Western Australian Planning Commission

Your ref: 109/048
Our ref: TPS/1923
Enquiries: Heather Brooks (6551 9436)

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Chief Executive Officer
City of Cockburn
PO Box 1215
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Transmission via electronic mail to: recordsrequests@cockburn.wa.gov.au

Dear Sir

LOCAL PLANNING SCHEME NO. 3 - AMENDMENT NO. 112

I refer to your letter dated 16 January 2018 regarding Amendment No. 112.

The WAPC has considered the amendment and submitted its recommendation to the Minister in accordance with section 87(1) of the *Planning and Development Act 2005* (the Act).

The Minister has approved the amendment in accordance with section 87(2)(a) of the Act.

In accordance with section 87(3) of the Act, the WAPC will cause the approved amendment to be published in the Government Gazette.

The WAPC has forwarded notice to the State Law Publisher (attached) and it is the local governments' responsibility to make arrangements for the payment of any publication costs. The local government is required under section 87(4B) of the Act, and regulation 64 of the *Planning and Development (Local Planning Schemes) Regulations 2015*, to publish the approved amendment, ensure that it is available to the public, and notify each person who made a submission.

For all payment and purchase order queries, please contact the State Law Publisher on (08) 6552 6012 or fax (08) 9321 7536. One signed set of the amending documents is returned for your records.

Please direct any queries about this matter to Heather Brooks on 6551 9436 or schemes@dphl.wa.gov.au.

Yours sincerely

KM Blenkinsop

Kerrine Blenkinsop
Secretary
Western Australian Planning Commission
26/02/2018

PLANNING AND DEVELOPMENT ACT 2005

APPROVED LOCAL PLANNING SCHEME AMENDMENT

City of Cockburn

LOCAL PLANNING SCHEME No. 3- AMENDMENT No. 112

Ref: TPS/1923

It is hereby notified for public information, in accordance with section 87 of the *Planning and Development Act 2005* that the Minister for Planning approved the City of Cockburn Local Planning Scheme amendment on 23 February 2018 for the purpose of:

1. Extending the Additional Use area AU1 covering Lots 701, 702 and portion of Lot 703, Jandakot Road, corner of Pilatus Street, Jandakot to include the whole of Lots 701, 702 and 703 excluding road widenings and Bush Forever Site 388C.

2. Amending the Scheme map accordingly.

3. Amending Table 6 - Additional Uses of the Scheme Text by deleting the provisions relating to Additional Use AU1 and replacing them with the following:

No.	Description of Land	Additional Use	Conditions
AU1	Lots 701, 702 and 703 (excluding Bush Forever Area 388C) Jandakot Road, Jandakot. [Formerly Lots 101, 103 and 104 Jandakot Road, Jandakot]	• Nursery; • Masonry Production; • Warehouse, Showroom and Storage where the display, selling, hiring or storage of goods, equipment, plant or materials and the incidental site activities do not pose risk of pollution to the below ground public drinking water source. The Use Class Definitions for 'Warehouse', 'Showroom' and 'Storage' are defined in Part 6 of the Scheme inclusive of the supplementary restrictions as mentioned above which limit the nature of the permisable goods, equipment, plant or materials to those which do not pose risk of pollution to the below ground public drinking water source.	1. All development is to have due regard to a Local Development Plan prepared for the Additional Use No. 1 area. The Local Development Plan is to address the following: a. The standards to be applied for physical development in order to ensure the protection of the below ground public drinking water source; b. Building design, and vehicle access and egress arrangements to minimise the

			amenity impact to surrounding properties; c. Noise mitigation measures pursuant to the details of an acoustic report where required; d. Interface controls and/or measures with regard to Bush Forwver Area 388, including, but not limited to; a hard road edge within the AU1 area abutting the Bush Forever area and/or bushland identified for protection; Bushfire mitigation measures being provided outside the Bush Forever area within the AU1 area; an appropriate wetland buffer, if considered relevant by the assessing authority, and; drainage to be contained within the AU1 area; e. Identify revegetation areas to be used as a buffer between adjoining environmental and rural living land uses; and f. Identify land on Lot 703 required for the upgrade of Jandakot Road, which may form part of Additional Use No. 1 area. 2. No bulk storage of green-waste, compost or Toxic or Hazardous Substances (THS)

			are permitted above 25 litres in total volume, excluding fuel within vehicle fuel tanks. THS includes pesticides, herbicides, fuel (storage), explosives, flammable liquids, cleaners, alcohol, fertilisers (other than on Lot 702 under current development approvals), medical or veterinary chemicals, pool chemicals and corrosive substances; inclusive of the substances listed in the *Poisons Act 1964* (Appendix B). These substances may only be stored in volumes above 25 Litres if contained within domestic sized packages ready for end use in domestic situations. 3. Development of any Warehouse, Showroom, or Storage land use must be connected to reticulated sewer. 4. Any applications for the development of any Warehouse, Showroom or Storage land use is subject to the preparation, implementation and update the following documents to the satisfaction of the Local Government: a. Site Chemical Risk Assessment report; b. Dust Management Plan; and c. Acoustic report. 5. No below ground storage is permitted.

			6. As part of any future application for subdivision and/or development, land identified for the upgrade of Jandakot Road is to be ceded free of cost and constructed by the Applicant as follows: a. The amount of land to be ceded from the Additional Use No. 1 area is to form a single carriage way as depicted on an approved Local Development Plan; and b. The Applicant is required to construct the ceded land as one additional carriage way to Jandakot Road. 7. As part of the first application for subdivision and/or development, the Applicant shall cede land within the Bush Forever Site free of cost to the Crown. 8. Notwithstanding any subdivision provisions in the Scheme, the minimum lot size for subdivision is 2 hectares.

L HOWLETT
MAYOR

S CAIN
CHIEF EXECUTIVE OFFICER

PLANNING AND DEVELOPMENT ACT 2005

RESOLUTION DECIDING TO AMEND TOWN PLANNING SCHEME

CITY OF COCKBURN

TOWN PLANNING SCHEME NO. 3

AMENDMENT NO. 112

RESOLVED that the Council, in pursuance of Section 75 of the Planning and Development Act 2005 amend the above Town Planning Scheme by:

1. Extending the Additional Use area A1 covering Lots 101, 104 and portion of Lot 103, Jandakot Road, corner of Launders Street, Jandakot to include the whole of Lots 101, 103 and 104 excluding road widenings, Bush Forever Site 388 C.

2. Amending the Scheme map accordingly.

3. Amending Schedule 2 – Additional Uses of the Scheme Text by deleting the provisions relating to Additional Use AU 1 and replacing them with the following:

No.	Description of Land	Additional Use	Conditions
AU 1	Lots 101, 103 [excluding Bush Forever Area 388] and Lot 104 Jandakot Road, Jandakot.	• Nursery; • Masonry Production; • Warehouse, Showroom and Storage where the display, selling, hiring or storage of goods, equipment, plant or materials and the incidental site activities do not pose risk of pollution to the below ground public drinking water source. The Use Class Definition's for 'Warehouse', 'Showroom' and 'Storage' are defined in ~~Schedule 1~~ of the Scheme inclusive of the supplementary restrictions as mentioned above which limit the nature of the permissible goods, equipment, plant or materials to those which do not pose risk of pollution to the below ground public drinking water source.	Development Approval for Lots 101, 103 and 104 Jandakot Road, Jandakot, are subject to; a) Due consideration to groundwater risk minimisation. b) No bulk storage of green-waste, compost or 'Toxic and Hazardous Substances' ('THS') are permitted above 25 litres in total volume, excluding fuel within vehicle fuel tanks. THS includes pesticides, herbicides, fuel (storage), explosives, flammable liquids, cleaners, alcohols, fertilisers (other than on lot 104 under current development approvals), medical or veterinary chemicals, pool chemicals and corrosive

