

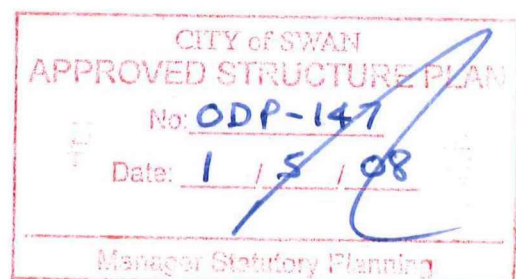
CITY OF SWAN  
17 MAR 2014  
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PEET LTD

# BRIGADOON STRUCTURE PLAN

MARCH 2014

PREPARED BY



# BRIGADOON STRUCTURE PLAN

MARCH 2014

**Prepared for:** **Peet Ltd**  
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This structure plan is prepared under the provisions of the City of Swan Local Planning Scheme No. 17.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

26 March 2014

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In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Date of Expiry: 19 October 2025

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# EXECUTIVE SUMMARY

The purpose of this report is to provide the City of Swan with sufficient information to adopt a revised Structure Plan (SP) within the Landscape Zone for the balance of Brigadoon Estate, being Lot 1010 Boulonnais Drive and 1022 Campersic Road. The revisions proposed have been made pursuant to City of Swan Local Planning Scheme No. 17.

Located in the Darling Ranges with views over the Swan Coastal Plain, Brigadoon provides for people seeking a 'rural residential' lifestyle orientated community within the City of Swan.

The document provides a comprehensive overview of background information, statutory and strategic planning considerations, analysis and justification for the adoption of the revised Structure Plan.

The revised Structure Plan has been refined to reflect improved design parameters, particularly:

- Formalisation of existing public infrastructure facilities and land holdings; and
- Design philosophy that is more site responsive in a challenging environment.

The revised Structure Plan addresses the necessary requirements of the City of Swan and promotes best practice for development within the Darling Ranges, key elements include:

- Recognition, addressing and the mitigation of fire risk;
- Provision of a new eastern access route through to O'Brien Road;
- Protection of native vegetation and environs identified as worthy of protection;
- Protection of visual amenity along the periphery of the site;

Approval of the revised Structure Plan is required to facilitate the subdivision and development of the Brigadoon Estate.



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1. Clause 42 Certificate
2. Existing Structure Plan (Subdivision Guide Plan)
3. Revised Structure Plan (Revised and Updated June 2009)
4. Fire Management Plan (Revised March 2009)
5. Subdivision Approval for Access Road to O'Brien Road
6. Geotechnical (broad Land Capability) Assessment
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19. Building Area Plans (Indicative)
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## 1. INTRODUCTION

### 1.1 PURPOSE

The Structure Plan (SP) has been prepared to facilitate further controlled and guided subdivision of the subject site. The SP and report, sets out a broad road network and land use framework over the subject land and has been compiled in accordance with the requirements of Part 5A of the City of Swan's Local Planning Scheme No.17.

The purpose of this report is to provide Council with the necessary information to adopt a revised structure plan over the subject site, being for the balance of unsubdivided Brigadoon Estate.

Approval of the SP is required to facilitate the subdivision and development of the Brigadoon Estate.

### 1.2 LEGAL DESCRIPTION AND OWNERSHIP

The subject land comprises part of an original ownership of some 1390 hectares that was first zoned and developed for Special Rural Purpose in 1984. Stage 1 and 2 of the Brigadoon Estate were developed by the Bond Corporation in the late 1980's following a long period of stagnant activity. It is now proposed by the new owners, Peet Limited to finalise development of the balance of the Estate in accordance with the revised plans being the subject of this report.

The composite site area is bound by a Parks and Recreation Reserve to the north (Walyunga National Park), the Swan River to the west, rural landholdings to the east, and landscape development to the south (Refer to **Figure 1**).

The study area which is subject to this SP comprises of Lots 1010 and 1022 totalling 861 hectares in area. The size of the individual parcels and ownership details are identified in **Table 1** on the following page. Clause 42 certificates providing additional site and ownerships details are also included for further information (**Attachment 1**).

Whilst the site is some 861 hectares in area, approximately 393 hectares is zoned 'Parks and Recreation' and forms part of Walyunga National Park (refer to **Section 3.0**).

TABLE 1 – TITLE DETAILS AND LAND OWNERSHIP

LOT NO	OWNER	CERTIFICATE	LOT AREA
1010	Peet No 67 Syndicate Ltd	1941 / 263	608.0604 Ha
1022	Peet No 67 Syndicate Ltd	1556 / 798	253.3758 Ha
TOTAL			861.4362 ha

In 1989 there was an Amendment to the Shire of Swan's Town Planning Scheme No.9 (Amendment No.45), resulting in the adoption of various provisions and alterations to the Subdivision Guide Plan including:

- A new subdivisional layout; and
- A requirement to transfer free of cost to the State Planning Commission and the Shire of Swan various parcels of river valley (totalling in excess of 800 hectares).

The original developer, Bond Corporation, whilst having actively developed Stages 1 and 2 of the Estate between 1985 and 1990, wound down development thereafter.

On the 12th October, 1993 a Deed of Release was signed by Bond Corporation and the Shire in relation to the original agreement associated with Amendment No.119 (TPS No.1). This permitted the release for the land owner from the original obligations and transfer of the river valley to Parks and Recreation Reserve as well as various other actions.

The zoning of the subject site was again changed in 1996 by the Shire of Swan, from 'Special Rural' to 'Landscape Zone' (refer Amendment Nos. 172, 174 and 176).

The adoption of the SP will finalise a project involving various planning applications and structure plans extending over 20 years facilitating best practice development benefiting the City of Swan.



