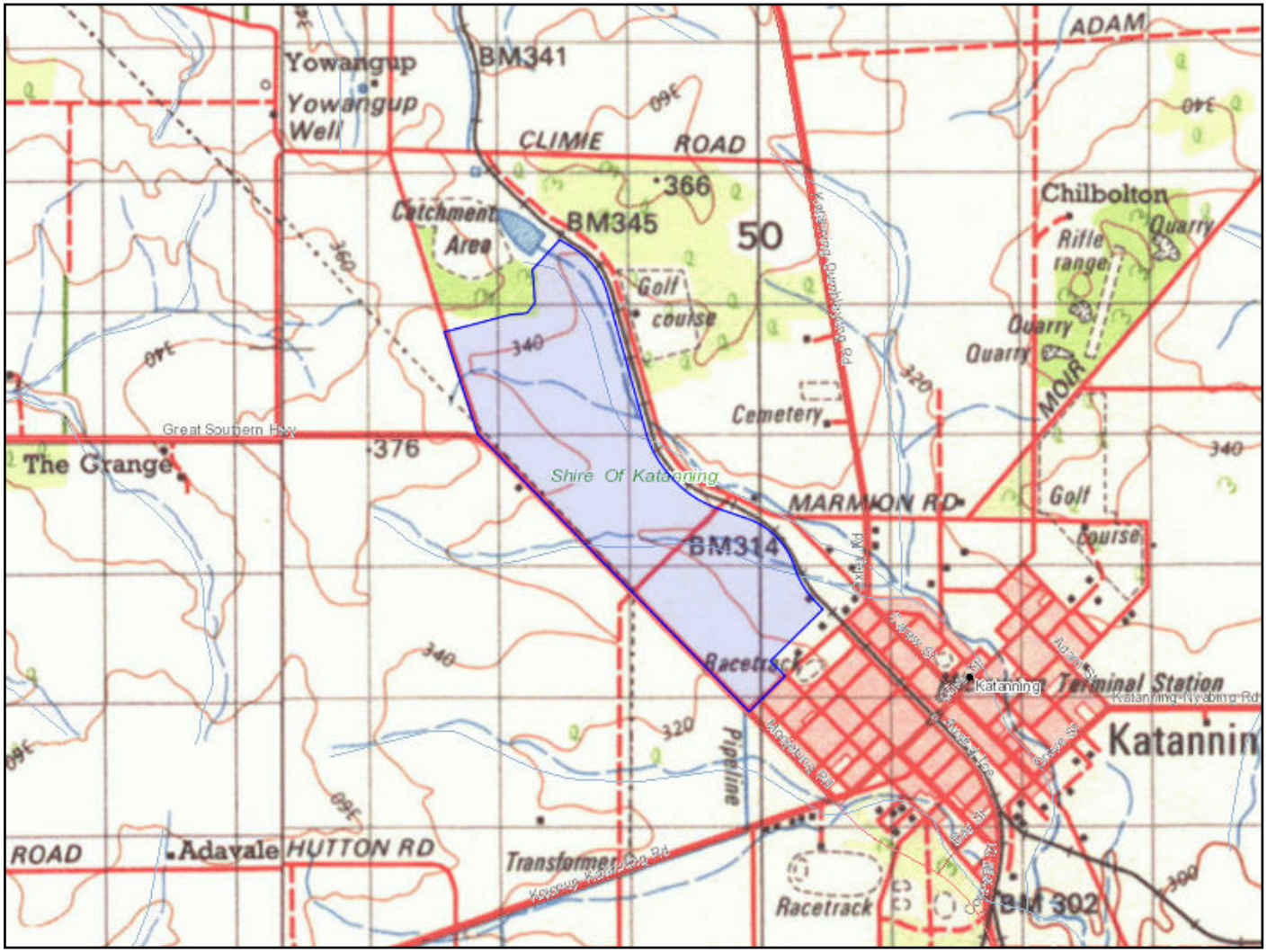
## List of Registered Aboriginal Sites with Map

No Results

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database




## Legend

**Selected Heritage Sites**

- Registered Sites
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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## Search Criteria

1 Other Heritage Places in Shapefile - WAMMCO (5)

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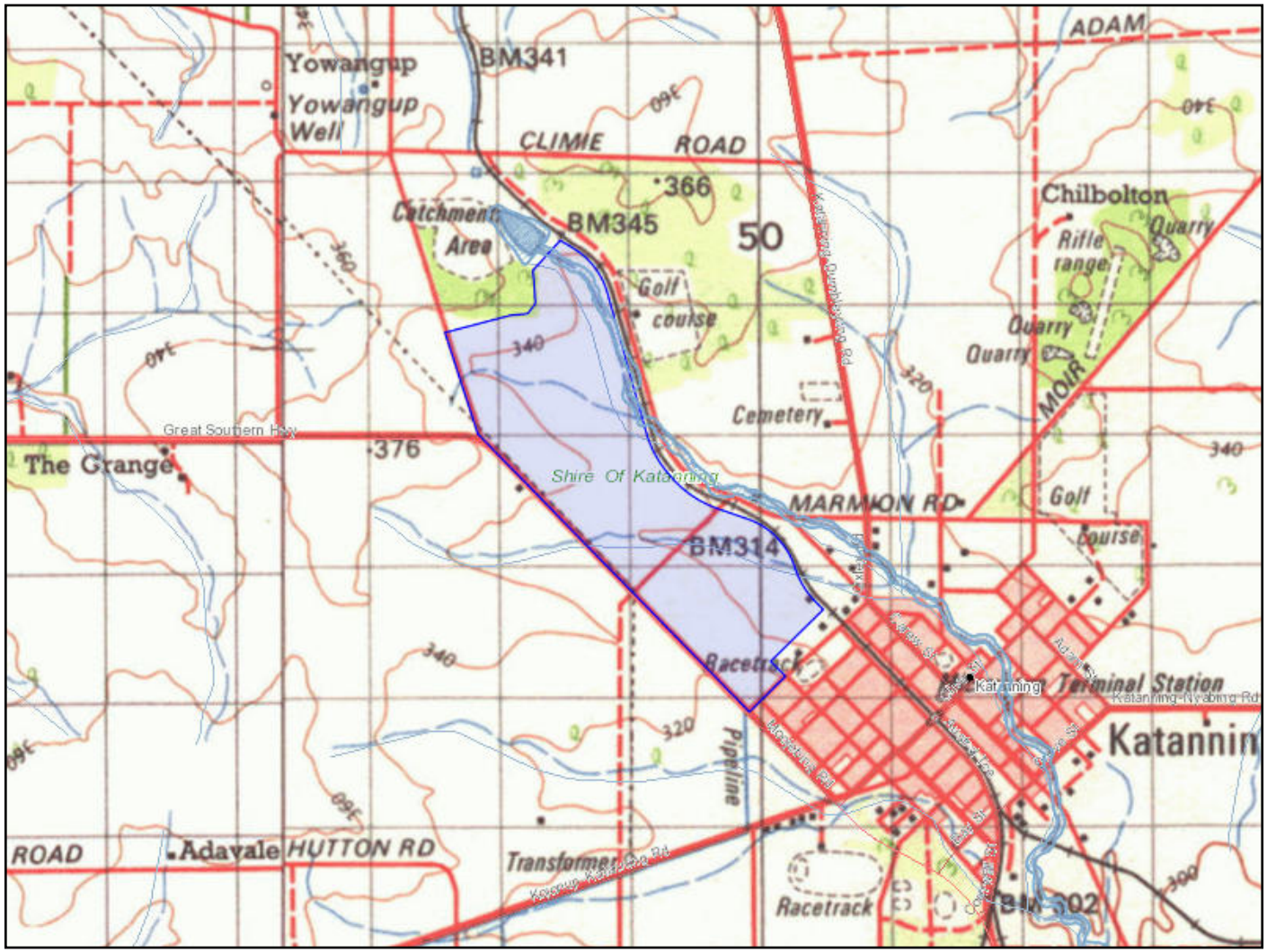
## List of Other Heritage Places with Map

| ID | Place Name | File Restricted | Boundary Restricted | Restrictions | Status | Type | Knowledge Holders | Coordinates | Legacy ID |
|---|---|---|---|---|---|---|---|---|---|
| 22816 | Katanning Town Creek | No | No | No Gender Restrictions | Lodged | | *Registered Knowledge Holder names available from DAA | 551363mE 6272240mN Zone 50 [Unreliable] | |

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database




## Legend

**Selected Heritage Places**

- Other Heritage Places
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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## Search Criteria

3 Heritage Surveys containing 3 Survey Areas in Shapefile - Industrial Land

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| Indeterminate | Surveys submitted with insufficient information to allow boundary capture. |

## Survey Report 106010

| | |
|---|---|
| **Title** | Report of the archaeological survey of Katanning reuse pipeline and emergency storage location, Southwest Australia |
| **Authors** | Greenfield, Paul |
| **Lead Consultant** | Australian Interaction Consultants |
| **Survey Types** | Archaeological |

### Related Survey Areas for Survey Report 106010

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Archaeological | Katanning reuse pipeline and emergency storage location, including the laying of approximately 5 km of a 200mm ID pipeline and the construction and installation of associated pipe works including valves, meters and concrete valve pits. | Indeterminate | Field and Desktop |

## Survey Report 106012

| | |
|---|---|
| **Title** | Site avoidance survey under the Aboriginal Heritage Act (1972) of an effluent reuse pipline and an emergency overflow pond at Katanning W A : volume 1 of 2 - the Wom-Ber People |
| **Authors** | Parker, Ronald T |
| **Lead Consultant** | Australian Interaction Consultants |
| **Survey Types** | Ethnographic |

### Related Survey Areas for Survey Report 106012

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Ethnographic | An effluent reuse pipline and an emergency overflow pond at Katanning as shown in map 3. | Good | Field and Desktop |

## Survey Report 106986

**Title** Addendum to Site avoidance survey under the Aboriginal Heritage Act (1972) of an effluent reuse pipline and an emergency overflow pond at Katanning W A [January 2002.]

**Authors** Parker, Ronald T

**Lead Consultant** Australian Interaction Consultants

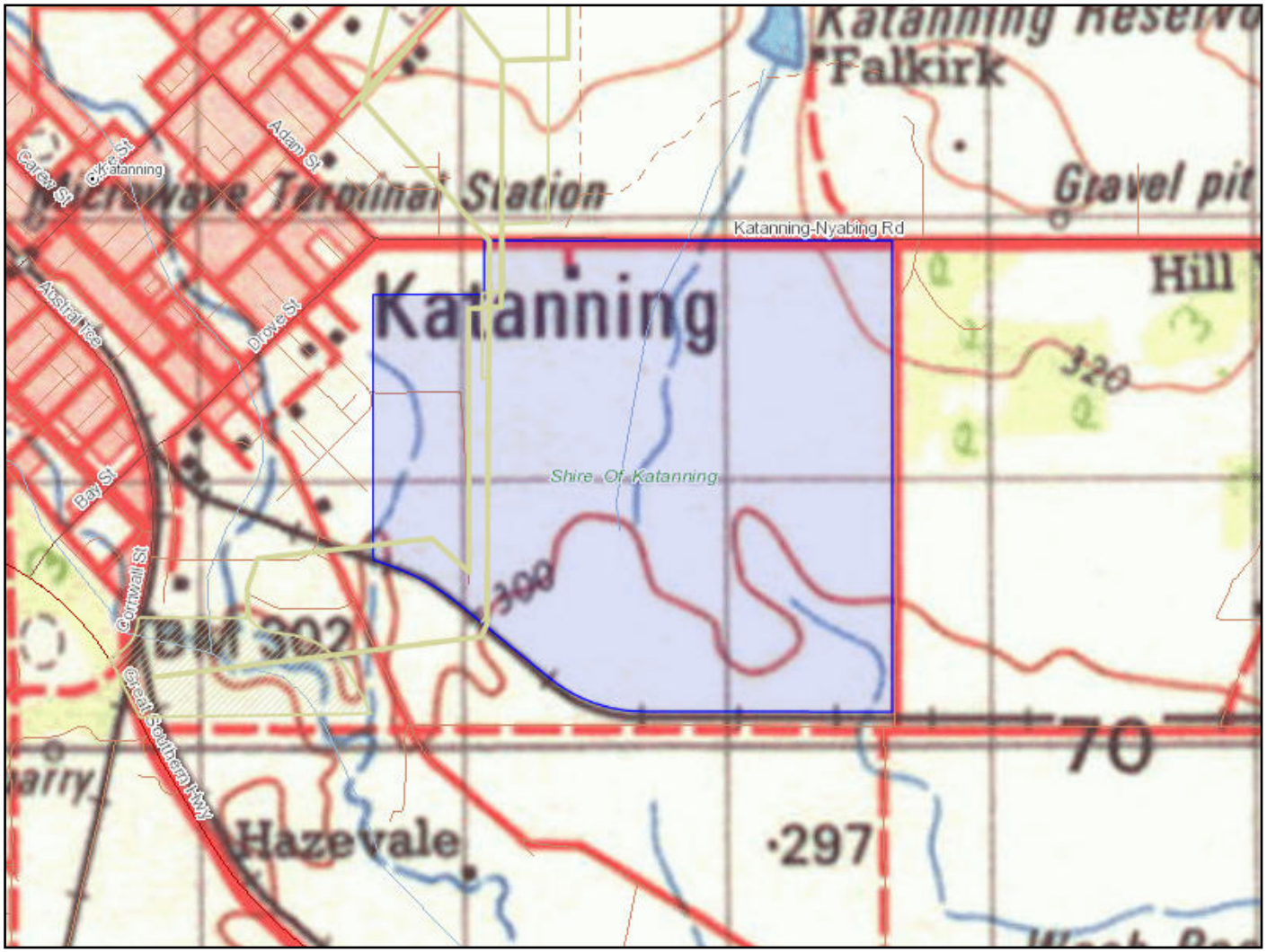
**Survey Types** Ethnographic

### Related Survey Areas for Survey Report 106986

| Area Number | Survey Type | Area Description | Spatial Accuracy | Field / Desktop |
|---|---|---|---|---|
| 1 | Ethnographic | The survey area comprises an amended pipeline route at Katanning. The original project area that had been previously surveyed was approximately 5km long and 200mm wide, however the extent of the survey area in relation to the amended route is not known, only that the area of concern runs east of the Katanning Clay Target Club. The survey area location and extent are therefore unreliable. See map, p.6 | Unreliable | Field and Desktop |

# Aboriginal Heritage Inquiry System

Heritage Survey Database




## Legend

**Selected Heritage Surveys**

- Heritage Survey
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## Search Criteria

1 Registered Aboriginal Sites in Shapefile - Industrial Land

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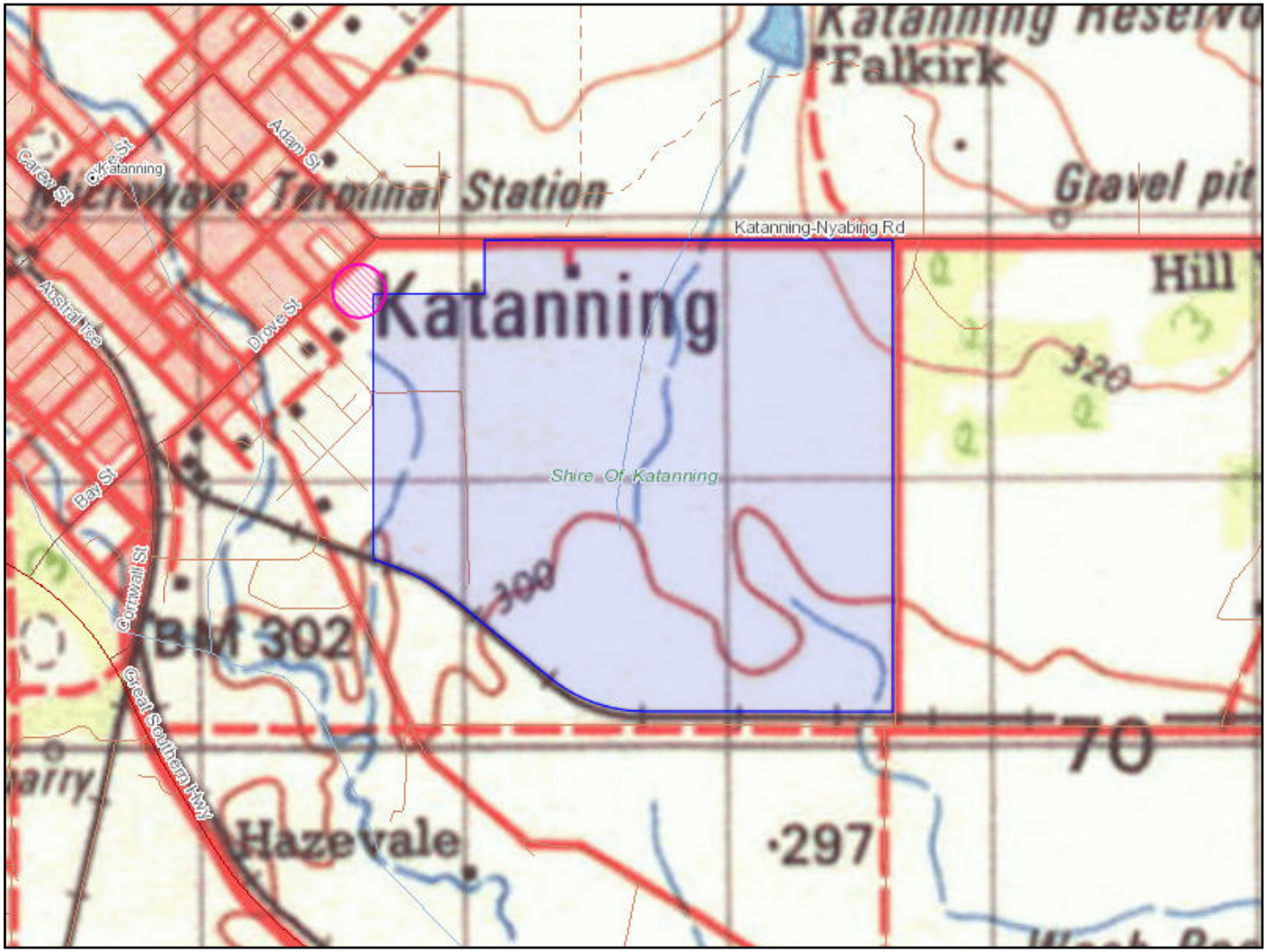
## List of Registered Aboriginal Sites with Map

| Site ID | Site Name | File Restricted | Boundary Restricted | Restrictions | Status | Site Type | Knowledge Holders | Coordinates | Legacy ID |
|---|---|---|---|---|---|---|---|---|---|
| 4435 | KATANNING CAMPING GROUNDS. | No | No | No Gender Restrictions | Registered Site | | *Registered Knowledge Holder names available from DAA | 552760mE 6271888mN Zone 50 [Reliable] | S02817 |

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database

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## Search Criteria

No Other Heritage Places in Shapefile - Industrial Land (2)

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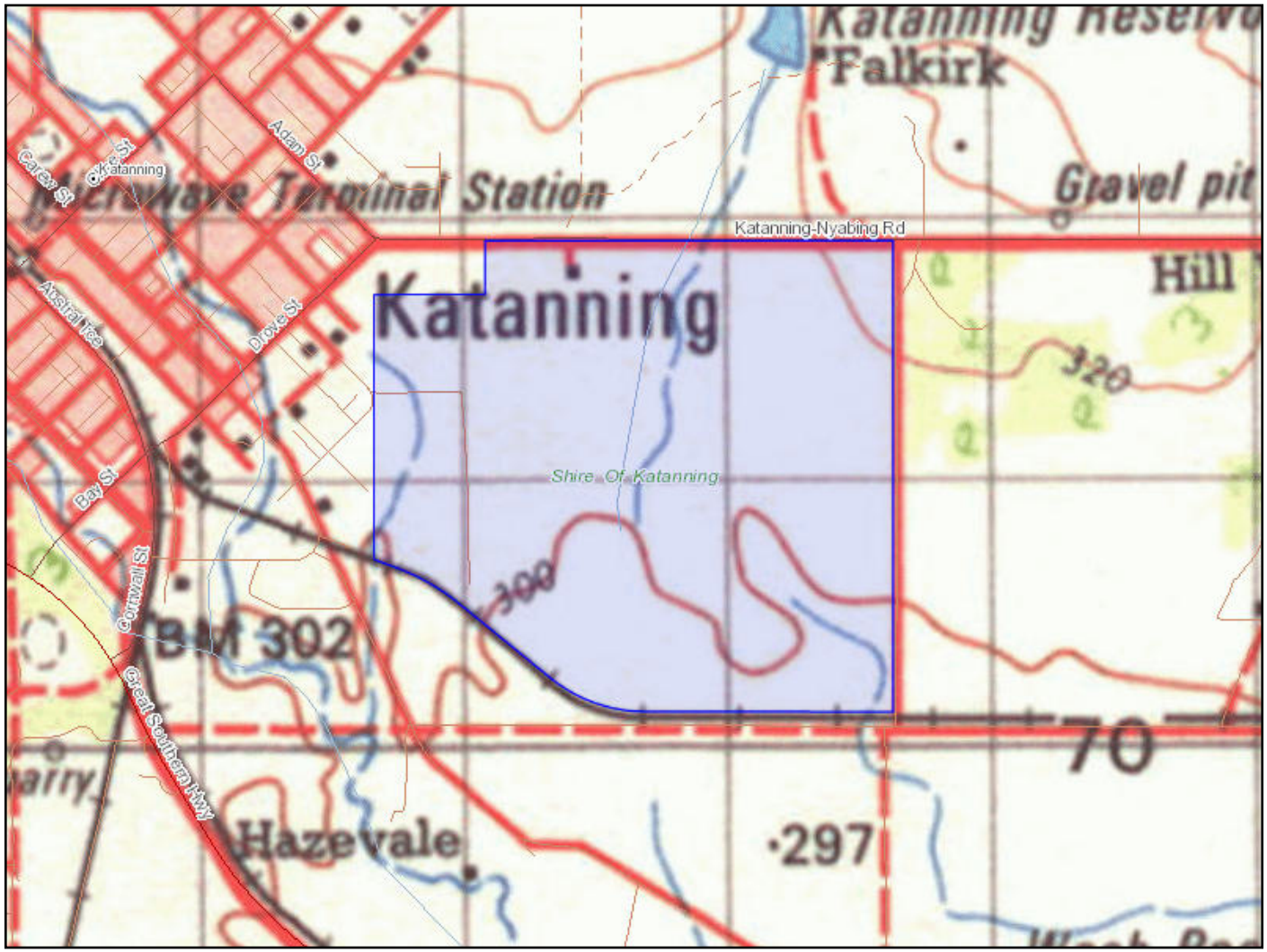
Aboriginal Sites Database

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## Search Criteria

No Survey Areas in Shapefile - DIA4

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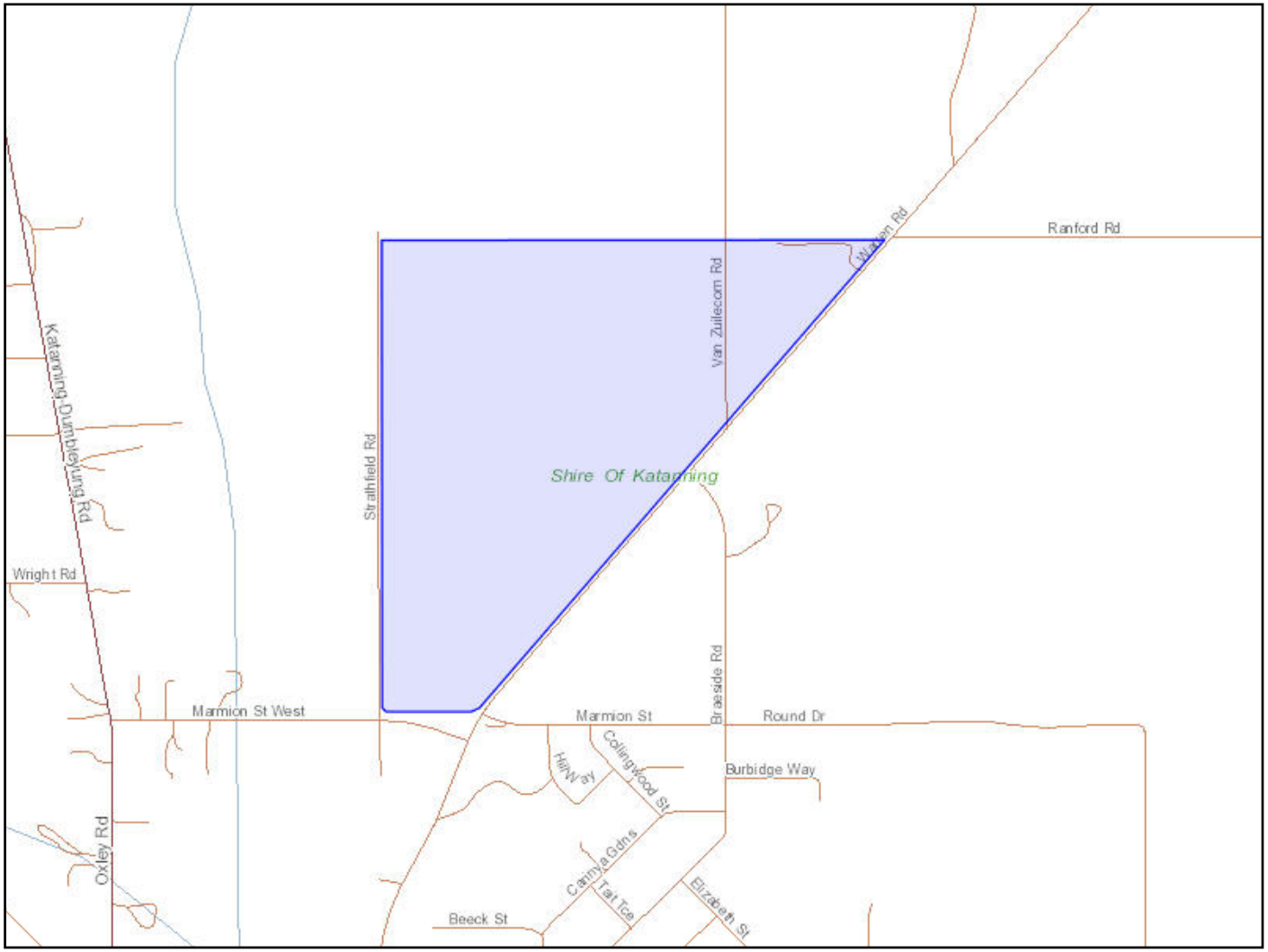


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**Selected Heritage Surveys**

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## Search Criteria

No Registered Aboriginal Sites in Shapefile - DIA4 (2)

## Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Aboriginal Affairs by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at HeritageEnquiries@daa.wa.gov.au and we will make every effort to rectify it as soon as possible.

## Copyright

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## Coordinate Accuracy

Accuracy is shown as a code in brackets following the coordinates.

**Terminology (NB that some terminology has varied over the life of the legislation)**

**Place ID/Site ID:** This a unique ID assigned by the Department of Aboriginal Affairs to the place

**Status:**

- **Registered Site**: The place has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*
- **Other Heritage Place which includes:**
  - **Stored Data / Not a Site:** The place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972*
  - **Lodged:** Information has been received in relation to the place, but an assessment has not been completed at this stage to determine if it meets Section 5 of the *Aboriginal Heritage Act 1972*

**Access and Restrictions:**

- **File Restricted = No:** Availability of information (other than boundary) that the Department of Aboriginal Affairs holds in relation to the place is not restricted in any way.
- **File Restricted = Yes:** Some of the information that the Department of Aboriginal Affairs holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Aboriginal Affairs receives written approval from the informants who provided the information. Download the Request to Access Restricted Information letter and form.
- **Boundary Restricted = No:** place location is shown as accurately as the information lodged with the Registrar allows.
- **Boundary Restricted = Yes:** To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km²) provides a general indication of where the place is located. If you are a landowner and wish to find out more about the exact location of the place, please contact DAA.
- **Restrictions:**
  - **No Restrictions:** Anyone can view the information.
  - **Male Access Only:** Only males can view restricted information.
  - **Female Access Only:** Only females can view restricted information

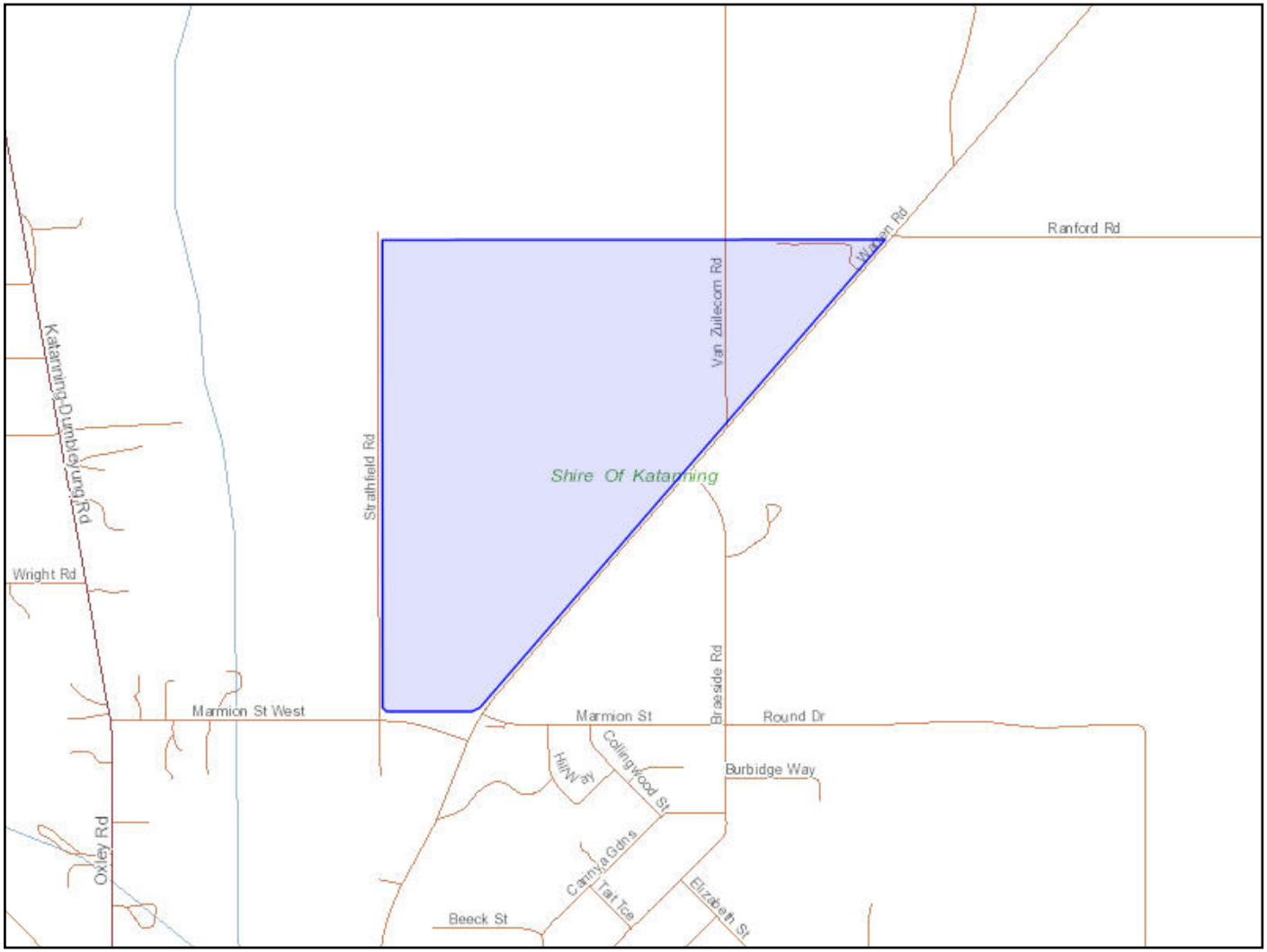
**Legacy ID:** This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.

## List of Registered Aboriginal Sites with Map

No Results

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database




## Legend

**Selected Heritage Sites**

- Registered Sites
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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## Search Criteria

No Other Heritage Places in Shapefile - DIA4 (2)

## Disclaimer

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  - **Male Access Only:** Only males can view restricted information.
  - **Female Access Only:** Only females can view restricted information

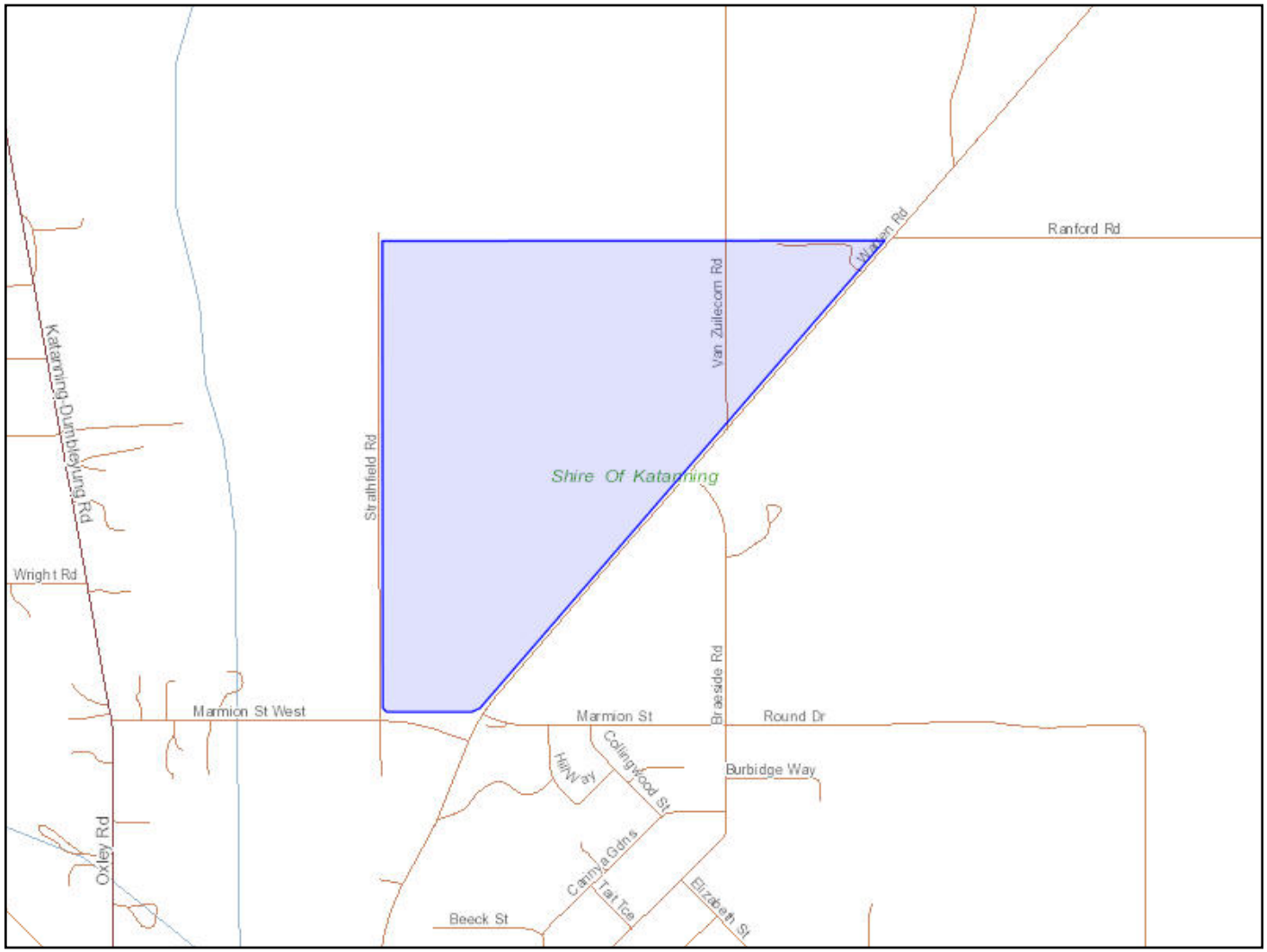
**Legacy ID:** This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.

## List of Other Heritage Places with Map

No Results

# Aboriginal Heritage Inquiry System

Aboriginal Sites Database




## Legend

**Selected Heritage Places**

- Other Heritage Places
- Aboriginal Community Occupied
- Aboriginal Community Unoccupied
- Town
- Search Area

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# Appendix F: Aurora Environmental Report

**Albany**
2A Nakina Street
Albany WA 6330
T (08) 6819 5000
F (08) 9841 3570

29 January 2014

Dean Taylor
Shire of Katanning
16-24 Austral Terrace
Katanning, WA 6317

Dear Dean,

**RE: Uncontrolled Fill Management at Lot 1 Synnott Avenue, Katanning**

This letter provides general guidance associated with the proposed capping of uncontrolled fill which contains asbestos-containing material (ACM) at Lot 1 Synnott Avenue, Katanning (the site, as shown on Figure 1). The Shire propose to undertake capping of uncontrolled fill at the site utilising clays which have been excavated in association with development of an evaporation basin at Lot 1 Warren Avenue, on the southern margin of the site. The capping will manage an ongoing potential risk of asbestos exposure to persons who transit the site (which is currently vacant), and is in general consistent with principles outlined in Department of Health guidance on management of sites with widespread asbestos contamination.

**Background**

Previous owners of the site historically accepted uncontrolled fill at the site, seeking to increase levels. The fill which was received at the site comprised mostly clay, silt, and sand but also included various other materials, including concrete, bricks, timber, metal, tiles, and asbestos-cement sheeting; the fill likely derived largely from building demolition sites. It is understood that several years ago the fill at the site was reworked, separating out large items (such as items of large concrete, timber, metal, and tyres) for offsite disposal. Most of the oversize material was taken offsite, although three small stockpiles of it remain (Figure 2). The remaining fill was apparently then mechanically tilled and re-laid at the site, except for several stockpiles of material which are understood to represent material that was excavated for removal of large items and then re-laying, but which were abandoned when the owner suspended the works.

The fill material comprises a matrix of sand, silt, and clay with varying amounts of fragments of concrete, metal, plastic (i.e. PVC), ceramic and terra-cotta tiles, asbestos-cement sheeting, as well as laterite and blue metal gravel. This material is present at surface across the north and east of the site (as indicated on Figure 2), as well as in stockpiles (also indicated on Figure 2). There is a change in levels along the eastern margin of the site, as the eastern edge of fill declines to the natural ground level in the adjacent road reserve area. Similarly, there is a change in levels extending approximately north to south within the site where the fill material ends (indicated on Figure 2). Typically, there is a change of approximately 0.5m in elevation at the edge of the fill. The approximate area of fill is indicated on Figure 2, as determined by observations and GPS coordinates collected during site visits in December 2013. It appears to extend into the road reserve to the east.

The low overgrown stockpile identified as SP1 on Figure 2 is within the road reserve east of the site, indicating that fill material extends slightly beyond the site boundary in this direction. Other soil stockpiles which contain fill material within the site are SP2, SP3, SP4, SP5, SP7, SP9, and SP10 (Figure 2). A low and elongate soil stockpile present along the western edge of fill (SP6 on Figure 2) appears to comprise topsoil which is understood to have been intended to be laid as a top-dressing across the site following the reworking of fill. Two low stockpiles identified as SP8 on Figure 2 comprise large items of concrete, metal, and timber which appears to have been separated from the fill, likely intended for offsite disposal.

**Contamination Issues**

Due to the presence of uncontrolled fill of unknown origin, the site is understood to have been identified as "Possibly contaminated – investigation required" under the *Contaminated Sites Act 2003*. Potential contaminants associated with uncontrolled fill include pesticides, hydrocarbons, metals, and asbestos. The presence of asbestos containing materials has been confirmed visually, as well as through a limited sampling program. No sampling and analysis has been undertaken to assess the presence and/or distribution of other contaminants; although no visual evidence of gross impacts by other potential contaminants was noted during the site inspection. The results of the limited asbestos sampling program (comprising samples from stockpiles as KS-SP-1 to KS-SP-5 and ground surface samples as KS-GS-1 to KS-GS-6 on Figure 2) did not identify reportable concentrations of asbestos fibres in any sample, although ACM was identified in samples KS-GS-3 and KS-GS-5. A copy of the laboratory analytical certificate for the samples analysed is included as Attachment 1.

The presence of potential contamination at the site has been discussed with the Department of Environment Regulation (DER, formerly the Department of Environment and Conservation, DEC), as the DER are responsible for management of site classifications under the *Contaminated Sites Act*. Representatives from the DER visited the site in December 2013. Typically, sites with potential contamination issues are investigated in consultation with guidance as set out in the Contaminated Sites Management Series (comprising documents by DER and predecessor agencies including DEC). Guidelines for investigation and management of asbestos contamination are set out by the Department of Health (DoH) in *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (2009). DoH representatives were unable to visit the site when invited to attend with DER in December 2013.

In considering the management of contamination issues at the site, a conceptual site model is required in order to consider potential pathways between contaminants and receptors. The site is currently vacant, but will become an area of public open space with a parking area for persons accessing the evaporation basin and landscaped areas being constructed at Lot 1 Warren Avenue. Accordingly, the primary potential receptors of contamination are persons transiting the site (through direct contact with uncontrolled fill or exposure to dust), as well as surrounding residents (through dust exposure). The natural shallow soil profile appears to be dominated by low-permeability pale clays, reducing the opportunity for contaminants to infiltrate to local groundwater. Furthermore, local groundwater is generally saline and has no identified beneficial use.

The Shire propose to cap the uncontrolled fill at the site with 0.5m of natural clays derived from excavations at Lot 1 Warren Avenue. This is to be undertaken during February 2014, in order to utilise machinery which has been mobilised to Lot 1 Warren Avenue and will be available at that

time. This proposed *in situ* management approach would disrupt the pathway between asbestos contamination and potential receptors. This approach is consistent with DoH (2009) guidelines for asbestos management. While the presence and distribution of other potential contaminants at the site has not been assessed, discussions with DER indicate that the proposed capping would likely be considered to be an appropriate means of management of other potential contaminants as well.

It is, however, anticipated that the site classification will remain classified as "Possibly contaminated – investigation required" until additional information can be provided to regulators about the presence and distribution of other contaminants. This would likely require (as a minimum) the installation and monitoring of three groundwater monitoring wells in order to assess groundwater quality upgradient and downgradient of the site. The site would likely not be able to be reclassified as "Remediated for restricted use", or to be subdivided and assigned a more sensitive land use (such as residential) without further assessment of the contamination potential of the fill.

**Proposed Management via Capping**

*In situ* management comprises the isolation of contamination using cover material (as clean fill and/or geotextile barriers). The DoH (2009) asbestos guidelines indicate that *in situ* management is appropriate in situations where asbestos contamination covers a large area, the distribution of asbestos is difficult to determine, the proponent does not wish to characterise the asbestos contamination, and the requirement for a memorial on title is not a concern; this is consistent with the conditions at the site. The DoH (2009) guidelines indicate that nominally, 1m of clean fill is expected for public open space, and 0.5m for all other uses. A greater depth is nominated for public open space because of a potential for trenching to install services and irrigation, as well as there being a potential for lower awareness of contamination. A memorial on title is placed on sites where there is less than 3m of clean fill cover over asbestos contamination in order to document this material for future landowners. It is also expected that vegetative cover be planted over the clean fill, and an ongoing management plan be developed for long-term site management.

Aurora consider that the placement of a 0.5m capping layer of the clean pale clay from 1 Warren Avenue across areas of fill, followed by placement of 0.15m topsoil layer and planting of a grass cover could be appropriate at the site. The reduction of the capping layer thickness from 1m to 0.5m is considered possible without increasing risk of future ACM exposure due to the increased difficulty of excavating/penetrating compacted clay material as compared to sands, reducing potential for casual breaches of the capping layer. Additionally, it is not anticipated that there is likely to be expansion of amenity within the POS beyond development of a carpark, and additional service installation requirements are considered unlikely based on advice from Shire personnel. Furthermore, a responsible body such as the Shire is likely to be able to implement procedures or install signage to ensure that no subsurface works take place at the site without reference to the ongoing management plan.

In regards to the capping process, minimisation of dust generation from the fill material at the site needs to be considered during site works. Some areas of the site currently have a vegetated cover and will not require disturbance prior to placement of capping material, so dust generation is unlikely. However, stockpiled fill material at the site will require levelling, and fill material which extends beyond the eastern site boundary should be consolidated within the site. During previous site visits, it has been identified that some stockpiled material is richer in sand and organic materials,

and other material has a more clay-rich matrix. Wetting down the stockpiles and material along the eastern boundary should be undertaken in order to minimise dust during the required earthworks; use of a wetting agent may assist water penetrating the material. Water should also be used as a dust suppressant during levelling works. If dust barriers will not be utilised at the site, works should be undertaken during low-wind conditions to minimise the opportunity for dust to escape the site and potentially impact on residences to the north and east of the site. Capping should extend at least 0.5m laterally beyond the fill material at full thickness, and then can taper to integrate with the natural landform.

**Ongoing Site Management**

An ongoing site management plan should be finalised after capping is complete and the thickness and extent of capping are documented. However, general information which should be made available by the site owners/managers for provision to persons undertaking any earthworks at the site is summarised in Attachment 2.

**Closing**

I would be happy to further discuss the above information and can be reached on 6819 5000.

For and on behalf of Aurora Environmental

Dr Susie Brown
Associate Environmental Scientist

Attachments:

| | |
|---|---|
| Figure 1 | Regional Location |
| Figure 2 | Site Features |
| Attachment 1 | Laboratory Certificate |
| Attachment 2 | Site Asbestos Information |

**DISCLAIMER**

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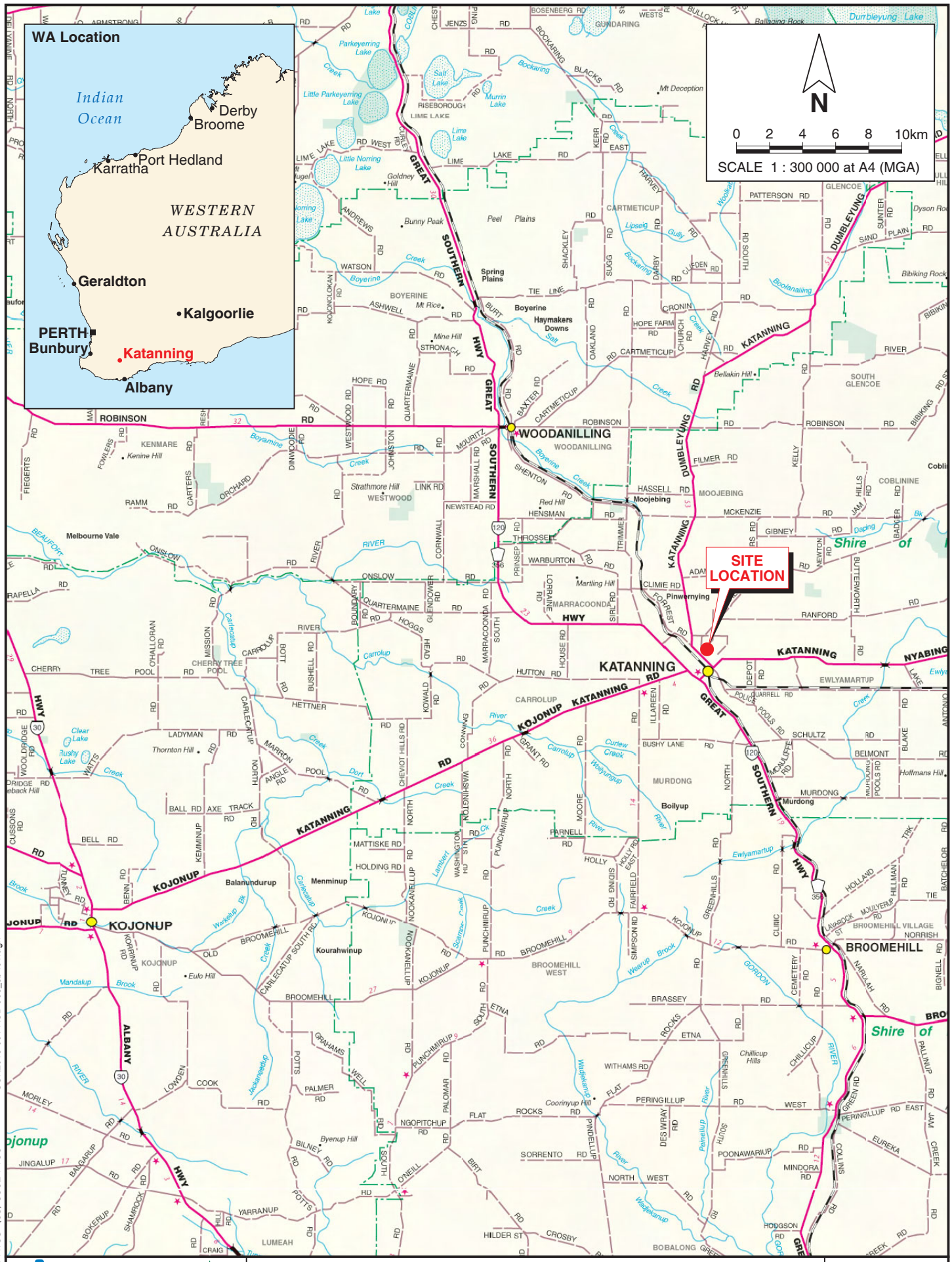



SOK2013-001-ASB-003_sb-f01.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136

Aurora environmental

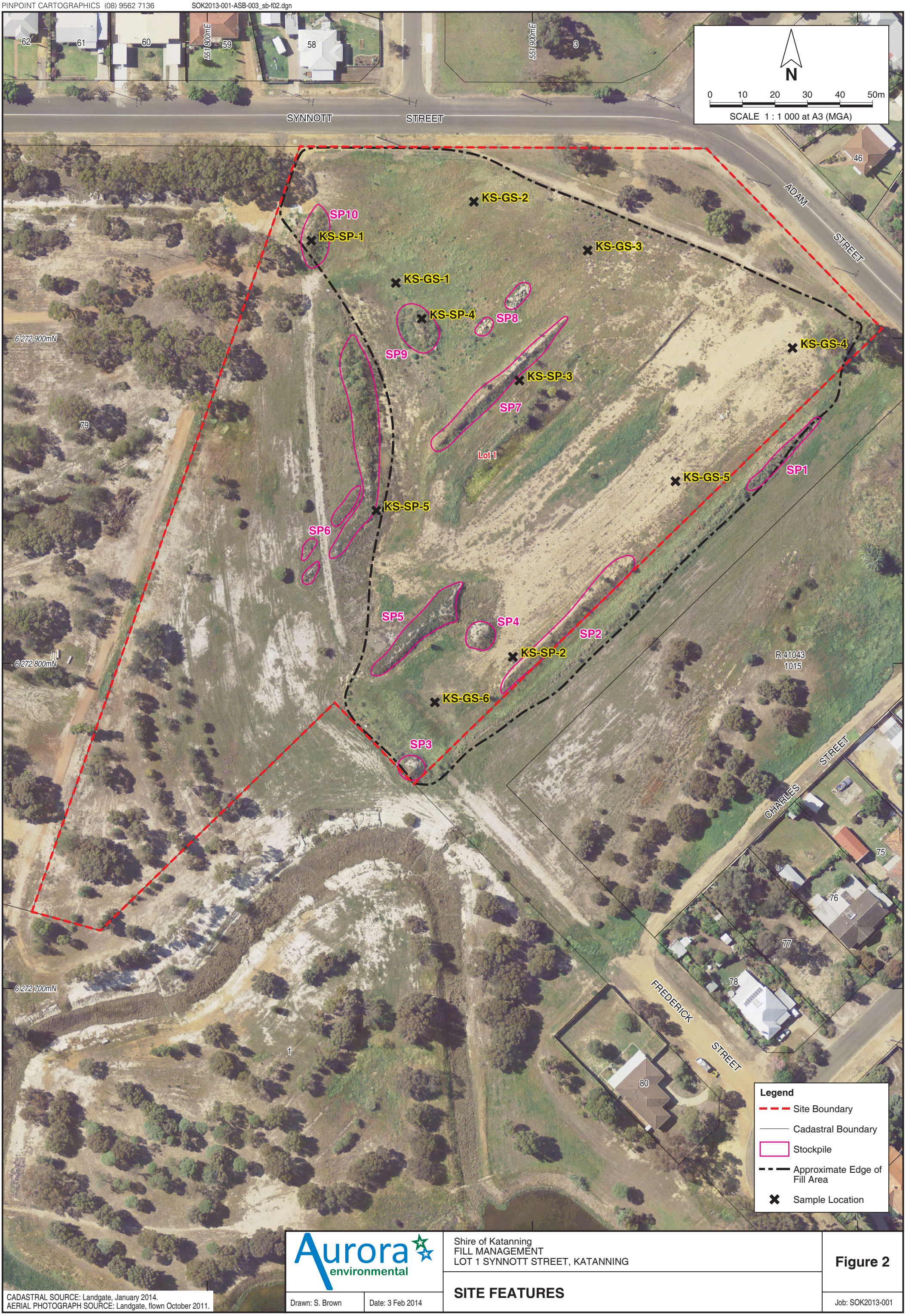
Shire of Katanning
FILL MANAGEMENT
LOT 1 SYNNOTT STREET, KATANNING

**Figure 1**

## REGIONAL LOCATION

Drawn: S. Brown | Date: 23 Jan 2014 | Job: SOK2013-001

PINPOINT CARTOGRAPHICS (08) 9562 7136 SOK2013-001-ASB-003_sb-f02.dgn




CADASTRAL SOURCE: Landgate, January 2014.
AERIAL PHOTOGRAPH SOURCE: Landgate, flown October 2011.

Aurora environmental

Shire of Katanning
FILL MANAGEMENT
LOT 1 SYNNOTT STREET, KATANNING

**SITE FEATURES**

**Figure 2**

Drawn: S. Brown | Date: 3 Feb 2014 | Job: SOK2013-001

Attachment 1

Environmental and Analytical Laboratory

# LABORATORY REPORT

**Job Number:** 13-9420
**Revision:** 00
**Date:** 30 December 2013

**ADDRESS:** **Aurora Environmental Albany**
2a Nakina Street
Albany WA 6330

**ATTENTION:** Susie Brown

**DATE RECEIVED:** 23/12/2013

**YOUR REFERENCE:** Shire of Katanning

**PURCHASE ORDER:** Shire of Katanning

**APPROVALS:**

Adam Green
Approved Identifier

Adam Green
Approved Signatory

NATA
WORLD RECOGNISED ACCREDITATION
This document is issued in accordance with NATA's accreditation requirements
Accreditation No. 2377

**SAMPLING COMMENTS:**

Samples are analysed on an "as received" basis

**METHOD:**

ASBID — Qualitative determination of fibre type in bulk samples by Stereo Microscope Examination and Polarised Light Microscopy, including Dispersion Staining, using ARL in-house method ASBID.

| Sample Number | Sample Description | Sample Type | Approximate Sample Weight (g) | Asbestos in Bulk/Soil Sample |
|---|---|---|---|---|
| 13-9420-1 | KS-GS-1 | Soil | Total ~970, Subsample ~280 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-2 | KS-GS-2 | Soil | Total ~860, Subsample ~530 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-3 | KS-GS-3 | Soil | Total ~1100, Subsample ~570 | Chrysotile Asbestos Detected<br>5 x cement fragments <10mm x 10mm<br>Organic Fibres Detected |
| 13-9420-4 | KS-GS-4 | Soil | Total ~1400, Subsample ~440 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-5 | KS-GS-5 | Soil | Total ~1300, Subsample ~640 | Chrysotile Asbestos Detected<br>Cement fragment ~ 35mm x 20mm<br>Organic Fibres Detected |



Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Environmental and Analytical Laboratory

| Sample Number | Sample Description | Sample Type | Approximate Sample Weight (g) | Asbestos in Bulk/Soil Sample |
|---|---|---|---|---|
| 13-9420-6 | KS-GS-6 | Soil | Total ~1100, Subsample ~470 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-7 | KS-SP-1 | Soil | Total ~1000, Subsample ~410 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-8 | KS-SP-2 | Soil | Total ~1100, Subsample ~710 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-9 | KS-SP-3 | Soil | Total ~1100, Subsample ~530 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-10 | KS-SP-4 | Soil | Total ~1300, Subsample ~290 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |
| 13-9420-11 | KS-SP-5 | Soil | Total ~790, Subsample ~570 | No Asbestos Detected at Reporting Limit of 0.1g/kg<br>Organic Fibres Detected |

**REPORT COMMENTS:**

This report is consistent with the analytical procedures in the Western Australia "Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009".

All soil samples received were sieved and the greater than 2mm fraction analysed, and the less than 2mm fraction sub-sampled and analysed.



**Analytical Reference Laboratory (WA) Pty. Ltd.**
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

# Attachment 2

## General Information Regarding the Presence of Asbestos Materials in Soil at Depth at Lot 1 Synnott Avenue, Katanning

This information sheet provides information for Lot 1 Synnott Avenue, Katanning (the site) in relation to the presence of residual asbestos which is managed in accordance with the *Contaminated Sites Act 2003* (CS Act).

**Background**

Historically, uncontrolled fill of unknown origin was accepted at the site. The source and nature of the fill is unknown, although it is known that it included asbestos-cement building materials; other potential contaminants may be present. The site has subsequently been redeveloped for use as public open space, including a roadway and parking area which will provide access to the evaporation basin at Lot 1 Warren Avenue, south of the site.

**Asbestos Health Effects**

Asbestos is a naturally-occurring mineral which was widely used in building products between the 1940s and the 1980s. Such materials included cement sheeting and fencing, drainage pipes, roofing, guttering and flexible building boards. While bound in a matrix, asbestos does not pose a health risk; however, the degradation (via aging, weathering or mechanical action) of asbestos-containing materials can allow asbestos fibres to be released where they can pose a health risk through inhalation. Inhalation effects can include asbestosis, lung cancer and mesothelioma. While these effects generally only result from exposure over a long period of time, the recognition of the risks associated with asbestos fibres led to a complete ban on asbestos use in Australia in 2003.

**Site Management**

Due to the presence of asbestos-cement building materials in fill at the site, there is considered to be some risk of persons exposed to the fill being exposed to asbestos. In order to reduce the risk of persons utilising the site being exposed to asbestos, management has been undertaken to minimise opportunities for exposure to the asbestos materials. In consultation with Department of Health (DoH) guidance in *Guidelines for the Assessment, Remediation and Management of Asbestos-contaminated Sites in Western Australia* (DoH, 2009) the area of the site where fill is present has been capped using a 0.5m layer of clean natural soils, topped with approximately 0.15m of topsoil for growing a grass cover.

A memorial will be placed on the site title in order to ensure that the presence of the asbestos-containing fill at depth remains documented into the future. This information sheet is to form part of a site management plan in regard to the asbestos-containing fill, to assist persons considering undertaking earthworks at the site in understanding potential risks associated with soil disturbances.

**On-going Management**

Wherever possible, disturbance of the capping layer should be avoided in order to minimise the opportunity to provide access to the underlying asbestos-containing fill. Any contractors engaged to undertake earthworks at the site need to be made aware of the location and thickness of the capping layer and the potential occurrence of asbestos below it. If the capping layer requires disturbance, excavated material is to be reinstated appropriately. If earthworks result in penetration

of the 0.5m cap of clean fill, then measures to reduce personnel exposure to asbestos are required, such as dust management measures, and the use of dust masks (e.g. class P1 or P2 disposable respirator), gloves, and disposable coveralls.

Any soil excavated from below the clean fill horizon must be treated as contaminated by asbestos, and not mixed with the clean fill. It should be separately stockpiled in a controlled fashion for offsite disposal. This may involve placement in a dedicated bin, or containment in heavy-duty plastic. Any separate asbestos fragments found should be placed in heavy-duty plastic bags or wrapped and sealed in plastic. In both cases the excavated material should be disposed of to a facility licensed to accept asbestos waste in accordance with the DER guidelines. Note that not all landfill facilities are able to accept asbestos. If additional information is required in regards to the handling and disposal of asbestos waste materials, consult appropriate guidelines or contact the environmental health officer at the Shire of Katanning for advice.

**Further Information**

Further information about the nature of fill at the site, and the capping layer of clean fill installed to manage potential fill exposure can be requested from the Shire of Katanning. Advice concerning the possible health risks of asbestos may be obtained from the WA Department of Health, as well as links to fact sheets and guidance on asbestos management (via www.public.health.wa.gov.au).

# Appendix G: Site inspection photographs

**O'Callaghan:** Northern/north-western portion of the site **Orientation:** North-east

**O'Callaghan:** Former race track. **Orientation:** South-west

**O'Callaghan:** Enterance to the former race track. **Oreintation:** North

**O'Callaghan:** Central portion within the former race track**Orientation:** South

**O'Callaghan:** Vegetation to the north of the former race track. **Orientation:** East

**O'Callaghan:** Southern portion of the former race track. **Orientation:** West

**Piesse Park:** Northern portion of the site, north of Synnott Ave. **Orientation:** North-east

**Piesse Park:** Northern portion of the site, bowls club. **Orientation:** West

**Piesse Park:** Western portion of the site. **Oreintation:** North-east

**Piesse Park:** Southern portion of the site, adjacent to residential properties. **Orientation:** East

**Piesse Park:** Man-made lake within southern portion of the site. **Orientation:** East

**Piesse Park:** Man-made lake within southern portion of the site. **Orientation:** North-east

**Piesse Park:** Piesse Dam adjoining to the man-made lake. **Orientation:** North-west

**Piesse Park:** Katanning Creek within the south-western portion of the site. **Orientation:** West

**Piesse Park:** Katanning Creek within the south-western portion of the site and wetland in the background. **Ortientation:** North-west

**Piesse Park:** Eastern portion of the Site. **Orientation:** North

**Piesse Park:** North-eastern poriton of the site former landfill. **Orientation:** North-east

**Piesse Park:** North-eastern poriton of the site former landfill. **Orientation:** North-east

**WAMMCO:** Southern portion of the site. **Orientation:** North-east

**WAMMCO:** Southern portion of the site, south of Henry Street. **Orientation:** North

**WAMMCO:** Southern portion of the site, south of Henry Street. **Orientation:** South

**WAMMCO:** Southern portion of the site, south of Henry Street **Oreintation:** South-west

**WAMMCO:** Harper Street disecting the southern portion of the site: **Orientation:** East

**WAMMCO:** South of Harper Street. **Orientation:** South-east

**WAMMCO:** Creek running through the site, near Harper Street. **Orientation:** South

**WAMMCO:** Culvert to the east of the site, with surface ponding. **Orientation:** West

**WAMMCO:** Sheep grazing within the western portion of the site. **Orientation:** East

**WAMMCO:** Enterance to the WAMCCO site, centrally to the west. **Orientation:** East

**Industrial Expansion:** Northern/north-western portion of the site **Orientation:** South

**Industrial Expansion:** Farm within the northern portion of the site. **Orientation:** South

**Industrial Expansion:** North-eastern portion of the site. **Oreintation:** South-east

**Industrial Expansion:** Clay lined ponds within the north-eastern portion of the site. **Orientation:** South-east

**Industrial Expansion:** Water tanks with undercover sales yard in background. **Orientation:** East

**Industrial Expansion:** Eastern portion of the site, south of the sales yard **Orientation:** West

**Industrial Expansion:** Eastern portion of the site, south of the sales yard **Orientation:** West

**Industrial Expansion:** Western portion of the site. **Orientation:** East

**DIA4:** Southern portion of the site. **Orientation:** North

**DIA4:** Central portion of the site, wheat plantations and residentail property entrance. **Orientation:** West

**DIA4:** Canola flowers within central portion of the site. **Oreintation:** West

**DIA4:** Residential property within north-eastern portion of the site. **Orientation:** North

**DIA4:** Sheep grazing paddocks, residentail property in background. **Orientation:** East

**DIA4:** Intert waste stockpile located

**DIA4:** Residential property within south-western portion of the site. **Orientation:** south-east

**DIA4:** Tree plantation adjacent to residential property within south-western portion of the site. **Orientation:** East

# Piesse Lake Structure Plan

## DRAFT FOR ADVERTISING

## APRIL 2016

## prepared for the Shire of Katanning

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# Piesse Lake Structure Plan (KATA/2016/1)

Prepared by:
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**Document History**

| Date | Document Name | Document Manager | Summary of Document Revision | Client Delivered |
|---|---|---|---|---|
| Oct-15 | 969-03 Draft D-Oct15-MT | MT | Draft Structure Plan for internal review and finalisation. | Nov 15 |
| Jan-16 | 969-03 Draft E-Jan16-MT | MT | Draft Structure Plan revised in accordance with Structure Plan Framework (August 2015)<br>Additional information inserted relating to draft Local Planning Scheme Provisions<br>Other updates as required. | Feb-16 |
| Apr-16 | 969-03 Draft F – Apr16-MT | MT | Draft for advertising | Apr-16 |
| | | | | |

**Technical input provided by:**

1. Shawmac Consulting Engineers
2. Bushfire Prone Planning
3. Talis Consultants
4. Galt Geotechnics
5. Terratree

**This Structure Plan is prepared under the provisions of the Shire of Katanning Local Planning Scheme No. 4.**

**IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:**

**[DATE]**

**Signed for and on behalf of the Western Australian Planning Commission:**

an officer the Commission duly authorised by the Commission pursuant to section 16 of the *Planning and Development Act 2005* for that purpose, in the presence of:

WITNESS

DATE

**DATE OF EXPIRY**

## Table of Amendments

| Amendment No. | Summary of the Amendment | Amendment Type | Date Approved by WAPC |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

## Pre-lodgement Consultation

The following were consulted as the Structure Plan was being prepared.

| Agency or Organisation | Date of Consultation | Method of Consultation |
|---|---|---|
| Shire of Katanning | July 2014, May 2015, November 2015, February/March 2016 | Meeting, Phone, Email |
| Department of Planning | October 2014 | Meeting |
| Great Southern Development Commission | July 2014, May 2015 | Meeting |
| Department of Environment Regulation | September 2014 | Letter |
| Western Power | | Letter |
| Water Corporation | | Letter |
| Department of Water | | Letter |
| | | |
| | | |
| | | |
| | | |

# *Executive summary*

Piesse Lake is recognised as the Shire of Katanning's premier passive open space destination through the Super Town Growth and Implementation Plan. This Structure Plan has been prepared to provide guidance on the future development of the site, focussing on land uses to support the ongoing development of the open space area.

The Piesse Lake Structure Plan area includes existing public and private recreation areas and residential land which has been identified as a Development Investigation Area (DIA) in the Local Planning Strategy with the following purpose:

> *"To provide for a mix of residential development including medium density housing and potential aged accommodation around a high amenity lake and parkland revitalisation."*

The Piesse Lake Structure Plan responds to the sites challenges by incorporating elements that achieve amenity and functional objectives. The design creates linkages to the lake creating an attractive interface and connection with the existing town. The aim of this Structure Plan is to guide development which will enhance the amenity to the east of the central business district transforming a currently underutilised and undeveloped reserve into a unique medium residential density infill and recreational area.

The Structure Plan applies to Lots 1 and 3 Synott Street and Lots 1 and 79 Warren Avenue, Katanning being the land contained within the Structure Plan map.

**Land description**

| Land Description | Vol/Fol | Street Address | Registered Proprietor |
|---|---|---|---|
| Lot 3 on Diagram 27422 | 1261/665 | Lot 3 Synnott Ave, Katanning | Shire of Katanning of Katanning |
| Lot 1 on Diagram 26384 | 1383/405 | Lot 1 Synnott Ave, Katanning | Shire of Katanning of 16/24 Austral Terrace, Katanning |
| Lot 79 on Diagram 13273 | 1878/185 | Lot 79 Warren St | Shire of Katanning of Austral Terrace, Katanning |
| Lot 1 on Diagram 3847 | 1878/186 | Lot 1 Warren St, Katanning | Shire of Katanning of Austral Terrace, Katanning |

Land uses proposed within the Structure Plan area include:

- Medium-density residential land.
- Aged and Independent Persons development
- Public Open Space
- Associated Roads.

This Structure Plan is the first prepared for the site and does not supersede any earlier planning work.

A summary of the proposal is outlined in the table below.

| Item | Data (Approximate, subject to detailed design) |
|---|---|
| Total area covered by the structure plan | 17.70 ha |
| Area of each land use proposed:<br>• Residential<br>• Aged and Dependent Persons<br>• Public Open Space | <br>5.157ha<br>1.585ha<br>10.954ha |
| Total estimated lot yield | Approximately 50 Residential, including grouped/multiple dwelling sites |

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| 2 | Local Water Management Strategy Rev A |
| 3 | Bushfire Hazard Assessment |
| 4 | Transport Assessment |
| 5 | Servicing and Infrastructure |
| 6 | Possible Layouts |

## Abbreviations

| | |
|---|---|
| Asbestos Containing Material | ACM |
| Australian Height Datum | AHD |
| Average Recurrence Interval | ARI |
| Below Ground Level | bgl |
| Bushfire Attack Level | BAL |
| Department of Aboriginal Affairs | DAA |
| Department of Agriculture and Food | DAFWA |
| Department of Environment Regulation | DER |
| Department of Parks and Wildlife | DPaW |
| Department of Planning | DoP |
| Department of the Environment | DotE |
| Department of Water | DoW |
| Development Investigation Area | DIA |
| Environmental Protection Authority | EPA |
| Environmental Protection and Biodiversity Conservation | EPBC |
| Megavolt Amperes | MVA |
| State Planning Policy | SPP |
| Water Information Network | WIN |
| Western Australian Planning Commission | WAPC |

# PART ONE
# Implementation

# 1 Implementation

## 1.1 Structure Plan Area

The Piesse Lake Structure Plan shall apply to Lots 1 and 3 Synnott Street and Lots 1 and 79 Warren Avenue, Katanning being the land contained within the Structure Plan map (Figure 1.1: Piesse Lake Structure Plan map).

***Table 1.1 – Land description***

| Land Description | Volume/ Folio | Street Address | Registered Proprietor |
|---|---|---|---|
| Lot 3 on Diagram 27422 | 1261/665 | Lot 3 Synnott Ave, Katanning | Shire of Katanning of Katanning |
| Lot 1 on Diagram 26384 | 1383/405 | Lot 1 Synnott Ave, Katanning | Shire of Katanning of 16/24 Austral Terrace, Katanning |
| Lot 79 on Diagram 13273 | 1878/185 | Lot 79 Warren St | Shire of Katanning of Austral Terrace, Katanning |
| Lot 1 on Diagram 3847 | 1878/186 | Lot 1 Warren St, Katanning | Shire of Katanning of Austral Terrace, Katanning |

## 1.2 Operation

The Structure Plan comes into effect on the date the Structure Plan is approved by the WAPC. This date is outlined in the certification on Page ii of this document.

## 1.3 Staging

The Shire is currently completing the Piesse Lake Botanical Gardens that form part of the Public Open Space. The development sites will be released by Council as required. Release of lots approved by subdivisions proposed which meet the structure plan objectives will be dependent on developer commitment and market demand.

## 1.4 Subdivision and development requirements

### Residential Density Target

The Structure Plan provides potential for a medium Residential Density Target ranging from 25 - 50 lots and/or dwellings per site hectare. This is achieved via the requirement of a variety of residential lot sizes, to be implemented as generally depicted on the Structure Plan. In the case of a proposed change the recommended density, where that density variance is within the range already represented on the structure plan, the variation can be provided with the subdivision plan as requested addressing the proposed yield and lot size and servicing requirements.

An average of 30 Lots and Dwellings per site hectare was applied to estimate yield for infill areas in Katanning. The Structure Plan provides opportunity for the Shire to target these residential infill targets by providing a variety of residential uses and densities.

A range of possible layouts has been explored as part of the Structure Plan process. The final layout will be developed as part of a future subdivision application. For guidance, a range of layouts is provided at Appendix 6.

### Design requirements

The following subdivision design requirements apply:

- All proposed lots with a density of or greater than R40 shall be subject to detailed design guidelines indicating interface with public open space, surveillance, fencing, paths, landscaping and building orientation. The eastern and southern lots adjoining the public open space reserve are to be oriented to

face east or south respectively. Pathways to be provided as an interface between the lots and the drainage reserve.

- A servicing and infrastructure report will be required to design and implement required services as part of future subdivision.

- A targeted survey/assessment will need to be done to identify the size and types of trees to be impacted as part of any future subdivision.

**Public Open Space**

The provision of Public Open Space is outlined clearly on the Structure Plan.

The assembly and development of the Public Open Space, including development of Piesse Lake and adjoining Botanical Gardens, is being undertaken by the Shire as part of separate process known as the "Piesse Park Botanic Garden" project. To support the successful integration of the park/lake and adjacent development areas the Shire of Katanning will ensure that the following considerations are incorporated into the project:

- Water management and construction of the lake in accordance with outcomes/recommendations of the Local Water Management Strategy.

- The existing "Residential" zoned land on Lot 1 Synnott Street will be included in the Public Open Space. The Shire of Katanning has undertaken investigation of the site identified by the Department of Environmental Regulation as *Potentially contaminated,* and has implemented remediation management recommendations prior to development of the land for Public Open Space.

- Appropriate measures be being taken in relation to mosquito management in accordance with the Department of Health (DoH) *Chironomid midget and mosquito risk assessment guide for constructed water bodies* (2007) given the presence of existing and future residential properties in close proximity to the water bodies.

- Preparation of a detailed Landscaping and Management Plan for the Piesse Lake and adjoining Public Open Space, which should address the following:

    - Revegetation/vegetation - environmental conditions

    - Detail treatment of the interface between existing lots backing onto the open space along the southern boundary of the structure plan with access from Starling Lane, Forrest, Federal and Frederick Street to include landscaping, fencing and/or pathways to address surveillance, safety and connectivity

    - Address the access, surveillance and connectively with the proposed medium density development

    - Car parking

    - Paths, boardwalk and bridges

    - Facilities such as bbq's, toilets, benches, playgrounds

    - Lighting

    - Signage.

**Conditions of Subdivision Approval**

The following are recommended conditions of Subdivision Approval specific to the Structure Plan area.

1. All development to be provided with connection to reticulated water and sewerage services.

2. The following shall be finalised, to the satisfaction of the Shire Katanning, prior to subdivision approvals in the structure plan area:

    a. Implementation of the Department of Water endorsed Local Management Strategy through the production of an Urban Water Management Plan being submitted with the applications for relevant stages of subdivision.

    b. Detailed road, public open space drainage design will need to be provided generally in accordance with the structure plan and the endorsed Local Water Management Strategy.

    c. Contaminated site assessment for Lot 1 Synott Avenue prior to development of land for Public Open Space

    d. Preparation of a paths plan.

    e. The preparation of suitable landscaping plans. Any such plans are to include the use of local endemic plan species that occur within the relevant vegetation complexes and soil types in the locality.

    f. A cost contributions schedule is to be prepared and endorsed by the Shire of Katanning prior to the clearance of relevant subdivision that identifies necessary community facilities, public open space development, and infrastructure to the satisfaction of the Shire of Katanning and the Western Australian Planning Commission.

**Local Development Plan**

A Local Development Plan is to be prepared for the Lot 3 Tait Tce to provide for aged and independent living. As a separate site, or part of the overall development a community/communal facility should be incorporated to replace the existing bowling club facilitate.

Piesse Park Structure Plan Area

R30-R50

R25-R40

INTERFACE BETWEEN RESIDENTIAL AND POS TO BE DETERMINED AT DETAILED DESIGN STAGE

Date: 5/04/2016
Name: Fig1_1 Structure Plan.mxd
Photography: Landgate 2012

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0 0.015 0.03 0.06 0.09 0.12 0.15 km

1:2,500

# PIESSE PARK STRUCTURE PLAN

## FIGURE 1.1
## STRUCTURE PLAN

# PART TWO
# Explanatory Section

# 2 Planning background

## 2.1 Introduction and purpose

The Piesse Lake Structure Plan is recognised as the Shire of Katanning's premier passive open space destination through the Super Town Growth and Implementation Plan.

Piesse Lake Structure Plan area includes existing public and private recreation areas and residential land which has been identified as a Development Investigation Area (DIA) in the Local Planning Strategy with the following purpose:

> *"To provide for a mix of residential development including medium density housing and potential aged accommodation around a high amenity lake and parkland revitalisation."*

The Piesse Lake Structure Plan responds to the sites challenges by incorporating elements that achieve amenity and functional objectives. The design creates linkages to the lake creating an attractive interface and connection with the existing town. The aim of this Structure Plan is to guide development which will enhance the amenity to the east of the central business district transforming a currently underutilised and undeveloped reserve into a unique medium residential density infill and recreational area.

The objectives are to:

- Rehabilitate and create an environmental and recreational feature in development of Piesse Lake Botanical Gardens and associated Public Open Space
- Create a focal point for the community
- Facilitate medium density development in town
- Provide a balanced range of lot sizes with access to open space
- Provide options for aged person, independent, short stay and affordable accommodation
- Provide connections and cohesion with the existing town to add vibrancy to the existing centre
- Provide an interconnected movement network that balances the needs of pedestrian, cyclists and vehicles within the Structure Plan area and into the existing town
- Increase local population catchment to support the existing commercial, retail and tourist ventures in the town and locality
- Promote collaborative involvement with the community, non-governmental organisations and state and local government agencies
- Recognise Mythological significance.

## 2.2 Location and Land Description

The Piesse Lake Structure Plan is located north east of the railway and the town centre and represents a central location to the public open space network servicing the towns residential areas. The site is bound by Synnott Avenue to the north, Tait Terrace, Adam Street and Fredrick Street to the north-east, Clive Street to the south-east, Starling Lane to the south-west and Warren Road to the west.

The combined landholdings comprise 19.6 hectares. Land ownership details are described in Table 2.1 - Legal Description and Ownership.

### Existing open space area

The current recreation area includes Piesse Lake located at the south-east corner, and parkland cleared vegetation in a degraded condition. The recreational area is bounded by existing constructed roads. Work is ongoing to upgrade the Piesse Lake and commence development of the adjoining Botanical Gardens and Public Open Space.

The recreation area is the subject of rehabilitation. A previous landfill area located at the northern end of the structure plan area has recently been covered in 300mm of clay as part of rehabilitation works in accordance with a previous environmental assessment of the area (undertaken separately to the Structure Plan process). Earthworks have also progressed in creation of a lake in the centre of the site and some associated landscaping.

### Katanning Bowling Club

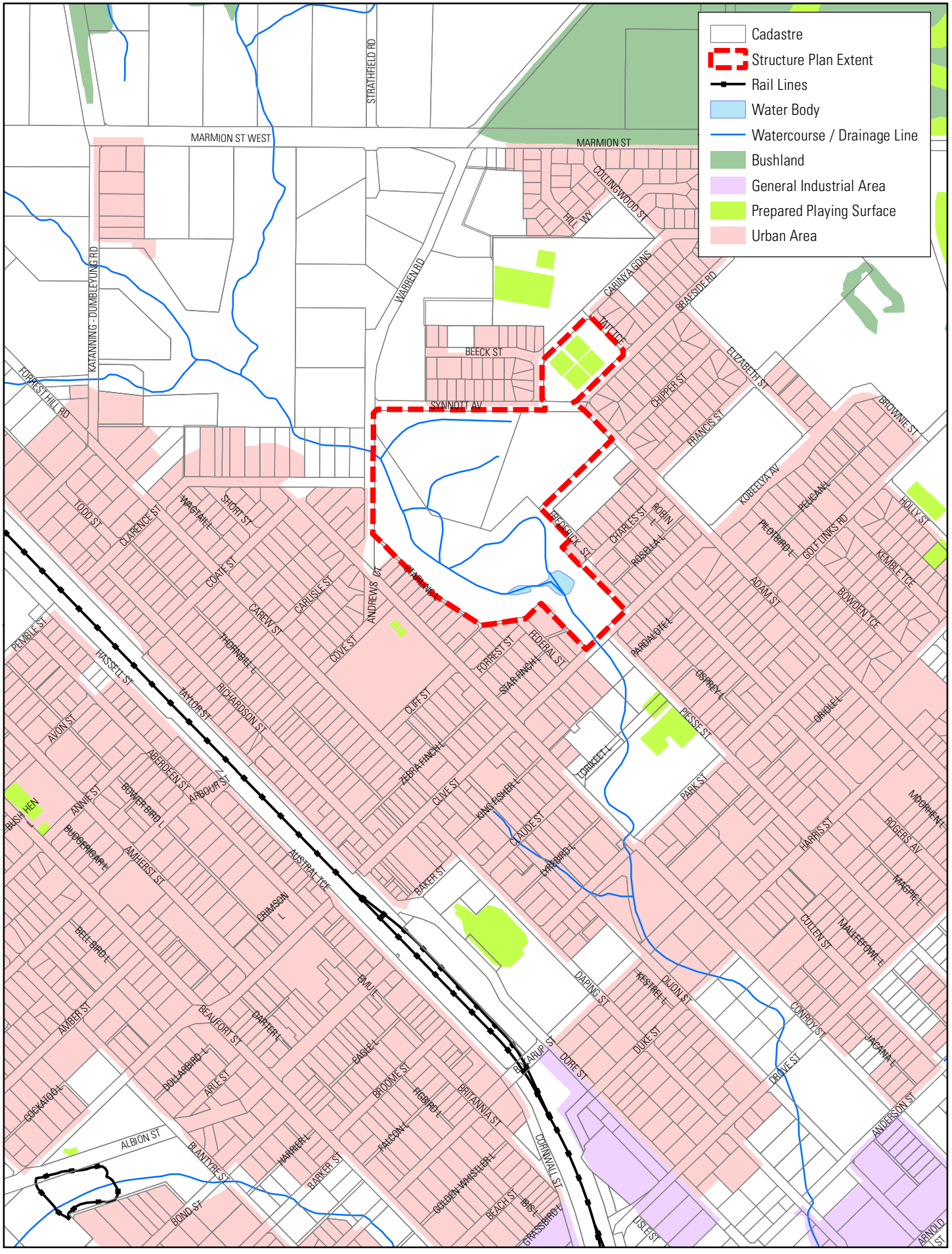
Lot 3 Synott Avenue includes the Katanning Bowling Club and associated club rooms and parking facilities. The club is still used however there are plans in place to relocate to a combined sporting area elsewhere in the town.

### Surrounding residential land

The surrounding residential development largely comprises low density single storey dwellings, with some limited two storey Department of Health dwellings nearby. The existing interface of the Structure Plan area with the residential area includes standard colour bond and super six fencing where residential land abuts.