		1. Environmental Requirements **Industrial Wastewater:** All wastewater produced from activities on-site must be disposed of to a system approved by the Local Government and in liaison with the Department of Water. **Site Chemical Risk:** A Site Chemical Risk Assessment Report being prepared and implemented and regularly updated. **Dust Management:** No visible dust generated by any aspect of operations on-site is to leave the subject land. The operator is required to submit to the Local Government, after consultation with the Department of Environment Regulation a Dust Management Plan. The Dust Management Plan must be to the satisfaction of the Local Government, and upon approval by the Local Government, is to be implemented and all times. **Noise Emissions:** The development is to comply with the *Environmental Protection Act 1986,* which contains penalties where noise limits exceed those, prescribed by the *Environmental Protection (Noise) Regulations 1997.* If noise emissions from loading operations and the block plant fail to comply with the *Environmental Protection Act 1986,* additional acoustic measures must be carried out as soon as reasonably practical to ensure the use complies with the Act. **Lighting:** The installation and maintenance of lighting must at all times comply with the requirements of Australian Standard AS 4282-1997 "Control of the Obstructive Effects of Outdoor Lighting". **Complaints:** The operator must prepare a "Complaints Handling Procedure" to ensure that there is a	substances; inclusive of the substances listed in the Poisons Act 1964 (Appendix B). These substances may only be stored in volumes above 25 litres if contained within domestic sized packages ready for end-use in domestic situations. c) Due consideration and compliance with the Western Australian Planning Commission's '*Transport Assessment Guidelines for Developments'*, where appropriate. d) The prior preparation and approval of a Local Development Plan ('LDP') detailing; i. The standards to be applied for physical development in order to ensure the protection of the below ground public drinking water source; ii. Vehicle access and egress arrangements; iii. Noise mitigation measures pursuant to the details of an acoustic report where required (refer to point 'e' below); iv. Interface controls and/ or measures with regard to Bush Forever Area 388. e) With regard to any application for 'Warehouse', 'Showroom' or 'Storage', the preparation and lodgement of a report prepared by a suitably qualified acoustic consultant detailing the potential noise impact on noise sensitive land uses. The report shall demonstrate how the proposed development has been acoustically assessed

		process for administering any complaints including the recording, investigation and response to any concern regarding the operation. **2. Design Requirements** Building design and location shall minimise the visual impact of the development from surrounding residents inclusive of appropriate buffers, noise bunds and vegetation (light and visual) screening. Building materials and colours must be clad or coloured to complement the surroundings, and/or adjoining developments in which it is located, and shall use non-reflective materials and colours. Regard shall be had to the screening of product storage. Staging Plan in the form of a Local Development Plan ('LDP') shall be prepared by the applicant and approved by the Local Government prior to any development within Additional Use area 1. **3. Traffic requirements** Planning proposals shall demonstrate appropriate traffic generation calculations and traffic impact assessments on the current and future planned road network. Mitigation measures shall demonstrate viability and road upgrade responsibilities. The extent of all traffic related considerations should be identified and agreed upon early in the planning process to the satisfaction of the Local Government.	and designed for the purposes of minimising the effects of noise intrusion and/or noise emissions. The report must demonstrate the measures required to address noise to the Local Government's satisfaction and be implemented and maintained as part of the development of the land f) Development of any 'Warehouse', 'Showroom' or 'Storage' must: i. Be connected to a reticulated sewer system; ii. Have all lighting comply with the requirements of Australian Standard AS-4282-1997 *"Control of the Obstructive Effects of Outdoor Lighting"* and the *Civil Aviation Regulations 1988* and the *Civil Aviation Safety Authority Manual* of Standards in accordance with the details prescribed within the *Jandakot Airport Masterplan*; iii. Have all structures comply with the Obstacle Limitation Surfaces in accordance with the details prescribed within the Jandakot Airport Masterplan; iv. Have a 'Site Chemical Risk Assessment Report' prepared, implemented and regularly updated, including annual reporting to the Local Government and the Department of Mines and Petroleum. v. Lodge a Dust Management Plan for approval by the Local Government and ongoing compliance by the property owner(s). g) Building design, internal

			vehicles access ways, and locations shall minimise the amenity impact of the development from surrounding residents. h) Building materials and colours must be clad or coloured to complement the surroundings, and/ or adjoining developments in which it is located, and shall use non-reflective materials and colours. i) No below ground storage is permitted. j) Stormwater from roofs and clean paved areas should be directed away from potentially contaminated areas where THS (below 25 litres in total volume) are stored or handled. Stormwater from carpark areas is to be managed as recommended in the Stormwater Management Manual for Western Australia (reference 8d) or relevant equivalent. k) Any liquids discharged to the environment (via soakage or ground application) should have been tested as compatible with downstream water resource values. Discharge to drains or waterways should not occur due to the risk of release of contaminated water. The effluent quality should be determined by sampling in accordance with Australian Standard 5667 Water quality sampling (reference 9b) or relevant equivalent. l) As part of future development and/or subdivision of the

			subject land, the applicant will be expected to; Provide the land for the Bush Forever site (as agreed) free of cost and ceded to the Crown. m) As part of future development and/or subdivision of the subject land, the land owner/applicant will be expected to: i. Provide the land for the widening of the adjoining section of Jandakot Road from a single carriageway road to a dual carriageway road free of cost to the City of Cockburn; ii. Upgrade the adjoining section of Jandakot Road from a single carriageway to a dual carriageway.

Dated this 8 day of September 2016

CHIEF EXECUTIVE OFFICER

FILE NUMBER. AMENDMENT 112

REPORT

1.	LOCAL AUTHORITY:	City of Cockburn
2.	DESCRIPTION OF TOWN PLANNING SCHEME:	Town Planning Scheme No. 3
3.	TYPE OF SCHEME:	District Zoning Scheme
4.	SERIAL NO. OF AMENDMENT:	Amendment No. 112
5.	PROPOSAL:	Deleting the columns headed "Additional Use" and "Conditions" from AU 1 of Schedule 2 – Additional Uses and replacing those columns with new provisions as well as adjusting the AU 1 area on Lots 102, 103 and 104 Jandakot Road, Jandakot (corner Launders Street) to allow for future road widening and expanding the AU 1 area over the balance of Lot 103 excluding Bush Forever Site 388.

AMENDMENT REPORT

1.0 Introduction

Amendment No. 112 proposes to expand the Additional Use area (AU 1) on Lots 101, 103 and 104, corner Jandakot Road and Launders Street (Pilatus Street), Jandakot allowing it to be used for a range of commercial purposes with low risk of polluting the Jandakot Groundwater Mound. An expanded Additional Use area will allow the location of uses supporting the rapidly developing Jandakot City Specialised Activity Centre as well as logistics functions taking advantage of proximity to the Kwinana Freeway, Roe Highway and the proposed Perth Freight Link connection to Fremantle Port.

The Amendment responds to the dramatic changes occurring in this part of Jandakot including the construction of Pilatus Street as the southern entry to the Jandakot City Specialised Activity Centre, necessary upgrades to Jandakot Road as a consequence of urbanisation to the east as well as recent announcements regarding the Perth Freight Link and regional transport infrastructure.

The Amendment is also backgrounded against the established planning framework as discussed later in this report, including securing the future of Bush Forever Site 388.

2.0 Background

Schaffer Corporation Ltd acquired the land the subject of this Amendment in 1989. It was originally used as a sandpit and subsequently, the Corporation developed the Urbanstone plant on the site, manufacturing mainly paving products but also a range of borders and other garden requirements, polished masonry flooring and wall panels as well as fireplace surrounds, mouldings etc. for commercial and domestic use.

Urbanstone's Jandakot plant supplies product marketed in all other states. It is the major producer of these types of products in the country with virtually all competing product being imported. Urbanstone employs approximately 100 people directly with more engaged in indirect employment, servicing and supplying the plant.

To the north, adjoining the Amendment land is the Jandakot Airport, a Specialised Activity Centre accommodating Jandakot City comprising an oil and gas bub, major retailing, warehousing and logistics industries as well as the general aviation airport. Development of the Specialised Activity Centre includes the construction of Pilatus Street (nee Launders Street), ultimately designed to highway standards, linking directly into Berrigan Drive and the Kwinana Freeway. As part of this work, the section of Jandakot Road east of the Berrigan Drive intersection is to be widened and upgraded. Increasing traffic volumes on Jandakot Road and works to accommodate this growth dictate that in the foreseeable future, B-double trucks leaving the Urbanstone plant will be unable to complete right hand turns onto Jandakot Road resulting in circuitous and inefficient connections to the regional road network. This will be seriously detrimental to the plant.

To address this outcome, routes need to be identified within the Amendment Area allowing B-double traffic to exit onto the future Pilatus Street in order to obtain more direct and efficient access to the regional road network. Coupled with this need is a demand identified by the airport operators for smaller scale support businesses to be accommodated within the Amendment Area.

In addition to the Urbanstone plant, the land accommodates a nursery and development approval has been granted to a showroom component. The northern 13ha (approximately) is identified as Bush Forever Site 388. This Amendment will result in this Site being secured in public ownership.

A range of policy initiatives and strategic plans impact the Amendment Area requiring this report to address development proposals in the context of those policies and strategic plans.

The factors identified in this background conspire to result in this Amendment being the best planning outcome for the subject land. These factors are discussed in detail in this report providing the necessary justification for promulgation of this Amendment.

3.0 Amendment Type

As per Part 5 of the Regulations, there are several amendment types: basic, standard and complex. These are defined in Part 5, Division 1, Regulation 34.

Regulation 35(2) requires the local government to specify in their resolutions to prepare or adopt an amendment what type of amendment it is, as well as the explanation for forming that opinion.