## 2. CONTEXT ANALYSIS

### 2.1 REGIONAL CONTEXT

The subject land being the balance, yet to be subdivided portion of the Brigadoon Estate, is located within the Darling Range, some 25 kilometres north-east of Perth CBD, approximately 12 kilometres north of the Midland Regional Centre (**Figure 1**) which provides the higher order services to the future community at Brigadoon. At a district level, the developing Ellenbrook Town Centre provides for lower order services and goods.

As noted, the Swan River traverses the site within a generally north-south valley. This valley also contains the standard gauge railway line which links Perth with Kalgoorlie and the eastern States.

### 2.2 REGIONAL ROADS

The main access to Brigadoon is via Campersic Road which links to Toodyay Road and Great Northern Highway. The main access to the subject land from the Central Business District and Midland Regional Centre is via Great Northern Highway.

### 2.3 REGIONAL PARKS AND RECREATION RESERVES

The site is bound to the north and west by the 1,790 hectare Walyunga National Park. Located within the Darling Range, Walyunga National Park features the confluence of the Avon and Brockman Rivers forming the Swan River.

Although functioning as a conservation reserve of major significance, Walyunga National Park provides for both active and passive recreation pursuits including, bushwalking, canoeing, picnicking and bird watching.

Walyunga National Park in turn adjoins a larger park system of nearly 10,000 hectares of land incorporating the Avon Valley National Park and the Paruna Wildlife Sanctuary.

### 2.4 LOCAL CONTEXT

As introduced, the land immediately surrounding the subject SP area is dominated by Walyunga National Park to the North and West with large rural land holdings to the east (**Figure 2**).

Directly south are the two initial stages of Brigadoon Estate developed by the Bond Corporation. **Attachment 2** identifies these stages as well as the previously approved Subdivision Guide Plan covering the subject land area.

The area west of the site, referred to as 'Jumbuck Hill', formerly part of the original Brigadoon Estate, has been purchased by the Western Australian Planning Commission for Parks and Recreation purposes.

### 3. STATUTORY AND STRATEGIC CONSIDERATIONS

#### 3.1 MRS ZONING

The majority of the study area is zoned 'Rural' under the provisions of the Metropolitan Region Scheme (MRS), with the balance being reserved for 'Parks and Recreation' (**Figure 4**).

The 'Parks and Recreation' reserve boundary that has been utilised, has been confirmed via a Clause 42 search for both lots (**Attachment 1**).

Development is to be in accordance with the submitted SP, and is in accordance with the intention and land uses permissible within the 'Rural' zone of the MRS.

#### 3.2 LOCAL AUTHORITY ZONING AND APPROVED PLANS

The northern and western portion of the subject site (amounting to some 393 hectares) is reserved 'Parks and Recreation' in the City of Swan Town Planning Scheme No.17, whilst the balance of the land is currently zoned 'Landscape' (**Figure 5**).

The objectives of the 'Landscape' zone are too;

- a) provide for low density rural residential development and associated rural-residential activities, recognizing the visual characteristics of the landscape;
- b) ensure as far as practicable, that the environmental and landscape characteristics of the area are not compromised by development and use of the land for either rural or residential purposes; and
- c) encourage the rehabilitation of degraded areas through selected replanting of indigenous flora.

The proposed SP covering the subject site forms **Attachment 3** of this report.

#### 3.3 COUNCIL / STATE POLICIES

As discussed below, there are multiple State and Local Government policies in operation over the area. Each policy and their influences to the site are discussed below.

##### 3.3.1 NORTH EASTERN HILLS SETTLEMENT PATTERN PLAN

The North Eastern Hills Settlement Pattern Plan (NEHSPP) was adopted by the Western Australian Planning Commission in 2002.

Within the NEHSPP, 18 key issues including, sustainable development, transport, waste management and ecology are identified.

Following the preparation of the NEHSPP, the City of Swan prepared the Gidgegannup / Brigadoon Place Plan following lengthy public consultation, identified the subject site for 'landscape/special rural' type development as discussed in **Section 3.3.3**.

The proposed SP is in accordance with the objectives of the Place Plan.



Fire planning has been incorporated as part of the planning process to mitigate threats where ever possible. Under the direction of FirePlan WA, a plan incorporating the appropriate setbacks, firebreaks, and separation and protections zones has been prepared for the subject area. To provide for increased fire mitigation along the site's western face, various additional measures are also incorporated into the management strategy (refer section 5.2.4).

A copy of the findings from FirePlan WA is included as **Attachment 4**.

The design response to bushfire planning requirements is described in detail also in **Section 5.2.4** of this report.

A key element of the bushfire management strategy is the provision of a secondary access road linking to O'Brien Road to the east.

Peet Limited has obtained subdivision approval over a portion of Lot 243 O'Brien Road, enabling the construction of this secondary access road to/from the Estate (WAPC Subdivision Reference: 140580). A copy of the subdivision approval is included (**Attachment 5**). The road will be delivered as part of the Stage 1 subdivision works.n n

### 3.3.5 BUSH FOREVER

The WAPC's Bush Forever policy document identifies regionally significant bushland which is to be retained and protected.

There are **no** Bush Forever sites identified within the area subject of this SP.

## 4. SITE ANALYSIS

### 4.1 TOPOGRAPHY

The subject site is located within the Darling Scarp. Levels within the site range from a low of approximately 175m AHD along the northern boundary, to a high ridgeline of approximately 280m running in an east-west direction through the site. The topography of the site whilst relatively flat in the central and eastern portions, becomes undulating before falling steeply towards the valley floor to both the west and north, and to a lesser degree, towards the south.

Elevation ranges for the site are depicted on **Figure 6**.

### 4.2 GEOLOGY & GEOMORPHOLOGY

The major soil formation over the site includes Dwellingup Plateau, Helena, Mambup and Myara classifications (Department of Agriculture, 1990). These soil formations can be described as gently undulating terrain with well drained, shallow to moderately deep gravely brownish sands, pale brown sands and earthy sand overlaying laterite duricrust.