***Table 2.1: Legal Description and Ownership***

| Lot | Lot Area | Title Details | Road Name | Land owner |
|---|---|---|---|---|
| 3 | 1.6ha | D27422 | Synnott Avenue | Shire of Katanning |
| 1 | 3.1ha | D26384 | Synnott Avenue | Shire of Katanning |
| 79 | 4.6ha | D13273 | Synnott Avenue | Shire of Katanning |
| 1 | 8.4ha | D3847 | Warren Road | Shire of Katanning |

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**PIESSE PARK STRUCTURE PLAN**

**FIGURE 2.1**
**CONTEXT**

## 2.3 Planning framework

### Shire of Katanning Town Planning Scheme No. 4

The Structure Plan area is affected by three land use classifications in Town Planning Scheme No. 4 ("TPS4").

The central portion of the site is reserved for *Recreation and Open Space*, while the remainder of the central area is currently zoned R12.5/25). The bowling club land is included in Special Use zone SU3, with the associated purpose of private *Club and Recreation.*

The north-eastern section zoned *Special Use SU3. SU3* is located on Lot 3 Synott Avenue and is bound by Tait Terrace, Braeside Road, and Carinya Gardens for the purpose of private *Club and Recreation*. The north-central section is zoned *Residential 12.5/25.* Zoning is described in Table 2.2 below.

***Table 2.2 – Town Planning Scheme***

| Land description | Zone |
|---|---|
| Lot 3 Synnott Avenue (D27422) | Special Use SU3 |
| Lot 1 Synott Avenue (D26384) | Southern portion reserved as Recreation and Open Space and remainder Residential R12.5/25 |
| Lot 79 Synnott Avenue (D13273) | Majority is reserved as *Recreation and Open Space* and northern portion zoned *Residential R12.5/25* |
| Lot 1 Warren Road (D3847) | Reserved as Recreation and Open Space |

The objectives of the zones relating to Piesse Lake are outlined in Table 2.3 below.

***Table 2.3: Zone Objectives***

| Zone | Objective |
|---|---|
| Special Use SU3 | Special Use zones will apply where the Council wants to have specific land use control and/or development requirements. This may be on land where a mix of land uses is appropriate but which are not readily captured by the terms of a specific zone. Special Use 3 is *"Private Club and Recreation".* |
| Residential R12.5/25 | a) to retain the single house as the predominant form of residential development in the town.<br>b) to provide for lifestyle choice in and around the town with a range of residential densities.<br>c) to allow for the establishment of non-residential uses subject to local amenities not being adversely affected.<br>d) to achieve a high standard of residential development.<br>Council may permit a development density of up to R25 where the development would be connected to the reticulated sewerage system |
| Recreation and Open Space | N/A |

TPS4 contains no specific provisions for the consideration and adoption of a Structure Plan, however with the introduction of the *Planning and Development Regulations 2015* deemed provisions now provide a mechanism for the Shire to consider and assess a Structure Plan. The current zone of the site arguably does not trigger the requirements of Clause 15 of the regulations, however it is envisaged that Clause 15(c) may be invoked.

**Draft Shire of Katanning Local Planning Scheme No. 5**

Draft Local Planning Scheme No.5. (LPS5) is currently being advertised. LPS5 proposes that the southern portion of the Structure Plan area be included within the *Urban Development* zone. Table 3 of LPS outlines Additional Provisions relating to this zone, which provide the basis for the preparation and endorsement of a Structure Plan. The relevant clause states:

1) Prior to the Local Government granting approval to any development or supporting any proposal for subdivision or development of land within the Urban Development Zone, other than development and minor changes in the use of land outlined in (2) below, a Structure Plan shall be prepared and approved.

2) Notwithstanding the provisions of (1) above, within the Urban Development Zone the Local Government may consider the establishment of those uses in accordance with the zoning table prior to the completion and endorsement of a structure plan.

3) Where a Structure Plan has been endorsed by the Local Government and the Western Australian Planning Commission, the land to which the Structure Plan applies shall be developed generally in accordance with the Structure Plan.

Lot 3 Tait Terrace, Braeside Road, Synnott Avenue and Carinya Gardens, Katanning (currently comprising the Bowling Club) is retained within Special Use Zone SU3. The Special Uses within this zone are expanded (compared to TPS4) to include *Private Club and Recreation, Residential Uses Other associated complementary uses approved by the Local Government.*

**Katanning Super Town: Growth and Implementation Plan**

The Growth Plan identifies Piesse Lake as the premier passive open space destination in Katanning. The Growth Plan identifies this site and suggests that the Structure Plan is *to provide for medium density housing around high amenity dam and parkland revitalisation.* The Spatial Growth Plan identifies Piesse Lake as *Redevelopment Area to Encourage Higher Density Development.* A *Green Link Enhancements* is also identified through the site and an *Activity/Exercise Trail* is located along the south-west boundary of the site.

The Growth Plan identifies a range of features to incorporate into the development of Piesse Lake, Botanic Gardens and adjoining Public Open Space. These are largely being refined as part of a separate project currently being undertaken by the Shire.

The Structure Plan area has been identified in the Grown Plan as an ideal location to provide a higher density of housing which would greatly improve the housing choice in the town. The area is well situated as being close to the town centre and hospital, as well as being provided with a high amenity environment with the proposed upgrades to Piesse Lake.

The Growth Plan identifies a number of transformational projects based on their ability to contribute to the economic, social and environmental qualities of the town. Four key project areas are identified. Project 1 is Town Centre Commercial and Streetscape Revitalisation with the objective of *planning and undertaking the structural modifications necessary for Katanning to have a sufficiently robust town centre to accommodate future growth.*

Recommendations from the Growth Plan relating to Piesse Lake include:

- Recommendation 39 – Prepare a structure plan around Piesse Lake to incorporate open space upgrades, rationalisation of the public open space improve amenity and provide medium density housing

- Recommendation 43 – Prepare a structure plan for the length of Clive Street between the main street precinct and Piesse Lake to provide a higher density residential and mixed use transition from the main street to the medium density precincts

- Recommendation 74 – Work with major land owners in vicinity of Piesse Lake with a view to setting up a joint venture with LandCorp to produce medium density housing which reflects the 'urban living in the country' theme

- Recommendation 75 – Encourage the progressive consolidation and redevelopment of defined areas close to the town centre and Piesse Lake for urban consolidation

- Recommendation 83 – Promote R40 medium density housing opportunities on land bounded by Synott Ave, Adam St and Chipper St on the periphery to achieve surveillance of the park and offset development costs

- Recommendation 84 – Encourage redevelopment of Department of Housing lots on Synott Ave for medium density housing (this is adjacent to the structure plan area)

- Recommendation 85 – Utilise bowling club land for medium density housing if club relocated

- Recommendation 87 – Create a venue for major community gatherings with facilities

- Recommendation 86 – Create a multi-use drainage corridor along Piesse Creek

- Recommendation 83 – Promote R40 medium density residential opportunities on land bound by Synott Avenue, Adam Street and Chipper Street on the periphery to achieve surveillance of the park

- Recommendation 84 – Encourage redevelopment of Department of Housing lots on Synott Avenue for medium density housing.

As the Structure Plan has progressed further consideration and refinement of these recommendations has occurred with the resultant Structure Plan addressing many of these items.

**Shire of Katanning Local Planning Strategy**

Piesse Lake has been identified as a Priority 1 Development Investigation Area (DIA) 2 in the Shire of Katanning Local Planning Strategy with the following purpose:

> *"To provide for a mix of residential development including medium density housing and potential aged accommodation around a high amenity lake and parkland revitalisation."*

Development investigation areas are subject to detailed planning prior to subdivision and development. The Strategy recommended at the time that the Local Planning Scheme No. 5 will include priority DIAs to accommodate a minimum of 5 years' potential urban expansion where detailed planning and environmental assessment and land use outcomes are finalised by the Structure Plan process. The mechanism proposed under LPS5 will be to introduce a Future Development Zone for infill and priority DIAs to facilitate subdivision and development control to be addressed by endorsed Structure Plans. Since the preparation of the Local Planning Strategy

Table 1 of the Local Planning Strategy describes DIA2 as comprising 21.2ha. Factoring in approximately 45% for retained open space, drainage, and roads, the LPS states that the developable area estimates 11.6ha yielding approximately 290 Lots @ 25 Lots/ha.

The Land Use Designation for Piesse Lake is *Residential Infill*. An *Activity/Exercise Trail* and *Multi Use Corridor* are identified along the southern end which corresponds to the Katanning Creek and Piesse Lake.

The Local Planning Strategy identifies the following in regards to DIA 2:

***Table 2.4 – LPS Opportunities and Constraints***

| Opportunities and characteristics | Constraints |
|---|---|
| • Infill and increased residential density (R20 to R40)<br>• Variety of dwelling types<br>• Aged accommodation<br>• Consolidate, revitalise and activate residential area close to town centre, hospital and open space<br>• Rationalise and provide high amenity public open space for housing and community use<br>• Existing creek/drainage line degraded<br>• Majority of area cleared with isolated trees. | • Existing development<br>• Servicing<br>• Drainage/water management<br>• Land tenure and reservation/zoning<br>• Contaminated site<br>• Tree retention<br>• Pedestrian linkage required to DIA 1 to implement the LPS Multiple Use Corridor. |

The opportunities and constraints outlined in the Local Planning Strategy have informed this Structure Plan and formed the starting point for further detailed investigations undertaken. Recommendations regarding Local Planning Scheme No. 5 have been reviewed in line with the requirements of the revised requirements for Local Planning Schemes.

**Great Southern Regional Planning and Infrastructure Framework**

The Framework defines a strategic direction for the future development of the Great Southern region over the next 20 years. It highlights the opportunities for economic development and infrastructure priorities for the region, and addressed land use planning response to future growth and development pressures.
The framework recognises Katanning as part of the "Regional Centres Development Plan" and as a sub-regional centre that offer services and facilities which provide for the needs of the local community and that of the rural population in their sub-regional hinterland.

In terms of economic growth, the Framework recognises that there are opportunities to increase value of livestock and livestock products in the region and that the new Katanning sale yards will play an important role in supporting this growth. The gold mining operation near Katanning is identified in the Framework as a potential employer in the region, especially during the construction phase. It notes that attracting residents to live in the area would provide the greatest economic benefit to the region. Jobs in the manufacturing, service sector and retail should grow as a result.

Regarding services and infrastructure, the Framework notes that there will also be a need to provide a higher level of infrastructure and services in Katanning that also services a number of smaller rural communities in the northern part of the region. It is hoped that through the higher level of accessibility and services this will increase the attractiveness of the town in retaining and growing population. This will lead to a growth in the provision of retail, employment, recreational and other activities. Katanning is supplied by the Great Southern Towns Water Supply Interconnected Scheme, however Water Corporation plans to phase out reliance in this area on local water sources and focus on reducing risk and securing safe drinking water. SuperTown planning for Katanning could include a major upgrade to the Narrogin-Katanning connection to the Harris Dam.

The preparation of this Structure Plan is supported by recommendation A43 which is to plan for population growth in Albany and the sub-regional centres – Local planning strategies and schemes for Katanning to provide sufficient zoned land to accommodate a range of services such as retail, administrative, general health and specialist health, education, recreation, community and entertainment.

**State Planning Policies**

A number of State Planning Policies (SPP) are relevant to the Piesse Lake Structure Plan. These are outlined in Table 2.5 below.

***Table 2.5 – State Planning Policies***

| SPP | Description | Comment |
|---|---|---|
| SPP 1 State Planning Policy Framework (Variation No. 2) | SPP 1 helps guide the decision-making process in regards to land use and development in WA. It indicates which policies and strategies the WAPC and the Department of Planning should refer to when making decisions. It provides a list of all the plans, policies and strategies that form a part of the State Planning Framework. | SPP 1 should be referred to during the preparation of the Piesse Lake structure plan and the relevant policies which should be referred to. |
| SPP 2 – Environment and Natural Resources | SPP 2 defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues within the framework of the State Planning Strategy. | A number of environmental features have been taken into consideration in the preparation of the Piesse Lake structure plan such as waterbodies, vegetation, soils and habitat. These features will be appropriately protected through the provision of recreational areas and open space. |
| SPP 2.9 – Water Resources | This policy provides clarification when taking water resources into account in the planning process. | A number of waterbodies are located within the structure plan area. These features will be appropriately protected through the provision of recreational areas and open space. |
| SPP 3 – Urban Growth and Settlement | The aim of this policy is to facilitate sustainable patterns of urban growth and settlement by setting out the requirements of sustainable settlements and communities and the broad policy in accommodating growth and change. | Urban development (including residential development) within the Structure Plan area is consistent with SPP 3. |
| SPP 3.1 – Residential Design Codes | This Policy provides a comprehensive basis for the control of residential development throughout Western Australia. | The Residential Design Codes will be included into the Structure Plan provisions where required. |
| SPP 3.6 Development Contributions for Infrastructure | This policy aims to promote the efficient and effective provision of public infrastructure and facilities to meet the demands arising from new growth and development and to ensure that development contributions are charged equitably among those benefiting from the infrastructure and facilities to be provided. | Development contributions will be considered during the more detailed planning stages. |
| SPP 3.7 – Draft Planning for Bushfire Risk Management | This policy should be used to inform and guide decision-makers, referral authorities and proponents to achieve acceptable fire protection outcomes on planning proposals in bush-fire prone areas. | Bushfire hazard assessments and Fire Management Plan will be prepared for Piesse Lake. The bushfire hazard across the site is predominantly low. |

| SPP | Description | Comment |
|---|---|---|
| SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning | This policy aims to promote a system in which sustainable land use and transport are mutually compatible. | Development of sensitive land uses in Piesse Lake such as residential should consider the impact of existing road and rail transport noise. However, considering Piesse Lake is already surrounded by residential land uses, this is not considered a major issue. |

### WAPC Development Control Policies

Relevant WAPC Development Control (DC) Policies are discussed in Table 2.6 below.

***Table 2.6 – Development Control Policies***

| Policy | Description | Comment |
|---|---|---|
| DC Policy 1.1 – Subdivision of Land – General Principles | This policy sets out the general principles used by the WAPC in determining applications for the subdivision of land. It specifies the WAPC's basic requirements for the creation of new lots as well as the procedures it will follow in processing subdivision applications. | It's important that the information required by the WAPC is included in the Structure Plan and any future subdivision applications in accordance with DC 1.1. |
| DC Policy 1.7 – General Road Planning | The policy establishes requirements for land contributions and the construction of various categories of roads and outlines principles that apply to aspects of the planning and provision of all types of roads. | This policy should be referred to at the detailed planning stage. |
| DC 2.2 – Residential Subdivision | This policy establishes the WAPC requirements for the subdivision of land into residential lots. | This policy should be referred to at the detailed planning stage. |
| DC 2.3 – Public Open Space in Residential Areas | This policy sets out the requirements of the Commission for public open space and the provision of land for community facilities in residential areas. The basic component is the requirement that 10 percent of the gross subdivisible area of a conditional subdivision shall be given up free of cost by the subdivider for public open space. | The Piesse Lake structure plan includes a substantial amount of public open space for the purposes of public recreation. |
| DC 2.6 – Residential Road Planning | This policy sets out the WAPC's requirements for the planning and design of roads in residential areas and provides guidelines for the design and layout of residential roads. | This policy should be referred to at the detailed planning stage. |

### EPA Position Statements

Relevant EPA Position Statements are discussed in the table below.

***Table 2.7 – EPA Position Statements***

| Policy | Description | Comment |
|---|---|---|
| Position Statement 2 – Environmental Protection of Native Vegetation in WA | This Statement addresses the issues of native vegetation clearing in WA, particularly in agricultural areas. The EPA has previously stated that *all existing remnant native vegetation is important, and it should be managed to ensure its retention.* It states that the EPA could possibly support clearing in agricultural areas providing the proposal has a net environmental benefit, the area to be cleared in relatively small and that any residual land degradation will not be intensified. | The Structure Plan area comprises small areas of native vegetation and parkland cleared trees. It is important that the principles of this position statement are given due consideration, however it is considered that the areas to be cleared as part of the structure plan proposals will be relatively small given most of the site is already cleared. |
| Position Statement 3 – Terrestrial Biological Surveys as an Element of Biodiversity Protection | The EPA has prepared this Position Statement to ensure that the issue of biological diversity is recognised as being of importance in the land use planning process and to ensure that minimum standards of survey work are undertaken to enable the EPA to undertake an assessment of a proposed activity. | The provisions of this position statement are to be followed in the preparation of flora and fauna surveys across the structure plan area. |
| Position Statement 4 – Environmental Protection of Wetlands | The Position Statement defines important environmental values and functions of wetlands and establishes principles for the environmental protection of wetlands in general. It suggests land use zoning should be applied so as to achieve sustainable water resources management and protect the beneficial functions performed by wetlands as part of that process. | No wetlands are located within the structure plan area; however, some minor watercourses are located throughout which will need adequate protection in accordance with the general principles of this Position Statement. |
| Position Statement 7 – Principles of Environmental Protection | This position statement sets the scene for environmental management in WA. Key principles include the precautionary principle, conservation of biological diversity and ecological integrity, waste hierarchy, best practice, accountability and transparency and enforcement. | The future structure planning process should pay particular regard to the principles contained within the statement. |
| Position Statement 9 – Environmental Offsets | This statement provides guidance on environmental offsets to ensure a 'net conservation benefit' to proposals. | This statement will need to be referred to if environmental offsets are required as part of the project. Considering the environmental values of the site are not significant and the impact will be low, environmental offsets may not be required. |

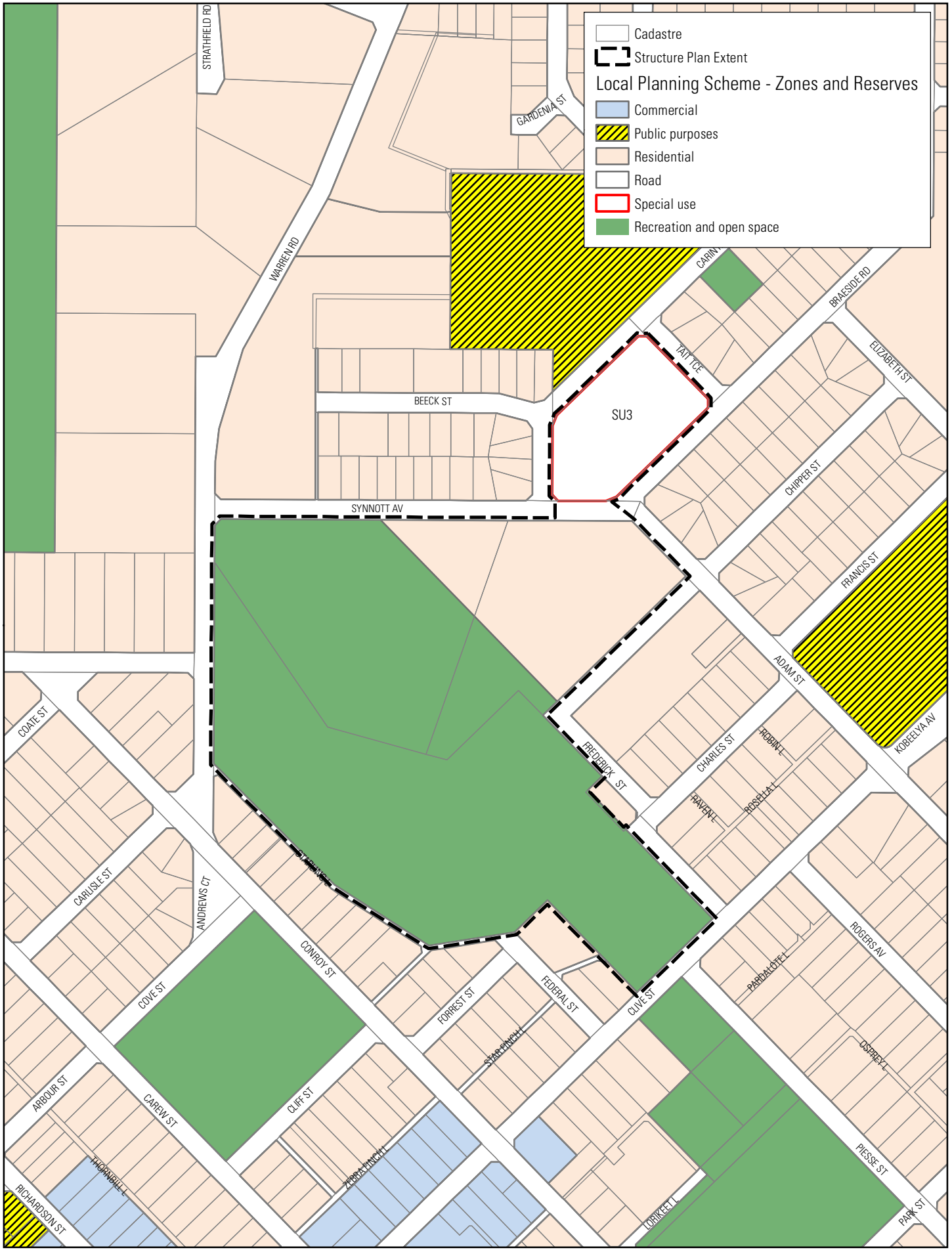
### EPA Guidance Statements

Relevant EPA Guidance Statements are discussed in the table below.

***Table 2.8 – EPA Guidance Statements***

| Policy | Description | Comment |
|---|---|---|
| Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses | This statement provides guidance on the generic separation distances between sensitive and industrial land uses to avoid conflicts between these uses. It aims to protect sensitive land uses from unacceptable impacts on amenity that may result from industrial activities, emissions and infrastructure. Impacts from emissions include noise and air emissions (gases, dust and odours). Types of sensitive land uses include residential development, public services (hospitals, schools, shopping centres, playgrounds etc.), tourist development (caravan parks and hotels) and some public buildings. | The separation distances provided in this statement will be generally applied to the structure plan and will need to be further refined at a detailed planning stage once the exact land uses are determined. It is understood that this guidance statement is currently under review. |
| Guidance Statement No. 8 – Environmental Noise | This statement provides guidance to proponents submitting proposals for environmental impact assessment to ensure that noise emissions comply with the *Environmental Protection (Noise) Regulations 1997*. Noise is defined in the Environmental Protection Act as vibration of any frequency, whether transmitted through air or any other physical medium. | The general principles in this statement will be applied to the structure plan. However, noise will need to be further considered further once the exact land uses are determined. |
| Guidance Statement No. 19 – Environmental Offsets Biodiversity | This statement provides advice on environmental offsets for proposals or schemes that impact on biodiversity. It is to be read in conjunction with Position Statement No. 9 but provides more specific advice particularly in relation to the technical application of biodiversity offsets. | This statement will need to be referred to if environmental offsets are required as part of the project. Considering the environmental values of the site are not significant and the impact will be low, environmental offsets may not be required. |
| Guidance Statement 33 – Environmental Guidance for Planning and Development | This statement provides an overview of information to assist proponents and decision making authorities in considering environmental management as part of the planning and development process. It also contains guidance for the Environmental Impact Assessment process | The information in this statement has been referred to in the environmental assessment of the structure plan to ensure that all relevant information is provided. Further detailed assessments may be required once the details of the development have been more accurately determined. |
| Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia | This statement provides direction and information on the general standards and protocols for terrestrial flora and vegetation surveys as part of the environmental impact assessment process. | This statement should be referred to in the preparation of vegetation and flora surveys and reports. |

| Policy | Description | Comment |
|---|---|---|
| Guidance Statement No. 55 – Implementing Best Practice in Proposals Submitted to the Environmental Impact Assessment Process | This statement provides guidance on what the EPA means by the term 'best practice' when it is used in the environmental impact assessment process and the approach the EPA will take when assessing proposals. It has a particular focus on human health and the environment as affected by, but not confined to, industrial processes. | The guiding principles in this statement should be referred to at a more detailed planning stage once the exact land uses and industries are more clearly determined. |
| Guidance Statement No. 56 Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia | This statement provides direction and information on the general standards and protocols for terrestrial fauna surveys as part of the environmental impact assessment process. | The statement should be referred to in the preparation of fauna surveys and reports. |

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**PIESSE PARK STRUCTURE PLAN**

**FIGURE 2.2**
**TOWN PLANNING SCHEME 4**

# 3 Site conditions and constraints

## 3.1 Biodiversity and natural assets

### Vegetation

A Level 1 vegetation and flora survey was undertaken by Terratree in September 2014 in accordance with EPA Guidance Statement 51. A search was undertaken of the following databases within a 20km radius of the site:

- DPaW's Threatened and Priority Flora
- DPaW's Threatened Ecological Communities
- WA Herbarium Declared Rare and Priority Flora
- Department of the Environment's Projected Matters Search Tool.

A total of 41 significant florae were recorded on the databases. No species of Threatened Flora (Declared Rare Flora) pursuant to the WA Wildlife Conservation Act 1950, or listed as Threatened pursuant to the EPBC Act 1999 were recorded during the targeted search or the Level 1 vegetation survey. As the site is cleared of native vegetation, no flora species of conservation significance were identified at the site.

Vegetation condition at the site was classified as being 'completely degraded' (according to the scale by Keighery (1994)) as the vegetation is no longer intact and the area is completely or almost completely without native species. The vegetation can be described as 'parkland cleared' with the flora compromising weed or crop species with isolated trees or shrubs (Terratree, 2014).

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site.

A complete copy of the Flora and Fauna Assessment by Terratree (2014) is provided at Appendix 1.

### Fauna

A Level 1 fauna survey was undertaken by Terratree in September 2014 in accordance with EPA Guidance Statement 56. A search was undertaken of the following databases within a 20km radius of the site for records of known Threatened, Schedule and Priority Fauna:

- DPaW's Threatened Fauna
- Department of the Environment's Projected Matters Search Tool.

The DPAW database returned nine Threatened Fauna species including one that is presumed extinct, seven migratory birds and two other specially protected fauna species. The database also showed one Priority 2 species and six Priority 4 species. The DotE database search returned five Endangered and Vulnerable fauna species, and 10 Invasive fauna species. No fauna species of conservation significance were identified at the site.

A complete copy of the Flora and Fauna Assessment by Terratree (2014) is provided at Appendix 1.

### Summary

There are few biodiversity-related constraints that would preclude development of the site for its intended use (Talis, 2014). The site has been historically cleared and vegetation is parkland cleared and in degraded condition and there is no flora and fauna of conservation significance. There are no significant biological constraints to development on site. The only exceptions which may need further consideration include:

- Proposed disturbance activities are unlikely to significantly affect migratory species, with the possible exception of the Rainbow Bee-eater which may nest at the site between August and January

- Disturbance to mature trees may require targeted surveys to determine habitat value for Carnaby's Black Cockatoo

- Any disturbance to eucalypt woodlands is required to consider potential impacts to Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4), Western Shrike-tit (Priority 4) in consultation with DPaW.

## *3.2 Landform and soils*

### Topography

The landscape throughout the site is generally flat and slopes gently from the north-east to the south-west. The northern part of the site sites at approximately 320m AHD (Australian Height Datum) and slopes to approximately 310m AHD.

### Geology

The Dumbleyung Geology series map 1:250,000 scale indicated the site is underlain by: colluvium and minor alluvium described as 'silt, sand and gravel; generally on slopes adjoining to rock and laterite outcrops' (Galt, 2014). The assessment by Galt Geotechnics, 2014, found that the site is underlain by clayey sand to sandy clay. Fill material (including uncontrolled fill) was also encountered across the site.

### Soils

The generalised soil profile of at the site is described by Galt Geotechnics (2014) as:

- FILL: Clayey SAND/Silty SAND – fine to coarse grained, approximately 15% to 30% non-plastic to high plasticity fines, grey/brown/white/orange brown, locally with some fine to medium grained gravel, trace organics and rootlets, localised refuse[4] (plastic bags), moist to dry, generally stiff to very stiff, locally present from the surface, extending to depths of between 0.4 m and 1.0 m; overlying

- Clayey SAND/Silty SAND/SAND – fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, clayey material is generally soft to stiff, moist to wet, trace organics and rootlets, locally present from the surface, extending to depths of between 0.5 m and 1.2 m; overlying

- Clayey SAND/Sandy CLAY – fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, extending to depths of between 1.0 m and the maximum depth of investigation of 2.5 m; locally overlying

- CLAY – low plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.6 m, extending to the maximum depth of investigation of 2.5 m.

### Geotechnical Investigation

Geotechnical investigations were conducted between 1 and 5 September 2014 by Galt Geotechnics (Appendix 1). A total of 12 test pits extending to depths between 1 m and 2.5 m below the surface level were installed by Galt. The assessment was conducted in accordance with Australian Standard AS2870-2011 *Residential Slabs and Footings*. Based on the findings, majority of the site was classified as 'Class M' provided that the site preparation recommendations are followed. Galt (2014) considers that the site is *geotechnically capable of supporting the proposed residential subdivision development*. A portion of the site formerly used an uncontrolled landfill was classified as 'Class P' and was considered not suitable for development as residential subdivision however may be

used as a landscape area (Galt, 2014). Galt also recommends that future buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness.

The assessment also concluded that the underlying clayey material is unsuitable for onsite effluent disposal by percolation (however this can be improved with importation and placement of an adequate thickness of granular fill).

### Acid Sulphate Soils

Acid sulphate soil data by the Department of Environment Regulation (DER) is not available for the site, however the CSIRO's ASRIS (2014) data show that the site is in an area with *Low Probability/Very Low Confidence* of acid sulphate soils occurring (Talis, 2014).

## *3.3 Contaminated sites*

A portion of the site (Lot 1 Synnott Avenue) has been classified by the DER as *Potentially Contaminated – Investigation Required* due to previous owners accepting uncontrolled fill material at the site. It is understood that the material received at the site was used for levelling of the surface and was comprised predominantly of clay, silt and sand, however included various other material including bricks, concrete, timber, PVC piping, metal, tiles and asbestos containing materials (ACM) in the form of asbestos-cement sheeting, which is most likely associated with construction and demolition (C&D) waste.

Aurora Environmental (2014) conducted limited sampling for asbestos in 2013, which showed two samples taken from the site to contain ACM. Aurora proposed 0.5 m capping to be obtained from the evaporation pond construction located on Lot 1 Warren Road with an additional 0.15 m top soil and grass. Based on discussions with the Shire, it is understood that a capping layer of approximately 300 mm of excavated clay material from the lake construction was placed on top of the surface. This work was undertaken separately to the Structure Plan process. It is understood that further work on the site may be required as a result of the classification imposed by the DER.

## *3.4 Groundwater*

The site is not located within any proclaimed groundwater area (as identified in the *Rights in Water and Irrigation Act 1914*) and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow.

Perched groundwater was identified at depths between 0.5m and 0.8m at two locations by Galt Geotechnics during the geotechnical investigations in 2014 (at the northern part of the site on Lot 3 and in the centre of the site). This could be as a result if recent rainfall in the days preceding fieldwork and the water remaining on top of the superficial clayey soils.

A review of the *Katanning Town Groundwater Program 2003 Drilling Bore Completion and Test Pumping Report* (Global Groundwater, 2004) prepared for the Shire of Katanning showed a groundwater bore previously placed within approximately 600m south-west in May 2003 which recorded groundwater depth at 1.963m bgl (Talis, 2014).

While a shallow groundwater depth may be viewed as a constraint to residential development, additional groundwater investigations would be recommended to identify quantities of fill material required to be imported to the site to raise levels for development (Talis, 2014). Based on Galt's 2014 preliminary geotechnical investigations, for drainage purposes, the buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness.

### Surface water

The Katanning Town Creek runs through the southern part of the site and flows into the Piesse Dam which is located at the south-east corner.

The creek has recently been landscaped into a constructed lake. The lake is still undergoing contouring and revegetation. Vegetated areas consisting of wetland species such as sedges, will be planted in areas to provide wetland habitat. Anecdotal evidence indicates that long-neck turtles are located within the Piesse Dam.

No FPM 100 year ARI area is mapped within or immediately surrounding the site.

The surface water features of the site (the Katanning Town Creek and Piesse Dam) are an environmental constraint to residential development, however these areas are to be landscaped and developed for recreational purposes which is an appropriate use for these areas. Areas of the site identified for residential development are not constrained by surface water features. However, it should be noted that mosquito management should be considered as part of any future residential development proposals.

Development of the surrounding area will also need to give consideration to the potential for surface water flows offsite and into the waterbodies onsite. Talis recommends that appropriate management measures are put in place to control stormwater migration from the site. Any stormwater not retained onsite should be appropriately managed to ensure that any potential migration of contaminants from the developed site is minimised as far as practicable.

## *3.5 Bushfire hazard*

A Bushfire Hazard Assessment was conducted across the site by Bushfire Prone Planning (2014). The rating on the existing vegetation within the subject site was a combination of *Low* and *Moderate*. However, it was also noted that the vegetation mapped at the moderate level within the subject site is low threat vegetation and can be excluded when defining Bushfire Attack Levels (BAL), as classified vegetation as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "maintained public reserves and parklands".

The vegetation within the site is managed and meets the requirements under AS 3959: 2009, Section 2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas "maintained public reserves and parklands". To the north west of Piesse Lake is an area of vegetation, classified as woodland. The north western section of Piesse Lake has been identified as having a BAL 12.5 and BAL 19 area. The area identified as BAL 12.5 and BAL 19 can be excluded if the identified vegetation to the north west is managed.

External to Piesse Lake, the Bushfire Hazard is a combination of *Low* and *Moderate* and the BAL stage can be managed to achieve a low threat vegetation classification as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "nature strip".

A complete copy of the Bushfire Hazard Assessment is at Appendix 3.

## *3.6 Heritage*

### Aboriginal Heritage

A search for relevant Aboriginal Heritage was conducted by Talis (2014) using the DAA online *Aboriginal Heritage Inquiry System* which indicated that the site was not list as a *Registered Aboriginal Site* or *Survey Area*. The lower portion of the site was listed as *Other Heritage Places* which was associated with the Katanning Town Creek (ID 22816), which also extended offsite.

## *3.7 European Heritage*

An online search of the Australian Government's Department of Environment Heritage Database by Talis (2014) found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500m).

An online search of the Heritage Council WA database by Talis (2014) using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site.

## *3.8 Buffers*

Proposed and existing land uses within Piesse Lake are identified as 'sensitive land uses'. No industrial land is located adjoining or nearby the site. Therefore, appropriate buffers and separation distances are already in place between the site and industrial land uses.

In terms of buffers and separation distances, there are no constraints on the proposed land use. However, it should be noted that any future investigations will need to refer to the updated EPA Guidance Statement No. 3 and WAPC State Planning Policies on separation distances if and as required

## *3.9 Servicing and infrastructure*

A review of services and infrastructure was undertaken by Shawmac Consulting Engineers in 2014. A complete copy of the report is provided at Appendix 5.

### Electrical

The Katanning town site currently has 5-10MVA capacity remaining in terms of power availability which will drop to <5MVA in 2019. This allows for the development of approximately 1,000 residential dwellings from 2019 onwards on a first come, first serve basis, the development capacity substantially reduces if industrial and commercial lots are developed. Once the power capacity is reached, significant works would be required to source power from other areas to facilitate future development. It is expected that the power availability be a major constraint to development within the town site.

### Water and Wastewater

Lot 79 and 3 has not been included in the Water Corporations water planning and therefore a reticulated potable water supply is not immediately available. However, it is likely it can be served with potentially some existing network improvements to meet projected demands. The proponent should arrange for water infrastructure planning to be undertaken. A formal submission by the proponent should be made in a timely manner considering the proposed development schedule and the infrastructure planning review.

### Wastewater

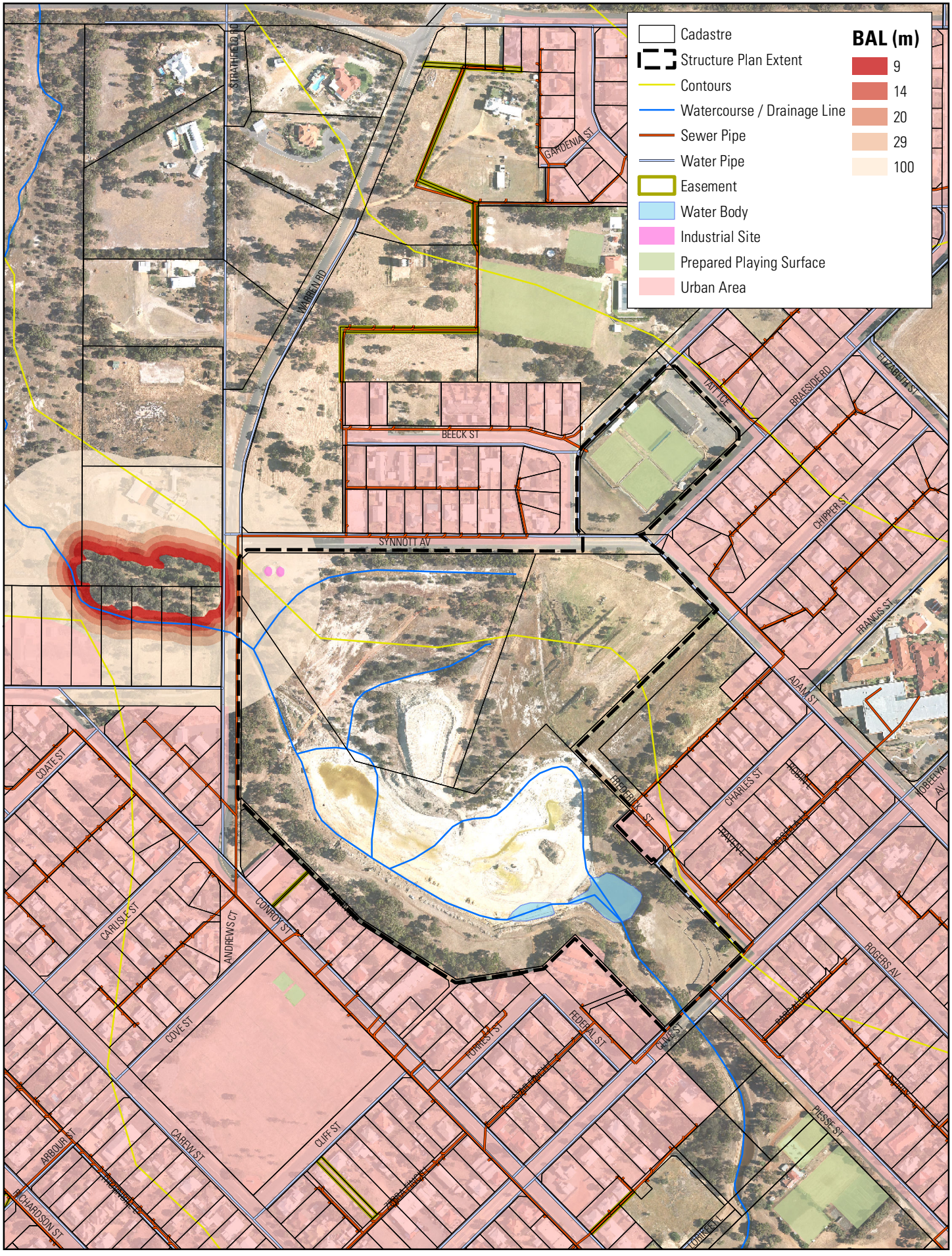
Lot 79 has not been included in the Water Corporations water infrastructure planning and therefore a reticulated wastewater connection is not immediately available. The proponent should arrange for wastewater infrastructure planning to be undertaken. A formal submission by the proponent should be made in a timely manner considering the proposed development schedule and the infrastructure planning review. The geotechnical assessment also concluded that the underlying clayey material is unsuitable for onsite effluent disposal by percolation (however this can be improved with importation and placement of an adequate thickness of granular fill) (Galt Geotechnics, 2014).

### Gas

There is no gas reticulation available within the town site.

### Communications

Phone services and ADSL are provided in the town. At present, NBN rollout has not commenced in the town site however will be implemented in future. Optus maintains a fibre optic network through much of the town which may provide broadband services. Telstra would be required to service any future development in the absence of NBN or interest from other communications providers.

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**PIESSE PARK STRUCTURE PLAN**

**FIGURE 3.1**
**SITE CONDITIONS & CONSTRAINTS**

# 4 Land use and subdivision requirements

The Piesse Lake Structure Plan aims to facilitate a medium density residential land development adjacent to a unique community recreation area east of the CBD, which will assist in the attraction and retention of population.

## 4.1 Land use

Land uses proposed within the Structure Plan area include:

- Medium-density residential land.
- Aged and Independent Persons development
- Public Open Space
- Associated Roads.

This Structure Plan is the first prepared for the site and does not supersede any earlier planning work.

***Table 4.1 – Structure Plan Summary Table***

| Item | Data |
|---|---|
| Total area covered by the structure plan | 17.70 ha |
| Area of each land use proposed: | |
| • Residential | 5.157ha |
| • Aged and Dependent Persons | 1.585ha |
| • Public Open Space | 10.954ha |
| Total estimated lot yield | 50 Residential, including grouped/multiple dwelling sites |

Note: Table is repeated in Executive Summary

## 4.2 Public open space

One of the key objectives of this Structure Plan is to provide guidance to Council regarding the development and management of the Piesse Lake dam and lake extension, drainage function and enhancement of the surrounding environment, whilst serving as a community focal place. Planning of the open space involves consideration of its Role and function, development and amenity.

*Parks and Recreation* comprises the largest land use component of this Structure Plan area which is predominately located on Lot 1 Warren Street Katanning and Lot 1 Synott Avenue Katanning. The extent of the Public Open Space area is 10.954 hectares.

### Role and Function

WAPC Liveable Neighbourhoods advocates provision of a hierarchy of public park lands servicing residents. Although a formal public open space audit and the establishment of a parkland hierarchy has not formally been established for the Katanning town site, Piesse Lake may be considered as having a district function based on criteria set out in WAPC liveable neighbourhoods, and includes the following features:

- The total combined area of the Parks and Recreation area is approximately 11 hectares (albeit a large portion of this has multi - use function with the integration of a water management function).
- A large portion of the town's residential area is located within 1km of the park.
- The park has road frontage and access from six local roads.

A District Park is generally considered applicable in the case where there are extensive playing fields and the site is centrally located. However, given the extent of planned investment to enhance environmental and landscape features not otherwise available in Katanning, this parkland may function as a district or "destination park" for tourists and residents outside the immediate walkable catchment. Therefore, it is recommended that future development stages of the parkland reflect this function in providing adequate amenities such as parking and amenities (i.e. toilets, bbqs, lighting etc.).

The park also directly abuts existing low density and proposed medium density housing and therefore will also provide a local park function to its neighbours. The detailed design of the park will need to provide small areas for local children's play at a safe distance to the lake and dam.

**Development and Amenity**

The key planning considerations for development of the park are included in Part1 Implementation Section 1.4 Subdivision and Development requirements for public open space

## *4.3 Residential*

Piesse Lake is identified in the Local Planning Strategy and Growth Plan as one of the key infill areas within the town site *" to provide for a mix of medium density housing and potential aged accommodation around a high amenity lake"*.

Traditionally the take up rate for infill development within rural towns can be limited and slow as the highest demand is generally for traditional single residential and low density lifestyle lots. In preparation of the Local Planning Strategy practical yields from infill development included the Piesse Lake Structure Plan area as one of the areas identified to ensure that sufficient land was available to meet projected demand. An average of 30 Lots and Dwellings per site hectare was applied to estimate yield for infill areas in Katanning.

The Structure Plan provides opportunity for the Shire to target these residential infill targets by providing a variety of residential uses and densities.

A range of possible layouts has been explored as part of the Structure Plan process. The final layout will be developed as part of a future subdivision application. For guidance, a range of layouts is provided at Appendix 6.

## *4.4 Movement networks*

A Transport Assessment has been undertaken based on an indicative lot layout promoting the most intensive likely use of the site.

For the purposes of the Transport Assessment the lot layout maximised the number of smaller lots, provided multiple access points to the existing road network and, where appropriate, incorporated new internal subdivisional roads. This approach was thought to represent the most intense development of the site in regards to traffic movement and thus would test the impact of residential development on the existing road network.

The predicted flow within the site has been calculated as 1 152 vehicles per day. On this basis, the Transport Assessment has concluded that the traffic impact of the site will have minimum impact on the function of the adjacent network.

The final layout of the Piesse Lake Public Open Space and Botanical Garden has not been finalised, and detailed consideration has not yet been given to parking or access arrangements to those areas at this stage. It was further noted that connection of the site to the town site footpath and cycle path network would be required. Section 1.4 Subdivision and Development requirements include the provision for "Preparation of a detailed Landscaping and Management Plan for the Piesse Lake and adjoining Public Open Space" which will include detailed planning for car parking and paths.

## *4.5 Water management*

A Local Water Management Strategy (LWMS) has been prepared to support the Structure Plan. The objective of the LWMS is to ensure that the site achieves best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner.

For the purposes of the LWMS the lot layout maximised the number of smaller lots, provided multiple access points to the existing road network and, where appropriate, incorporated new internal subdivisional roads. This approach was thought to represent the most intense development of the site in regards to water management and would test the impact of the residential development on the existing drainage network.

### Water supply

Potable water should be supplied from an extension of the existing mains.

### Wastewater

Wastewater should be connected via an extension to the existing mains.

### Stormwater management

A basin system is required at the interface with Piesse Lake. Runoff will be detained to discharge at predeveloped flow rates to Piesse Lake.

All floor levels will need to be set a minimum of 500mm above the 100-year water levels of the creek.

In regards to groundwater, appropriate earthworks and excavation methods are required to minimise impact on groundwater. There is no requirement to lower groundwater levels to facilitate development.

## *4.6 Education facilities*

No education facilities are proposed as part of the Structure Plan. There are existing facilities within the town site.

## *4.7 Activity centres and employment*

The site is located close to the Katanning Town Centre which is the principal activity centre that corresponds to the Structure Plan area, however is not included within the area. The Town Centre and adjacent hospital provide the employment focus for the structure plan area. Aside from the broader recreational, tourism and possibly community centre within the future aged/independent housing site, no additional significant activity centres are proposed as part of the Structure Plan.

## *4.8 Infrastructure coordination, servicing and staging*

As outlined in Section 3.9, electrical, water and wastewater services are available to the area, however further planning and upgrades will likely be required. A servicing and infrastructure report will be required to design and implement required services as part of future subdivision.

## *4.9 Developer contributions*

The entire Structure Plan area is owned by the Shire of Katanning. As such, there is no Developer Contribution Plan proposed as part of this Structure Plan. It is envisaged that the Shire will liaise with the ultimate developer of the site in regards to the provision of services.

## *4.10 Implementation/other requirements*

The Structure Plan shall be adopted by the Shire of Katanning Council and the WAPC as a strategic document that will form the basis of decision-making by the Shire and WAPC until such time as the Shire's Local Planning Scheme No. 5 is adopted that then specifically includes provisions for the statutory adoption of Structure Plans.

Once the Local Planning Scheme is gazetted the Structure Plan can be endorsed as a Statutory Structure Plan under the scheme.

# 5 Appendices

**Technical Appendices Index**

| Appendix no. | Document title | |
|---|---|---|
| 1 | Structure Planning – Environmental Investigations | (AVAILABLE FROM SHIRE OFFICE) |
| 2 | Local Water Management Strategy Rev A | (AVAILABLE FROM SHIRE OFFICE) |
| 3 | Bushfire Hazard Assessment | (AVAILABLE FROM SHIRE OFFICE) |
| 4 | Transport Assessment | (AVAILABLE FROM SHIRE OFFICE) |
| 5 | Servicing and Infrastructure | (AVAILABLE FROM SHIRE OFFICE) |
| 6 | Possible Layouts | |

# APPENDIX 1
# Structure Planning – Environmental Investigations

# APPENDIX 2
# Local Water Management Strategy

CONSULTING CIVIL & TRAFFIC ENGINEERS, RISK MANAGERS.

| | |
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| Client: | Land Insights |
| Job Number: | 1409018 |
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# 1. Executive Summary

## 1.1. Background

Katanning has been identifies as one of a network of nine SuperTowns due to Katanning's growth potential, central location and demonstrated governance ability.

The SuperTowns vision is to create well-connected communities with access to services, affordable housing, and a diverse range of lifestyle and employment opportunities. This will result in more choices for people living in regional areas and provide an attractive alternative to residing in the metropolitan area.

## 1.2. Objective

The objective of this Local Water Management Strategy (LWMS) is to achieve best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner.

This LWMS has been prepared to support the development of a detailed structure plan for the creation of a residential development at Piesse Park north of the Katanning town site between Synott Av, Warren Rd, Conroy St and Clive St.

## 1.3. Existing Site

The proposed development is located at Lot 1 and Lot 3 Synnott Avenue and Lot 1 and Lot 79 Warren Street within the Shire of Katanning. The site consists of approximately 19.6ha of land located within the Katanning town site. The site is bounded by Synnott Avenue to the north, Taite Terrace, Adam Street and Fredrick Street to the north-east, Clive Street to the south-east, Starling Lane to the south-west and Warren Road to the west.

The site is currently zoned Residential, Recreation and Open Space, and Special Use, private club premises, under the Shire of Katanning Town Planning Scheme No. 4 and it is proposed to rezone the site to provide for a mix of residential development including medium density housing and potential aged accommodation around a high amenity lake and parkland revitalisation.

The site is generally clear with the exception of the bowling club north of Synott St and a portion of the site that was formerly used as an uncontrolled landfill.

The north-east portion of the site slope downwards from a north-easterly direction to a south-westerly direction. The northern half of the site sits between 320m AHD and 310m AHD, with the southern half of the site being relatively flat sitting at 310m AHD. Katanning Creek runs through the southern portion of the site and Piesse Dam which is in the south-east corner of the site.

## 1.4. Water Supply

Potable water should be supplied from an extension to the existing mains within the Katanning town site to the south, however details of the extensions and upgrades required are currently not known as the area is outside of Water Corporation planning areas.

## 1.5. Wastewater

Wastewater should be connected via an extension to the existing mains within the Katanning town site to the south, however details of the extensions and upgrades required are currently not known as the area is outside of Water Corporation planning areas.

## 1.6. Stormwater Management

### 1.6.1. Flood Protection

All floor levels are to be set a minimum of 500mm above the 100 year water levels of the creek.

### 1.6.2. Drainage Concept

Stormwater from lots and road reserves will be collected through the piped street drainage system and conveyed to a basin located at the interface with Piesse Lake. Runoff will be detained in this basin to discharge at predeveloped flow rates to Piesse Lake. Basin will be required to be lined with clay, or similar to prevent water infiltrating the ground and adding to groundwater.

### 1.6.3. Protect Ecology

Basin to be heavily vegetated with the vegetated area to be sized at 2% of the connected impervious catchment area.

## 1.7. Environmental

There are not expected to be any environmental concerns with the development of the site.

## 1.8. Groundwater

The following to be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements;
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas);
- Earthworks on this site be done in drier months of the year (November to April); and

- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.
- All basin and drains will need to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

There is no requirement to lower groundwater levels to facilitate development.

# 2. Introduction

## 2.1. Principals and Objectives

The objective of this Local Water Management Strategy (LWMS) is to achieve best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner. The objectives of total water cycle management, as described by the Water Resources State Planning Policy (WAPC, 2004) are to:

- Take into account total water cycle management and water-sensitive urban design principles;
- Ensure that the development is consistent with current best management practices and best planning practices for the sustainable use of water resources;
- Seek to achieve zero net variations in water quality and quantity, unless necessary to meet identified environmental water requirements;
- Promote management of the urban water cycle as a single system in which all urban water flows are recognised as a potential resource;
- Maximise the opportunities for compliance with best practice stormwater management including retention of stormwater on site/at the source;
- Promote the use of water conservation mechanisms that increase the efficient use of water, including stormwater;
- Incorporate the re-use and recycling of water, particularly stormwater and grey water, consistent with state water strategy recycling objectives. Alternative water sources should be considered where appropriate; and
- Promote the retention and use of local native vegetation in developments to minimise water use and maximise filtration, particularly where landscaping is proposed.

In order to achieve these objectives, the LWMS follows the principles of Water Sensitive Urban Design (WSUD).

## 2.2. Planning Background

Over the next three to four decades, Western Australia's population is set to double. As part of preparing for this growth and working to decentralise Western Australia's future population, the State Government devised a plan to make regional towns even more attractive places to live in the future. Therefore a plan to transform towns into SuperTowns was announced in July 2011.

The SuperTowns vision is to create well-connected communities with access to services, affordable housing, and a diverse range of lifestyle and employment opportunities. This will result in more choices for people living in regional areas and provide an attractive alternative to residing in the metropolitan area.

Katanning has been identified as one of a network of nine SuperTowns due to Katanning's growth potential, central location and demonstrated governance ability.

As part of the SuperTown initiative, five sites within Katanning have been targeted for the first stage in a Growth Plan to include industrial, commercial, residential and rural-residential development. These sites comprise:

- O'Callaghan Park;
- Piesse Park;
- Western Australian Meat Marketing Cooperative Ltd (WAMMCO);
- Industrial Expansion Area; and
- Warren Road (DIA 4).

This LWMS has been prepared to support the development of a detailed structure plan for the creation of a residential development at Piesse Park north of the Katanning town site between Synott Av, Warren Rd, Conroy St and Clive St.

## 2.3. Previous Studies

The following previous and supporting studies have been undertaken and provide relevant background data for the Industrial Expansion Area:

- Katanning District Water Management Strategy (Doc No. W-A1266.03, May 2014, Opus International Consultants);
- Structure Planning: Environmental Investigations (Doc No.TE14012_1b, November 2014, Talis Consultants Pty Ltd);
- Preliminary Geotechnical Study - Proposed Residential Development – Piesse Park, Katanning (Doc No. J1401161 002 R Rev 0, 26 September 2014, Galt Geotechnics); and
- Katanning Flood Assessment (Opus, 2013).

## 2.4. Level of Design

The LWMS has been prepared with the understanding that the proposed development and Lot boundaries are only at a conceptual level. The Lot boundaries and sizes, as well as road locations and public open space areas, are likely to be refined in the future. Therefore the LWMS has been prepared to outline the likely developer requirements and set out an agreed concept. However, it has been prepared to a high level and will need to be refined in the future when the proposed development configuration has been confirmed.

# 3. Proposed Development

## 3.1. Proposed Development

The proposed development is located at Lot 1 and Lot 3 Synnott Avenue and Lot 1 and Lot 79 Warren Street within the Shire of Katanning. The site consists of approximately 19.6ha of land located within the Katanning town site. The site is bounded by Synnott Avenue to the north, Taite Terrace, Adam Street and Fredrick Street to the north-east, Clive Street to the south-east, Starling Lane to the south-west and Warren Road to the west. **Figure 1** below shows the site location. **Figure 8** in Appendix A shows the proposed structure plan for the site.

Figure 1. Site Location

The site is currently zoned Residential, Recreation and Open Space, and Special Use, private club premises, under the Shire of Katanning Town Planning Scheme No. 4 and it is proposed to rezone the site to provide for a mix of residential development including medium density housing and potential aged accommodation around a high amenity lake and parkland revitalisation.

Previous land use over the site included parkland, an uncontrolled landfill, and a bowl's club.

**Figure 9** in Appendix A shows the Katanning Town Planning Scheme for the site.

# 4. Design Criteria

## 4.1. Water Conservation – Potable and Wastewater

- Ensure there is an adequate water supply to accommodate townsite and business growth;
- Develop a secure sustainable water management system;
- Treatment and conveyance of wastewater to enable an increase in the volume of re-use;
- Increase in the volume of suitable water that can be re-used; and
- Reduce reliance on scheme water through the promotion of suitable stormwater and wastewater.

## 4.2. Water Quantity Management

- Ensure existing drainage issues do not prejudice future development opportunities;
- Increase the volume of suitable water that can be re-used;
- Reduce reliance on scheme water through the promotion of suitable stormwater and wastewater;
- Ecological Protection – Maintain pre-development flow rates and volumes for the 1 year ARI event;
- Maintain or restore desirable environmental flows and/or hydrological cycles; and
- Flood Management – Maintain pre-development flow rates and volumes for the 100 year ARI event.

## 4.3. Water Quality Management

- Management to protect the health of existing creeks, wetlands and vegetation to improve water quality to treat nutrients at their source;
- Improve nutrient outputs; and
- Treat all runoff in the drainage network prior to discharge consistent with the Stormwater Management Manual.

## 4.4. Disease Vector and Nuisance Insect Management

- Design detention structures so that stormwater is fully infiltrated or discharged within 96 hours.

## 4.5. Groundwater

- Beneficially re-use the groundwater to reduce its impact on the environment and public infrastructure; and
- Implement controls to lower/limit the height of groundwater.

# 5. Pre-development Environment

## 5.1. Existing Site

The Site is generally clear with the exception of the bowl's club in the north-east corner, two man-made lakes, which are under construction, and Piesse Dam. **Figure 2** below shows the existing site.

Figure 2. Existing Site

The north-east portion of the site slope downwards from a north-easterly direction to a south-westerly direction. The northern half of the site sits between 320m AHD and 310m AHD, with the southern half of the site being relatively flat sitting at 310m AHD.

The majority of the site contains sparse vegetation.

## 5.2. Geotechnical

A geotechnical investigation was undertaken by Galt in September 2014. The investigation comprised of:

- A walkover of the site;
- Excavation of test pits at 12 locations to depths of 1.0m to 2.5m;
- Dynamic Cone Penetrometer (DCP) at each test pit location, extending to depths of 0.5m to 1.0m;
- Percolation testing for effluent disposal assessment at 3 locations at depths of between 0.2 to 0.3m; and
- Collection of representative samples from selected test pits for inspection and possible laboratory testing.

The investigation found that the site soils generally consist of:

- FILL: Clayey SAND/Silty SAND (SC/SM), fine to coarse grained, with some gravel, extending from the surface to a depth of 0.4m to 1.0m; overlying;
- Clayey SAND/Silty SAND /SAND (SC/SM/SP), fine to coarse grained, with some gravel, extending from the surface to a depth of 0.5m to 1.2m; overlying;
- Clayey SAND/Sandy CLAY (SC/CI), fine to coarse grained sand, with some fine grained gravel, extending from the surface to a depth of 1.0m to the maximum test pit depth of 2.5m; locally overying;
- Sandy CLAY (CI), fine to medium grained sand, extending from a depth of 0.6m to the maximum test pit depth of 2.5m.

A review of the Acid Sulphate Soils (ASS) potential for the site undertaken by Talis found that risk mapping is not available for the site, however a review of the CSIRO's ASRIS data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring.

## 5.3. Environmental

An environmental study was undertaken by Terratree in October 2014. The investigation comprised of a desktop study which included searches of the following databases:

- Department of Parks and Wildlife's Threatened and Priority Flora;
- Department of Parks and Wildlife's Threatened Fauna and Ecological Community;
- WA Herbarium's Declared Rare and Prioirty Flora;

- Department of the Environment's Protected Matters Search Tool; and
- Associated Level 1 flora and Level 1 fauna surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The study found that the site contains:

- 'Completely degraded' vegetation whereby the structure of the vegetation is no longer intact and the area is completely or almost completely without native species;
- Vegetation that is considered to have limited conservational values;
- No species of threatened flora were identified at the site;
- No fauna species of conservation significance were identified at the site;
- No threatened or priority ecological communities were identified within a 20km radius of the site;
- The site is not considered to be an Environmentally Sensitive Areas; and
- No ecological linkages of conservation significance within the site.

## 5.4. Surface Water

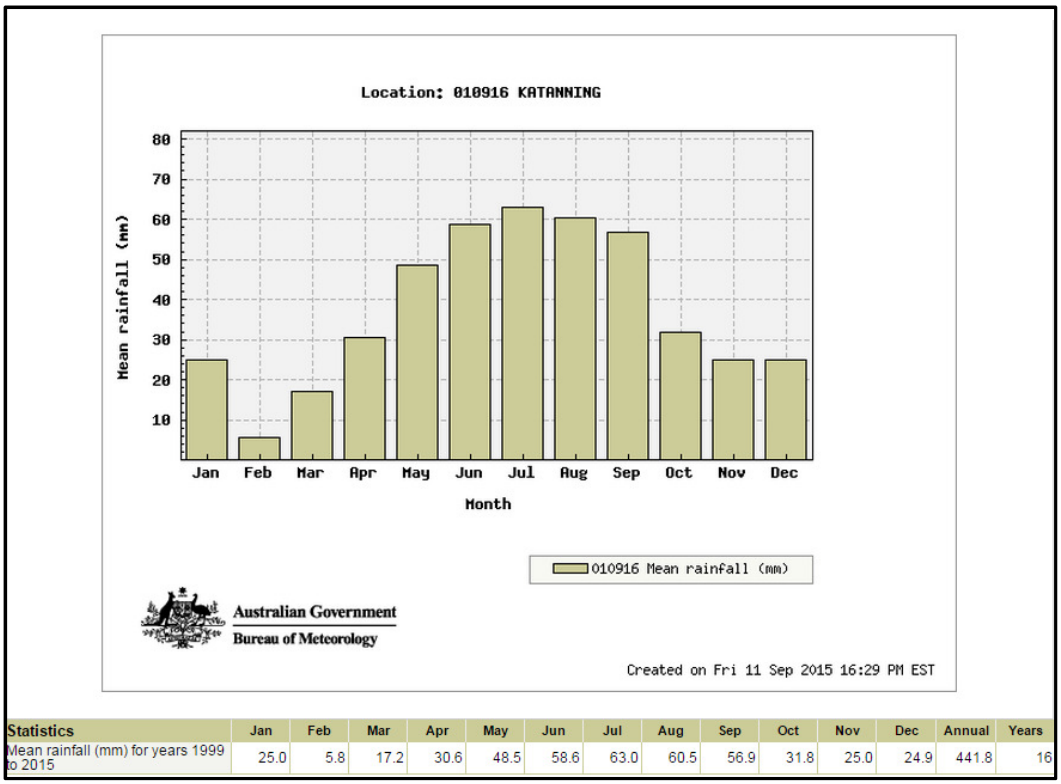
### 5.4.1. Topography

The north-east portion of the site slope downwards from a north-easterly direction to a south-westerly direction. The northern half of the site sits between 320m AHD and 310m AHD, with the southern half of the site being relatively flat sitting at 310m AHD. Water flows along the road to low points on Synnott Avenue and into the lots on the south side of Synnott Avenue towards Katanning Creek.

### 5.4.2. Rainfall

Most of the annual rainfall for Katanning occurs between May and September in association with the winter cold fronts. The long-term average annual rainfall for Katanning is 441.8mm.

**Figure 3** overleaf shows a rainfall occurrence chart for Katanning and **Figure 4** overleaf shows the Intensity Frequency Duration (IFD) table, both are obtained from the Australian Bureau of Meteorology.




| Statistics | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual | Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean rainfall (mm) for years 1999 to 2015 | 25.0 | 5.8 | 17.2 | 30.6 | 48.5 | 58.6 | 63.0 | 60.5 | 56.9 | 31.8 | 25.0 | 24.9 | 441.8 | 16 |

Figure 3. IFD Chart

Home | IFD Table | IFD Chart | Coefficients | ARI | Print IFD table | Help IFD table

## Intensity-Frequency-Duration Table

Location: 33.675S 117.550E Issued: 27/8/2015

Rainfall intensity in mm/h for various durations and Average Recurrence Interval

| | Average Recurrence Interval | | | | | | |
|---|---|---|---|---|---|---|---|
| Duration | 1 YEAR | 2 YEARS | 5 YEARS | 10 YEARS | 20 YEARS | 50 YEARS | 100 YEARS |
| 5Mins | 40.3 | 55.4 | 80.0 | 99.0 | 125 | 167 | 204 |
| 6Mins | 37.4 | 51.4 | 74.1 | 91.7 | 116 | 154 | 188 |
| 10Mins | 29.8 | 40.6 | 57.4 | 70.3 | 87.9 | 115 | 140 |
| 20Mins | 20.8 | 27.8 | 37.9 | 45.4 | 55.7 | 71.3 | 85.0 |
| 30Mins | 16.4 | 21.8 | 29.1 | 34.5 | 41.8 | 52.9 | 62.4 |
| 1Hr | 10.6 | 14.0 | 18.3 | 21.3 | 25.5 | 31.7 | 37.0 |
| 2Hrs | 6.78 | 8.88 | 11.4 | 13.2 | 15.7 | 19.4 | 22.5 |
| 3Hrs | 5.20 | 6.80 | 8.73 | 10.1 | 12.0 | 14.7 | 17.1 |
| 6Hrs | 3.31 | 4.32 | 5.53 | 6.38 | 7.57 | 9.31 | 10.8 |
| 12Hrs | 2.09 | 2.73 | 3.50 | 4.03 | 4.79 | 5.89 | 6.82 |
| 24Hrs | 1.29 | 1.69 | 2.18 | 2.50 | 2.98 | 3.67 | 4.25 |
| 48Hrs | .770 | 1.01 | 1.31 | 1.51 | 1.79 | 2.22 | 2.57 |
| 72Hrs | .560 | .730 | .943 | 1.10 | 1.31 | 1.62 | 1.89 |

(Raw data: 14.47, 2.84, 0.76, 27.23, 5.2, 1.43, skew=0.66, F2=4.88, F50=17.82)

© Australian Government, Bureau of Meteorology

Copy Table

Figure 4. IFD Chart

### 5.4.3. Pre-development Surface Water Flow

**Table 1** and **Figure 5** below provides the summary of the pre-development flows through the site.

Table 1. Pre-development Flows

| Pre-developed Catchment | Description | Area (km²) | Q1(m³/s) | Q5(m³/s) | Q100(m³/s) |
|---|---|---|---|---|---|
| CA01 | Whole of site. Discharge via Katanning Creek | 0.84 | 0.107 | 0.189 | 0.404 |

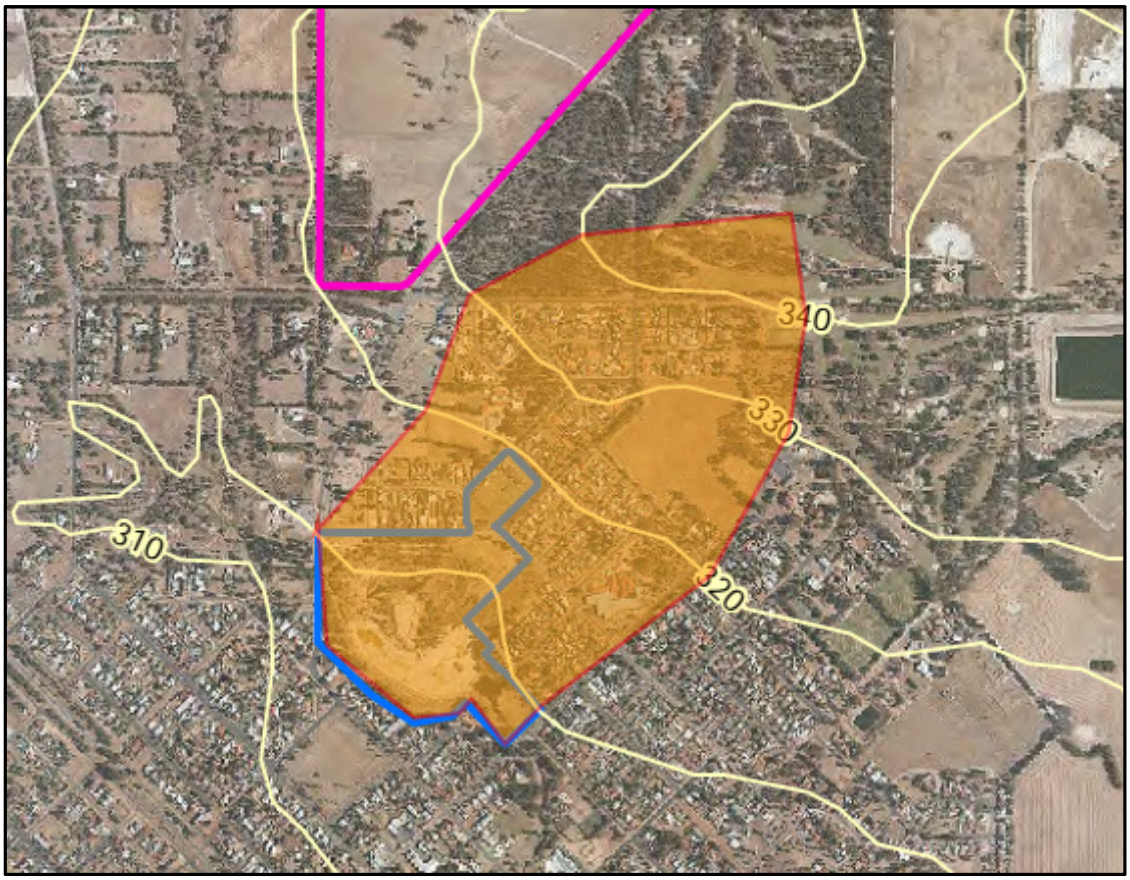



Figure 5. Pre-development Catchment Plan

### 5.4.4. Flood Modelling

One of the outcomes from the Katanning Flood Assessment (Opus 2013) was the compilation of an estimated Q100 flood level for the SuperTowns development scenario. The flood fringe area within the proposed development is shown in **Figure 6** overleaf, which highlights that a significant proportion of the site is expected to be affected by flooding during the 100 year event. The flooded area however is generally outside the proposed development footprint and is not likely to form a major constraint to development.

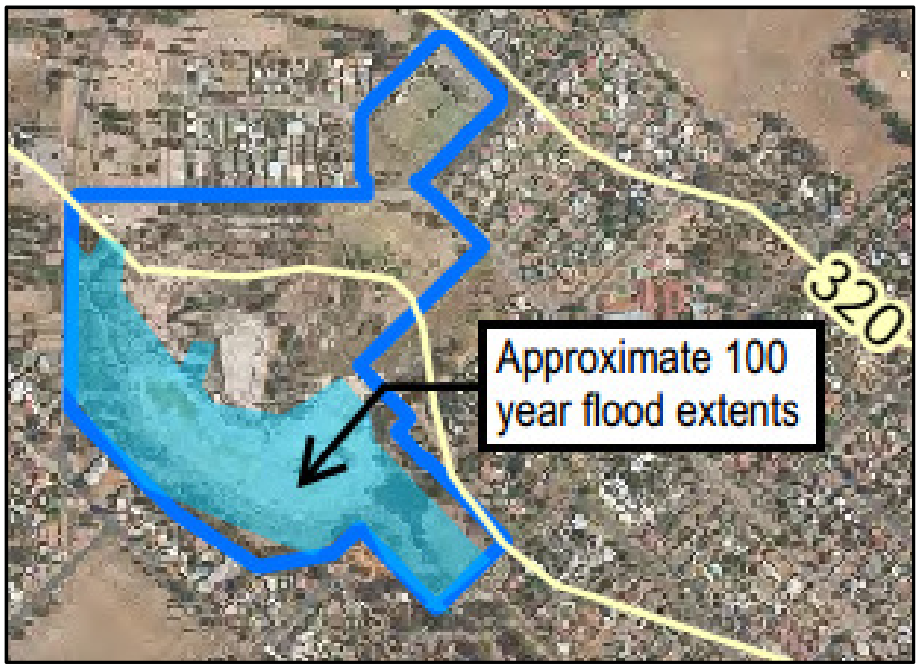



Figure 6. Pre-development 100 year flood extents

### 5.4.5. Surface Water Quality

As the majority of the proposed development area is currently undeveloped there are unlikely to be any major concerns with surface water quality, however as there is no treatment of stormwater this results in poor water quality within the Katanning Creek after rain events.

## 5.5. Groundwater

The District Water Management Strategy prepared by Opus provided several findings in relation to groundwater for Katanning which are summarised as follows:

- Approximately 60% of the town experiences groundwater within 2m of the surface;
- The groundwater is naturally collecting in the valley areas of the local landscape, but these areas become water logged as the groundwater is unable to flow away due to the low permeability of the clay/soil conditions;
- Due to the low hydraulic conductivity of the deeper subsoil, pumping to control groundwater levels has been generally unsuccessful; and
- Salinity is considered high as levels ranged from 1800 ppm up to 16,000 ppm.

The geotechnical investigation undertaken by Galt found perched water within two of the test pits at a depth of 0.8m north of Synnott Avenue and at a depth of 0.5m north of the lake construction. Ponding of surface water was observed in many locations around the site, Galt assessed that the ponded surface water was also perched

groundwater over the surficial clayey soils.

# 6. Water Use Sustainability Initiatives

## 6.1. Water Efficiency Measures

### 6.1.1. Landscaping

Any proposed vegetation should be waterwise native plants that do not require ongoing irrigation.

Open space areas are to be planted with drought-resistant local native species suited to the prevailing site conditions.

Any grass plantings to comprise of hardy grass species that require minimal irrigation beyond the first season and can cope with drying out in summer.

Plantings should be kept dense and compact to improve efficiency of any irrigation,

## 6.2. Water Supply

The development area has not been included in the Water Corporations water planning and therefore a reticulated water supply is not immediately available. Water Corporation advises that the proponent should arrange for water infrastructure planning to be undertaken. Notwithstanding this, it is expected that the development could be serviced from extension to the existing reticulation mains within the Katanning Townsite.

## 6.3. Wastewater Management

The development area has not been included in the Water Corporations water planning and therefore a reticulated wastewater connection is not immediately available. Water Corporation advises that the proponent should arrange for wastewater infrastructure planning to be undertaken. Notwithstanding this, it is expected that the development could be serviced from extension to the existing reticulation mains within the Katanning Townsite.

# 7. Stormwater Management Strategy

## 7.1. Flood Protection

As discussed in Section 5.4.4 the 100 year flood extent affects a significant portion of the subject land, but generally not within the development footprint. The existing flooding of the land is expected to be attributed to the capacity of Katanning Creek.

All future building floor levels are to be set at a minimum of 500mm above the 100 ARI flood levels.

The 100 ARI storm event will be directed away from the lots to the Katanning Creek by overland flow.

## 7.2. Manage Serviceability

The results of the Katanning Flood Assessment (Opus, 2013) showed that Katanning Creek had a 10 year ARI design storm hydraulic design capacity however, the existing piped and overland stormwater system is less than this. This has resulted in localised flooding throughout Katanning.

Therefore a 10 year ARI design storm has been adopted for the proposed development which is typical for business, commercial and industrial areas and intensely developed residential areas.

## 7.3. Drainage Concept

Given the low permeability of the site soils, on site infiltration within lots will not be possible. It is proposed to provide on-site detention storage within each lot with connection to the piped street drainage system. The piped street system will collect stormwater from lots and road reserves and convey these to a basin located at the interface with Piesse Lake. Runoff will be detained in this basin to discharge at predeveloped flow rates to Piesse Lake. The basin will be required to be lined with clay, or similar to prevent water infiltrating the ground and adding to groundwater.

## 7.4. Protect Ecology

Due to the fact that the groundwater levels and salinity across Katanning have caused environmental and infrastructure problems throughout Katanning, it is not recommended that infiltration systems are adopted as part of the treatment of stormwater.

Therefore to improve the quality of stormwater the inside of the basin will be heavily vegetated to trap and filter pollutants (suspended solids and trace metals). The vegetated area is to be sized at a minimum of 2% of the connected impervious area.

## 7.5. Drainage Plans

Drainage plans are shown in **Figure 7** overleaf.

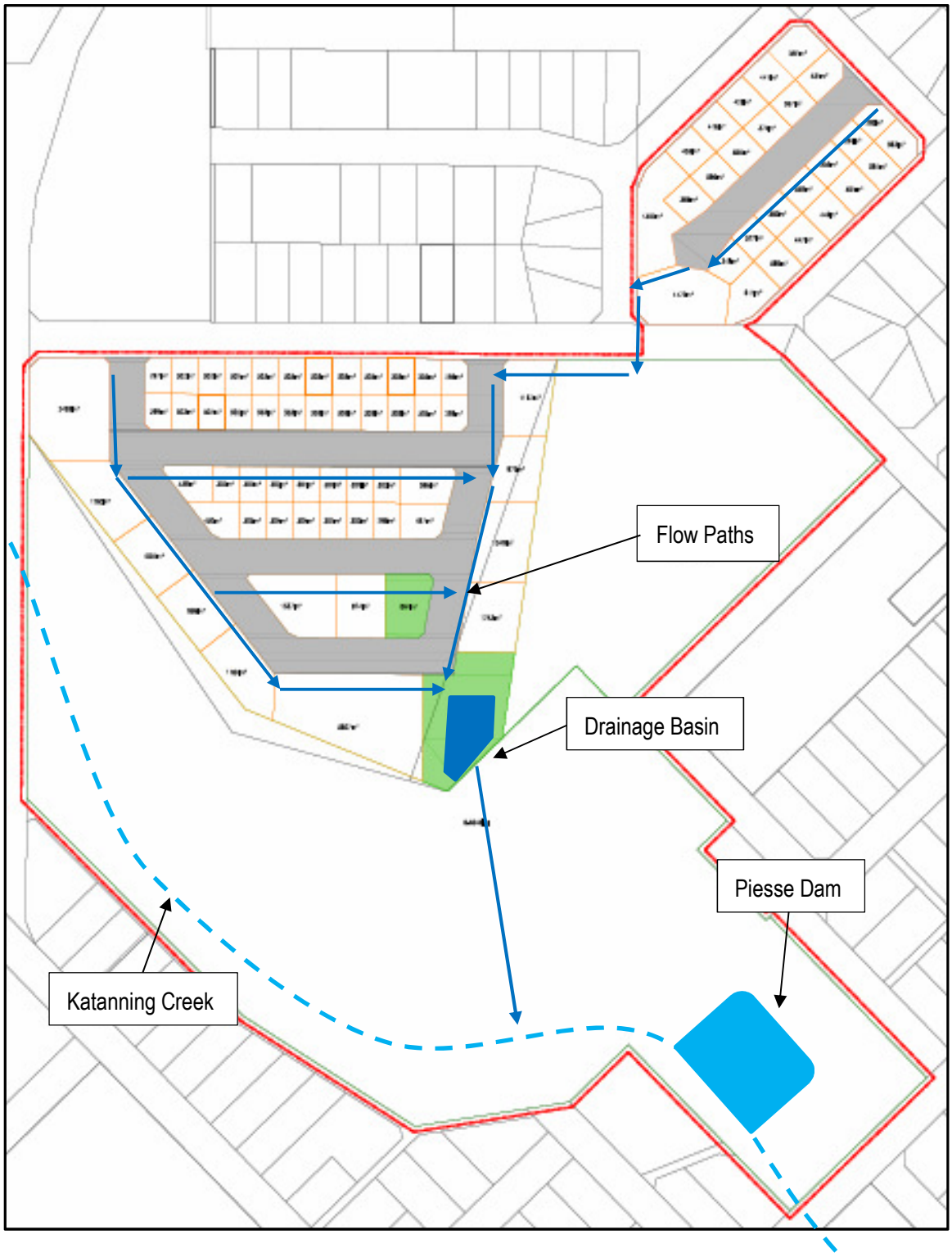



Figure 7. Proposed Drainage Plan

## 7.6. Basin Sizing

In order for the post-development flows to equal pre-development flows a basin is required.

Matching pre-development flows is achieved by installing a pipe inlet at the base of the basin for a 450mm pipe limiting the 5 year stormwater flow and an overland flow channel for the 100 year stormwater flow.

An estimate of required basin sizing is show in **Table 2**.

Table 2. Approximate Basin Sizing

| | Pre-development flow | Depth | Water Level | Slope | Base Area | Inundated Area | Top Area | Approximate Volume |
|---|---|---|---|---|---|---|---|---|
| **5 year** | 0.189 $m^3/s$ | 1 m | 0.219 m | 1:3 | 770 $m^2$ | 845 $m^2$ | 1139 $m^2$ | 954 $m^3$ |
| **100 year** | 0.404 $m^3/s$ | 1 m | 0.761 m | 1:3 | 770 $m^2$ | 1044 $m^2$ | 1139 $m^2$ | 954 $m^3$ |

# 8. Groundwater Management Strategy

## 8.1. Proposed Development Area

The geotechnical investigation undertaken by Galt only found perched water within two test pit within the proposed development. All other test locations did not encounter groundwater within the 1-2.5m pit depth.

The geotechnical consultant has recommended that the following be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements;
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas);
- Earthworks on this site be done in drier months of the year (November to April); and
- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.
- All basin and drains will need to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

## 8.2. Infiltration Trenches

The groundwater across Katanning has been causing water logging and salinity related issues to the environment and the built infrastructure for an extended period of time whilst the variety of historical groundwater pumping initiatives and study investigations have not been sustainably successful.

Due to the high groundwater table and salinity across Katanning, and the low hydraulic conductivity of the clay material, introducing desalination to treat the water to an appropriate level for its subsequent use as a non-potable water source is not economically viable.

Therefore it was recommended by Opus in the Katanning District Water Management Strategy that the groundwater is collected using low technology and low energy arrangements to lower the groundwater table rather than treat and reuse.

Opus recommended to allow the groundwater to flow downstream of Katanning under the effects of gravity (i.e., no annual operating costs to move/pump the groundwater), a network of shallow (<2m – 3m deep) infiltration trenches should be installed across Katanning.

Infiltration trenches have not been considered for this development area as water logging or high groundwater

levels are not an issue for this particular area.

Notwithstanding this, infiltration trenches can be retrofitted into the proposed open drains and within the Lots in the future if required.

# 9. Urban Water Management Plan

The Urban Water Management Plan (UWMP) is mostly and extension of the work developed through the District Water Management Strategy and LWMS stages and often requires further work to help define future requirements. The addition work includes;

- Groundwater quality monitoring at downstream points of each proposed Lot to develop trigger values and water quality improvement targets;
- Surface water quality monitoring at upstream and downstream sections of the Creek adjacent to the proposed development to develop trigger values and water quality improvement targets;
- Determination of post development monitoring points for groundwater and surface water quality and quantity;
- Determination of stormwater systems and management plans for each individual Lot;
- Detailed geotechnical investigation across building/construction footprints;
- Application for any groundwater extraction licences; and
- A dewatering management plan as required.

# 10. Monitoring

A monitoring program has been produced, as per **Table 3**, to allow quantitative assessment of hydrological impacts of proposed development within the area. In particular the program addresses the monitoring of surface water quality, and seasonal fluctuation of groundwater levels and quality within the development area. The program may need to be modified as data is collected to increase or decrease the monitoring effort in a particular area or to alter the scope of the program itself. Any modification to the program would require the agreement of all parties (Department of Water, Shire of Katanning and the developer). The program is designed to operate over a three year post-development period (After completion of 80% of the lots) including throughout construction to allow for time lag for full impacts of development on the receiving environment to occur.