This proposed amendment is considered to be a complex amendment, which Regulation 34 describes as:

complex amendment means any of the following amendments to a local planning scheme –

a) an amendment that is not consistent with a local planning strategy for the scheme that has been endorsed by the Commission;

b) an amendment that is not addressed by any local planning strategy;

c) an amendment relating to development that is of a scale, or will have an impact, that is significant relative to development in the locality;

d) an amendment made to comply with an order made by the Minister under section 76 or 77A of the Act;

e) an amendment to identify or amend a development contribution area or to prepare or amend a development contribution plan;

This proposed amendment satisfies a), b) and c) of the above criteria. In particular, the proposal is no countenanced in any local planning strategy, endorsed by the Commission or otherwise the amendment is of a scale with potential impacts relative to the development in the locality, principally in relation to traffic, Bush Forever Site 388 and the Jandakot Groundwater Mound.

4.0 Town Planning Context

4.1 Local Planning Context

4.1.1 City of Cockburn Town Planning Scheme No. 3

TPS 3 zones the subject land as "Resource" along with land to the south and either side as shown at **Figure 1**.

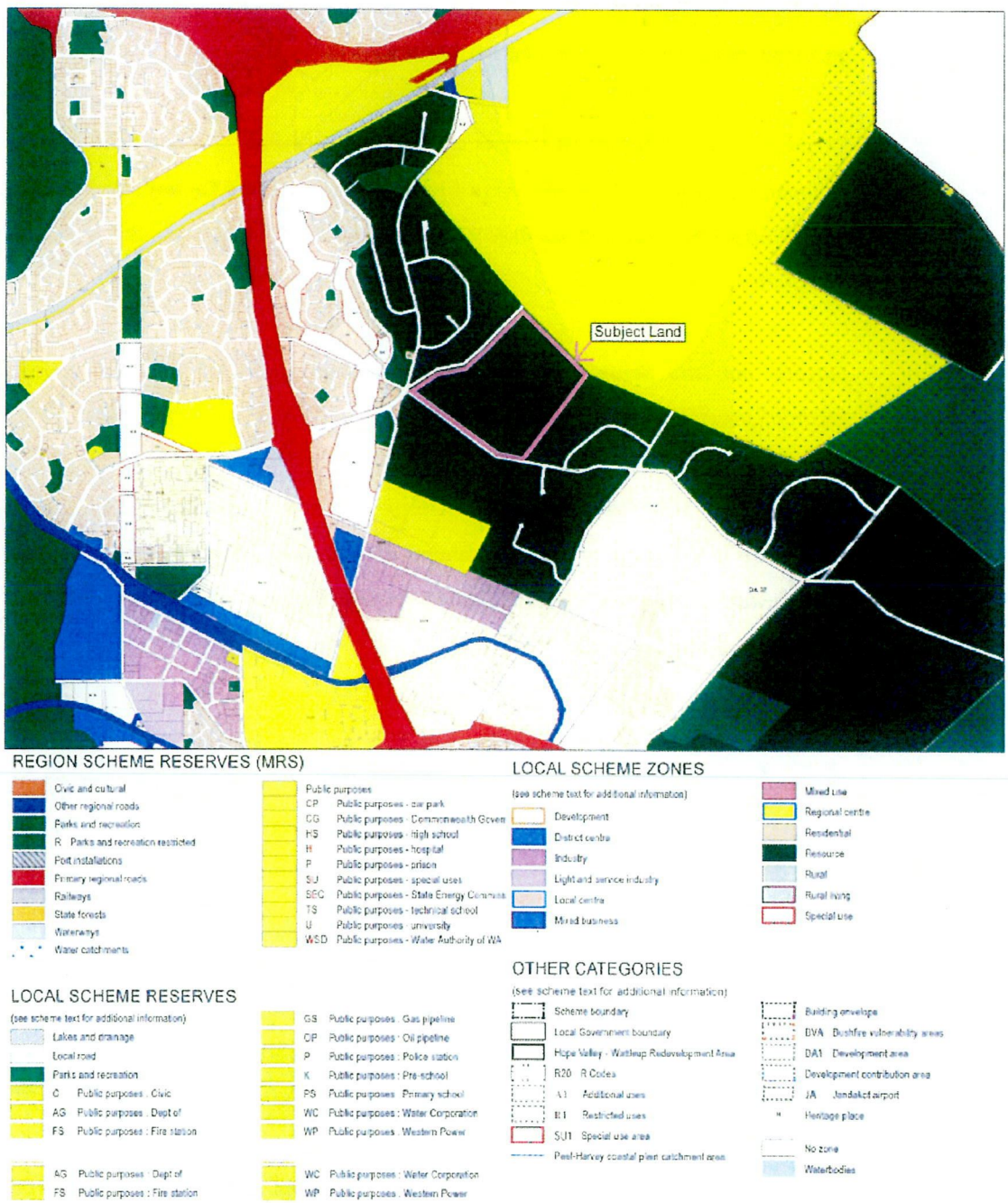

FIGURE 1

The Zoning Table of the Scheme advises that:

"Development and use of land is to be in accordance with –

i). ***Statement of Planning Policy No. 2.1*** *– Peel-Harvey Coastal Plain Catchment Policy gazetted on 21 February 1992; and (AMD 6 GG 13/6/06)*

ii). ***Statement of Planning Policy No. 2.3*** *– Jandakot Groundwater Protection Policy gazetted on 12 June 1988; (AMD 6 GG 13/6/06)*

iii). *Despite the provisions of Statement of Planning Policy No. 2.1 and Statement of Planning Policy No. 2.3 referred to in (i) and (ii), Use Classes* ***Cattery, Dog Kennels and Poultry Farm (housed) are uses not permitted 'X'*** *in the Resource Zone, with the exception of (iv).*

iv). ***Cattery and Dog Kennels*** *may only be permitted within the Resource zone in accordance with Schedule 2 – Additional Uses.*

v). *The Use Classes of* ***Plant Nursery*** *(wholesale and retail) and* ***Equestrian Activity*** *prescribed in Table 1 of the* ***Statement of Planning Policy No. 6*** *Jandakot Groundwater Protection Policy shall only be permitted on a lot which has an area in excess of* ***4 Hectares****"*

The subject land is not affected by the Peel – Harvey Coastal Plain Catchment Policy and therefore, the provisions of this policy are not relevant to the land. TPS 3 identifies that the development and use of the subject land is to accord with SPP 2.3. This Scheme Amendment demonstrates that the additional uses identified are orderly, although inconsistent with SPP 2.3.

Lots 101, 103 and portion of 104 are currently included within Additional Use Zone 1, which provides for the land uses of Nursery, Masonry Production, Warehouse where ancillary to masonry production and Showroom, again where ancillary to masonry production.

The proposed Amendment extends the Additional Use area and incorporates provisions to allow general showroom and warehouse/storage uses over the extended area.

4.1.2 Local Planning Policy LPP 1.12 Noise Attenuation

This LPP is relevant to this Amendment which creates the potential for non-residential uses in an area where there is low density housing. Provisions of this Policy are addressed in the Acoustic Report prepared by Lloyd George Acoustics at **Appendix 1**.

4.1.3 Local Planning Policy LPP 1.13 Bushfire Prone Areas

Bushland in the area of the Amendment including Bush Forever Site 388 result in a risk of bushfires. A Fire Management Plan by bushfire consultants RUIC is provided at **Appendix 2** addressing the provisions of LPP 1.13.

4.1.4 Position Statement Planning and Development PSPD7 Jandakot Airport

PSPD7 provides for the control of the height of structures in the vicinity of the airport and notification of potential noise issues. The issue of structure height as well as the reflectivity of construction materials and the impact of external lighting on the operations of the airport are dealt with by conditions in the text of the proposed Amendment.

As is discussed later, the issue of the impact of aircraft noise is governed by State Planning Policy 5.3 – Jandakot Airport Vicinity. This Policy seeks to control the location of Noise Sensitive Premises within areas of high noise exposure and as the proposed uses are not Noise Sensitive Premises, the noise exposure provisions of PSPD7 are not relevant to this Amendment.

4.2 Regional Planning Context

4.2.1 Metropolitan Region Scheme (MRS)

Figure 2 shows the regional zoning/reservation pattern affecting the locality of this Amendment. The Amendment Area is zoned "Rural-Water Protection" as is land to the west, south and east. The northern portion of the Amendment Area is shown to be affected by a Bush Forever area.

A "Public Purpose" reservation covers Jandakot Airport to the north of the Amendment Area.

Beyond the immediate surrounds of the Amendment Area is "Urban" zoning to the west covering the Glen Iris Golf Course Estate as well as an area of recent "Urban" zoning to the east, generally between Solomon and Fraser Roads.

North of Armadale Road, "Industrial" Zoning covers a showroom/warehouse area.