Areas of the site comprises gently to moderately incised rocky valleys with moderately well to well drained duplex and granulation soils formed from the weathering of granites and gneisses, and intruded doleritic parent materials. (**Figure 7**)

The main area to be subject to development comprises primarily Dwellingup Sands with minor incursion by Yarragil and Myara classifications.

A land capability (geotechnical) assessment of the subject area was conducted by Land Assessment WA Pty Ltd in February 2007 (**Attachment 6 and 7**). The report concluded that there are no areas of poor drainage or shallow water table across the site, with the proposal to utilise best practice techniques in the construction of roads etc providing further safeguarding against any potential geotechnical issues.

Additional geotechnical investigation was undertaken by Coffey Geotechnics (**Attachment 7**).

### 4.3 HYDROGEOLOGICAL

Limited groundwater in the area occurs in small localised pockets of variable quality and quantity. However, due to the topography of the area, surface expressions are characterised by deeply incised stream to the south and west of the site. Such streams include the tributary running from east to west towards the Swan River and other surface water expressions.

As depicted from the Department of Environment (DoE) *Perth Groundwater Atlas* (2004), groundwater salinity information is presented. As identified within the Atlas, groundwater in the vicinity of the site may be of moderate to high salinity. Water tables will not be disturbed due to the high level of tree retention and water for drinking purposes will be derived from the reticulated water scheme. Further hydrological and drainage considerations are dealt with in more detail in **Section 6.0** of this report.

- Suitable setbacks of effluent disposal systems from watercourses; and
- Continuation of the weed management program that commenced in 2006.

The SP appropriately acknowledges and caters for the protection of these areas wherever possible.

Subsequent to the above assessment, Cardno BSD was engaged in 2007 to undertake further studies and investigations relating to environmental/flora and fauna management issues. Specifically, Cardno BSD oversaw the production of:

- A Fauna Assessment (level 1) by Greg Harewood;
- Detailed site visits and reporting on wetlands/creek lines; and
- Identification of (fauna) habitat trees – undertaken as part of the Fauna Assessment by Greg Harewood.

This additional investigation work, further detailed in **Attachment 9**, resulted in the following key outcomes for the SP:

- The identification of a 'perched' wetland and associated creek line and recommendations for the protection and management of these;
- The re-confirmation of areas containing 'pristine' and 'excellent' vegetation;
- Identification of habitat trees across the site;
- Recommendations for the refinement of lot and road boundaries and use of building envelopes to enable the better protection of the higher quality vegetation, creek lines and habitat trees across the site; and
- A reduction in the number of proposed lots to further assist in the protection of the above environmental attributes across the site.

This additional environmental assessment and associated recommendations have improved the site responsiveness of the SP to the point where the attached refined design (**Attachment 3**) can be considered to address all key environmental issues and government policy relevant to the site, address the environmental issues raised through public consultation and display best practice environmental design for this type of development.

The environmental process was also subject to review by the Minister for Environment, with the level of assessment having been appealed. The appeals were dismissed, with the Minister upholding the initial determination that the site was not required to be formally assessed. A copy of this determination is attached as **Attachment 10**.

## 4.5 VIEW SCAPE ANALYSIS

EPCAD (Specialist Landscape Architecture Consultants) has undertaken an extensive view scape analysis for the western and northern boundary of the proposed development.

From the desktop analysis taken to date, there were potential sites of Aboriginal Heritage within the subject land. In light of this, consultation with the Nyoongar people was undertaken, with site truthing of any proposed site. Following this consultation process, managed by Australian Interaction Consultants, an Aboriginal Management Plan (**Attachment 12**) was prepared, and is to implemented during the development of the subject area.

#### 4.7 EUROPEAN HERITAGE

As the site is largely undeveloped, there is no sites identified featuring European heritage. A search of the Heritage Council of Western Australia's (HCWA) Place's Database confirms this. However, should artefacts or sites of European Heritage be discovered on site, they will be reported to the City of Swan and where necessary, HCWA also.



## 5. STRUCTURE PLAN

### 5.1 DESIGN PHILOSOPHY

The SP espouses the highest standards in urban design, environmental performance and sustainability.

The revised plan (**Attachment 3**):

- incorporates bush fire management techniques and strategies that protect lives and property, whilst being sympathetic to visual amenity;
- responds to the native remnant vegetation located in the area by protecting and preserving its landscape qualities and the various communities identified through the vegetation assessment (**Section 5.2.1**);
- respects and integrates with the existing surrounding Brigadoon community;
- implements current best practice urban design elements – safety, legibility, diversity, energy efficiency, connectivity and identity;
- features a sympathetic road network, recognising natural topography, fire management and accessibility requirements and existing vegetation;
- provides for best practice in relation to water and nutrient management through water sensitive techniques that is sympathetic to the Swan River, including appropriate stormwater and wastewater management;
- provides a site responsive design capitalising on the natural attributes of the site by sharing and protecting these benefits with both the future inhabitants and the greater community;
- provides sufficient space for future infrastructure to be provided within the area; and
- facilitates the necessary road connection to O'Brien Road.

In conjunction with the design guidelines, construction will comply with Building Code of Australia and Building Design Guidelines.

### 5.2 DESIGN RESPONSE TO CONTEXT AND SITE ANALYSIS

#### 5.2.1 GENERAL RESPONSE

The SP shown as **Attachment 3** represents a response to the particular dynamics of the site. Presenting a strictly managed approach that is responsive to the environment, the lot design complements the unique characteristics of the locality.

Two additional sites incorporating 'Excellent' vegetation are located towards the central western portion of the site adjacent to the existing creek lines. Through detailed design and lot configuration, future rural-residential development can be configured away from the areas of 'Excellent' vegetation. This balanced approach enables development to occur in an ecologically sustainable manner.

As part of the Vegetation Assessment conducted over the subject site, the habitats of potential priority flora species have also been identified. Through detailed design, nearly all potential habitats for potential priority species have been protected. The configuration of lots in close proximity to the potential habitats has been altered to accommodate development whilst protecting habitat areas. Furthermore, clearing restrictions and design guidelines are proposed on affected lots in order to minimise disturbance caused by future built form.