Table 3. Approximate Basin Sizing

| Monitoring Type | Parameter | Method | Frequency | Reporting |
|---|---|---|---|---|
| Groundwater Quality | pH, Electrical Conductivity, Iron, Nitrogen, Phosphorus, major Cation and Anions | Pumped Bore Sample | Quarterly for 2 years pre-development and 3 years post-development (typically Jan, Apr, Jul and Oct). | Annual assessment reports to be submitted to Department of Water & Shire of Katanning for 3 years post-development.<br><br>Suitability of existing monitoring and reporting frequencies to be assessed annually with any modifications requiring agreement by all parties (Department of Water, Shire of Katanning, & Developer) |
| Surface Water Quality | pH, Electrical Conductivity, Total Suspended Solids, Iron, Nitrogen, Phosphorus, major Cation and Anions | Surface Collection (primarily within the Katanning Creek) | Monthly sampling when flowing, typically June to October for 5 years. Frequency to be reviewed following initial 12 month sampling period. | |
| Vegetation | Number of Dead Plants and Weeds | Visual Inspections | 3 years post-development | |
| Erosion | Signs of Erosion | Visual Inspections | 3 years post-development | |

# 11. Implementation

Roles and responsibilities for the proposed light industrial development are detailed in **Table 4**Table 4.

Table 4. Table of Responsibility

| Item | Development | Interim Maintenance (first three years) | Long-term Maintenance |
|---|---|---|---|
| Landscaping (within Road Reserve) | Developer | Developer | Council |
| Landscaping (within Lots) | Lot Developer | Lot Developer | Lot Developer |
| Swales and Drainage (within Road Reserve) | Developer | Developer | Council |
| Swales and Drainage (within Lots) | Lot Developer | Lot Developer | Lot Developer |
| Monitoring the Development | Developer | Developer | Council |
| Public Open Space Landscaping | Developer | Developer | Council |

# Figures

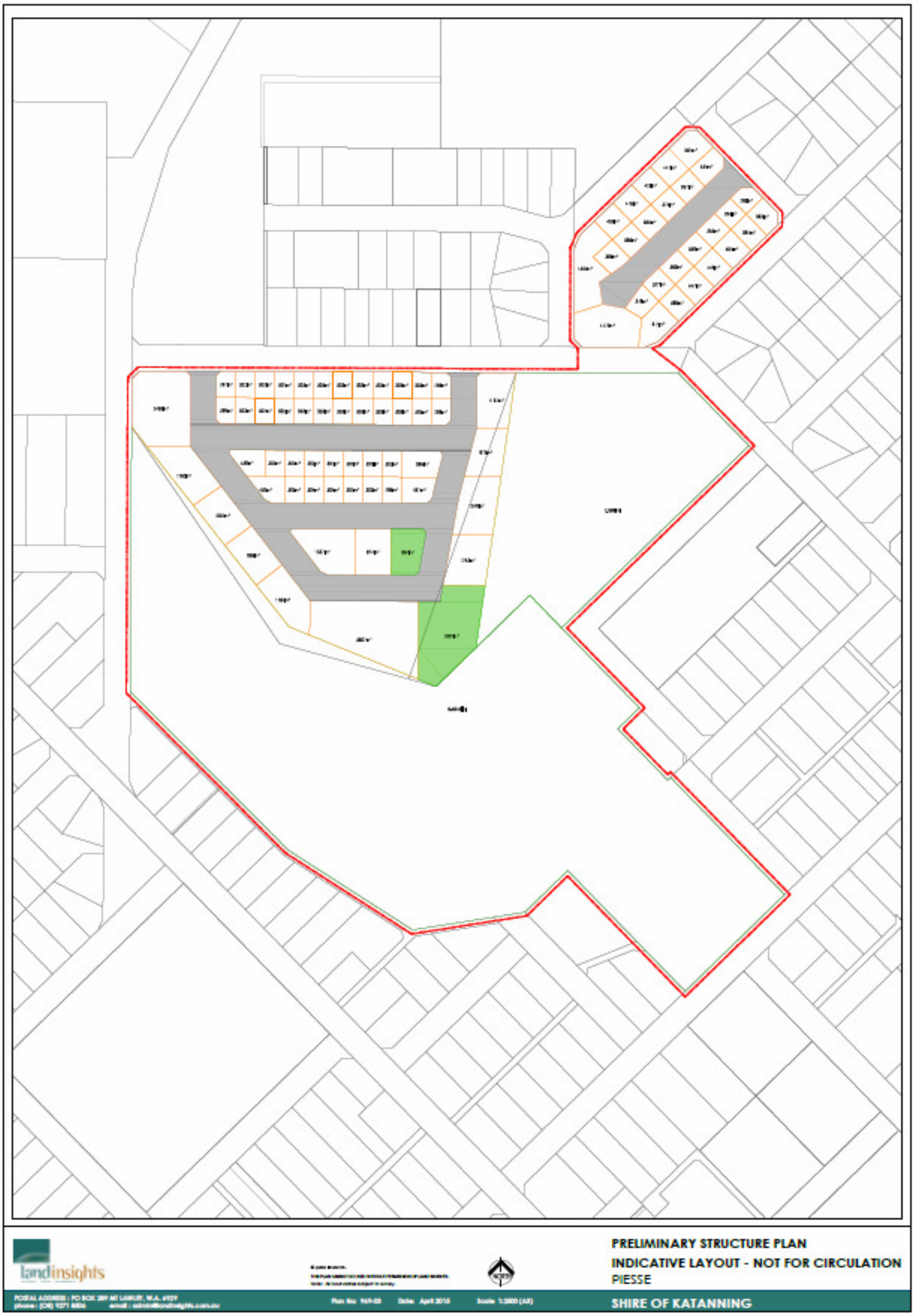



Figure 8. Proposed Structure Plan

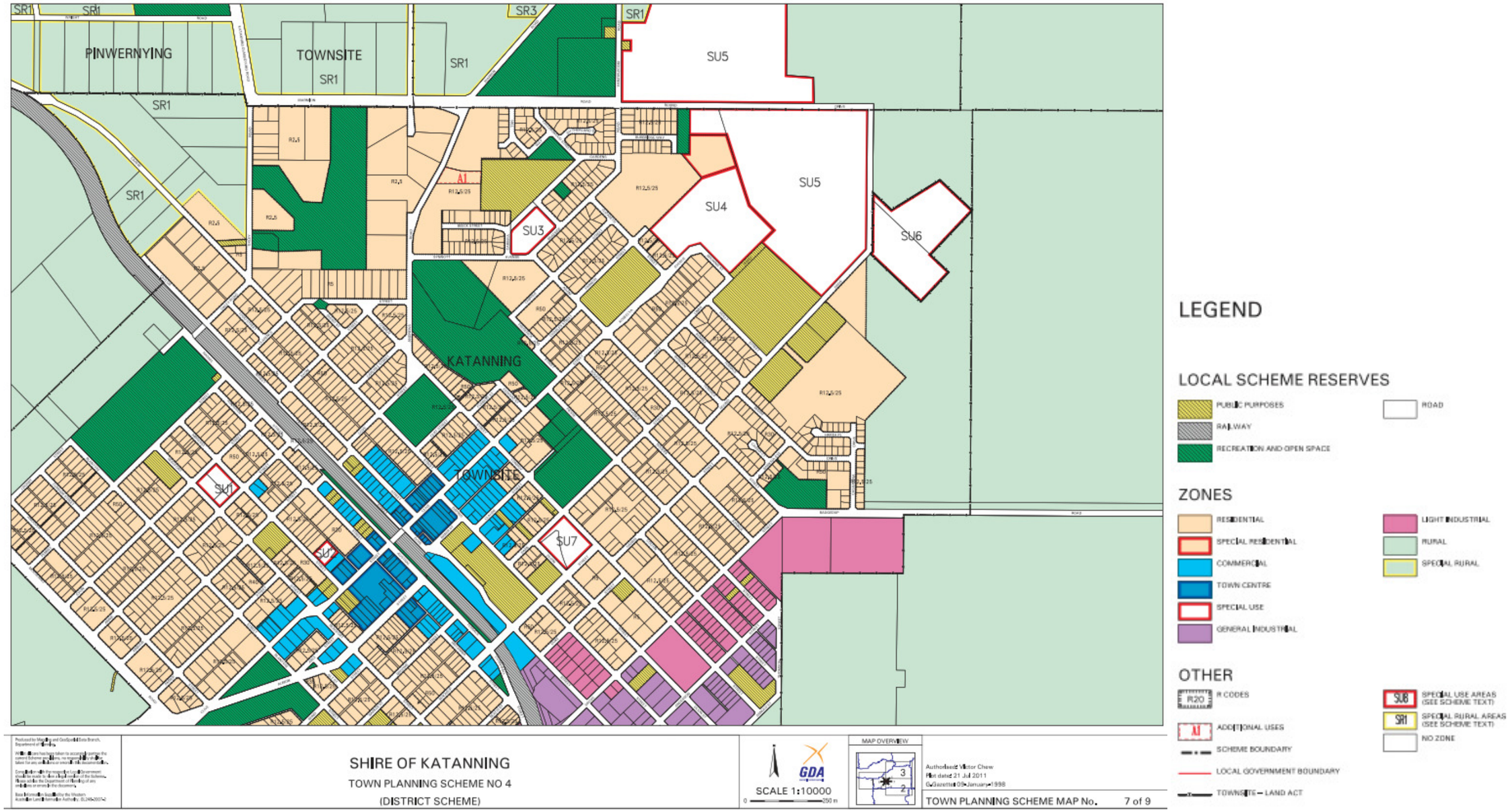



Figure 9. Katanning Town Planning Scheme

# APPENDIX 3
# Bushfire Hazard Assessment

# BUSHFIRE HAZARD ASSESSMENT

## KATANNING

**PROJECT NO: 14129**
**DATE: JULY 2014**

# Document Control Record

| | |
|---|---|
| **Site Details** | katanning |
| **Prepared By** | **Bushfire Prone Planning (BPP Pty Ltd)**<br>ABN: 39 166 551 784<br><br>M: 0438 946 285<br>Email: enquiries@bushfireprone.com.au |
| **Prepared For** | landinsight |
| **Reference** | 1488 |
| **Document Status and Date** | |

*Disclaimer: The measures contained in this Hazard assessment are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bush fire. All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to Bushfire Prone Planning at the time; and achievement of the level of implementation of fire precautions will depend among other things on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control. Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of the consultants, their servants or agents) arising out of the services provided by the consultants.*

Purpose of Report

*The Western Australian Planning for Bushfire Protection Guidelines Edition 2* and the Australian Standard, *AS 3959:2009 Construction of buildings in bushfire prone areas (AS 3959:2009)* are the guiding reference documents in Western Australia for subdivision and related development for rural and rural /urban interface to minimise the impact of fire on communities. In October 2014, the sites were assessed and the subsequent report and associated maps have been prepared as a strategic hazard assessment for consideration of the development of the Shire of Katanning Structure Plan.

The following Bushfire assessment maps accompany this report:

1. Bushfire Hazard Assessment- strategic
    - Piesse Park
    - OCallaghan
    - Wammco
    - Industrial Land
2. Classified Vegetation and Bushfire Attack Level Buffering – strategic
    - Piesse Park

## 1. Hazard Assessment

The map shows a broad brush assessment intended to be used at the strategic level planning stage to identify the suitability of an area for additional development and to determine if the area is bushfire prone.

The methodology classifies the bushfire hazard by assessing the predominant vegetation, this is the key to the initial determination of the site suitability for subdivision/development. If deemed suitable, the potential level of construction standard is determined by the application of *AS 3959:2009 Construction of buildings in bushfire prone areas* (AS 3959:2009). The methodology for the Hazard Assessment specifies three bush hazard levels as per the *Western Australian Planning for Bushfire Protection Guidelines Edition 2*:

- Low
- Moderate
- Extreme

This analysis forms the basis for land use and planning. Additional considerations may be required, for example increasing construction standards of homes and other performance criteria to reduce the impact of bushfire to an acceptable level.

Piesse Park

Piesse Park is a recreational park located north of the town centre and is predominately surrounded by residential lots. A bushfire Hazard Assessment was carried out and the Bushfire Hazard rating on the existing vegetation within the subject site was a combination of Low and Moderate (Refer Figure xx).

Note: The vegetation mapped at the moderate level within the subject site is low threat vegetation and can be excluded when defining Bushfire attack Levels (BAL) , as classified vegetation as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "maintained public reserves and parklands".

External to Piesse Park, the Bushfire Hazard is a combination of Low and Moderate. The vegetation within the waterway located to the north east of Piesse Park is rated as moderate (Refer Figure xx). All other areas 100 metres from Piesse Park boundary is rated as Low. The moderate area identified, at the BAL stage can be managed to achieve a low threat vegetation classification as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "nature strip".

WAMMCO

The WAMMCO site is a rural site located north east of the townsite and is bordered by residential properties to the south and south east, a combination of bushland and small land holdings to the east, rural land holding to the west and bushland to the north and the northern half of the eastern boundary. A bushfire Hazard assessment was carried out and the Bushfire Hazard rating on the existing vegetation within the subject site was a combination of Low and Moderate with a small percentage as extreme to the north (Refer Figure xx).

External to the WAMMCO site, the Bushfire Hazard is a combination of Low Moderate and Extreme. The threat external to the subject site is predominately Low and Moderate.

Industrial Land

The Industrial Land is predominately a rural site located east of the town site. Commercial sale yards are located in the north eastern section of the subject area. The western boundary is adjoining industrial and residential properties, the southern and northern adjoins rural farmland and the north boundary adjoins rural farmland and the towns refuse site. The refuse site is buffered by bushland. The Bushfire Hazard rating on the existing vegetation within the subject site is a combination of Low and Moderate and the external area is Low and Moderate (Refer Figure xx).

O'Callaghan Park

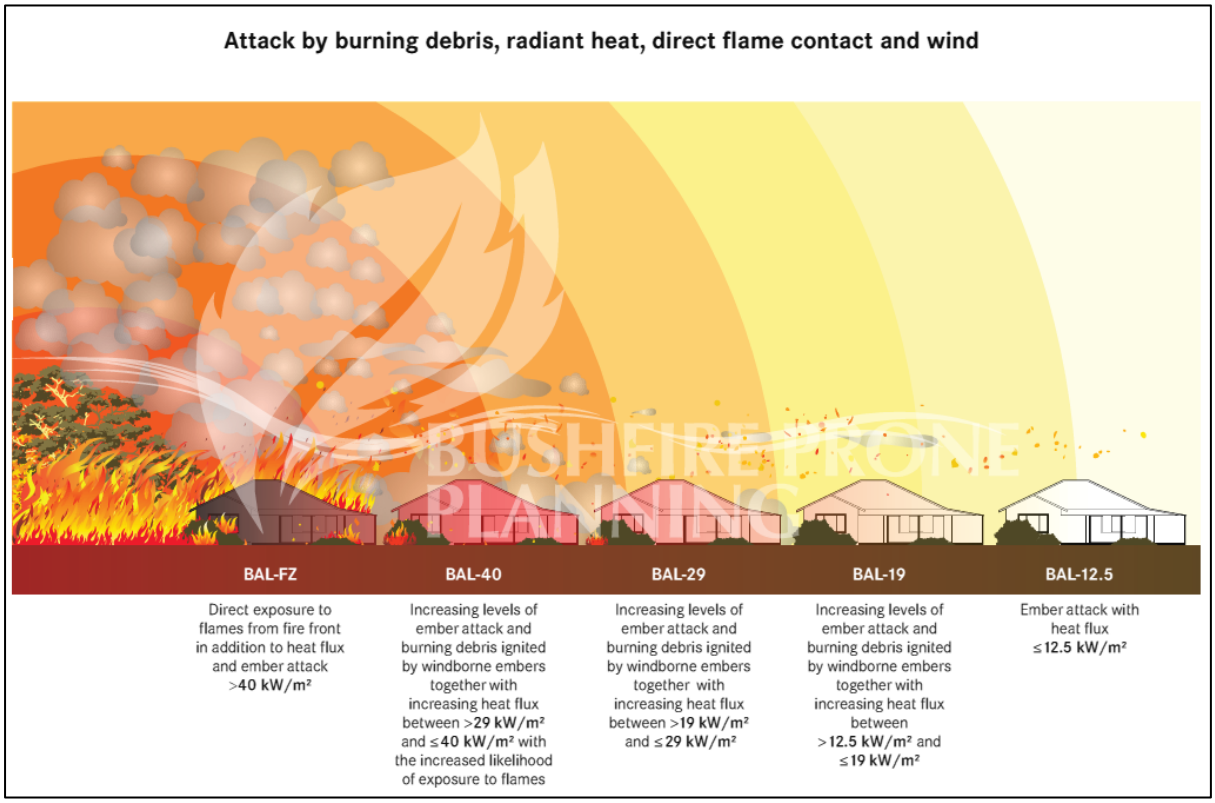
O'Callaghan Park is predominately bushland and part of this land is used as a training track for hoses. The Park is adjoined by small land holdings on all sides. The Bushfire Hazard rating on the vegetation within the subject site is a combination of Low, Moderate and extreme and the external area is rated as Low, Moderate and Extreme (Refer Figure xx).

## 2. Classified Vegetation and Bushfire Attack Level Buffering – strategic

The Bushfire Attack Levels detailed on the following maps complies with AS 3959:2009 requirements and rates bushfire attack using a combination of vegetation type, slope and distance from the predominant Classified Vegetation. In Western Australia it assumes a Forest Fire Danger Index (FFDI) of 80. The BAL assessment involves the following process in accordance with the AS 3959:2009 (Method 1);

- Determination of the area to be assessed
- Identification of vegetation type and class
- Determination of distance of the site from classified vegetation
- Determination of average slope (under the classified vegetation)
- Determination of a BAL
- Determination of construction standards

AS 3959:2009 has six categories of BAL. These categories are based on heat flux exposure thresholds and are summarised in the following Table.




As the distance from the Classified Vegetation is reduced, the construction standard for dwellings must be increased as detailed in Table xx

Table xx

| Classified Vegetation | BAL-12.5 | BAL-19 | BAL-29 | BAL-40 | BAL-FZ |
|---|---|---|---|---|---|
| Distance in metres from Classified Vegetation assuming 0 degrees (flat land) | | | | | |
| **Woodland** | 29-<100 | 20-<29 | 14-<20 | 10-<14 | <16 |

Piesse Park

Piesse Park is a recreational ground and has areas that are parkland cleared and areas that have been revegetated. The vegetation within the subject site is managed and meets the requirements under AS 3959: 2009, Section 2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas “maintained public reserves and parklands”. To the north west of Piesse Park is an area of vegetation, classified as woodland. The mapping shows BAL levels

as buffers and has used woodland as the classified vegetation and assumed 0 degrees as slope. The north western section of Piesse Park has been identified as having a BAL 12.5 and BAL 19 area. (Refer Figure xx). The area identified as BAL 12.5 and BAL 19 can be excluded if the identified vegetation to the north west is managed.

***Figure 2.*** **Bushfire Hazard Mapping** Piesse Park, Katanning

0 20 40 60 80 100
Meters

N W E S

LOCALITY

**LEGEND**

- Piesse Park
- Low Bushfire Hazard
- Moderate Bushfire Hazard
- Extreme Bushfire Hazard

BUSHFIRE PRONE PLANNING

Date: 16/09/2014

June 2014

***Figure 2.*** **Classified vegetation** Piesse Park, Katanning

# APPENDIX 4
# Transport Assessment

SHAWMAC

CONSULTING CIVIL & TRAFFIC ENGINEERS, RISK MANAGERS.

| | |
|---|---|
| Project: | Transport Assessment, Piesse Park, Preliminary Structure Plan, Shire of Katanning. |
| | V1 |
| Client: | Landinsights |
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# 1 Summary

Landinsights has prepared a Preliminary Structure Plan (PSP) for Piesse Park (site) which is bound by Synnott Street, Warden Road, Carinya Garden and Tait Street within the Townsite of Katanning. The site is situated to the north of the Katanning Townsite and is less than 1.0 km from the town centre. The land at the site consists of a bowling green and undeveloped recreational land.

The trip volumes per day are generated based on the land use type and have been derived from the ITE Guide, thus the predicted flows generated within the site are predicted to be 1,152 vpd.

The modeled network predicts that the traffic volumes on individual streets are at acceptable threshold levels and that connections to the existing footpath network located within the Katanning Townsite will be required.

The traffic generation and distribution exercise undertaken to quantify the traffic impact of the site indicate that site will have minimal impact on the function of the adjacent network.

Traffic Hierarchy indicates that the midblock cross section for internal roads is an Access Street.

On the basis of the assessment undertaken it is concluded that the proposed preliminary street network will have minimal impact on the surrounding road network.

# 2 Introduction and Background

Landinsights has prepared a Preliminary Structure Plan (PSP) for Piesse Park (site) which is bound by Synnott Street, Warden Road, Carinya Garden and Tait Street within the Townsite of Katanning. The site is situated to the north of the Katanning Townsite and is less than 1.0 km from the town centre. As part of the preparation of the PSP, the planners for the project (Landinsights) commissioned Shawmac to prepare a Transport Assessment for the site.

The intent of this transport assessment is to clearly demonstrate to the approving authority that the PSP would:

- provide safe and efficient access for all modes;
- be well integrated with the surrounding land uses;
- not adversely impact on the surrounding area; and
- not adversely impact on the surrounding transport networks and the users of those networks.

This version of the Transport Assessment has been prepared for review by the Shire of Katanning.

## 2.1 Locality Plan

The location of the site is shown on **Figure 1** and the PSP is shown Appendix B.

**Figure 1: Locality Plan**

An extract of the PSP is shown on **Figure 2**.

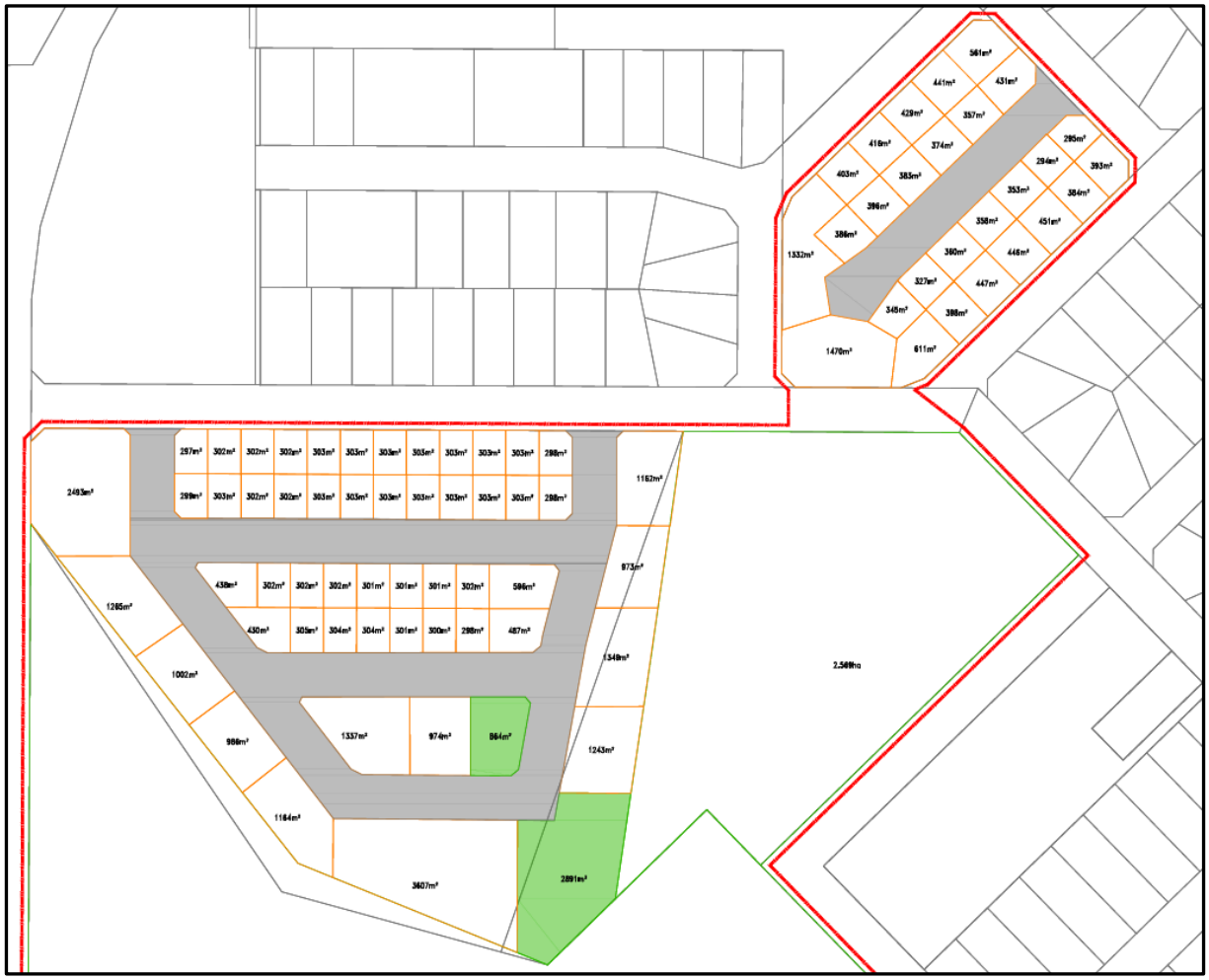


**Figure 2: Extract of Preliminary Structure Plan (PSP)**

Existing uses include:

- Recreation;
- Vacant Land.

Changes of use include:

- Residential;
- Public Open Space.

## 2.2 Subdivision proposal

### 2.2.1 Site Zoning

The site is currently zoned "Recreation and Open Space" and “Special Use” under the Shire of Katanning Local Planning Scheme (LPS) No. 4. An extract from the planning scheme is shown below in **Figure 3.**

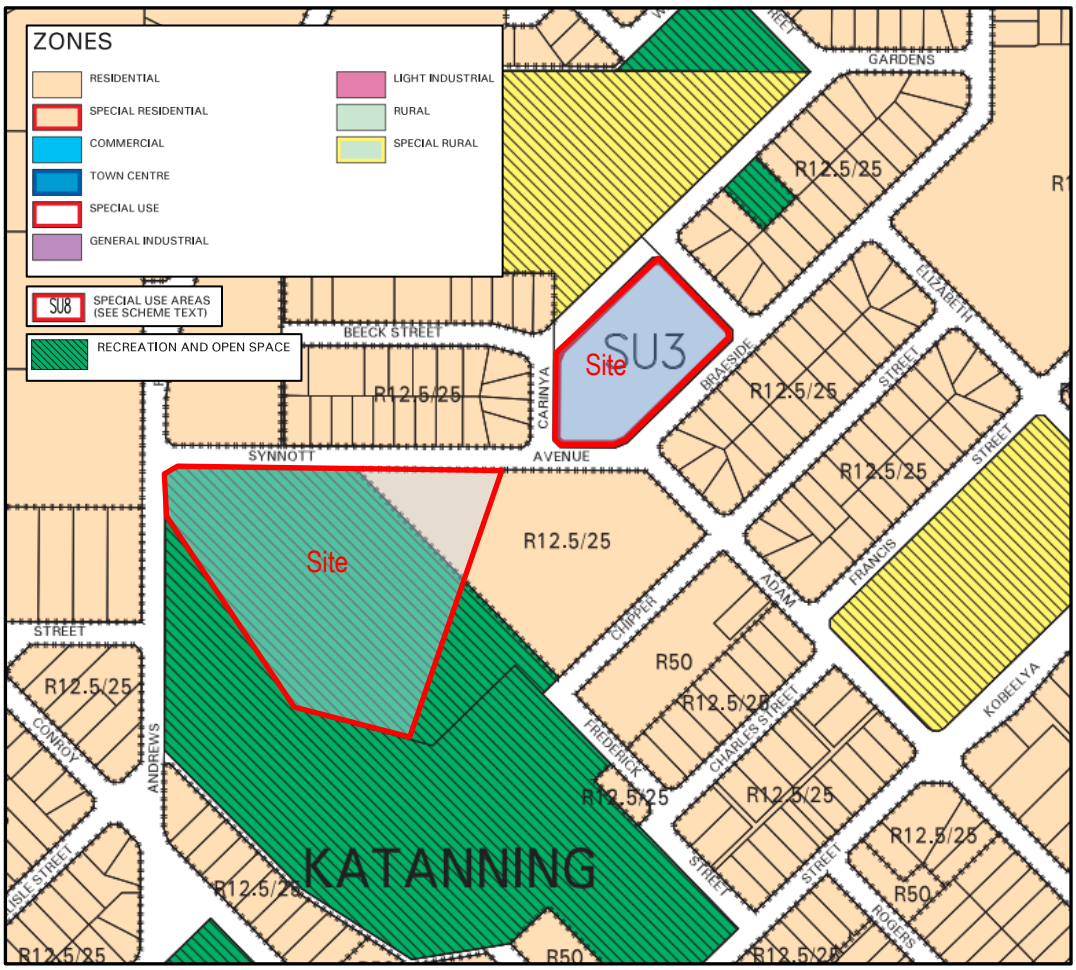



**Figure 3: Site Zoning Extract of LPS 4**

Proposed land use has been estimated from the PSP and is summarised in **Table 1**.

| Land Use | Quantum (ha) |
|---|---|
| Residential lots zoned R30 | 4.65 |
| Public Open Space / Drainage | 0.38 |

**Table 1: Proposed Land Use**

### 2.2.2 Issues

The site will need to be rezoned to accommodate the proposed Use.

### 2.2.3 Dwellings

| Land Use | Area (ha) | No of Dwellings |
|---|---|---|
| R30 (small Lots) | 2.55 (67 lots) | 67 |
| R30 (Large Lots) | 2.1(13 Lots) | 78 |
| Proposed POS | 0.38 | |
| **Total** | **5.03** | **145** |

**Table 2: Number of Dwellings**

# 3 Existing situation

## 3.1 Land Use

The land at the site consists of a bowling green and undeveloped recreational land. The adjoining properties surrounding the site are used for residential purposes **Figure 4** shows the existing situation.

**Figure 4: Existing Site (Source Google Maps)**

## 3.2 Existing Road Network

**Synnott Street**

Synnott Street is classified as an Access Road under the MRWA regional road hierarchy and is described as a sealed and kerbed single carriageway road with 5m wide traffic lanes.

Synnott Road has an urban speed limit of 50km/hr.

**Warren Road**

Warren Road is classified as an Access Road under the MRWA regional road hierarchy and at the site is described as an kerbed and sealed single carriageway road with 3m wide traffic lanes. A 1.5m wide concrete footpath is located in the southbound lane verge.

Warren Road has an urban speed limit of 50km/hr.

**Braeside Road**

Braeside Road is classified as an Access Road under the MRWA regional road hierarchy and at the site is described as a kerbed and sealed single carriageway road with 5m wide traffic lanes. A 1.2m wide concrete footpath is located in the southwest bound lane verge.

Braeside Road has an urban speed limit of 50km/hr.

**Tait Terrace**

Tait Road is classified as an Access Road under the MRWA regional road hierarchy and at the site is described as a kerbed and sealed single carriageway road with 5m wide traffic lanes. A 1.2m wide concrete footpath is located in the northwest bound lane verge.

Tait Road has an urban speed limit of 50km/hr.

**Carinya Garden** Carinya Garden Road is classified as an Access Road under the MRWA regional road hierarchy and at the site is described as a one way kerbed and sealed single carriageway road with provision for parking. A 1.2m wide concrete footpath is located within the southernmost verge.

Tait Road has an urban speed limit of 50km/hr and a posted school area limit of 40km/hr.

## 3.3 Existing Intersections

Table 3 summarises the existing intersections adjacent to the site.

| Road | Intersection details |
|---|---|
| Synnott Street/Warren Road | Channelised 3 way intersection. |
| Synnott Street/ Carinya Garden | Un-channelised 3 way intersection |
| Synnott Street/Braeside Road/ Adam Street | Un-channelised 3 way intersection |
| Carinya Garden/Tait Terrace | Un-channelised 3 way intersection |
| Braeside Road/Tait Terrace | Un-channelised 3 way intersection |
| Walters Road / Linton Road North | Un-channelised 3 way intersection |

**Table 3: Intersection Summary**

# 4 Proposed internal transport networks

Figure 5 below indicates the proposed internal transport routes and has been developed from predicted flows.

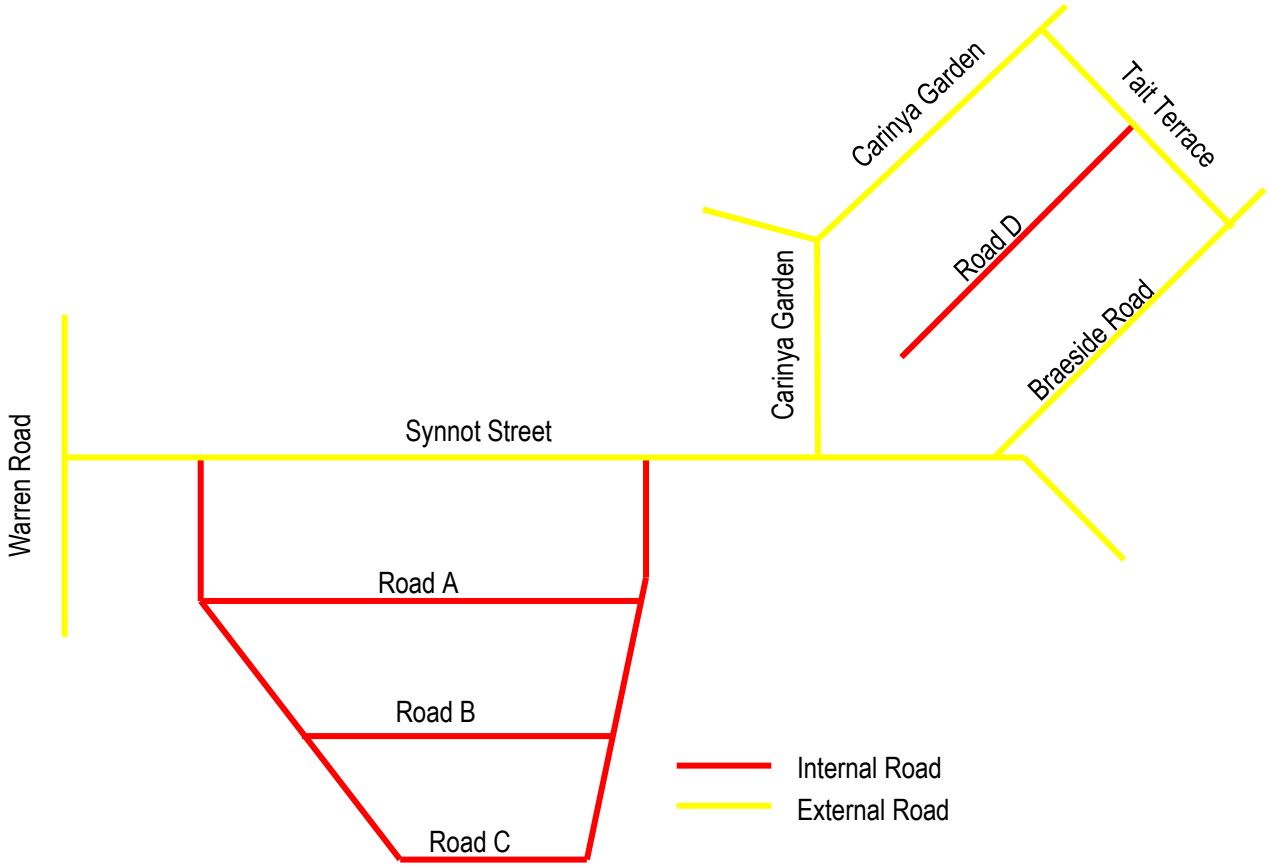



**Figure 5: Proposed Internal Road Network**

# 5 Changes to external transport networks

There are no known changes to the external road network in the immediate vicinity of the site.

# 6 Integration with surrounding area

## 6.1 Major attractors and generators

Major attractors and generators are shown on **Figure 6**.

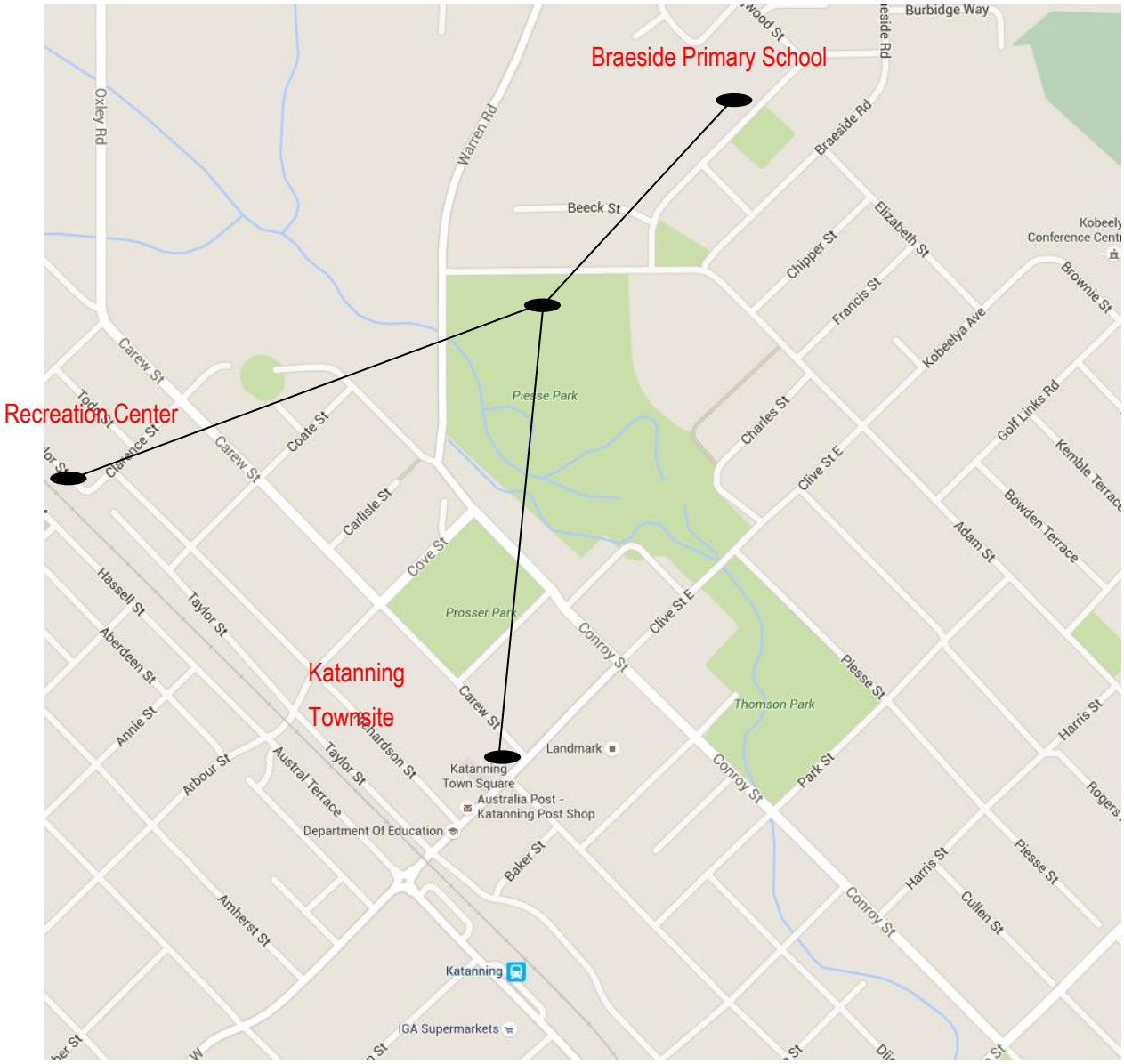



**Figure 6: Attractors and Generators**

Key attractors are likely to be:

- The Breaside Primary School;
- The Recreation centre; and
- Residential and commercial areas within the Katanning Townsite.

## 6.2 Main desire lines

Main desire lines are identified in section 6.1 with an assumed split shown on **Figure 7**.

**Figure 7: Assumed Traffic Split**

## 6.3 Gap analysis.

An assessment was carried out to determine whether or not the existing transport networks, plus any proposed changes, would adequately match predicted desire lines. It is assumed that all lots will be serviced via the internal roads within the site and that footpaths are included as part of the road network. External to site it is noted that the footpath network does not extend to the site and that this will need to be constructed as part of the development.

# 7 Analysis of transport networks

## 7.1 Introduction

Section 2 of the assessment provides a description and an inventory of the proposal and surrounding area with respect to land uses and transport networks. The following sections provide a more detailed quantitative analysis of the proposed internal and external transport networks to demonstrate that they will provide a high level of accessibility and safety for all modes.

## 7.2 Assessment years

Assessment is based on the full development of the site and is taken as being 2015.

## 7.3 Time periods for assessment

The assessment is based on analysis of expected peak traffic flows for the site.

# 8 TRAFFIC GENERATION

## 8.1 Subdivision Generated Traffic

Vehicle trip generation rates are based on the following recognised land use traffic generation databases:

- Land Use Traffic Generation Guidelines, March 1987 - Director General of Transport, South Australia;
- Guide to Traffic Generating Developments Version 2.2, October 2002 – Roads and Traffic Authority, New South Wales; and
- Trip Generation 7th edition, 2003 - Institute of Transportation Engineers, Washington, USA.

Assessed generation is shown on Table 4 based on Traffic Assessment Zones (TAZ's) shown on Figure 8.

**Figure 8: Traffic Assessment Zones**

The trip volumes per day are generated based on planning codes and land use type and have been derived from the ITE Guide. Trip volumes are shown in Table 4.

| Traffic Assessment Zone (TAZ) | Area ($m^2$) | Number of Dwellings | Number of Trips | Total V/d |
|---|---|---|---|---|
| 1 | 3622 | 12 | 8 | 96 |
| 2 | 3625 | 12 | 8 | 96 |
| 3 | 3145 | 9 | 8 | 72 |
| 4 | 2729 | 8 | 8 | 64 |
| 5 | 2311 | 8 | 8 | 62 |
| 6 | 6912 | 23 | 8 | 184 |
| 6A | 3607 | 12 | 8 | 96 |
| 7 | 7727 | 26 | 8 | 206 |
| 8 | 3130 | 7 | 8 | 56 |
| 8A | 2802 | 9 | 8 | 75 |
| 9 | 2342 | 7 | 8 | 56 |
| 10 | 2327 | 7 | 8 | 56 |
| 11 | 2250 | 5 | 8 | 40 |
| Total | 64529 | 145 | 104 | 1,159 |

**Table 4: Estimated Daily Traffic**

Using the QRS II software, traffic flows were assigned to the network as shown on Figure 9.

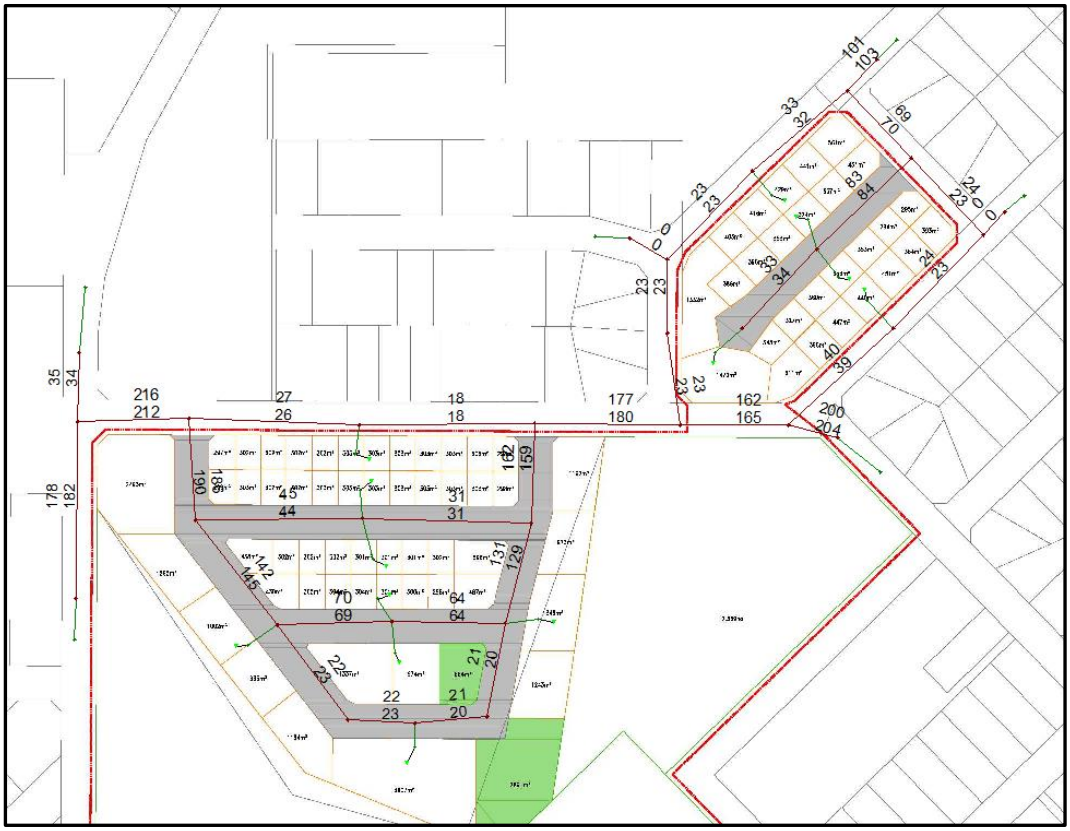


**Figure 9: Subdivision Generated Traffic**

## 8.2 Non subdivision traffic

Traffic data obtained from the Shire of Katanning are shown Appendix A and indicate that Warren Street east of Braeside Road carrries 292 vpd (weekdays) and that Adam Road south Braeside Road carries 760 vpd. Other counts supplied include traffic volumes at Clive Street East, east of Richardson Street (4,623 vpd) which is the main town street and a significant distance from the site, however these have been used to interpolate daily traffic for Warren Street south of Synnott Street. Additionally the traffic count for Adam Street has been used to estimate flows along Braeside Road and Carinya Garden.

Table 5 shows the existing traffic daily traffic volumes compared with the future daily traffic volumes predicted as part of the PSP.

**Table 5: Predicted Traffic Volumes**

| Road Name | Existing Traffic Volumes (vpd) | Predicted Traffic Volumes (vpd) | Total (vpd) |
|---|---|---|---|
| Warren Street North of Synnott Street<br>Warren Street South of Synnott Street | 292<br>*1,217 (Est) | 69<br>450 | 361<br>1,667 |
| Adam Street | 760 | 404 | 1,164 |
| Synnot Street | 1,217 | 428 | 1,645 |
| Braeside Road | *532 (Est) | 79 | 611 |
| Carinya Garden | *228 (Est) | 206 | 434 |
| Tait Street | *160 (Est) | 139 | 299 |

*Est (Estimated value), 20% of Clive Street East Traffic Count plus Warren Street count north of Synnott, 70% of Adam Street Count, 30% of Adam Street Count, 30% of Braeside Road.

## 8.3 Roads and intersections

### 8.3.1 Mid Block Cross Sections

Road cross section requirements have been based on recommendations contained within Liveable Neighborhoods and the Austroads Guide to Traffic Engineering Practice which requires the following:

| Indicative volume. | Route type / name. | Indicative Reserve Width. | Indicative Carriageway Width. |
|---|---|---|---|
| 50,000. | Primary Distributor. | | Determined by Main Roads WA |
| 35,000. | Primary Distributor. | | Determined by Main Roads WA |
| 15,000 to 35,000. | Integrator Arterial A (District Distributor A). | 50.6 – 52.6 metres. | 2 x 8.2 metre carriageways including bike lane and 2 x 5.5 metre service roads containing parking. |
| <25,000 | Integrator Arterial A (District Distributor A). | 35.6 metres. | 2 x 10.7 metre carriageways including combined on street parking and bike lane. |
| 7,000 to 15,000. | Integrator Arterial B (District Distributor B). | 29.2 metres. | 2 x 7.5 metre carriageways with on street parking and bike lane. |
| 15,000. | Integrator Arterial B (District Distributor B). | 25.2 metres. | 2 x 7.5 metre carriageways with on street parking. |
| 7,000. | Neighborhood Connector A. | 24.4 metres | 2 x 7.1 metres including parking, on street bike lane, median plus shared path on one verge. |
| 3,000. | Neighborhood Connector B. | 19.4 metres | 11.2 metres including parking plus shared path on one verge. |
| 3,000. | Access Street A (Avenue). | 20 - 24 metres. | 2 x 3.5 metre lanes plus indented parking. |
| 3,000. | Access Street B (Wider street). | 16.5 - 18 metres. | 9.7 metre lane. |
| 3,000. | Access Street C (Yield or give way street). | 15.4 - 16 metres. | 7.2 (7.0 – 7.5) metre lane. |
| 1,000. | Access Street D (Narrow yield or give way street). | 14.2 metres. | 5.5 – 6.0 meter lane. |
| 150 | Access Street D (Narrow yield or give way street). | 14.2 metres. | 3.5 metre lane plus parking indents. |
| 3,000. | Access Street D (Wider street). | 16.5 - 18 metres. | 9.7 metre lane. |

**Table 6: Road Hierarchy Criteria**

Based on these criteria, road requirements are as shown on **Table 6.** Note the cross sections have been modified from the indicative widths shown on **Table 7**; however the capacity has been maintained consistent with the intent of the Livable Neighborhoods Criteria.

| Road | Predicted Volume (vpd). | Reserve Requirement. | Carriageway Requirement. | Recommended Road Reserve Width 9 (from Table 4) |
|---|---|---|---|---|
| Warren Road | Up to 1,667 | Access Road | 5.5 – 6.0 meter lanes. | Existing |
| Synnott Road | Up to 1,645 | Access Road | 5.5 – 6.0 meter lanes. | Existing |
| Adam Street | Up to 1,164 | Access Road. | 5.5 – 6.0 meter lanes.. | Existing |
| Braeside Road | Up to 611 | Access Road. | 5.5 – 6.0 meter lane. | Existing |
| Carinya Garden | Up to 434 | Access Road. | 5.5 – 6.0 meter lane. | Existing |
| Tait Street | Up to 299 | Access Road. | 5.5 – 6.0 meter lane. | Existing |
| Road A | Up to 99 | Access Road. | 5.5 – 6.0 meter lanes.. | 14m |
| Road B | Up to 130 | Access Road. | 5.5 – 6.0 meter lane. | 14m |
| Road C | Up to 45 | Access Road. | 5.5 – 6.0 meter lane. | 14m |
| Road D | Up to 167 | Access Road. | 5.5 – 6.0 meter lane. | 14m |

**Table 7 Road Cross Sections**

### 8.3.2 Intersection Analysis

Internal peak hour traffic volumes within the development are generally small and as such negligible impacts are predicted. The capacity of an intersection has been evaluated using warrants for analysis for each intersection as shown in Table 8.1 of Austroads Guide to Engineering Practice Part 2, Roadway Capacity were applied to determine which intersections required capacity analysis. Peak hour traffic volumes were assumed to be approximately 10% of predicted daily traffic.

| Intersection | Hourly volume major road | Hourly volume minor road | Comment. |
|---|---|---|---|
| Warrants as per Table 8.1 of Austroads Guide to Engineering Practice Part 2, Roadway Capacity - Two Lane Major Road Cross Road | 400 vph<br>500 vph<br>650 vph | 250 vph<br>200 vph<br>100 vph | Table details flows that initiate intersection analysis. As major flows increase, there is reduced capacity to accept minor flows. |
| Warren Road /Synnott Road | 167 | 165 | 3 way intersection – Analysis not required. |
| Adman Street /Braeside Road | 116 | 61 | 3 way intersection – Analysis not required. |
| All others intersections | <100 | <100 | Analysis not required. |

**Table 8: Analysis Warrants**

## 8.4 Pedestrian / cycle networks

A review of the pedestrian facilities indicate that the extension of the local footpath and cycleway networks will be required to provide connections for the PSP.

## 8.5 Access to public transport

The site has no access to public transport.

# 9 Analysis of external transport networks

## 9.1 Design traffic flows on external road network

Design traffic flows on the external network as affected by the proposal are covered in section 7.

## 9.2 Impact on external roads

The impacts of design traffic flows on the external network as affected by the proposal are covered in section 8.

## 9.3 Impact on external intersections

Impacts on external intersections are not expected.

## 9.4 Pedestrian / cycle networks

Footpath / cyclepaths are not identified within the PSP.

# 10 Safety issues

A review of the overall transport proposal for the site did not identify any specific issues that present unacceptable risks to the road user or that cannot be managed through appropriate design protocols.

Road hazards are typically present at intersections and may be manifest through inadequate sight distance, inappropriate geometry or substandard capacity that promotes undesirable and potentially hazardous movements.

For the new roads, the allocation of adequate road reservation width and truncation of corners will generally allow sight distance requirements to be accommodated in the detailed design phase of the project. Geometric standards prescribed by Austroads and Main Roads WA guidelines will ensure that no unacceptable risk is introduced into the road environment.

Detailed design undertaken as part of the Development Application process would need to define at least the following elements:

- Road cross sections including lane widths, on-road cycle lanes, path widths and provisions for people with disabilities;
- Intersection geometries;
- Pedestrian and cycle facilities (cross sections, crossing requirements and ramps).

# 11 Noise

Impacts associated with noise are not expected.

# 12 Conclusions

The traffic generation and distribution exercise undertaken to quantify the traffic impact of the site indicate that the site will have minimal impact on the function of the adjacent network.

The trip volumes per day are generated based on the land use type and have been derived from the ITE Guide, thus the predicted flows generated within the site are 1,152 vpd.

Traffic Hierarchy indicates that the midblock cross section for internal roads is an Access Street.

Connection to the existing Townsite footpath and cyclepath network will be required.

Thus on the basis of the assessment undertaken it is concluded that the proposed preliminary street network will have minimal impact on the surrounding road network.

# 14 Appendix A Traffic Counts

# Daily Classes

**DailyClass-533**
**Site:** clive st east.0.0EW
**Description:** **10 mtrs east of richardson st**
**Filter time:** **12:28 Friday, 1 May 2015 => 15:52 Wednesday, 27 May 2015**
**Scheme:** Vehicle classification (AustRoads94)
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

Monday, 4 May 2015

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon | 4291 | 44 | 195 | 28 | 17 | 1 | 7 | 1 | 0 | 0 | 0 | 0 | 4584 |
| (%) | 93.6 | 1.0 | 4.3 | 0.6 | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 4129 | 46 | 212 | 20 | 20 | 0 | 7 | 1 | 3 | 0 | 1 | 0 | 4439 |
| (%) | 93.0 | 1.0 | 4.8 | 0.5 | 0.5 | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | |
| Wed | 4272 | 48 | 212 | 20 | 18 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 4574 |
| (%) | 93.4 | 1.0 | 4.6 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | |
| Thu | 4269 | 44 | 197 | 17 | 11 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 4545 |
| (%) | 93.9 | 1.0 | 4.3 | 0.4 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri | 4689 | 43 | 206 | 22 | 7 | 1 | 5 | 2 | 1 | 0 | 1 | 0 | 4977 |
| (%) | 94.2 | 0.9 | 4.1 | 0.4 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat | 3390 | 60 | 125 | 4 | 4 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 3589 |
| (%) | 94.5 | 1.7 | 3.5 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun | 2289 | 39 | 75 | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2408 |
| (%) | 95.1 | 1.6 | 3.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entire week | | | | | | | | | | | | | |
| | 3904 | 45 | 174 | 16 | 11 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 4158 |
| (%) | 93.9 | 1.1 | 4.2 | 0.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Weekdays | | | | | | | | | | | | | |
| | 4329 | 44 | 203 | 20 | 14 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 4623 |
| (%) | 93.6 | 1.0 | 4.4 | 0.4 | 0.3 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Weekend | | | | | | | | | | | | | |
| | 2839 | 49 | 100 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2998 |
| (%) | 94.7 | 1.6 | 3.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

# Daily Classes

**DailyClass-530**
**Site:** Adam st.0.0NS
**Description:** **Adam st 19.5 mtrs south of Braeside**
**Filter time:** **13:41 Wednesday, 12 January 2011 => 10:41 Thursday, 3 February 2011**
**Scheme:** Vehicle classification (AustRoads94)
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

**Monday, 17 January 2011**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon | 618 | 10 | 21 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 653 |
| (%) | 94.6 | 1.5 | 3.2 | 0.2 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 789 | 11 | 28 | 8 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 839 |
| (%) | 94.0 | 1.3 | 3.3 | 1.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | |
| Wed | 656 | 6 | 21 | 5 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 692 |
| (%) | 94.8 | 0.9 | 3.0 | 0.7 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu | 731 | 7 | 15 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 759 |
| (%) | 96.3 | 0.9 | 2.0 | 0.0 | 0.4 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri | 809 | 16 | 20 | 7 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 861 |
| (%) | 94.0 | 1.9 | 2.3 | 0.8 | 0.8 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat | 552 | 10 | 10 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 578 |
| (%) | 95.5 | 1.7 | 1.7 | 0.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun | 500 | 6 | 10 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 521 |
| (%) | 96.0 | 1.2 | 1.9 | 0.8 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

**Average daily volume**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Entire week** | | | | | | | | | | | | | |
| | 665 | 9 | 17 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 700 |
| (%) | 95.0 | 1.3 | 2.4 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| **Weekdays** | | | | | | | | | | | | | |
| | 720 | 9 | 20 | 3 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 760 |
| (%) | 94.7 | 1.2 | 2.6 | 0.4 | 0.4 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| **Weekend** | | | | | | | | | | | | | |
| | 526 | 8 | 10 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 549 |
| (%) | 95.8 | 1.5 | 1.8 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

# Daily Classes

**DailyClass-531**
**Site:** Warren rd.0.0WE
**Description:** **Warren rd 100 mtrs East of Braiside rd**
**Filter time:** **15:18 Thursday, 8 December 2011 => 10:41 Wednesday, 8 February 2012**
**Scheme:** Vehicle classification (AustRoads94)
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

Monday, 19 December 2011

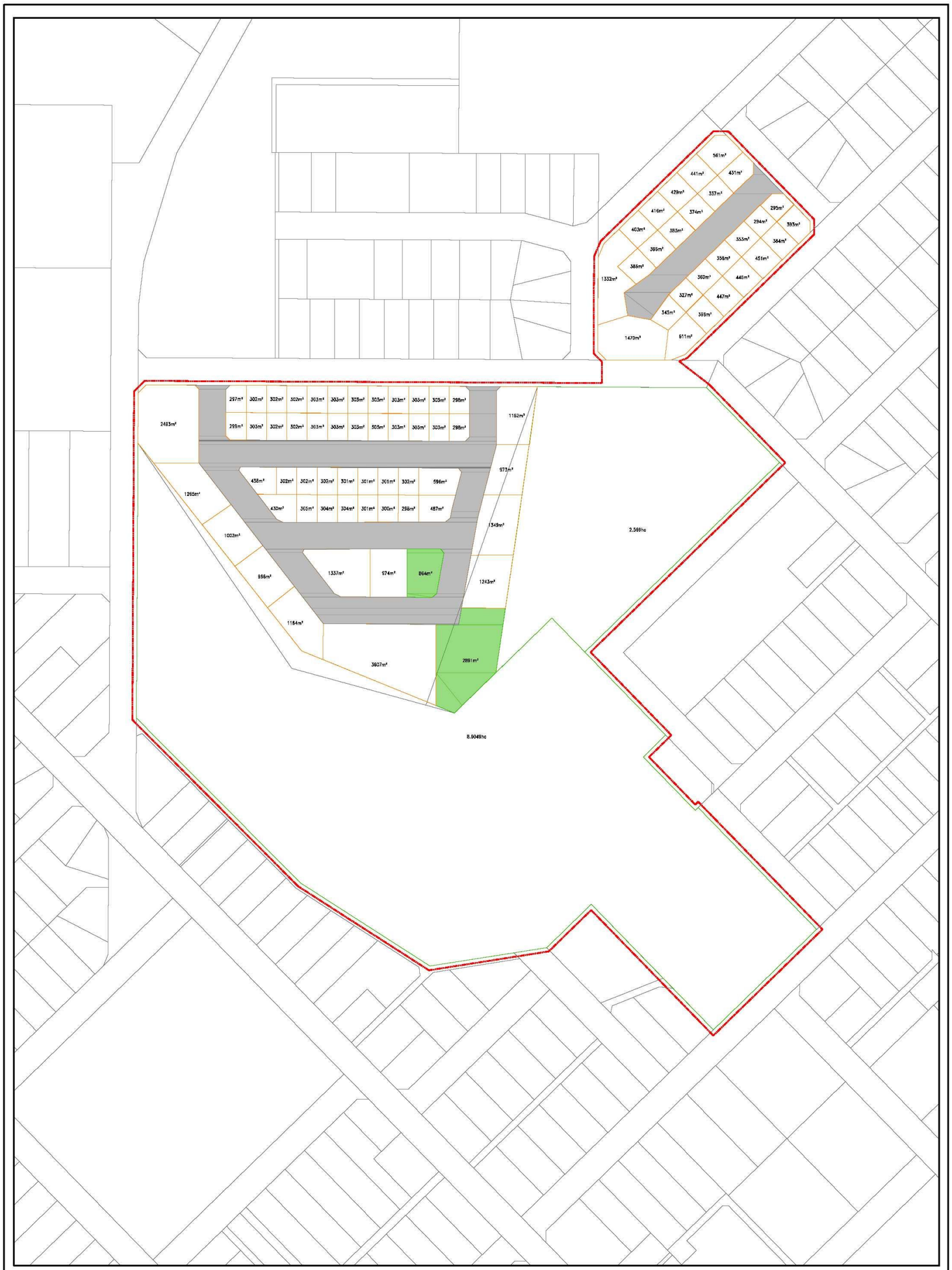
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon | 195 | 4 | 28 | 6 | 0 | 0 | 1 | 2 | 5 | 6 | 16 | 0 | 263 |
| (%) | 74.1 | 1.5 | 10.6 | 2.3 | 0.0 | 0.0 | 0.4 | 0.8 | 1.9 | 2.3 | 6.1 | 0.0 | |
| Tue | 204 | 4 | 30 | 11 | 1 | 0 | 0 | 9 | 3 | 8 | 21 | 1 | 292 |
| (%) | 69.9 | 1.4 | 10.3 | 3.8 | 0.3 | 0.0 | 0.0 | 3.1 | 1.0 | 2.7 | 7.2 | 0.3 | |
| Wed | 196 | 10 | 33 | 10 | 15 | 0 | 1 | 4 | 4 | 8 | 34 | 0 | 315 |
| (%) | 62.2 | 3.2 | 10.5 | 3.2 | 4.8 | 0.0 | 0.3 | 1.3 | 1.3 | 2.5 | 10.8 | 0.0 | |
| Thu | 204 | 8 | 21 | 13 | 17 | 0 | 2 | 12 | 2 | 8 | 26 | 1 | 314 |
| (%) | 65.0 | 2.5 | 6.7 | 4.1 | 5.4 | 0.0 | 0.6 | 3.8 | 0.6 | 2.5 | 8.3 | 0.3 | |
| Fri | 209 | 3 | 13 | 10 | 2 | 0 | 3 | 11 | 2 | 0 | 23 | 0 | 276 |
| (%) | 75.7 | 1.1 | 4.7 | 3.6 | 0.7 | 0.0 | 1.1 | 4.0 | 0.7 | 0.0 | 8.3 | 0.0 | |
| Sat | 169 | 4 | 5 | 6 | 1 | 0 | 0 | 1 | 2 | 0 | 2 | 0 | 190 |
| (%) | 88.9 | 2.1 | 2.6 | 3.2 | 0.5 | 0.0 | 0.0 | 0.5 | 1.1 | 0.0 | 1.1 | 0.0 | |
| Sun | 89 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 92 |
| (%) | 96.7 | 1.1 | 0.0 | 0.0 | 0.0 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entire week | | | | | | | | | | | | | |
| | 180 | 4 | 18 | 8 | 4 | 0 | 0 | 4 | 2 | 4 | 16 | 0 | 248 |
| (%) | 72.6 | 1.6 | 7.3 | 3.2 | 1.6 | 0.0 | 0.0 | 1.6 | 0.8 | 1.6 | 6.5 | 0.0 | |
| Weekdays | | | | | | | | | | | | | |
| | 201 | 5 | 24 | 10 | 6 | 0 | 0 | 7 | 2 | 6 | 23 | 0 | 292 |
| (%) | 68.8 | 1.7 | 8.2 | 3.4 | 2.1 | 0.0 | 0.0 | 2.4 | 0.7 | 2.1 | 7.9 | 0.0 | |
| Weekend | | | | | | | | | | | | | |
| | 128 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 141 |
| (%) | 90.8 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

* - Incomplete

# 15 Appendix B – Preliminary Structure Plan

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Note: All boundaries subject to survey.

NORTH

# PRELIMINARY STRUCTURE PLAN
## INDICATIVE LAYOUT - NOT FOR CIRCULATION
PIESSE

POSTAL ADDRESS : PO BOX 289 MT LAWLEY, W.A. 6929
phone : (08) 9271 8506 email : admin@landinsights.com.au

Plan No: 969-03 Date: April 2015 Scale 1:2500 (A3)

## SHIRE OF KATANNING

# APPENDIX 5
# Servicing and Infrastructure

| | |
|---|---|
| Subject: | Katanning Structure Plans – Preliminary Servicing Assessment |
| Date: | 26 September 2014 |
| Author: | Ryan Needham |
| Attention: | Sharee Rasmussen |

Shawmac has been commissioned by Land Insights to undertake a Servicing Assessment for 5 sites within the Katanning Town Site in support of Structure Plans being prepared for the areas. This Technical Note outlines the preliminary findings of the servicing assessment and is based upon a review of service authorities GIS data, DBYD data and Shawmac's assessments. Individual service authorities have not yet assessed on the proposals and as such the findings may be refined in future.

The key findings from the Servicing Assessment are summaries as follows:

Electrical

i) The Katanning Town Site currently has 5-10MVA capacity remaining in terms of power availability. This drops to <5MVA in 2019. This allows for the development of approximately 1,000 residential dwellings from 2019 onwards on a first come, first serve basis, the development capacity substantially reduces if industrial and commercial lots are developed. Once the power capacity is reached, significant works would be required to source power from other areas to facilitate future development. It is expected that the power availability be a major constraint to development within the Town Site;

Communications

ii) NBN rollout has not commenced in the Town Site. It is expected that the town would be serviced by fixed wireless, similarly to other regional centres. Due to a change in government policy, the timeline for NBN rollout will not be provided;

iii) Optus maintains a fibre optic network through much of the town which may provide broadband services

iv) Telstra would be required to service any future development in the absence of NBN or interest but other communications providers

Water and Sewer

v) Water Corporation planning indicates there are proposed water main extensions along Ranford Road and Great Southern Highway which may aid the development of the DIA 4 structure plan area;

vi) Notwithstanding the above, there is no water corporation planning for the majority of the town and any headworks would need to be funded by the developers. It is expected that Piesse Park and O'Callaghan Park could largely be serviced by extensions to the existing infrastructure, however WAMMCO, DIA 4 and the Industrial Land would need major headworks to be constructed;

vii) The existing Katanning WWTP Treated Waste Water pressure main runs through the eastern portion of Industrial Land which may be a constraint to development

Gas

viii) There is no gas reticulation available within the Town Site

The key constraints to development are expected to be the power availability and the provision of water and sewer:

- There is limited capacity within the existing power network to facilitate developments on the proposed scale
- There appears to be limited capacity for expansion of the water and sewer network.

In each case it is expected that significant headworks would be required to be constructed and largely funded by the developers.

# APPENDIX 6
# Possible Layouts

**Legend**

R40 - Residential (180 - 260m$^2$ lots)

R60 - Residential (120 - 180m$^2$ lots)

Note: Plan lot areas are given in square meters.

Residential R40/60

Residential R60

20m road

Residential R40

Residential R60

20m road

Residential R60

20m road

Residential R60

Residential R40

Public Open Space

Multiple Use Purpose

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PLANNING DESIGN ENVIRONMENT

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Note: All boundaries subject to survey.

NORTH

Plan No: 969-04 Date: June 2015 Scale 1:2000 (A3)

# PRELIMINARY STRUCTURE PLAN
## INDICATIVE LAYOUT - NOT FOR CIRCULATION
PIESSE

## SHIRE OF KATANNING

**Legend**

R12.5 - Residential (700 - 900m$^2$ lots)

R20 - Residential (350m$^2$ - 450m$^2$ lots)

R30/40 - Aged and Independent Living (180 - 340m$^2$ lots)

R40/60 - Group Dwelling Sites (120 - 260m$^2$ lots)

Note: Plan lot areas are given in square meters.

"Aged and Dependant Persons Dwellings" in this precinct.

retain existing club house

250m$^2$ - 300m$^2$ lots

car park, gardens etc.

10m laneway

250m$^2$ - 300m$^2$ lots

Residential R12.5

Residential R20

20m road

Group Dwelling Sites R40/60

Residential R12.5

20m road

20m road

Public Open Space

Multiple Use Purpose

Warren Road

Beeck Street

Synnott Street

Carinya Terrace

Tait Terrace

Braeside Road

Adam Street

Conroy Street

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Note: All boundaries subject to survey.

NORTH

**PRELIMINARY STRUCTURE PLAN**

**INDICATIVE LAYOUT - NOT FOR CIRCULATION**

PIESSE

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**SHIRE OF KATANNING**

**Legend**

R12.5 - Residential (700 - 900m$^2$ lots)

R30/50 - Aged and Independent Living (160 - 340m$^2$ lots)

R30/40 - Short Stay Residential Accommodation (180 - 340m$^2$ lots)

Note: Plan lot areas are given in square meters.

Warren Road

Beeck Street

Synnott Street

Carinya Garden

Tait Terrace

Braeside Road

Adam Street

Conroy Street

**Aged and Independent Living**
**R30/50**

Subject to detailed area plan to also incorporate a new community facility.

**Residential**
**R12.5**

741 755 782 800 800 800 800 800 800 800 800 840 782 800 800 800 800 800 800 800 701

20m road

**Residential**
**R12.5**

870 801 877 800 800 800 800

826 829 824 800 800 800 791

**Short Stay**
**Residential Accommodation**
**R30/40**

20m road

20m road

**Public Open Space**

**Multiple Use Purpose**

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Note: All boundaries subject to survey.

NORTH

# PRELIMINARY STRUCTURE PLAN
## INDICATIVE LAYOUT - NOT FOR CIRCULATION
PIESSE

POSTAL ADDRESS : PO BOX 289 MT LAWLEY, W.A. 6929
phone : (08) 9271 8506 email : admin@landinsights.com.au

Plan No: 969-07 Date: September 2015 Scale 1:2,000 (A3)

**SHIRE OF KATANNING**

**Legend**

R10/12.5 - Residential (700 - 1125m$^2$ lots)

R10/17.5 - Residential (642 - 1125m$^2$ lots)

R10/25 - Residential (300 - 1125m$^2$ lots)

R30/50 - Aged and Independent Living (160 - 340m$^2$ lots)

Note: Plan lot areas are given in square meters.

Warren Road

Beeck Street

Carinya Garden

Tait Terrace

**Aged and Independent Living**
**R30/50**

Subject to detailed area plan to also incorporate a new community facility.

Braeside Road

**Residential**
**R10/12.5**

Synnott Street

779 993 799

569 591 634 618

755 764 691 715 804 753 646 849 1073

798 807 730 866 813 1121 1931

12m road

**Residential**
**R10/17.5**

12m road

Adam Street

2733

14m road

**Public Open Space**

671 404 540 574 1016 628 667 614 809 843 1056

12m road

**Residential**
**R10/25**

830 729 764 978 883

10m R.O.W

924 377 362 530 494 664 530 492 1274

992 845 882 1111

**Residential**
**R10/12.5**

12m road

**Multiple Use Purpose**

Conroy Street

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THIS PLAN CANNOT BE USED WITHOUT PERMISSION OF LAND INSIGHTS.
Note: All boundaries subject to survey.

NORTH

**PRELIMINARY STRUCTURE PLAN**
**INDICATIVE LAYOUT - NOT FOR CIRCULATION**
PIESSE

POSTAL ADDRESS : PO BOX 289 MT LAWLEY, W.A. 6929
phone : (08) 9271 8506 email : admin@landinsights.com.au

Plan No: 969-08 Date: February 2016 Scale 1:2,000 (A3)

**SHIRE OF KATANNING**

# Henry Street Structure Plan

## DRAFT FOR ADVERTISING

## APRIL 2016

## prepared for the Shire of Katanning

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# Henry Street Precinct Structure Plan (KATA/2016/2)

Prepared by:
Land Insights

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Document details:
File: 969-04 Draft F-Apr16-MT
Date: Apr-16

**Document History**

| Date | Document Name | Document Manager | Summary of Document Revision | Client Delivered |
|---|---|---|---|---|
| Oct-15 | 969-03 Draft D-Oct15-MT | MT | Draft Structure Plan for internal review and finalisation. | Nov 15 |
| Feb-16 | 969-03 Draft E-Jan16-MT | MT | Draft Structure Plan revised in accordance with Structure Plan Framework (August 2015)<br>Additional information inserted relating to draft Local Planning Scheme Provisions<br>WAMMCO Lot Removed<br>Structure Plan Area renamed<br>Other updates as required. | Feb 16 |
| Apr-16 | 969-04 Draft F-Apr166-MT | MT | DRAFT FOR ADVERTISING | Apr 16 |
| | | | | |

**Technical input provided by:**

1. Shawmac Consulting Engineers
2. Bushfire Prone Planning
3. Talis Consultants
4. Galt Geotechnics
5. Terratree

**This Structure Plan is prepared under the provisions of the Shire of Katanning Local Planning Scheme No. 4.**

**IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:**

**[DATE]**

**Signed for and on behalf of the Western Australian Planning Commission:**

an officer the Commission duly authorised by the Commission pursuant to section 16 of the *Planning and Development Act 2005* for that purpose, in the presence of:

WITNESS

DATE

**DATE OF EXPIRY**

## Table of Amendments

| Amendment No. | Summary of the Amendment | Amendment Type | Date Approved by WAPC |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

## Pre-lodgement Consultation

The following were consulted as the Structure Plan was being prepared.

| Agency or Organisation | Date of Consultation | Method of Consultation |
|---|---|---|
| Shire of Katanning | July 2014, May 2015, November 2015, February/March 2016 | Meeting, Phone, Email |
| Department of Planning | October 2014 | Meeting |
| Great Southern Development Commission | July 2014, May 2015 | Meeting |
| Department of Environment Regulation | September 2014 | Letter |
| WAMMCO | September 2014 | Meeting |
| Western Power | | Letter |
| Water Corporation | | Letter |
| Department of Water | | Letter |
| | | |
| | | |
| | | |
| | | |

# *Executive summary*

WAMMCO are Western Australia's largest lamb processor and operate the abattoir in Katanning, north of the town site. The Henry Street Precinct Structure Plan area has been identified to provide limited industrial expansion to facilitate complementary land uses to the WAMMCO abattoir operations.

The Henry Street Precinct Structure Plan has been identified as a Development Investigation Area (DIA) 9 in the Local Planning Strategy with the following purpose:

> *'To provide limited industrial expansion to facilitate complementary land use to WAMMCO.'*

The Henry Street Precinct Structure Plan area is located north-west of the Katanning townsite. It is bounded by Forrest Hill Road to the east, Henry Street and Crosby Street to the south, Great Southern Highway and Trimmer Road to the west and Water Corporation landholdings to the north.

**Land Description**

| Lot | Lot Area | Title Details | Street address | Landowner |
|---|---|---|---|---|
| 2809 | 77ha | DP117098 | Great Southern Highway | Shire of Katanning |
| 6 | 5ha | D60642 | Forrest Hill Road | Shire of Katanning |
| 5 | 3ha | D60642 | Henry Street | Shire of Katanning |
| 4 | 19ha | D60155 | Great Southern Highway | Shire of Katanning |
| 1 | 11.8ha | D3246 | Great Southern Highway | Shire of Katanning |

**Key elements of the Structure Plan**

The Structure Plan provides for the ongoing use of the WAMMCO site and facilitates appropriate and complementary industrial uses. It is anticipated that development of the Structure Plan area will occur over time. This Structure Plan is the first prepared for the site and does not supersede any earlier planning work.

A summary of the Structure Plan is provided in the following table.

| Item | Data |
|---|---|
| Total area covered by the Structure Plan | 117.75ha |
| Industrial Lots | 113.83ha |
| Highway Vegetation Strip | 2.48ha |
| Indicative Lot Yield – Industrial | 15 lots |

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| 1 | Structure Planning – Environmental Investigations |
| 2 | Local Water Management Strategy Rev A |
| 3 | Bushfire Hazard Assessment |
| 4 | Transport Assessment |
| 5 | Servicing and Infrastructure |

### Abbreviations

| | |
|---|---|
| Asbestos Containing Material | ACM |
| Australian Height Datum | AHD |
| Average Recurrence Interval | ARI |
| Below Ground Level | bgl |
| Bushfire Attack Level | BAL |
| Department of Aboriginal Affairs | DAA |
| Department of Agriculture and Food | DAFWA |
| Department of Environment Regulation | DER |
| Department of Parks and Wildlife | DPaW |
| Department of Planning | DoP |
| Department of the Environment | DotE |
| Department of Water | DoW |
| Development Investigation Area | DIA |
| Environmental Protection Authority | EPA |
| Environmental Protection and Biodiversity Conservation | EPBC |
| Megavolt Amperes | MVA |
| State Planning Policy | SPP |
| Water Information Network | WIN |
| Western Australian Planning Commission | WAPC |

# PART ONE
# Implementation

# 1 Implementation

## 1.1 Structure plan area

This Structure Plan shall apply to Lot 2809 Baker Road, Lots 1 and 4 Great Southern Highway, and Lot 5 Henry Street and Lot 6 Forrest Hill Road, Katanning being the land contained within the Structure Plan map.

***Table 1.1 – Legal Description and Ownership***

| Lot | Lot Area | Title Details | Street address | Landowner |
|---|---|---|---|---|
| 2809 | 77ha | DP117098 | Great Southern Highway | Shire of Katanning |
| 6 | 5ha | D60642 | Forrest Hill Road | Shire of Katanning |
| 5 | 3ha | D60642 | Henry Street | Shire of Katanning |
| 4 | 19ha | D60155 | Great Southern Highway | Shire of Katanning |
| 1 | 11.8ha | D3246 | Great Southern Highway | Shire of Katanning |

## 1.2 Operation

The Structure Plan comes into effect on the date the Structure Plan is approved by the WAPC. This date is outlined in the certification on Page ii of this document.

## 1.3 Staging

There is no staging proposed for this Structure Plan. The development sites will be released by Council as required.

## 1.4 Subdivision and development requirements

### Land Use Permissibility

Permissible land uses within the Structure Plan area shall be in accordance with the "General Industry" zone under the operative Local Planning Scheme.

## 1.5 Subdivision

### Further studies

The following are recommended conditions of Subdivision Approval specific to the Structure Plan area.

- Urban Water Management Plan as discussed in this Structure Plan
- Landscaping Plan addressing streetscape and aesthetic amenity along Great Southern Highway or any internal subdivision roads
- Watercourse assessment and Management Plan for lots affected by the Watercourse Setback Overlay.

## 1.6 Development

### Groundwater

The following to be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas)

- A building pad of free draining compacted sand of at least 0.5 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage

- All basin and drains to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

**Water Supply**

Water is to be supplied by a water main extension from the existing reticulation on Pemble St, or via suitable, sustainable and fit for purpose alternative supply to be considered on a case-by-case basis. Water supply should be supplemented by rainwater tanks and grey water for non-potable re-use.

**Wastewater**

Each lot is to be treated by an onsite effluent disposal unit. Soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

**Stormwater Management**

- All floor levels to be set a minimum of 500mm above the 100year water level of the creek

- The flood fringe impacts slightly on some lots and it is recommended the lot boundaries be cognisant of this issue

- The developer of each lot will need to provide storage for stormwater that allows discharge at predeveloped rates for the 1, 10 and 100 year events

- Existing culverts to be lowered/upgraded to allow free drainage of the surrounding areas

- Basins are recommended at each Lot with overflow to the open drains in the street via culverts (low flow) or rock lined spillway (high flow). Basins should be lined with clay to prevent groundwater recharge

- The road is drained by open drains sized for the 1:10 year event. These will also serve to carry overflow from lot areas

- Open drain outlets to be heavily vegetated with the vegetated areas to be sized at 2% of the connected impervious catchment area.

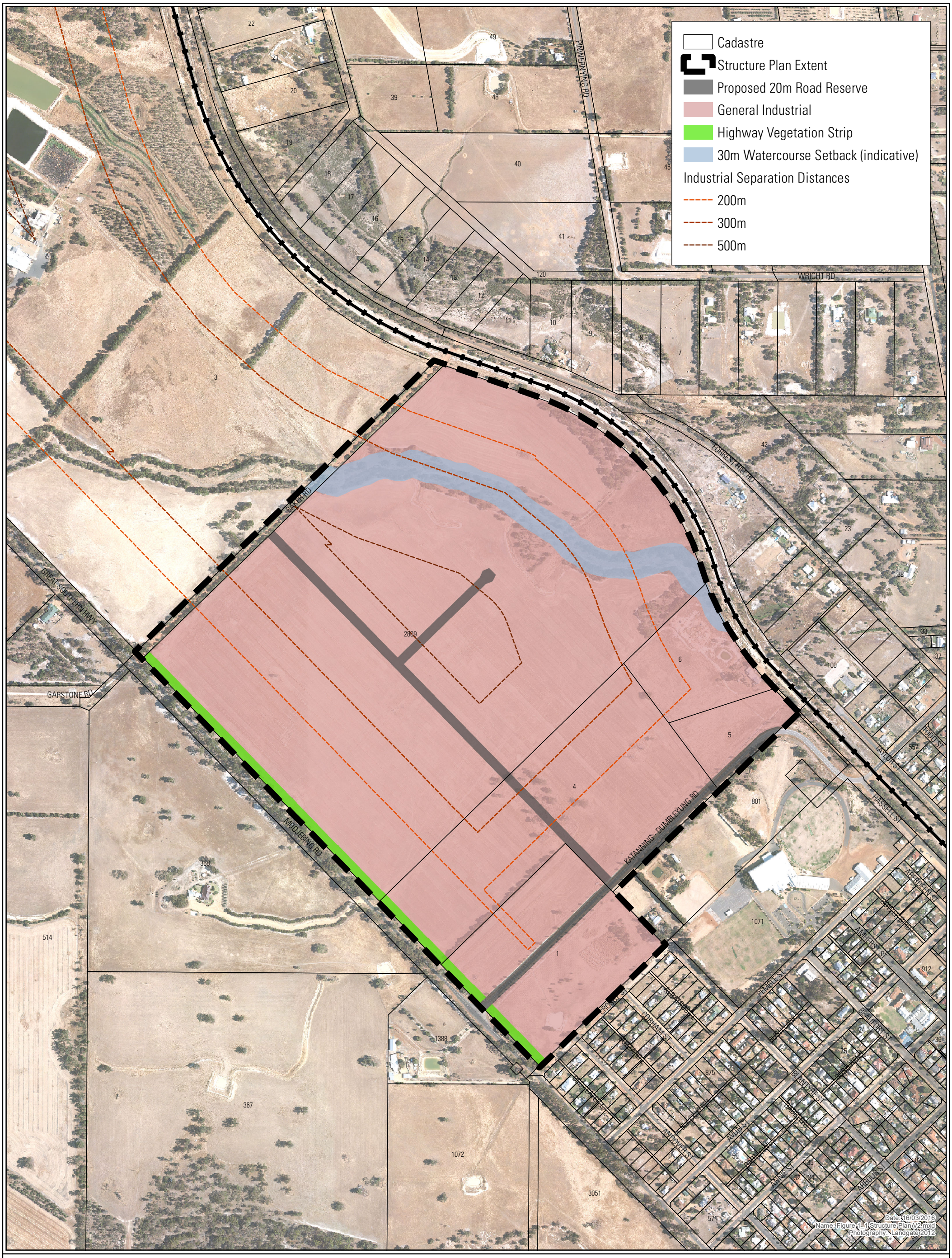
## *1.7 Other requirements*

**Internal Access Road**

The Shire of Katanning will progress the dedication of the existing local road (Henry Street) within the Structure Plan area.