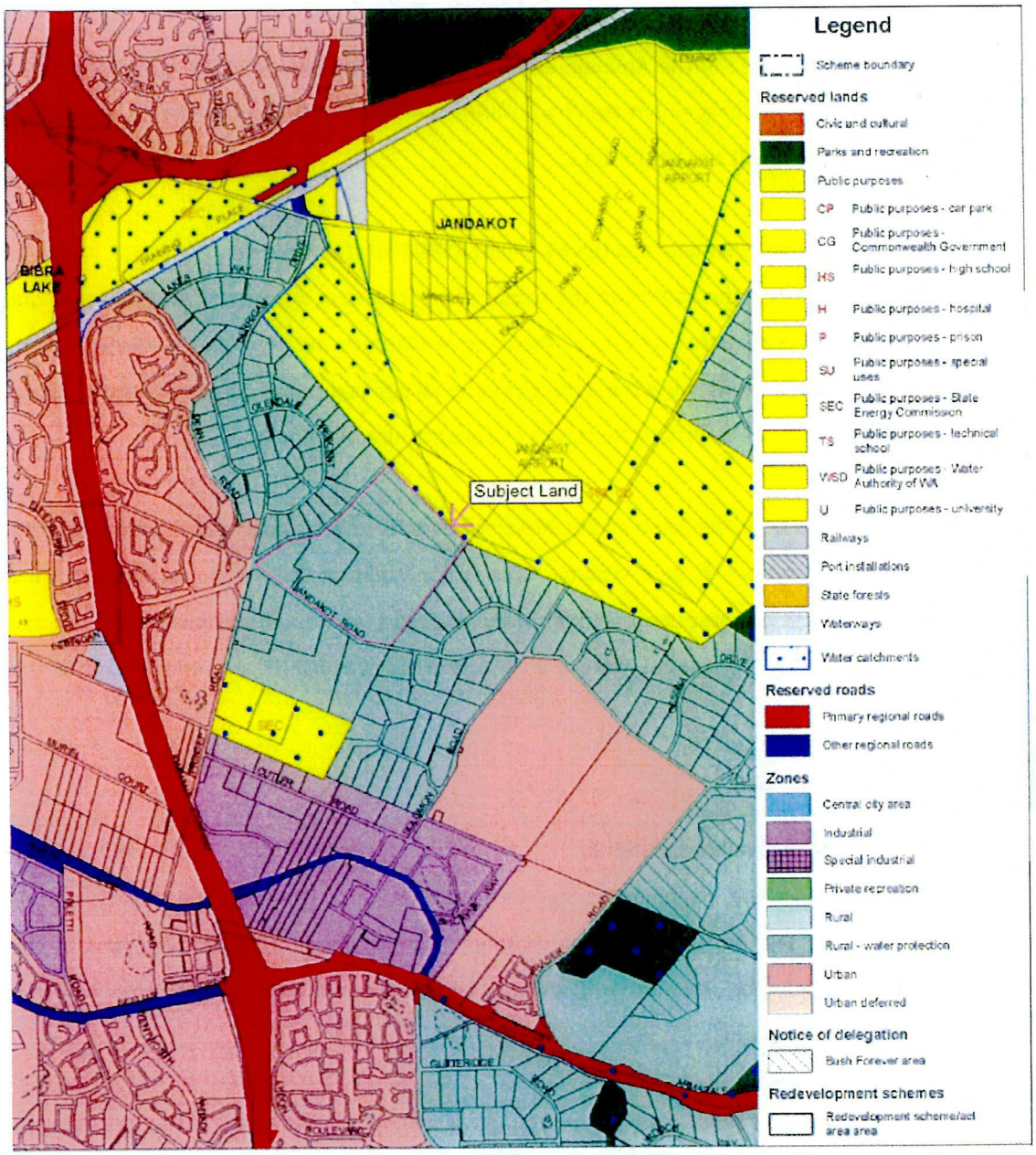

FIGURE 2

4.2.2 State Planning Policy 4.2 – Activity Centres For Perth and Peel (SPP 4.2) For Perth and Peel (SPP 4.2)

SPP 4.2 identifies Jandakot Airport as a "Specialised" activity centre for the purposes of "aviation and logistic services". A similar status/purpose is given to the city's other major airport, the Perth Domestic/International Airport.

The Policy advises that Specialised Centres provide opportunities for the development of complementary activities and that land uses which complement the primary function of the centre will generally be encouraged.

On 1 September 2014 (**Appendix 3**), Jandakot Airport Holdings wrote to Schaffer Corporation (the owner of the Amendment Area) advising of the release of a new Masterplan for Jandakot Airport and commenting on the potential commercial relationship between the Amendment Area and Jandakot Airport as well as the operational relationship. Jandakot Airport Holdings tended to see the Amendment Area as an extension of the Airport Specialised Centre because of these relationships.

A similar relationship exists between Perth Airport and land to the east which is being developed for logistics purposes and integrated with the development on the Perth Airport site.

4.2.3 State Planning Policy 2.3 – Jandakot Groundwater Protection Policy (SPP 2.3)

SPP 2.3 is designed to ensure that development over the Jandakot public groundwater supply mound is compatible with the long term use of the groundwater for human consumption. A broad view is taken in the policy based on the generalisation that land within the policy area is essentially zoned for rural purposes. It therefore deals with the permissibility of rural type uses and established a minimum lot size policy of 2ha to accommodate rural/residential activities.

SPP 2.3 is under review with a revised draft having been published in July 2014. This revision is yet to be finally adopted.

Additional Use area AU 1 currently allows storage, showrooms and nursery uses as well as masonry production. Amendment No. 112 seeks to extend these existing uses. Council has consulted the Department of Water in relation to this extension as detailed in the series of emails appended at **Appendix 4**.

4.2.4 State Planning Policy 5.3 – Jandakot Airport Vicinity (SPP 5.3)

This policy recognises the importance of Jandakot Airport and seeks to protect the airport from the encroachment of incompatible uses as well as minimizing the impact of airport operations on existing and future communities. SPP 5.3 is also under review with a revision published in 2015.

A key matter in relation to incompatible uses is exposure to aircraft noise. This amendment essentially proposes to replace potential incompatible uses (rural/residential) with compatible commercial functions in line with Jandakot Airport Holdings preferences as outlined previously.

4.2.5 State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region (SPP 2.8)

SPP 2.8 is designed to protect significant remnant bushland and to provide for its adequate management. Bush Forever is a key document in terms of identifying bushland which should be protected.

The Amendment Area is affected by Bush Forever Site 388 C (12.92ha) along the north of the property. The defined area of this site leaves a gap on the eastern side, sufficient to enable a direct access to the airport.

In line with policy objectives in relation to protection and management of bushland and in particular, Bush Forever sites, it is intended that as a consequence of this Amendment and associated development, Bush Forever Site 388 C would be ceded to public ownership.

4.2.6 State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7)

The intent of SPP 3.7 is to implement effective, risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure.

The subject land and surrounding land is mapped as being a risk area. Consequently, RUIC Fire has been engaged to report on fire management. A copy of management proposals are included at **Appendix 2**.

5.0 Proposal

5.1 Location

Strategically located inside the "elbow" of the Kwinana Freeway and Roe Highway, adjacent to Jandakot Airport/Jandakot City, the site is 15 minutes south of the CBD.