The topography of the site is such that two seasonal creek lines are located towards the north and a further two along the western portions of the site. As reflected on the SP, buffers as derived from the a biophysical assessment undertaken and adopted by the Department of Water, will be provided either side of the creek line in which effluent disposal will be prohibited.

The proposal with respect to the vegetation on the subject site, its clearing & modification, and retention of native bushland was assessed by the Environmental Protection Authority in 2008/2009, with the proposal and controls contained within this SP deemed acceptable and compliant with current policy and objectives of the EPA (**Attachment 10**).

### 5.2.3 VIEW SCAPE PROTECTION RESPONSE

As conveyed in **Section 4.5**, the extensive view scape analysis conducted for the site's western boundary has resulted in the recommendation and adoption of view scape building envelopes as depicted on the SP (**Attachment 3**).

The utilisation of these envelopes is based on the assessment provided by EPCAD and provides a detailed design response protecting view points from the coastal plain and the Swan Valley. Combined with the other recommendations, the use of building envelopes on the western lots will protect the visual interface of Brigadoon.

Importantly, as embodied within the existing approved Brigadoon Structure Plan, a key strategy for maintaining the visual landscape integrity of the site's western face is the reduction of major embankments/earthworks that would ordinarily be needed to support the construction of a boundary road(s) within this steep and undulating terrain.

To this end, the utilisation of more site sensitive strategic fire breaks along the site's perimeter is viewed as the most sympathetic and appropriate response.

### 5.2.4 BUSHFIRE RESPONSE

As discussed in **Section 3.3.4** Bushfire Planning, the WAPC Policy Guide's Development Control Policy No. 3.7 Fire Planning and "Planning for Bushfire Protection" have been used to conduct a Bush Fire Hazard Assessment which forms the basis for the design response reflected in the SP. Through consultation with the City of Swan, in principle agreement for the bushfire response has been attained.



- Hazard reduction within remnant vegetation to be maintained below 6-8 tonnes per hectare beyond the protection and separation zones.
- Driveways to be constructed to the same standard as the Strategic Firebreak; and
- Planting of trees not to be permitted within 6 metres of the centre of any firebreak.

Importantly, the negotiation of a (third) road link towards O'Brien Road provides an additional evacuation route in the event of an emergency. In the event of a fire front from a southerly or westerly direction, the access from O'Brien Road prevents entrapment for the entire community being important criteria for successful bushfire management. The designated road connection between the northern portion of Brigadoon Estate proposed under this SP and O'Brien Road is to be constructed and gazetted as a public road as part of, or prior to, any subdivision.

The Bushfire Management Plan has been prepared to reflect the requirements of the Planning for Bushfire Protection document and is required to be approved by the City's Coordinator Volunteer and Fire Services.

### 5.3 ROAD NETWORK / ACCESS

Conforming with the previously approved Structure Plan (ODP), principal access to the site is from the south via the eastern and western sections of the previously proposed 'loop' road. The design proposes extensions and connection of these roads into the subject land to complete the 'loop' of some 23 metres in width.

This internal loop road is an extension of Campersic Road, of which a Road Safety Review (audit) has been undertaken (**Attachment 14**). This audit determined that there are several areas that need to be upgraded with respect to Campersic and other adjoining roads, though the increased traffic volumes resulting from the proposed development are not the cause for this.

Campersic and surrounding roads were originally designed to cater for the lots proposed by this development, with the subject site forming the last stage of the larger Brigadoon Estate. The Road Safety Report identifies that the existing road network in terms of capacity is sufficient to cater for the traffic generated by the 214 lots proposed by this SP.

Extending from the loop road is the secondary road network servicing proposed lots. The gently meandering road network responds to the natural topography of the area and the desire to retain identified significant native tree stands. A road reserve width of 20m has been provided for these roads to accommodate roadway, drainage and landscaping infrastructure.

Although the road and access network is gently meandering, it is distinctively permeable and legible. To maintain consistency, the carriageway widths will remain consistent with previous stages of Brigadoon Estate.

In precincts where cul-de-sacs are used, appropriate firebreaks and multiple egress points are provided to ensure a significantly reduced risk to entrapment.

A third access to the site is provided to the east which links onto O'Brien Road. This road further improves potential access options for visitors and residents to the area and provides additional evacuation routes for the community in the event of a bushfire.

As stated, the road connection is being facilitated through an approved subdivision application and has resulted from negotiations and agreement reached between Peet Limited and the two land owners to the east within which the proposed road is to traverse through to O'Brien Road.

### 5.4 RURAL RESIDENTIAL LOTS

Complementing the improvements of the SP is the refinements made to the proposed mix of rural residential lots within the plan.

The proposed rural residential lot product ranges from 1.5 hectares through to 5.05 hectares in area. The average lot size of 1.9 hectares prevails over the 214 lots proposed in total. The following summary table provides a breakdown of the proposed lot product.

An agreement has been prepared between Peet Limited and the Public Transport Authority (PTA) relating to the ongoing use of the existing railways communications tower. The agreement allows the PTA a 'Licence to Occupy' part Lot 1010 Connemara Drive, Brigadoon for the purpose of the erection of and operation of communications mast and equipment shelter, together with a right of access over existing tracts from the access gate. The licence is valid until such time that a separate lot is created for the licensed premises. This licence will allow Telstra and the WA Police to enter the licensed premises.

An additional site at the second high point has been allocated for water tanks at this location. In consultation with the Water Corporation, a site of 1.47 hectares has been designated for further water tanks. Funding of the additional infrastructure is anticipated to occur via headwork contributions to the Water Corporation.