**Industrial Buffers**

All development within the Structure Plan area shall have due regard to industrial buffer requirements stipulated by the Environmental Protection Authority and/or Western Australian Planning Commission. Development within the Structure Plan area should only be approved by Council if the Proponent can confirm that buffers can be contained within the bounds of the Structure Plan area.

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N
W E
S

0 0.05 0.1 0.2 0.3 0.4 0.5 km

1:7,500

**HENRY STREET STRUCTURE PLAN**

**FIGURE 1.1**
**STRUCTURE PLAN**

# PART TWO
# Explanatory Section

# 2 Planning background

## 2.1 Introduction and purpose

WAMMCO are Western Australia's largest lamb processor and operate the abattoir in Katanning, north of the town site. The Henry Street Precinct Structure Plan area has been identified to provide limited industrial expansion to facilitate complementary land uses to the WAMMCO abattoir operations.

The Henry Street Precinct Structure Plan has been identified as a Development Investigation Area (DIA) 9 in the Local Planning Strategy with the following purpose:

> *'To provide limited industrial expansion to facilitate complementary land use to WAMMCO.'*

The Henry Street Precinct Structure Plan facilitates the development of the Structure Plan area for industrial uses that, subject to the discretion of Council, will complement the existing WAMMCO operation, and provide a suitable level of industry adjacent to the residential area.

## 2.2 Location and land description

The Henry Street Precinct Structure Plan area is located north-west of the Katanning townsite. It is bounded by Forrest Hill Road to the east, Henry Street and Crosby Street to the south, Great Southern Highway and Trimmer Road to the west and the WAMMCO landholdings to the north.

The combined landholdings comprise 117 hectares which relates specifically to the lots described in Table 2.1.

***Table 2.1 – Legal Description and Ownership***

| Lot | Lot Area | Title Details | Street address | Landowner |
|---|---|---|---|---|
| 2809 | 77ha | DP117098 | Great Southern Highway | Shire of Katanning |
| 6 | 5ha | D60642 | Forrest Hill Road | Shire of Katanning |
| 5 | 3ha | D60642 | Henry Street | Shire of Katanning |
| 4 | 19ha | D60155 | Great Southern Highway | Shire of Katanning |
| 1 | 11.8ha | D3246 | Great Southern Highway | Shire of Katanning |

Existing land use across the Structure Plan area is rural.

## 2.3 Planning framework

### Shire of Katanning Town Planning Scheme No. 4

The Henry Street Precinct Structure Plan area is currently zoned *Rural* under the Shire of Katanning TPS No.4 ("TPS4") as indicated in Figure 2.2. The WAMMCO site to the north is zoned *Special Use SU8.*

Although outside the Structure Plan area, it is relevant to note that *SU8* is located on Part Lot 3 Great Southern Highway and Trimmer Road, Katanning for *abattoir, water storage, stockyards, skin drying sheds and such other associated uses as may be approved by the Council in accordance with the Scheme.*

The objectives of the zones relating to the Henry Street Precinct Structure Plan area are outlined in Table 2.2 below.

***Table 2.2 – Town Planning Scheme Zone Objectives***

| Zone | Objective |
|---|---|
| *Special Use SU8* | Special Use zones will apply where the Council wants to have specific land use control and/or development requirements. This may be on land where a mix of land uses is appropriate but which are not readily captured by the terms of a specific zone. |
| *Rural* | a) to ensure the continuation of broad-hectare farming as the principal land use in the District and encouraging where appropriate the retention and expansion of agricultural activities.<br>b) to consider non-rural uses where they can be shown to be of benefit to the District and not detrimental to the natural resources or the environment.<br>c) to allow for facilities for tourists and travellers, and for recreation uses. |

TPS4 contains no specific provisions for the consideration and adoption of a Structure Plan, however with the introduction of the *Planning and Development Regulations 2015* deemed provisions now provide a mechanism for the Shire to consider and assess a Structure Plan. The current zone of the site arguably does not trigger the requirements of Clause 15 of the regulations, however it is envisaged that Clause 15(c) may be invoked.

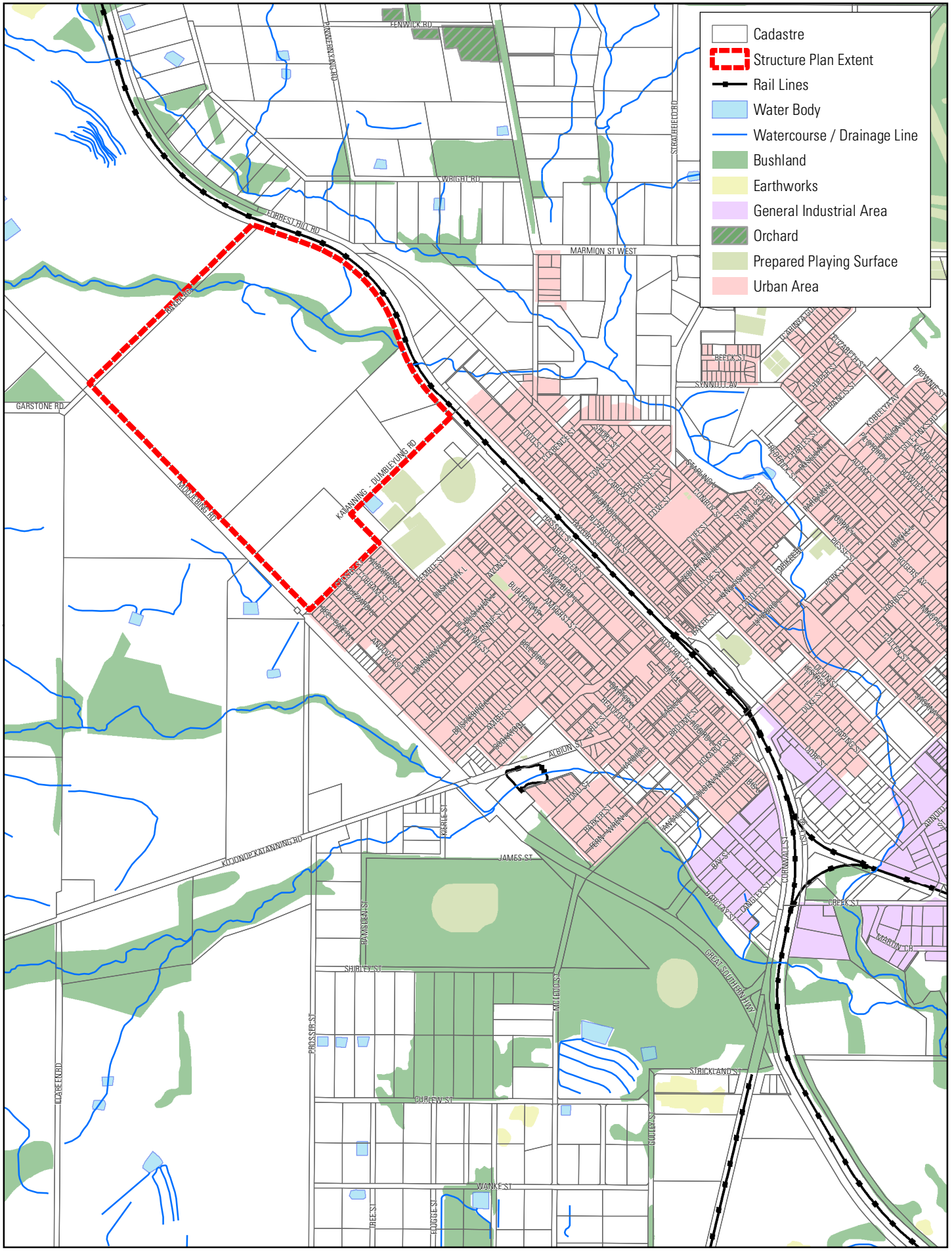
### Draft Shire of Katanning Local Planning Scheme No. 5

Draft Local Planning Scheme No.5. (LPS5) is currently being advertised. LPS5 proposes that the structure plan to be zoned "General Industry". Table 2 zone objectives under *Part 3- Zones and use of land* are as follows:

- To provide for a broad range of industrial, service and storage activities which, by the nature of their operations, should be isolated from residential and other sensitive land uses.
- To allow for the continuation of existing industries and provide for the establishment of new industries that contribute to Katanning's and the region's economic growth.
- To encourage manufacturing and processing using produce from the region.
- To take advantage of the attributes of location, availability of services and transport facilities servicing Katanning and the region.
- To discourage non-industry uses that may constrain industrial activities.
- To accommodate industry that would not otherwise comply with the performance standards of light industry.
- Seek to manage impacts such as noise, dust and odour within the zone.

Site and development requirements under Table 3 include specific provisions for the General Industry zone as follows:

1. *In considering an application for planning approval for an industrial activity, the Local Government may*

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# HENRY STREET STRUCTURE PLAN

## FIGURE 2.1
## CONTEXT

*require the applicant to demonstrate:*

a) *That the intended industrial activity meets environmental guidelines in terms of gaseous and particulate, noise, dust and odour emissions and will not adversely impact on any surrounding existing or anticipated land use activities; and*

b) *That the intended industrial activity will not result in the need for an off- site buffer to be provided to avoid future impacts upon adjoining land uses and zones.*

This provision will ensure that land uses particularly those proposed on Lot 1 which lies adjacent to the residential area will only be approved if compatible, and also supports the requirements of the State Industrial Buffer Policy 4.1. The importance of maintaining the buffer requirement is further supported under the "Matters to be addressed in Structure Plans" under *Table 9 - Additional requirements that apply to land covered by the Structure Plan* detailed below:

***Table 2.3 – LPS5 Additional Requirements***

| Area No. | Description of land | Land Use Expectations | Matters to be addressed in Structure Plans | Associated Provisions |
|---|---|---|---|---|
| 4 | Henry Street Industry and Agricultural Foods | Limited rural based Industrial expansion | • Provision for rural based industries to complement existing abattoir operations that require large lot sizes not available within existing industrial zoned land.<br>• Demand assessment for planning and investment.<br>• Buffer and transitional landuse requirements to existing abattoir and residential landuses to be incorporated within structure plan area.<br>• Buffers to be internal within structure plan area and not encroach on surrounding lots.<br>• Drainage Management.<br>• Protection of creekline and water quality.<br>• Servicing and infrastructure requirements.<br>• Highway visual impact. | Nil |

**Katanning Super Town: Growth and Implementation Plan**

The Growth Plan states that the Henry Street Precinct Structure Plan should *provide for limited industrial expansion for complementary uses.*

The overall Katanning Growth Plan Vision is:

> *Katanning will embrace its Aboriginal, agricultural, multi cultural and built heritage as it moves forward as a cohesive community seeking investment in economic, environmental and social infrastructure to achieve a population of 15,000, self-supporting growth and recognition as the inland heart of the Great Southern.*

The Economic Vision of the Growth Plan is:

> *To create the infrastructure and business environment required to encourage new enterprises and sustainable employment opportunities.*

A major business opportunity in achieving this vision included the action to *facilitate expansion of WAMMCO.* The Growth Plan identifies a number of transformational projects based on their ability to contribute to the economic, social and environmental qualities of the town. Four key project areas are identified.

Project 2 is to support Residential and Industrial development with the objective of *ensuring that planning for the delivery of land, housing and infrastructure is sufficiently advanced to accommodate the growth of Katanning in a timely manner, and to pursue economic development and strategic infrastructure essential to economic growth and the creation of sustainable employment*".

Action 2.3 of this project area includes:

> *Facilitate Private Land Release for Industrial Purposes on existing Industrial use sites (WAMMCO), considering developing a dedicated Food Industry Precinct associated with WAMMCO and the new Saleyards.*

The Growth Plan notes that industrial growth could potentially occur to the south of the WAMMCO facility. Evidently there will be relationship in function between the two structure plan areas to support the Food Industry Precinct (Agrifood) business.

The agrifood sector consists of domestic and exporting primary producers, manufacturers and packagers of food and beverage products, from raw materials to finished products for the food service and retail segments. By locating complementary agrifood businesses in close proximity there are significant economies that could be realised as well as opportunities to improve the eco-efficiency of the businesses by utilising waste sources to create other value added products. The following industries have been identified in the Growth Plan as having the potential to be located in an agrifood precinct;

- Abattoir (beef, lamb, pork)
- Agribusiness goods and services
- Canning plant
- Chicken processing facility
- Containerisation park
- Dairy processors
- Freezer works
- Livestock exporters
- Packing house and grading facility for horticultural products
- Pet food company
- Sale yards
- Small goods (meat smoking, etc.)

- Transport hub/need to expand trucking depots
- Cereal Food and baking mix manufacture
- Beverage and malt manufacture
- Skin and Hide Treatment
- Various value-adding facilities (e.g. marinating meat, packaging meat and vegetables etc.)
- Feed Grains
- Tallow
- Fertiliser
- Flour mill/grains product manufacturer.

The Growth Plan recommends the following with relation to future industrial development:

- **Recommendation 29** - Investigate the feasibility of establishing a Centre for Agricultural and Engineering Excellence, with the intention to improving the sustainability, profitability across all aspects of the existing agriculture sector chains in Katanning – Producing, Handling, Processing
- **Recommendation 30** - Improve transport efficiency between Katanning, processing facilities and ports
- **Recommendation 32** - Promote sheep sales and look for expansion opportunities.

Through the establishment of an agrifood precinct there may be some scope to co-locate some complimentary industries adjacent to the existing abattoir. The Growth Plan recommends the following with relation to the WAMMCO site:

- **Recommendation 16** – Investigate the services and incentives needed to establish a beef processing train
- **Recommendation 17** – Ensure adequate buffers are maintained in future planning to ensure ongoing operation is not prejudiced
- **Recommendation 18** – Provide some limited development opportunities to south of abattoir to assist viability of beef chain upgrade
- **Recommendation 19** – Establish a working party to work closely with WAMMCO to identify and plan for:
    - Future expansion opportunities
    - Reducing impediments to growth
    - Ensure sufficient land is maintained to allow for potential expansion.
- **Recommendation 20** – Include WAMMCO as part of the Centre for Agricultural and Engineering Excellence

- **Recommendation 28** – Locate an Agrifood precinct in a location taking into account the location and linkages to WAMMCO

- **Recommendation 90** – Provide for limited expansion of industrial land south of WAMMCO where these uses will not extend the range of existing buffers and prejudice future urban expansion opportunities.

**Shire of Katanning Local Planning Strategy (LPS)**

The Henry Street Precinct Structure Plan area is identified as Development Investigation Area (DIA) 9 in the Local Planning Strategy with the following purpose:

> *To provide limited industrial expansion to facilitate complementary land use to WAMMCO.*

The Strategy states that the Henry Street Precinct Structure Plan area should incorporate the abattoir with potential for related rural industries to provide for additional abattoir investment and employment opportunities. The Strategy makes it clear that any such proposals must incorporate required buffers to the abattoir, related rural industries and adjoining residential development within the confines of the DIA boundary.

It identifies the following opportunities and environmental characteristics associated with DIA 9:

- Potential for only rural based industries to complement existing abattoir operation and expansion compatible with buffer requirements

- Predominantly cleared

The following constraints and issues are identified in the Strategy:

- Determination and justification of proposed complimentary land uses, development and lot sizes

- Buffer and transitional land use requirements to existing abattoir and residential land uses to be incorporated within DIA and Structure Plan area

- Buffer to be internal/ within DIA and not encroaching on surrounding lots

- Drainage management

- Protection of creekline and water quality

- Servicing and infrastructure requirements

- Highway visual impact.

**Great Southern Regional Planning and Infrastructure Framework**

The Framework defines a strategic direction for the future development of the Great Southern region over the next 20 years. It highlights the opportunities for economic development and infrastructure priorities for the region, and addressed land use planning response to future growth and development pressures.

The framework recognises Katanning as part of the "Regional Centres Development Plan" and as a sub-regional centre that offer services and facilities which provide for the needs of the local community and that of the rural population in their sub-regional hinterland.

In terms of economic growth, the Framework recognises that there are opportunities to increase value of livestock and livestock products in the region and that the new Katanning sale yards will play an important role in supporting this growth. The gold mining operation near Katanning is identified in the Framework as a potential

employer in the region, especially during the construction phase. It notes that attracting residents to live in the area would provide the greatest economic benefit to the region. Jobs in the manufacturing, service sector and retail should grow as a result.

Regarding services and infrastructure, the Framework notes that there will also be a need to provide a higher level of infrastructure and services in Katanning that also services a number of smaller rural communities in the northern part of the region. It is hoped that through the higher level of accessibility and services this will increase the attractiveness of the town in retaining and growing population. This will lead to a growth in the provision of retail, employment, recreational and other activities. Katanning is supplied by the Great Southern Towns Water Supply Interconnected Scheme, however Water Corporation plans to phase out reliance in this area on local water sources and focus on reducing risk and securing safe drinking water. SuperTown planning for Katanning could include a major upgrade to the Narrogin-Katanning connection to the Harris Dam.

The preparation of this Structure Plan is supported by recommendation A43 which is to plan for population growth in Albany and the sub-regional centres – Local planning strategies and schemes for Katanning to provide sufficient zoned land to accommodate a range of services such as retail, administrative, general health and specialist health, education, recreation, community and entertainment. This Structure Plan is the first stage in the future planning for DIA 9 – WAMMCO.

### State Planning Policies

A number of State Planning Policies (SPP) are relevant to the Henry Street Precinct Structure Plan. These are outlined in Table 2.4 below.

***Table 2.4 – State Planning Policies***

| SPP | Description | Comment |
|---|---|---|
| SPP 1 State Planning Policy Framework (Variation No. 2) | SPP 1 helps guide the decision-making process in regards to land use and development in WA. It indicates which policies and strategies the WAPC and the Department of Planning should refer to when making decisions. It provides a list of all the plans, policies and strategies that form a part of the State Planning Framework. | SPP 1 should be referred to during the preparation of the WAMMCO structure plan and the relevant policies which should be referred to. |
| SPP 2 – Environment and Natural Resources | SPP 2 defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues within the framework of the State Planning Strategy. | A number of environmental features have been taken into consideration in the preparation of the WAMMCO structure plan. These features will be appropriately protected through the provision of setbacks and open space. |
| SPP 2.9 – Water Resources | This policy provides clarification when taking water resources into account in the planning process. | A number of minor watercourses are located within the structure plan area. These features will be appropriately protected through the provision of setbacks and open space. |

| SPP | Description | Comment |
|---|---|---|
| SPP 3 – Urban Growth and Settlement | The aim of this policy is to facilitate sustainable patterns of urban growth and settlement by setting out the requirements of sustainable settlements and communities and the broad policy in accommodating growth and change. | No urban development is proposed, however the site adjoins existing residential to the west. |
| SPP 3.1 – Residential Design Codes | This Policy provides a comprehensive basis for the control of residential development throughout Western Australia. | No urban development is proposed in the WAMMCO structure plan. |
| SPP 3.6 Development Contributions for Infrastructure | This policy aims to promote the efficient and effective provision of public infrastructure and facilities to meet the demands arising from new growth and development and to ensure that development contributions are charged equitably among those benefiting from the infrastructure and facilities to be provided. | Development contributions will be considered during the more detailed planning stages. |
| SPP 3.7 – Draft Planning for Bushfire Risk Management | This policy should be used to inform and guide decision-makers, referral authorities and proponents to achieve acceptable fire protection outcomes on planning proposals in bush-fire prone areas. | A bushfire hazard assessment has been undertaken for the structure plan area. The bushfire risk is predominantly low. |
| SPP 4.1 – State Industrial Buffer Policy (draft) | This policy applies to planning decision-making, and proposals which seek to provide for new industrial areas and uses, and essential infrastructure, sensitive land uses in proximity to existing industrial areas. | The buffers and separation distances recommended in SPP 4.1 will need to be considered as part of the structure plan process. Adjoining sensitive land uses will need an adequate separation distance from proposed industrial uses.<br>The Structure Plan has specifically referred to industrial buffers needing to be maintained within the bounds of the Structure Plan. |
| SPP 4.3 Poultry Farms Policy | This policy is to guide planning and development applications for land in the vicinity of poultry farms and for the development of poultry farms. Conflicts which can arise between poultry farms and residential, rural-residential and other developments because of the odours, noise, dust and visual impacts associated with poultry farms | No poultry farms are located in close proximity to the WAMMCO structure plan area and no farms are proposed as part of the development. |

| SPP | Description | Comment |
|---|---|---|
| SPP 5.2 Telecommunications Infrastructure | The policy provides a framework for the preparation, assessment and determination of applications for planning approval of telecommunications facilities. | No telecommunication infrastructure is proposed as part of the Henry Street Precinct Structure Plan. |
| SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning | This policy aims to promote a system in which sustainable land use and transport are mutually compatible. | No sensitive land uses are proposed in the structure plan, therefore it is considered that noise from road and rail should not be a significant issue. |

### WAPC Development Control Policies

Relevant WAPC Development Control (DC) Policies are discussed in the table below.

***Table 2.5 – Development Control Policies***

| Policy | Description | Comment |
|---|---|---|
| DC Policy 1.1 – Subdivision of Land – General Principles | This policy sets out the general principles used by the WAPC in determining applications for the subdivision of land. It specifies the WAPC's basic requirements for the creation of new lots as well as the procedures it will follow in processing subdivision applications. | It's important that the information required by the WAPC is included in the Structure Plan and any future subdivision applications in accordance with DC 1.1. |
| DC Policy 1.7 – General Road Planning | The policy establishes requirements for land contributions and the construction of various categories of roads and outlines principles that apply to aspects of the planning and provision of all types of roads. | This policy should be referred to at the detailed planning stage. |
| DC 2.3 – Public Open Space in Residential Areas | This policy sets out the requirements of the Commission for public open space and the provision of land for community facilities in residential areas. The basic component is the requirement that 10 percent of the gross subdivisible area of a conditional subdivision shall be given up free of cost by the subdivider for public open space. | This policy should be considered in conjunction with DC 4.1 Industrial Subdivision when determining the area for public open space. |
| DC 3.4 – Subdivision of Rural Land | This policy sets out the principles that will be used by the WAPC in determining applications for the subdivision of rural land. | The structure plan proposes to subdivide rural land into residential and industrial lots, therefore the provisions of DC 3.4 will no longer apply in this situation. |

| Policy | Description | Comment |
|---|---|---|
| DC 4.1 – Industrial Subdivision | This policy provides guidance on the matters considered by the WAPC when determining applications for industrial subdivision throughout the state. These include such matters as the design and shape of industrial lots, road layout, servicing and open space requirements. | This policy should be referred to in the detailed planning stage. |

### EPA Position Statements

Relevant EPA Position Statements are discussed in the table below.

***Table 2.6 – EPA Position Statements***

| Policy | Description | Comment |
|---|---|---|
| Position Statement 2 – Environmental Protection of Native Vegetation in WA | This Statement addresses the issues of native vegetation clearing in WA, particularly in agricultural areas. The EPA has previously stated that *all existing remnant native vegetation is important, and it should be managed to ensure its retention.* It states that the EPA could possibly support clearing in agricultural areas providing the proposal has a net environmental benefit, the area to be cleared in relatively small and that any residual land degradation will not be intensified. | The Structure Plan area comprises small areas of native vegetation and parkland cleared trees. It is important that the principles of this position statement are given due consideration, however it is considered that the areas to be cleared as part of the structure plan proposals will be relatively small given most of the site is already cleared. |
| Position Statement 3 – Terrestrial Biological Surveys as an Element of Biodiversity Protection | The EPA has prepared this Position Statement to ensure that the issue of biological diversity is recognised as being of importance in the land use planning process and to ensure that minimum standards of survey work are undertaken to enable the EPA to undertake an assessment of a proposed activity. | The provisions of this position statement are to be followed in the preparation of flora and fauna surveys across the structure plan area. |
| Position Statement 4 – Environmental Protection of Wetlands | The Position Statement defines important environmental values and functions of wetlands and establishes principles for the environmental protection of wetlands in general. It suggests land use zoning should be applied so as to achieve sustainable water resources management and protect the beneficial functions performed by wetlands as part of that process. | No wetlands are located within the structure plan area, however some minor watercourses are located throughout which will need adequate protection in accordance with the general principles of this Position Statement. |
| Position Statement 7 – Principles of Environmental Protection | This position statement sets the scene for environmental management in WA. Key principles include the precautionary principle, conservation of biological diversity and ecological integrity, waste hierarchy, best practice, accountability and | The future structure planning process should pay particular regard to the principles contained within the statement. |

| Policy | Description | Comment |
|---|---|---|
| | transparency and enforcement. | |
| Position Statement 9 – Environmental Offsets | This statement provides guidance on environmental offsets to ensure a 'net conservation benefit' to proposals. | This statement will need to be referred to if environmental offsets are required as part of the project. Considering the environmental values of the site are not significant and the impact will be low, environmental offsets may not be required. |

**EPA Guidance Statements**

Relevant EPA Guidance Statements are discussed in the table below.

***Table 2.7 – EPA Guidance Statements***

| Policy | Description | Comment |
|---|---|---|
| Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses | This statement provides guidance on the generic separation distances between sensitive and industrial land uses to avoid conflicts between these uses. It aims to protect sensitive land uses from unacceptable impacts on amenity that may result from industrial activities, emissions and infrastructure. Impacts from emissions include noise and air emissions (gases, dust and odours). Types of sensitive land uses include residential development, public services (hospitals, schools, shopping centres, playgrounds etc), tourist development (caravan parks and hotels) and some public buildings. | The separation distances provided in this statement will be generally applied to the structure plan and will need to be further refined at a detailed planning stage once the exact land uses are determined. It is understood that this guidance statement is currently under review.<br>The Structure Plan has specifically referred to industrial buffers needing to be maintained within the bounds of the Structure Plan. |
| Guidance Statement No. 8 – Environmental Noise | This statement provides guidance to proponents submitting proposals for environmental impact assessment to ensure that noise emissions comply with the *Environmental Protection (Noise) Regulations 1997*. Noise is defined in the Environmental Protection Act as vibration of any frequency, whether transmitted through air or any other physical medium. | The general principles in this statement will be applied to the structure plan. However, noise will need to be further considered further once the exact land uses are determined. |
| Guidance Statement No. 19 – Environmental Offsets Biodiversity | This statement provides advice on environmental offsets for proposals or schemes that impact on biodiversity. It is to be read in conjunction with Position Statement No. 9 but provides more specific advice particularly in relation to the technical application of biodiversity offsets. | This statement will need to be referred to if environmental offsets are required as part of the project. Considering the environmental values of the site are not significant and the impact will be low, environmental offsets may not be required. |
| Guidance Statement 33 – Environmental Guidance for Planning and Development | This statement provides an overview of information to assist proponents and decision making authorities in considering environmental management as part of the planning and development process. It also | The information in this statement has been referred to in the environmental assessment of the structure plan to ensure that all relevant information is provided. Further detailed assessments may be required once the details of the development have been more accurately |

| Policy | Description | Comment |
|---|---|---|
| | contains guidance for the Environmental Impact Assessment process | determined. |
| Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia | This statement provides direction and information on the general standards and protocols for terrestrial flora and vegetation surveys as part of the environmental impact assessment process. | This statement should be referred to in the preparation of vegetation and flora surveys and reports. |
| Guidance Statement No. 55 – Implementing Best Practice in Proposals Submitted to the Environmental Impact Assessment Process | This statement provides guidance on what the EPA means by the term 'best practice' when it is used in the environmental impact assessment process and the approach the EPA will take when assessing proposals. It has a particular focus on human health and the environment as affected by, but not confined to, industrial processes. | The guiding principles in this statement should be referred to at a more detailed planning stage once the exact land uses and industries are more clearly determined. |
| Guidance Statement No. 56 Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia | This statement provides direction and information on the general standards and protocols for terrestrial fauna surveys as part of the environmental impact assessment process. | The statement should be referred to in the preparation of fauna surveys and reports. |

**SPP 4.1 – State Industrial Buffers.**

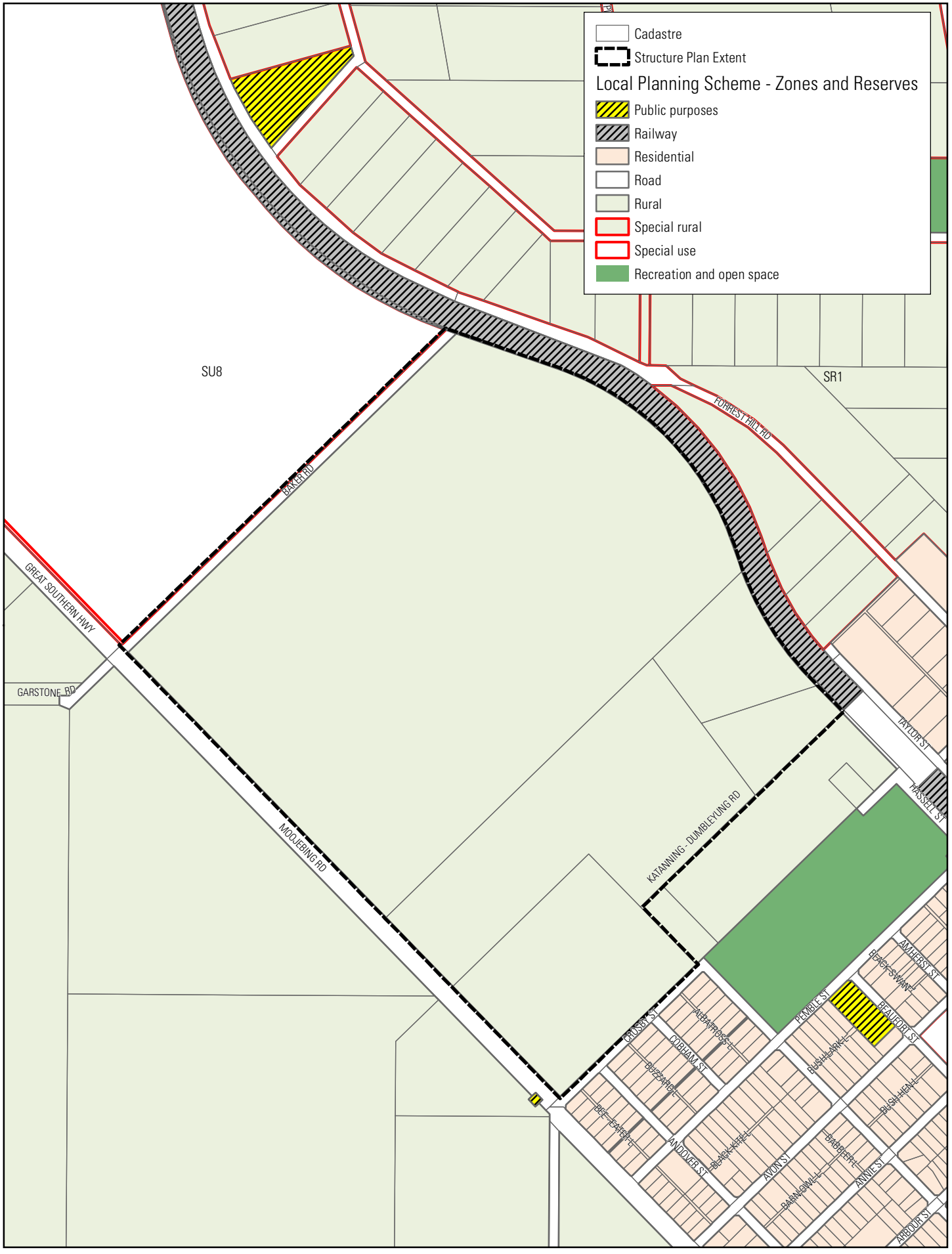
This policy provides guidelines to better ensure the safety and amenity of surrounding land uses.
A number of objectives and principles are established in the policy, along with an explanation as to how these principles should be applied to define and secure buffer areas and who should pay for them.
The objectives of this policy are as follows:

- To guide the definition of buffer areas around industry, infrastructure and some special uses
- To protect industry, infrastructure and special uses from the encroachment of incompatible land uses
- To enable a higher level of the safety and amenity of land uses surrounding industry, infrastructure and special uses
- To recognise the interests of existing landowners within buffer areas who may be affected by residual emissions and risks, as well as the interests, needs and economic benefits of existing industry and infrastructure which may be affected by encroaching incompatible land uses.

The policy will be useful in preparing the Structure Plan to determine the limit of impacts from the proposed uses within the Structure Plan area to ensure that cumulative impacts of uses will not extend beyond the boundary of the Structure Plan. That the Structure Plan will incorporate the buffer requirement to the industries it includes.

**Other approvals and decisions**

WAMMCO have advised that the current plant has the capacity to facilitate any increase in operations should this occur at some point in the future. These will generally be included within the current development footprint and infrastructure, and therefore no large scale physical expansions are foreseen.

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**HENRY STREET STRUCTURE PLAN**

**FIGURE 2.2**
**TOWN PLANNING SCHEME 4**

# 3 Site conditions and constraints

## 3.1 Biodiversity and natural area assets

### Vegetation

A Level 1 vegetation and flora survey was undertaken by Terratree in September 2014 in accordance with EPA Guidance Statement 51. A search was undertaken of the following databases within a 20km radius of the site:

- DPaW's Threatened and Priority Flora
- DPaW's Threatened Ecological Communities
- WA Herbarium (WAH) Declared Rare and Priority Flora
- Department of the Environment's Projected Matters Search Tool.

A total of 41 significant florae were recorded on the databases. No species of Threatened Flora (Declared Rare Flora) pursuant to the WA Wildlife Conservation Act 1950, or listed as Threatened pursuant to the EPBC Act 1999 were recorded during the targeted search or the Level 1 vegetation survey. As the site is cleared of native vegetation, no flora species of conservation significance were identified at the site.

Vegetation condition at the site was classified as being 'completely degraded' (according to the scale by Keighery (1994)) as the vegetation is no longer intact and the area is completely or almost completely without native species. The vegetation can be described as 'parkland cleared' with the flora compromising weed or crop species with isolated trees or shrubs (Terratree, 2014).

Several older remnant eucalypts are located along Barker Road and at the south-east along the creek. There is a possibility that these eucalypts could contain hollows which have habitat value for native fauna.

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site.

A complete copy of the Flora and Fauna Assessment by Terratree (2014) is provided at Appendix 1.

### Fauna

A Level 1 fauna survey was undertaken by Terratree in September 2014 in accordance with EPA Guidance Statement 56. A search was undertaken of the following databases within a 20km radius of the site for records of known Threatened, Schedule and Priority Fauna:

- DPaW's Threatened Fauna
- Department of the Environment's Projected Matters Search Tool.

A total of 32 species of conservation significance were identified within the search area. An assessment of habitat value identified the likelihood of the following species to potentially occupy the site: Australian Painted Snipe and Bush Stone-curlew. The mature trees on Barker Road and along the watercourse could also have habitat value for Carnaby's Black Cockatoo. No fauna species of conservation significance were identified at the site. It is unlikely that habitat will be affected as a result of development on the site, however this matter will require further consideration as subdivision designs and development proposals are refined further over time.

A complete copy of the Flora and Fauna Assessment by Terratree (2014) is provided at Appendix 1.

### Opportunities and constraints

There are few environmental constraints that would preclude development of the site for its intended use (Talis, 2014). The site has been historically cleared and vegetation in degraded condition. There is no flora and fauna of conservation significance and vegetation has limited value as a habitat for fauna of conservation significance. There are no significant biological constraints to development on site. The only exceptions which may need further consideration include:

- Disturbance to mature trees may require targeted surveys to determine habitat value for Carnaby's Black Cockatoo
- Any disturbance to eucalypt woodlands is required to consider potential impacts to Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4) and Western Shrike-tit (Priority 4) in consultation with DPaW.

## *3.2 Landform and soils*

### Topography

The site gently slopes from the north to south-east. The highest point is at the northern part of the site at approximately 350m AHD and slopes to approximately 320m AHD.

### Geology

The Dumbleyung Geology series map 1:250,000 scale indicated the site is underlain by:

- colluvium and minor alluvium described as silt, sand and gravel; generally on slopes adjoining to rock and laterite outcrops
- laterite described as limonite cemented, nodular and massive duricrust; overlies deeply weathered bedrock
- biotite granite and adamellite described as *medium and coarse, even-grained; locally fioate*' (Galt, 2014).

The assessment by Galt Geotechnics, 2014, found that the site is underlain by sandy clay to clayey sand. A copy of the report can be found at Appendix 1.

### Soils

The generalised soil profile of at the site is described by Galt Geotechnics (2014) as:

- SAND/Clayey SAND/Silty SAND – fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, sand is generally loose, clayey material is generally soft to firm, moist to wet, trace organics and rootlets, present from the surface, extending to depths of between 0.1 m and 0.8 m; overlying
- Clayey SAND/Sandy CLAY – fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, locally laterised, locally present from the surface, extending to depths of between 0.6 m and 1.9 m; locally overlying
- CLAY – low plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.6 m, extending to the maximum depth of investigation of 2.3 m.

### Geotechnical Investigations

Geotechnical investigations were conducted between 1 and 5 September 2014 by Galt Geotechnics (Appendix X). A total of 20 test pits extending to depths between 0.9m and 2.5m below the surface level were installed by Galt. The assessment was conducted in accordance with Australian Standard AS2870-2011 *Residential Slabs and Footings*. Based on the findings, the site is classified as 'Class M' provided that the site preparation

recommendations are followed. Galt (2014) considers that the site is "*geotechnically capable of supporting the proposed light industrial subdivision development*". Galt also recommends that future buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness.

The assessment also concluded that the underlying clayey material is unsuitable for onsite effluent disposal by percolation (however this can be improved with importation and placement of an adequate thickness of granular fill).

### Acid Sulphate Soils

Acid sulphate soil data by the Department of Environment Regulation (DER)is not available for the site, however the CSIRO's ASRIS (2014) data show that the site is in an area with *Low Probability/Very Low Confidence* of acid sulphate soils occurring (Talis, 2014).

### Contaminated Sites

Talis (2014) has observed buried material on Lot 1 (D3246) at the southern extent of the site which will need further investigation for contaminated sites prior to development. The rest of the structure plan area does not include any contaminated sites and therefore will be no implications for the development of the site for industrial purposes.

Talis (2014) have recognised that there *is potential for contamination to have previously occurred/to occur* in association with the adjacent WAMMCO abattoir. The DER identifies an abattoir is a *potentially contaminating industry/land use*. Further investigation of the ponds on the WAMMCO site will be required to determine the likelihood of contamination, however Talis (2014) has indicated that *these structures are unlikely to have a significance impact on development of the surrounding land*.

It should be noted that this area is now outside of the Structure Plan boundary and should not result in any implications for the development of the Structure Plan area for industrial purposes.

### Opportunities and Constraints

The geotechnical assessment concluded that the site is classified Class 'M' provided that the site preparation recommendations are followed. Based on the preliminary geotechnical investigations, the site is *geotechnically capable of supporting the proposed light industrial subdivision development* (Galt, 2014), however more detailed investigations are required.

The underlying clayey material is unsuitable for onsite effluent disposal by percolation.

Acid sulphate soils are not considered to be an issue that will require further management.

Talis (2014) identified potential for contamination at the WAMMCO site (in particular the wastewater ponds) and the buried material on Lot 1 at the southern extent of the site. These areas will need further investigation.

## *3.3 Hydrology*

### Groundwater

The site is not located within any proclaimed groundwater area (as identified in the *Rights in Water and Irrigation Act 1914*) and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow.

Perched groundwater was identified at depths between 0.5m and 0.6m at three locations by Galt Geotechnics during the geotechnical investigations in 2014. This could be as a result if recent rainfall in the days preceding fieldwork and the water remaining on top of the surficial clayey soils.

The nearest WIN site (ID: 60912739) with recorded groundwater levels is located 1.5km to the north-east of the site. Static groundwater level at this site was recorded as 0.7m bgl. Additionally, a review of the *Katanning Town Groundwater Program 2003 Drilling Bore Completion and Test Pumping Report* (Global Groundwater, 2004) prepared for the Shire of Katanning showed a groundwater bore (03KC02D) located approximately 430m south-east of the site, which showed static groundwater level to be 2.5m bgl in May 2003 (Talis, 2014).

Whilst a shallow groundwater depth may be viewed as a constraint to residential development, additional groundwater investigations would be recommended to identify quantities of fill material required to be imported to the site to raise levels for development (Talis, 2014). Based on Galt's 2014 preliminary geotechnical investigations, for drainage purposes, the buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness.

**Surface Water**

The Katanning Town Creek runs through the centre of the site, from west to east. The creek flows into town (Piesse Park) and there is some native vegetation situated along the creekline. It is likely that the Katanning Town Creek will need to be retained and a buffer retained on either side to mitigate potential impacts from future land uses.

No FPM 100 year ARI area is mapped within or immediately surrounding the site.

## *3.4 Bushfire hazard*

A Bushfire Hazard Assessment was conducted across the site by Bushfire Prone Planning (2014). The rating on the existing vegetation within the subject site was a combination of *Low* and *Moderate* with a small percentage as extreme to the north. External to the WAMMCO site, the Bushfire Hazard is a combination of *Low, Moderate* and *Extreme*. The threat external to the subject site is predominately *Low* and *Moderate*.

A complete copy of the Bushfire Hazard Assessment is at Appendix 3.

**Opportunities and Constraints**

The vegetation classified as *moderate* risk is within the WAMMCO site and along the creekline. A majority of the site has a *low* bushfire hazard and therefore is fairly unconstrained by bushfire hazard.

## *3.5 Heritage*

**Aboriginal Heritage**

A search for relevant Aboriginal Heritage was conducted by Talis (2014) using the DAA online *Aboriginal Heritage Inquiry System* which indicated that the site was not list as a *Registered Aboriginal Site* or *Heritage Survey Area*.

One *Other Heritage Place* is located within the structure plan area; the Katanning Town Creek (ID 22816) which runs along the eastern boundary of the northern half of the site. Two *Other Heritage Places* are located in the vicinity; Katanning Reserve (ID S2801) and Katanning (ID S00285). Three *Heritage Survey Areas* are located in the vicinity; two are located on Great Southern Highway on the western boundary of the site (ID 16482 and ID 17057) and the third is located adjacent to the northern boundary (ID 27384).

**European Heritage**

An online search of the Australian Government's Department of Environment Heritage Database by Talis (2014) found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500m). An online search of the Heritage Council WA database by Talis (2014) using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site.

### Opportunities and Constraints

No European Heritage or Registered Aboriginal sites were listed at the site. The Katanning Town Creek (listed as *Other Heritage Places*) runs along the eastern site of the site. The creek is located within the WAMMCO property and it is unlikely that this portion of the site will be developed. It is therefore considered that the site is not constrained by heritage values.

## *3.6 Buffers*

The WAMMCO abattoir has an industry buffer of 1,000m. However, given that a complementary land use is proposed for the site which is not considered to be a sensitive land use under Guidance Statement No. 3, a site-specific buffer would be required to be considered depending on the nature of the proposed land-use. In relation to the future development of the site, consideration will be required in relation to providing adequate buffers for noise, dust and odour emissions from the new development and the residential and rural properties adjacent to the site (Talis, 2014). The offsite impacts of the abattoir extend across the Henry Street Structure Plan as indicated on Figure 3.1. This may require consideration in addressing the cumulative impact of industry as it relates to containing impacts within the structure plan boundary as the area develops overtime.

## *3.7 Servicing and infrastructure*

A review of services and infrastructure was undertaken by Shawmac Consulting Engineers in 2014. A complete copy of the report is provided at Appendix 5.

### Electrical

The Katanning Town Site currently has 5-10MVA capacity remaining in terms of power availability which will drop to <5MVA in 2019. This allows for the development of approximately 1,000 residential dwellings from 2019 onwards on a first come, first serve basis, the development capacity substantially reduces if industrial and commercial lots are developed. Once the power capacity is reached, significant works would be required to source power from other areas to facilitate future development. It is expected that the power availability be a major constraint to development within the town site.

### Water and Wastewater

There is no Water Corporation planning for the majority of the town and any headworks would need to be funded by the developers. The Structure Plan area will need major headworks to be constructed or alternative water sources could be considered on a case by case basis.

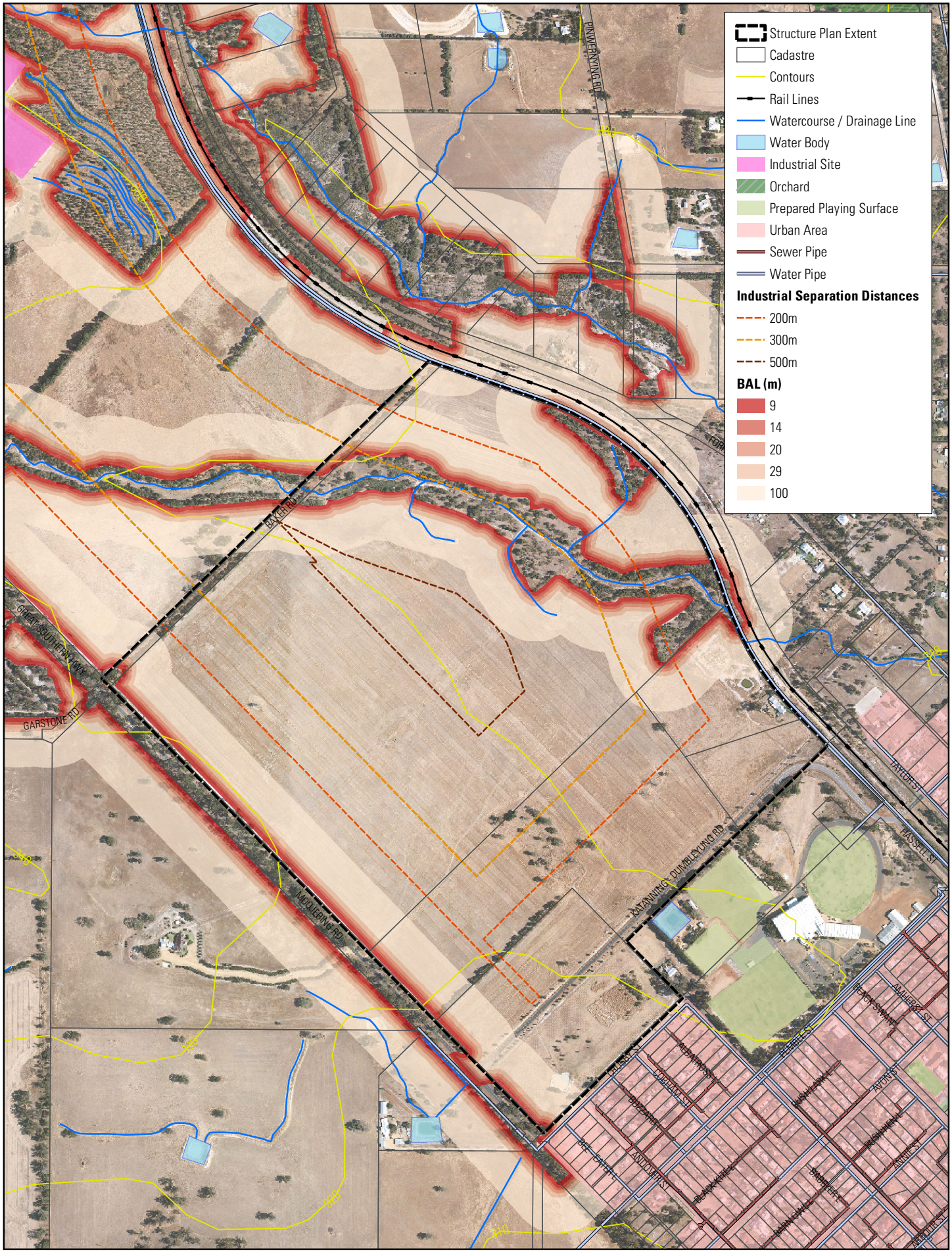
The geotechnical assessment also concluded that the underlying clayey material is unsuitable for onsite effluent disposal by percolation (however this can be improved with importation and placement of an adequate thickness of granular fill) (Galt Geotechnics, 2014).

### Gas

There is no gas reticulation available within the town site.

### Communications

Phone services and ADSL are provided in the town. At present, NBN rollout has not commenced in the town site however will be implemented in future. Optus maintains a fibre optic network through much of the town which may provide broadband services. Telstra would be required to service any future development in the absence of NBN or interest from other communications providers.

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# HENRY STREET STRUCTURE PLAN

## FIGURE 3.1
## SITE CONDITIONS & CONSTRAINTS

# 4 Landuse and subdivision requirements

The Henry Street Precinct Structure Plan area has been identified to provide limited industrial expansion to facilitate complementary land uses to the WAMMCO abattoir operations.

## 4.1 Land use

Land uses proposed within the Structure Plan area include:

- General Industry

Permissible land uses within the Structure Plan area shall be in accordance with the the "General Industry" zone and provisions under Table 9 of the operative Local Planning Scheme.

This Structure Plan is the first prepared for the site and does not supersede any earlier planning work.

***Table 4.1 – Structure Plan Summary Table***

| Item | Data |
|---|---|
| Total area covered by the Structure Plan | 117.75ha |
| Industrial Lots | 113.83a |
| Highway Vegetation Strip | 2.48ha |
| Indicative Lot Yield – Industrial | 15 lots |

Note: Table is repeated in Executive Summary

## 4.2 Subdivision

### Lot sizes

The Structure Plan does not depict a range of suitable lot sizes for the structure plan, however these will be addressed in detail at the subdivision stage and will be largely influenced by the road network, onsite servicing requirements (water and effluent) for the proposed industry, and the use impacts (buffer requirements). In general, the lot sizes will be determined to fit the development as they arise. Smaller lot sizes are recommended within the central portion of the site. A suggested layout is provided at Figure 4.1.

### Further studies

The following are recommended conditions of Subdivision Approval specific to the Structure Plan area.

- Urban Water Management Plan as discussed in this Structure Plan
- Landscaping Plan addressing streetscape and aesthetic amenity along Great Southern Highway or any internal subdivision roads, particularly along the identified Highway Vegetation Strip
- Watercourse assessment and Management Plan for lots affected by the Watercourse Setback Overlay.

## 4.3 Development

### Groundwater

The following to be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements

- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas)

- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage

- All basin and drains to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

**Water Supply**

Water is to be supplied by a water main extension from the existing reticulation on Pemble St or via suitable, sustainable and fit for purpose alternative supply to be considered on a case-by-case basis. Water supply should be supplemented by rainwater tanks and grey water for non-potable re-use.

**Wastewater**

Each lot is to be treated by an onsite effluent disposal unit. Soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

**Stormwater Management**

- All floor levels to be set a minimum of 500mm above the 100-year water level of the creek

- The flood fringe impacts slightly on some lots and it is recommended the lot boundaries be adjusted

- The developer of each lot will need to provide storage for stormwater that allows discharge at predeveloped rates for the 1, 10 and 100 year events

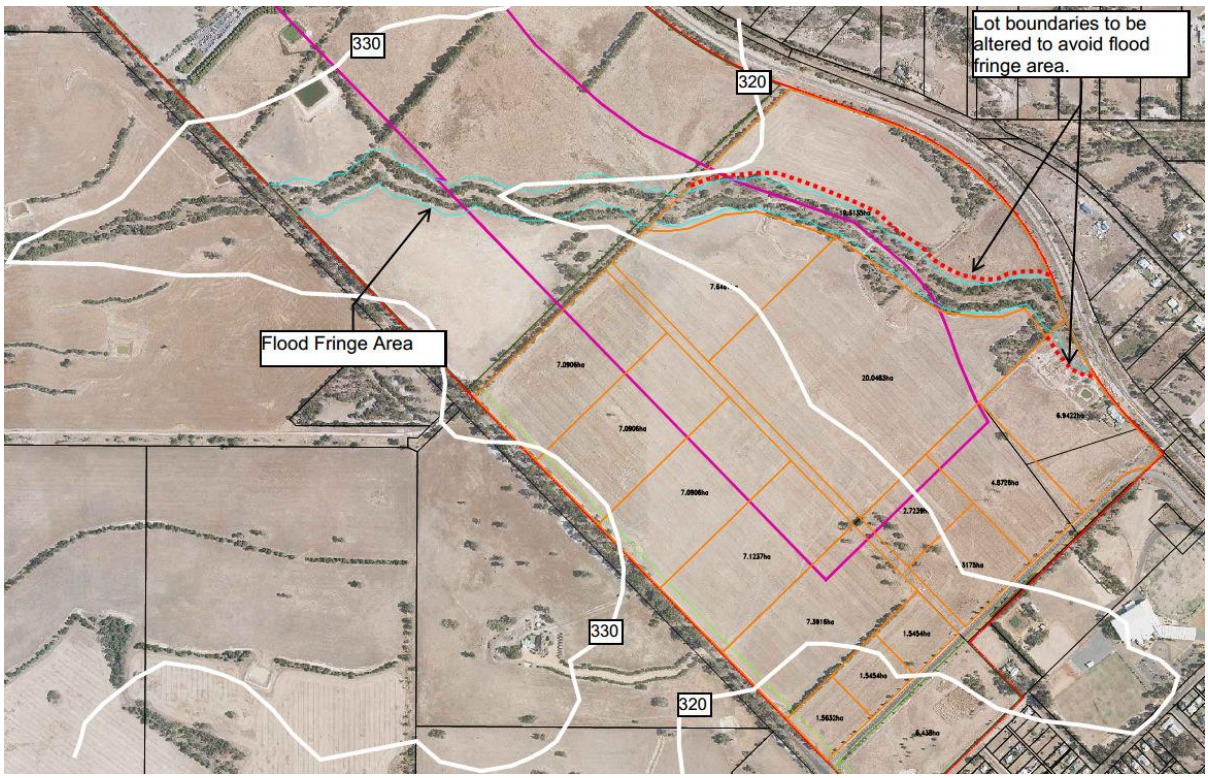
- Existing culverts to be lowered/upgraded to allow free drainage of the surrounding areas

- Basins are recommended at each Lot with overflow to the open drains in the street via culverts (low flow) or rock lined spillway (high flow). Basins should be lined with clay to prevent groundwater recharge

- The road is drained by open drains sized for the 1:10 year event. These will also serve to carry overflow from lot areas

- Open drain outlets to be heavily vegetated with the vegetated areas to be sized at 2% of the connected impervious catchment area.

In regards to the second bullet point above, the Structure Plan recommends that the creekline and buffer area be retained in the larger proposed lot fronting the rail line and as such a modification to the boundaries is not proposed (as suggested in the figure at the end of this section. This situation may change should the Shire decide to seek the creekline and buffer as an open space or drainage reserve.




Source: LWMS (Shawmac, 2015)

### Industrial Buffers

All development within the Structure Plan area shall have due regard to industrial buffer requirements stipulated by the Environmental Protection Authority and/or Western Australian Planning Commission. Development within the Structure Plan area should only be approved by Council if the Proponent can confirm that buffers can be contained within the bounds of the Structure Plan area and/or within the adjoining WAMMCO site (subject to agreement with WAMMCO). These requirements area supported by the relevant provisions included under the Local Planning Scheme No. 5.

## *4.4 Open space/natural areas*

No open space is proposed within the Structure Plan area.

## *4.5 Movement networks*

### Internal Access Road

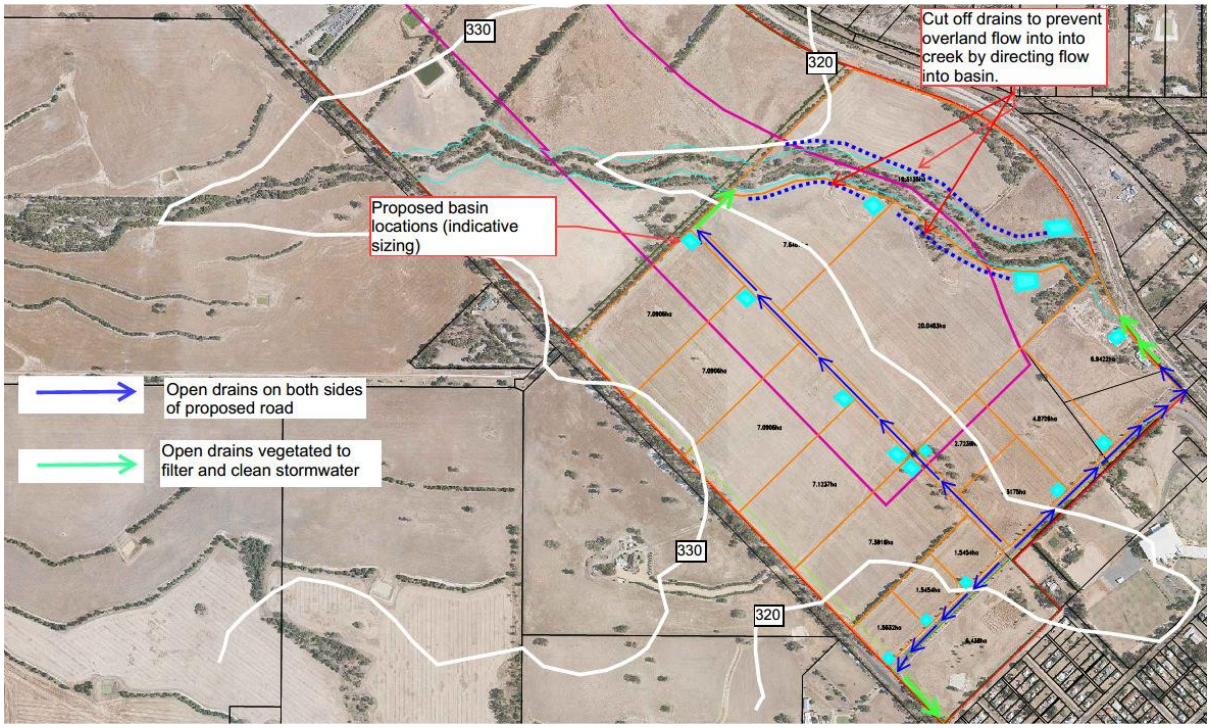
The Shire of Katanning will progress the gazettal of the existing local road (Henry Street) within the Structure Plan area.

## *4.6 Water management*

The Local Water Management Strategy (Appendix 2) outlines the likely developer requirements and sets out an agreed concept. It has been prepared at a broad conceptual level and will need to be refined when further details on the lot yield, configuration and land use are developed. The LWMS provides a comprehensive storm water, groundwater and water use strategy.

A key issue for storm water management in Katanning concluded from the Katanning Flood Assessment (Opus 2013) was the compilation of an estimated Q100 flood level for the SuperTowns development scenario which indicated that the flood fringes predominantly follow the Katanning Creek alignment. Although the majority of the site will not be affected by flooding issues, a non-perennial watercourse with a west east orientation dissects the site and therefore a flood fringe area within the structure plan area has been nominated to exclude development.

The results of the Katanning Flood Assessment (Opus, 2013) showed that Katanning Creek had a 10 year ARI design storm hydraulic design capacity however, the existing piped and overland stormwater system is less than this. This has resulted in localised flooding throughout Katanning. Therefore, a 10 year ARI design storm has been adopted for the proposed development which is typical for business, commercial and industrial areas and intensely developed residential areas. The figure below shows the drainage concept.




Source: LWMS (Shawmac, 2015)

The LWMS recommends:

- Road reserve drainage will be directed to the Katanning Creek via open drains.
- The developer/owner of each lot will need to provide stormwater storage that allows discharge at the predevelopment flow rate at the 1, 10 and 100-year storm events. This would consist of designing and constructing a basin that discharges into the road drainage network through appropriately sized culverts, perforated pipes and overflow spillways.
- Basins will need to be lined with clay, or similar, to prevent water infiltrating the ground and adding to the groundwater.
- To improve the quality of stormwater the last sections of drains will be heavily vegetated to trap and filter pollutants (suspended solids and trace metals). The same philosophy is to be adopted within each Lot. As well as inside the basin, the drains leading into the basins shall also be vegetated.
- Subdivision to address flood fringe impacts in detailing lot boundaries.
- Development to require minimum floor levels of 500m above the 100year water level of the creek, and to provide storage for storm water that allows discharge at pre-developed rates for the 1, 10 and 100 year events.

The LWMS recommends that the each building envelope be graded such that there is no potential for groundwater to perch below building footings, with a 300mm min thickness sand pad above (as detailed in the provisions). The DWMS recommendation to implement infiltration trenches has not been considered for this development area as water logging or high groundwater levels are not an issue for this particular area. In

addition, lowering the groundwater in this area would likely have limited benefit to the town centre which is considerable distance from the subject site. Notwithstanding this, infiltration trenches can be retrofitted into the proposed open drains and within the lots in the future if required.

## *4.7 Infrastructure coordination, servicing and staging*

It is envisaged that the Structure Plan precinct will develop progressively over several years. As such, the Structure Plan promotes flexibility to reduce the need for infrastructure provision. Dedication of Henry Street is required, along with a likely upgrade (comprising sealing, however the Shire has advised that it is unlikely to require widening) of Baker Road. Only one other internal road is proposed, which will be developed as the Structure Plan area progresses.

A sketch plan of possible subdivision is provided in Figure 4.1. The Structure Plan has deliberately avoided inclusion of the subdivision sketch plan to enable a future industrial land user to determine their own requirements and have the flexibility in the Structure Plan to meet their needs at the time.

## *4.8 Developer contributions*

The entire Structure Plan area is owned by the Shire of Katanning. As such, there is no Developer Contribution Plan proposed as part of this Structure Plan. It is envisaged that the Shire will liaise with the ultimate developer of the site in regards to the provision of services.

## *4.9 Implementation/other requirements*

The Structure Plan shall be adopted by the Shire of Katanning Council and the WAPC as a strategic document that will form the basis of decision-making by the Shire and WAPC until such time as the Shire's Local Planning Scheme No. 5 is adopted that then specifically includes provisions for the statutory adoption of Structure Plans.

Once the Local Planning Scheme is gazetted the Structure Plan can be endorsed as a Statutory Structure Plan under the scheme.

landinsights
PLANNING DESIGN ENVIRONMENT

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S

0 0.05 0.1 0.2 0.3 0.4 km

1:10,000

**WAMMCO STRUCTURE PLAN**

**FIGURE 4.1**
**INDICATIVE LOT LAYOUT**

# 5 Appendices

### Technical Appendices Index

| Appendix no. | Document title |
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| 1 | Structure Planning – Environmental Investigations |
| 2 | Local Water Management Strategy Rev A |
| 3 | Bushfire Hazard Assessment |
| 4 | Transport Assessment |
| 5 | Servicing and Infrastructure |

# APPENDIX 1
# Structure Planning – Environmental Investigations

# APPENDIX 2
# Local Water Management Strategy

CONSULTING CIVIL & TRAFFIC ENGINEERS, RISK MANAGERS.

| | |
|---|---|
| Project: | Katanning WAMMCO Site LWMS |
| Client: | Land Insights |
| Job Number: | 1409018 |
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# Glossary of Terms

## Abbreviations

| | |
|---|---|
| ARI | Average Recurrence Interval |
| ASRIS | The Australian Soil Resource Information System |
| ASS | Acid Sulphate Soils |
| CA | Catchment Area |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| DCP | Dynamic Cone Penetrometer |
| GSTWS | Great Southern Towns Water Supply |
| LWMS | Local Water Management Strategy |
| POS | Public Open Space |
| Q | Flow ($m^3/s$) |
| WAMMCO | Western Australian Meat Marketing Co-operative Limited |
| WAPC | Western Australian Planning Commission |
| WSUD | Water Sensitive Urban Design |
| WWTP | Wastewater Treatment Plant |

# 1. Executive Summary

## 1.1. Background

Katanning has been identified as one of a network of nine SuperTowns due Katanning's growth potential, central location and demonstrated governance ability.

The SuperTowns vision is to create well-connected communities with access to services, affordable housing, and a diverse range of lifestyle and employment opportunities. This will result in more choices for people living in regional areas and provide an attractive alternative to residing in the metropolitan area.

## 1.2. Objective

The objective of this Local Water Management Strategy (LWMS) is to achieve best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner.

This LWMS has been prepared to support the development of a detailed structure plan for the creation of a light industrial area adjacent to the existing WAMMCO site in Katanning, which is approximately 280 km south-east of Perth.

## 1.3. Existing Site

The proposed development is located at Lots 2809, 4 and 1 on Great Southern Highway, Lot 5 on Henry Street and Lot 6 on Hassell Street within the Shire of Katanning. The site consists of approximately 117ha of land located immediately south east of the existing WAMMCO site and north west of the Katanning town site.

Currently the site is unused with the majority of the area cleared, and overgrown with grasses.

The majority of the site is considered to be agricultural land, with the WAMMCO abattoir and associated infrastructure and dams/water bodies located centrally within the site. A non-perennial watercourse with a west-east orientation dissects the site. One residential property and small dam is also located within the south eastern corner of the site, west of Henry Street. The portion of the site, east of Henry Street is predominantly vacant land with a water body and various soil mounds located within this portion of the site.

## 1.4. Water Supply

- Water to be supplied by a water main extension from the existing reticulation on Pemble St; and
- Water supply is to be supplemented by rainwater tanks and grey water storage for non-potable re-use.

## 1.5. Wastewater

- Water Corporation has confirmed the development area will not be included in their wastewater planning; and
- Wastewater in each Lot is to be treated by an onsite effluent disposal unit. Soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

## 1.6. Stormwater Management

### 1.6.1. Flood Protection:

- All floor levels to be set a minimum of 500mm above the 100year water level of the creek; and
- The flood fringe impacts slightly on some lots and it is recommend the lot boundaries be adjusted.

### 1.6.2. Drainage Concept:

- Existing culverts to be lowered/upgraded to allow free drainage of the surrounding areas;
- The developer of each lot will need to provide storage for stormwater that allows discharge at pre-developed rates for the 1, 10 and 100 year events;
- Basins are recommended at each Lot with overflow to the open drains in the street via culverts (low flow) or rock lined spillway (high flow). Basins should be lined with clay to prevent groundwater recharge; and
- The road is drained by open drains sized for the 1:10 year event. These will also serve to carry overflow from lot areas.

### 1.6.3. Protect Ecology

Open drain outlets to be heavily vegetated prior to discharge to the Katanning Creek. Vegetated area to be sized at 2% of the impervious catchment area.

## 1.7. Environmental

There is potentially a number of species of conservation significance along the Katanning Creek within the proposed development area. Therefore it is recommended that a clearing exclusion zone be implemented along the creek line, unless detailed environmental investigations confirm the absence of species of significance.

## 1.8. Groundwater

The following to be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements;
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas);
- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage;
- All basin and drains to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

There is no requirement to lower groundwater levels to facilitate development.

# 2. Introduction

## 2.1. Principals and Objectives

The objective of this Local Water Management Strategy (LWMS) is to achieve best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner. The objectives of total water cycle management, as described by the Water Resources State Planning Policy (WAPC, 2004) are to:

- Take into account total water cycle management and water-sensitive urban design principles;
- Ensure that the development is consistent with current best management practices and best planning practices for the sustainable use of water resources;
- Seek to achieve zero net variations in water quality and quantity, unless necessary to meet identified environmental water requirements;
- Promote management of the urban water cycle as a single system in which all urban water flows are recognised as a potential resource;
- Maximise the opportunities for compliance with best practice stormwater management including retention of stormwater on site/at the source;
- Promote the use of water conservation mechanisms that increase the efficient use of water, including stormwater;
- Incorporate the re-use and recycling of water, particularly stormwater and grey water, consistent with state water strategy recycling objectives. Alternative water sources should be considered where appropriate; and
- Promote the retention and use of local native vegetation in developments to minimise water use and maximise filtration, particularly where landscaping is proposed.

In order to achieve these objectives, the LWMS follows the principles of Water Sensitive Urban Design (WSUD).

## 2.2. Planning Background

Over the next three to four decades, Western Australia's population is set to double. As part of preparing for this growth and working to decentralise Western Australia's future population, the State Government devised a plan to make regional towns even more attractive places to live in the future. Therefore a plan to transform towns into SuperTowns was announced in July 2011.

The SuperTowns vision is to create well-connected communities with access to services, affordable housing, and a diverse range of lifestyle and employment opportunities. This will result in more choices for people living in regional areas and provide an attractive alternative to residing in the metropolitan area.

Katanning has been identified as one of a network of nine SuperTowns due Katanning's growth potential, central location and demonstrated governance ability.

As part of the SuperTown initiative, five sites within Katanning have been targeted for the first stage in a Growth Plan to include industrial, commercial, residential and rural-residential development. These sites comprise:

- O'Callaghan Park;
- Piesse Park;
- Western Australian Meat Marketing Cooperative Ltd (WAMMCO);
- Industrial Expansion Area; and
- Warren Road (DIA 4).

This LWMS has been prepared to support the development of a detailed structure plan for the creation of a light industrial area adjacent to the existing WAMMCO site in Katanning, which is approximately 280 km south-east of Perth.

## 2.3. Previous Studies

The following previous studies have been undertaken for the WAMMCO site:

- Katanning District Water Management Strategy (Doc No. W-A1266.03, May 2014, Opus International Consultants);
- Structure Planning: Environmental Investigations (Doc No.TE14012_1b, November 2014, Talis Consultants Pty Ltd);
- Preliminary Geotechnical Study - Proposed Industrial Development - WAMMCO Site, Katanning (Doc No. J1401161 003 R_Rev 0, 26 September 2014, Galt Geotechnics); and
- Katanning Flood Assessment (Opus, 2013).

## 2.4. Level of Design

This LWMS has been prepared with the understanding that the proposed development and Lot boundaries are only at a conceptual level. The Lot boundaries and sizes, as well as road locations and public open space areas, are likely to be refined in the future.

In addition, it is unknown what type of industrial activities the Lots will be used for an as a result it difficult to determine building envelopes, required carpark/hardstand areas and number of people at the facilities which all directly influences potable water supply, rainwater tank storage and stormwater runoff calculations.

Therefore the LWMS has been prepared to outline the likely developer requirements and set out an agreed concept. However, it has been prepared to a high level and will need to be refined in the future when the proposed development configuration has been confirmed. It is recommended that a detailed LWMS is prepared in future, when further details on the lot yield, configuration and land use are developed.

# 3. Proposed Development

## 3.1. Proposed Development

The proposed development is located at Lots 2809, 4 and 1 on Great Southern Highway, Lot 5 on Henry Street and Lot 6 on Hassell Street within the Shire of Katanning. The site consists of approximately 117ha of land located immediately south east of the existing WAMMCO site and north west of the Katanning town site. The site is bounded by Great Southern Highway, Baker Road, Henry Street and the railway line to the north-west. Figure 1 below shows the site location.

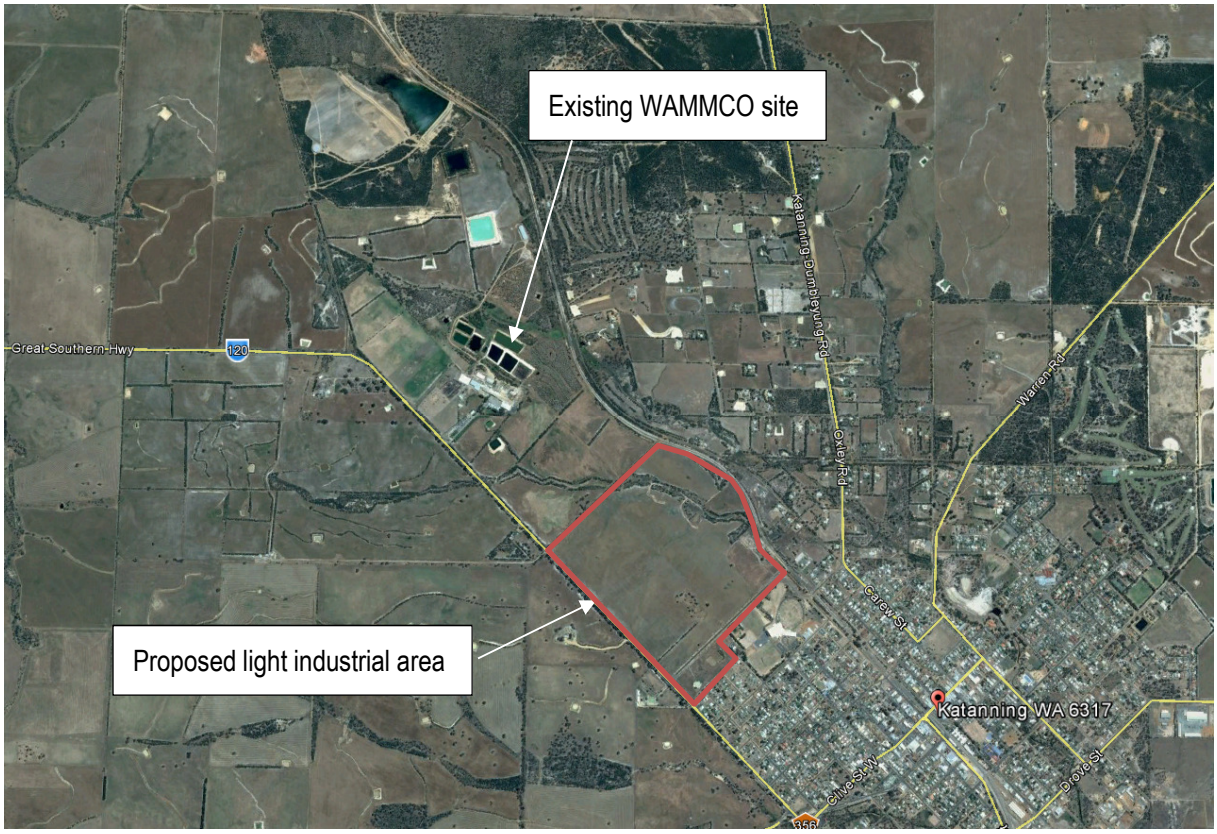



Figure 1. Site Location

Figure 2 shows the proposed structure plan for the site.

The site is currently zoned Rural under the Shire of Katanning Town Planning Scheme No. 4 and it is proposed to rezone the site to Industrial.

Currently the site is unused with the majority of the area cleared, and overgrown with grasses.

The majority of the site is considered to be agricultural land, with the WAMMCO abattoir and associated infrastructure and dams/waterbodies located centrally within the site. A non-perennial watercourse with a west-east orientation dissects the site. One residential property and small dam is also located within the south eastern corner of the site, west of Henry Street. The portion of the site, east of Henry Street is predominantly vacant land with a water body and various soil mounds located within this portion of the site.

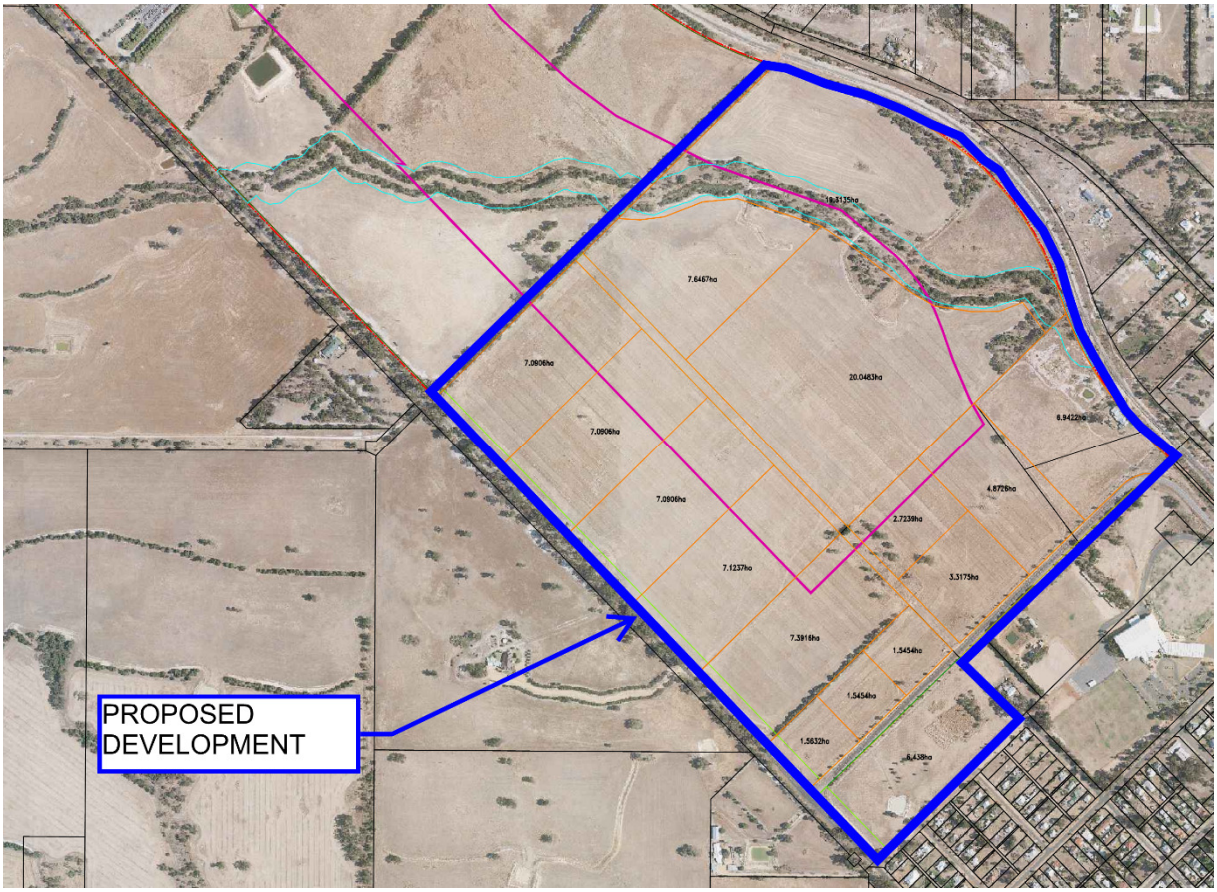



Figure 2. Preliminary Structure Plan

# 4. Design Criteria

## 4.1. Water Conservation – Potable and Wastewater

- Ensure there is an adequate water supply to accommodate townsite and business growth;
- Develop a secure sustainable water management system;
- Treatment and conveyance of wastewater enable an increase in the volume of re-use;
- Increase the volume of suitable water that can be re-used; and
- Reduce reliance on scheme water through the promotion of suitable stormwater and wastewater.

## 4.2. Water Quantity Management

- Ensure existing drainage issues do not prejudice future development opportunities;
- Increase the volume of suitable water that can be re-used;
- Reduce reliance on scheme water through the promotion of suitable stormwater and wastewater;
- Ecological Protection – Maintain pre-development flow rates and volumes for the 1 year ARI event;
- Maintain or restore desirable environmental flows and/or hydrological cycles; and
- Flood Management – Maintain pre-development flow rates and volumes for the 100 year ARI event.

## 4.3. Water Quality Management

- Management to protect the health of existing creeks, wetlands and vegetation to improve water quality to treat nutrients at their source;
- Improve nutrient outputs; and
- Treat all runoff in the drainage network prior to discharge consistent with the Stormwater Management Manual

## 4.4. Disease Vector and Nuisance Insect Management

- Design detention structures so that stormwater is fully infiltrated or discharged within 96 hours.

## 4.5. Groundwater

- Beneficially re-use the groundwater to reduce its impact on the environment and public infrastructure; and
- Implement controls to lower/limit the height of groundwater.

# 5. Pre-development Environment

## 5.1. Existing Site

The Site is generally cleared and vacant with the exception of an abandoned house at the end of Hassell Street and a water body and various soil mounds located south of Henry Street. Figure 3 below shows the existing site.

Figure 3. Existing Site

The site is generally flat, grading from approximately 330m AHD in the west to 315m AHD in the east, equating to a maximum gradient of around 2%. There is an existing creek which runs through the north of the site from west to east.

## 5.2. Geotechnical

A geotechnical investigation was undertaken by Galt in September 2014. The investigation comprised of:

- A walkover of the site;
- Excavation of test pits at 30 locations to depths of 0.9 m to 2.5m;
- Dynamic Cone Penetrometer (DCP) at each test pit location, extending to depths of 0.5m to 0.9m;
- Percolation testing for effluent disposal assessment at 4 locations at depths of between 0.3 to 0.4m; and
- Collection of representative samples from selected test pits for inspection and possible laboratory testing.

The investigation found that the site soils generally consist of:

- SAND/Clayey SAND/Silty SAND (SP/SC/SM), fine to coarse grained, locally with some gravel, extending to depths of between 0.1 m and 0.8 m; overlying
- Clayey SAND/Sandy CLAY (SC/CI), fine to coarse grained sand, trace to some fine grained gravel, extending to depths of between 0.6 m and 1.9 m; locally overlying
- Sandy CLAY (CI/CH), locally present, trace fine grained sand and quartz, locally present from as shallow as 0.6 m extending to the maximum depth of 2.3 m.

A review of the Acid Sulphate Soils (ASS) potential for the site undertaken by Talis found that risk mapping is not available for the site, however a review of the CSIRO's ASRIS data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring.