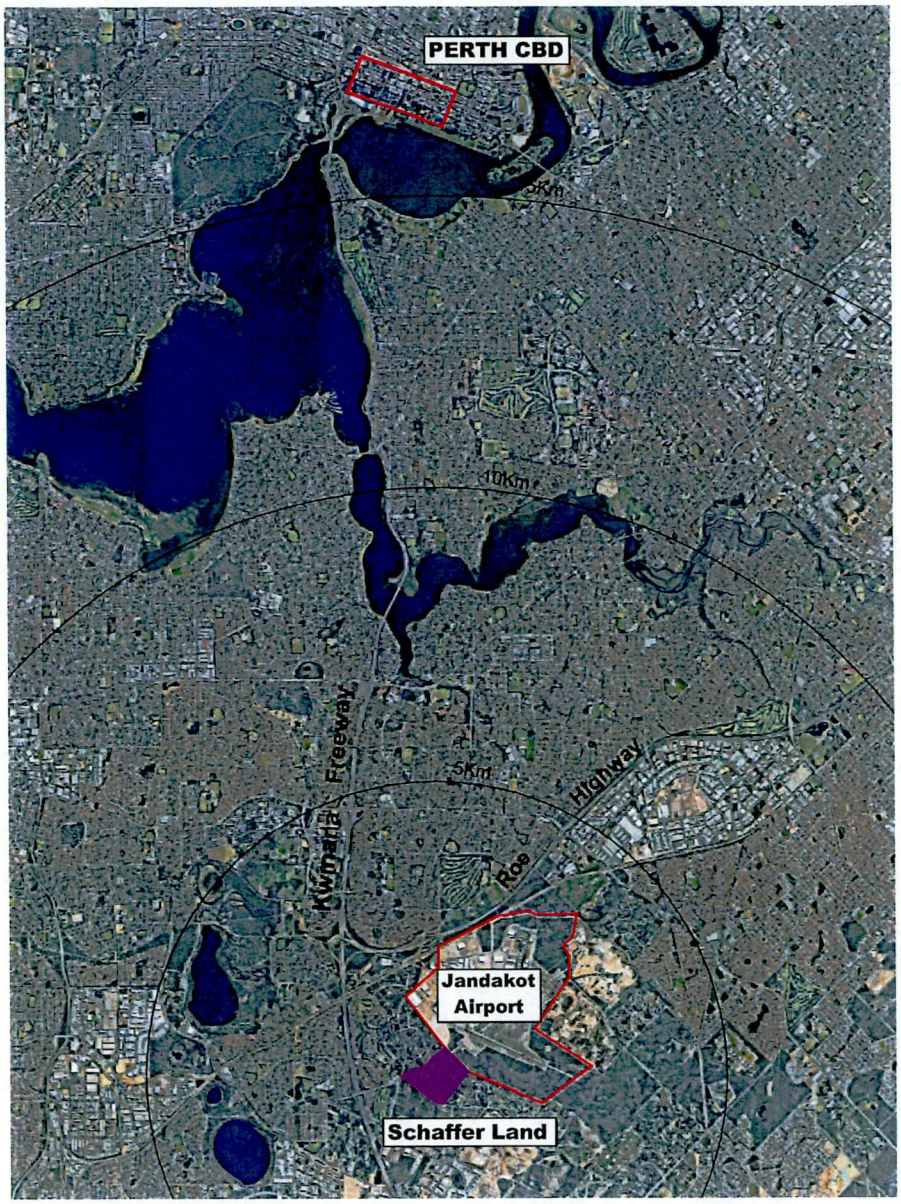

FIGURE 3

In future, the land's strategic positioning will be enhanced by the Perth Freight Link, a $1.6 billion Commonwealth/State initiative to improve heavy transport links with the Port of Fremantle.

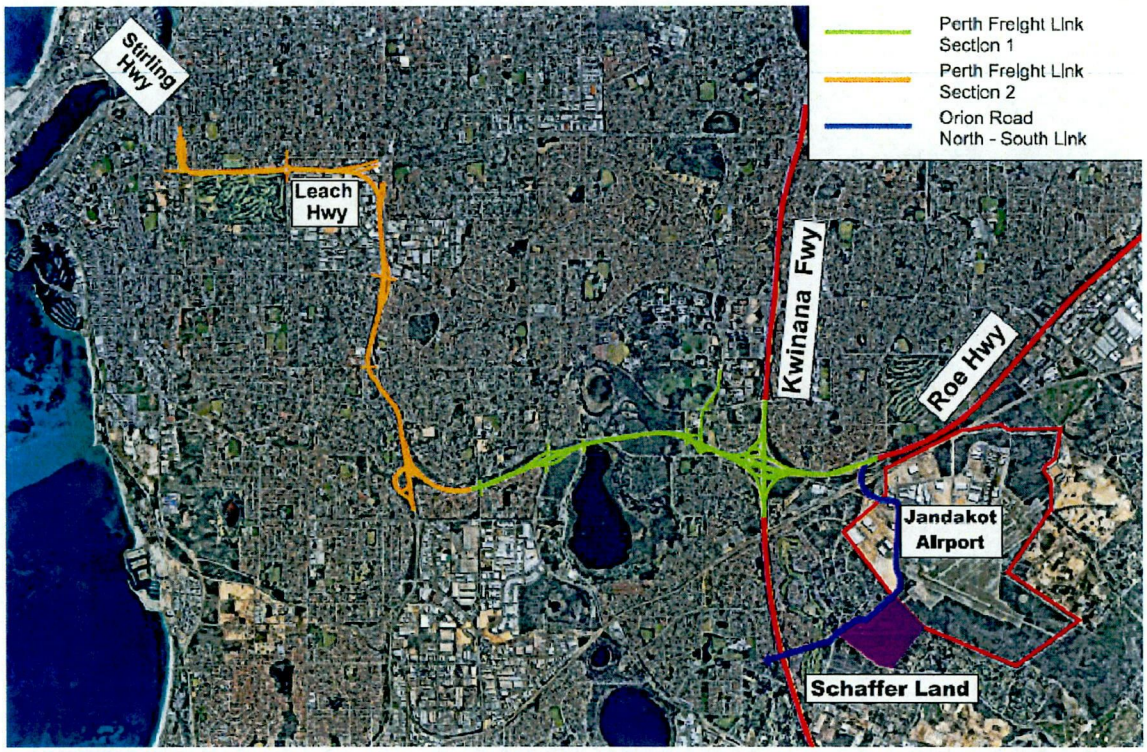

FIGURE 4

Connections to the Primary Regional Road system including the Perth Freight Link will be facilitated by major upgrades to the roads bounding the site including Jandakot Road (E-W) and the extension of Orion Road through Jandakot City connecting via Launders (Pilatus) Street to Berrigan Drive (N-S). This north-south link provides direct connections to the Kwinana Freeway and Roe Highway including the Perth Freight Link.

5.2 Relationship to Jandakot Airport

On 1 September 2014, Jandakot Airport Holdings (JAH) wrote to Schaffer Corporation (**Appendix 3**) pointing out the operational relationship the subject land has with the Jandakot Airport and also the potential for a commercial relationship with Jandakot City, the rapidly developing Specialised Activity Centre at the Airport site. JAH see the potential benefits of smaller scale logistics industries supporting projects vital to the State's economy, including the emerging Oil and Gas hub at Jandakot City.

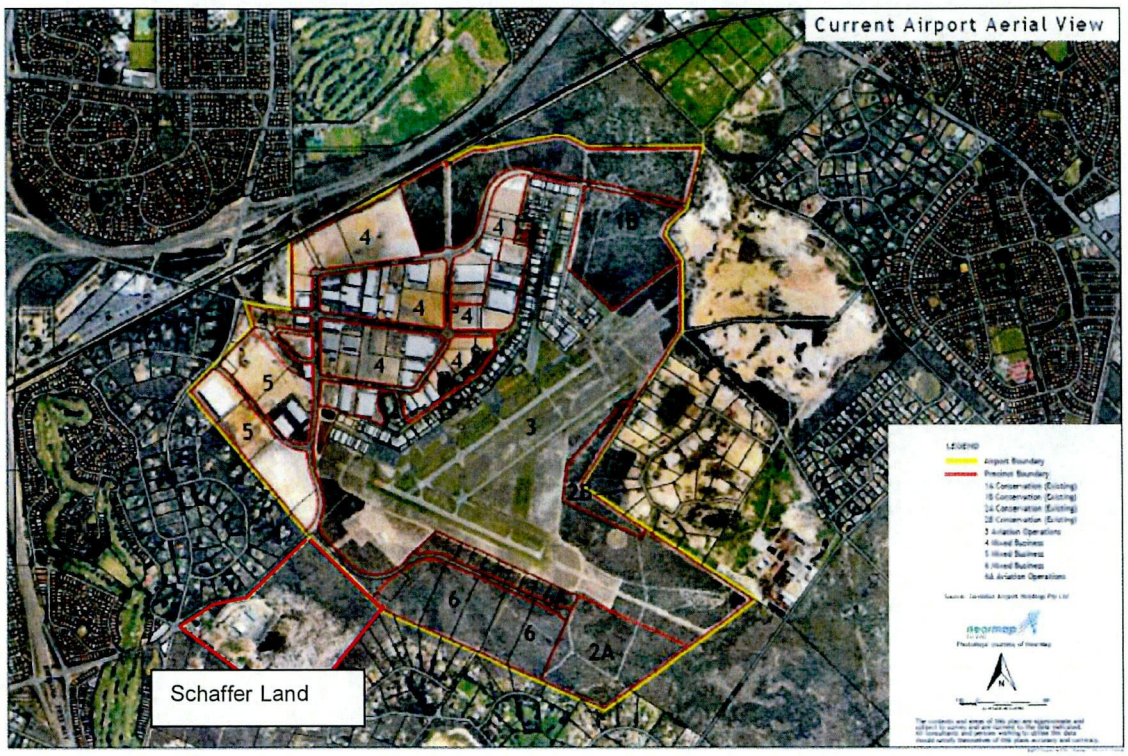

FIGURE 5

The planning merit of this proposal is also recognised in the WAPC Chairperson's letters of 23 June 2015 (**Appendix 5**). In particular, the Chairperson notes the proximity to Roe Highway and Kwinana Freeway, as well as the freight link extension network of the Government.

In terms of logistics/commercial development on the subject land through Additional Use provisions, 13ha of the 57ha of Schaffer Corporation's land is available for such purposes. This includes the existing Urbanstone factory (6.1ha) plus a Nursery/Showroom area with potential for additional showroom functions (up to 6.8ha or 30,000sqm of Nursery/Showroom space). The proposal to allow more land to be used for semi-industrial type purposes therefore represents in-fill development between the existing 13ha of "Additional Use" area and Jandakot City. It is not a radical departure from the existing planning framework.