## 5.7 BUILDING ENVELOPES

Whilst there is no requirement under Section 5A1.6 of Council's Scheme to include building envelopes on the SP, arising from the more specific recommendations of the detailed vegetation, bushfire prevention and view scape analysis undertaken by the specialist sub-consultants, Building Envelopes have been depicted on all of the proposed allotments. This is to foster the protection of existing vegetation (including habitat trees), creek lines and view scape which are considered paramount.

For the remaining allotments, where no building envelopes are depicted on the SP, explicit siting requirements are specified (e.g. capping envelope sizing to maximum 10% of the lot area, minimum boundary setbacks, separation from creek lines etc). These requirements can be and have been notated on the SP itself, thereby providing for a legal means of enforcement. In this way, building envelopes can be achieved through descriptive and not prescriptive means.

## 5.8 DESIGN GUIDELINES

Design Guidelines are to be prepared to guide all built form on the proposed rural residential lots. These will help implement key objectives including the protection of visual amenity and fire protection as conveyed in the findings of the visual landscape appraisal and fire management plan.

The Design Guidelines will provide direction to prospective purchasers in regard to the following design elements:

- Development Processes
- Site Planning
- Bushfire Protection
- Building Envelopes
- Setbacks and Heights
- Materials and Finishes



## 6. SERVICING

### 6.1 MAJOR SERVICES

Development Engineering Consultants has prepared an Engineering Services & Development Report detailing the items including roads, water supply, power supply, site drainage and wastewater. A copy of the Engineering Services & Development Report is attached as **Attachment 16**. The key findings are outlined below.

Utilities are either existing or easily extendable into the site. The disposal of residential wastewater will be through individual household disposal systems. It is envisaged that all houses will utilise aerobic treatment units (ATUs - NovaClear) for treatment prior to disposal of wastewater into gardens. Each system will be individually approved by the City at building approvals stage.

#### 6.1.1 WATER SUPPLY

Advice from the Water Corporation has indicated that some 200 lots are currently catered for in the design of the system. As 219 lots are proposed, there may need to be some minor upgrading to supply system.

As the system does service lots located above the 275 metre contour, there will be a need to have either a booster pump system or a high level supply tank installed. The water supply site identified on the Structure Plan (ODP) has been appropriately sized to incorporate the existing ground tank plus the high level tank with accompanying overflow accommodation.

The water supply pipeline to the site will be located within the proposed road reserves. Any future augmentation of the supply will need to be similarly located, and will be installed at the direction of the Water Corporation.

#### 6.1.2 DRAINAGE

It is proposed that site drainage will be restricted to roads with a combination of piped and rock pitched table drains depending on soil type, topography and road grade.

Storm water will be directed to collection points located either within road reserves where special treatment with vegetation can be attained, or to drainage basins for storage, compensation and nutrient stripping.

The eventual outfall for site drainage is into local water courses and therefore attention will be given to ensure the water is as clean as possible. Any modification to a watercourse, its bed or banks requires a permit from the Department of Water. It is anticipated that the basins will be located along the road frontages either in easements in favour of the City or in special drainage reserves. Vegetation screening will accompany the basin construction to ensure an aesthetic compatibility.

At the time of subdivision further geotechnical analysis will be undertaken to ensure compliance with the requirements of the Western Australian Planning Commission with building envelope locations being dependent on geotechnical findings as well.

## 7. TIMING OF DEVELOPMENT

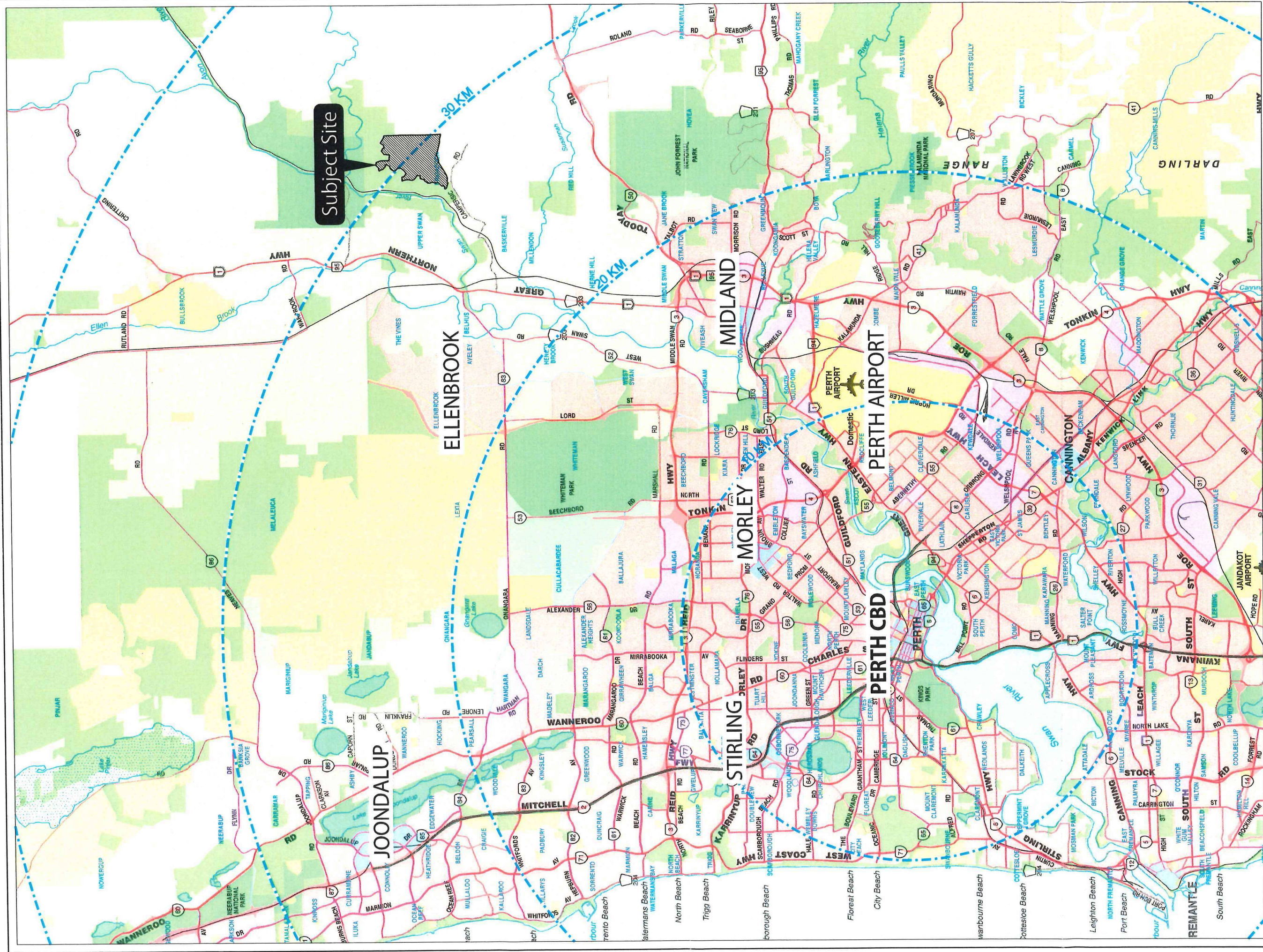
Dependent upon the timing of approval of the proposed SP and future subdivision applications, site works are anticipated to commence at Brigadoon in winter 2010.