## 5.3. Environmental

An environmental study was undertaken by Terratree in October 2014. The investigation comprised of a desktop study which included searches of the following databases:

- Department of Parks and Wildlife's Threatened and Priority Flora;
- Department of Parks and Wildlife's Threatened Fauna and Ecological Community;
- WA Herbarium's Declared Rare and Priority Flora;
- Department of the Environment's Protected Matters Search Tool; and
- Associated Level 1 flora and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The study found that the site contains:

- 'Completely degraded' vegetation;
- Vegetation that is considered to have limited conservational values;

- No species of threatened flora;
- A total of 32 species of conservation significance were identified within the search area;
- Site is suitable to support conservation of the Australian Painted Snipe and Bush Stone-curlew (significant fauna);
- Carnaby's Black Cockatoo (protected species) generally nest in a few trees with large hollows at the site along Baker Road and the drainage line;
- No threatened or priority ecological communities;
- No environmentally sensitive areas; and
- No ecological linkages of conservation significance.

Due to the protected species the Carnaby's Black Cockatoo, and as the site is suitable to support conservation of the Australian Painted Snipe and Bush Stone-curlew, it is recommended that the existing vegetation along the main drainage/creek line, which accounts for the majority of the vegetation on site, be retained as much as possible. Therefore a clearing exclusion zone should be applied around this area as per Figure 4. Any proposed vegetation clearing and other disturbance activities within this area will require further assessment to determine the impacts to the species in consultation with the relevant state and federal agencies.

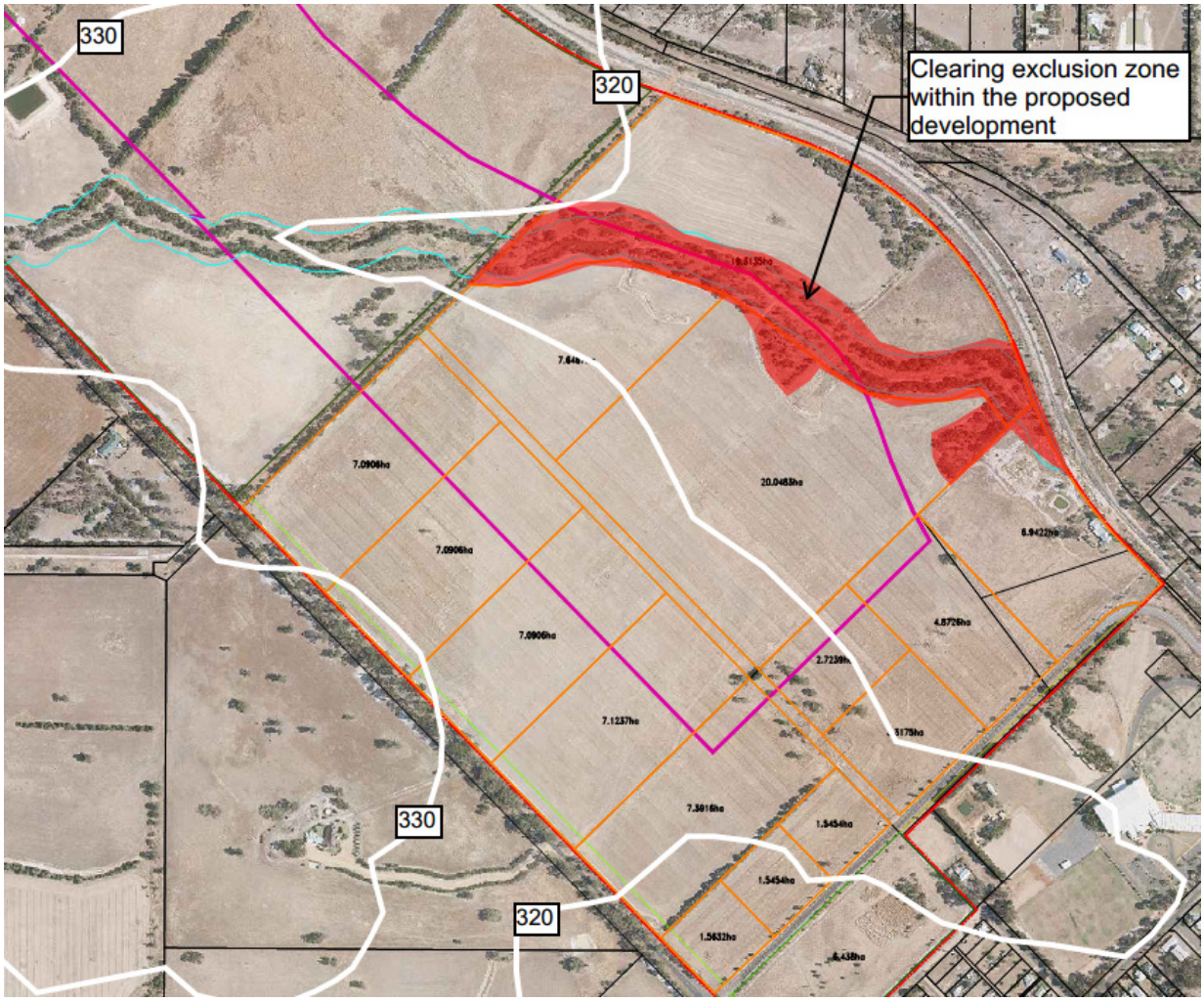



Figure 4. Clearing Exclusion Zone

## 5.4. Surface Water

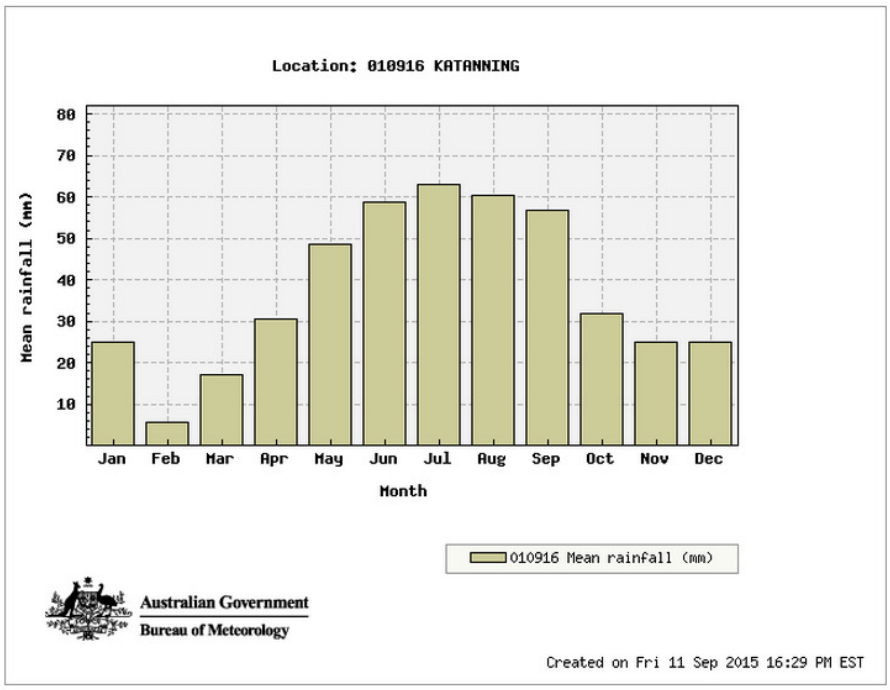
### 5.4.1. Topography

The site is generally flat, grading from approximately 330m AHD in the west to 315m AHD in the east, equating to a maximum gradient of around 2%. There is an existing creek which runs through the north of the site from west to east towards Katanning Creek.

### 5.4.2. Rainfall

Katanning has most of the annual rainfall between May and September in association with the winter cold fronts. The long-term average annual rainfall for Katanning is 441.8mm.

Figure 5 shows a rainfall occurrence chart for Katanning and the Intensity Frequency Duration (IFD) chart obtained from the Australian Bureau of Meteorology is shown in Figure 6.




| Statistics | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual | Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean rainfall (mm) for years 1999 to 2015 | 25.0 | 5.8 | 17.2 | 30.6 | 48.5 | 58.6 | 63.0 | 60.5 | 56.9 | 31.8 | 25.0 | 24.9 | 441.8 | 16 |

Figure 5. Katanning Mean Rainfall

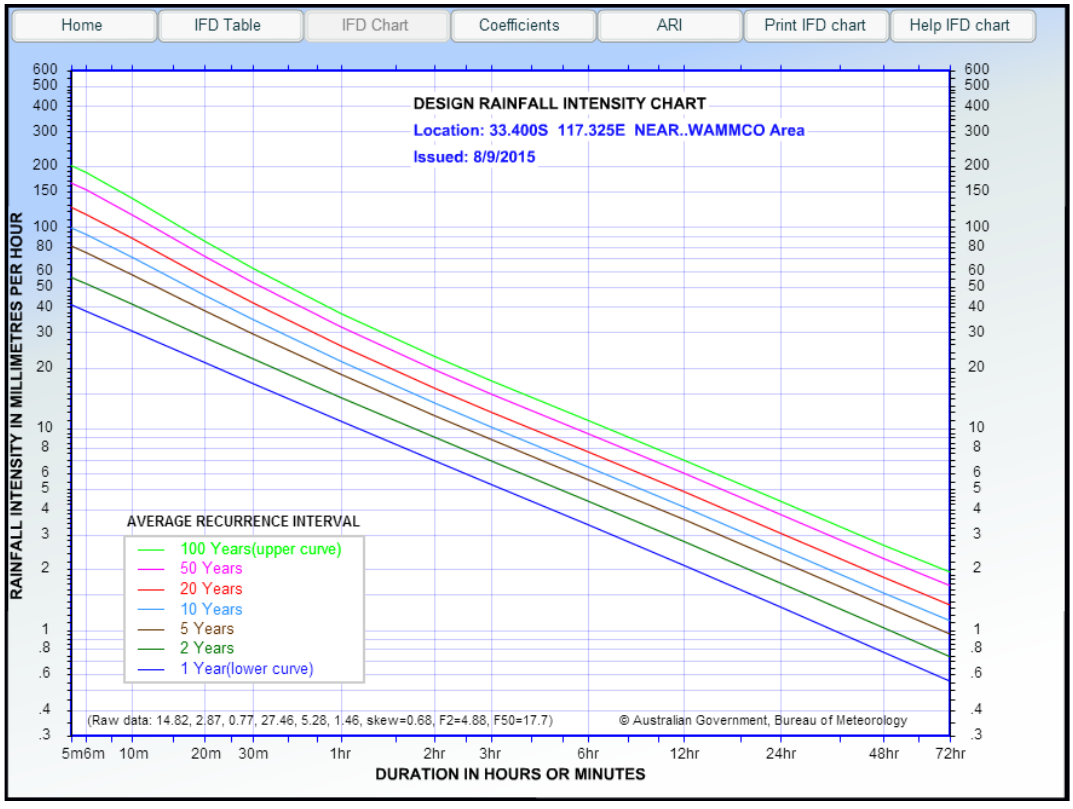



Figure 6. IFD Chart

### 5.4.3. Predevelopment Surface Water Flow

Predevelopment flow rates have been calculated using the Index Flood Method for the Wheatbelt Region as per Australian Rainfall and Runoff Book IV – Estimation of Design Peak Discharges (2001).

Table 1. Major Catchment Predevelopment Flows

| Pre-developed Catchment | Description | Area ($km^2$) | Q1($m^3/s$) | Q5($m^3/s$) | Q10($m^3/s$) | Q100($m^3/s$) |
|---|---|---|---|---|---|---|
| CA01 | West of Great Southern Highway | 2.01 | 0.47 | 1.44 | 2.54 | 13.11 |
| CA02 | CA01 and area between Great Southern Highway and Baker Road | 2.75 | 0.57 | 1.74 | 3.06 | 15.82 |
| CA03 | South of main creek line within development area | 0.79 | 0.27 | 0.82 | 1.44 | 7.46 |
| CA04 | North of main creek line within development area | 0.16 | 0.10 | 0.31 | 0.55 | 2.82 |
| CA05 | CA01, CA02, CA03, CA,04 and additional area north of proposed development | 3.77 | 0.69 | 2.10 | 3.70 | 19.11 |
| CA06 | South portion of proposed development flowing in the south east direction | 0.27 | 0.14 | 0.43 | 0.76 | 3.94 |

Figure 7 shows the proposed catchment areas for the site.

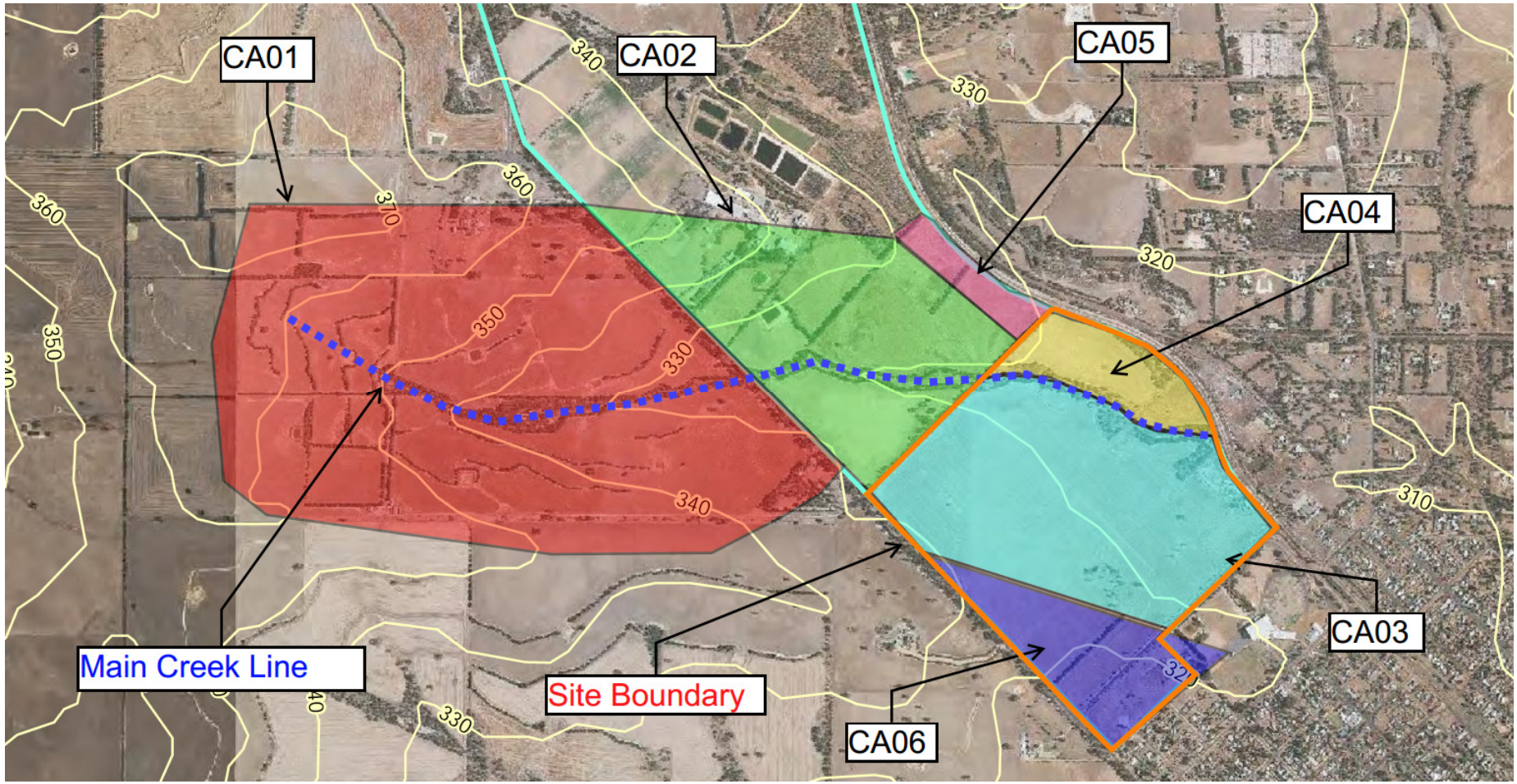



Figure 7. Catchment Areas

### 5.4.4. Surface Water Quantity

Flooding is an issue in some areas of Katanning where the capacity of the creek is exceeded however it is likely that there are local constrictions within this system (e.g., culvert diameters too small, overgrown vegetation in the channels, etc.) that have caused these overflows. The results of the flood analysis indicates that whilst the main components of Katanning Creek (i.e., the tributaries) have approximately a 1:10 year ARI design capacity, the existing piped and overland stormwater system is less than this.

One of the outcomes from the Katanning Flood Assessment (Opus 2013) was the compilation of an estimated Q100 flood level for the SuperTowns development scenario which indicated that the flood fringes predominantly follow the Katanning Creek alignment.

The flood fringe area within the proposed development is shown in Figure 8.

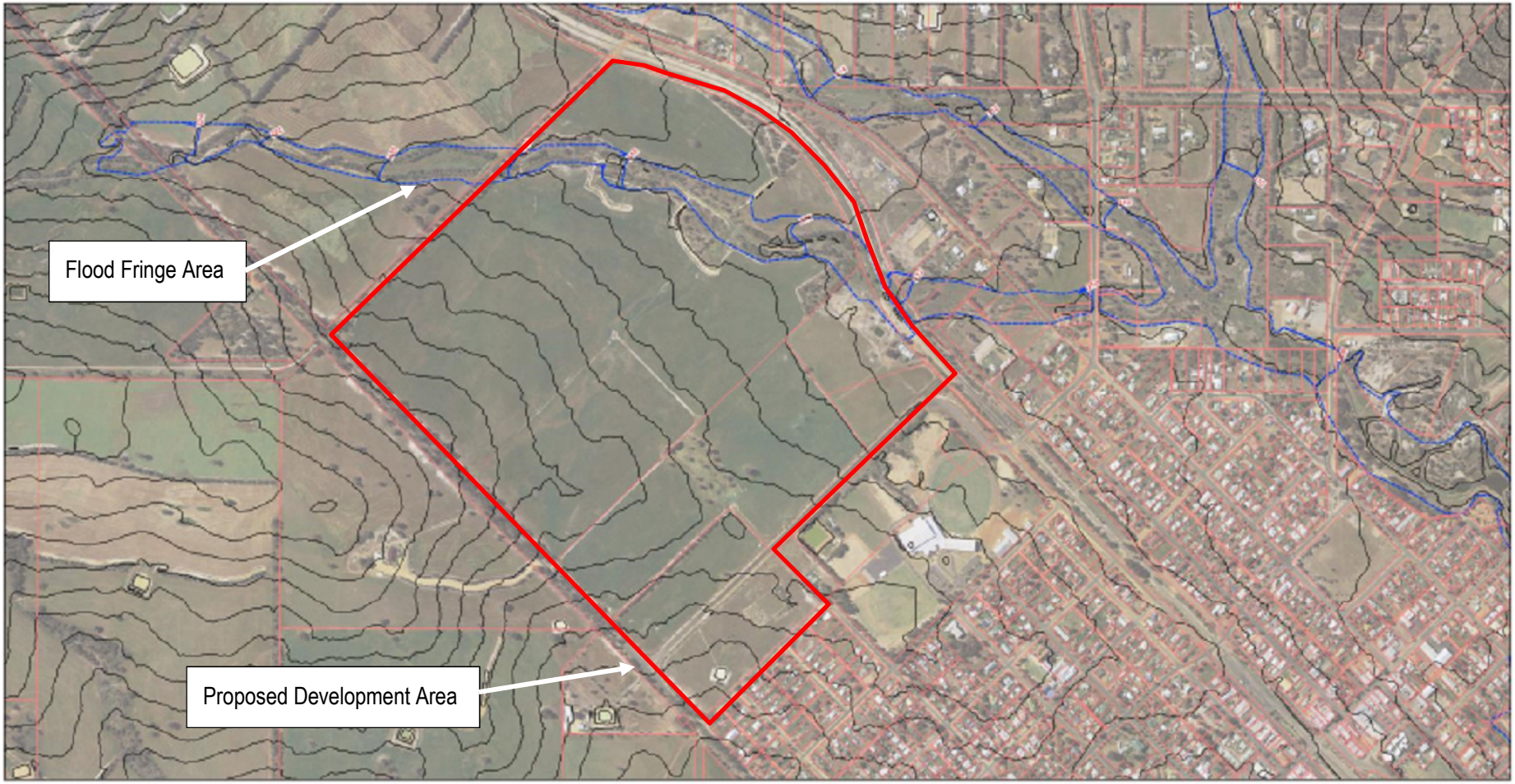



Figure 8. Flood Fringe Area

### 5.4.5. Surface Water Quality

As the majority of the proposed development area is currently undeveloped there are unlikely to be any major concerns with surface water quality.

## 5.5. Groundwater

The District Water Management Strategy prepared by Opus provided several findings in relation to groundwater for Katanning which are summarised as follows:

- Approximately 60% of the town experiences groundwater within 2m of the surface;
- The groundwater is naturally collecting in the valley areas of the local landscape, but these areas become water logged as the groundwater is unable to flow away due to the low permeability of the clay/soil conditions;
- Due to the low hydraulic conductivity of the deeper subsoil, pumping to control groundwater levels has been generally unsuccessful; and
- Salinity is considered high as levels ranged from 1800 ppm up to 16,000 ppm.

The geotechnical investigation undertaken by Galt found perched water within four of the test pits between 0.3m and 0.6m, however only two test pit were located within the proposed development as shown in Figure 9. Surficial ponding water was also observed at the same locations which Galt considered likely to be perched groundwater over the surficial clayey soils.

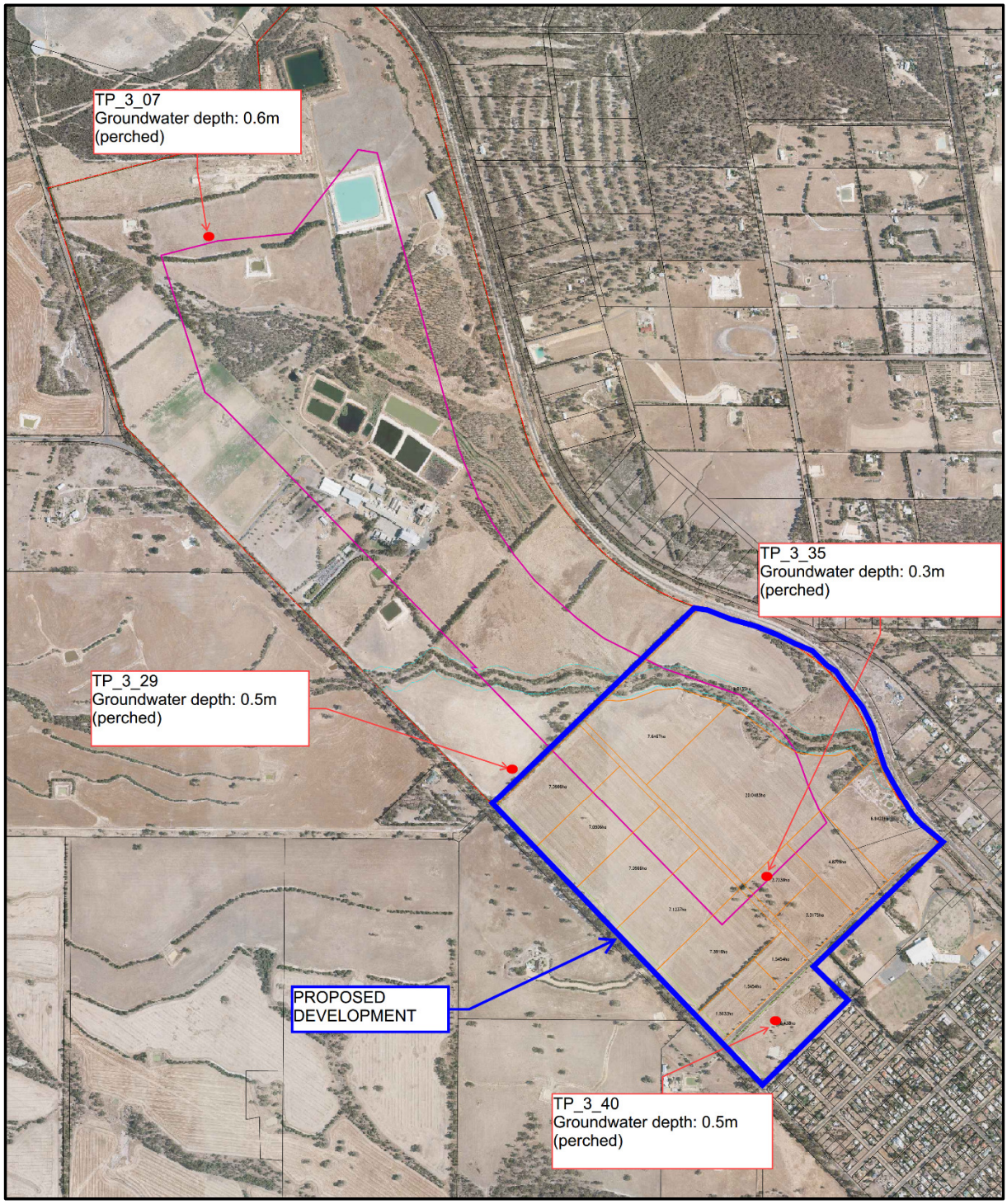



Figure 9. Flood Fringe Area

# 6. Water Use Sustainability Initiatives

## 6.1. Water efficiency measures

### 6.1.1. Landscaping

Any proposed vegetation should be waterwise native plants that do not require ongoing irrigation.

Open space areas to be planted with drought-resistant local native species suited to the prevailing site conditions.

Any grass plantings to comprise of hardy grass species that require minimal irrigation beyond the first season and can cope with drying out in summer.

Plantings should be kept dense and compact to improve efficiency of any irrigation.

### 6.1.2. Industrial Use

The developer/owner of each Lot to provide rainwater tanks for 'clean water' reuse on site for non-potable use.

Water tanks to be sized appropriately to store enough rainwater during the winter months to allow water reuse during the dryer summer months for the specified number of people occupying the proposed building.

The developer/owner of each Lot should be required to contain 'grey water' and runoff from hardstand areas (i.e., truck bays, roadway, carparking, etc.) for reuse on site for non-potable use.

## 6.2. Water Supply

The development area has not been included in the Water Corporations water planning. However Water Corporation have confirmed that water could be supplied by a water main extension from the existing reticulation on Pemble St (refer Figure 10).

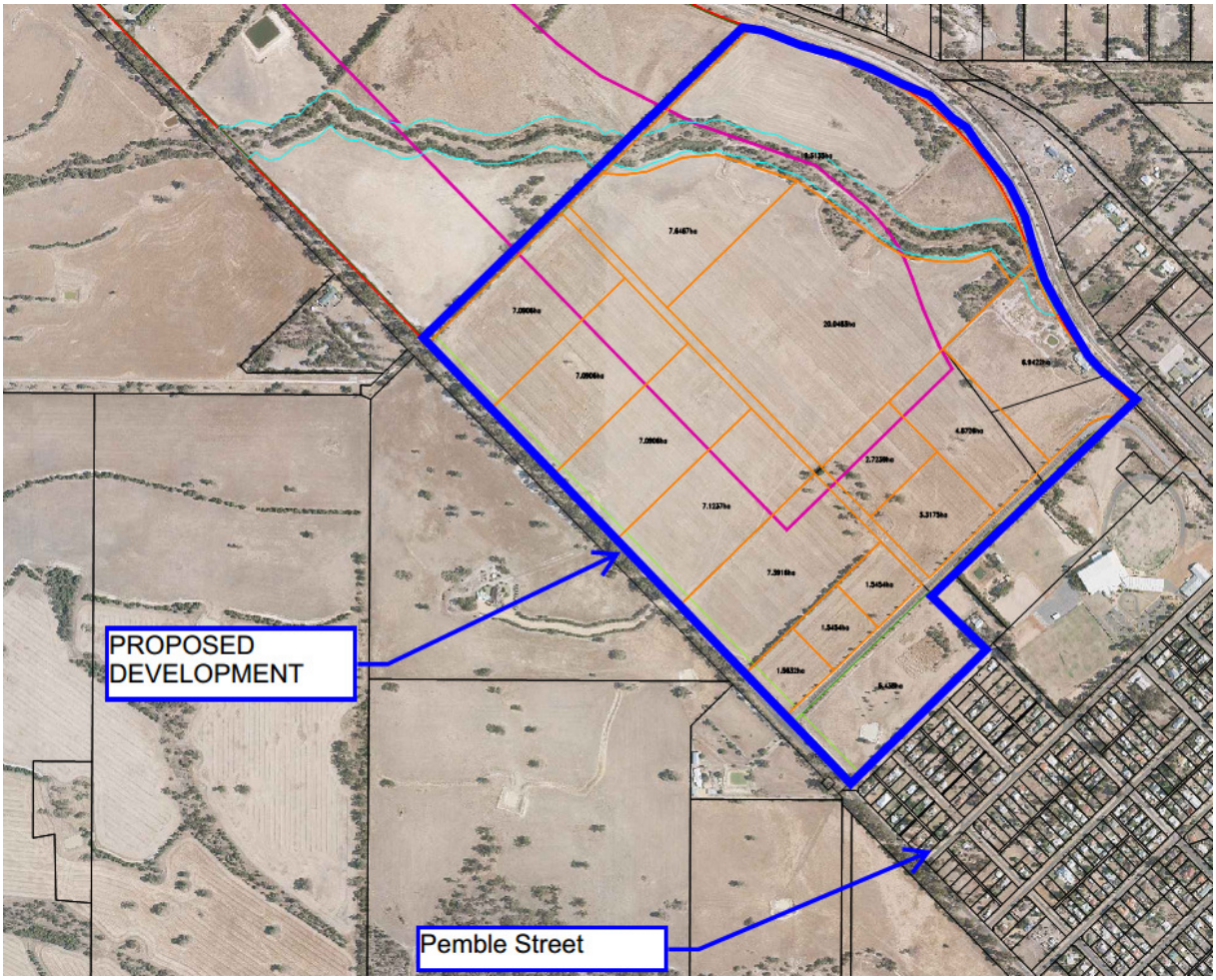



Figure 10. Pemble Street Water Supply

The Great Southern Towns Water Supply (GSTWS) currently supplies the significant majority of potable water to Katanning and there does not appear to be another suitable surface or groundwater source that are within close proximity of Katanning that could are able to provide sufficient quantity and quality to modify this reliance on the GSTWS.

Therefore, to reduce the reliance upon the GSTWS to provide potable water for Katanning, it is desirable that the water supply is only used for drinking water uses whilst the development water supply is supplemented by rainwater tanks and grey water storage for non-potable re-use.

## 6.3. Wastewater Management

The Water Corporation has confirmed that the proposed development area has not been included in the Water Corporations wastewater planning and at this stage is not going to be included in the future.

This is due to the fact that wastewater treatment plants in regional centres employ biological processes, which are highly sensitive to contaminants. Wastewater from industrial areas presents a significant operational risk to the plant because of the potential to disrupt the biological treatment process, and compromise reuse of treated effluent. The presence of an industrial subdivision in the catchment of a small regional wastewater treatment plant presents a substantial risk to the Katanning wastewater treatment plant (WWTP), particularly as the businesses that may establish in that subdivision are not initially known.

Therefore wastewater in each Lot is to be treated by an onsite effluent disposal unit.

The percolation test results within the upper sandy material range between 5 minutes and 36 minutes for water to fall 25 mm when testing was carried out in accordance with Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1972, Schedule 8. Therefore the underlying clayey material is considered unsuitable for onsite effluent disposal by percolation. As a result the soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

The groundwater levels for each Lot will also need to be considered.

# 7. Stormwater Management Strategy

## 7.1. Flood Protection

All floor levels of industrial buildings to be constructed 500mm above the 100 ARI flood level of the creek. All Lots are to be developed at or above the 100 ARI flood level. No filling operations are to occur in the flood fringe areas.

Currently the majority of the proposed Lots of the development area are outside of the flood area however the boundaries will need to be changed for two Lots as per Figure 11 below.

The 100 ARI storm events will be directed away from the Lots to the Katanning creek by overland flow.

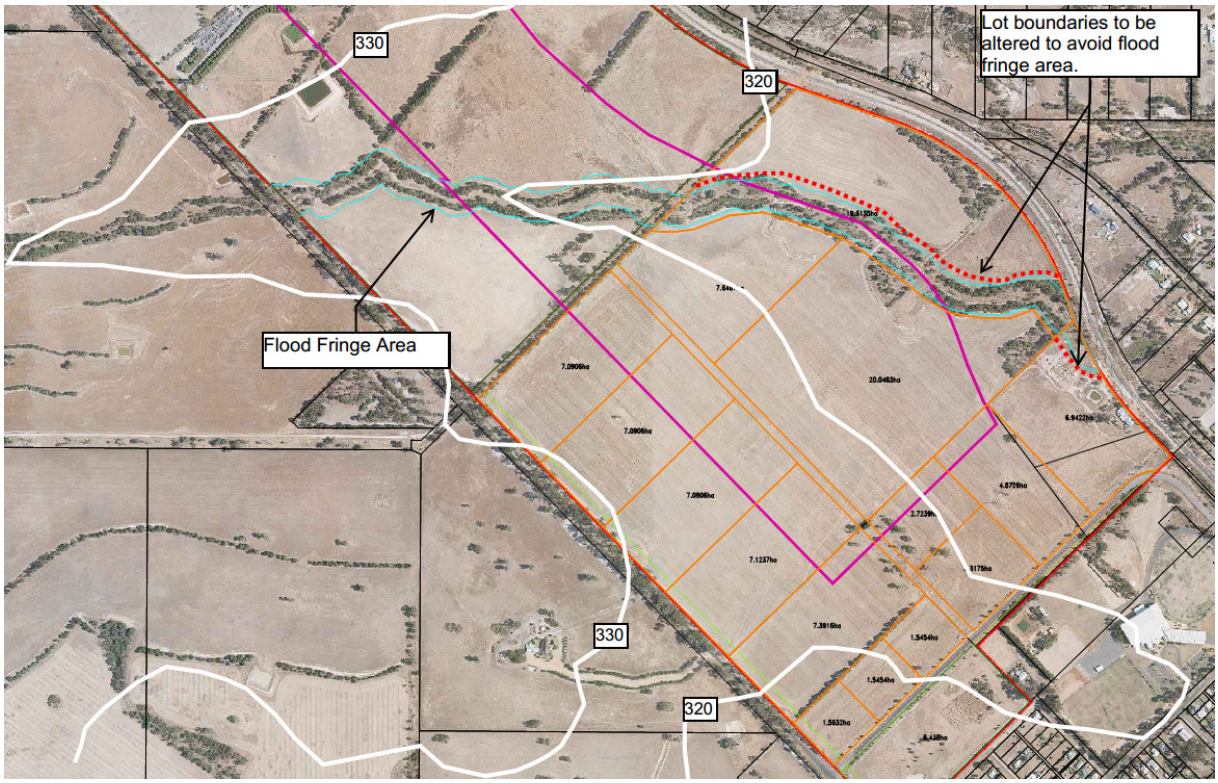



Figure 11. Flood Fringe Area and Lots Boundaries

## 7.2. Manage Serviceability

The results of the Katanning Flood Assessment (Opus, 2013) showed that Katanning Creek had a 10 year ARI design storm hydraulic design capacity however, the existing piped and overland stormwater system is less than this. This has resulted in localised flooding throughout Katanning.

Therefore a 10 year ARI design storm has been adopted for the proposed development which is typical for business, commercial and industrial areas and intensely developed residential areas.

## 7.3. Drainage Concept

The developer/owner of each Lot will need to provide stormwater storage that allows discharge at the predevelopment flow rate at the 1, 10 and 100 year storm events. This would consist of designing and constructing a basin that discharges into the road drainage network through appropriately sized culverts, perforated pipes and overflow spillways. Basins will need to be lined with clay, or similar, to prevent water infiltrating the ground and adding to the groundwater.

As discussed previously in Section 6.1.2 the developer/owner of each Lot will also need to provide water tanks for storage of 'grey water' and runoff from roof or hardstand areas for reuse on site for potable and non-potable use, respectively. This would reduce the stormwater being directed to the basin however, as it is unknown how much potable and non-potable water each Lot will require, it has been assumed that all runoff will be directed to the basins for conservatism.

Road reserve drainage will be directed to the Katanning Creek via open drains.

## 7.4. Protect Ecology

Due to the fact that the groundwater levels and salinity across Katanning have caused environmental and infrastructure problems throughout Katanning, it is not recommended that infiltration systems are adopted as part of the treatment of stormwater.

Therefore to improve the quality of stormwater the last sections of drains will be heavily vegetated to trap and filter pollutants (suspended solids and trace metals).

The same philosophy is to be adopted within each Lot. As well as inside the basin, the drains leading into the basins shall also be vegetated.

## 7.5. Drainage Plans

Drainage plans are shown in Figure 12 and Figure 13.

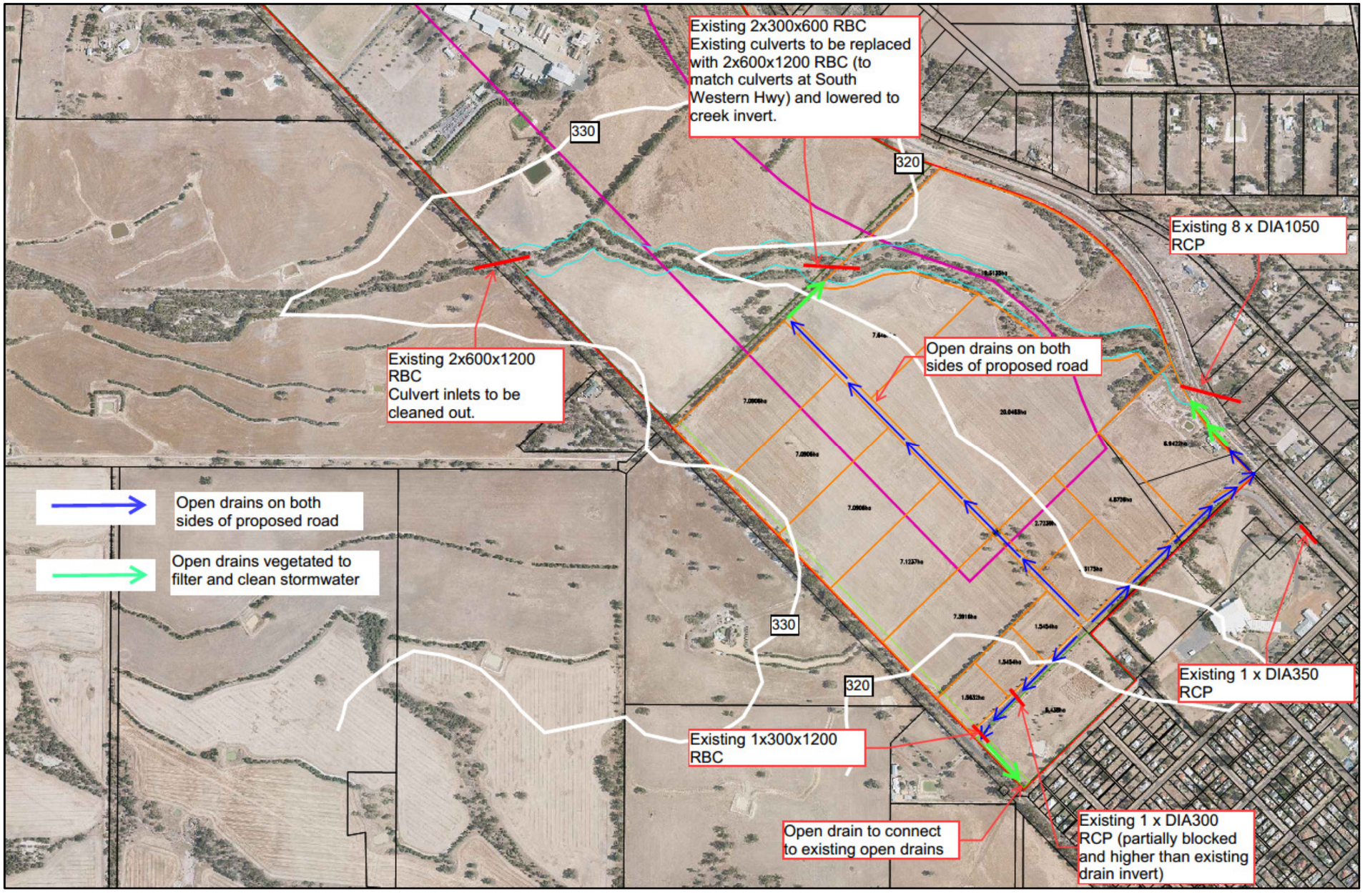



Figure 12. Proposed Drains and Culvert Plan

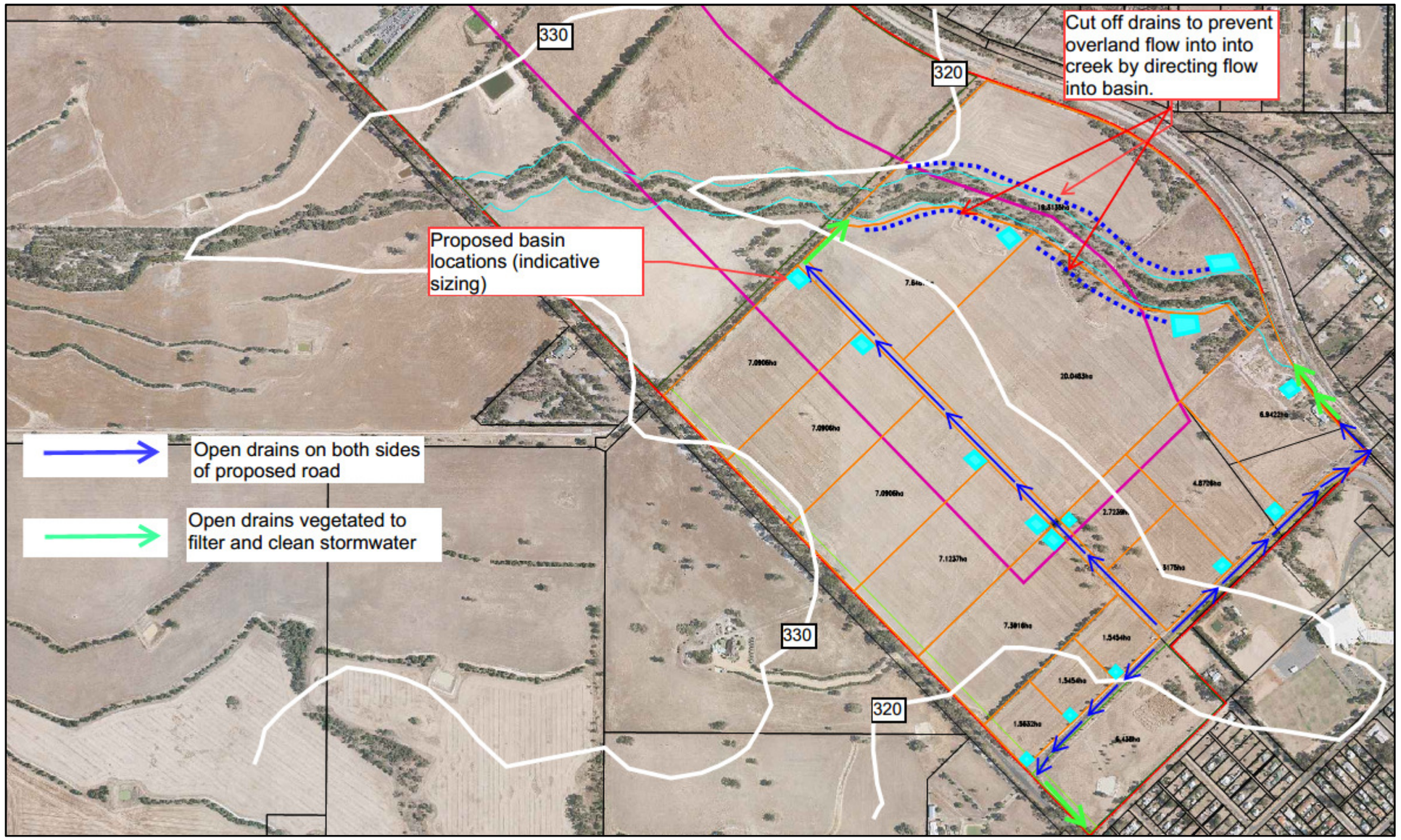



Figure 13. Proposed Basin Plan

## 7.6. Design Assumptions

### 7.6.1. Lot Use

As discussed in Section 2.4 of this LWMS the industrial activities are unknown and therefore the pervious and impervious proportions of each Lot are currently unknown.

In order to estimate the likely post development flows and approximate basin sizes required for each Lot it has been assumed that 70% of each Lot will be made up of buildings and hardstand areas.

Therefore it has been assumed that:

- 70% of area is impervious; and
- 30% of area is pervious.

### 7.6.2. Runoff Coefficients

Runoff coefficients for stormwater flow calculations are as below:

- Existing & Developed - pervious areas;
    - 1 year: 0.07
    - 10 year: 0.23
    - 100 year : 0.68
- Developed - impervious areas;
    - 1 year: 0.8
    - 10 year: 0.85
    - 100 year : 0.9

## 7.7. Basin Sizing

Basins have been sized individually for Lots with similar sizes. As discussed previously basins have been designed assuming 70% impervious areas and have assumed outflow of the basins are at predevelopment flow rates for the 1, 10 and 100 year flow.

Basin depths have been restricted to 500mm to ensure that the basin can be sufficiently drained into adjacent road drains and to ensure that the invert of the basin is above any potential groundwater.

In summary approximate basin sizes are as per Table 2.

Table 2. Approximate Basin Sizes

| | Predevelopment Flow (m3/s) | | | Basin Storage Required (m3) | | Basin Properties | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Catchment/Lot Size | 1yr | 10yr | 100yr | 10yr | 100yr | Design Volume (m3) | Depth (m) | Slope 1:x | Base Width (m) | Base Length (m) | Approx. Volume | Approx. Surface Area (m2) | Volume check |
| 20.1 HA Lot | 0.06 | 0.46 | 1.90 | 1492 | 1643 | 1643 | 0.5 | 4 | 56 | 56 | 1683 | 3600 | ok |
| 7.1 HA Lot | 0.03 | 0.23 | 0.99 | 453 | 479 | 479 | 0.5 | 4 | 29 | 29 | 482 | 1089 | ok |
| 4.9 HA Lot | 0.02 | 0.16 | 0.70 | 311 | 326 | 326 | 0.5 | 4 | 24 | 24 | 339 | 784 | ok |
| 3.4 HA Lot | 0.02 | 0.16 | 0.70 | 186 | 202 | 202 | 0.5 | 4 | 19 | 19 | 222 | 529 | ok |
| 1.6 HA Lot | 0.01 | 0.09 | 0.41 | 78 | 83 | 83 | 0.5 | 4 | 11 | 11 | 86 | 225 | ok |

Basin sizes will need to be reconfirmed for each Lot depending on actual quantities of impervious and pervious areas as well as water storage requirements for potable and non-potable use. For the purpose of estimating approximate sizes of basins for varying lot sizes the average basin volume and area was estimated per hectare, as shown in Table 3.

Table 3. Approximate Average Basin Sizes per Hectare

| Catchment/Lot Size | Average Basin Volume/Hectare (m3) | Average Basin Area/Hectare (m2) |
|---|---|---|
| 20.1 HA Lot | 84 | 179 |
| 7.1 HA Lot | 68 | 153 |
| 4.9 HA Lot | 69 | 160 |
| 3.4 HA Lot | 65 | 156 |
| 1.6 HA Lot | 54 | 141 |
| Total Average | 68 | 158 |

Basins are to drain into the adjacent road drains at predevelopment flows. This can be achieved by installing an orifice to a pipe inlet limiting the 1 year stormwater flow into the drains while a larger pipe inlet at a higher level allows the 10 year stormwater flow to drain at predevelopment flows. The 100 year stormwater can be directed to the open drains through a rock lined spillway.

## 7.8. Open Drain Sizing

Road reserve drains have been sized to withstand a 10 and 100 year storm event from the road reserve as well as the pre-development flows that are being directed into the drains from each Lot basin with a 150mm and 0mm freeboard, respectively.

To improve the quality of stormwater the last sections of drains will be heavily vegetated to trap and filter pollutants (suspended solids and trace metals). The Department of Water stipulates that the area of vegetation within a drain must be greater than 2% of the impervious area. As each Lot will have a basin, that will treat the stormwater in a similar way, only the area of the road reserve was included in the calculations.

Drain sizes have been summarised in Figure 14.

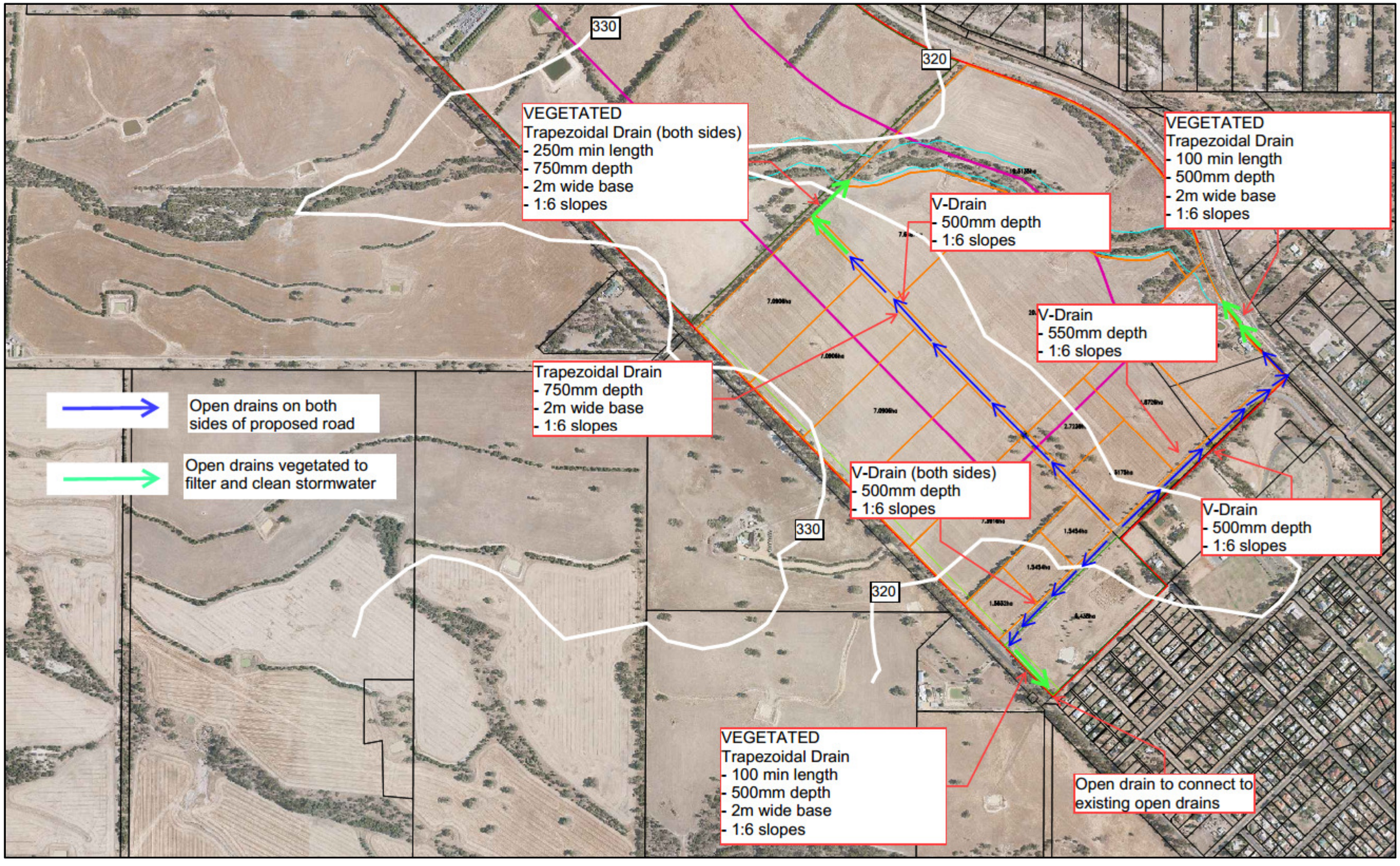



Figure 14. Proposed Drain Sizing

# 8. Groundwater Management Strategy

## 8.1. Proposed Development Area

As per Section 5.5 of this LWMS the geotechnical investigation undertaken by Galt only found perched water within two test pit within the proposed development. All other test locations did not encounter groundwater within the 1-2m pit depth.

The geotechnical consultant has recommended that the following be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements;
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas);
- Earthworks on this site be done in drier months of the year (November to April); and
- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.

All basin and drains will need to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

The existing culverts will also need to be altered as previously shown in Figure 12 to allow free drainage of the surrounding areas.

## 8.2. Infiltration Trenches

The groundwater across Katanning has been causing water logging and salinity related issues to the environment and the built infrastructure for an extended period of time whilst the variety of historical groundwater pumping initiatives and study investigations have not been sustainably successful.

Due to the high groundwater table and salinity across Katanning, and the low hydraulic conductivity of the clay material, introducing desalination to treat the water to an appropriate level for its subsequent use as a non-potable water source is not economically viable.

Therefore it was recommended by Opus in the Katanning District Water Management Strategy that the groundwater is collected using low technology and low energy arrangements to lower the groundwater table rather than treat and reuse.

Opus recommended to allow the groundwater to flow downstream of Katanning under the effects of gravity (i.e.,

no annual operating costs to move/pump the groundwater), a network of shallow (<2m – 3m deep) infiltration trenches should be installed across Katanning.

Infiltration trenches have not been considered for this development area as water logging or high groundwater levels are not an issue for this particular area. In addition, lowering the groundwater in this area would likely have limited benefit to the town centre which is downstream of the proposed development area.

Notwithstanding this, infiltration trenches can be retrofitted into the proposed open drains and within the Lots in the future if required.

# 9. Urban Water Management Plans

The Urban Water Management Plan (UWMP) is mostly an extension of the work developed through District Water Management Strategy and LWMS stages and often requires further work to help define future requirements. The additional work includes;

- Groundwater quality monitoring at downstream points of each proposed Lot to develop trigger values and water quality improvement targets;
- Surface water quality monitoring at upstream and downstream sections of the Katanning Creek adjacent to the proposed development to develop trigger values and water quality improvement targets;
- Determination of post development monitoring points for groundwater and surface water quality and quantity;
- Determination of stormwater systems and management plans for each individual Lot;
- Detailed geotechnical investigation across building/construction footprints;
- Application for any groundwater extraction licences; and
- A dewatering management plan as required.

# 10. Monitoring

A monitoring program has been produced, as per Table 4, to allow quantitative assessment of hydrological impacts of proposed development within the area. In particular the program addresses the monitoring of surface water quality, and seasonal fluctuation of groundwater levels and quality within the development area. The program may need to be modified as data is collected to increase or decrease the monitoring effort in a particular area or to alter the scope of the program itself. Any modification to the program would require the agreement of all parties (Department of Water, Shire of Katanning and the developer). The program is designed to operate over a three year post-development period (After completion of 80% of the lots) including throughout construction to allow for time lag for full impacts of development on the receiving environment to occur.

Table 4. Monitoring Schedule

| Monitoring Type | Parameter | Method | Frequency | Reporting |
|---|---|---|---|---|
| Groundwater Quality | pH, Electrical Conductivity, Iron, Nitrogen, Phosphorus, major Cation and Anions | Pumped Bore Sample | Quarterly for 2 years pre-development and 3 years post-development (typically Jan, Apr, Jul and Oct). | Annual assessment reports to be submitted to Department of Water & Shire of Katanning for 3 years post-development.<br><br>Suitability of existing monitoring and reporting frequencies to be assessed annually with any modifications requiring agreement by all parties (Department of Water, Shire of Katanning, & Developer) |
| Surface Water Quality | pH, Electrical Conductivity, Total Suspended Solids, Iron, Nitrogen, Phosphorus, major Cation and Anions | Surface Collection (primarily within the Katanning Creek) | Monthly sampling when flowing, typically June to October for 5 years. Frequency to be reviewed following initial 12 month sampling period. | |
| Vegetation | Number of Dead Plants and Weeds | Visual Inspections | 3 years post-development | |
| Erosion | Signs of Erosion | Visual Inspections | 3 years post-development | |

# 11. Implementation

Roles and responsibilities for the proposed light industrial development are detailed in Table 5.

Table 5. Table of Responsibility

| Item | Development | Interim Maintenance (first three years) | Long-term Maintenance |
|---|---|---|---|
| Landscaping (within Road Reserve) | Developer | Developer | Council |
| Landscaping (within Lots) | Lot Developer | Lot Developer | Lot Developer |
| Swales and Drainage (within Road Reserve) | Developer | Developer | Council |
| Swales and Drainage (within Lots) | Lot Developer | Lot Developer | Lot Developer |
| Monitoring the Development | Developer | Developer | Council |
| Public Open Space Landscaping | Developer | Developer | Council |
| Rainwater Tanks | Lot Developer | Lot Developer | Lot Developer |

# APPENDIX 3
# Bushfire Hazard Assessment

# BUSHFIRE HAZARD ASSESSMENT

## KATANNING

**PROJECT NO: 14129**
**DATE: JULY 2014**

# Document Control Record

| | |
|---|---|
| **Site Details** | katanning |
| **Prepared By** | **Bushfire Prone Planning (BPP Pty Ltd)**<br>ABN: 39 166 551 784<br><br>M: 0438 946 285<br>Email: enquiries@bushfireprone.com.au |
| **Prepared For** | landinsight |
| **Reference** | 1488 |
| **Document Status and Date** | |

*Disclaimer: The measures contained in this Hazard assessment are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bush fire. All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to Bushfire Prone Planning at the time; and achievement of the level of implementation of fire precautions will depend among other things on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control. Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of the consultants, their servants or agents) arising out of the services provided by the consultants.*

Purpose of Report

*The Western Australian Planning for Bushfire Protection Guidelines Edition 2* and the Australian Standard, *AS 3959:2009 Construction of buildings in bushfire prone areas (AS 3959:2009)* are the guiding reference documents in Western Australia for subdivision and related development for rural and rural /urban interface to minimise the impact of fire on communities. In October 2014, the sites were assessed and the subsequent report and associated maps have been prepared as a strategic hazard assessment for consideration of the development of the Shire of Katanning Structure Plan.

The following Bushfire assessment maps accompany this report:

1. Bushfire Hazard Assessment- strategic
    - Piesse Park
    - OCallaghan
    - Wammco
    - Industrial Land
2. Classified Vegetation and Bushfire Attack Level Buffering – strategic
    - Piesse Park

## 1. Hazard Assessment

The map shows a broad brush assessment intended to be used at the strategic level planning stage to identify the suitability of an area for additional development and to determine if the area is bushfire prone.

The methodology classifies the bushfire hazard by assessing the predominant vegetation, this is the key to the initial determination of the site suitability for subdivision/development. If deemed suitable, the potential level of construction standard is determined by the application of *AS 3959:2009 Construction of buildings in bushfire prone areas* (AS 3959:2009). The methodology for the Hazard Assessment specifies three bush hazard levels as per the *Western Australian Planning for Bushfire Protection Guidelines Edition 2*:

- Low
- Moderate
- Extreme

This analysis forms the basis for land use and planning. Additional considerations may be required, for example increasing construction standards of homes and other performance criteria to reduce the impact of bushfire to an acceptable level.

Piesse Park

Piesse Park is a recreational park located north of the town centre and is predominately surrounded by residential lots. A bushfire Hazard Assessment was carried out and the Bushfire Hazard rating on the existing vegetation within the subject site was a combination of Low and Moderate (Refer Figure xx).

Note: The vegetation mapped at the moderate level within the subject site is low threat vegetation and can be excluded when defining Bushfire attack Levels (BAL) , as classified vegetation as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "maintained public reserves and parklands".

External to Piesse Park, the Bushfire Hazard is a combination of Low and Moderate. The vegetation within the waterway located to the north east of Piesse Park is rated as moderate (Refer Figure xx). All other areas 100 metres from Piesse Park boundary is rated as Low. The moderate area identified, at the BAL stage can be managed to achieve a low threat vegetation classification as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "nature strip".

WAMMCO

The WAMMCO site is a rural site located north east of the townsite and is bordered by residential properties to the south and south east, a combination of bushland and small land holdings to the east, rural land holding to the west and bushland to the north and the northern half of the eastern boundary. A bushfire Hazard assessment was carried out and the Bushfire Hazard rating on the existing vegetation within the subject site was a combination of Low and Moderate with a small percentage as extreme to the north (Refer Figure xx).

External to the WAMMCO site, the Bushfire Hazard is a combination of Low Moderate and Extreme. The threat external to the subject site is predominately Low and Moderate.

Industrial Land

The Industrial Land is predominately a rural site located east of the town site. Commercial sale yards are located in the north eastern section of the subject area. The western boundary is adjoining industrial and residential properties, the southern and northern adjoins rural farmland and the north boundary adjoins rural farmland and the towns refuse site. The refuse site is buffered by bushland. The Bushfire Hazard rating on the existing vegetation within the subject site is a combination of Low and Moderate and the external area is Low and Moderate (Refer Figure xx).

O'Callaghan Park

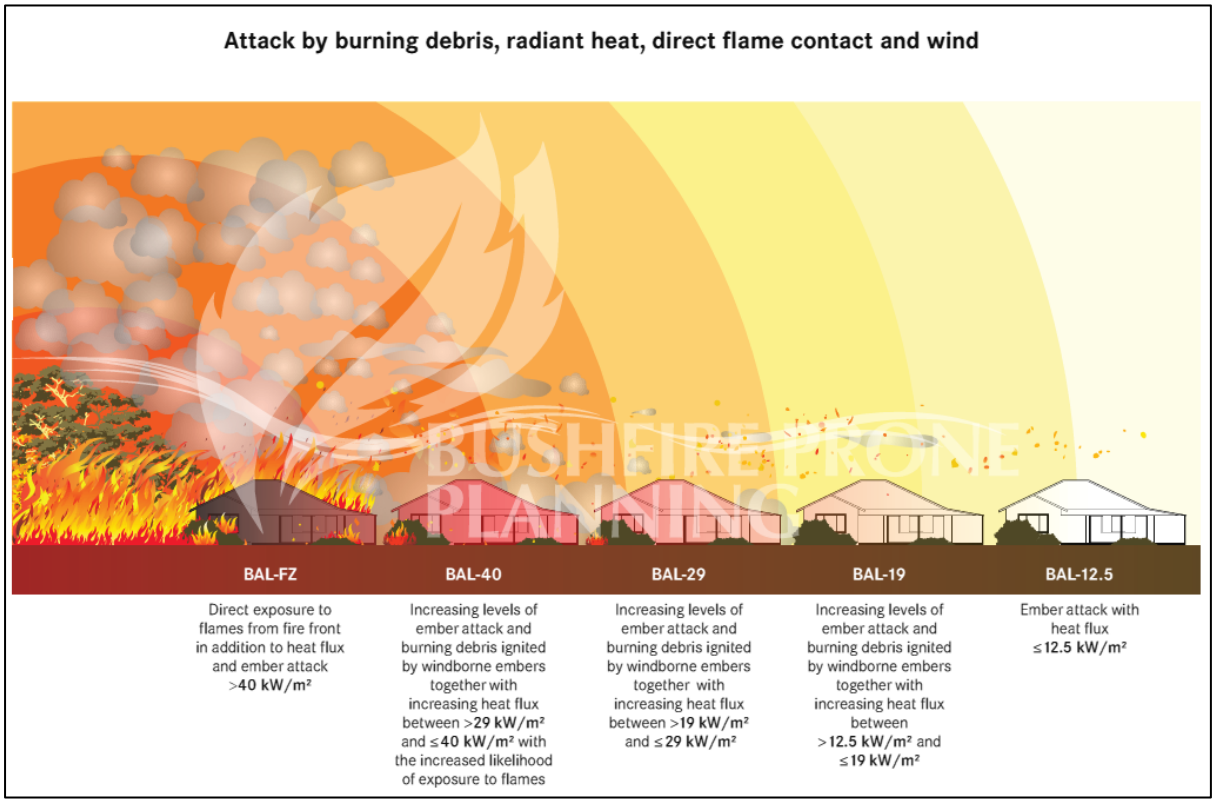
O'Callaghan Park is predominately bushland and part of this land is used as a training track for hoses. The Park is adjoined by small land holdings on all sides. The Bushfire Hazard rating on the vegetation within the subject site is a combination of Low, Moderate and extreme and the external area is rated as Low, Moderate and Extreme (Refer Figure xx).

## 2. Classified Vegetation and Bushfire Attack Level Buffering – strategic

The Bushfire Attack Levels detailed on the following maps complies with AS 3959:2009 requirements and rates bushfire attack using a combination of vegetation type, slope and distance from the predominant Classified Vegetation. In Western Australia it assumes a Forest Fire Danger Index (FFDI) of 80. The BAL assessment involves the following process in accordance with the AS 3959:2009 (Method 1);

- Determination of the area to be assessed
- Identification of vegetation type and class
- Determination of distance of the site from classified vegetation
- Determination of average slope (under the classified vegetation)
- Determination of a BAL
- Determination of construction standards

AS 3959:2009 has six categories of BAL. These categories are based on heat flux exposure thresholds and are summarised in the following Table.




As the distance from the Classified Vegetation is reduced, the construction standard for dwellings must be increased as detailed in Table xx

Table xx

| Classified Vegetation | BAL-12.5 | BAL-19 | BAL-29 | BAL-40 | BAL-FZ |
|---|---|---|---|---|---|
| Distance in metres from Classified Vegetation assuming 0 degrees (flat land) | | | | | |
| **Woodland** | 29-<100 | 20-<29 | 14-<20 | 10-<14 | <16 |

Piesse Park

Piesse Park is a recreational ground and has areas that are parkland cleared and areas that have been revegetated. The vegetation within the subject site is managed and meets the requirements under AS 3959: 2009, Section 2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas “maintained public reserves and parklands”. To the north west of Piesse Park is an area of vegetation, classified as woodland. The mapping shows BAL levels

as buffers and has used woodland as the classified vegetation and assumed 0 degrees as slope. The north western section of Piesse Park has been identified as having a BAL 12.5 and BAL 19 area. (Refer Figure xx). The area identified as BAL 12.5 and BAL 19 can be excluded if the identified vegetation to the north west is managed.

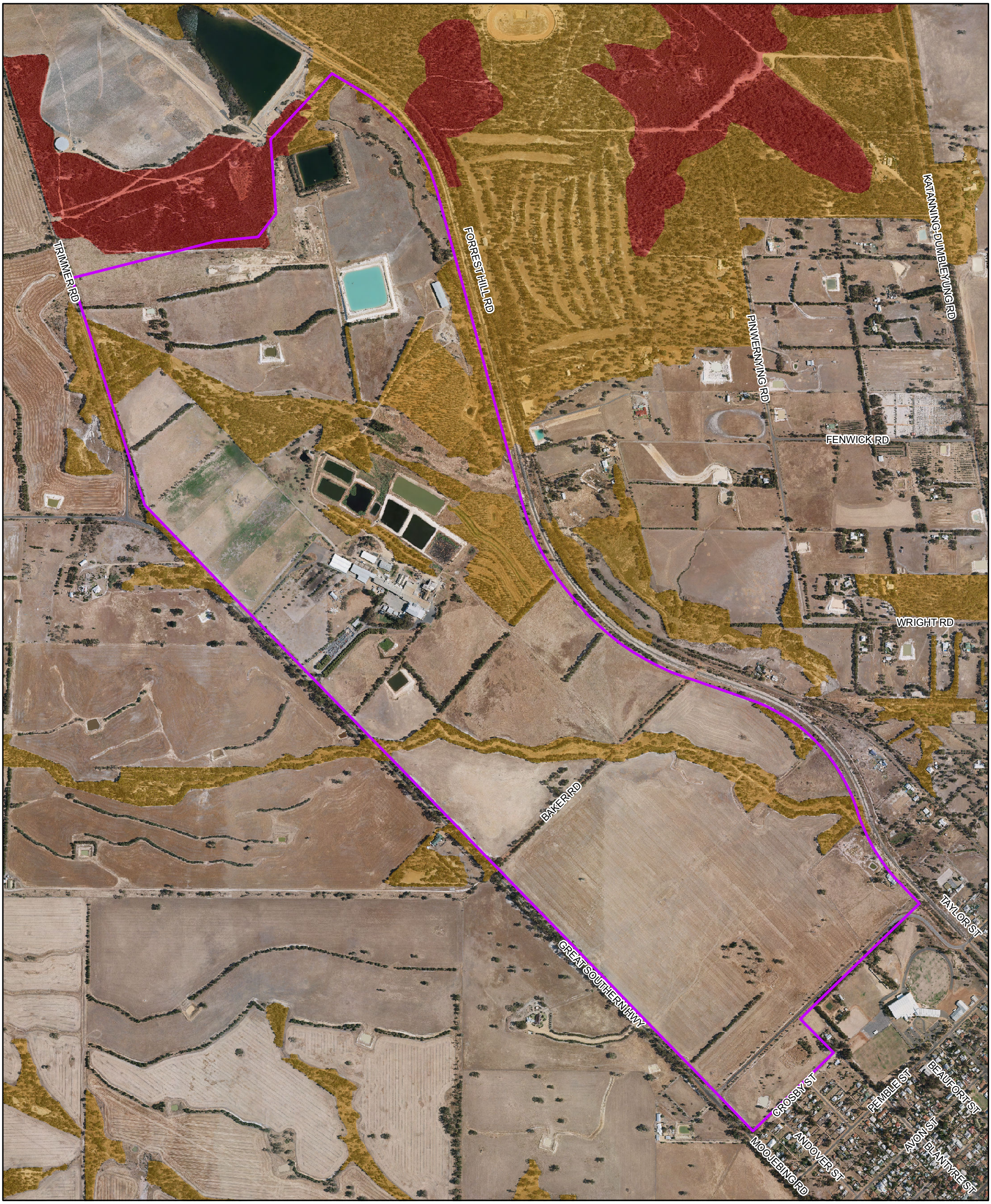



***Figure 2.*** **Bushfire Hazard Mapping** WAMMCO, Katanning

0 100 200 300 400
Meters

N
W E
S

LOCALITY

**LEGEND**

- WAMMCO
- Low Bushfire Hazard
- Moderate Bushfire Hazard
- Extreme Bushfire Hazard

BUSHFIRE PRONE PLANNING

Date: 19/09/2014

June 2014

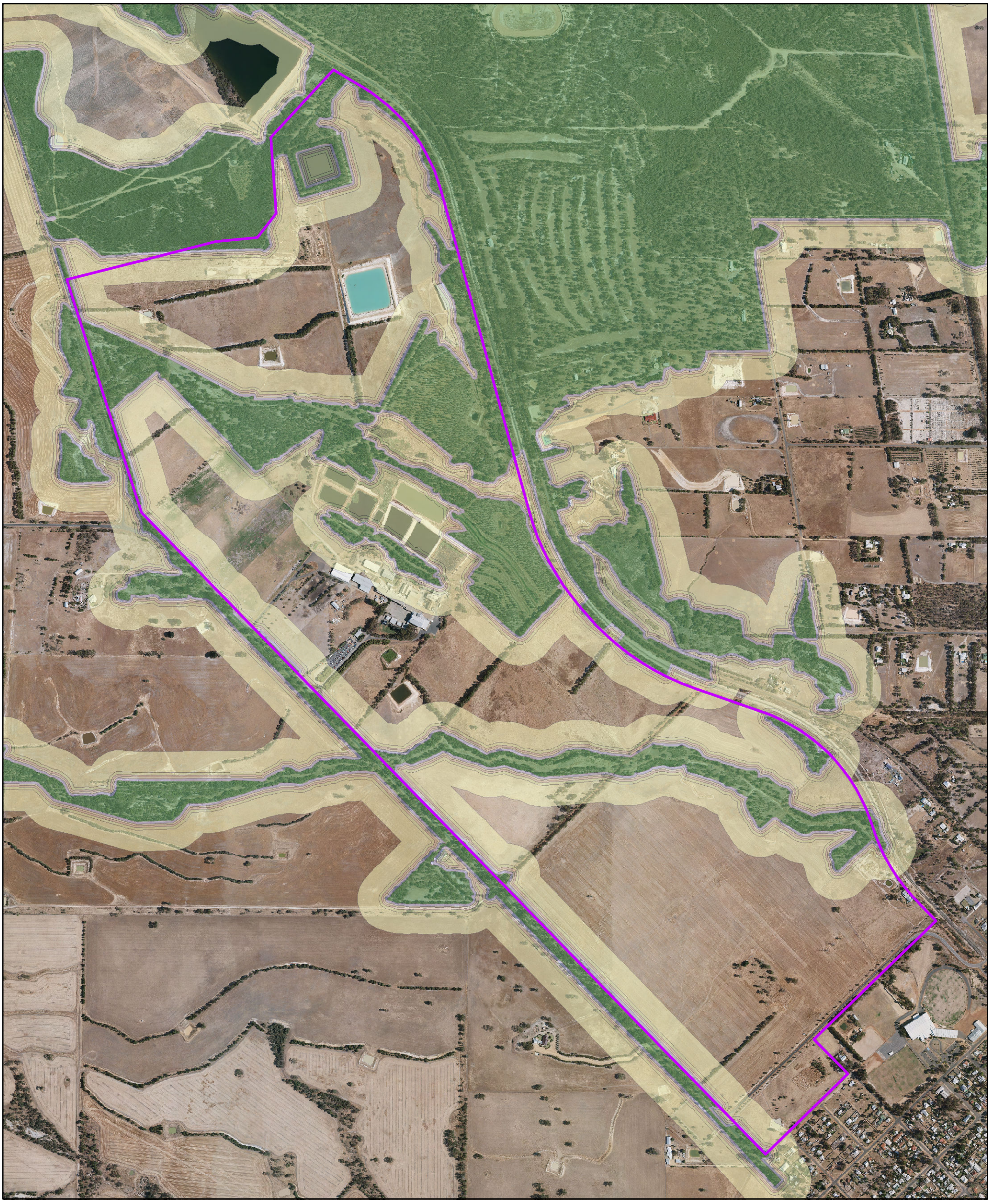



***Figure 2.*** **Classified vegetation** WAMMCO, Katanning

# APPENDIX 4
# Transport Assessment

# APPENDIX 5
# Servicing and Infrastructure

| | |
|---|---|
| Subject: | Katanning Structure Plans – Preliminary Servicing Assessment |
| Date: | 26 September 2014 |
| Author: | Ryan Needham |
| Attention: | Sharee Rasmussen |

Shawmac has been commissioned by Land Insights to undertake a Servicing Assessment for 5 sites within the Katanning Town Site in support of Structure Plans being prepared for the areas. This Technical Note outlines the preliminary findings of the servicing assessment and is based upon a review of service authorities GIS data, DBYD data and Shawmac's assessments. Individual service authorities have not yet assessed on the proposals and as such the findings may be refined in future.

The key findings from the Servicing Assessment are summaries as follows:

Electrical

i) The Katanning Town Site currently has 5-10MVA capacity remaining in terms of power availability. This drops to <5MVA in 2019. This allows for the development of approximately 1,000 residential dwellings from 2019 onwards on a first come, first serve basis, the development capacity substantially reduces if industrial and commercial lots are developed. Once the power capacity is reached, significant works would be required to source power from other areas to facilitate future development. It is expected that the power availability be a major constraint to development within the Town Site;

Communications

ii) NBN rollout has not commenced in the Town Site. It is expected that the town would be serviced by fixed wireless, similarly to other regional centres. Due to a change in government policy, the timeline for NBN rollout will not be provided;

iii) Optus maintains a fibre optic network through much of the town which may provide broadband services

iv) Telstra would be required to service any future development in the absence of NBN or interest but other communications providers

Water and Sewer

v) Water Corporation planning indicates there are proposed water main extensions along Ranford Road and Great Southern Highway which may aid the development of the DIA 4 structure plan area;

vi) Notwithstanding the above, there is no water corporation planning for the majority of the town and any headworks would need to be funded by the developers. It is expected that Piesse Park and O'Callaghan Park could largely be serviced by extensions to the existing infrastructure, however WAMMCO, DIA 4 and the Industrial Land would need major headworks to be constructed;

vii) The existing Katanning WWTP Treated Waste Water pressure main runs through the eastern portion of Industrial Land which may be a constraint to development

Gas

viii) There is no gas reticulation available within the Town Site

The key constraints to development are expected to be the power availability and the provision of water and sewer:

- There is limited capacity within the existing power network to facilitate developments on the proposed scale
- There appears to be limited capacity for expansion of the water and sewer network.

In each case it is expected that significant headworks would be required to be constructed and largely funded by the developers.

# Industrial Expansion Structure Plan

## DRAFT FOR ADVERTISING

## APRIL 2016

## prepared for the Shire of Katanning

landinsights
PLANNING DESIGN ENVIRONMENT

# Industrial Expansion Structure Plan (KATA/2016/3)

Prepared by:
Land Insights

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Document details:
File: 969-05 Draft F-Apr16-MT
Date: April-16

**Document History**

| Date | Document Name | Document Manager | Summary of Document Revision | Client Delivered |
|---|---|---|---|---|
| Oct-15 | 969-05 Draft D-Oct15-MT | MT | Draft Structure Plan for internal review and finalisation. | Nov 15 |
| Feb-16 | 969-05 Draft E-Jan16-MT | MT | Draft Structure Plan revised in accordance with Structure Plan Framework (August 2015)<br>Additional information inserted relating to draft Local Planning Scheme Provisions<br>Other updates as required. | Feb 16 |
| Apr-16 | 969-05 Draft F-Apr166-MT | MT | DRAFT FOR ADVERTISING | Apr 16 |
| | | | | |

**Technical input provided by:**

1. Shawmac Consulting Engineers
2. Bushfire Prone Planning
3. Talis Consultants
4. Galt Geotechnics
5. Terratree

**This Structure Plan is prepared under the provisions of the Shire of Katanning Local Planning Scheme No. 4.**

**IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:**

**[DATE]**

**Signed for and on behalf of the Western Australian Planning Commission:**

an officer the Commission duly authorised by the Commission pursuant to section 16 of the *Planning and Development Act 2005* for that purpose, in the presence of:

WITNESS

DATE

**DATE OF EXPIRY**

## Table of Amendments

| Amendment No. | Summary of the Amendment | Amendment Type | Date Approved by WAPC |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

## Pre-lodgement Consultation

The following were consulted as the Structure Plan was being prepared.

| Agency or Organisation | Date of Consultation | Method of Consultation |
|---|---|---|
| Shire of Katanning | July 2014, May 2015, November 2015, February/March 2016 | Meeting, Phone, Email |
| Department of Planning | October 2014 | Meeting |
| Great Southern Development Commission | July 2014, May 2015 | Meeting |
| Department of Environment Regulation | September 2014 | Letter |
| Mr Kip Taylor | September 2014 | Meeting |
| Department of Agriculture and Food | September 2014 | Meeting |
| Western Power | | Letter |
| Water Corporation | | Letter |
| Department of Water | | Letter |
| | | |
| | | |
| | | |
| | | |

# *Executive summary*

The Industrial Expansion Structure Plan has been identified as an opportunity to provide industrial land uses based around the new sales yards on Lot 501. The Industrial Expansion Area has been identified as a Development Investigation Area (DIA) 8 in the Local Planning Strategy with the following purpose:

> *"To provide for industrial expansion based around the new sales yards and existing rural service industries."*

The Structure Plan area has been identified in a location which boasts efficient transport networks and proximity to the town site and the WAMMCO Structure Plan area. This Structure Plan area provides a strategic location for the expansion of rural and associated general and enterprise industries.

The Industrial Expansion Structure Plan area is located east of the Katanning town site adjoining the existing light industrial and residential area (proposed Enterprise zone under draft LPS No 5). This zone provides a landuse buffer for the Industrial Expansion Structure Plan.

The Structure Plan area comprises Lot 3 Thomson Road, Katanning and Lots 500 and 501 Katanning- Nyabing Road, Katanning. The site is bound by Katanning-Nyabing Road to the north, Depot Road to the east, Quarrel Road to the south and various roads including Arnold Street, Cullen Street, Dijon Street and Piesse Street to the west.
The combined landholdings comprise 312.3 hectares.

**Land Description**

| Lot | Lot Area | Title Detail | Road Name | Landowner |
|---|---|---|---|---|
| Lot 3 | 43.5ha | D13517 | Thomson Road | Nurel Taylor, Rapal Taylor and Dol-Kipley Taylor |
| 500 | 72.8ha | P70820 | Katanning Nyabing Road | Crown Land – State of WA |
| 501 | 196ha | P70820 | Katanning Nyabing Road | Crown Land – State of WA |

**Key elements of the Structure Plan**

The Structure Plan provides for *Industrial Development* Land use across the Structure Plan area. It is anticipated that development of the Structure Plan area will occur over time. Stage 1 of the Structure Plan has been identified.

A breakdown of the Structure Plan is provided in the following table.

| Item | Data |
|---|---|
| Total area covered by the Structure Plan | 311.20 hectares |
| Area of Stage 1 | 36.29 ha |
| Lot Yield of Stage 1 | 10 lots |

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Figure 3.1 – Site Conditions and Constraints
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|---|---|
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| 2 | Local Water Management Strategy Rev A |
| 3 | Bushfire Hazard Assessment |
| 4 | Transport Assessment |
| 5 | Servicing and Infrastructure |

## *Abbreviations*

| | |
|---|---|
| Asbestos Containing Material | ACM |
| Australian Height Datum | AHD |
| Average Recurrence Interval | ARI |
| Below Ground Level | bgl |
| Bushfire Attack Level | BAL |
| Department of Aboriginal Affairs | DAA |
| Department of Agriculture and Food | DAFWA |
| Department of Environment Regulation | DER |
| Department of Parks and Wildlife | DPaW |
| Department of Planning | DoP |
| Department of the Environment | DotE |
| Department of Water | DoW |
| Development Investigation Area | DIA |
| Environmental Protection Authority | EPA |
| Environmental Protection and Biodiversity Conservation | EPBC |
| Megavolt Amperes | MVA |
| State Planning Policy | SPP |
| Water Information Network | WIN |
| Western Australian Planning Commission | WAPC |

# PART ONE
# Implementation

# 1 Implementation

## 1.1 Structure Plan Area

This Structure Plan shall apply to Lot 3 Thomson Road, Katanning and Lots 500 and 501 Katanning- Nyabing Road, Katanning.

*Table 1.1 – Legal Description and Ownership*

| Lot | Lot Area | Title Detail | Road Name | Landowner |
|---|---|---|---|---|
| Lot 3 | 43.5ha | D13517 | Thomson Road | Nurel Taylor, Rapal Taylor and Dol-Kipley Taylor |
| 500 | 72.8ha | P70820 | Katanning Nyabing Road | Crown Land – State of WA |
| 501 | 196ha | P70820 | Katanning Nyabing Road | Crown Land – State of WA |

## 1.2 Operation

The Structure Plan comes into effect on the date the Structure Plan is approved by the WAPC. This date is outlined in the certification on Page ii of this document.