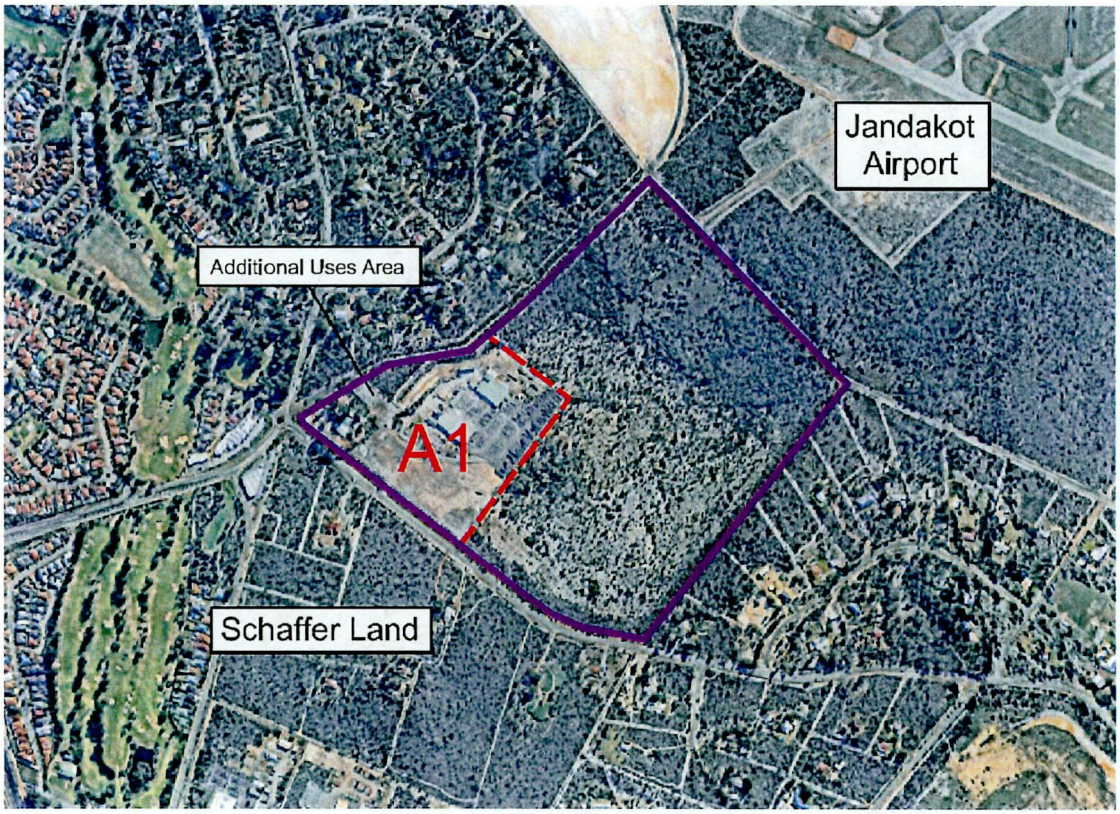

FIGURE 6

In terms of viewing the site as an extension of the Jandakot Specialised Activity Centre, proposals to extend Pilatus Street via the Launders Street road reserve to an upgraded Berrigan Drive link to the Kwinana Freeway, require land to be obtained from the subject site. For this, and various other reasons associated with aircraft movements, the subject land is strongly associated with the Airport operationally.

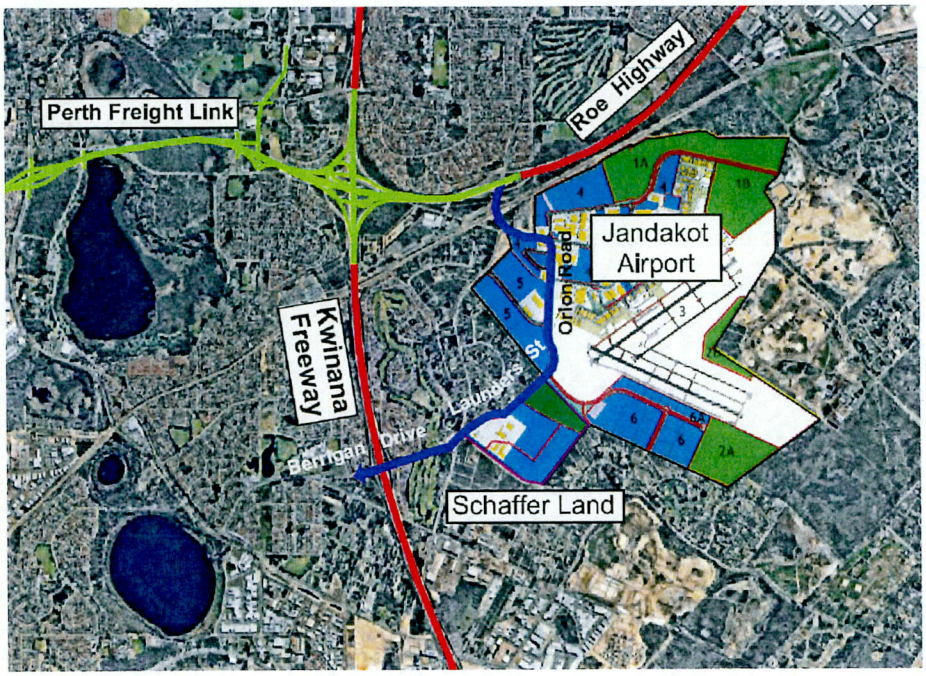

FIGURE 7

As will be appreciated, Lot 103 is affected by Bush Forever Site 388c and the boundary of 388c does not extend all the way to the Lot boundary in the north-eastern corner leaving a route for a possible local road connection to Jandakot City. Strong linkages are therefore possible via both major and local connections to allow businesses supporting the major enterprises at Jandakot City to locate on the subject land.

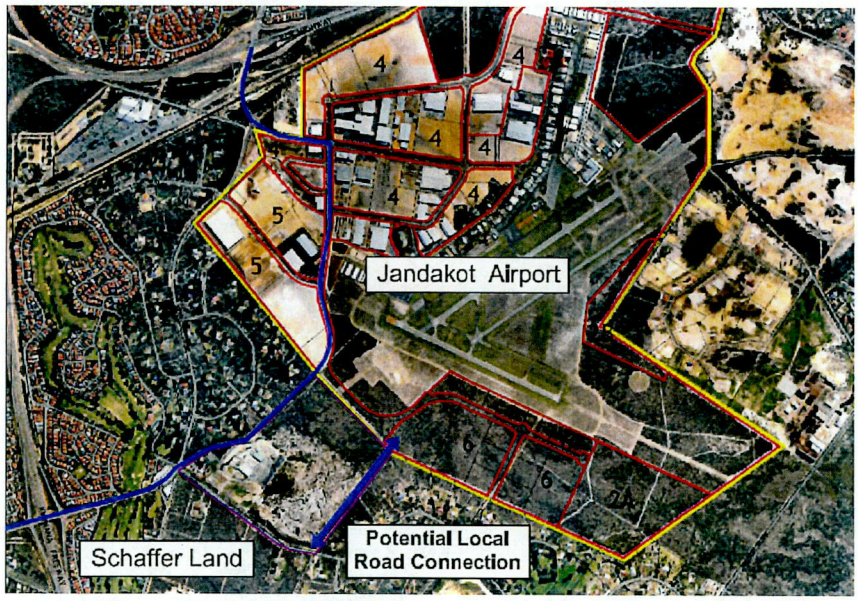

FIGURE 8

5.3 Concept Plan

Figure 9 is a Concept Plan illustrating the proposed disposition of uses on the land as well as the principal movement systems. As discussed earlier, increasing traffic volumes and road works to accommodate this traffic, particularly along Jandakot Road, will prevent heavy vehicles servicing the Urbanstone plant from undertaking right turns out of the site onto Jandakot Road. Unless an alternative means of egress is found, these vehicles would need to turn left onto Jandakot Road and proceed to the regional road network, principally the Kwinana Freeway and Roe Highway, by circuitous, inefficient, local road routes. In turn, this inefficiency jeopardises the industry.

All trucks entering and leaving the plant report to the office so that the paperwork for receivables and departure orders can be checked and the load ratified. It is essential that the heavy vehicle route takes the site layout of the plant into account resulting in a situation where it is not simply a case of making an alternative crossover connection to either Jandakot Road or the soon to be constructed Pilatus Street.