Staging of development is currently anticipated to be programmed at 50 lots per stage and released progressively from the southern end of the site towards the north. This would present a staged release of four to five phases.



FIGURE 1



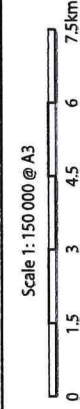


## REGIONAL CONTEXT PLAN

BRIGADOON

for: Peet Limited.

Scale 1: 150 000 @ A3



COMPILED: DPS	DRAWN BY: JNP
DATE: 9/8/2012	REVISED:
GRID: MGA 50	DATUM:
DRAWING NUMBER: PACBR-5-001	JOB CODE: PACBR5P
FILE ID: MYPACBRBASEReport FiguresPACBR-5-001.dgn	



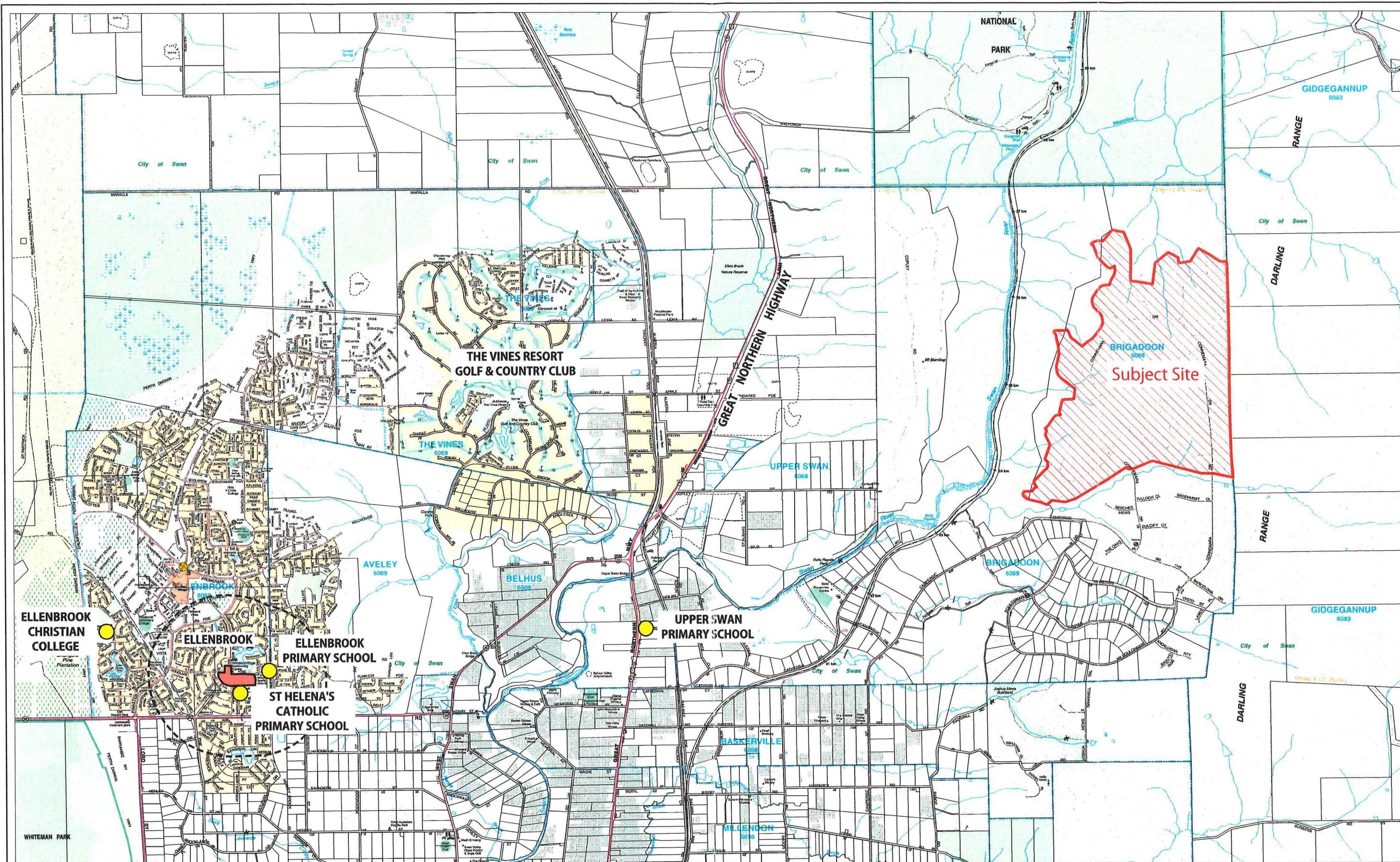
Development  
Planning Strategies

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PO BOX 6697 EAST PERTH 6892  
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E dps@dpswa.com.au



FIGURE 2





**LOCAL CONTEXT PLAN**

**BRIGADOON**

for: Peet Limited.