## 1.3 Staging

A single first stage has been identified as part of this Structure Plan. There may be one of more subsequent stages of development depending on demand at the time.

## 1.4 Landuse

Permissible land uses within the Structure Plan area shall be in accordance with the Local Planning Scheme No.5 for the *Industrial Development* zone as depicted on the Structure Plan. The Industrial Development zone provides flexibility for a range of rural and industrial uses which will benefit the establishment of an agribusiness precinct close to town. The Industrial Development zone also provides for a range of uses which are considered sensitive uses that are not typically identified within Industrial or rural areas with larger lot sizes as proposed in this instance, and therefore are not considered to be compatible with the range of rural and general industries accepted in this structure plan area. The following uses are "D" discretionary under the LPS (which means that the use is not permitted unless the local government has exercised its discretion by granting development approval) and will generally not be permitted as they are not considered to be consistent with the objectives of the Industrial Expansion Structure Plan:

- Bed and Breakfast D use
- Child Care Premises D
- Consulting rooms D
- Educational Establishment D
- Family Day Care D
- Holiday Accommodation D
- Medical Centre A
- Restaurant/Cafe D

- Shop D
- Bulky Goods Showroom D
- Workforce Accommodation D

## *1.5 Subdivision*

**Further Studies**

The following are recommended conditions of Subdivision Approval specific to the Structure Plan area.

- Urban Water Management Plan as discussed in this Structure Plan, but specifically addressing drainage across the site, a possible 'living stream' approach and the consideration of lot boundaries as a result of this work.
- Landscaping Plan addressing streetscape and aesthetic amenity along road interfaces.

## *1.6 Development*

The development process will have a significant role in addressing ground water, waste water, water supply, separation distances, localised environmental impact and stormwater management. All development will be subject to the following conditions:

**Groundwater**

The following to be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient
- of at least 1% downhill (so that runoff is directed away from building areas)
- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage
- All basin and drains to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

**Wastewater**

Each lot is to be treated by an onsite effluent disposal unit. Soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

**Stormwater Management**

- The developer of each lot will need to provide storage for stormwater that allows discharge at predeveloped rates for the 1, 10 and 100 year events
- Basins are recommended at each lot with overflow to the open drains in the street via culverts (low flow) or rock lined spillway (high flow). Basins should be lined with clay to prevent groundwater recharge
- The road is drained by open drains sized for the 1:10 year event - these will also serve to carry overflow from lot areas

- All floor levels to be set a minimum of 500mm above the 100year water level of the drainage line
- Open drain outlets to be heavily vegetated with the vegetated areas to be sized at 2% of the connected impervious catchment area.

## *1.7 Other Requirements*

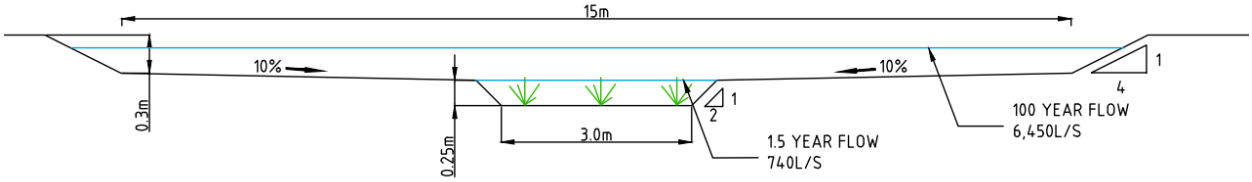
### Industrial Buffers

All development within the Structure Plan area shall have due regard to industrial buffer requirements stipulated by the Environmental Protection Authority and/or Western Australian Planning Commission. Development within the Structure Plan area can only be approved by Council if the Proponent can confirm that any buffers can be contained within the bounds of the Structure Plan area.

### Living Streams

To ensure flow capacity and control flooding it is proposed to undertake improvements to achieve a 'Living Stream'. This will involve widening and refining of the existing drainage line cross section, planting to improve water quality and partial realignments. The cross section would be developed to DoW guidelines to provide a bankfull channel catering for the 1.5-year flow and a wider floodplain facilitating the 100-year flow.

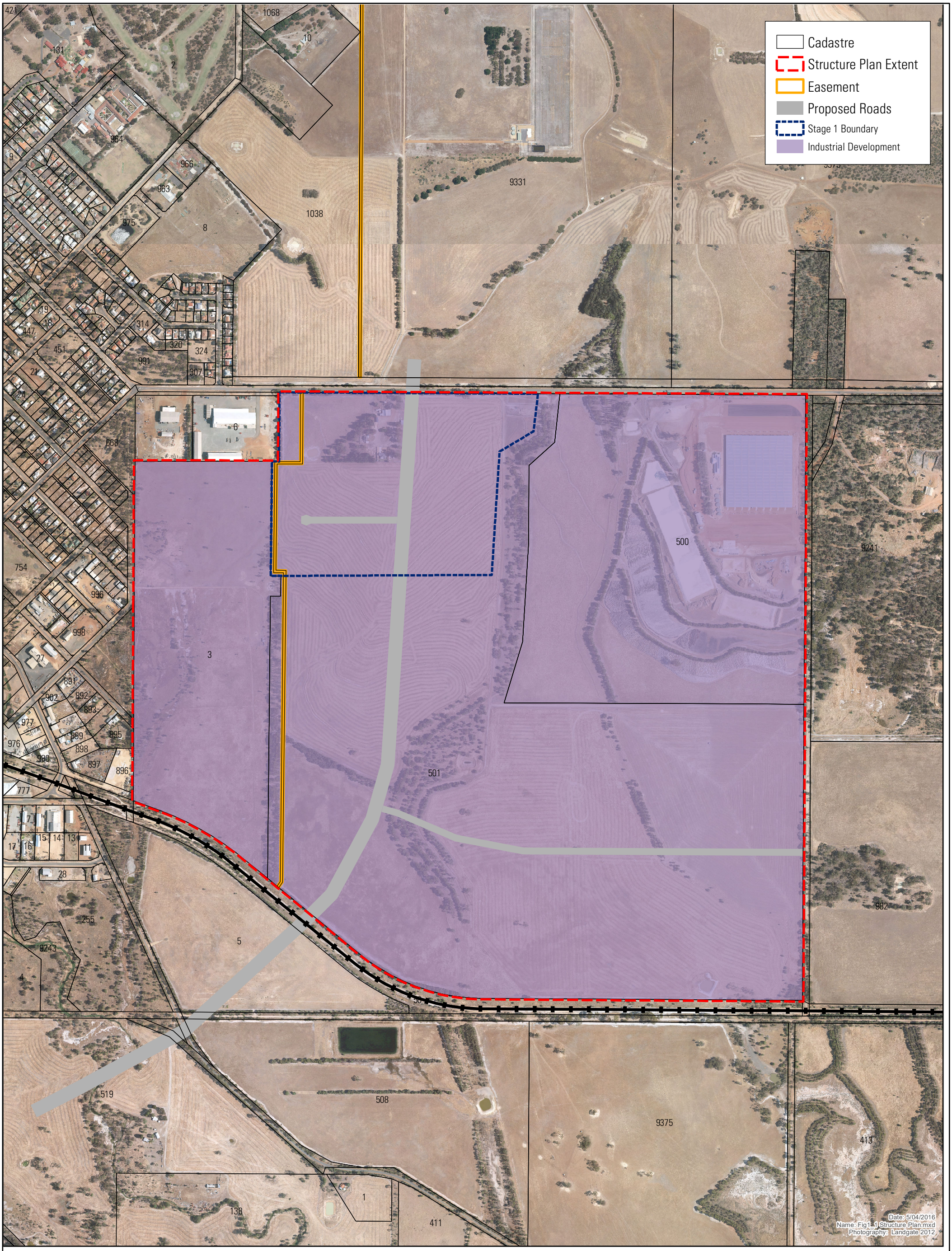
The proposed living stream cross section is shown below.




Source: LWMS (Shawmac, 2015)

### Water Supply

Potable water should be supplied from an extension to the existing mains within the Katanning town site to the west, however details of the extensions and upgrades required are currently not known as the area is outside of Water Corporation's planning areas. Water supply should be supplemented by rainwater tanks and grey water for non-potable re-use.


Cadastre
Structure Plan Extent
Easement
Proposed Roads
Stage 1 Boundary
Industrial Development
421
1068
10
131
2
964
9
966
963
1038
9331
975
8
19
18
314
447
320
324
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landinsights
PLANNING DESIGN ENVIRONMENT
INDUSTRIAL LAND STRUCTURE PLAN
FIGURE 1.1
STRUCTURE PLAN

# PART TWO
# Explanatory Section

# 2 Planning background

## 2.1 Introduction and purpose

The Industrial Expansion Structure Plan has been identified as an opportunity to provide industrial land uses based around the new sales yards on Lot 501. The Industrial Expansion Area has been identified as a Development Investigation Area (DIA) 8 in the Local Planning Strategy with the following purpose:

> *"To provide for industrial expansion based around the new sales yards and existing rural service industries."*

The Structure Plan area has been identified in a location which boasts efficient transport networks and proximity to the town site and the WAMCO Structure Plan area. This Structure Plan area provides a strategic location for the expansion of rural and associated general industries.

The aim of the Structure Plan is to provide guidance for industry and business for a suitable area to agglomerate, whist providing flexibility in its development and subdivision (as this will be determined largely by the needs of business/industry). The type of industry able to locate in this precinct will be dependent on the provision of infrastructure provided by the developer and management/containment of the impacts of the proposed industrial use within the Structure Plan area. These uses may be similar in nature to rural industries, albeit the zoning and Structure Plan provisions may facilitate subdivision within the precinct, and management of any emissions on a use by use basis.

## 2.2 Location and land description

The Industrial Expansion Structure Plan area is located east of the Katanning town site adjoining the existing light industrial and residential area (proposed *Enterprise* zone under draft LPS No 5).

The Structure Plan area comprises Lot 3 Thomson Road, Katanning and Lots 500 and 501 Katanning- Nyabing Road, Katanning. The site is bound by Katanning-Nyabing Road to the north, Depot Road to the east, Quarrel Road to the south and various roads including Arnold Street, Cullen Street, Dijon Street and Piesse Street to the west.
The combined landholdings comprise 312.3 hectares. Land ownership details are described in Table 2.1 below.

***Table 2.1 – Legal Description and Ownership***

| Lot | Lot Area | Title Detail | Road Name | Landowner |
|---|---|---|---|---|
| Lot 3 | 43.5ha | D13517 | Thomson Road | Nurel Taylor, Rapal Taylor and Dol-Kipley Taylor |
| 500 | 72.8ha | P70820 | Katanning Nyabing Road | Crown Land – State of WA |
| 501 | 196ha | P70820 | Katanning Nyabing Road | Crown Land – State of WA |

The Structure Plan area is largely cleared and is primarily used for rural purposes. Lot 3 is privately owned and is currently used for rural purposes. A small abattoir has previously been approved on Lot 3 however it was not developed. Lot 501 is used by the Department of Agriculture and Food for research purposes. Lot 500 comprises the newly constructed sale yards.

Cadastre
Structure Plan Extent
Watercourse / Drainage Line
Water Body
Easement
Bushland
Earthworks
General Industrial Area
Orchard
Prepared Playing Surface
Rifle Range
RubbishTip
Urban Area

YOUNG RD
KATANNING PLAINVIEW RD
PINNEYKYING RD
FENWICK RD
WRIGHT RD
S BRATHFIELD RD
VAN ZUILECOM RD
WARREN RD
RANFORD RD
MARMION ST WEST
MARMION ST
BURBIDGE WY
FORREST HILL RD
BEECK ST
SYNNOTT AV
ROUND DR
GOLF LINKS RD
HAKEA PL
MATTER DR
CASSIA CT
KATANNING NYABING RD
MOOJEBING RD
ALBION ST
KOJONUP KATANNING RD
KIEBLE ST
JAMES ST
RAMSDEN ST
SHIRLEY ST
MCLEOD ST
DORE ST
ARNOLD ST
DEPOT RD
CREEK ST
MARTIN CR
APPLIN ST
QUARREL RD
STRICKLAND ST
CURLEW ST
GILLEY ST
WANKE ST
TREE ST
FLUGGE ST
MILLS ST
POLICE POOLS RD
GREAT SOUTHERN HWY

Date: 5/04/2016
Name: Fig2_1 Context.mxd
Photography: Landgate 2012

landinsights
PLANNING DESIGN ENVIRONMENT

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1:20,000

**INDUSTRIAL LAND STRUCTURE PLAN**

**FIGURE 2.1**
**CONTEXT**

## *2.3 Planning framework*

### Shire of Katanning Town Planning Scheme No. 4

The Industrial Expansion Structure plan area is currently zoned *Rural* under the Shire of Katanning Town Planning Scheme No. 4 as indicated in Figure 2.2.

The objectives of the zones relating to the Structure Plan area are outlined in Table 2.2 below.

***Table 2.2 – Town Planning Scheme Zone Objectives***

| Zone | Objective |
|---|---|
| *Rural* | a) to ensure the continuation of broad-hectare farming as the principal land use in the District and encouraging where appropriate the retention and expansion of agricultural activities.<br>b) to consider non-rural uses where they can be shown to be of benefit to the District and not detrimental to the natural resources or the environment.<br>c) to allow for facilities for tourists and travellers, and for recreation uses. |

TPS4 contains no specific provisions for the consideration and adoption of a Structure Plan, however with the introduction of the *Planning and Development Regulations 2015* deemed provisions now provide a mechanism for the Shire to consider and assess a Structure Plan. The current zone of the site arguably does not trigger the requirements of Clause 15 of the regulations, however it is envisaged that Clause 15(c) may be invoked.

### Draft Shire of Katanning Local Planning Scheme No. 5

The proposed Local Planning Scheme No 5 *Industrial Development zone* will provide the basis for the zoning the Structure Plan precincts.

Proposed LPS No.5 Table 2 - zone objectives for Industrial Development are:

- To designate land for future industrial development.
- To provide a basis for future detailed planning in accordance with the structure planning provisions of this Scheme.

There are no special provisions relating to the Industrial Development zone however the following requirements apply (refer to Table 9 of LPS5):

***Table 2.3 – LPS5 Additional Requirements***

| Area No. | Description of land | Land Use Expectations | Matters to be addressed in Structure Plans | Associated Provisions |
|---|---|---|---|---|
| 3 | Industrial – Agricultural Business | Industrial | • Retention and management of sales yards.<br>• Demand assessment for planning and investment.<br>• Determination and justification for lot sizes for intended landuses.<br>• Removal of land from agricultural production.<br>• Servicing and infrastructure requirements. | Environmental assessment shall be undertaken as part of structure plan process. |

**Katanning Super Town: Growth and Implementation Plan**

The Growth Plan identifies the Structure Plan area as *Future Industrial to provide for industrial expansion and potentially Agri-food Precinct based around sale yards.* A *Long Term Freight Route* is shown north-south through the site.

The overall Katanning Growth Plan Vision states that:

> *"Katanning will embrace its Aboriginal, agricultural, multi-cultural and built heritage as it moves forward as a cohesive community seeking investment in economic, environmental and social infrastructure to achieve a population of 15,000, self-supporting growth and recognition as the inland heart of the Great Southern."*

The Economic Vision of the Growth Plan is:

> *"To create the infrastructure and business environment required to encourage new enterprises and sustainable employment opportunities."*

One of the major business opportunities identified under the Growth Plan is to facilitate *the potential Agri-Food precinct.*

The Growth Plan identifies a number of transformational projects based on their ability to contribute to the economic, social and environmental qualities of the town. Of relevance to this Structure Plan, Project 2 is to support Residential and Industrial development with the objective of *ensuring that planning for the delivery of land, housing and infrastructure is sufficiently advanced to accommodate the growth of Katanning in a timely manner, and to pursue economic development and strategic infrastructure essential to economic growth and the creation of sustainable employment.*

The Growth Plan recommends the following with relation to future industrial development:

- **Recommendation 27** – Build a business case for Katanning to accept/develop an Agri-food precinct.
- **Recommendation 28** – Locate an Agri-food precinct in a location taking into account the location and linkages to WAMMCO.
- **Recommendation 29** – Investigate the feasibility of establishing a Centre for Agricultural and Engineering Excellence, with the intention to improving the sustainability, profitability across all aspects of the existing agriculture sector chains in Katanning – Producing, Handling, Processing
- **Recommendation 30** – Improve transport efficiency between Katanning, processing facilities and ports.
- **Recommendation 32** – Promote sheep sales and look for expansion opportunities.
- **Recommendation 33** – Utilise water resources from sale yards.
- **Recommendation 46** – Prepare a Structure Plan for the eastern industrial expansion to facilitate a range of industrial initiatives.
- **Recommendation 88** – Promote expansion of industrial land into a south eastern corridor extending to the new sheep sale yards.

The Super Towns report described that "*the agrifood sector consists of domestic and exporting primary producers, manufacturers and packagers of food and beverage products, from raw materials to finished products for the food service and retail segments. By locating complementary agrifood businesses in close proximity there are significant*

*economies that could be realised as well as opportunities to improve the eco-efficiency of the businesses by utilising waste sources to create other value added products.*

*The following industries have the potential to locate in an agrifood precinct;*

- *Abattoir (beef, lamb, pork);*
- *Agribusiness goods and services;*
- *Canning plant;*
- *Chicken processing facility;*
- *Containerisation park;*
- *Dairy processors;*
- *Freezer works;*
- *Livestock exporters;*
- *Packing house and grading facility for horticultural products;*
- *Pet food company;*
- *Sale yards;*
- *Small goods (meat smoking, etc.);*
- *Transport hub/need to expand trucking depots;*
- *Flour mill/grains product manufacturer;*
- *Cereal Food and baking mix manufacture;*
- *Beverage and malt manufacture;*
- *Skin and Hide Treatment;*
- *Various value-adding facilities (e.g. marinating meat, packaging meat and vegetables etc.);*
- *Feed Grains;*
- *Tallow; and,*
- *Fertiliser.*

*Such a precinct would provide considerable benefits to the town and the region. It is recommended that a full feasibility be undertaken to fully scope a precinct and determine the likely industries that could be viable in the area together with establishing the most appropriate locations for the various industries to ensure that the impacts such as odour, noise and dust do not impact the growth potential of the town."*

### Shire of Katanning Local Planning Strategy

The Industrial Expansion Area has been identified as a Development Investigation Area (DIA) 8 in the Local Planning Strategy and designated as *Industrial* with the following purpose:

> *"To provide for industrial expansion based around the new sales yards and existing rural service industries."*

The Local Planning Strategy identifies the following opportunities and environmental characteristics associated with DIA 8:

***Table 2.4 – LPS Opportunities and Constraints***

| Opportunities and characteristics | Constraints |
|---|---|
| • Potential for broad range of industrial and agri-food based industries that require large lot sizes not available within existing industrial zoned area<br>• Proximity to town centre, local road network and railway<br>• New sales yard potential business catalyst<br>• Proximity to services<br>• Potential to be serviced by proposed long term freight route<br>• Large site to accommodate buffers<br>• Potential for value adding to regional economy<br>• Predominantly cleared, gently undulating and well drained. | • Need to confirm established demand for planning and investment<br>• Determination and justification of lot sizes for intended uses<br>• Removal of land from agricultural production<br>• Servicing and infrastructure requirements and costs<br>• Ownership. |

The opportunities and constraints outlined in the Local Planning Strategy have informed this Structure Plan and formed the starting point for further detailed investigations undertaken. Recommendations regarding Local Planning Scheme No. 5 have been reviewed in line with the requirements of the revised requirements for Local Planning Schemes.

### Great Southern Regional Planning and Infrastructure Framework

The Framework defines a strategic direction for the future development of the Great Southern region over the next 20 years. It highlights the opportunities for economic development and infrastructure priorities for the region, and addresses land use planning response to future growth and development pressures. The framework recognises Katanning as part of the "Regional Centres Development Plan" and as a sub-regional centre that offer services and facilities which provide for the needs of the local community and that of the rural population in their sub-regional hinterland.

In terms of economic growth, the Framework recognises that there are opportunities to increase value of livestock and livestock products in the region and that the new Katanning sale yards will play an important role in supporting this growth. The gold mining operation near Katanning is identified in the Framework as a potential employer in the region, especially during the construction phase. It notes that attracting residents to live in the area would provide the greatest economic benefit to the region. Jobs in the manufacturing, service sector and retail should grow as a result.

Regarding services and infrastructure, the Framework notes that there will also be a need to provide a higher level of infrastructure and services in Katanning. It is hoped that through the higher level of accessibility and services this

will increase the attractiveness of the town in retaining and growing population. This will lead to a growth in the provision of retail, employment, recreational and other activities.

### State Planning Policies

A number of State Planning Policies (SPP) is relevant to the Industrial Expansion Structure Plan. These are outlined in Table 2.5 below.

***Table 2.5 – State Planning Policies***

| SPP | Description | Comment |
|---|---|---|
| SPP 1 State Planning Policy Framework (Variation No. 2) | SPP 1 helps guide the decision-making process in regards to land use and development in WA. It indicates which policies and strategies the WAPC and the Department of Planning should refer to when making decisions. It provides a list of all the plans, policies and strategies that form a part of the State Planning Framework. | SPP 1 should be referred to during the preparation of the Industrial Expansion Structure Plan and the relevant policies which should be referred to. |
| SPP 2 – Environment and Natural Resources | SPP 2 defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues within the framework of the State Planning Strategy. | A number of environmental features have been taken into consideration in the preparation of the Structure Plan, including waterlines and, remnant vegetation and habitat. These features will be appropriately protected through the provision of setbacks and open space. |
| SPP 2.9 – Water Resources | This policy provides clarification when taking water resources into account in the planning process. | Some minor drainage lines are located within the Structure Plan area. These features will be appropriately protected through the provision of setbacks and open space. |
| SPP 3 – Urban Growth and Settlement | The aim of this policy is to facilitate sustainable patterns of urban growth and settlement by setting out the requirements of sustainable settlements and communities and the broad policy in accommodating growth and change. | No urban development is proposed; however, the site adjoins existing residential to the east. |
| SPP 3.1 – Residential Design Codes | This Policy provides a comprehensive basis for the control of residential development throughout Western Australia. | No urban development is proposed in the Industrial Expansion Structure Plan. |
| SPP 3.6 Development Contributions for Infrastructure | This policy aims to promote the efficient and effective provision of public infrastructure and facilities to meet the demands arising from new growth and development and to ensure that development contributions are charged equitably among those benefiting from the infrastructure and facilities to be provided. | Development contributions will be considered during the more detailed planning stages. |
| SPP 3.7 – Draft Planning for Bushfire Risk Management | This policy should be used to inform and guide decision-makers, referral authorities and proponents to achieve acceptable fire protection outcomes on planning proposals in bush-fire prone areas. | A bushfire hazard assessment has been undertaken for the Structure Plan area. The bushfire risk is predominantly low. |
| SPP 4.1 – State Industrial Buffer Policy (draft) | This policy applies to planning decision-making, and proposals which seek to provide for new industrial areas and uses, and essential infrastructure, sensitive land uses in proximity to existing industrial areas. | The buffers and separation distances recommended in SPP 4.1 will need to be considered as part of the Structure Plan process. Adjoining residential land uses to the east will need an adequate separation distance from proposed industrial uses. |

| SPP | Description | Comment |
|---|---|---|
| SPP 4.3 Poultry Farms Policy | This policy is to guide planning and development applications for land in the vicinity of poultry farms and for the development of poultry farms. Conflicts which can arise between poultry farms and residential, rural-residential and other developments because of the odours, noise, dust and visual impacts associated with poultry farms | A poultry farm and abattoir has previously been approved on Lot 3 (eastern side of the Structure Plan area). The guidelines and provisions of SPP 4.3 will need to be further considered as part of the Structure Plan process. |
| SPP 5.2 Telecommunications Infrastructure | The policy provides a framework for the preparation, assessment and determination of applications for planning approval of telecommunications facilities. | No telecommunication infrastructure is proposed as part of the Industrial Expansion Structure Plan. |
| SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning | This policy aims to promote a system in which sustainable land use and transport are mutually compatible. | No sensitive land uses are proposed in the Structure Plan, therefore it is considered that noise from road and rail should not be a significant issue. |

The WAPC State Industrial Buffer policy approved in 1997 was reviewed in 2009 forming the basis of SPP 4.1 as described in the table above. The State Industrial Buffer Policy requires that industrial uses are managed appropriately to ensure that their impacts are contained onsite/ or within the existing industrial zone/special use/extraction area. Should industry be supported where by the impacts encroach on surrounding areas, then the policy requires that these impacts are identified and included in a buffer area. The policy provides ways in which these buffers can be identified and secured. The response under the Town Planning Scheme is to show the buffer area as a Special Control Area recognising that the area is not suitable for sensitive land uses.

### WAPC Development Control Policies

Relevant WAPC Development Control (DC) Policies are discussed in the Table 2.6 below.

***Table 2.6 – Development Control Policies***

| Policy | Description | Comment |
|---|---|---|
| DC Policy 1.1 – Subdivision of Land – General Principles | This policy sets out the general principles used by the WAPC in determining applications for the subdivision of land. It specifies the WAPC's basic requirements for the creation of new lots as well as the procedures it will follow in processing subdivision applications. | It's important that the information required by the WAPC is included in the Structure Plan and any future subdivision applications in accordance with DC 1.1. |
| DC Policy 1.7 – General Road Planning | The policy establishes requirements for land contributions and the construction of various categories of roads and outlines principles that apply to aspects of the planning and provision of all types of roads. | This policy should be referred to at the detailed planning stage. |
| DC Policy 2.3 – Public Open Space in Residential Areas | This policy sets out the requirements of the Commission for public open space and the provision of land for community facilities in residential areas. The basic component is the requirement that 10 percent of the gross subdivisible area of a | This policy should be considered in conjunction with DC 4.1 Industrial Subdivision when determining the area for public open space. |

| Policy | Description | Comment |
|---|---|---|
| | conditional subdivision shall be given up free of cost by the subdivider for public open space. | |
| DC Policy 3.4 – Subdivision of Rural Land | This policy sets out the principles that will be used by the WAPC in determining applications for the subdivision of rural land. | The Structure Plan proposes to subdivide rural land into residential and industrial lots; therefore, the provisions of DC 3.4 will no longer apply in this situation. |
| DC Policy 4.1 – Industrial Subdivision | This policy provides guidance on the matters considered by the WAPC when determining applications for industrial subdivision throughout the state. These include such matters as the design and shape of industrial lots, road layout, servicing and open space requirements. | This policy should be referred to in the detailed planning stage. |

### EPA Position Statements

Relevant EPA Position Statements are discussed in the table below.

***Table 2.7 – EPA Position Statements***

| Policy | Description | Comment |
|---|---|---|
| Position Statement 2 – Environmental Protection of Native Vegetation in WA | This Statement addresses the issues of native vegetation clearing in WA, particularly in agricultural areas. The EPA has previously stated that *all existing remnant native vegetation is important, and it should be managed to ensure its retention.* It states that the EPA could possibly support clearing in agricultural areas providing the proposal has a net environmental benefit, the area to be cleared in relatively small and that any residual land degradation will not be intensified. | The Structure Plan area comprises small areas of native vegetation and parkland cleared trees. It is important that the principles of this position statement are given due consideration, however it is considered that the areas to be cleared as part of the Structure Plan proposals will be relatively small given most of the site is already cleared. |
| Position Statement 3 – Terrestrial Biological Surveys as an Element of Biodiversity Protection | The EPA has prepared this Position Statement to ensure that the issue of biological diversity is recognised as being of importance in the land use planning process and to ensure that minimum standards of survey work are undertaken to enable the EPA to undertake an assessment of a proposed activity. | The provisions of this position statement are to be followed in the preparation of flora and fauna surveys across the Structure Plan area. |
| Position Statement 4 – Environmental Protection of Wetlands | The Position Statement defines important environmental values and functions of wetlands and establishes principles for the environmental protection of wetlands in general. It suggests land use zoning should be applied so as to achieve sustainable water resources management and protect the beneficial functions performed by wetlands as part of that process. | No wetlands are located within the Structure Plan area; however, some minor watercourses are located throughout which will need adequate protection in accordance with the general principles of this Position Statement. |
| Position Statement 7 – Principles of Environmental Protection | This position statement sets the scene for environmental management in WA. Key principles include the precautionary principle, conservation of biological | The future Structure Planning process should pay particular regard to the principles contained within the statement. |

| Policy | Description | Comment |
|---|---|---|
| | diversity and ecological integrity, waste hierarchy, best practice, accountability and transparency and enforcement. | |
| Position Statement 9 – Environmental Offsets | This statement provides guidance on environmental offsets to ensure a 'net conservation benefit' to proposals. | This statement will need to be referred to if environmental offsets are required as part of the project. Considering the environmental values of the site are not significant and the impact will be low, environmental offsets may not be required. |

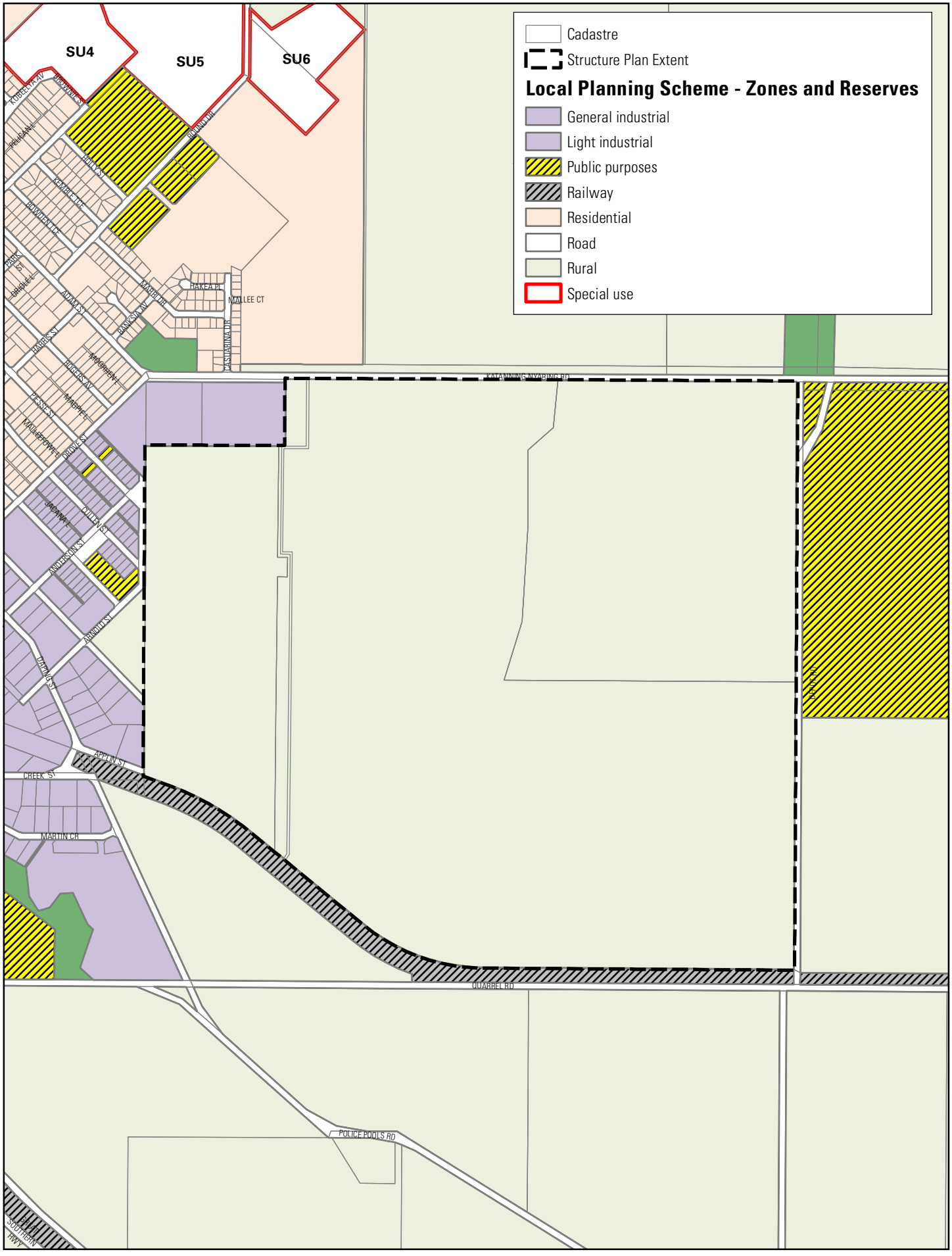
**EPA Guidance Statement**

Relevant EPA Guidance Statements are discussed in the table below.

***Table 2.8 – EPA Guidance Statements***

| Policy | Description | Comment |
|---|---|---|
| Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses | This statement provides guidance on the generic separation distances between sensitive and industrial land uses to avoid conflicts between these uses. It aims to protect sensitive land uses from unacceptable impacts on amenity that may result from industrial activities, emissions and infrastructure. Impacts from emissions include noise and air emissions (gases, dust and odours). Types of sensitive land uses include residential development, public services (hospitals, schools, shopping centres, playgrounds etc.), tourist development (caravan parks and hotels) and some public buildings. | The separation distances provided in this statement will be generally applied to the Structure Plan and will need to be further refined at a detailed planning stage once the exact land uses are determined. It is understood that this guidance statement is currently under review. |
| Guidance Statement No. 8 – Environmental Noise | This statement provides guidance to proponents submitting proposals for environmental impact assessment to ensure that noise emissions comply with the *Environmental Protection (Noise) Regulations 1997*. Noise is defined in the Environmental Protection Act as vibration of any frequency, whether transmitted through air or any other physical medium. | The general principles in this statement will be applied to the Structure Plan. However, noise will need to be further considered further once the exact land uses are determined. |
| Guidance Statement No. 19 – Environmental Offsets Biodiversity | This statement provides advice on environmental offsets for proposals or schemes that impact on biodiversity. It is to be read in conjunction with Position Statement No. 9 but provides more specific advice particularly in relation to the technical application of biodiversity offsets. | This statement will need to be referred to if environmental offsets are required as part of the project. Considering the environmental values of the site are not significant and the impact will be low, environmental offsets may not be required. |
| Guidance Statement 33 – Environmental Guidance for Planning and Development | This statement provides an overview of information to assist proponents and decision making authorities in considering environmental management | The information in this statement has been referred to in the environmental assessment of the Structure Plan to ensure that all relevant information is |

| Policy | Description | Comment |
|---|---|---|
| | as part of the planning and development process. It also contains guidance for the Environmental Impact Assessment process | provided. Further detailed assessments may be required once the details of the development have been more accurately determined. |
| Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia | This statement provides direction and information on the general standards and protocols for terrestrial flora and vegetation surveys as part of the environmental impact assessment process. | This statement should be referred to in the preparation of vegetation and flora surveys and reports. |
| Guidance Statement No. 55 – Implementing Best Practice in Proposals Submitted to the Environmental Impact Assessment Process | This statement provides guidance on what the EPA means by the term 'best practice' when it is used in the environmental impact assessment process and the approach the EPA will take when assessing proposals. It has a particular focus on human health and the environment as affected by, but not confined to, industrial processes. | The guiding principles in this statement should be referred to at a more detailed planning stage once the exact land uses and industries are more clearly determined. |
| Guidance Statement No. 56 Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia | This statement provides direction and information on the general standards and protocols for terrestrial fauna surveys as part of the environmental impact assessment process. | The statement should be referred to in the preparation of fauna surveys and reports. |




land insights
PLANNING DESIGN ENVIRONMENT

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**INDUSTRIAL LAND STRUCTURE PLAN**

**FIGURE 2.2**
**TOWN PLANNING SCHEME 4**

# 3 Site Conditions and Constraints

## 3.1 Biodiversity and Natural Area Assets

### Vegetation

A Level 1 vegetation and flora survey was undertaken by Terratree in September 2014 in accordance with EPA Guidance Statement 51. A search was undertaken of the following databases within a 20km radius of the site:

- DPaW's Threatened and Priority Flora
- DPaW's Threatened Ecological Communities
- WA Herbarium (WAH) Declared Rare and Priority Flora
- Department of the Environment's Projected Matters Search Tool.

A total of 41 significant florae were recorded on the databases. No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, or listed as Threatened pursuant to the Commonwealth *EPBC Act* 1999 were recorded during the targeted search or the Level 1 vegetation surveys. The database search indicated that Priority 2 *Banksia acanthopoda* were recorded at two locations adjacent to Katanning-Nyabing Road, within the vicinity of the site; however, this was not identified at the site during the survey.
Vegetation condition at the site was classified as being 'completely degraded' (according to the scale by Keighery (1994)) as the vegetation is no longer intact and the area is completely or almost completely without native species. The vegetation can be described as 'parkland cleared' with the flora compromising weed or crop species with isolated trees or shrubs (Terratree, 2014).

There were no Threatened or Priority Ecological Communities identified within a 20 km radius of the site.
A complete copy of the Flora and Fauna Assessment by Terratree (2014) is provided at Appendix 1.

### Fauna

A Level 1 fauna survey was undertaken by Terratree in September 2014 in accordance with EPA Guidance Statement 56. A search was undertaken of the following databases within a 20km radius of the site for records of known Threatened, Schedule and Priority Fauna:

- DPaW's Threatened Fauna
- Department of the Environment's Projected Matters Search Tool.

A total of 32 species of conservation significance were identified within the search area. Given the completely degraded nature of the vegetation at the site, there were no fauna species of conservation significance recorded at the site.

The assessment also concluded that the habitat is not suitable to support any Threatened or Vulnerable species with the exception of potentially the Carnaby's Black Cockatoo within eucalypts.

There are unlikely to be any environmental constraints that would preclude development of the site for its intended use (Talis, 2014). The site has been historically cleared and vegetation is parkland cleared and in degraded condition and there is no flora and fauna of conservation significance located at the site. One Priority 2 species was located (*Banksia acanthopoda*) adjacent to Katanning-Nyabing Road within the northern portion of the site. There are no significant biological constraints to development on site. The only exceptions which may need further consideration include:

- Possible disturbance to habitat of the Rainbow Bee-eater which may nest at the site between August and January

- Disturbance to mature trees may require targeted surveys to determine habitat value for Carnaby's Black Cockatoo
- Any disturbance to eucalypt woodlands is required to consider potential impacts to Carpet Python (Schedule 4), Barking Owl (Priority 2), Bush Stone-curlew (Priority 4), Western Rosella (Priority 4) and Western Shrike-tit (Priority 4) in consultation with DPaW.

## *3.2 Landform and Soils*

### Topography

The site is generally flat and gently slopes downward in a north to south direction and from a north-east to south-westerly direction. The north-east of the site is at the highest point at approximately 330m AHD and slopes to approximately 300m AHD at the southern extent.

### Geology

The Dumbleyung Geology series map 1:250,000 scale indicates the site is underlain by colluvium and minor alluvium described as *silt, sand and gravel; generally on slopes adjoining to rock and laterite outcrops* and alluvium described as *silt and sand in broad valley flats; extensively reworked by present drainage* (Galt, 2014). The assessment by Galt Geotechnics, 2014, found that the site is underlain by sandy clay to clayey sand.

### Soils

The generalised soil profile of at the site is described by Galt Geotechnics (2014) as:

- SAND/Clayey SAND/Silty SAND – fine to coarse grained, approximately 3% to 20% non-plastic to low plasticity fines, locally with some fine to medium grained, rounded to sub-rounded gravel, dark grey becoming grey, sand is generally loose, clayey material is generally soft to firm, moist to wet, trace organics and rootlets, present from the surface, extending to depths of between 0.3 m and 0.5 m; overlying
- Clayey SAND/Sandy CLAY – fine to coarse grained sand, low to medium plasticity clay fines, generally pale brown to orange brown mottled grey, trace to some fine grained gravel, firm to hard, moist to dry, locally laterised, present from as shallow as 0.3 m, extending to depths of between 0.8 m and the maximum depth of investigation of 2.5 m; locally overlying
- CLAY – low plasticity, white locally mottled grey and red-brown, trace fine grained sand, trace quartz, locally present from as shallow as 0.8 m, extending to the maximum depth of investigation of 2.5 m.

### Geotechnical Investigation

Geotechnical investigations were conducted between 1 and 5 September 2014 by Galt Geotechnics. A copy of the report can be found at Appendix 1. A total of 10 test pits extending to depths between 1.1 m and 2.5 m below the surface level were installed by Galt.

The assessment was conducted in accordance with Australian Standard AS2870-2011 *Residential Slabs and Footings*. Based on the findings, majority of the site was classified as class 'M' provided that the site preparation recommendations are followed. Galt (2014) considers that the site is "*geotechnically capable of supporting the proposed light industrial subdivision development*". Galt also recommends that future buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness.

The assessment also concluded that the underlying clayey material is unsuitable for onsite effluent disposal by percolation (however this can be improved with importation and placement of an adequate thickness of granular fill).

### Acid Sulphate Soils

Acid sulphate soil data by the DER is not available for the site, however the CSIRO's ASRIS (2014) data show that the site is in an area with *Low Probability/Very Low Confidence* of acid sulphate soils occurring (Talis, 2014).

### Contaminated Sites

According to the DER Contaminated Sites Database the site was not listed on the database on 19 August 2014 (Talis, 2014).

### Conclusion

The geotechnical assessment concluded that the site is classified Class 'M' provided that the site preparation recommendations are followed. Based on the preliminary geotechnical investigations, the site is 'geotechnically capable of supporting the proposed light industrial subdivision development' (Galt, 2014), however more detailed investigations are required.

The underlying clayey material is unsuitable for onsite effluent disposal by percolation. Acid sulphate soils are not an issue that will require further management in terms of the proposed development of the site and there is no reason to suggest that there are any previous potentially contaminating activities that have been undertaken on site (Talis, 2014).

## *3.3 Hydrology*

### Groundwater

The site is not located within any proclaimed groundwater area (as identified in the *Rights in Water and Irrigation Act 1914*) and as a result water may be taken from the area provided it is not from an artesian aquifer or affect downstream users through diminished flow.

The nearest WIN site (ID:6094934) with recorded groundwater levels is located 1.5km to the south west of the site. Static groundwater level at this site was recorded as 10.13m bgl. Additionally, a review of the *Katanning Town Groundwater Program 2003 Drilling Bore Completion and Test Pumping Report* (Global Groundwater, 2004) prepared for the Shire of Katanning showed a groundwater bore (03KC02D) located approximately 10m east of the site, which showed static groundwater level to be 1.354m bgl in May 2003 (Talis, 2014).

Galt Geotechnics encountered perched groundwater within one of the test pits at a depth of 0.4m (located outside of the study area at the north-west corner). It was considered that the surficial water observed is likely perched groundwater over surficial clayey soils from recent rainfall (Galt, 2014). It is recommended that groundwater investigations be undertaken to determine the quantities of fill material to be imported to the site to raise levels of the development. Based on Galt's 2014 preliminary geotechnical investigations, for drainage purposes, the buildings should be built on a built up pad of free draining compacted sand of at least 300 mm thickness.

### Surface Water

One un-named minor non-perennial watercourse is located through the centre of the site (aligned north-south). A number of dams, tanks and minor drains are located throughout the site, most of which service the rural and industrial land uses on site. It is likely that the minor non-perennial watercourse will be retained and a buffer provided on either side to mitigate potential impacts from future land uses.

No FPM 100 year ARI area is mapped within or immediately surrounding the site.

## *3.4 Bushfire Hazard*

A Bushfire Hazard Assessment was conducted across the site by Bushfire Prone Planning (2014). The Bushfire Hazard rating on the existing vegetation within the subject site is a combination of Low and Moderate and the external area is *Low* and *Moderate*. Areas of Moderate bushfire hazard correspond to the vegetated areas such as the drainage line land and the rows of trees along the property boundary of Lot 3. Surrounding land largely has a *low* bushfire hazard with some small areas with *moderate* hazard.

A complete copy of the Bushfire Hazard Assessment is at Appendix 3.

## *3.5 Heritage*

### Aboriginal Heritage Sites

A search for relevant Aboriginal Heritage was conducted by Talis (2014) using the DAA online *Aboriginal Heritage Inquiry System* which indicated one Registered Aboriginal Heritage Site is recorded at the north-west corner of the site. However, this site only affects a small portion of the site and is not expected to have a significant impact on the overall development of the site. Talis (2014) recommend that the heritage site is considered a constraint to development within this portion of the site, and further investigations would be required to determine the exact nature of this site.

Part of the site was also listed as *Heritage Survey Areas*, which comprises three long narrow channel investigation areas (survey report IDs 106010, 106012 and 106986) which were associated with effluent and reuse pipeline installation. These *Heritage Survey Areas* extended offsite, with an additional two survey areas located adjacent to the southern site boundary (survey report IDs 17057 and 106482).

### European Heritage Sites

An online search of the Australian Government's Department of Environment Heritage Database by Talis (2014) found that no recorded Australian heritage listed sites at the site or within the vicinity of the site (<500m).

An online search of the Heritage Council WA database by Talis (2014) using the *inHerit* portal found that no recorded sites of European heritage from the State register occur at the site.

## *3.6 Buffers*

The existing landfill site has a recommended industry buffer of 500m, the sales yard 1 000m from sensitive land uses and the various industrial land uses located within the vicinity of the site will have their own industry specific buffers associated with each land use.

The issue of appropriate separation distances (or buffers) will need to be considered during the future development of the subject site within the context of EPA Guidance Statement No.3. This matter will also require consideration given the nature of the surrounding land-uses, in particular within the southern portion of the site where the adjacent land use is rural. Despite this, buffers are not considered to pose a significant constraint to the development of the site (Talis, 2014). Future investigations will also need to refer to the updated EPA Guidance Statement No. 3 and WAPC State Planning Policies on separation distances, buffers and agricultural uses.

Assessment of proposed industry will need to determine that its impacts (noise, odour, vibration, emissions) will be contained within the boundary of the Structure Plan area. As industry develops in the Structure Plan area, the co-location of the industries may start to have cumulative impacts which also need to be managed within the Structure Plan area. Servicing and Infrastructure
The Structure Plan area is serviced with some essential infrastructure, however it is recognised that significant upgrades are likely to be required over time to facilitate development of the Structure Plan precinct. A summary is provided in the following section, with full details provided in the appendices/

### Electrical

The Katanning town site currently has 5-10MVA capacity remaining in terms of power availability which will drop to <5MVA in 2019. This allows for the development of approximately 1,000 residential dwellings from 2019 onwards on a first come, first serve basis, the development capacity substantially reduces if industrial and commercial lots are developed. Once the power capacity is reached, significant works would be required to source power from other areas to facilitate future development. It is expected that the power availability be a major constraint to development within the town site.

### Water and Wastewater

The Local Water Management Strategy (Appendix 2) details recommendations for water and wastewater serving for the structure plan area as reflected in the provisions. In summary: -

- The Water Corporation will consider the structure plan area for inclusion in their forward planning however a reticulated potable water supply is not immediately available. The preferred scenario is that potable water supply be sourced from extension to the existing reticulation main in Pemble St (Water Corporation will advise what headworks upgrades are required at a later stage). However, given the supply constraints it is proposed that a non-potable supply be supplemented by rainwater tanks and grey water for non-potable re-use.

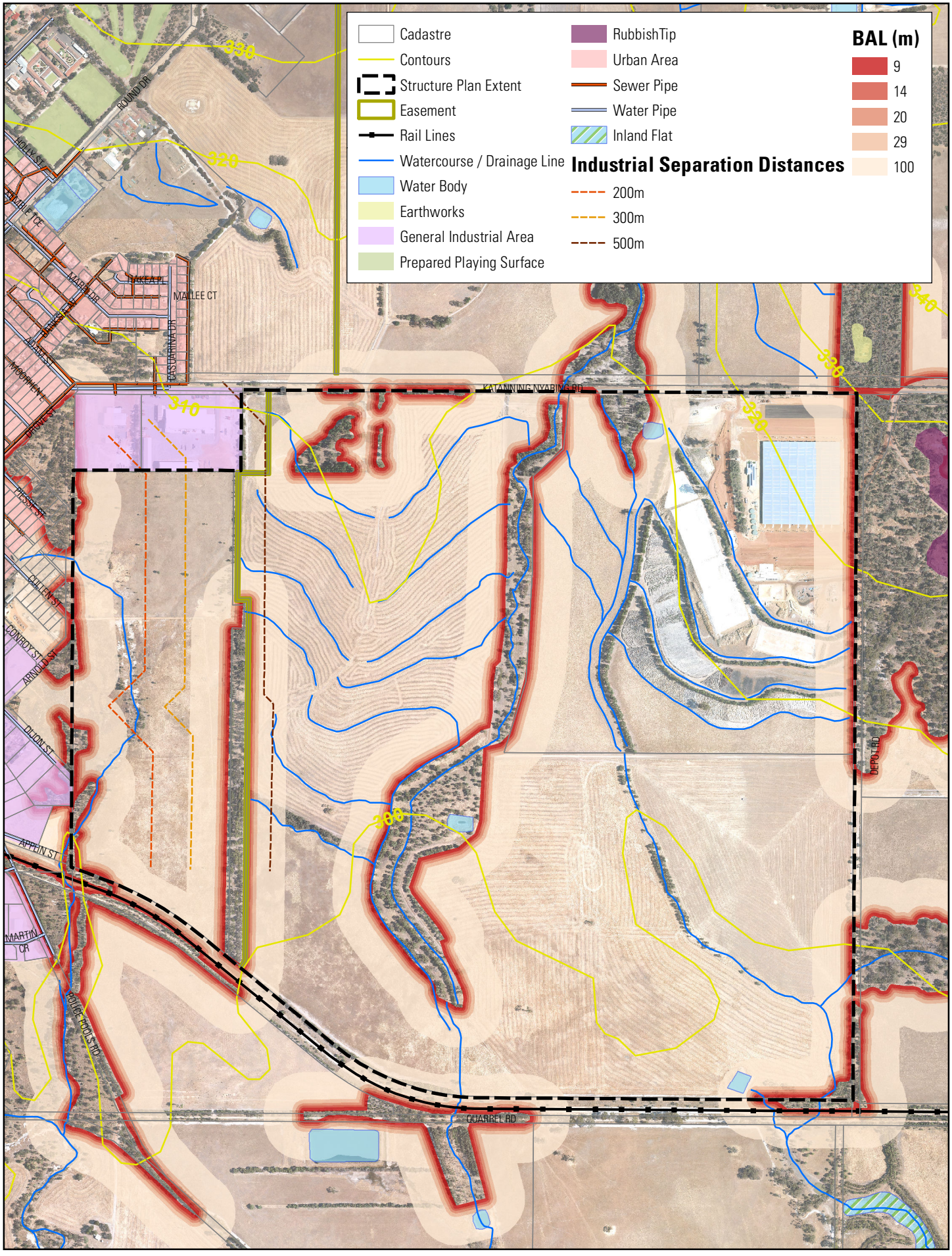
- The Water Corporation have advised that they will not accept wastewater from industrial developments in the existing or any future WWTP. It is recommended that sewage disposal be via on-site means. It is noted that the geotechnical investigation recommends against this, however it is considered that an appropriate system can be designed in conjunction with soil improvements and/or filling.

### Gas

There is no gas reticulation available within the town site.

### Communications

NBN rollout has not commenced in Katanning. It is expected that the town would be serviced by fixed wireless, similarly to other regional centres. Due to a change in government policy, the timeline for NBN rollout will not be provided. Optus maintains a fibre optic network through much of the town which may provide broadband services. Telstra would be required to service any future development in the absence of NBN or interest but other communications providers.

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**INDUSTRIAL LAND STRUCTURE PLAN**

**FIGURE 3.1**
**SITE CONDITIONS & CONSTRAINTS**

# 4 Land use and Subdivision Requirements

The Industrial Expansion Structure Plan facilitates the development of the primary industrial site within the Katanning townsite.

## 4.1 Land use

Permissible land uses within the Structure Plan area shall be in accordance with the Local Planning Scheme No.5 for the *Industrial Development* zone as depicted on the Structure Plan. The Industrial Development zone provides flexibility for a range of rural and industrial uses which will benefit the establishment of an agribusiness precinct close to town. The Industrial Development zone also provides for a range of uses which are considered sensitive uses that are not typically identified within Industrial or rural areas with larger lot sizes as proposed in this instance, and therefore are not considered to be compatible with the range of rural and general industries accepted in this structure plan area. The following uses are "D" discretionary under the LPS (which means that the use is not permitted unless the local government has exercised its discretion by granting development approval) and will generally not be permitted as they are not considered to be consistent with the objectives of the Industrial Expansion Structure Plan, and these include:

- Bed and Breakfast D use
- Child Care Premises D
- Consulting rooms D
- Educational Establishment D
- Family Day Care D
- Holiday Accommodation D
- Medical Centre A
- Restaurant/Cafe D
- Shop D
- Bulky Goods Showroom D
- Workforce Accommodation D

There may be scope for Council to consider uses not listed which will be compatible with the general and rural industrial uses such as the previously approved Chicken processing facility on Lot 3, and the Sales Yard on Lot 500.

This Structure Plan is the first prepared for the site and does not supersede any earlier planning work.

***Table 4.1 – Structure Plan Summary Table***

| Item | Data |
|---|---|
| Total area covered by the Structure Plan | |
| Industrial Development | 311.20 hectares |
| Stage 1 Release | 36.29 ha |
| Lot Yield of Stage 1 | 10 lots |

### Open Space/Natural Areas

No Open Space or Natural Areas are proposed within this Structure Plan. The central Living Stream will facilitate a managed drainage regime for the site. It is important to note that an access easement will need to be created along this area to provide access for both the Shire (drainage purposes) and the Department of Agriculture and Food (movement of stock).

### Industrial land uses

The Structure Plan facilitates the development of an Industrial Precinct for the Shire. It is anticipated it will be developed over many years. Stage 1 has already been earmarked and is considered large enough to meet short and medium term demand.

The Structure Plan addresses the containment of impacts within the boundary by providing the *Enterprise* precinct as the buffer: or transitional precinct to the neighbouring residential areas. The Structure Plan provides for its intensive industries in the *General Industry* precinct. Although lot sizes will be determined by future industry, it is anticipated that a number of larger lots to accommodate intensive (general) industry will be provided at the very centre of the structure plan and some smaller lots along the periphery adjacent to major road connections. The location of proposed industry and the resultant lot sizes will ultimately be determined by assessment of its offsite impacts, servicing and access needs. However, as a guide an indicative layout has been prepared to guide future considerations (Figure 4.1). The requirement to assess each industry will naturally provide the framework which will enable the establishment of intensive industrial uses further from the sensitive uses of the town and the adjacent enterprise zone. The proposed road network indicates the placement of larger lots particularly across Lots 500-501. Lot 3 may suit lighter industries and uses with smaller lots.

## *4.2 Subdivision*

### Urban Water Management Plan

The Urban Water Management Plan (UWMP) is mostly an extension of the work developed through District Water Management Strategy and LWMS stages and often requires further work to help define future requirements. The additional work includes;

- Groundwater quality monitoring at downstream points of each proposed lot to develop trigger values and water quality improvement targets
- Surface water quality monitoring at upstream and downstream sections of the drainage line adjacent to the proposed development to develop trigger values and water quality improvement targets
- Determination of post development monitoring points for groundwater and surface water quality and quantity
- Determination of stormwater systems and management plans for each individual lot
- Detailed geotechnical investigation across building/construction footprints
- Application for any groundwater extraction licences
- A dewatering management plan as required.
- Design and implementation of the 'Living Stream' concept

### Landscaping Plan

A Landscaping Plan should be prepared addressing streetscape and aesthetic amenity along road interfaces.

## *4.3 Development*

### Stormwater Management

The Local Water Management Strategy (Appendix 2) outlines the likely developer requirements and set out an agreed concept. It has been prepared at a broad conceptual level and will need to be refined when further details on the lot yield, configuration and land use are developed. The LWMS provides a comprehensive storm water, groundwater and water use strategy.

A key issue for storm water management was identifying that a significant portion of the site is expected to be affected by flooding during the 100-year event and considered a major constraint to the development of the site. The existing flooding of the land is expected to be attributed to two causes; the capacity of the drainage line and the capacity of the existing culverts under the railway line to the south of the site. The LWMS recommends:

- Implementing a "living stream" to improve the flow capacity and control the extent of flooding which will involve widening and refining of the drainage line cross section, planting to improve water quality and partial realignments.
- Constructing compensating areas prior to the culverts to control the extent of flooding (Upgrading the culverts may not be feasible due to the disruption to the rail line and the increased flow through the culverts may create flooding issues downstream. However, this can be addressed in the future)
- Installing roadside drains to convey storm water runoff from roads and lots with appropriate freeboard.
- Vegetate the open drain prior to discharge to the drainage line.
- Subdivision to address flood fringe impacts in detailing lot boundaries.
- Development to require minimum floor levels of 500m above the 100year water level of the drainage line, and to provide storage for storm water that allows discharge at pre-developed rates for the 1, 10 and 100 year events.

The LWMS recommends that the each building envelope be graded such that there is no potential for groundwater to perch below building footings, with a 300mm min thickness sand pad above (as detailed in the provisions). The LWMS recommendation to implement infiltration trenches has not been considered for this development area as water logging or high groundwater levels are not an issue for this particular area. In addition, lowering the groundwater in this area would likely have limited benefit to the town centre which is considerable distance from the subject site. Notwithstanding this, infiltration trenches can be retrofitted into the proposed open drains and within the lots in the future if required.

### Water Supply

Water is to be supplied by a water main extension from the existing reticulation. Water supply should be supplemented by rainwater tanks and grey water for non-potable re-use.

### Wastewater

Subject to geotechnical considerations, each lot is to be treated by an onsite effluent disposal unit. Soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

### Industrial Buffers

All development within the Structure Plan area shall have due regard to industrial buffer requirements stipulated by the Environmental Protection Authority and/or Western Australian Planning Commission. Development within the

Structure Plan area should only be approved by Council if the Proponent can confirm that buffers can be contained within the bounds of the Structure Plan area.

## *4.4 Movement Networks*

The Structure Plan area is bound by Katanning-Nyabing Road to the north, Depot Road to the east, Quarrel Road to the south and various roads including Arnold Street, Cullen Street, Dijon Street and Piesse Street to the west.

Three internal road linkages are proposed, however their exact alignment and build date are currently uncertain. A sketch plan of possible subdivision is provided in Figure 4.1. The Structure Plan has deliberately avoided inclusion of the subdivision sketch plan in the Statutory Section of this document to enable a future industrial land user to determine their own requirements and have the flexibility in the Structure Plan to meet their needs at the time.

Stage 1 is an area to be developed by Landcorp with direct access onto Katanning – Nyabbing Road.

## *4.5 Infrastructure coordination, servicing and staging*

It is envisaged that the Structure Plan precinct will develop progressively over many years. As such, the Structure Plan promotes flexibility to reduce the need for infrastructure provision. Stage 1 as depicted on the Structure Plan is anticipated to meet demand for some time.

A formal submission by the proponent should be made in a timely manner considering the proposed development schedule and the infrastructure planning review.

Any future subdivision application will, however, be subject to the preparation of a Detailed Area Plan if deemed necessary by Council, and will need to ensure that any separation distances required by the proposed industry are able to be accommodated within the Structure Plan boundary.

## *4.6 Developer contributions*

With the exception of Lot 3, the remaining lots are all owned by the State of Western Australia. As such, there is no Developer Contribution Plan proposed as part of this Structure Plan.

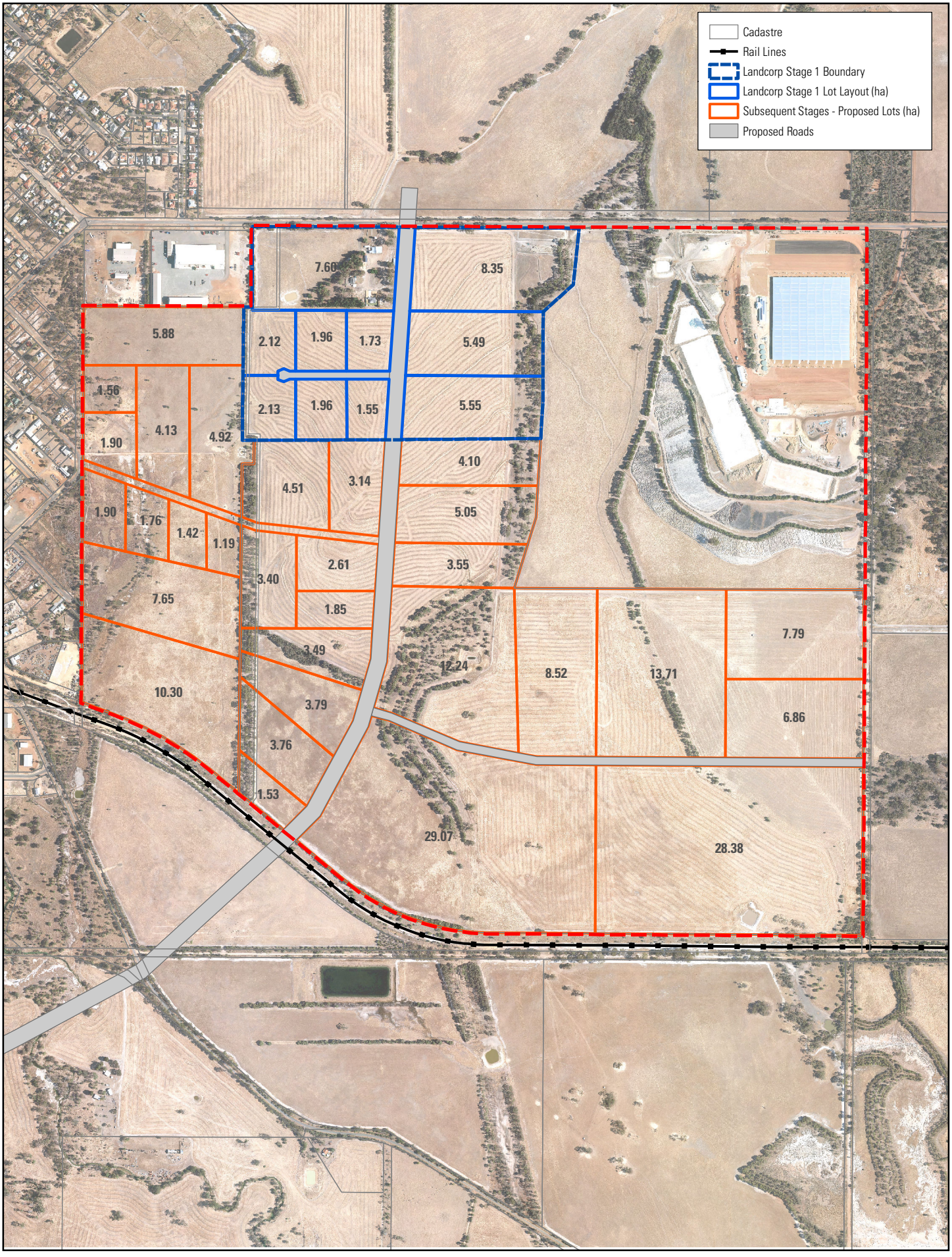
## *4.7 Implementation/Other Requirements*

The Structure Plan shall be adopted by the Shire of Katanning Council and the WAPC as a strategic document that will form the basis of decision-making by the Shire and WAPC until such time as the Shire's Local Planning Scheme No. 5 is adopted that then specifically includes provisions for the statutory adoption of Structure Plans.

Once the Local Planning Scheme is gazetted the Structure Plan can be endorsed as a Statutory Structure Plan under the scheme.

### Transitional arrangements

The land will continue to be used for agricultural/rural purposes until such time as developed in accordance with this Structure Plan.




landinsights
PLANNING DESIGN ENVIRONMENT

N
W E
S

0 0.05 0.1 0.2 0.3 0.4 0.5 km

1:12,500

**INDUSTRIAL LAND STRUCTURE PLAN**

**FIGURE 4.1**
**INDICATIVE LOT LAYOUT**

# 5 Appendices

**Technical Appendices Index**

| Appendix no. | Document title | |
|---|---|---|
| 1 | Structure Planning – Environmental Investigations | (AVAILABLE FROM SHIRE OFFICE) |
| 2 | Local Water Management Strategy Rev A | (AVAILABLE FROM SHIRE OFFICE) |
| 3 | Bushfire Hazard Assessment | (AVAILABLE FROM SHIRE OFFICE) |
| 4 | Transport Assessment | (AVAILABLE FROM SHIRE OFFICE) |
| 5 | Servicing and Infrastructure | (AVAILABLE FROM SHIRE OFFICE) |
| 6 | Possible Layouts | |

# APPENDIX 1
# Structure Planning – Environmental Investigations

# APPENDIX 2
# Local Water Management Strategy

CONSULTING CIVIL & TRAFFIC ENGINEERS, RISK MANAGERS.

| | |
|---|---|
| Project: | Katanning Industrial Site LWMS |
| Client: | Land Insights |
| Job Number: | 1409018 |
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## Document Status

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# 1. Executive Summary

## 1.1. Background

Katanning has been identified as one of a network of nine SuperTowns due Katanning's growth potential, central location and demonstrated governance ability.

The SuperTowns vision is to create well-connected communities with access to services, affordable housing, and a diverse range of lifestyle and employment opportunities. This will result in more choices for people living in regional areas and provide an attractive alternative to residing in the metropolitan area.

## 1.2. Objective

The objective of this Local Water Management Strategy (LWMS) is to achieve best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner.

This LWMS has been prepared to support the development of a structure plan for the creation of the Industrial Expansion Area east of the Katanning town site between Quarrell Road, Depot Road and Katanning-Nyabing Road.

## 1.3. Existing Site

The proposed development is located at Lot 3 Thompson Street, Lot 500 on Deposited Plan 70820 and Lot 501 on Deposited Plan 70820 within the Shire of Katanning. The site consists of approximately 309ha of land located immediately to the east of the Katanning town site, bounded by Katanning – Nyabing Road to the north, Depot Road to the east and a railway line to the south.

The site is currently zoned Rural under the Shire of Katanning Town Planning Scheme No. 4 and it is proposed to rezone the site to Industrial.

The Site is generally cleared and vacant with the exception of the sales yard on the north-east portion and the farm on the north-west portion

The site is generally flat, grading from approximately 320m AHD in the north-east to 300m AHD in the south, equating to a maximum gradient of around 1%. There is an existing non-perennial creek which runs centrally through the site from north to south.

Previous land use over the site included a livestock sales yard on the north-east portion, a farm within the north-west portion and agriculture over the balance of the site.

## 1.4. Water Supply

- Potable water should be supplied from an extension to the existing mains within the Katanning town site to the west, however details of the extensions and upgrades required are currently not known as the area is outside of Water Corporations planning areas.
- Water supply should be supplemented by rainwater tanks and grey water for non-potable re-use.

## 1.5. Wastewater

- Water Corporation has confirmed the development area will not be included in their wastewater planning; and
- Wastewater in each Lot is to be treated by an onsite effluent disposal unit. Soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill.

## 1.6. Stormwater Management

### 1.6.1. Flood Protection:

- All floor levels to be set a minimum of 500mm above the 100year water level of the creek; and
- The flood fringe impacts significantly on some lots and it is recommend that the lot boundaries be adjusted.

### 1.6.2. Drainage Concept:

- The developer of each lot will need to provide storage for stormwater that allows discharge at pre-developed rates for the 1, 10 and 100 year events;
- Basins are recommended at each Lot with overflow to the open drains in the street via culverts (low flow) or rock lined spillway (high flow). Basins should be lined with clay to prevent groundwater recharge; and
- The road is drained by open drains sized for the 1:10 year event. These will also serve to carry overflow from lot areas.

### 1.6.3. Protect Ecology

Open drain outlets to be heavily vegetated with the vegetated areas to be sized at 2% of the connected impervious catchment area.

## 1.7. Environmental

There are not expected to be any environmental concerns with the development of the site, however any

clearing of eucalypts will require targeted surveys, nest tree surveys and consultation with the relevant state and federal agencies due to the potential presence of the Carnaby's Black Cockatoo.

## 1.8. Groundwater

The following to be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements;
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas);
- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage;
- All basin and drains to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

There is no requirement to lower groundwater levels to facilitate development.

# 2. Introduction

## 2.1. Principals and Objectives

The objective of this Local Water Management Strategy (LWMS) is to achieve best practice water management outcomes through strategies that manage the total water cycle in a sustainable manner. The objectives of total water cycle management, as described by the Water Resources State Planning Policy (WAPC, 2004) are to:

- Take into account total water cycle management and water-sensitive urban design principles;
- Ensure that the development is consistent with current best management practices and best planning practices for the sustainable use of water resources;
- Seek to achieve zero net variations in water quality and quantity, unless necessary to meet identified environmental water requirements;
- Promote management of the urban water cycle as a single system in which all urban water flows are recognised as a potential resource;
- Maximise the opportunities for compliance with best practice stormwater management including retention of stormwater on site/at the source;
- Promote the use of water conservation mechanisms that increase the efficient use of water, including stormwater;
- Incorporate the re-use and recycling of water, particularly stormwater and grey water, consistent with state water strategy recycling objectives. Alternative water sources should be considered where appropriate; and
- Promote the retention and use of local native vegetation in developments to minimise water use and maximise filtration, particularly where landscaping is proposed.

In order to achieve these objectives, the LWMS follows the principles of Water Sensitive Urban Design (WSUD).

## 2.2. Planning Background

Over the next three to four decades, Western Australia's population is set to double. As part of preparing for this growth and working to decentralise Western Australia's future population, the State Government devised a plan to make regional towns even more attractive places to live in the future. Therefore a plan to transform towns into SuperTowns was announced in July 2011.

The SuperTowns vision is to create well-connected communities with access to services, affordable housing, and a diverse range of lifestyle and employment opportunities. This will result in more choices for people living in regional areas and provide an attractive alternative to residing in the metropolitan area.

Katanning has been identified as one of a network of nine SuperTowns due Katanning's growth potential, central location and demonstrated governance ability.

As part of the SuperTown initiative, five sites within Katanning have been targeted for the first stage in a Growth Plan to include industrial, commercial, residential and rural-residential development. These sites comprise:

- O'Callaghan Park;
- Piesse Park;
- Western Australian Meat Marketing Cooperative Ltd (WAMMCO);
- Industrial Expansion Area; and
- Warren Road (DIA 4).

This LWMS has been prepared to support the development of a structure plan for the creation of the Industrial Expansion Area east of the Katanning town site between Quarrell Road, Depot Road and Katanning-Nyabing Road.

## 2.3. Previous Studies

The following previous and supporting studies have been undertaken and provide relevant background data for the Industrial Expansion Area:

- Katanning District Water Management Strategy (Doc No. W-A1266.03, May 2014, Opus International Consultants);
- Structure Planning: Environmental Investigations (Doc No.TE14012_1b, November 2014, Talis Consultants Pty Ltd);
- Preliminary Geotechnical Study - Proposed Industrial Development - WAMMCO Site, Katanning (Doc No. J1401161 003 R_Rev 0, 26 September 2014, Galt Geotechnics); and
- Katanning Flood Assessment (Opus, 2013).

## 2.4. Level of Design

This LWMS has been prepared with the understanding that the proposed development and Lot boundaries are only at a conceptual level. The Lot boundaries and sizes, as well as road locations and public open space areas, are likely to be refined in the future.

In addition, it is unknown what type of industrial activities the Lots will be used for an as a result it difficult to determine building envelopes, required carpark/hardstand areas and number of people at the facilities which all directly influences potable water supply, rainwater tank storage and stormwater runoff calculations.

Therefore the LWMS has been prepared to outline the likely developer requirements and set out an agreed concept. However, it has been prepared to a high level and will need to be refined in the future when the proposed development configuration has been confirmed. It is recommended that a detailed LWMS is prepared in future, when further details on the lot yield, configuration and land use are developed.

# 3. Proposed Development

## 3.1. Proposed Development

The proposed development is located at Lot 3 Thompson Street, Lot 500 on Deposited Plan 70820 and Lot 501 on Deposited Plan 70820 within the Shire of Katanning. The site consists of approximately 309ha of land located immediately to the east of the Katanning town site, bounded by Katanning – Nyabing Road to the north, Depot Road to the east and a railway line to the south. Figure 1 below shows the site location. Figure 11 in Appendix A shows the proposed structure plan for the site.

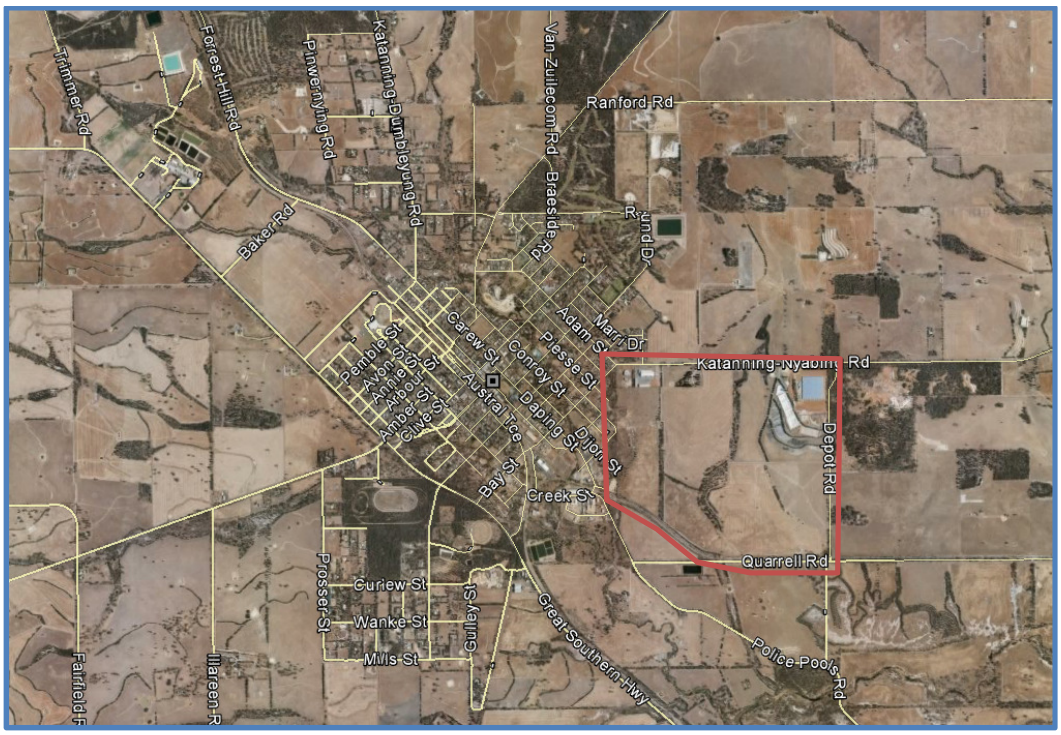



Figure 1. Site Location

The site is currently zoned Rural under the Shire of Katanning Town Planning Scheme No. 4 and it is proposed to rezone the site to Industrial.

Previous land use over the site included a livestock sales yard on the north-east portion, a farm within the north-west portion and agriculture over the balance of the site.

# 4. Design Criteria

## 4.1. Water Conservation – Potable and Wastewater

- Ensure there is an adequate water supply to accommodate townsite and business growth;
- Develop a secure sustainable water management system;
- Treatment and conveyance of wastewater enable an increase in the volume of re-use;
- Increase the volume of suitable water that can be re-used; and
- Reduce reliance on scheme water through the promotion of suitable stormwater and wastewater.

## 4.2. Water Quantity Management

- Ensure existing drainage issues do not prejudice future development opportunities;
- Increase the volume of suitable water that can be re-used;
- Reduce reliance on scheme water through the promotion of suitable stormwater and wastewater;
- Ecological Protection – Maintain pre-development flow rates and volumes for the 1 year ARI event;
- Maintain or restore desirable environmental flows and/or hydrological cycles; and
- Flood Management – Maintain pre-development flow rates and volumes for the 100 year ARI event.

## 4.3. Water Quality Management

- Management to protect the health of existing creeks, wetlands and vegetation to improve water quality to treat nutrients at their source;
- Improve nutrient outputs; and
- Treat all runoff in the drainage network prior to discharge consistent with the Stormwater Management Manual

## 4.4. Disease Vector and Nuisance Insect Management

- Design detention structures so that stormwater is fully infiltrated or discharged within 96 hours.

## 4.5. Groundwater

- Beneficially re-use the groundwater to reduce its impact on the environment and public infrastructure; and
- Implement controls to lower/limit the height of groundwater.

# 5. Pre-development Environment

## 5.1. Existing Site

The Site is generally cleared and vacant with the exception of the sales yard on the north-east portion and the farm on the north-west portion. Figure 2 below shows the existing site.

Figure 2. Existing Site

The site is generally flat, grading from approximately 310m AHD in the north-east to 300m AHD in the south, equating to a maximum gradient of around 0.6%. There is an existing non-perennial creek which runs centrally through the site from north to south.

## 5.2. Geotechnical

A geotechnical investigation was undertaken by Galt in September 2014. The investigation comprised of:

- A walkover of the site;
- Excavation of test pits at 20 locations to depths of 1.1m to 2.5m;
- Dynamic Cone Penetrometer (DCP) at each test pit location, extending to depths of 0.4m to 1.0m'
- Percolation testing for effluent disposal assessment at 3 locations at depths of between 0.2 to 0.4m; and

- Collection of representative samples from selected test pits for inspection and possible laboratory testing.

The investigation found that the site soils generally consist of:

- SAND/Clayey SAND/Silty SAND (SP/SC/SM), fine to course grained, with some gravel, extending from the surface to a depth of 0.3m to 0.5m; overlying
- Clayey SAND/Sandy CLAY (SC/CI), fine to course grained sand, trace to some fine grained gravel, extending to depths of between 0.8m to the maximum test pit depth of 2.5m; locally overlying
- Sandy CLAY (CI/CH), locally present from as shallow as 0.8m extending to the maximum test pit depth of 2.5m.

A review of the Acid Sulphate Soils potential for the site undertaken by Talis found that risk mapping is not available for the site, however a review of the CSIRO's ASRIS data shows the site to be in an area of 'Low Probability/Very Low Confidence' of ASS occurring.

## 5.3. Environmental

An environmental study was undertaken by Terratree in October 2014. The investigation comprised of a desktop study which included searches of the following databases:

- Department of Parks and Wildlife's Threatened and Priority Flora;
- Department of Parks and Wildlife's Threatened Fauna and Ecological Community;
- WA Herbarium's Declared Rare and Priority Flora;
- Department of the Environment's Protected Matters Search Tool; and
- Associated Level 1 flora and Level 1 flora surveys conducted in accordance with EPA Guidance Statements 51 and 56.

The study found that the site contains:

- 'Completely degraded' vegetation whereby the structure of the vegetation is no longer intact an the area is completely or almost completely without native species;
- A few linear areas of trees which were determined to be planted within approximately the last 30 years that are species native to Australia, though not of local provenance. The understory of the trees contains no native vegetation with limited habitat value, although several bird species were identified amongst the trees;
- No flora species of conservation significance were identified at the site;
- No suitable habitat for any threatened or vulnerable species, except potentially the Carnaby's Black Cockatoo within eucalypts. As such, any disturbance to eucalypts would require targeted surveys, nest tree surveys and consultation with the relevant state and federal agencies;

- No Threatened or Priority Ecological Communities were identified within a 20km radius of the site;
- The site is not considered to be an Environmentally Sensitive Area; and
- There are no ecological linkages of conservation significance within the site.

## 5.4. Surface Water

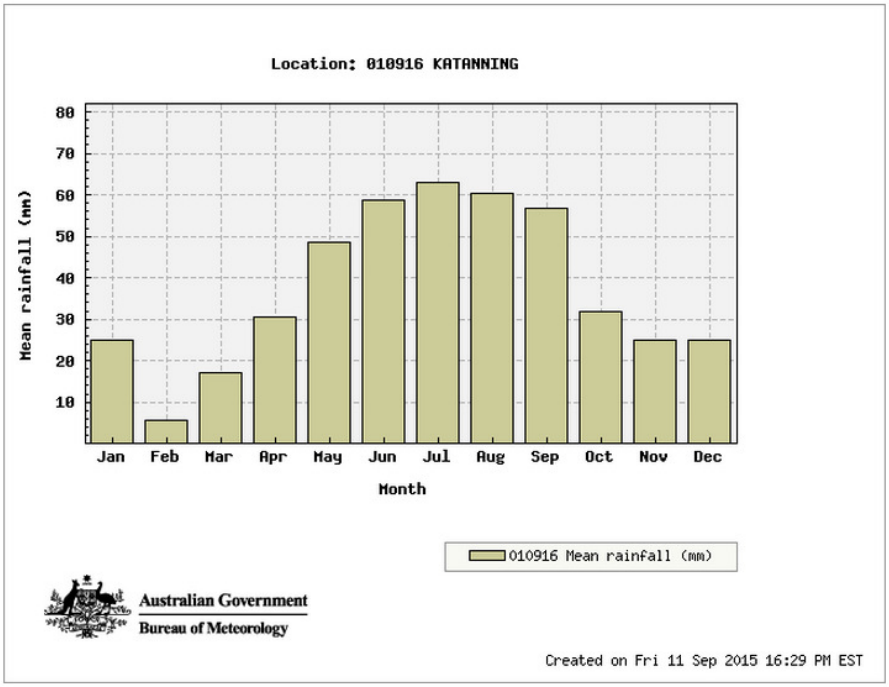
### 5.4.1. Topography

The site is generally flat, grading from approximately 310m AHD in the north to 300m AHD in the south, equating to an average gradient of around 0.6%. There is an existing creek which runs through the centre of the site from north to south.