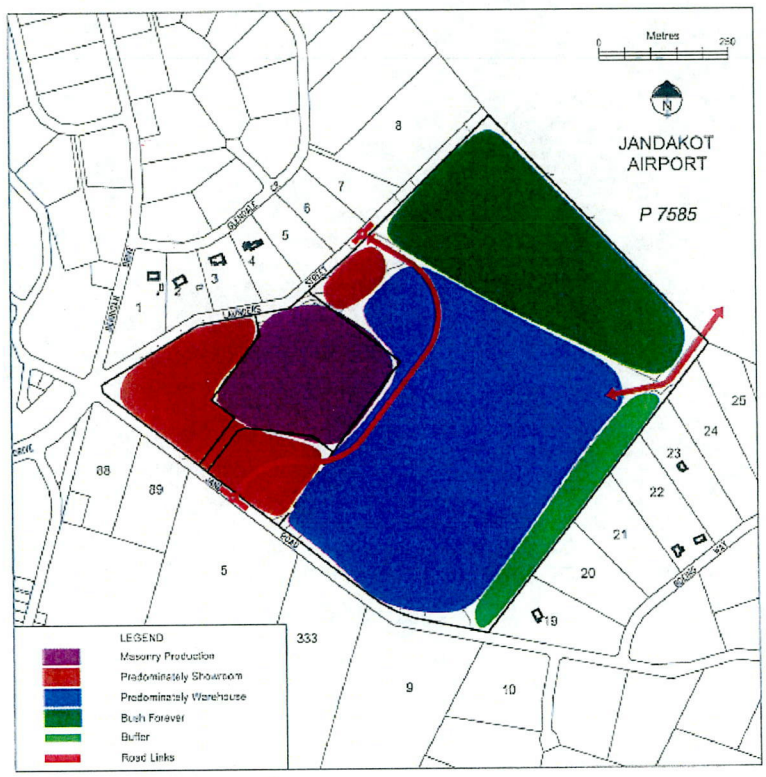

FIGURE 9

The Concept Plan therefore shows a linkage down the eastern side of the plant to a connecting route north of the plant and onto Pilatus Street. This connection will enable heavy vehicles to exit by a left turn onto Pilatus Street and hence to the Kwinana Freeway via Berrigan Drive or to turn right onto Pilatus Street and head north to the Roe Highway. Efficient access to the regional road network is therefore maintained by this re-routing of heavy vehicles following closure of the right hand turn onto Jandakot Road.

The alternative heavy vehicle exit route cannot simply be constructed across Lot 103 because it would amount to the use of land for masonry production without an appropriate zoning. This therefore, is another justification for this Amendment. The road works which will ultimately deny the Urbanstone plant efficient access to the regional road network via the existing right turn to Jandakot Road, require additional land for widening. The land owner has agreed to cede the necessary road widening on the basis that access/egress to the plant is not compromised which position will be secured by this Amendment.

In the longer term, two new entries to Jandakot Road are proposed. One is a short distance to the east of the existing Urbanstone entrance and will be facilitated by a round-about while the other is at the south-eastern corner of Lot 103.

A corridor of land excluded from Bush Forever Site 388 C at the north-eastern corner of Lot 103 allows a connection to the future road system on the Jandakot Airport site enabling greater integration. This link will be additional to that provided by Pilatus Street.

Over 10,000 VPD are expected to use Pilatus Street by 2034 with over 28,000 VPD on Jandakot Road. The land adjacent to these roads will therefore enjoy considerable exposure to passing traffic. Accordingly, the Concept Plan anticipates the land adjacent to these highly trafficked routes to be developed for showroom purposes. The exception to this use assignment is towards the eastern part of the Jandakot Road frontage where substantial differences in elevation deny high levels of exposure. The balance of the land not allocated to masonry production and showrooms is proposed for use as storage/logistics type activities with provision for a buffer strip utilising a substantial batter down the eastern side.

5.4 Traffic

Transcore traffic and transport engineering consultants have been engaged to determine potential traffic generation following rezoning and development and the implications on access arrangements and traffic impact on the adjoining road network. Transcore's Traffic Report is included at **Appendix 6**.

The Traffic Report concludes that the proposed development would likely generate around 6,000 VPD with morning and evening peak hour flows of 690 VPH and 790 VPH respectively. An alternative access through the amendment site between Jandakot Road and Pilatus Street is recommended and a proposed local link between the subject site and Jandakot Airport is also noted as an opportunity to reduce pressure on the external road system.

5.5 Engineering Services

Consulting Engineers, Cossill and Webley have assessed requirements for services and the capacity of existing systems. Their report is included at **Appendix 7**.

It is concluded that significant service headwork upgrades will not be required to facilitate the proposed development. The development of a strategy for sewering the land by filling or alternatively, constructing a small pump station is recommended in consultation with the Water Corporation.

5.6 Proposed Scheme Map Amendments

To enable the alternative access/egress arrangements for the Urbanstone plant and to permit the Concept Plan's implementation, the Additional Use zoning on the land needs to be extended. This proposed extension is shown on the Scheme Amendment Map.

The Additional Use zoning will cover much of Lots 101, 103 and 104 with exclusions including Bush Forever Site 388 C (12.92ha), current road widening requirements for Pilatus Street and Jandakot Road (2.42ha) as well as further, future widening to Jandakot Road (0.42ha).

5.7 Proposed Scheme Text Amendments

Textual amendments are aimed at three objectives:

- Allow a wider range of showroom and storage functions.
- Ensure land use and development compatibility with the Jandakot Airport as well as supporting the function of the Jandakot Specialised Activity Centre.
- Maintain land use compatibility with the Jandakot underground water public water supply area.

Widening the range of showroom functions will enable Urbanstone to market product from onsite in an environment where there is a synergy with related bulky goods. At present, sales of bulky goods are restricted to sales ancillary to masonry production, that is, essentially masonry products. This is restrictive and does not allow the creation of recognised centre for marketing home maker goods.

Similarly, by expanding the range of materials that can be stored in warehousing on the site, the objective of supporting the Jandakot Specialised Activity Centre is achieved as well as maximising the advantages of public investment in infrastructure, particularly the Perth Freight Link.

The proposed Text amendments also include provisions designed to ensure future development does not impede the operations of the airport including controls over lighting, the reflectivity of building materials and the potential intrusion of structures into air space.

Amendments to the Scheme Text also recognise the potential for materials to be stored within the Amendment Area which may pose a risk to groundwater quality. Provisions are therefore proposed which control types of materials that can be stored and in some cases, the manner of storage. These provisions have been reviewed by the Department of Water as detailed at **Appendix 4.**

6.0 Environment

PGV Environmental have conducted an Environmental Assessment of the proposal concluding that there are few impediments to the intended land use change (**Appendix 8**). Appropriate stormwater management is recommended along with a wetland boundary and buffer study and a flora survey for the Grand Spider Orchid.

Both of these exercises have been commissioned to be undertaken in spring of 2016.

1

Appendix 1

Acoustic Report -
Llyod George Acoustics

2

Appendix 2

Fire Management Plan -
RUIC

3

Appendix 3

Letter -
Jandakot Airport Holdings

4

Appendix 4

Emails -
Council / Department of Water

5

Appendix 5

Letters -
WAPC Chairperson

6

Appendix 6

Traffic Report -
Transcore

7

Appendix 7

Engineering Servicing Report -
Cossill & Webley

8

Appendix 8

Environmental Assessment -
PGV Environmental

9

10

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Noise and Vibration Impact Assessment

Lot 103 Jandakot Road, Jandakot

Reference: 16043563-01c.docx

Prepared for:
Schaffer Corporation Ltd

Report: 16043563-01c.docx

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Prepared By:	Olivier Mallié
Position:	Project Director
Date:	21 October 2016

Table of Contents

List of Tables

List of Figures

Appendices

1 INTRODUCTION

Lloyd George Acoustics was requested to assess the potential impacts from noise and vibration onto nearby rural residential areas from the change of zoning, and development, of Lot 103 Jandakot Road to permit showrooms and warehouse/logistics type of premises. The development site is located just south of the Jandakot Airport - refer *Figure 1.1*.

Lot 103 is currently vacant and bounded by mostly rural/residential land with established residences to the east and west. In the south-west corner there are also some established businesses; a nursery and a masonry factory. It is proposed to extend commercial development on Lot 103 to accommodate showrooms and warehouses/logistics type of premises.

The potential impacts from noise emissions from the future premises onto the nearby residences were assessed by means of noise modelling, with noise sources including mechanical plant located at ground level e.g. ventilation/refrigeration equipment, as well as common activities such as truck deliveries, forklift use in yards and waste collection.

In relation to ground vibration, significant sources of vibration such as crushers, metal shredders or other heavy industrial equipment are not expected within the future development and therefore ground vibration is not expected to be an issue.

Based on typical equipment and activities associated with showrooms and warehouses, a noise model of the development was built in dedicated modelling software and noise levels at the sensitive receivers to the east and west were predicted. These predicted noise levels were then compared against criteria contained within the *Environmental Protection (Noise) Regulations 1997* to assess the likelihood of adverse impact on the residential receivers.