**PEET**

ENDORSEMENT OF REGISTERED TOWN PLANNER

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

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NORTH		Scale 1: 40 000 @ A3	
COMPILED: DPS	DATE: 9/8/2012	DRAWN BY: JNP	REVISED:
GRID: MGA 50	DATUM: AHD	PACBR-5-002	JOB CODE: PACBRSTP
DRAWING NUMBER: PACBR-5-002	FILE ID: M:\PACBR\BASE\Report Diagrams\PACBR-5-002.dgn		

**dps**  
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FIGURE 3





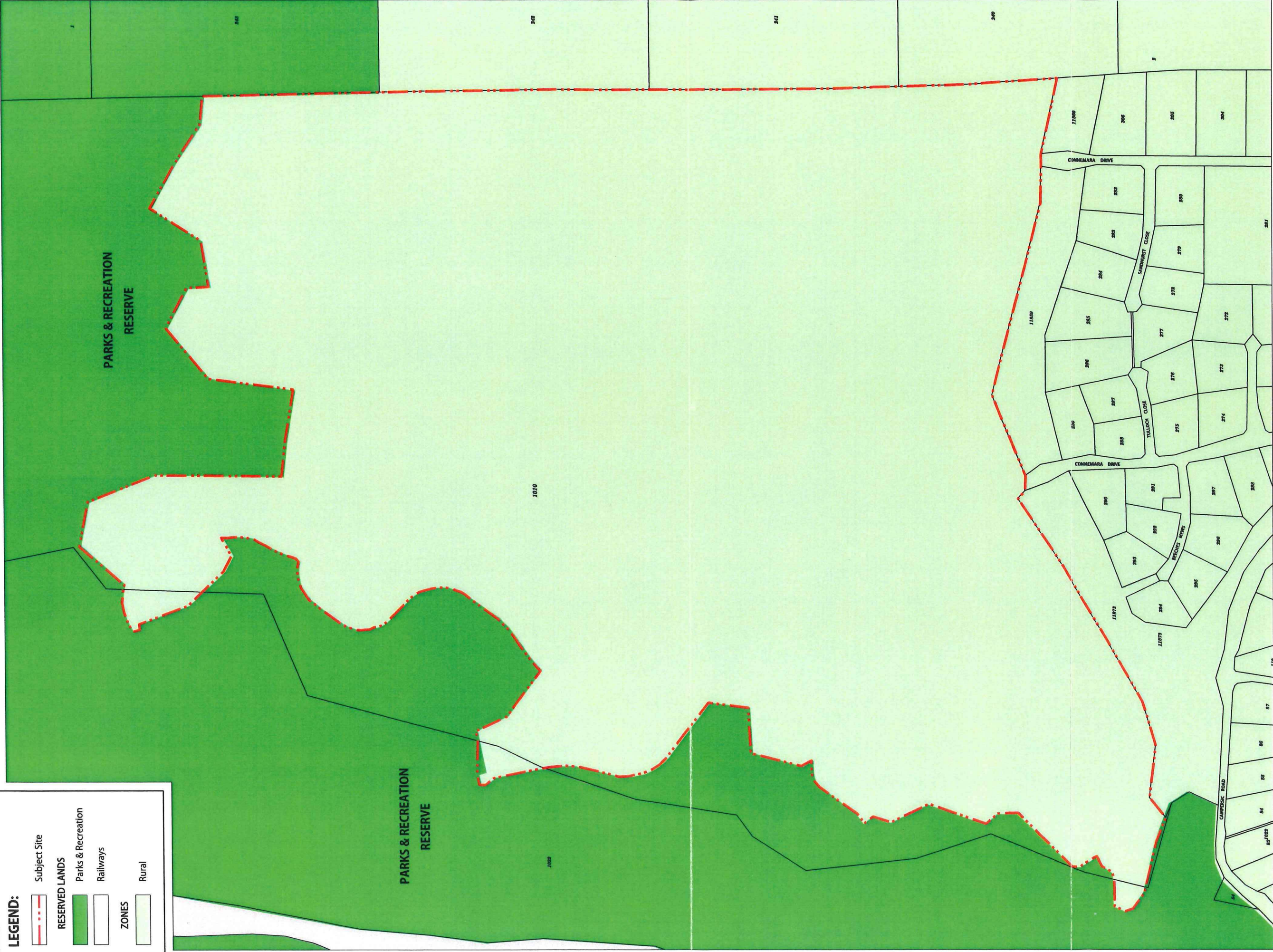


FIGURE 4



LEGEND:

- Subject Site
- RESERVED LANDS
- Parks & Recreation
- Railways
- ZONES
- Rural



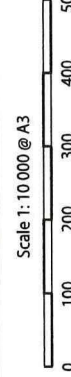
EXISTING MRS ZONING

BRIGADOON

for: Peet Limited.