### 5.4.2. Rainfall

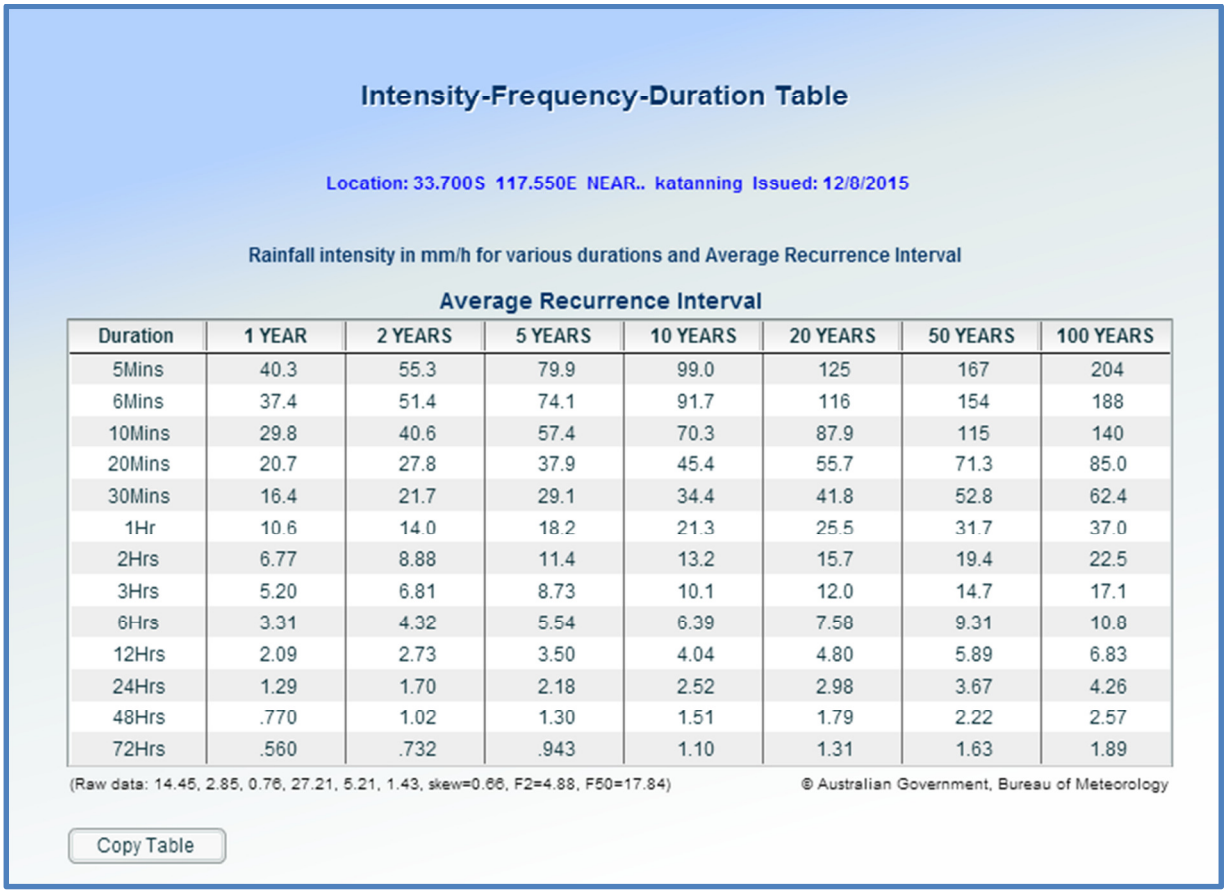
Katanning has most of the annual rainfall between May and September in association with the winter cold fronts. The long-term average annual rainfall for Katanning is 441.8mm.

Figure 3 shows a rainfall occurrence chart for Katanning and the Intensity Frequency Duration (IFD) table obtained from the Australian Bureau of Meteorology is shown in Figure 4.




| Statistics | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual | Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean rainfall (mm) for years 1999 to 2015 | 25.0 | 5.8 | 17.2 | 30.6 | 48.5 | 58.6 | 63.0 | 60.5 | 56.9 | 31.8 | 25.0 | 24.9 | 441.8 | 16 |

Figure 3. Katanning Mean Rainfall



**Intensity-Frequency-Duration Table**

Location: 33.700S 117.550E NEAR.. katanning Issued: 12/8/2015

Rainfall intensity in mm/h for various durations and Average Recurrence Interval

| Duration | Average Recurrence Interval | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 YEAR | 2 YEARS | 5 YEARS | 10 YEARS | 20 YEARS | 50 YEARS | 100 YEARS |
| 5Mins | 40.3 | 55.3 | 79.9 | 99.0 | 125 | 167 | 204 |
| 6Mins | 37.4 | 51.4 | 74.1 | 91.7 | 116 | 154 | 188 |
| 10Mins | 29.8 | 40.6 | 57.4 | 70.3 | 87.9 | 115 | 140 |
| 20Mins | 20.7 | 27.8 | 37.9 | 45.4 | 55.7 | 71.3 | 85.0 |
| 30Mins | 16.4 | 21.7 | 29.1 | 34.4 | 41.8 | 52.8 | 62.4 |
| 1Hr | 10.6 | 14.0 | 18.2 | 21.3 | 25.5 | 31.7 | 37.0 |
| 2Hrs | 6.77 | 8.88 | 11.4 | 13.2 | 15.7 | 19.4 | 22.5 |
| 3Hrs | 5.20 | 6.81 | 8.73 | 10.1 | 12.0 | 14.7 | 17.1 |
| 6Hrs | 3.31 | 4.32 | 5.54 | 6.39 | 7.58 | 9.31 | 10.8 |
| 12Hrs | 2.09 | 2.73 | 3.50 | 4.04 | 4.80 | 5.89 | 6.83 |
| 24Hrs | 1.29 | 1.70 | 2.18 | 2.52 | 2.98 | 3.67 | 4.26 |
| 48Hrs | .770 | 1.02 | 1.30 | 1.51 | 1.79 | 2.22 | 2.57 |
| 72Hrs | .560 | .732 | .943 | 1.10 | 1.31 | 1.63 | 1.89 |

(Raw data: 14.45, 2.85, 0.76, 27.21, 5.21, 1.43, skew=0.66, F2=4.88, F50=17.84)

© Australian Government, Bureau of Meteorology

Copy Table

Figure 4. IFD Table

### 5.4.3. Predevelopment Surface Water Flow

Predevelopment flow rates have been calculated using the Index Flood Method for the Wheatbelt Region as per Australian Rainfall and Runoff Book IV – Estimation of Design Peak Discharges (2001). Table 1 below provides the summary of the pre-developed flows through the site.

Table 1. Pre-development flows

| Pre-developed Catchment | Description | Area ($km^2$) | Q1($m^3/s$) | Q10($m^3/s$) | Q100($m^3/s$) |
|---|---|---|---|---|---|
| CA01 | Western portion of site. Discharge via 2x 675mm culverts under railway | 0.9 | 0.21 | 0.72 | 2.15 |
| CA02 | Creek line. Discharge via 3x 675mm culverts under railway, | 5.6 | 0.63 | 2.14 | 6.45 |
| CA03 | Eastern portion of site. Discharge under railway bridge | 1.1 | 0.20 | 0.67 | 2.03 |

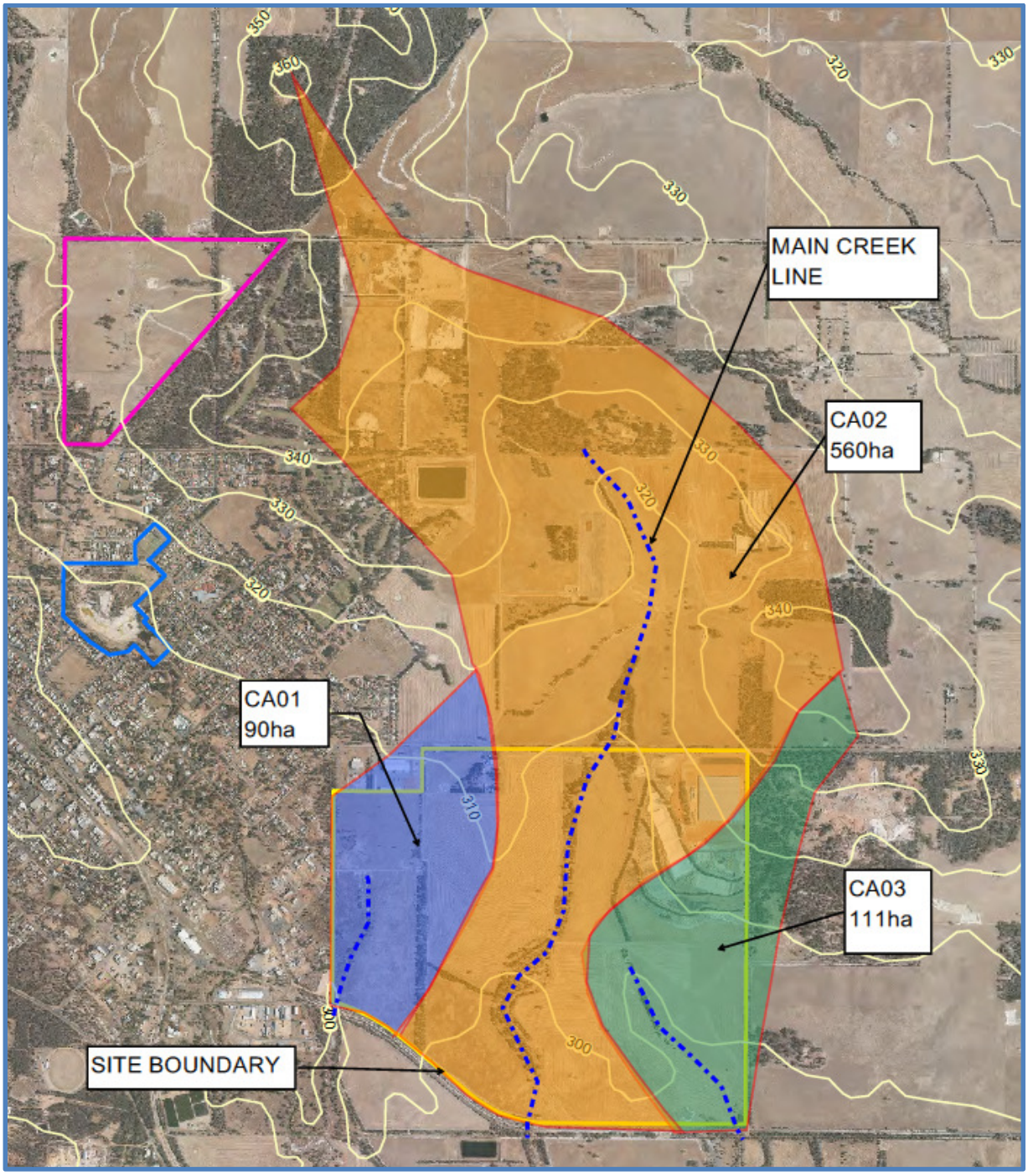



Figure 5. Pre-development Catchment Plan

### 5.4.4. Flood Modelling

One of the outcomes from the Katanning Flood Assessment (Opus 2013) was the compilation of an estimated Q100 flood level for the SuperTowns development scenario The flood fringe area within the proposed development is shown in Figure 6 which highlights that a significant portion of the site is expected to be affected by flooding during the 100 year event. This is considered to be a major constraint to the development of the site and it is suggested that measures to control the flood extents be implemented.

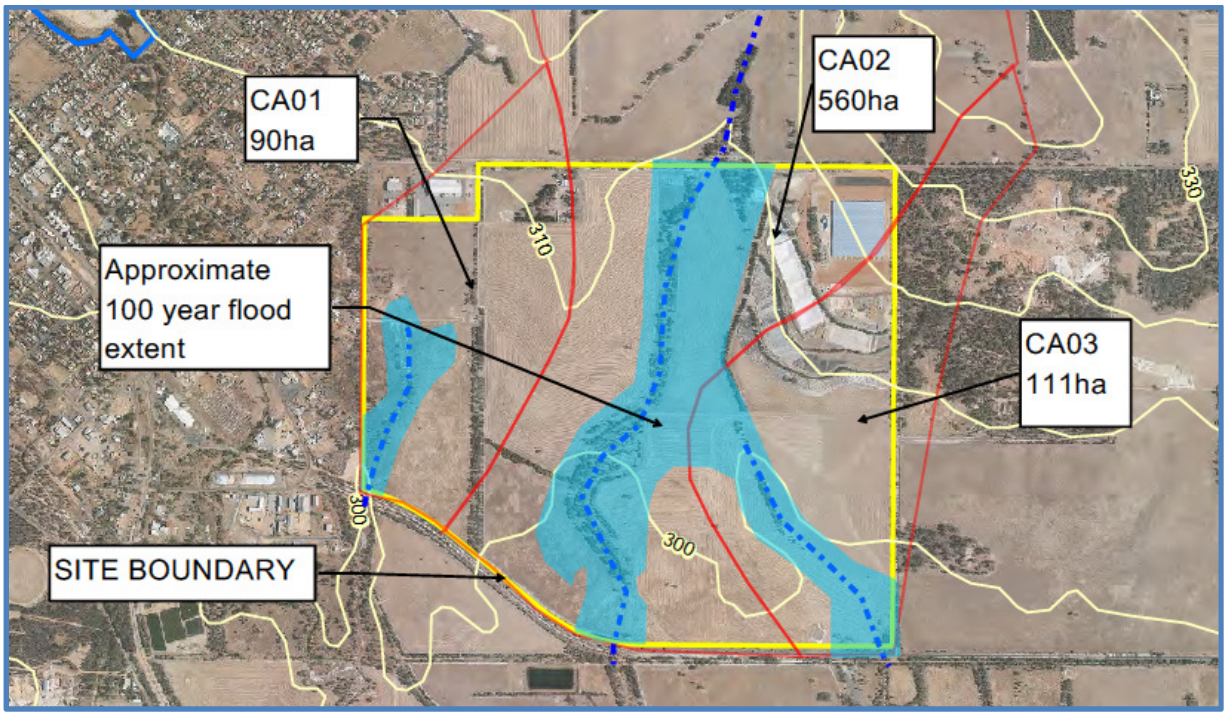



Figure 6. Pre-development 100 year flood extents

### 5.4.5. Surface Water Quality

As the majority of the proposed development area is currently undeveloped there are unlikely to be any major concerns with surface water quality.

## 5.5. Groundwater

The District Water Management Strategy prepared by Opus provided several findings in relation to groundwater for Katanning which are summarised as follows:

- Approximately 60% of the town experiences groundwater within 2m of the surface;
- The groundwater is naturally collecting in the valley areas of the local landscape, but these areas become water logged as the groundwater is unable to flow away due to the low permeability of the clay/soil conditions;

- Due to the low hydraulic conductivity of the deeper subsoil, pumping to control groundwater levels has been generally unsuccessful; and
- Salinity is considered high as levels ranged from 1800 ppm up to 16,000 ppm.

The geotechnical investigation undertaken by Galt found perched water within one of the twenty test pits at a depth of 0.4m. Surficial ponding of water was also observed at various locations around the site which Galt considered likely to be perched groundwater over the surficial clayey soils.

# 6. Water Use Sustainability Initiatives

## 6.1. Water efficiency measures

### 6.1.1. Landscaping

Any proposed vegetation should be waterwise native plants that do not require ongoing irrigation.

Open space areas to be planted with drought-resistant local native species suited to the prevailing site conditions.

Plantings should be kept dense and compact to improve efficiency of any irrigation.

## 6.2. Water Supply

The development area has not been included in the Water Corporations water planning and therefore a reticulated potable water supply is not immediately available. Water Corporation advises that the proponent should arrange for water infrastructure planning to be undertaken. Notwithstanding this, it is expected that the development could be serviced from extension to the existing reticulation mains within the Katanning Townsite to the west, although extensive headworks upgrades are likely to be required.

The Great Southern Towns Water Supply (GSTWS) currently supplies the significant majority of potable water to Katanning and there does not appear to be another suitable surface or groundwater source that are within close proximity of Katanning that could are able to provide sufficient quantity and quality to modify this reliance on the GSTWS.

Therefore, to reduce the reliance upon the GSTWS to provide potable water for Katanning and to minimise the extent of headworks upgrades require, it is desirable that the water supply is only used for drinking water uses whilst the development water supply is supplemented by rainwater tanks and grey water storage for non-potable re-use. Therefore, it is recommended that the developer of each be required to provide rainwater tanks, stormwater capture and reuse from hardstand areas and grey water systems to the extent required to provide for all non-potable usage.

## 6.3. Wastewater Management

The Water Corporation has confirmed that the proposed development area has not been included in the Water Corporations wastewater planning and at this stage is not going to be included in the future. This is due to the fact that wastewater treatment plants in regional centres employ biological processes, which are highly sensitive to contaminants. Wastewater from industrial areas presents a significant operational risk to the plant because of the potential to disrupt the biological treatment process, and compromise reuse of treated effluent. The presence of an industrial subdivision in the catchment of a small regional wastewater treatment plant presents a substantial risk to the Katanning wastewater treatment plant (WWTP), particularly as the businesses that may establish in that subdivision are not initially known.

Therefore, wastewater from each Lot will be required to be disposed though installation of an onsite effluent disposal unit.

The percolation test results within the upper sandy material range between 5 minutes and 36 minutes for water to fall 25 mm when testing was carried out in accordance with Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1972, Schedule 8. Therefore the underlying clayey material is considered unsuitable for onsite effluent disposal by percolation. As a result the soil around any onsite effluent disposal units will need to be improved with the importation and placement of an adequate thickness of granular fill. The groundwater levels for each Lot will also need to be considered.

# 7. Stormwater Management Strategy

## 7.1. Flood Protection

As discussed in section 5.4.4 flooding is considered a major constraint to the development of the land and it is considered that measures to control the flood extents should be implemented. The existing flooding of the land is expected to be attributed to two causes; the capacity of the creek line and the capacity of the existing culverts under the railway line to the south of the site.

All future building floor levels are to be set at a minimum of 0.5m above the 100 year flood levels from the creek including compensating areas.

### 7.1.1. Living Stream

The existing creek line is narrow, meandering and in some locations of low depth and is expected to have limited capacity to convey the 100 year flow, without spilling out of the main channel into the adjacent land. Figure 7 shows the existing cross section of the creek.

Figure 7. Existing Creek Cross Section

In order to improve the flow capacity and control the extent of flooding it is proposed to undertake improvements to the stream to achieve a 'Living Stream' standard. This will involve widening and refining of the cross section, planting to improve water quality and partial realignments.

The cross section would be developed to DoW guidelines to provide a bankfull channel catering for the 1.5 year flow and a wider floodplain facilitating the 100 year flow. Figure 8 shows the proposed living stream cross section.

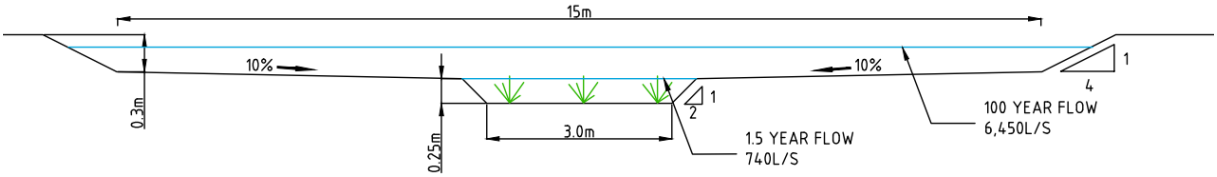



Figure 8. Proposed Living Stream Cross Section

### 7.1.2. Compensating Areas

An assessment of the existing culverts under the railway line indicates that these have been sized approximately for the 10 year event. Flows in excess of this capacity will cause flooding along the rail embankment and into the development area. Upgrading the culverts may not be feasible due to the disruption to the rail line and the increased flow through the culverts may create flooding issues downstream. As such it is suggested that compensating areas be constructed immediately prior to the culverts to control the extent of flooding. Figure 9 below shows the proposed compensating areas along with the realignment of the creek to form a living stream. The compensating areas have been calculated from a graphical hydrograph analysis and assume a 1m storage depth. The exact areas and volumes of these areas should be refined once a lot layout is confirmed.

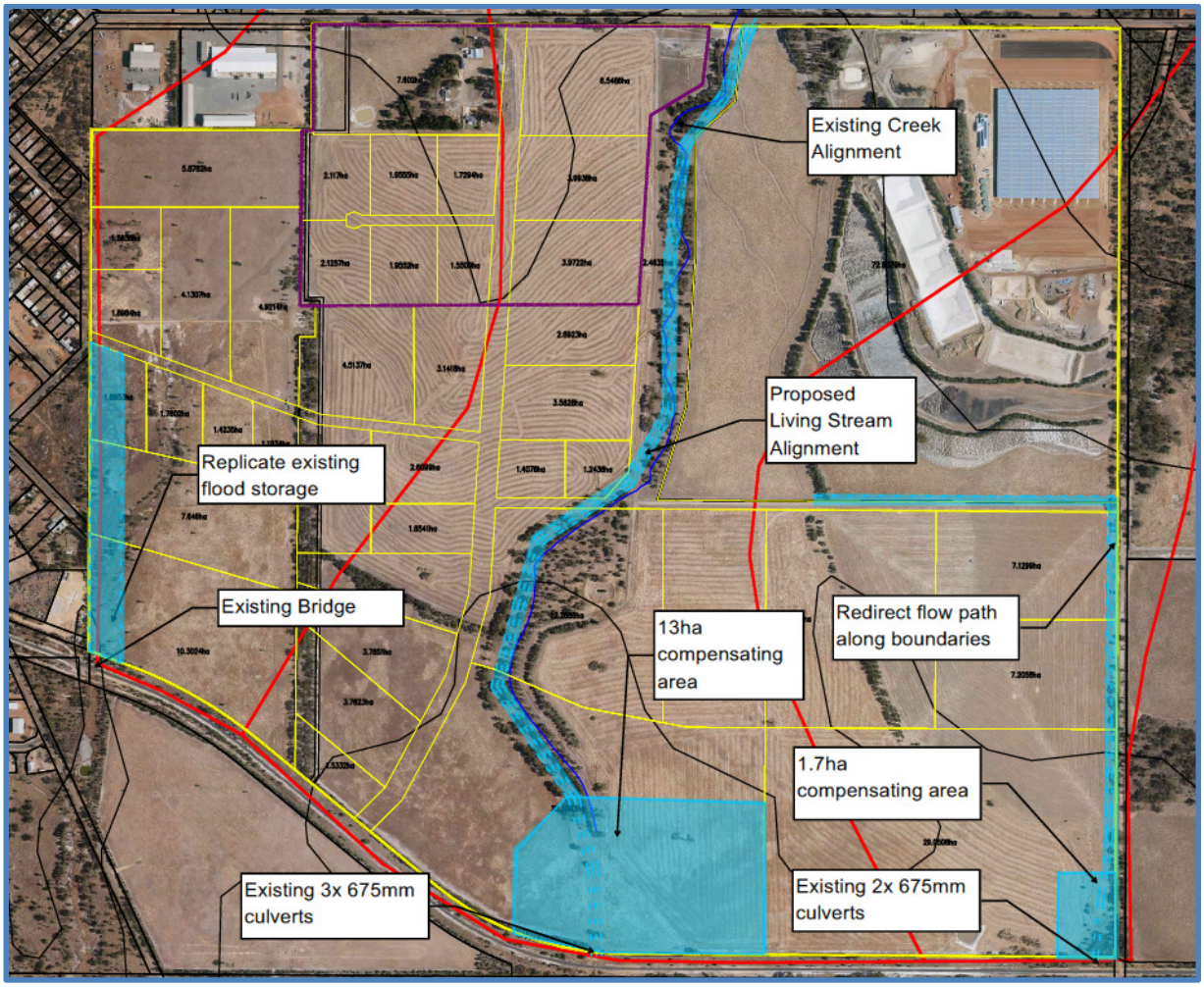



Figure 9. Post-development 100 year flood extents

## 7.2. Manage Serviceability

The results of the Katanning Flood Assessment (Opus, 2013) showed that Katanning Creek had a 10 year ARI design storm hydraulic design capacity however, the existing piped and overland stormwater system is less than this. This has resulted in localised flooding throughout Katanning.

Therefore a 10 year ARI design storm has been adopted for the design of proposed development which is typical for business, commercial and industrial areas and intensely developed residential areas. As the development is located within a rural setting it is proposed that roadside drains be installed to convey stormwater runoff from roads and lots with appropriate freeboard.

To improve the quality of stormwater the last sections of drains will be heavily vegetated to trap and filter pollutants (suspended solids and trace metals). The Department of Water stipulates that the area of vegetation within a drain must be greater than 2% of the connected impervious area.

Figure 10 below shows the proposed layout of the drainage network. The layout and sizes of the drains should be refined once a lot layout is confirmed.

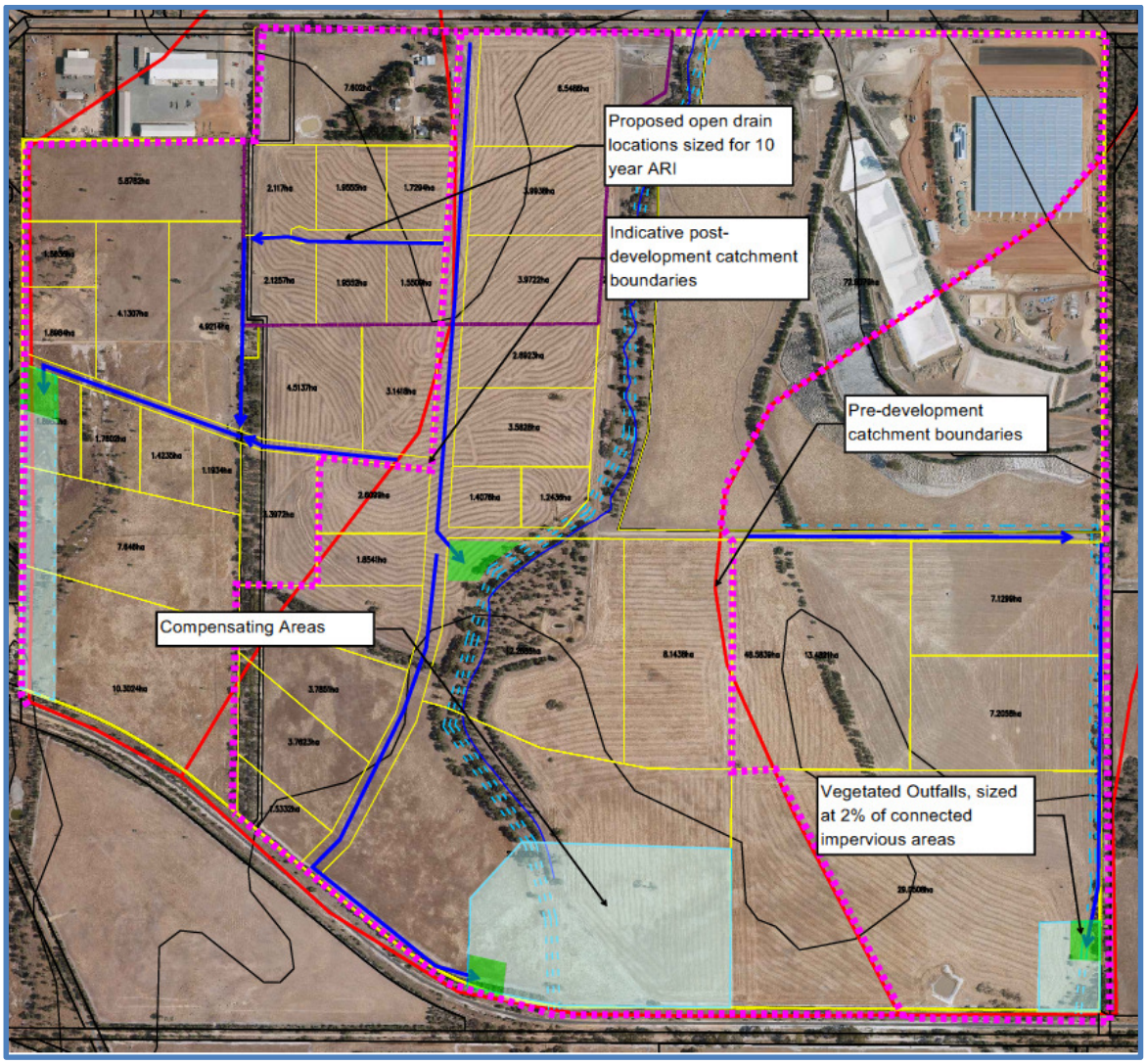



Figure 10. Drainage Concept Plan

## 7.3. Protect Ecology

To improve the quality of stormwater the last sections of drains will be heavily vegetated to trap and filter pollutants (suspended solids and trace metals). The Department of Water stipulates that the area of vegetation within a drain must be greater than 2% of the connected impervious area.

## 7.4. Lot scale drainage

To maintain pre-development flow rates and given the expected large areas of the future lots, the developer/owner of each Lot will need to provide stormwater storage that allows discharge at the predevelopment flow rate at the 1, 10 and 100 year storm events. It is suggested that this would consist of

designing and constructing a basin that discharges into the road drainage network through appropriately sized culverts, perforated pipes and overflow spillways. Basins will need to be lined with clay or similar, to prevent water infiltrating the ground and adding to the groundwater.

As discussed previously the developer/owner of each Lot will also need to provide water tanks for storage of 'grey water' and runoff from roof or hardstand areas for reuse on site for non-potable use. This would reduce the stormwater being directed to the basin however, as it is unknown how much potable and non-potable water each Lot will require, it has been assumed that all runoff will be directed to the basins for conservatism.

Indicatively, 200m$^3$ of storage would be required per ha of developed land, however this rate is approximate only and exact requirements should be confirmed with each development proposal.

## 7.5. Design Assumptions

### 7.5.1. Lot Use

The industrial activities are unknown and therefore the pervious and impervious proportions of each Lot are currently unknown.

In order to estimate the likely post development flows and approximate basin sizes required for each Lot it has been assumed that 70% of each Lot will be made up of buildings and hardstand areas.

Therefore it has been assumed that:

- 70% of area is impervious; and
- 30% of area is pervious.

### 7.5.2. Runoff Coefficients

Runoff coefficients for stormwater flow calculations are as below:

- Existing & Developed - pervious areas;
    - 1 year: 0.07
    - 10 year: 0.23
    - 100 year : 0.68
    - Lot tc: 30 mins
- Developed - impervious areas;
    - 1 year: 0.8
    - 10 year: 0.85
    - 100 year : 0.9
    - Lot tc: 10 mins

# 8. Groundwater Management Strategy

## 8.1. Proposed Development Area

The geotechnical investigation undertaken by Galt only found perched water within two test pit within the proposed development. All other test locations did not encounter groundwater within the 1.1-2.5m pit depth.

The geotechnical consultant has recommended that the following be undertaken to limit any impact of groundwater to the proposed development:

- Shape the surface of the site such so that run-off is directed away from buildings and does not pond adjacent to footings or pavements;
- Carry out excavations to the required level, making sure to grade the surface of clayey soils to a gradient of at least 1% downhill (so that runoff is directed away from building areas);
- Earthworks on this site be done in drier months of the year (November to April); and
- Area of any proposed building envelopes is built up with a pad of free draining compacted sand of at least 0.3 m thickness (subject to design of surface drainage). The existing ground surface will need to be first graded to promote drainage.

All basin and drains will need to be underlined with clay (or similar) to ensure stormwater runoff does not infiltrate the ground and raise the groundwater level.

## 8.2. Infiltration Trenches

The groundwater across Katanning has been causing water logging and salinity related issues to the environment and the built infrastructure for an extended period of time whilst the variety of historical groundwater pumping initiatives and study investigations have not been sustainably successful.

Due to the high groundwater table and salinity across Katanning, and the low hydraulic conductivity of the clay material, introducing desalination to treat the water to an appropriate level for its subsequent use as a non-potable water source is not economically viable.

Therefore it was recommended by Opus in the Katanning District Water Management Strategy that the groundwater is collected using low technology and low energy arrangements to lower the groundwater table rather than treat and reuse.

Opus recommended to allow the groundwater to flow downstream of Katanning under the effects of gravity (i.e., no annual operating costs to move/pump the groundwater), a network of shallow (<2m – 3m deep) infiltration trenches should be installed across Katanning.

Infiltration trenches have not been considered for this development area as water logging or high groundwater levels are not an issue for this particular area. In addition, lowering the groundwater in this area would likely have limited benefit to the town centre which is considerable distance from the subject site.

Notwithstanding this, infiltration trenches can be retrofitted into the proposed open drains and within the Lots in the future if required.

# 9. Urban Water Management Plans

The Urban Water Management Plan (UWMP) is mostly an extension of the work developed through District Water Management Strategy and LWMS stages and often requires further work to help define future requirements. The additional work includes;

- Groundwater quality monitoring at downstream points of each proposed Lot to develop trigger values and water quality improvement targets;
- Surface water quality monitoring at upstream and downstream sections of the Creek adjacent to the proposed development to develop trigger values and water quality improvement targets;
- Determination of post development monitoring points for groundwater and surface water quality and quantity;
- Determination of stormwater systems and management plans for each individual Lot;
- Detailed geotechnical investigation across building/construction footprints;
- Application for any groundwater extraction licences; and
- A dewatering management plan as required.

# 10. Monitoring

A monitoring program has been produced, as per Table 2, to allow quantitative assessment of hydrological impacts of proposed development within the area. In particular the program addresses the monitoring of surface water quality, and seasonal fluctuation of groundwater levels and quality within the development area. The program may need to be modified as data is collected to increase or decrease the monitoring effort in a particular area or to alter the scope of the program itself. Any modification to the program would require the agreement of all parties (Department of Water, Shire of Katanning and the developer). The program is designed to operate over a three year post-development period (After completion of 80% of the lots) including throughout construction to allow for time lag for full impacts of development on the receiving environment to occur.

Table 2. Monitoring Schedule

| Monitoring Type | Parameter | Method | Frequency | Reporting |
|---|---|---|---|---|
| Groundwater Quality | pH, Electrical Conductivity, Iron, Nitrogen, Phosphorus, major Cation and Anions | Pumped Bore Sample | Quarterly for 2 years pre-development and 3 years post-development (typically Jan, Apr, Jul and Oct). | Annual assessment reports to be submitted to Department of Water & Shire of Katanning for 3 years post-development.<br><br>Suitability of existing monitoring and reporting frequencies to be assessed annually with any modifications requiring agreement by all parties (Department of Water, Shire of Katanning, & Developer) |
| Surface Water Quality | pH, Electrical Conductivity, Total Suspended Solids, Iron, Nitrogen, Phosphorus, major Cation and Anions | Surface Collection (primarily within the proposed living stream) | Monthly sampling when flowing, typically June to October for 5 years. Frequency to be reviewed following initial 12 month sampling period. | |
| Vegetation | Number of Dead Plants and Weeds | Visual Inspections | 3 years post-development | |
| Erosion | Signs of Erosion | Visual Inspections | 3 years post-development | |

# 11. Implementation

Roles and responsibilities for the proposed light industrial development are detailed in Table 3.

Table 3. Table of Responsibility

| Item | Development | Interim Maintenance (first three years) | Long-term Maintenance |
|---|---|---|---|
| Landscaping (within Road Reserve) | Developer | Developer | Council |
| Landscaping (within Lots) | Lot Developer | Lot Developer | Lot Developer |
| Swales and Drainage (within Road Reserve) | Developer | Developer | Council |
| Swales and Drainage (within Lots) | Lot Developer | Lot Developer | Lot Developer |
| Monitoring the Development | Developer | Developer | Council |
| Public Open Space Landscaping | Developer | Developer | Council |
| Rainwater Tanks | Lot Developer | Lot Developer | Lot Developer |

# Figures

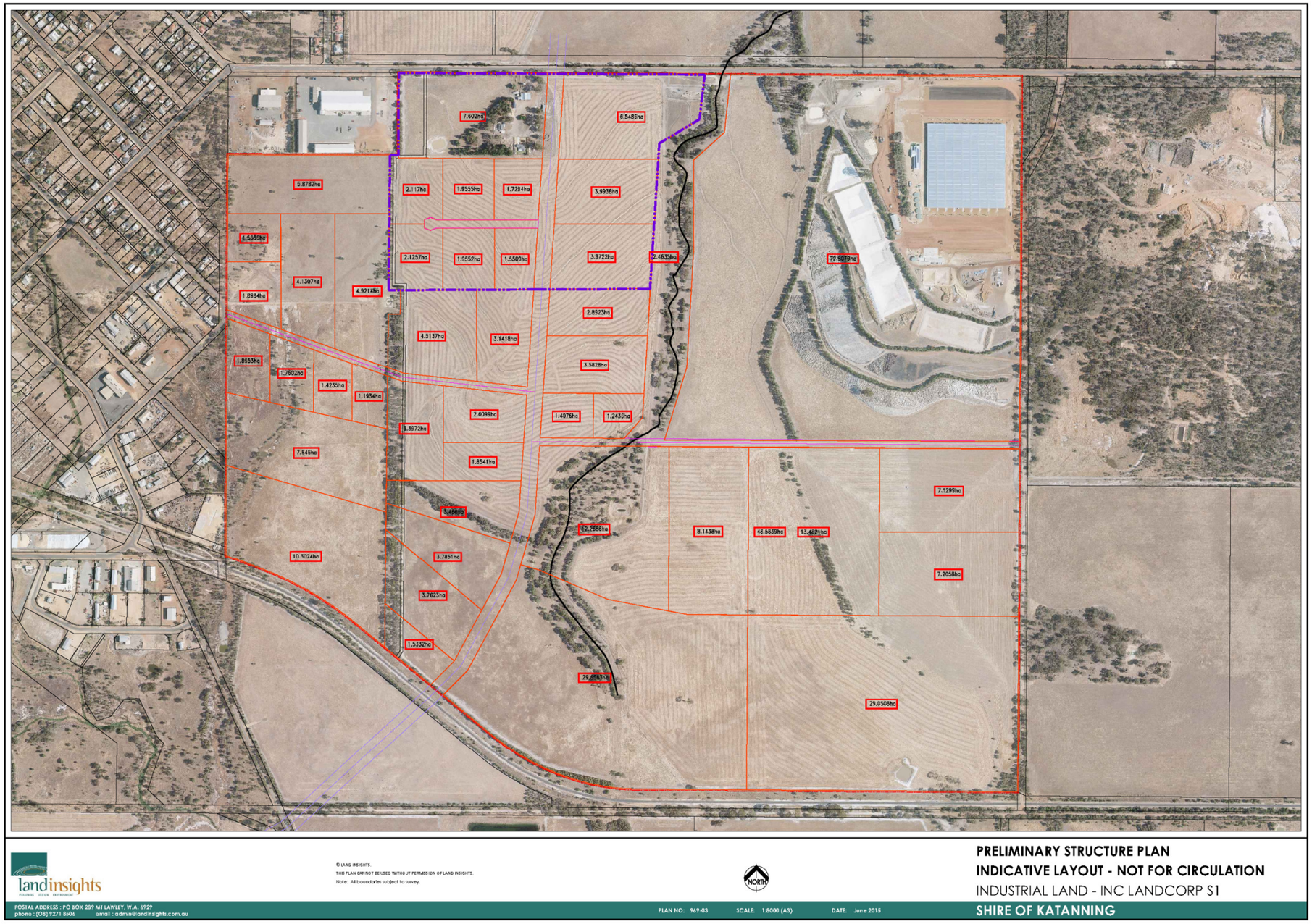



Figure 11. Preliminary Structure Plan

# APPENDIX 3
# Bushfire Hazard Assessment

# BUSHFIRE HAZARD ASSESSMENT

## KATANNING

**PROJECT NO: 14129**
**DATE: JULY 2014**

# Document Control Record

| | |
|---|---|
| **Site Details** | katanning |
| **Prepared By** | **Bushfire Prone Planning (BPP Pty Ltd)**<br>ABN: 39 166 551 784<br><br>M: 0438 946 285<br>Email: enquiries@bushfireprone.com.au |
| **Prepared For** | landinsight |
| **Reference** | 1488 |
| **Document Status and Date** | |

*Disclaimer: The measures contained in this Hazard assessment are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bush fire. All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to Bushfire Prone Planning at the time; and achievement of the level of implementation of fire precautions will depend among other things on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control. Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of the consultants, their servants or agents) arising out of the services provided by the consultants.*

Purpose of Report

*The Western Australian Planning for Bushfire Protection Guidelines Edition 2* and the Australian Standard, *AS 3959:2009 Construction of buildings in bushfire prone areas (AS 3959:2009)* are the guiding reference documents in Western Australia for subdivision and related development for rural and rural /urban interface to minimise the impact of fire on communities. In October 2014, the sites were assessed and the subsequent report and associated maps have been prepared as a strategic hazard assessment for consideration of the development of the Shire of Katanning Structure Plan.

The following Bushfire assessment maps accompany this report:

1. Bushfire Hazard Assessment- strategic
    - Piesse Park
    - OCallaghan
    - Wammco
    - Industrial Land
2. Classified Vegetation and Bushfire Attack Level Buffering – strategic
    - Piesse Park

## 1. Hazard Assessment

The map shows a broad brush assessment intended to be used at the strategic level planning stage to identify the suitability of an area for additional development and to determine if the area is bushfire prone.

The methodology classifies the bushfire hazard by assessing the predominant vegetation, this is the key to the initial determination of the site suitability for subdivision/development. If deemed suitable, the potential level of construction standard is determined by the application of *AS 3959:2009 Construction of buildings in bushfire prone areas* (AS 3959:2009). The methodology for the Hazard Assessment specifies three bush hazard levels as per the *Western Australian Planning for Bushfire Protection Guidelines Edition 2*:

- Low
- Moderate
- Extreme

This analysis forms the basis for land use and planning. Additional considerations may be required, for example increasing construction standards of homes and other performance criteria to reduce the impact of bushfire to an acceptable level.

Piesse Park

Piesse Park is a recreational park located north of the town centre and is predominately surrounded by residential lots. A bushfire Hazard Assessment was carried out and the Bushfire Hazard rating on the existing vegetation within the subject site was a combination of Low and Moderate (Refer Figure xx).

Note: The vegetation mapped at the moderate level within the subject site is low threat vegetation and can be excluded when defining Bushfire attack Levels (BAL) , as classified vegetation as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "maintained public reserves and parklands".

External to Piesse Park, the Bushfire Hazard is a combination of Low and Moderate. The vegetation within the waterway located to the north east of Piesse Park is rated as moderate (Refer Figure xx). All other areas 100 metres from Piesse Park boundary is rated as Low. The moderate area identified, at the BAL stage can be managed to achieve a low threat vegetation classification as defined in AS 3959: 2009 Section *2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas* "nature strip".

WAMMCO

The WAMMCO site is a rural site located north east of the townsite and is bordered by residential properties to the south and south east, a combination of bushland and small land holdings to the east, rural land holding to the west and bushland to the north and the northern half of the eastern boundary. A bushfire Hazard assessment was carried out and the Bushfire Hazard rating on the existing vegetation within the subject site was a combination of Low and Moderate with a small percentage as extreme to the north (Refer Figure xx).

External to the WAMMCO site, the Bushfire Hazard is a combination of Low Moderate and Extreme. The threat external to the subject site is predominately Low and Moderate.

Industrial Land

The Industrial Land is predominately a rural site located east of the town site. Commercial sale yards are located in the north eastern section of the subject area. The western boundary is adjoining industrial and residential properties, the southern and northern adjoins rural farmland and the north boundary adjoins rural farmland and the towns refuse site. The refuse site is buffered by bushland. The Bushfire Hazard rating on the existing vegetation within the subject site is a combination of Low and Moderate and the external area is Low and Moderate (Refer Figure xx).

O'Callaghan Park

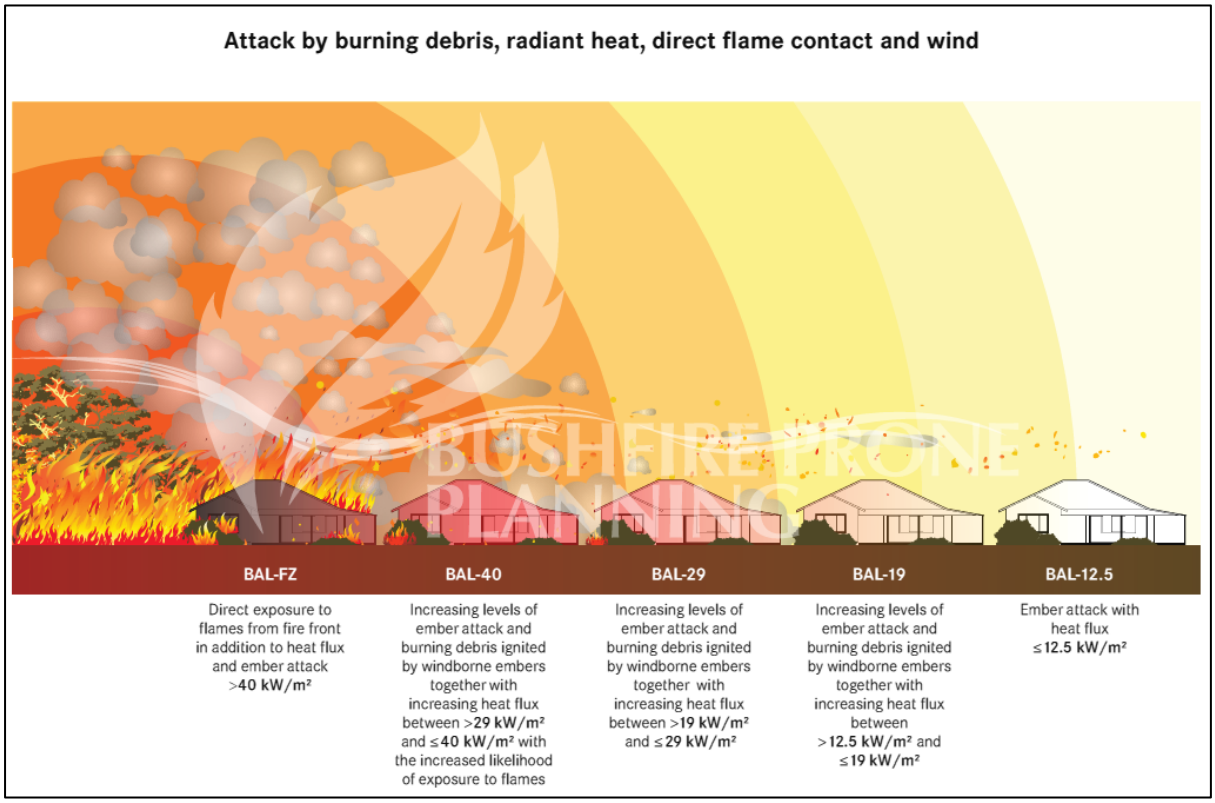
O'Callaghan Park is predominately bushland and part of this land is used as a training track for hoses. The Park is adjoined by small land holdings on all sides. The Bushfire Hazard rating on the vegetation within the subject site is a combination of Low, Moderate and extreme and the external area is rated as Low, Moderate and Extreme (Refer Figure xx).

## 2. Classified Vegetation and Bushfire Attack Level Buffering – strategic

The Bushfire Attack Levels detailed on the following maps complies with AS 3959:2009 requirements and rates bushfire attack using a combination of vegetation type, slope and distance from the predominant Classified Vegetation. In Western Australia it assumes a Forest Fire Danger Index (FFDI) of 80. The BAL assessment involves the following process in accordance with the AS 3959:2009 (Method 1);

- Determination of the area to be assessed
- Identification of vegetation type and class
- Determination of distance of the site from classified vegetation
- Determination of average slope (under the classified vegetation)
- Determination of a BAL
- Determination of construction standards

AS 3959:2009 has six categories of BAL. These categories are based on heat flux exposure thresholds and are summarised in the following Table.




As the distance from the Classified Vegetation is reduced, the construction standard for dwellings must be increased as detailed in Table xx

Table xx

| Classified Vegetation | BAL-12.5 | BAL-19 | BAL-29 | BAL-40 | BAL-FZ |
|---|---|---|---|---|---|
| Distance in metres from Classified Vegetation assuming 0 degrees (flat land) | | | | | |
| **Woodland** | 29-<100 | 20-<29 | 14-<20 | 10-<14 | <16 |

Piesse Park

Piesse Park is a recreational ground and has areas that are parkland cleared and areas that have been revegetated. The vegetation within the subject site is managed and meets the requirements under AS 3959: 2009, Section 2.2.3.2 (f) Exclusions – Low threat vegetation and non-vegetated areas “maintained public reserves and parklands”. To the north west of Piesse Park is an area of vegetation, classified as woodland. The mapping shows BAL levels

as buffers and has used woodland as the classified vegetation and assumed 0 degrees as slope. The north western section of Piesse Park has been identified as having a BAL 12.5 and BAL 19 area. (Refer Figure xx). The area identified as BAL 12.5 and BAL 19 can be excluded if the identified vegetation to the north west is managed.

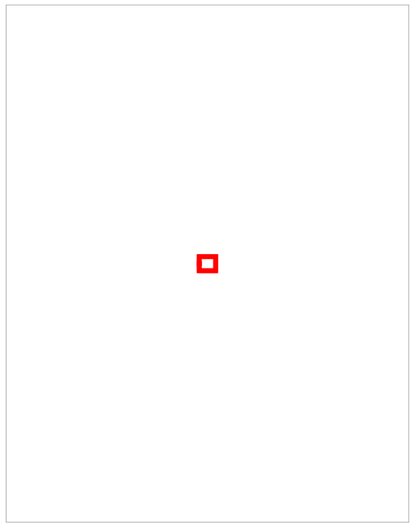
***Figure 2.***
**Bushfire Hazard Mapping**

Industrial Land,
Katanning

**LEGEND**

- Industrial land
- Low Bushfire Hazard
- Moderate Bushfire Hazard
- Extreme Bushfire Hazard

**LOCALITY**



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BUSHFIRE PRONE PLANNING

June 2014

Date: 16/09/2014

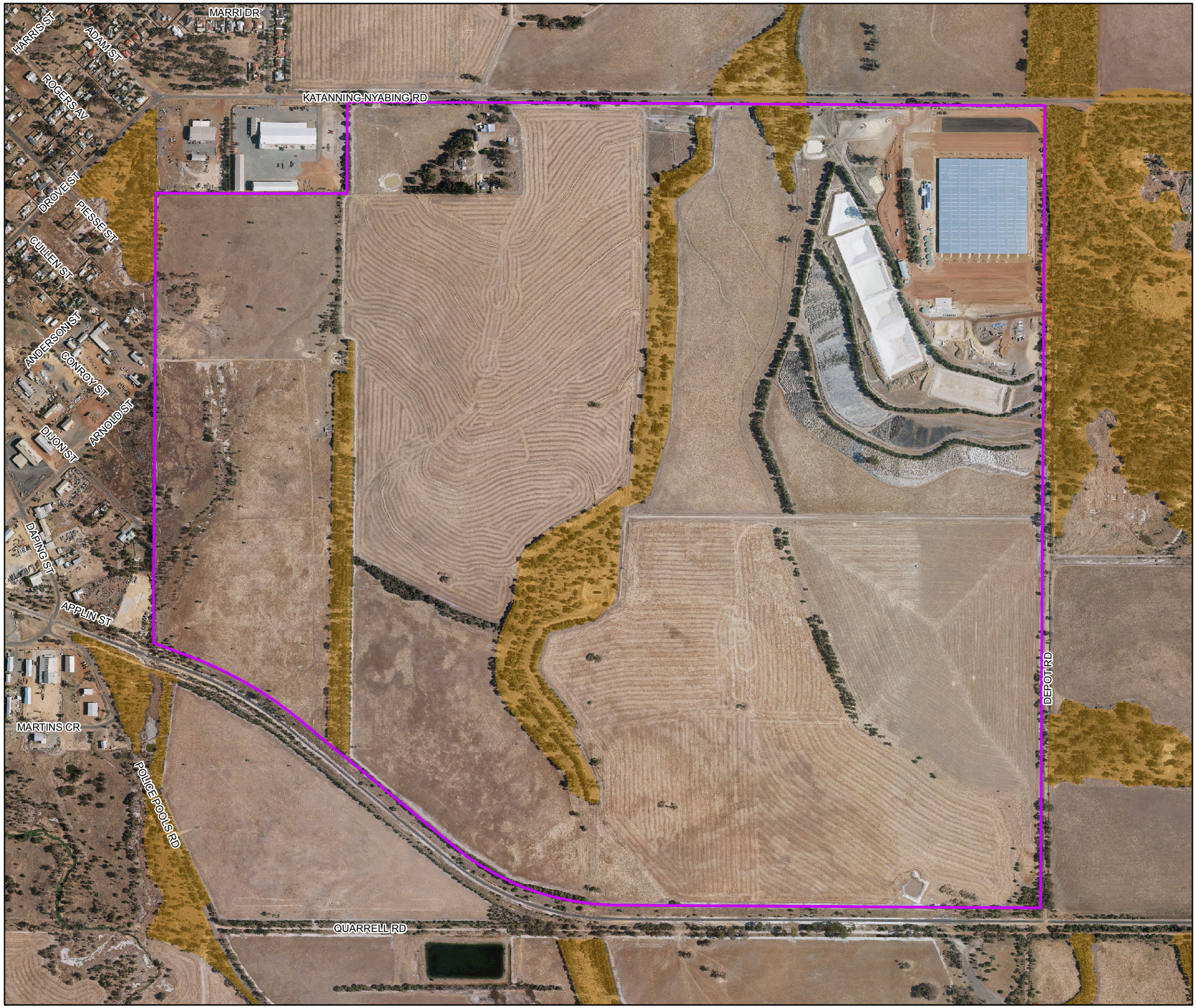


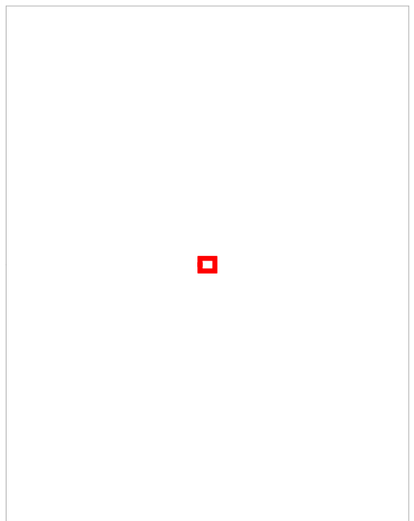
***Figure 2.***
**Classified Vegetation**

Industrial Land,
Katanning

**LEGEND**

- Industrial land
- Classified vegetation
- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5

**LOCALITY**



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BUSHFIRE PRONE PLANNING

June 2014

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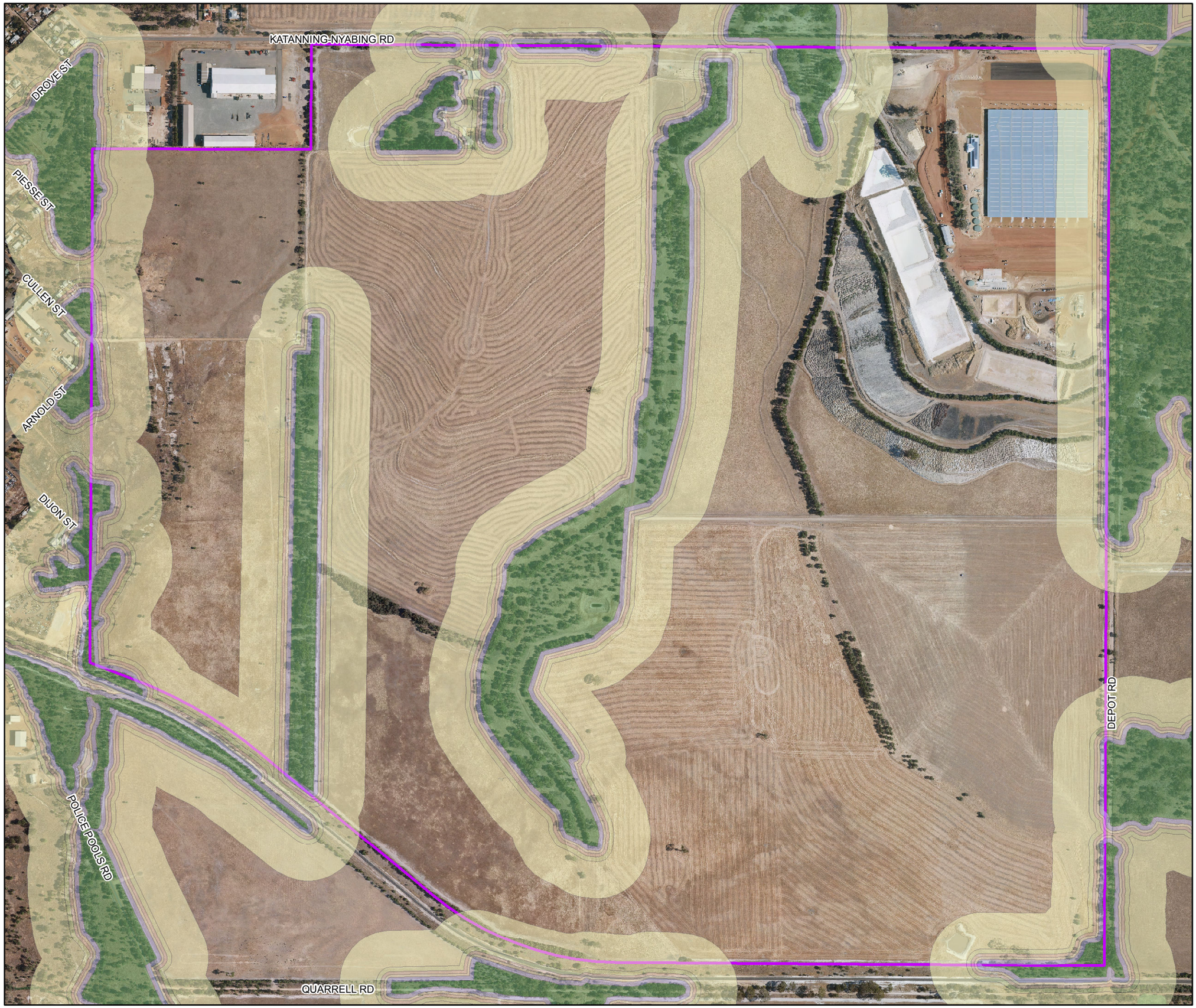

# APPENDIX 4
# Transport Assessment

SHAWMAC

CONSULTING CIVIL & TRAFFIC ENGINEERS, RISK MANAGERS.

| | |
|---|---|
| Project: | Transport Assessment, lots 500, 501 and 3, Preliminary Structure Plan, Shire of Katanning. V1 |
| Client: | Landinsights |
| Author: | S Millen |
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| Date: | October 2015 |

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# 1 Summary

Landinsights has prepared a Preliminary Structure Plan (PSP) for lots 500, 501 and 3 (site) which is bound by Katanning Nyabing Road in the north, Depot Road to the east, the Katanning Townsite to the west and a railway line to the south. The site is situated to the east of the Katanning Townsite approximately 2.0 km from the town centre.

The land at the site is principally undeveloped agricultural land. The adjoining properties to the north of the site are used for commercial purposes and livestock saleyards are located in the north-eastern corner.

Katanning Nyabing Road forms the northern boundary to the site and provides the main connection to the Central Business District (CBD) of Katanning.

The trip volumes per day are generated based on the land use type and have been derived from the ITE Guide, thus the predicted flows generated within the site are predicted to be 3,763 vpd.

On the basis of the assessment undertaken, it is concluded that the proposed street network will need to be reviewed to ensure all lots are serviced via the internal road network. The modeled network predicts that the traffic volumes on individual streets are at acceptable threshold levels and that connections to the existing footpath network located within the Katanning Townsite are required.

# 2 Introduction and Background

Landinsights has prepared a Preliminary Structure Plan (PSP) for lots 500, 501 and 3 (site) which is bound by Katanning Nyabing Road in the north, Depot Road to the east, the Katanning Townsite to the west and a railway line to the south. The site is situated to the east of the Katanning Townsite approximately 2.0 km from the town centre. As part of the preparation of the PSP, the planners for the project (Landinsights) commissioned Shawmac to prepare a Transport Assessment for the site.

The intent of this transport assessment is to clearly demonstrate to the approving authority that the PSP would:

- provide safe and efficient access for all modes;
- be well integrated with the surrounding land uses;
- not adversely impact on the surrounding area; and
- not adversely impact on the surrounding transport networks and the users of those networks.

This version of the Transport Assessment has been prepared for review by the Shire of Katanning.

## 2.1 Locality Plan

The location of the site is shown on **Figure 1** and the PSP is shown Appendix B.

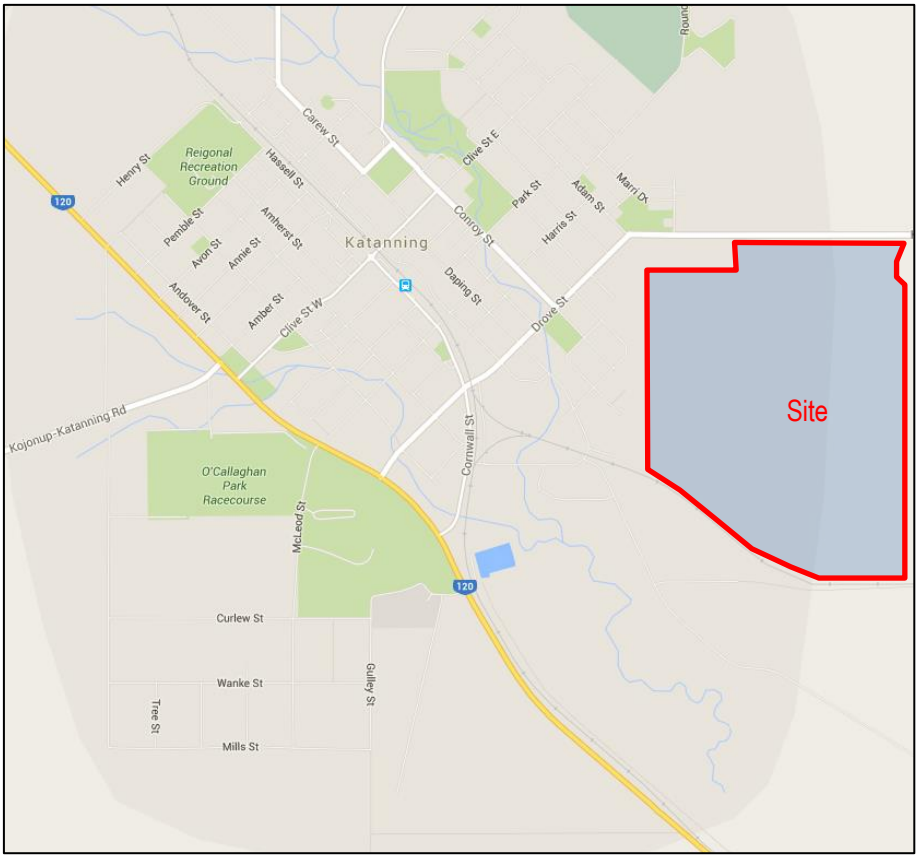



**Figure 1: Locality Plan**

An extract of the PSP is shown on **Figure 2**.

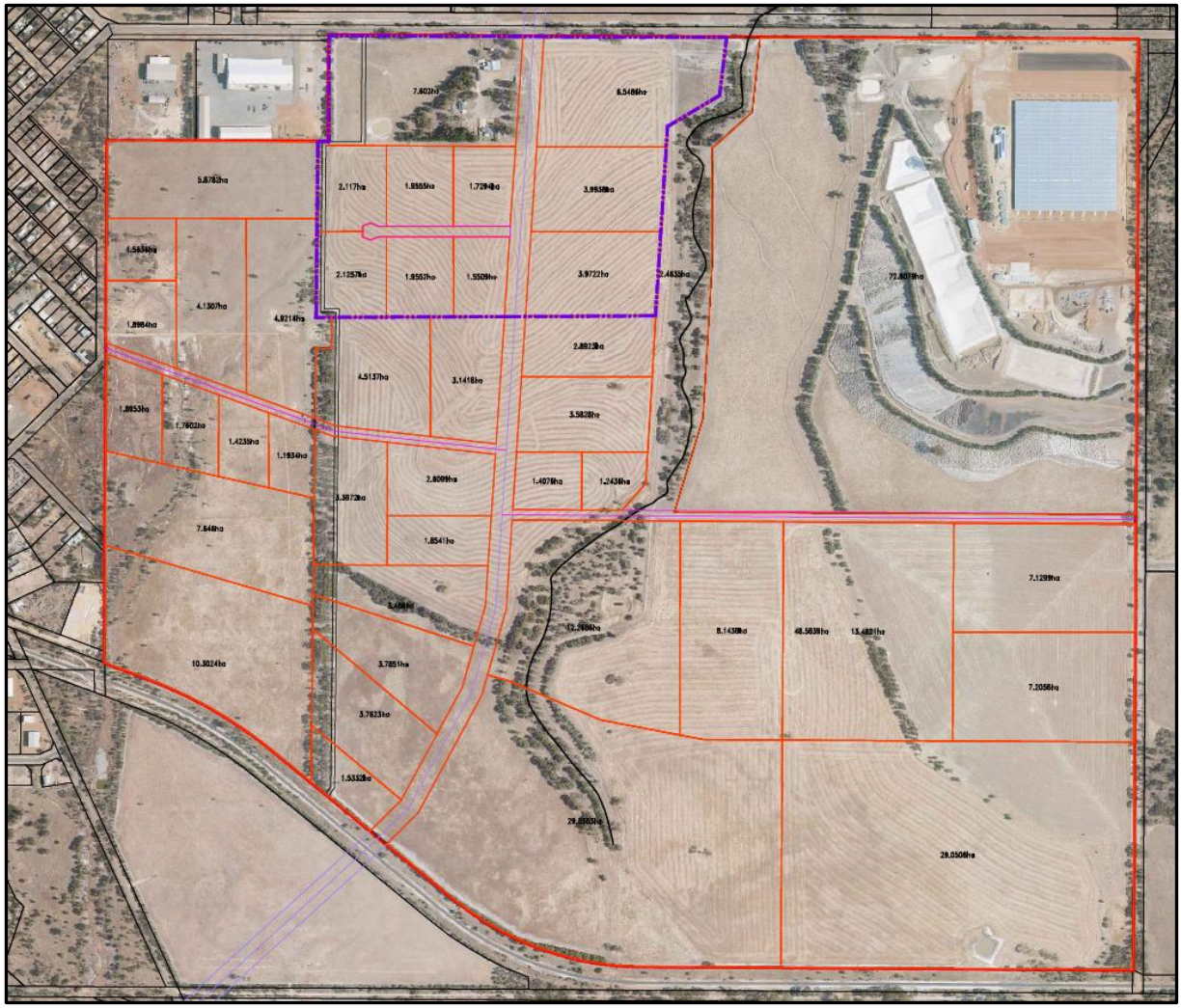


**Figure 2: Extract of Preliminary Structure Plan (PSP)**

Existing uses include:

- Agriculture;
- Vacant Land;

Changes of use include:

- Industrial;
- Public Open Space;

## 2.2 Subdivision proposal

### 2.2.1 Regional context

The site is currently zoned "Rural" under the Shire of Katanning Local Planning Scheme (LPS) No. 4. An extract from the planning scheme is shown below in **Figure 3** and **Figure 4**.

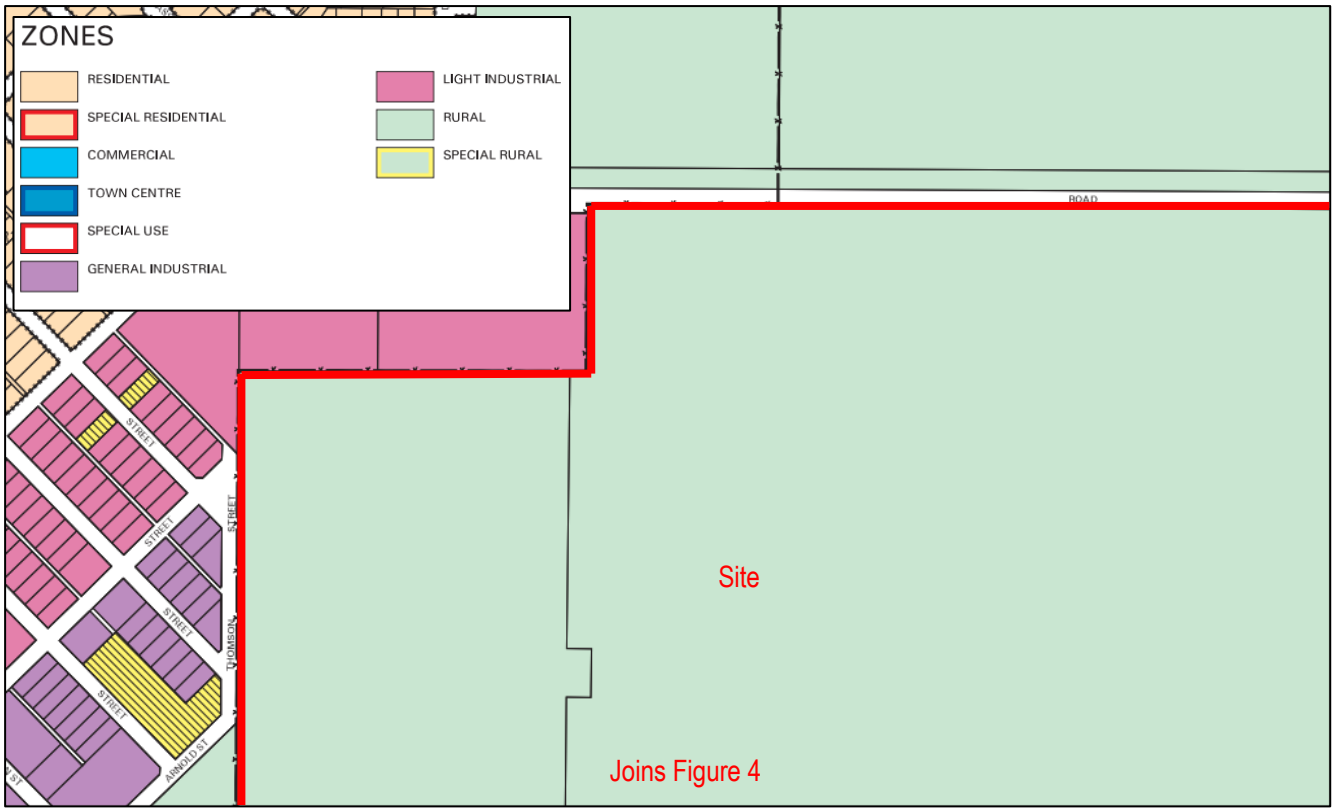



**Figure 3: Site Zoning Extract of LPS 4**

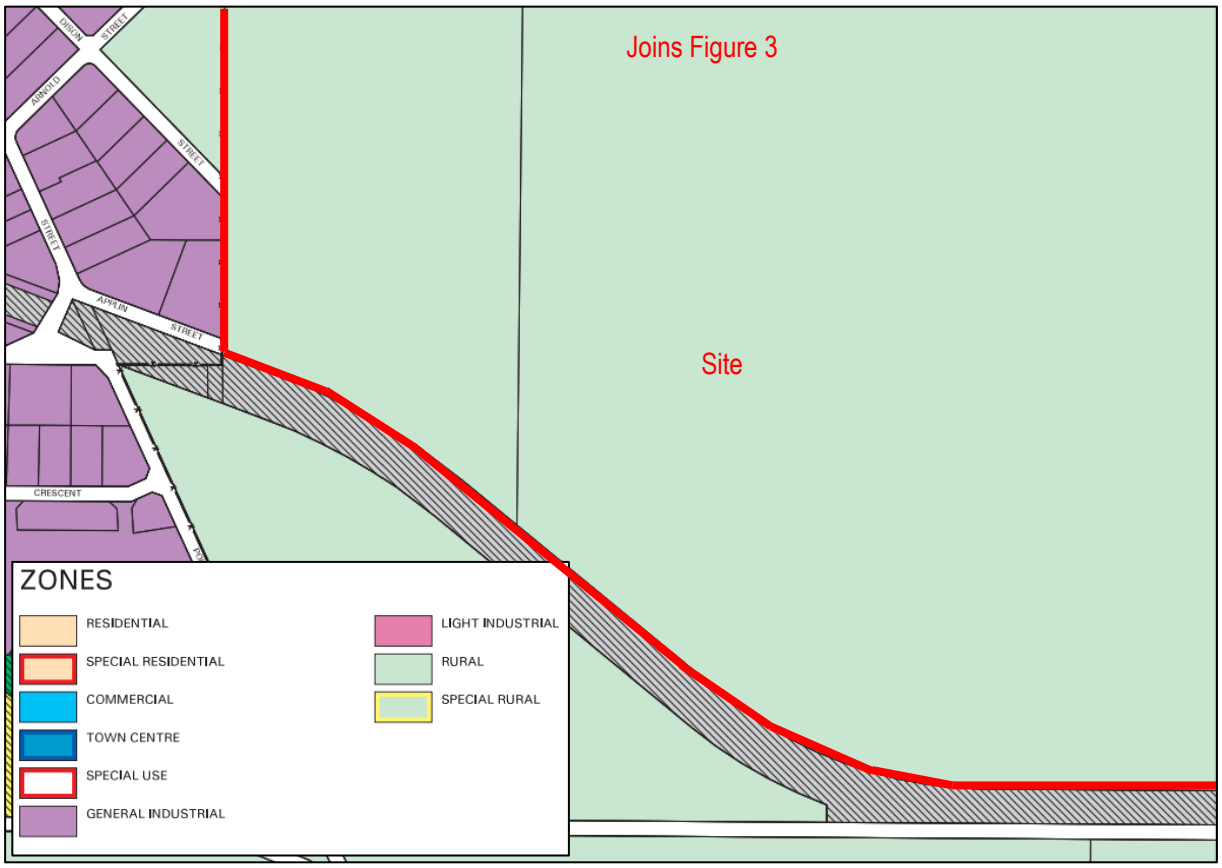



**Figure 4: Site Zoning Extract of LPS 4**

Proposed land use has been estimated from the PSP and is summarised in **Table 1**.

| Land Use | Quantum (ha) |
|---|---|
| Industrial Lots 500, 501 and 3 | 293.1 |
| Public Open Space / Drainage | 2.4 |

**Table 1: Proposed Land Use**

# 3 Existing situation

## 3.1 Land Use

The land at the site is principally undeveloped agricultural land. The adjoining properties to the north of the site are used for commercial purposes and livestock saleyards are located in the north-eastern corner of the site **Figure 5** shows the existing situation.

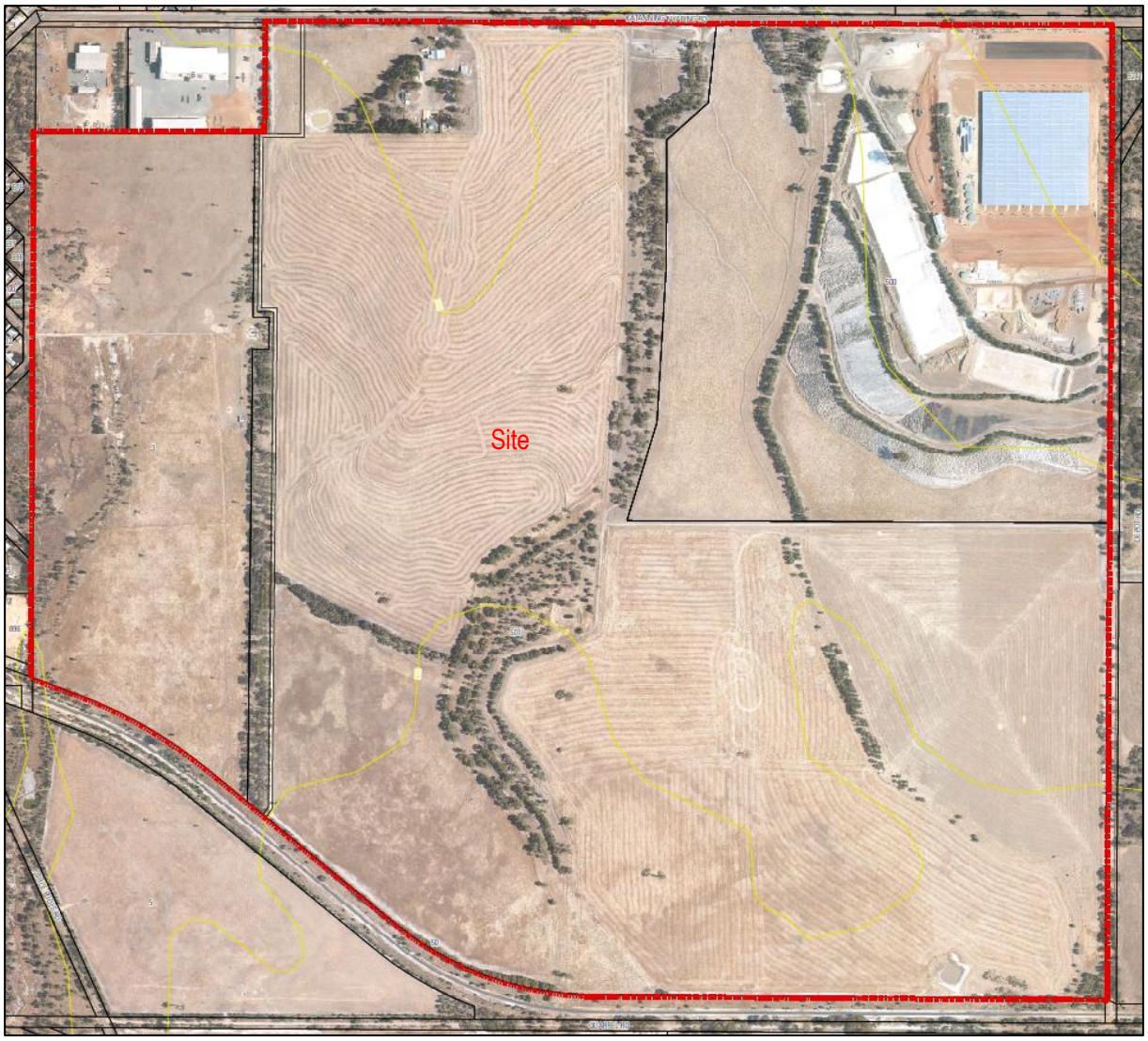



**Figure 5: Existing Site (Landinsights)**

## 3.2 Existing Road Network

**Katanning Nyabing Road**

Katanning Nyabing Road forms the northern boundary to the site and provides the main connection to the Central Business District (CBD) of Katanning. Katanning Nyabing Road is classified a Primary Distributor under the MRWA regional hierarchy and has a posted speed limit of 60km/hr and then 110 km/hr adjacent to the site. Katanning Nyabing Road is described as a single carriageway with 3.5m wide sealed carriageways and gravel shoulders. The road drains to a shallow verge swale.

Katanning Nyabing Road has a category 7 Restricted Access Vehicle (RAV) rating.

**Depot Road**

Depot Road is classified as an Access Road under the MRWA regional road hierarchy and at the site is described as an unsealed single carriageway road with 3m wide lanes and gravel shoulders. Depot Road provides access to the Katanning Townsite rubbish tip.

Figure 6 shows the Regional Hierarchy and Figure 7 shows the current Restricted Access Vehicle (RAV) status of the surround road network.