**PEET**

NORTH



Scale 1: 10 000 @ A3

COMPILED: DPs, WAPC	DRAWN BY: JNP
DATE: 10/8/2012	REVISED: AHD
GRID: MGA 50	DATUM: PACBRSTP
DRAWING NUMBER: PACBR-5-004	JOB CODE: PACBRSTP
FILE ID: M:\PACBR\BASE\Report Diagrams\PACBR-5-004.dgn	



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FIGURE 5





FIGURE 6

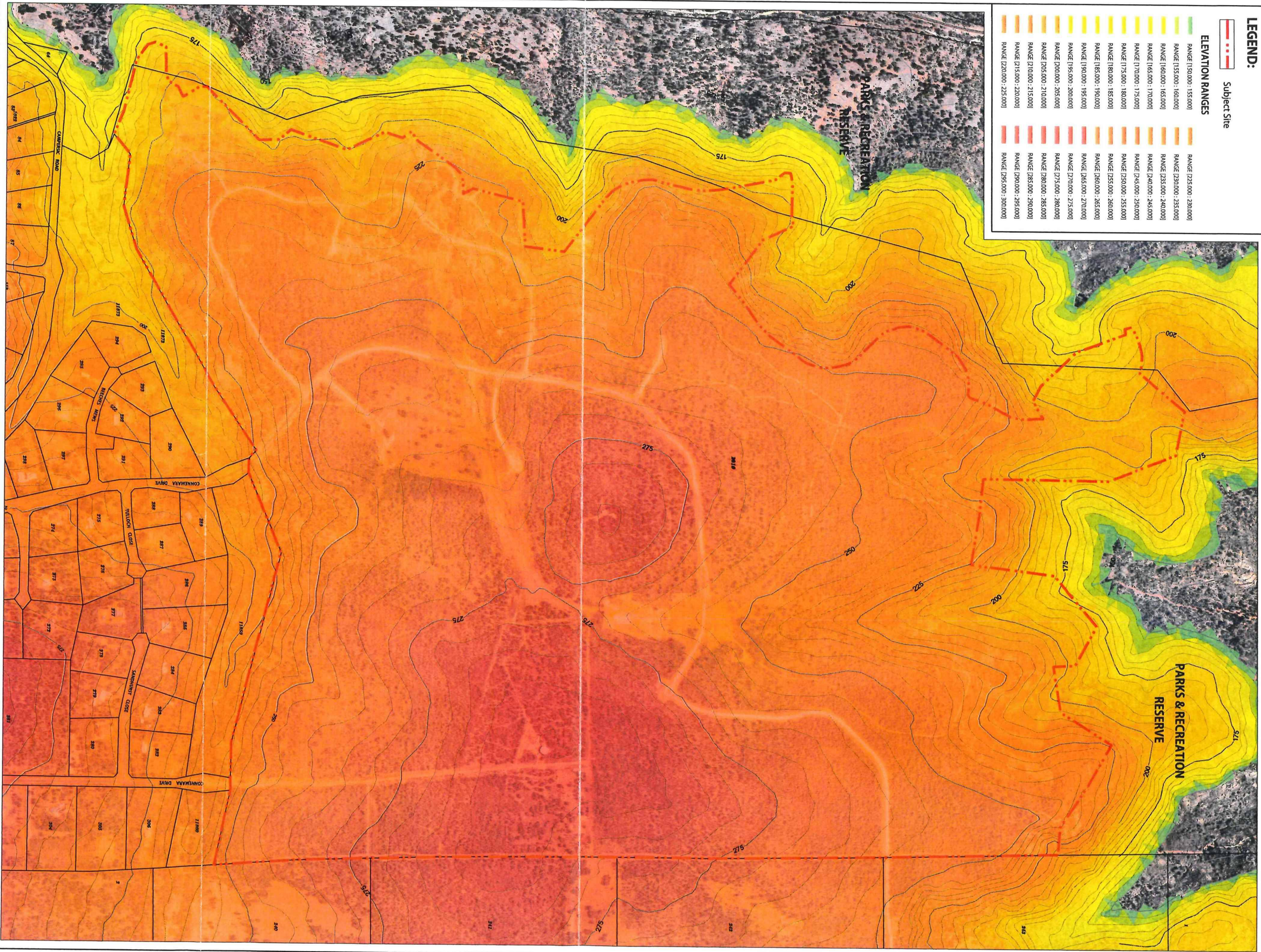


LEGEND:

Subject Site

ELEVATION RANGES

RANGE 1150.000 - 155.000	RANGE 125.000 - 230.000
RANGE 1155.000 - 160.000	RANGE 1250.000 - 235.000
RANGE 1160.000 - 165.000	RANGE 1255.000 - 240.000
RANGE 1165.000 - 170.000	RANGE 1260.000 - 245.000
RANGE 1170.000 - 175.000	RANGE 1265.000 - 250.000
RANGE 1175.000 - 180.000	RANGE 1270.000 - 255.000
RANGE 1180.000 - 185.000	RANGE 1275.000 - 260.000
RANGE 1185.000 - 190.000	RANGE 1280.000 - 265.000
RANGE 1190.000 - 195.000	RANGE 1285.000 - 270.000
RANGE 1195.000 - 200.000	RANGE 1290.000 - 275.000
RANGE 1200.000 - 205.000	RANGE 1295.000 - 280.000
RANGE 1205.000 - 210.000	RANGE 1300.000 - 285.000
RANGE 1210.000 - 215.000	RANGE 1305.000 - 290.000
RANGE 1215.000 - 220.000	RANGE 1310.000 - 295.000
RANGE 1220.000 - 225.000	RANGE 1315.000 - 300.000


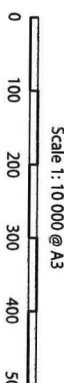


ELEVATION RANGES

BRIGADOON

for: Peet Limited.

PEET

Scale 1: 10 000 @ A3	
	
	
COMPILED: DPS, WAPC	DRAWN BY: JNP
DATE: 10/8/2012	REVISED:
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FILE ID: M:\PACBR\BASE\Report Diagrams\PACBR-5-006.dgn	



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FIGURE 7

LEGEND:

Subject Site

SOIL TYPES

"Darling Scarp"  
"Dwellingup"  
"Mambup"  
"Myara"  
"Helena"

PARKS & RECREATION  
RESERVE

PARKS & RECREATION  
RESERVE

SOIL TYPES (Source: Agriculture WA 1990)

BRIGADOON

for: Peet Limited.



Scale 1: 10 000 @ A3



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FILE ID: M:\PACBR\BASE\Report Diagrams\PACBR-5-007.dgn	



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FIGURE 8