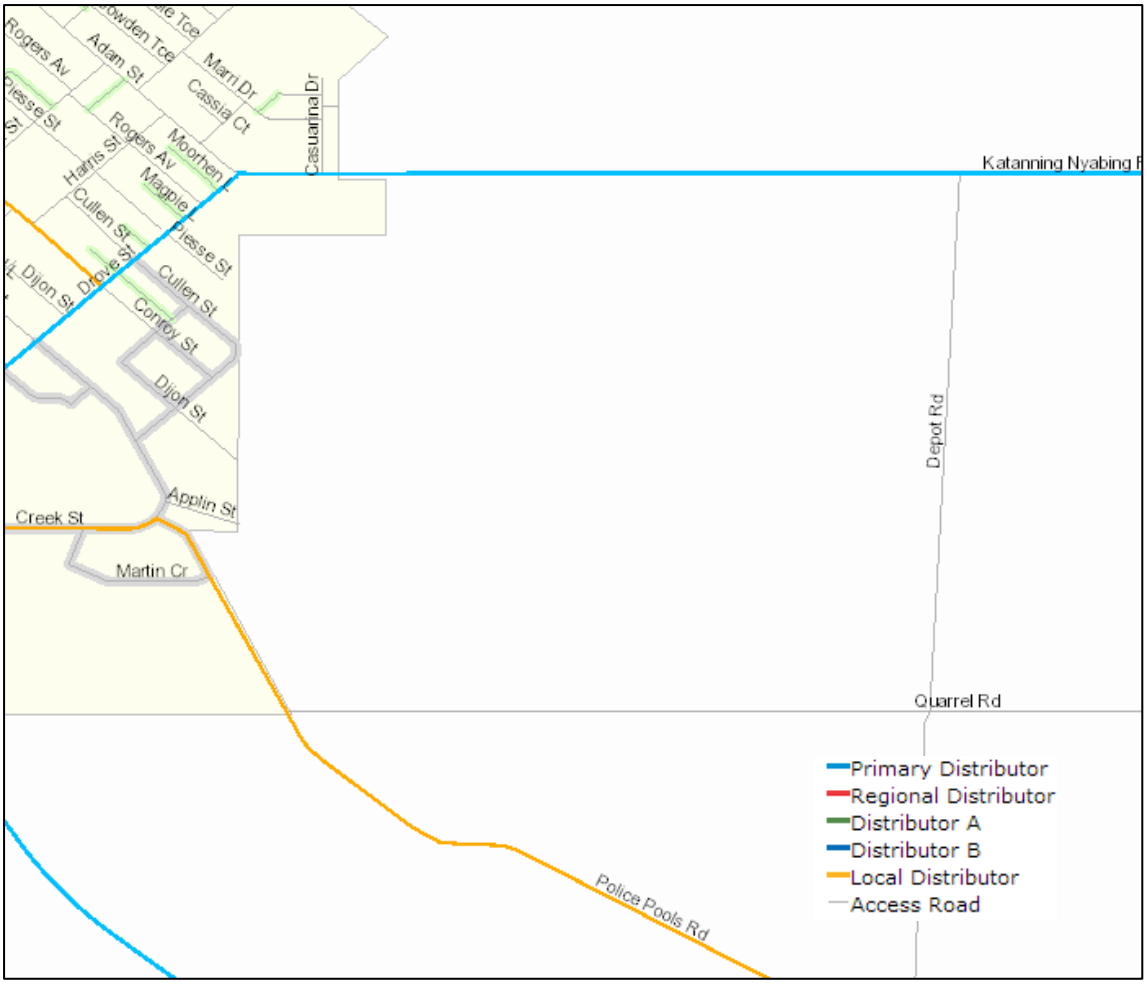



**Figure 6: Regional Road Hierarchy**

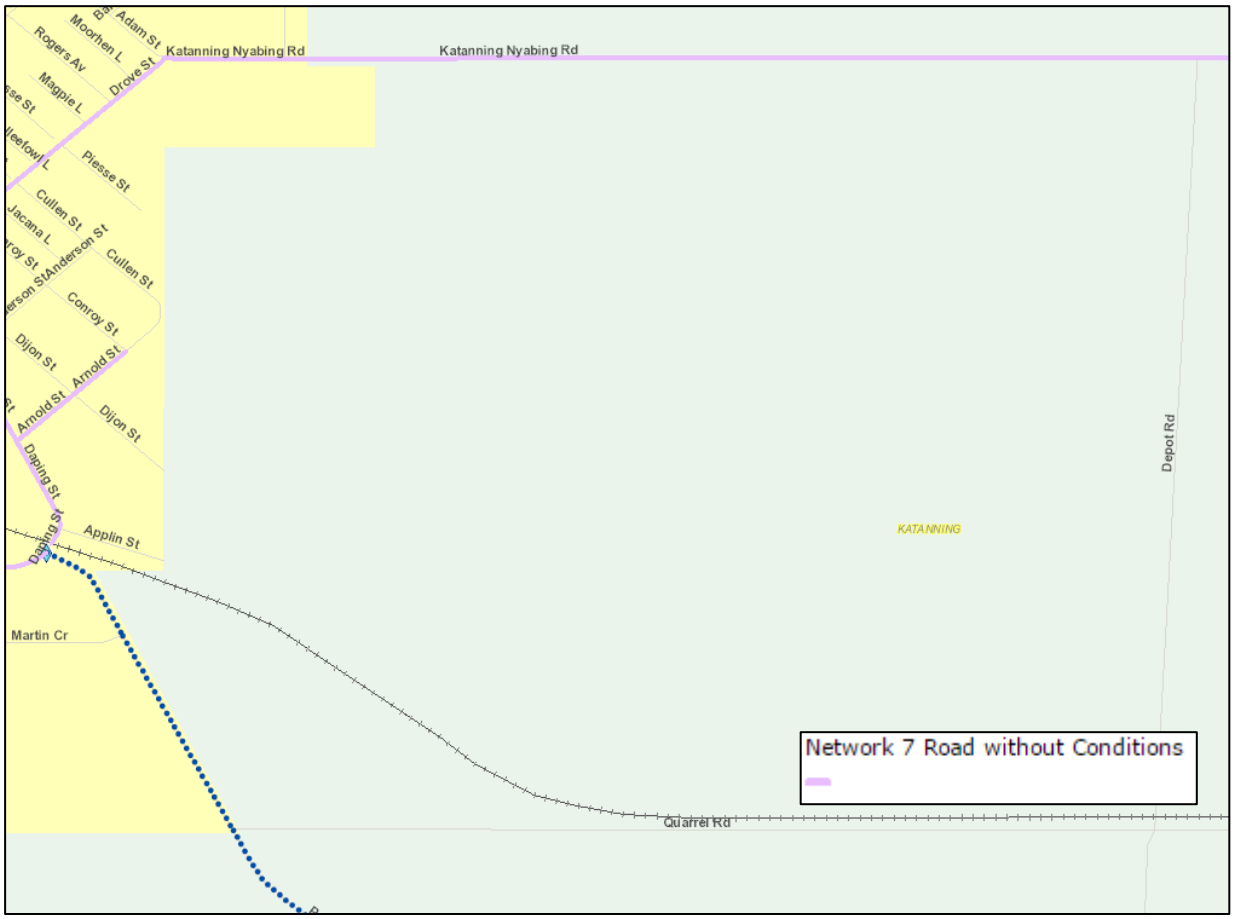



**Figure 7: RAV Network Adjacent to the Site (Source MRWA website)**

# 4 Proposed internal transport networks

**Figure 8** below indicates the proposed internal transport routes and has been developed from predicted flows.

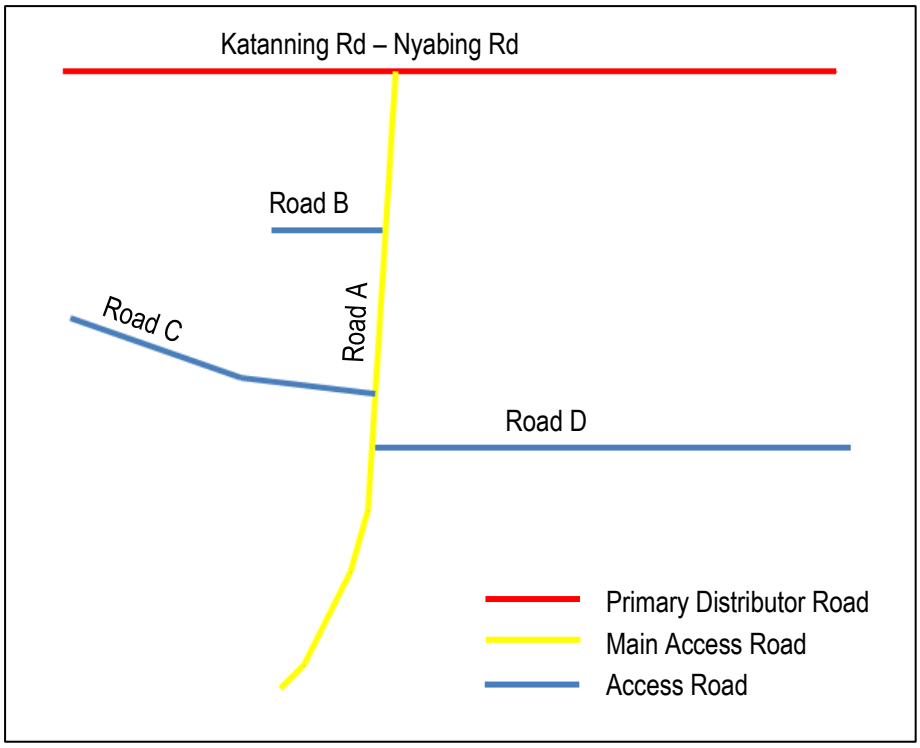



**Figure 8: Proposed Internal Road Network**

# 5 Changes to external transport networks

There are no known changes to the external road network in the immediate vicinity of the site.

# 6 Integration with surrounding area

## 6.1 Major attractors and generators

Major attractors and generators are shown on **Figure 9**.

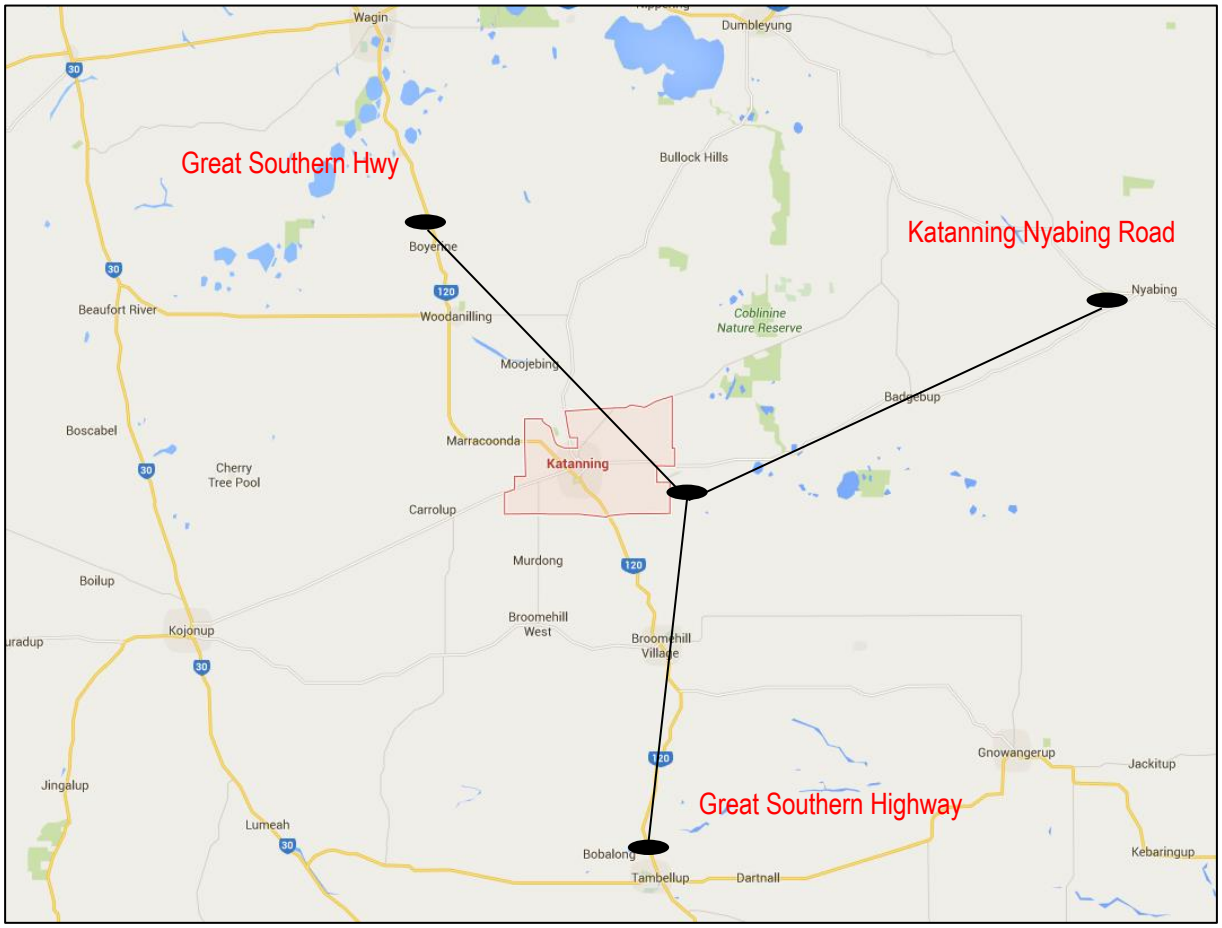



**Figure 9: Attractors and Generators**

Key attractors are likely to be:

- Smaller Townsites located along Great Southern Highway (within a 50 km radius);
- Surrounding Agricultural farms;
- Residential and commercial areas within the Katanning Townsite.

## 6.2 Main desire lines

Main desire lines are identified in section 6.1 with an assumed split shown on **Figure 10**. The connection to the Townsite via Arnold Street has not been considered given the anticipated number of heavy vehicles that will use the site.

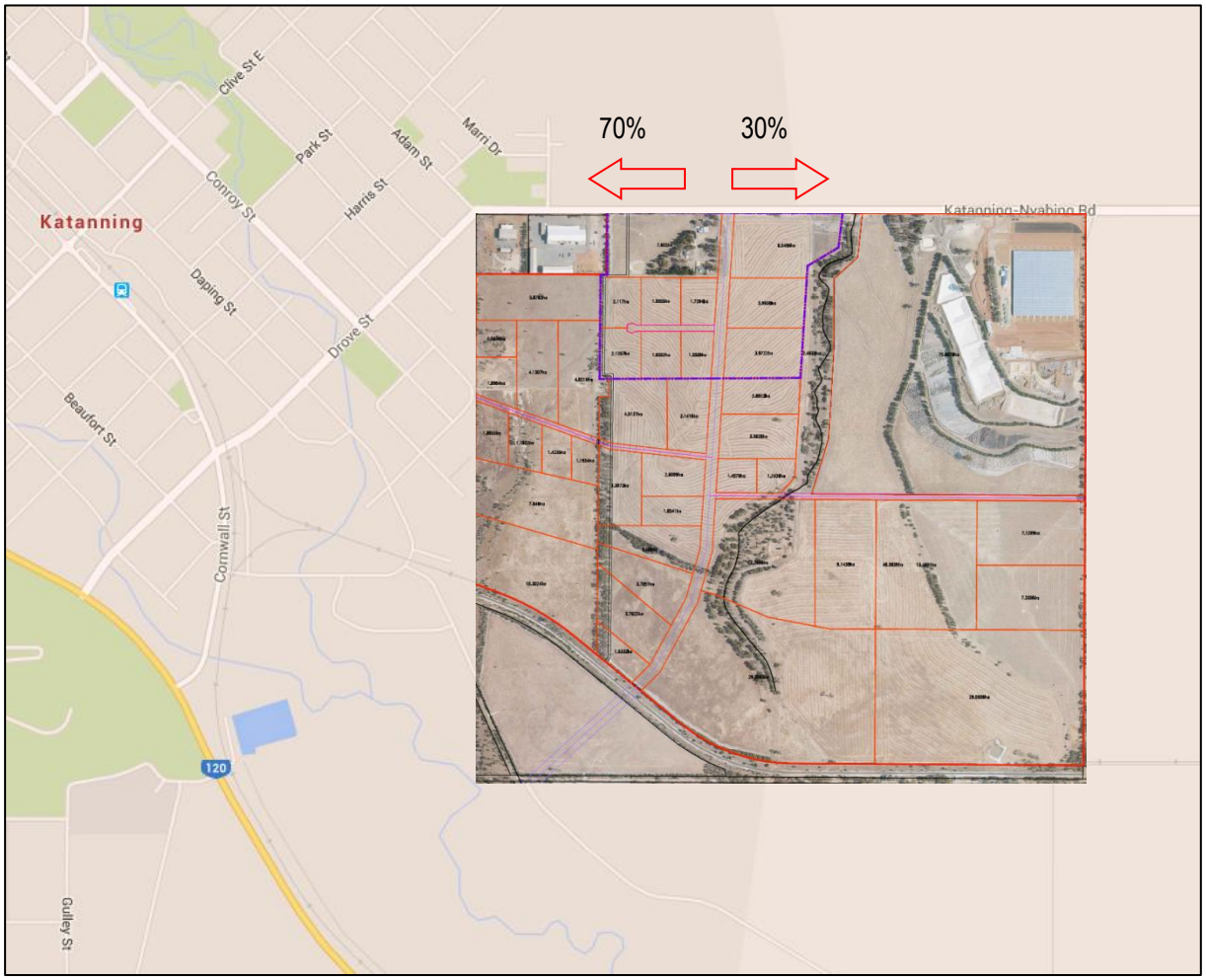



**Figure 10: Assumed Traffic Split**

## 6.3 Gap analysis.

An assessment was carried out to determine whether or not the existing transport networks, plus any proposed changes, would adequately match predicted desire lines. It is assumed that all lots will be serviced via the internal roads within the site, however there is no road frontage for those lots south east and west of the site. The road network will need to be modified to ensure all lots can be serviced by the internal road network.

# 7 Analysis of transport networks

## 7.1 Introduction

Section 2 of the assessment provides a description and an inventory of the proposal and surrounding area with respect to land uses and transport networks. The following sections provide a more detailed quantitative analysis of the proposed internal and external transport networks to demonstrate that they will provide a high level of accessibility and safety for all modes.

## 7.2 Assessment years

Assessment is based on the full development of the site and is taken as being 2015.

## 7.3 Time periods for assessment

The assessment is based on analysis of expected peak traffic flows for the site.

# 8 TRAFFIC GENERATION

In order to assess the potential traffic impacts associated within the site, a traffic generation and distribution exercise was undertaken. The trip generation was based on surveys undertaken for General Light Industrial which are characterised by a mix of industrial activities including printing, material testing, assembly and data processing equipment. The surveys target sites that typically contain diversified facilities with a mixture of light and heavy industrial manufacturing.

In this instance trip generation rates at the lower end of rate range will be used given the low number of lots and that the site is located within the wheatbelt near Katanning which is a small country town. Typically higher generation rates would only be used at industrial parks that are located within large population hubs such as those within city areas.

## 1.1. Predicted Daily Traffic Volumes

The predicted daily traffic volume generated by the site was estimated based on recognised land use traffic generation databases as follows:

- Trip Generation 7th edition, 2003 - Institute of Transportation Engineers, Washington, US, Page 108, General Light Industrial weekday trip generation and pages 111 and 112 for the AM and PM peak hour rate.

**Table 2: Predicted Daily Trip Generation**

| Land use | Generation rate | | | Unit | Quantum | Estimated Generation | | | Source |
|---|---|---|---|---|---|---|---|---|---|
| | ADT | AM Peak | PM Peak | | | ADT | AM Peak | PM Peak | |
| General Light Industrial (Area 1 and 2) | 12.1 | 4.0 | 3.3 | Ha | 293 | 3,763 | 1,165 | 955 | ITE Guide |
| **Total** | | | | | | **3,763** | **1,165** | **955** | |

**Table 3: Predicted Peak Hour Distribution**

| Land use | Peak Distribution | | | |
|---|---|---|---|---|
| | AM Peak in | AM Peak out | PM Peak in | PM Peak out |
| General Light Industrial (Area 1 and 2) | 990 | 174 | 286 | 668 |
| **Total** | **990** | **175** | **287** | **669** |

## 8.1 Non subdivision traffic

Traffic data obtained from the Shire of Katanning are shown Appendix A and indicate that Katanning Nyabing Road daily traffic volumes are 922 vehicles per day (weekdays) and that Depot Road traffic volumes are 109 vehicle per day (weekdays). It is predicted that the site will generate an additional 3,763 vpd and that all traffci will use Katanning Nyabing Road to enter and exit the site. The predicted traffic split of 70% westbound and the 30% eastbound was adopted and it is assumed that Depot Road will receive 10% (112 vpd) of the eastbound traffic as it is the shortest route from the site to the Townsite rubbish tip.

Table 4 shows the existing traffic daily traffic volumes compared with the future daily traffic volumes predicted as part of the PSP.

**Table 4: Predicted Traffic Volumes**

| Road Name | Existing Traffic Volumes (vpd) | Predicted Traffic Volumes (vpd) | Total (vpd) |
|---|---|---|---|
| Katanning Nyabing Road East | 466 (50% split assumed) | 1,129 | 1,595 |
| Katanning Nyabing Road West | 466 (50% split assumed) | 2,634 | 3,100 |
| Depot Road North | 55 (50% split assumed) | 66 | 121 |
| Depot Road South | 55 (50% split assumed) | 66 | 121 |

# 9 Analysis of internal transport networks

## 9.1 Subdivision generated traffic

Vehicle trip generation rates are based on the following recognised land use traffic generation databases:

- Land Use Traffic Generation Guidelines, March 1987 - Director General of Transport, South Australia;
- Guide to Traffic Generating Developments Version 2.2, October 2002 – Roads and Traffic Authority, New South Wales; and
- Trip Generation 7th edition, 2003 - Institute of Transportation Engineers, Washington, USA.

Assessed generation is shown on Table 4 based on Traffic Assessment Zones (TAZ's) shown on **Figure 11**.

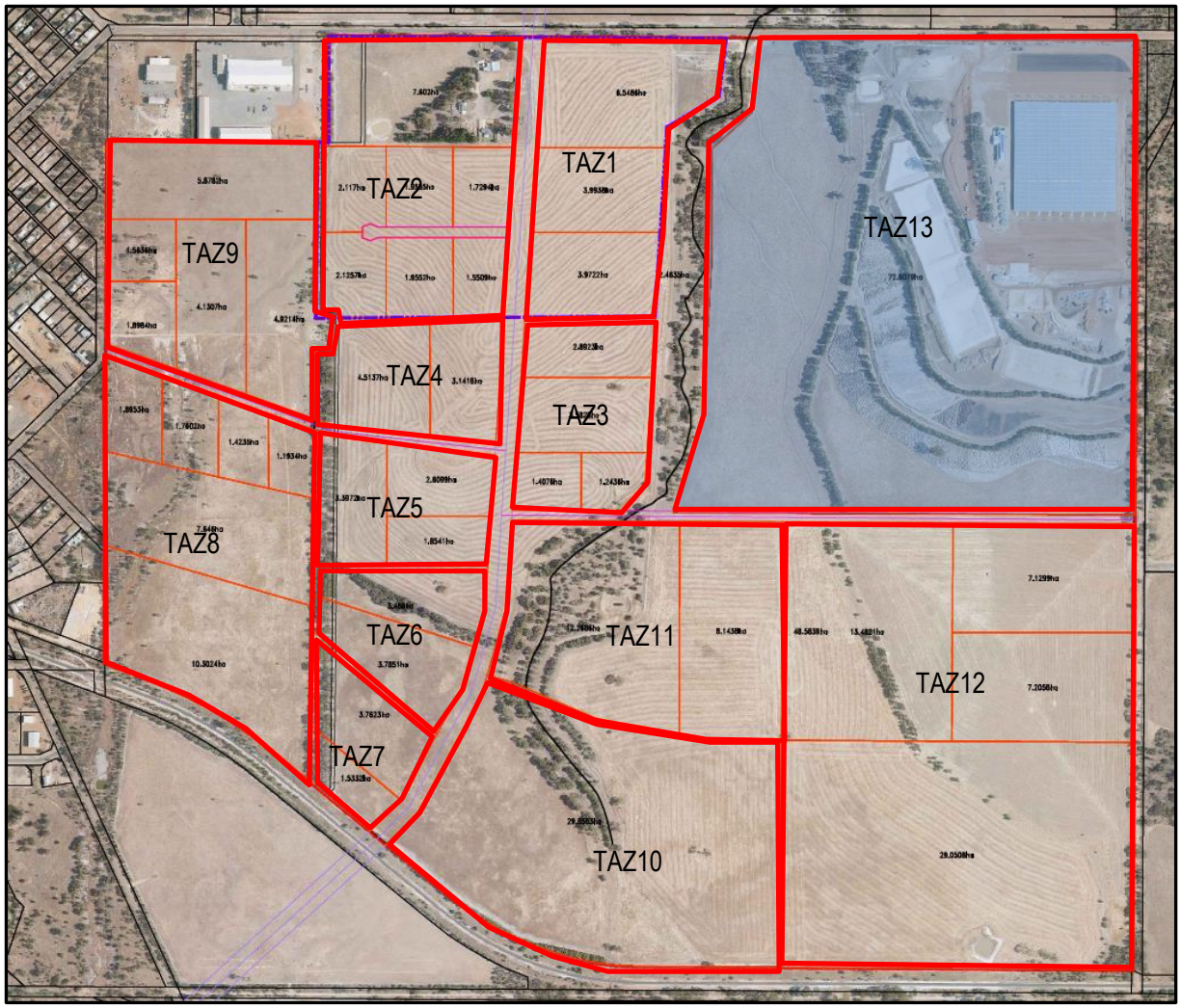



**Figure 11: Transport Assessment Zones (TAZ)**

The trip volumes per day are generated based on planning codes and land use type and have been derived from the ITE Guide. Trip volumes are shown in **Table 5**.

**Table 5: Internal Road Predicted Traffic Volumes**

| Road Name | Lot Area ha | Percentage | Predicted Traffic Volumes (vpd) |
|---|---|---|---|
| TAZ 1 | 16 | 6% | 210 |
| TAZ 2 | 18 | 6% | 236 |
| TAZ 3 | 9 | 3% | 116 |
| TAZ 4 | 7 | 3% | 98 |
| TAZ 5 | 8 | 3% | 100 |
| TAZ 6 | 7 | 3% | 95 |
| TAZ 7 | 5 | 2% | 67 |
| TAZ 8 | 24 | 8% | 311 |
| TAZ 9 | 18 | 6% | 234 |
| TAZ 10 | 29 | 10% | 378 |
| TAZ 11 | 20 | 7% | 260 |
| TAZ 12 | 57 | 19% | 730 |
| TAZ 13 | 72 | 25% | 927 |
| | Total | 100% | 3,763 |

Using the QRS II software, traffic flows were assigned to the network as shown on **Figure 12.**

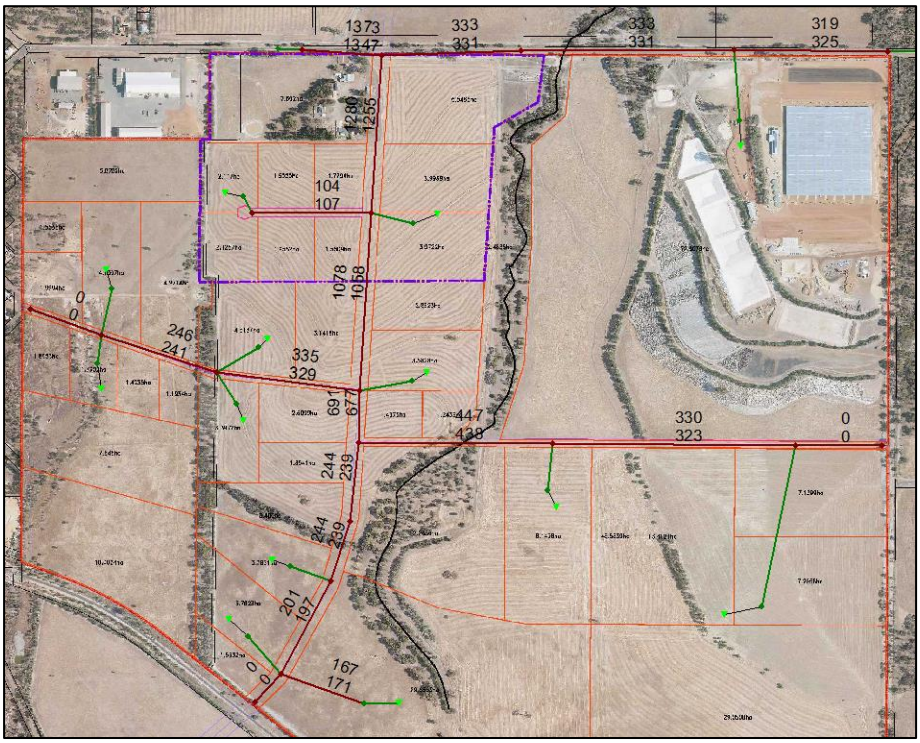



**Figure 12: Internal Road Network Traffic Volumes**

## 9.2 Roads and intersections

### 9.2.1 Mid Block Cross Sections

Road cross section requirements have been based on recommendations contained within Liveable Neighborhoods and the Austroads Guide to Traffic Engineering Practice which requires the following:

| Indicative volume. | Route type / name. | Indicative Reserve Width. | Indicative Carriageway Width. |
|---|---|---|---|
| 50,000. | Primary Distributor. | | Determined by Main Roads WA |
| 35,000. | Primary Distributor. | | Determined by Main Roads WA |
| 15,000 to 35,000. | Integrator Arterial A (District Distributor A). | 50.6 – 52.6 metres. | 2 x 8.2 metre carriageways including bike lane and 2 x 5.5 metre service roads containing parking. |
| <25,000 | Integrator Arterial A (District Distributor A). | 35.6 metres. | 2 x 10.7 metre carriageways including combined on street parking and bike lane. |
| 7,000 to 15,000. | Integrator Arterial B (District Distributor B). | 29.2 metres. | 2 x 7.5 metre carriageways with on street parking and bike lane. |
| 15,000. | Integrator Arterial B (District Distributor B). | 25.2 metres. | 2 x 7.5 metre carriageways with on street parking. |
| 7,000. | Neighborhood Connector A. | 24.4 metres | 2 x 7.1 metres including parking, on street bike lane, median plus shared path on one verge. |
| 3,000. | Neighborhood Connector B. | 19.4 metres | 11.2 metres including parking plus shared path on one verge. |
| 3,000. | Access Street A (Avenue). | 20 - 24 metres. | 2 x 3.5 metre lanes plus indented parking. |
| 3,000. | Access Street B (Wider street). | 16.5 - 18 metres. | 9.7 metre lane. |
| 3,000. | Access Street C (Yield or give way street). | 15.4 - 16 metres. | 7.2 (7.0 – 7.5) metre lane. |
| 1,000. | Access Street D (Narrow yield or give way street). | 14.2 metres. | 5.5 – 6.0 meter lane. |
| 150 | Access Street D (Narrow yield or give way street). | 14.2 metres. | 3.5 metre lane plus parking indents. |
| 3,000. | Access Street D (Wider street). | 16.5 - 18 metres. | 9.7 metre lane. |

**Table 6: Road Hierarchy Criteria**

Based on these criteria, road requirements are as shown on **Table 6.** Note the cross sections have been modified from the indicative widths shown on **Table 7**; however the capacity has been maintained consistent with the intent of the Livable Neighborhoods Criteria.

| Road | Predicted Volume (vpd). | Reserve Requirement. | Carriageway Requirement. | Recommended Road Reserve Width 9 (from Table 4) |
|---|---|---|---|---|
| Katanning Nyabing Road | Up to 4,695 | Primary Distributor | Determined by MRWA | Determined by MRWA |
| Depot Road | Up to 242 | Access Road | 5.5 – 6.0 meter lanes. | Determined by Local Authority |
| Road A | Up to 1280 | Access Road. | 5.5 – 6.0 meter lanes.. | 14m |
| Road B | Up to 107 | Access Road. | 5.5 – 6.0 meter lane. | 14m |
| Road C | Up to 335 | Access Road. | 5.5 – 6.0 meter lane. | 14m |
| Road D | Up to 447 | Access Road. | 5.5 – 6.0 meter lane. | 14m |

**Table 7 Road Cross Sections**

### 9.2.2 Intersection Analysis

Internal peak hour traffic volumes within the development are generally small and as such negligible impacts are predicted. The capacity of an intersection has been evaluated using SIDRA intersection software and warrants for analysis for each intersection as shown in Table 8.1 of Austroads Guide to Engineering Practice Part 2, Roadway Capacity were applied to determine which intersections required capacity analysis. Peak hour traffic volumes were assumed to be approximately 10% of predicted daily traffic.

| Intersection | Hourly volume major road | Hourly volume minor road | Comment. |
|---|---|---|---|
| Warrants as per Table 8.1 of Austroads Guide to Engineering Practice Part 2, Roadway Capacity - Two Lane Major Road Cross Road | 400 vph<br>500 vph<br>650 vph | 250 vph<br>200 vph<br>100 vph | Table details flows that initiate intersection analysis. As major flows increase, there is reduced capacity to accept minor flows. |
| Katanning Nyabing Road – Road A | 469 | 128 | 3 way intersection – Analysis not required. |
| All others intersections | <100 | <100 | Analysis not required. |

**Table 8: Analysis Warrants**

## 9.3 Pedestrian / cycle networks

A review of the pedestrian facilities indicate that the extension of the local footpath cycleway networks will be required to provide connections to the Light Industrial Area.

## 9.4 Access to public transport

The site has no access to public transport.

# 10 Analysis of external transport networks

## 10.1 Design traffic flows on external road network

Design traffic flows on the external network as affected by the proposal are covered in section 8.

## 10.2 Impact on external roads

The impacts of design traffic flows on the external network as affected by the proposal are covered in section 9.

## 10.3 Impact on external intersections

Impacts on external intersections are not expected.

## 10.4 Pedestrian / cycle networks

Footpath / cyclepaths are not identified within the PSP.

# 11 Safety issues

A review of the overall transport proposal for the site did not identify any specific issues that present unacceptable risks to the road user or that cannot be managed through appropriate design protocols.

Road hazards are typically present at intersections and may be manifest through inadequate sight distance, inappropriate geometry or substandard capacity that promotes undesirable and potentially hazardous movements.

For the new roads, the allocation of adequate road reservation width and truncation of corners will generally allow sight distance requirements to be accommodated in the detailed design phase of the project. Geometric standards prescribed by Austroads and Main Roads WA guidelines will ensure that no unacceptable risk is introduced into the road environment. Assessment of the operational performance of intersections undertaken in this study prescribes appropriate geometry and lane allocation to minimise delay and optimise performance.

Given the nature of Pinjarra Road it is desirable to provide a left turn in and out movement with a left turn pocket for the access to the site. These works and any resultant widening will need to be approved by MRWA and it is recommended that a Road Safety Audit be conducted to identify any deficiencies with the design and to recommend any desirable improvements.

Detailed design undertaken as part of the Development Application process would need to define at least the following elements:

- Road cross sections including lane widths, on-road cycle lanes, path widths and provisions for people with disabilities;
- Intersection geometries;

- Pedestrian and cycle facilities (cross sections, crossing requirements and ramps).

# 12 Noise

There is potential for noise impact from the site on nearby residential areas to the west within the Katanning Townsite.

# 13 Conclusions

The traffic generation and distribution exercise undertaken to quantify the traffic impact of the site indicate that site will have minimal impact on the function of the adjacent network.

The trip volumes per day are generated based on the land use type and have been derived from the ITE Guide, thus the predicted flows generated within the site are expected to be 3,763 vpd.

Traffic Hierarchy indicates that the midblock cross section for internal roads is an Access Street, however the geometry and cross section should be such that it can accommodate light Industrial traffic.

The road networks need to be reviewed to ensure all lots front the internal road network.

On the basis of the assessment undertaken, it is concluded that the proposed street network will need to be reviewed to ensure all lots are serviced via the internal road network. The modeled network predicts that the traffic volumes on individual streets are at acceptable threshold levels and that connections to the existing footpath network located within the Katanning Townsite will be required.

# 15 Appendix A Traffic Counts

**DailyClass-538**
**Site:** Depot rd.0.0NS
**Description:** **Depot rd 400 mtrs south of Kat/Nyabing rd**
**Filter time:** **8:06 Wednesday, 28 March 2012 => 12:26 Wednesday, 16 May 2012**
**Scheme:** Vehicle classification (AustRoads94)
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

Monday, 14 May 2012

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon | 90 | 5 | 7 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 105 |
| (%) | 85.7 | 4.8 | 6.7 | 1.0 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 99 | 3 | 7 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 114 |
| (%) | 86.8 | 2.6 | 6.1 | 0.9 | 0.0 | 0.9 | 1.8 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 54 | 6 | 6 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| (%) | 66.7 | 7.4 | 7.4 | 17.3 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entire week | | | | | | | | | | | | | |
| | 94 | 3 | 6 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 109 |
| (%) | 86.2 | 2.8 | 5.5 | 0.9 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Weekdays | | | | | | | | | | | | | |
| | 94 | 3 | 6 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 109 |
| (%) | 86.2 | 2.8 | 5.5 | 0.9 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekend No complete days.

# Daily Classes

**DailyClass-534**
**Site:** 15552.0.0WE
**Description:** **Katanning- Nyabing east of Bay/ Drove St at 40 metres**
**Filter time:** **11:43 Tuesday, 21 February 2012 => 10:21 Tuesday, 20 March 2012**
**Scheme:** Vehicle classification (AustRoads94)
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

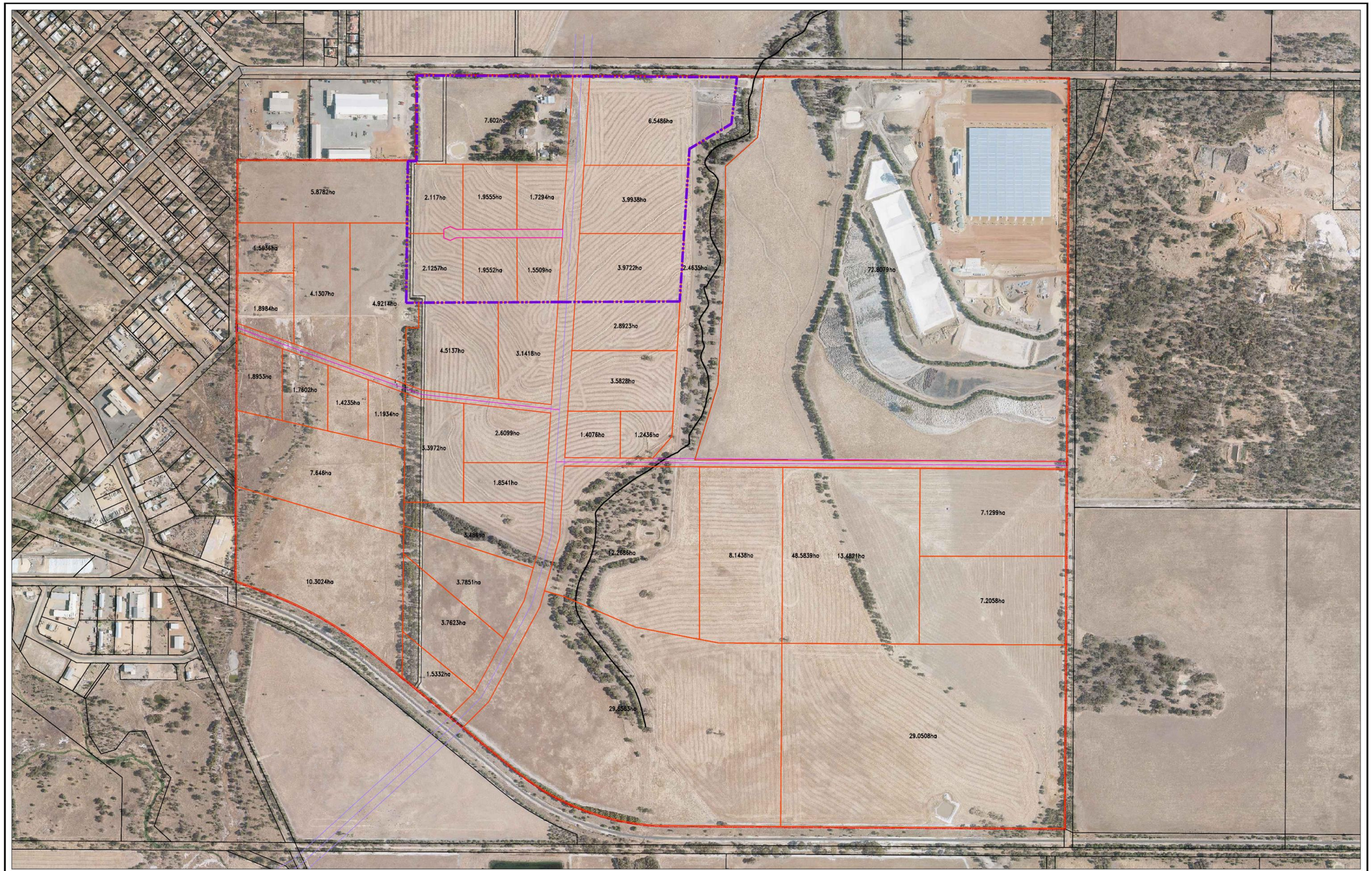
Monday, 20 February 2012

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue* | 469 | 15 | 85 | 23 | 4 | 1 | 2 | 1 | 9 | 2 | 1 | 0 | 612 |
| (%) | 76.6 | 2.5 | 13.9 | 3.8 | 0.7 | 0.2 | 0.3 | 0.2 | 1.5 | 0.3 | 0.2 | 0.0 | |
| Wed | 751 | 31 | 114 | 22 | 10 | 5 | 4 | 3 | 12 | 6 | 0 | 0 | 958 |
| (%) | 78.4 | 3.2 | 11.9 | 2.3 | 1.0 | 0.5 | 0.4 | 0.3 | 1.3 | 0.6 | 0.0 | 0.0 | |
| Thu | 661 | 46 | 87 | 23 | 14 | 5 | 4 | 0 | 5 | 8 | 4 | 0 | 857 |
| (%) | 77.1 | 5.4 | 10.2 | 2.7 | 1.6 | 0.6 | 0.5 | 0.0 | 0.6 | 0.9 | 0.5 | 0.0 | |
| Fri | 738 | 64 | 118 | 16 | 3 | 0 | 2 | 4 | 6 | 2 | 2 | 0 | 955 |
| (%) | 77.3 | 6.7 | 12.4 | 1.7 | 0.3 | 0.0 | 0.2 | 0.4 | 0.6 | 0.2 | 0.2 | 0.0 | |
| Sat | 396 | 42 | 30 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 473 |
| (%) | 83.7 | 8.9 | 6.3 | 0.6 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun | 341 | 59 | 24 | 3 | 6 | 7 | 1 | 0 | 2 | 3 | 0 | 0 | 446 |
| (%) | 76.5 | 13.2 | 5.4 | 0.7 | 1.3 | 1.6 | 0.2 | 0.0 | 0.4 | 0.7 | 0.0 | 0.0 | |

Average daily volume

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entire week | 577 | 48 | 74 | 12 | 6 | 3 | 1 | 0 | 4 | 3 | 0 | 0 | 737 |
| (%) | 78.3 | 6.5 | 10.0 | 1.6 | 0.8 | 0.4 | 0.1 | 0.0 | 0.5 | 0.4 | 0.0 | 0.0 | |
| Weekdays | 716 | 46 | 106 | 20 | 8 | 2 | 3 | 2 | 7 | 5 | 2 | 0 | 922 |
| (%) | 77.7 | 5.0 | 11.5 | 2.2 | 0.9 | 0.2 | 0.3 | 0.2 | 0.8 | 0.5 | 0.2 | 0.0 | |
| Weekend | 368 | 50 | 27 | 2 | 2 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 459 |
| (%) | 80.2 | 10.9 | 5.9 | 0.4 | 0.4 | 0.9 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | |

# 16 Appendix B – Preliminary Structure Plan




landinsights
PLANNING DESIGN ENVIRONMENT

© LAND INSIGHTS.
THIS PLAN CANNOT BE USED WITHOUT PERMISSION OF LAND INSIGHTS.
Note: All boundaries subject to survey.

NORTH

**PRELIMINARY STRUCTURE PLAN**
**INDICATIVE LAYOUT - NOT FOR CIRCULATION**
INDUSTRIAL LAND - INC LANDCORP S1
**SHIRE OF KATANNING**

POSTAL ADDRESS : PO BOX 289 MT LAWLEY, W.A. 6929
phone : (08) 9271 8506 email : admin@landinsights.com.au

PLAN NO: 969-03 SCALE: 1:8000 (A3) DATE: June 2015

# APPENDIX 5
# Servicing and Infrastructure

| | |
|---|---|
| Subject: | Katanning Structure Plans – Preliminary Servicing Assessment |
| Date: | 26 September 2014 |
| Author: | Ryan Needham |
| Attention: | Sharee Rasmussen |

Shawmac has been commissioned by Land Insights to undertake a Servicing Assessment for 5 sites within the Katanning Town Site in support of Structure Plans being prepared for the areas. This Technical Note outlines the preliminary findings of the servicing assessment and is based upon a review of service authorities GIS data, DBYD data and Shawmac's assessments. Individual service authorities have not yet assessed on the proposals and as such the findings may be refined in future.

The key findings from the Servicing Assessment are summaries as follows:

Electrical

i) The Katanning Town Site currently has 5-10MVA capacity remaining in terms of power availability. This drops to <5MVA in 2019. This allows for the development of approximately 1,000 residential dwellings from 2019 onwards on a first come, first serve basis, the development capacity substantially reduces if industrial and commercial lots are developed. Once the power capacity is reached, significant works would be required to source power from other areas to facilitate future development. It is expected that the power availability be a major constraint to development within the Town Site;

Communications

ii) NBN rollout has not commenced in the Town Site. It is expected that the town would be serviced by fixed wireless, similarly to other regional centres. Due to a change in government policy, the timeline for NBN rollout will not be provided;

iii) Optus maintains a fibre optic network through much of the town which may provide broadband services

iv) Telstra would be required to service any future development in the absence of NBN or interest but other communications providers

Water and Sewer

v) Water Corporation planning indicates there are proposed water main extensions along Ranford Road and Great Southern Highway which may aid the development of the DIA 4 structure plan area;

vi) Notwithstanding the above, there is no water corporation planning for the majority of the town and any headworks would need to be funded by the developers. It is expected that Piesse Park and O'Callaghan Park could largely be serviced by extensions to the existing infrastructure, however WAMMCO, DIA 4 and the Industrial Land would need major headworks to be constructed;

vii) The existing Katanning WWTP Treated Waste Water pressure main runs through the eastern portion of Industrial Land which may be a constraint to development

Gas

viii) There is no gas reticulation available within the Town Site

The key constraints to development are expected to be the power availability and the provision of water and sewer:

- There is limited capacity within the existing power network to facilitate developments on the proposed scale
- There appears to be limited capacity for expansion of the water and sewer network.

In each case it is expected that significant headworks would be required to be constructed and largely funded by the developers.

# GOVERNMENT OF WESTERN AUSTRALIA

## DEPARTMENT OF LANDS AND SURVEYS

Please address replies to
UNDER SECRETARY FOR LANDS
If telephoning or calling
contact Mr. Vickery

Ext. 377 TELEPHONE: 23 0151

PERTH, W.A. 28th February, 1966.

Our Ref. 2564/64

Your Ref.

Shire Clerk,
Shire of Katanning,
KATANNING: W.A.

11
Reserve

Dear Sir,

As a condition of approval to subdivision imposed by the Town Planning Board, portion of Kojonup Location 1619 and being Lots 25 and 26 on Plan 8282, as shown coloured green on the enclosed print, was vested in the Crown for the purpose of "Recreation".

This land has now been revested in Her Majesty as of her former estate, has been renumbered Katanning Lot 968 and Executive Council approval has been obtained to this lot being set apart as Reserve No. 27959 for the purpose of "Recreation".

Notices to this effect were published in the Government Gazette of the 11th February, 1966.

Yours faithfully,

A. E. Heagney

Actg. UNDER SECRETARY FOR LANDS.

WWV:MS.
Enc.

Government of **Western Australia**
Department of **Lands**

**Regional and Metropolitan Services**

Your ref:
Our ref: 2564-1964 (Job 160783))
Enquiries: Lynda Martin Ph: (08) 6552 4619
Fax: (08) 6552 4417
lynda.martin@lands.wa.gov.au

8 April 2016

Shire of Katanning
PO Box 130
KATANNING WA 6317

ATTENTION: Sam Davis

Dear Sam

**FUTURE TENURE OF UNMANAGED RESERVE 27959 – LOT 968 ON DP 8282**

The Department of Lands (DoL) has had an enquiry from an individual interested in purchasing Lot 968 on Deposited Plan 8282 being unmanaged Reserve 27959.

Reserve 8282 was ceded to the State as a condition of subdivision in 1966 under Section 152 of the Planning and Development Act (previously Section 20A) for the purpose of "Recreation". The reserve has been unmanaged since that time

Could you please provide comments on:

1. Does the Shire of Katanning wish to retain this Reserve and take care, control and management?;

2. If the Shire does not want management of the Reserve does it have any objections to DoL investigating the possibility of either:
   a. including the reserve into the South West Settlement Land Base; or
   b. disposal of the Reserve after consultation with other agencies and in accordance with S152 Policy.

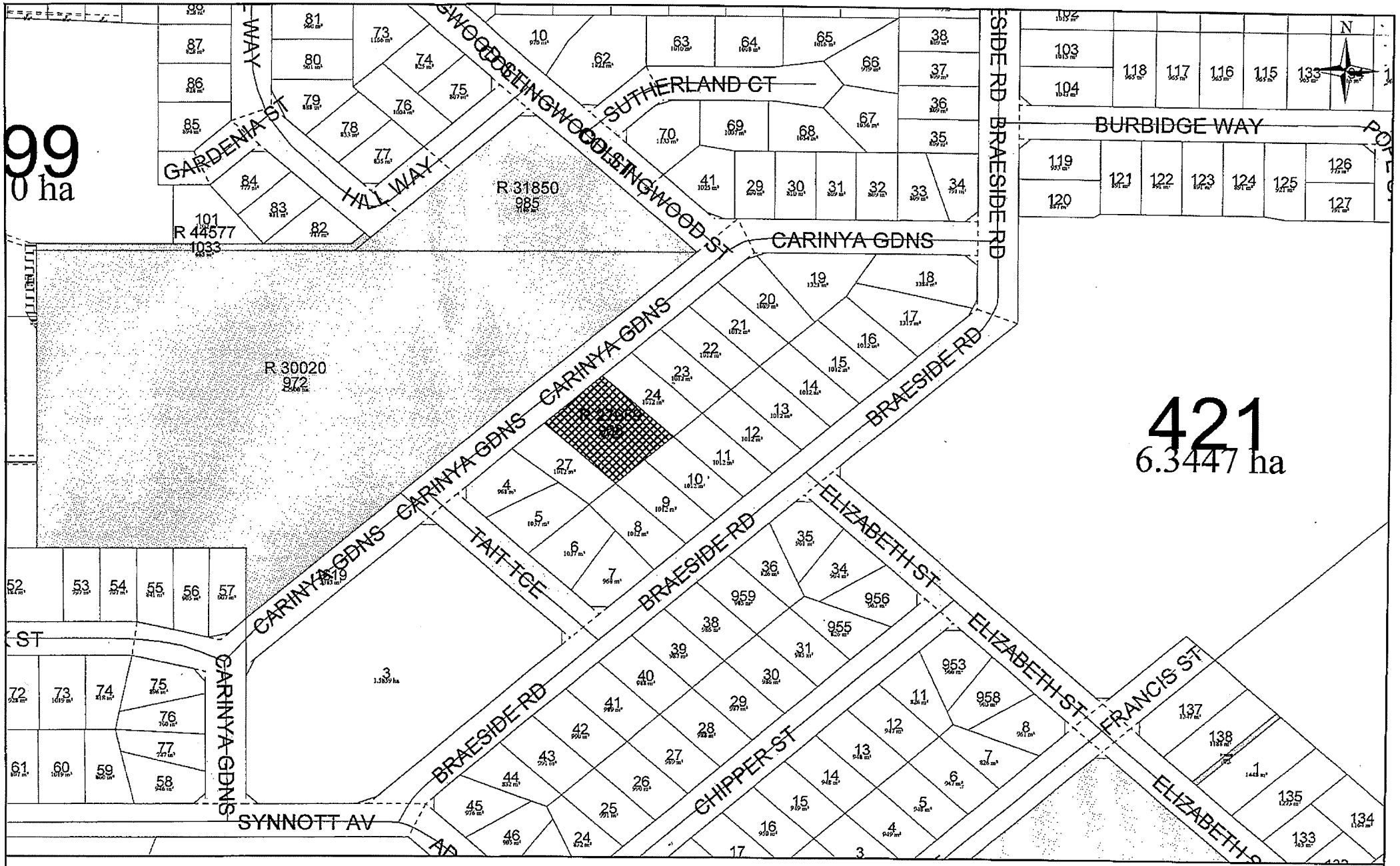
Reserves created under Section 152 can only be disposed of following strict guidelines. . I have attached a copy of the policy on disposal of Section 152 reserves for your information.

Also, please note that if the Shire wish to retain this reserve the purpose will be changed from "Recreation" to "Public Recreation".

Your comments of the above will be appreciated. If you have any further enquiries please contact Lynda Martin on 6552 4619 or via email.

Yours sincerely

**Lynda Martin**
**SENIOR STATE LAND OFFICER (335-13237)**
**SOUTH WEST GREAT SOUTHERN**




Scale : 1:2309 (Geographical)
MGA : SW=551753.7E,6272947.5N Zone 50 / NE=552442.0E,6273452.4N Zone 50
Lat/Long : 117°33'30.048", -33°40'55.688" / 117°33'56.672", -33°40'39.173" H 184mm by W 297mm

Printed : 14:05 Thu 10/Mar/2016
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This product is for information purposes only and is not guaranteed. The information may be out of date and should not be relied upon without further verification from the original documents. Where the information is being used for legal purposes then the original documents must be searched for all legal requirements.

32. There should be provision in the licence deed for variation or termination, whether by agreement between parties, or by the Minister for Lands, if it is in the public interest for the Minister to intervene.

33. Where a local government wishes to enter into a licensing arrangement with the DOE over a s152 reserve which it manages, it should ask SLS/RDL to include a power to license in its management order under s.46(3) of the LAA. Licences then granted by the local government would be subject to the approval of the Minister for Lands, under s.18 of the LAA. Such approval would in any case be required in relation to any licence granted over a managed reserve, under the *Local Government Act 1995* – s.18(2)(a) of the LAA refers.

Protection of s152 Reserves

34. Section 152 land – particularly s152 "public recreation" land – should be retained for its reserved purpose.

35. Necessity or desirability of a high order is to be established before a proposal adversely affecting a s152 "public recreation" reserve may be approved.

36. Nevertheless, subject to the following requirements, s152 "public recreation" reserves may be exchanged, disposed of, or have land excised from them.

Advertising Proposals

37. Where the "public recreation" reserve is to be cancelled or substantially reduced, a Council or other proponent must signpost the affected reserve to indicate the intended change, advertise in the local newspaper and, in appropriate cases, canvass nearby landholders by mail in order to demonstrate to the Minister the level of ratepayer support. This action may be satisfied by town planning procedures where formal rezonings are required.

Submissions by the Local Government

38. A request from a local government for approval to dispose of a s152 reserve must be supported by the following:
    (i) reasons for requesting the disposal of the reserve(s).
    (ii) in the event that the proposal is to purchase replacement land, the submission should –
        (a) identify the land involved and detail what negotiations for purchase have been undertaken, and
        (b) meet the requirements of point 19 below.
    (iii) Details of the level of public consultation undertaken together with the results of that consultation.

Purchase of Replacement Land

39. Where the reserve is to be sold to fund the purchase of other replacement land to effect the consolidation of another recreational reserve nearby, a Council must provide details of the proposed new site and budget forecasts, and give an undertaking to supply a statement of income and expenditure in relation to the transaction, with surplus proceeds either being committed to a Trust fund established by Council for capital improvements to recreational land or being passed to the Crown (s.152 reserves should not be a source of general revenue).

40. Such relocation is to be on the basis of equal area and suitability, and support by the Department of Planning is necessary.

Town Planning Schemes

41. Town Planning Schemes may be employed to comprehensively rationalise reserves created under s152

of the PDA, subject to the agreement of the Minister to the content of each Scheme and to such variation of the Guidelines as may be agreed by the Minister is necessary to give effect to the intent of the Scheme and to ensure Crown land administration issues are also accounted for.

Disposals by Local Governments

42. Where relocation of unwanted s152 land does not offer the best solution to the local community's needs, with the prior approval of the Minister, a local government may dispose of identified reserves and apply the proceeds to capital improvements to other recreation reserves in the general locality.

43. A condition of a reserve's transfer to a local government for disposal will require that a Trust fund be established for this purpose and that a separate audit and Audit Certificates be provided annually to show how the proceeds have been applied. Should certification be inadequate or indicate a breach of conditions, the Minister for Local Government will be asked to issue directions under the Local Government Act to address the situation.

44. To facilitate disposal in accordance with this policy, SLS/RDL will transfer the fee simple of the land to the relevant local government.

45. Disposal of s152 reserve to a local government shall be on the basis of payment to SLS/RDL of $500 or 5% of unimproved market value (as advised by the Valuer General), whichever is the greater. Statutory fees are also payable by the local government.

Trust Funds and Audits

46. A local government may establish one s152 Trust fund for proceeds from sale of all surplus s152 land, subject to:
    (i) community consultation, including reference to where funds are likely to be expended;
    (ii) the community being given an opportunity to comment on where funds from a particular disposal should be expended;
    (iii) establishment of a separate Trust fund for a particular purpose, where the community attitude is that disposal funds should be allocated to a specific project.

47. SLS Regional Teams are to maintain a Register (initially manual but preferably PC-based) recording details of reserves approved for disposal, VG valuation, land to be acquired by Council (if appropriate), record of follow-up of Trust Fund and payments out of the Trust Fund (as audited).

48. SLS Regional Teams are to follow up outstanding audits in January of each year, peruse the audits, and take any appropriate action.

49. Separate files are to be maintained for each local government to deal with disposal of s152 Reserves. Files are to contain copies of recommendations etc from the relevant reserve(s) file(s) and follow up of Trust audits will be undertaken in the general file. (This file will also be used to consider overall rationalisation programs covering s152 reserves).

Disposals by SLS/RDL

50. Where SLS/RDL has exhausted all other avenues for passing management responsibility to local governments, s152 reserves identified as being no longer required for community purposes may be sold by SLS/RDL, with revenue offsetting funds needed to undertake essential maintenance on unvested reserves remaining under SLS's control.

51. Where s152 reserves are to be disposed of by SLS/RDL –
    - Regional Teams need to undertake public consultation;
    - VG valuation and Department of Planning approval need to be obtained;
    - The approval of the Minister for Lands needs to be sought;
    - Disposal is to be by competitive process, except where s87 amalgamation with an adjoining property is the only feasible option;
    - Payment to be within a short term (30 to 90 days);
    - Funds are to be paid into Consolidated Fund following which a submission is to be made to Treasury seeking additional funds for ongoing program of removal of hazards from Crown reserves etc;
    - If additional funds are granted, expenditure is to be identified by a separate Chart Number (to be established by the Finance and Budget Officer);
    - Expenditure is to be approved by the Regional Manager;
    - Regional Teams are to maintain a Register detailing reserves to be disposed of, local government area, VG valuation, release date, disposal price, fund sought from Treasury, funds received and expenditure (how much, on what).

Telecommunications

52. Sites may be excised from s152 "public recreation" reserves for telecommunications facilities. Such sites will then be reserved for that purpose, and a management order issued to the local government with power to lease, subject to the lease revenue being used for either –
    (a) improvements to the "parent" s152 reserve from which the telecommunications site is excised, or
    (b) betterment of other "public recreation" reserves in the general locality, if the lease revenue cannot reasonably be applied to the "parent reserve" (see policy 22.30.1).

Public Purpose Excisions

53. Excisions of minor areas for public utilities such as Western Power padmounts or Water Corp pumping stations may be permissible where an easement is not a reasonable alternative.

54. Land may also be excised for other public purposes such as a road widening, where there are sound planning reasons or little alternative for doing so.

Conservation

55. When s152 reserves created to protect areas with conservation values are involved, there shall be consultation with the relevant Government agencies during formulation of the Town Planning Scheme.

56. The change of purpose of s152 reserves affected by EPA System recommendations (or similar) are not to be constrained by the Guidelines, provided that specific clearance is given by the Minister for Lands in each case, following consultation with the Department of Environment and Conservation.

57. Where appropriate, s152 reserves may be added to adjoining Conservation reserves.

Sundry Issues

58. There is no obligation to return s152 land to a former owner for nominal consideration.

59. These policy guidelines apply to land set aside in Crown subdivisions for the purposes specified in s152 of the PDA.

3rd May 2016

David & Julie Harries
Directors
Emu Lane Pty Ltd
PO Box 767
Katanning WA 6317

Chief Executive Officer
Shire of Katanning
PO Box 130
Katanning WA 6317

Dear Julian

Please find attached requested documentation as per the request for Submissions to provide Catering for the Katanning Regional Sheep Saleyards.

Emu Lane Pty Ltd currently runs the café at the BKW Co-op providing quality, affordable, meals to customers and patrons. Julie Harries was invited by the Co-op to take over the running of the café based upon her reputation from when she ran restaurants in Katanning. Whilst Emu Lane has only been running the café for a short period there have already been a great deal of positive feedback. With an emphasis on great customer service, matched with delicious food and great coffee it is expected thrive into the future.

Running the Saleyards Kitchens would be a good adjunct to the Coop café. Many menu items could be interchanged between the 2 locations, and the existing staff of the Coop can be utilised to help prepare meals and waitress. It would be envisaged that extra staff would be required, but given the success we have had in finding and engaging staff for other catering events such as the Christmas Pop Up restaurant we feel this would not be an issue. Where possible and appropriate we would look to take on any existing staff from the current operations.

Part of Emu Lanes business plan for the current calendar year is to run up to 4 themed pop up restaurants, the saleyards would be an ideal location for some of these events. In addition, we see an excellent opportunity to help build the saleyards as a tourist destination. There is a growing market for agriculture tourism and the unique environment the sale yard provides would make an excellent destination. Working with other sale yard businesses we could help provide a full experience including lunches, dinners or an afternoon tea.

The Saleyards kitchen are a wonderful resource for the Katanning community and we would be more than happy to share the facilities with other caters and groups. There are some logistical issues that need to be clarified for all parties but we believe these can worked out to all parties satisfaction.

We look forward to the opportunity of running the Katanning Regional Saleyard kitchen

David & Julie Harries
Directors
Emu Lane Pty Ltd

# Certificate of Registration of a Company

ASIC
Australian Securities & Investments Commission

This is to certify that

**EMU LANE PTY LTD**

**Australian Company Number 611 690 709**

is a registered company under the Corporations Act 2001 and is taken to be registered in Western Australia.

The company **is limited by shares.**

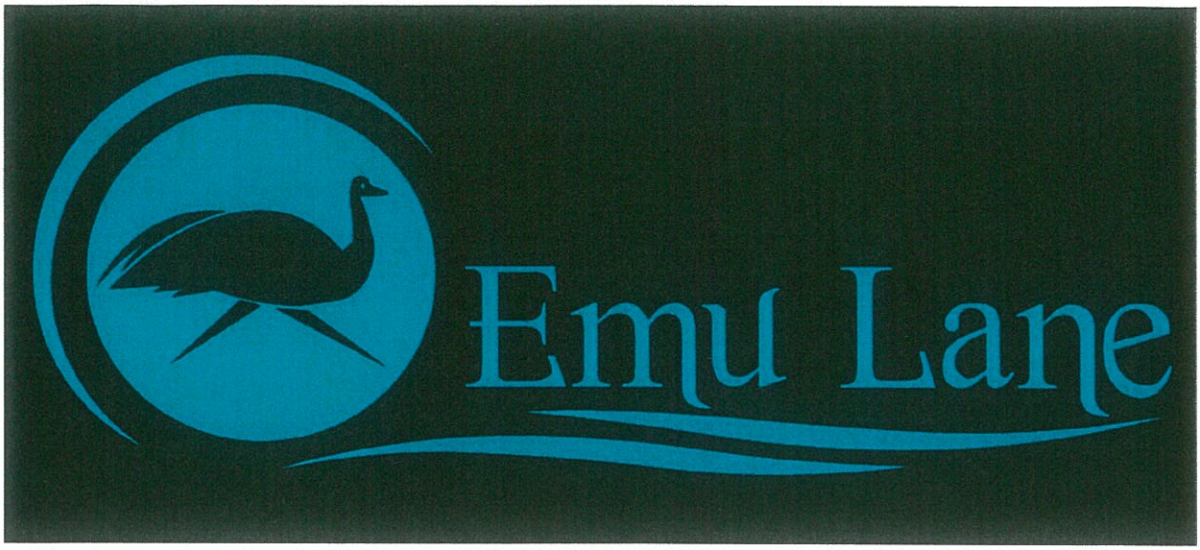
The company is a **proprietary** company.

The day of commencement of registration is **the fifth day of April 2016.**

CERTIFIED COPY

Issued by the
Australian Securities and Investments Commission
on this fifth day of April, 2016.

Greg Medcraft
Chairman




Response to

# CALL FOR SUBMISSIONS TO PROVIDE CATERING FOR THE KATANNING REGIONAL SHEEP SALEYARDS

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## Previous Experience

Emu Lane was incorporated on the 5th of April 2016, it is wholly owned by the Harries Family Trust, the 2 directors being James David William Harries and Julie Ann Harries.

Emu Lane has been running the café at the BKW Co-Op since the 11th of April 2014. Julie Harries was approached by the management of BKW Co-Op to run the café based on her reputation built up over 7 years of running her own restaurants in Katanning.

Upon returning to Katanning in October 2015 Julie and David Harries saw an opportunity to offer quality restaurant food for the local community. They decided to create a pop up restaurant for the Christmas period running it over 4 nights and 1 one lunch time sitting. In all over 200 people attended, enjoying a 3 course Christmas buffet dinner/lunch at the Katanning Club.

Since the New Year Julie Harries has run numerous catering engagements for local business and families. These include a wake for 120 and a 3 course sit down dinner hosted by ANZ Bank for 80 guests at the Katanning Regional Saleyards.

Julie attended Great Southern Regional College in Albany and completed certificate hospitality and advanced certificate hospitality management. After working in numerous kitchens Julie returned to Katanning in 1987 working at PM's restaurant before purchasing it in 12 months later and running the business until 1990. Julie reopened PM's restaurant 1992 in Katanning and ran it until 1996. In 1997 Julie took up a position as Executive Chef at Parliament House in Darwin where she remained until 1999.

After a break from the hospitality industry Julie returned in 2006 working with a group of independent chefs providing relief and contract services to hotels, pubs and clubs around Perth. In this role Julie was often called upon at short notice to take on the running of a kitchen with an existing menu.

Julie enjoys the creative outlet that planning, preparing and delivering great food involves and looks forward to the opportunity of delivering a great meal at the unique Katanning Regional Saleyards.

David is a trained barista with a passion of creating great coffee. For the last 16 years he has worked in the IT and training industry. David has a passion for excellence in customer service. He has delivered training courses to IT professionals on the implementation of service management practices, helping service and help desk personnel develop the skills required to deliver a great experience to customers.

Having worked in numerous senior management roles for Multinational Corporations David has learnt many of the skills required to run a successful business. In his last role before moving to Katanning David worked closely with small businesses helping them to grow their business through the use of cloud based applications that simplified the financial management of their business and provided insights into how to grow and build the business. All of this knowledge and skills David puts into use at Emu Lane.

## Staff Experience and Qualifications

**Jodie Mengini** –Jodie is currently employed as our lead cook in the café and will be assisting in service of Tuesday evening meals at the saleyards as well as food preparation for any function catering. Jodie joined us with 7 years' experience working at the Pingelly Hospital kitchens. Jodie currently holds her Hazard Analysis and Critical Control Point certification, and dietary meal planning as well as an RSA certification.

**Wendy Anderson** : 8 years hospitality experience in all aspects of front of house, coffee preparation and customer service

**Michelle Bonshore**: 10 years' experience at the BKW Co-Op café as assistant cook, kitchen hand and front of house.

**Antonetta Schiano** – Recently retired as full time cook after 9 years at BKW Co-Op, Antonetta has extensive experience in many cooking roles. She still works limited hours per week, sharing her vast knowledge with all our staff.

**Cathy Ryan** - has worked at the Co-Op for the last 3 years as Kitchen hand. Cathy show great potential as a Chef and will be working all hour at the saleyards to expand her cooking knowledge under Julie's tutelage.

Emu Lane will have a pool of at least 4 staff capable of food preparation at the Saleyard, to ensure continuity and maintain a high level of service.

We also currently have a pool of 8 other staff with varying degrees of experience in the kitchen and front of house to work with us at the Saleyards as required.

The current training plan is for all staff to complete SITXFSA101 - Use Hygienic Practices for Food Safety. Key personnel including all food preparation staff and directors will complete Food Safety Supervisor - SITXFSA201 – WA. The expected time frame for this is over the next 2 months. Both Directors will also complete a course Food Allergen Safety Training – WA.

Sample Menu

Saleyard Menu - Dinner

Soup of the Day $8.50

T-Bone Steak, cooked to your liking Served with our fresh sauces. Port Gravy, Field Mushroom or creamy Garlic. $28.50

The Yards MP Scotch Fillet topped with Bacon, prawns and a garlic cream sauce. $34.00

Lamb shanks Local lamb in a rich sauce served over Potato mash $26.00

Great Southern Fried Chicken Buttermilk and spiced coated crispy chicken schnitzels, served with chips and 'Comeback Sauce'.. $24.00

Fish & Chips Schnapper fillet in a crisp batter served with chips, a garden salad and our special Basil- tartare sauce $22.00

Pork Cutlets - Sticky ginger pork with greens and beans $24.00

Gnocci - pasta, roasted vegetable, spinach and parmesan cashew pesto $24.00

Steak Sandwich - marinated steak, topped with caramelised onion, bush tomato chutney, tasty cheese, lettuce, tomato and garlic Aoili in toasted turkish bread $16.50

Bourbon Beef Burger - slow roasted smoky beef brisket served on brioche bun, with coleslaw and tasty bourbon sauce $14.50

Chicken Burger - our fresh made chicken patties, layered with cheese, salad and our fresh Aioli in a toasted Brioche bun $14.50

Roast of the day served with vegetable or chips and salad $21.00

For the Spring lambs - all $12.50
3-14 years all served with chips, sauce and a small salad of lettuce, tomato, Cucumber and carrot

Mini Chicken Schnitzel,
Battered whiting fillet,
Mini Roast of the Day plate.

Breakfast

The big breakfast - Grilled bacon, fried eggs, mushroom, beef sausages hash browns, beans, tomato and toast $18.00

Pulled Pork egg Benny rolls - Turkish rolls topped with slow-roasted pork, fried egg and hollandaise sauce $14.50

Big Breakfast Wrap – scrambled eggs, bacon, cheese, hash brown and BBQ sauce in a toasted tortilla $11.50

Breaky Burger – layers of bacon, egg, cheese and BBQ sauce in a fresh toasted roll. Salad optional $13.00

Steak Sandwich – marinated steak, topped with caramelised onion, bush tomato chutney, tasty cheese, lettuce, tomato and mayo in toasted turkish bread

$16.50

BLT Bacon, lettuce, tomato toasted sandwich with Mayo and BBQ sauce

$8.50

Ham & Cheese Toastie $6.00

Eggs on Toast $10.50

Bacon & Eggs on Toast $12.50

Steak and Egg on toast $14.50

Lunch at the Yards

Slow cooked Spiced lamb-layered with spinach, tomato, cheese and feta in a toasted tortilla topped with sour cream and onion salsa $13.00

The Yard Burger –100% beef patty, egg, cheese, salad, aioli and BBQ sauce in a toasted roll with fries, $15.00

Breaky Burger – layers of bacon, egg, cheese and BBQ sauce in a fresh toasted roll. Salad optional with fries $13.00

Emu Burger – well really a bit of chicken, our fresh made chicken patties, layered with cheese, salad and our fresh Aioli in a toasted Brioche bun $14.50

Steak Sandwich – marinated steak, topped with caramelised onion, bush tomato chutney, tasty cheese, lettuce, tomato and garlic Aoili in toasted turkish bread with fries $16.50

Bourbon Beef Burger - slow roasted smoky beef brisket served on brioche bun, with coleslaw and tasty bourbon sauce. $14.50

Sandwiches and Rolls from $6.00

Fillings Ham, chicken, tuna, salami, roast beef, cheese,

Standard Salad of lettuce tomato, carrot and cucumber

Condiments: Relish, Chutney, mustard or mayonnaise.

Add extra, beetroot, pineapple, onion and avocado

Toasted

GF sandwich Bread or

our in-house made Gluten Free Focaccia extra $2.00 available

Beef Pies $5.00

Home made Sausage Rolls $5.00

Lamb & Rosemary Pie $6.00

# Evidence and demonstrate compliance across Food safety management, WH & S management, Risk management, operational procedural management, safe work method and performance standards.

Given the current business operation period of Emu Lane, we have not yet fully established our procedure manual framework. Our immediate goal is to get all staff trained in basic food handling, the nominated course is SITXFSA101 - Use Hygienic Practices for Food Safety. In addition, key personnel including all food preparation staff and directors will complete Food Safety Supervisor - SITXFSA201 – WA. The expected time frame for this is over the next 2 months. Both Directors will also complete a course Food Allergen Safety Training – WA.

For WH&S we plan to put all staff through SITXWHS101 Participate in safe work practices – a course specifically designed for the hospitality industry to provide the skills and knowledge staff need to work safely.

Emu Lane aims to provides a safe and clean working environment in compliance with Australia New Zealand Food Standards Code

Emu Lane enforces good hygiene practices and reinforces knowledge of all staff members in the areas of

- Follow hygiene procedures and identify hazards
- Report any personal health issues
- Prevent food and other item contamination.
- Prevent cross contamination by hand washing and correct food storage practices.
- We actively ensure our staff have sound knowledge of correct equipment applications and operation.
- Provide first aid supplies for the treatment on minor workplace injuries.

We are also happy to report that Emu Lane passed its first Australian Food Safety Assessment on the 19th of April.

# Insurance Coverage

Emu Lane currently has a public liability insurance cover note to the value of $20 million. Emu Lane also has full worker's compensation in place via a cover note. Please see attached confirmations, details of which can be confirmed with Kylie Westbrook of Nexus Risk services. Once all details have been completed Emu Lane will provide copies of the Certificate of Currency.

# Nexus Risk Services

ABN 66 009 111 719

## QUOTATION

| CLIENT | INSURER | 06.05.16 |
|---|---|---|
| Julie Harries<br>PO Box 767<br>Katanning WA 6317 | SURA Commercial<br>P O Box 226<br>CHARLESTOWN NSW 2290 | |

| CLASS OF RISK | PERIOD OF INSURANCE |
|---|---|
| SURA Commercial Latitude 360 | From: 4.00 pm on 11th April 2016<br>To : 4.00 pm on 11th April 2017 |
| Policy No : Q-100000046357 | Our Ref : PPK BUN H7335 0405536/000 |

**COVERAGE SUMMARY** This summary is not a policy document and is only an outline of the coverage. The terms conditions and limitations of the Insurer's policy shall prevail at all times.

SURA Commercial 360

The Insured: David & Julie Harries, Emu Lane Pty Ltd

The Insured's business: Cafe incl deep frying. Catering/Pop Up restaurant Saleyards Canteen

The policy form: SURA Commercial 360 | Version SURA360 V1.103-2014

ASSET PROTECTION Including breakdown of equipment

INSURED LOCATIONS

1. 72-78 Austral Terrace
   KATANNING WA 6317

| | |
|---|---|
| Buildings | $ 0 |
| Contents | $ 60,000 |
| Location limit @120% | $ 72,000 |
| Flood | Not Covered |

2. Lot 500
   Katanning-Nyabing
   Road KATANNING WA

| | | |
|---|---|---|
| 6317 | | |
| Buildings | $ | 0 |
| Contents | $ | 50,000 |
| Location limit @120% | $ | 60,000 |
| Flood | Not Covered | |

| | | |
|---|---|---|
| Unnamed | | |
| Anywhere in Australia - Location Limit | $ | 25,000 |
| Flood | Not Insured | |

Cover is included for:

| | | |
|---|---|---|
| Property in Transit - Limit per shipment | $ | 25,000 |
| Acquired Property Notification period - 90 days | $ | 250,000 |

Cover is included within the locations for:

| | | |
|---|---|---|
| Theft | $ | 100,000 |

Special Assets:

Cover is included in addition to the location limits at each insured location for:

| | | |
|---|---|---|
| Capital additions | $ | 500,000 |
| Property protection | $ | 100,000 |
| Land value | $ | 100,000 |
| Post loss expenses | $ | 25,000 |

The following excesses apply per event:

Earthquake
$20,000 or 1% of the declared values at the location where the damage occurs whichever is less

| | | |
|---|---|---|
| Breakdown of equipment | $ | 250 |
| Flood | $ | 0 |
| Theft | $ | 500 |
| Storm | $ | 500 |
| Named cyclone for insured locations above Tropic of Capricorn | $ | 500 |
| Property containing asbestos | $ | 0 |
| All claims (other than) | $ | 500 |
| Unnamed Location | $ | 500 |

Special Conditions

Spoilage
Coverage for deterioration of refrigerated stock caused by breakdown of equipment, is limited to $25,000, unless stock is

located in refrigerated chambers equipped with back to base monitored temperature alarms.

Cooking

It is a condition of cover that; deep fryers if any are thermostatically controlled to 215 degrees celsius with automatic cutoff; ducting, canopies and splashbacks must be professionally cleaned under a contract at least every six months; filters must be cleaned weekly; and at least 1 x 4.5 kg Dry Chemical extinguisher and a fire blanket be provided.

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BUSINESS INCOME PROTECTION Including breakdown of equipment

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| | |
|---|---|
| Annual Income | $ 590,000 |
| Ratio of gross profit to income | 56.37% |
| Gross profit limit | $ 399,100 |
| Accounts Receivable Limit | $ 0 |
| Expense limit | $ 75,000 |
| Simplified settlement period | 12 weeks |
| Period of recovery 12 months extended to | 24 months |
| Dependent business premises | |
| Anywhere in Australia - % of gross profit limit | 20% |

The following waiting periods apply under Business Income Protection

| | |
|---|---|
| Breakdown of equipment | 48 hours |
| Essential services | 48 hours |
| Dependent business premises | 48 hours |
| Access protection (50km radius) | 48 hours |

Special Conditions

Business Activity Statement

Unless the Insured s Australian Taxation Office Business Activity Statement is provided to SURA Commercial Business Income Protection claims may be proportionally reduced on the basis of declared income to actual income if the declared income is less than 80% of the annual declared income on the Insured s relevant Australian Taxation Office Business Activity Statement.

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CRIME PROTECTION

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Discovery period: Policy period plus 12 months

Employee Theft:

| | |
|---|---|
| Limit per occurrence | $ 5,000 |

| | | |
|---|---|---|
| Limit in the aggregate for the policy period | $ | 5,000 |
| Excess per occurrence | $ | 250 |
| **Money and securities:** | | |
| Limit per occurrence | $ | 5,000 |
| Limit for money conveyed by employees per occurrence | | 100% |
| Excess per occurrence | $ | 250 |

## LIABILITY PROTECTION

| | | |
|---|---|---|
| Limit per occurrence and in the aggregate | $ | 20,000,000 |
| Care, custody and control limit per occurrence | $ | 250,000 |
| Construction limit - Total cost of work | $ | 500,000 |
| **Excesses any one occurrence whichever is greater** | | |
| Personal injury | $ | 250 |
| Property damage or advertising injury | $ | 250 |
| Labour hire personal injury | $ | 2,500 |

SURA Commercial

SURA PTY LTD, ABN 36 115 672 350 AFSL 294313 T/A SURA Commercial (SURA Commercial) has developed this Commercial Insurance Protection Policy which is underwritten by the insurer referred to below.

SURA Commercial has an authority from the insurer to arrange, enter into / bind and administer this insurance (including handling and settling claims) for the insurer.

SURA Commercial's contact details are:
Level 13 / 141 Walker Street North Sydney NSW
PO Box 1813 North Sydney 2059
T: 02 9930 9500

CGU Insurance Limited

This insurance is underwritten by CGU Insurance Limited (CGU Insurance) ABN 27 004 478 371, AFSL 238 291 an authorised Australian insurer, regulated by the Australian Prudential Regulation Authority ('APRA').

CGU Insurance has been providing insurance to Australians for over 160 years and is part of the Insurance Australia Group (IAG).

CGU Insurance Limited contact details are:

388 George Street, Sydney, NSW 2000
T: (02) 8224 4000

You should contact SURA Commercial in the first instance in relation to this insurance.

Disclosure

Your duty of disclosure

Before the Insured enters into a contract of general insurance with CGU Insurance, the Insured has a duty, under the Insurance Contracts Act 1984 (Cth), to disclose to CGU Insurance every matter the Insured knows, or could reasonably be expected to know, is relevant to CGU Insurance's decision whether to accept the risk of insurance and, if so, on what terms. The Insured has the same duty to disclose those matters to the insurer before the Insured renews, extends, varies or reinstates a contract of general insurance.
The Insured's duty however does not require disclosure of a matter:

* that diminishes the risk to be undertaken by CGU Insurance;
* that is of common knowledge;
* that CGU Insurance knows or, in the ordinary course of its business ought to know;
* as to which compliance with the Insured's duty is waived by CGU Insurance.

Non-disclosure

If the Insured fails to comply with the duty of disclosure, CGU Insurance may be entitled to reduce its liability under the contract in respect of a claim or may cancel the policy.
If the Insured's non-disclosure is fraudulent, CGU Insurance may also have the option of avoiding the contract from its beginning.

Dispute Resolution

If the Insured has any complaints about the products or services provided to the Insured, please contact SURA Commercial and tell us about the complaint. SURA Commercial has a complaints and internal dispute resolution process to try and resolve them as quickly as possible. If this does not resolve the matter or the Insured is not satisfied with the way a complaint has been dealt with, the Insured has the right to refer the matter to SURA Commercial's external disputes resolution service. SURA Commercial will provide information about this service including contact information when the Insured lodges a complaint with SURA Commercial or at any time upon the Insured's request.

Privacy Statement

In this Privacy Statement the use of "we","our" or "us" means SURA Commercial and CGU Insurance unless specified otherwise. "You" or "your" means the Insured.
In this Privacy Statement the use of "personal information" includes sensitive information.

SURA Commercial and CGU Insurance are committed to protecting the privacy of the personal information you provide to us.

The Privacy Act 1988 (Cth) contains the Australian Privacy Principles which require us to tell you that we collect, handle, store and disclose your personal and sensitive information for the specific purpose of:

* deciding whether to issue a policy;
* determining the terms and conditions of your Policy;
* compiling data to help develop and identify other products and services that may interest clients, and
* handling Claims.

Personal information is information or an opinion about an identified individual, or an individual who is reasonably identifiable:

* whether the information or opinion is true or not;
* whether the information or opinion is recorded in a material form or not.

Sensitive information includes, amongst other things, information about an individual's racial or ethnic origin, political opinions, membership of a political organisation, religious beliefs or affiliations, philosophical beliefs, membership of a professional or trade association, membership of a trade union, sexual orientation or practices, criminal record, health information about an individual, genetic information, biometric information or templates.

You have given us your consent to collect, use and disclose your personal and sensitive information in order to provide you with the relevant services and/or products.

When you give us personal information about other individuals, we rely on you to have made or make the individual aware that you will or may provide their personal information to us and the types of other parties and service providers we may provide it to, the relevant purposes we and the other parties and service providers will use it for, and how they can access it. If you have not done or will not do either of these things, you must tell us before you provide the relevant personal information to us.

We disclose personal information to other parties and service providers whom we believe are necessary to assist us and them in providing the relevant services and/or products. For example, in

NEXUS
RISK SERVICES
YOUR TRUSTED PARTNER

06 May 2016

## *CONFIRMATION OF COVER*

This is to confirm that the policy detailed below is current, subject to the terms, conditions and exclusions.

| | |
|---|---|
| **INSURED:** | Emu Lane Pty Ltd<br>David Harries<br>Julie Harries<br>ACN 611 690 709 |
| **CLASS OF INSURANCE:** | Workers Compensation |
| **INTEREST INSURED:** | Legal Liability under the Western Australia Workers Compensation and Injury Management Act 1981 (and as amended) and at Common Law for Personal Injury sustained by Employees in the course of their Employment |
| **LIMIT OF LIABILITY:** | As per Act<br><br>Common Law Liability:$50 million any one person or number of persons arising out of the one event |
| **SITUATION:** | Anywhere in Western Australia or elsewhere as per Act. |
| **POLICY NUMBER:** | 1PE1958385GWC |
| **RENEWED OR ISSUED TO:** | 27th November 2016 at 4.00pm |
| **INSURER:** | QBE Insurance |

**SIGNED**----------
**For and on behalf of NEXUS RISK SERVICES**

handling Claims, we may have to disclose your personal and other information to other parties and service providers such as our claim management partner, other insurers, reinsurers, loss adjusters, external claims data collectors, investigators and agents, facilitators, assessors or other parties as required by law. We limit the use and disclosure of any personal information provided by us to them to the specific purpose for which we supplied it.

We may disclose your personal information to our insurers, reinsurers, related entities and service providers overseas, including but not limited to New Zealand, Singapore, United Kingdom, the Philippines, the European Union and the United States of America.

If you do not provide the personal information requested and/or do not provide us with your consent to the use and disclosure of your personal information as set out in this Privacy Statement, your insurance application may not be accepted, or we may not be able to administer your Policy, or you may be in breach of your duty of disclosure, the consequences of which are set out under the heading Disclosure in this document.

If you would like a copy of our Privacy Policies, would like to seek access to or correct your personal information, opt out of receiving materials we send, complain about a breach of our privacy or you have any query on how your personal information is collected or used, or any other query relating to our Privacy Policies, please contact us.