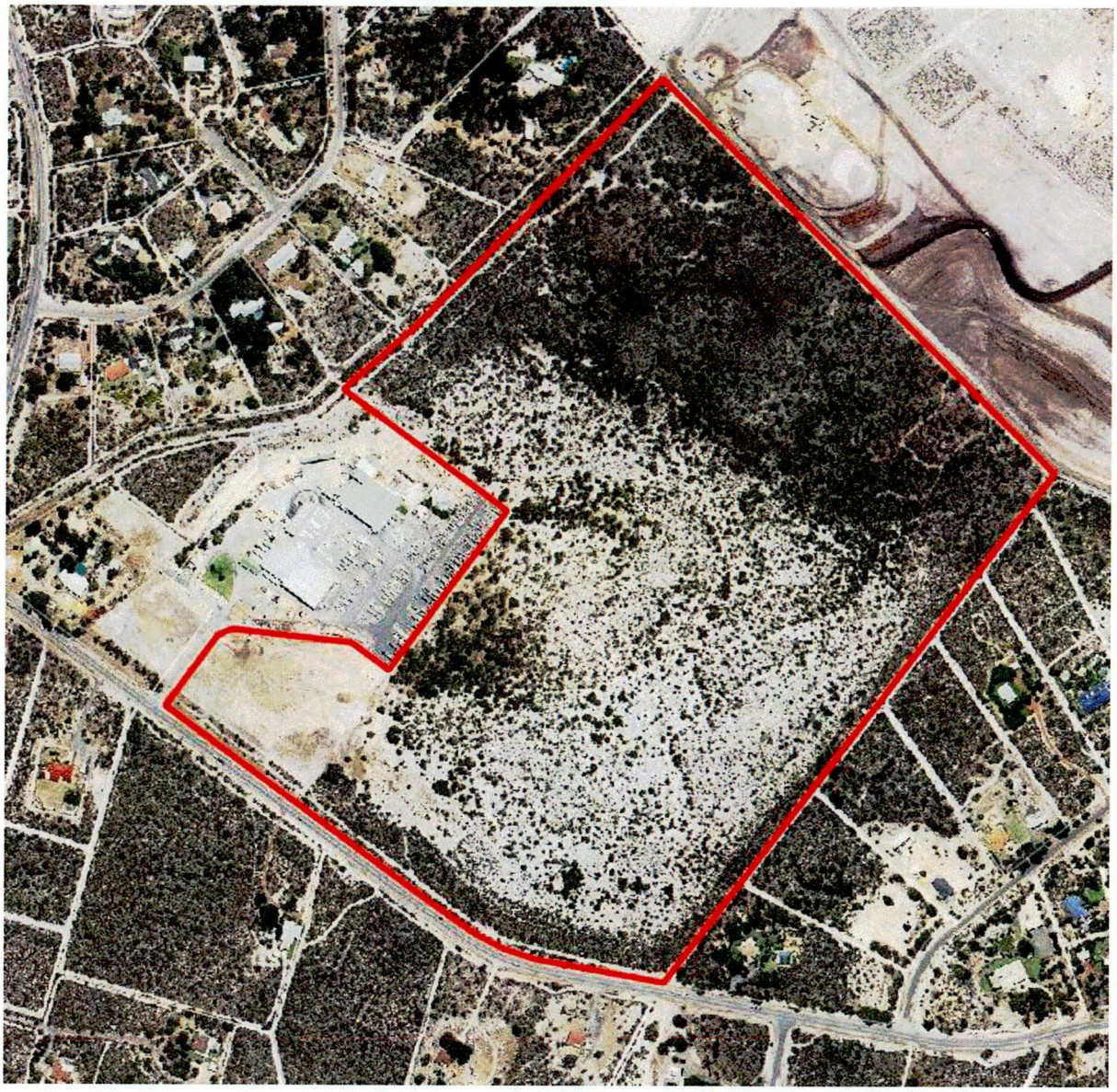


Figure 1-1 Development Site

A preliminary development plan is shown in *Appendix A* and forms the basis of this assessment.

Appendix C contains a description of some of the terminology used throughout this report.

2 CRITERIA

2.1 Environmental Protection (Noise) Regulations 1997

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

Regulation 7 defines the prescribed standard for noise emissions as follows:

"7. (1) Noise emitted from any premises or public place when received at other premises –

(a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and

(b) Must be free of –

i. tonality;

ii. impulsiveness; and

iii. modulation,

when assessed under regulation 9"

A "...noise emission is taken to significantly contribute to a level of noise if the noise emission ... exceeds a value which is 5 dB below the assigned level..."

Tonality, impulsiveness and modulation are defined in Regulation 9. Noise is to be taken to be free of these characteristics if:

(a) The characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and

(b) The noise emission complies with the standard prescribed under regulation 7 after the adjustments of *Table 2-1* are made to the noise emission as measured at the point of reception.

Table 2-1 Adjustments Where Characteristics Cannot Be Removed

Where Noise Emission is Not Music			Where Noise Emission is Music	
Tonality	Modulation	Impulsiveness	No Impulsiveness	Impulsiveness
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

Note: The above are cumulative to a maximum of 15dB.

The baseline assigned levels (prescribed standards) are specified in Regulation 8 and are shown in *Table 2-2*.

Table 2-2 Baseline Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area[1]	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial	All hours	60	75	80
Industrial	All hours	65	80	90

1. ***highly sensitive area*** means that area (if any) of noise sensitive premises comprising —
   (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
   (b) any other part of the premises within 15 metres of that building or that part of the building.

Based on the existing land use, the influencing factor, applicable at the noise sensitive premises has been calculated as 0 and 1 dB for the receivers to the east and west respectively. The transport factor has been calculated as 4 to 6 dB for the west receivers along Glendale Crescent, and 0 dB for the east sensitive receivers along Boeing Way. The basis for this being that Berigan Drive is a major road (traffic report t15281-rw-02a), Jandakot Road is a secondary road (traffic report t15281-rw-02a), and the future Pilatus street will be a secondary road with expected 10,300 vpd (traffic report t15281-rw-02a). This is summarised in *Tables 2-3* and *2-4*.

Table 2-3 Influencing Factor Calculation for East Receivers

Description	Within 100 metre Radius	Within 450 metre Radius	Total
Industrial Land	0 %	0 %	0 dB
Commercial Land	0 %	0 %	0 dB
Transport Factor			**0 dB**
Total			**0 dB**

Table 2-4 Influencing Factor Calculation for West Receivers

Description	Within 100 metre Radius	Within 450 metre Radius	Total
Industrial Land	0 %	9 %	1 dB
Commercial Land	0 %	2 %	0.1 dB
Transport Factor			**4 to 6 dB**
Total			**5 to 7 dB**

The future land uses were considered to be commercial premises as per Schedule 1 of the Regulations. With the inclusion of the future commercial premises, the influencing factor at residential premises was estimated to increase by 0.5 dB at the west receivers and 1 dB at the east receivers. In addition, it was considered that Jandakot Road will not become a major road in the distant future and is therefore considered a secondary road for the purpose of this assessment.

Table 2-5 shows the assigned noise levels including the influencing factor and transport factor at the receiving locations.

Table 2-5 Assigned Noise Levels at East Receivers

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area[1]	0700 to 1900 hours Monday to Saturday (Day)	45	55	65
	0900 to 1900 hours Sunday and public holidays (Sunday)	40	50	65
	1900 to 2200 hours all days (Evening)	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35	45	55
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

1. ***highly sensitive area*** means that area (if any) of noise sensitive premises comprising —
   (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
   (b) any other part of the premises within 15 metres of that building or that part of the building.

Table 2-6 Assigned Noise Levels at West Receivers

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area[1]	0700 to 1900 hours Monday to Saturday (Day)	50 to 52	60 to 62	70 to 72
	0900 to 1900 hours Sunday and public holidays (Sunday)	45 to 47	55 to 57	70 to 72
	1900 to 2200 hours all days (Evening)	45 to 47	55 to 57	60 to 62
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	40 to 42	50 to 52	60 to 62
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

1. ***highly sensitive area*** means that area (if any) of noise sensitive premises comprising —
   (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
   (b) any other part of the premises within 15 metres of that building or that part of the building.

It is noted the assigned noise levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the Representative Assessment Period (RAP) as *a period of time of not less than 15 minutes, and not exceeding 4 hours*, which is determined by an *inspector* or *authorised person* to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission. An *inspector* or *authorised person* is a person appointed under Sections 87 & 88 of the *Environmental Protection Act 1986* and include Local Government Environmental Health Officers and Officers from the Department of Environment Regulation. Acoustic consultants or other environmental consultants are not appointed as an *inspector* or *authorised person*. Therefore, whilst this assessment is based on a 4 hour RAP, which is assumed to be appropriate given the nature of the operations, this is to be used for guidance only.

Under regulation 3, nothing in the Regulations applies to the following noise emissions –

(a) noise emissions from the propulsion and braking systems of motor vehicles operating on a road;

(b) noise emissions from a safety warning device, other than a reversing alarm, fitted to a motor vehicle operating on a road;

(c) noise emissions from trains or aircraft (other than model aircraft and trains operating on railways with a gauge of less than 70cm);

(d) noise emissions from a safety warning device fitted to a train or vessel;

(e) noise emissions –

   (i) from a device for warning pedestrians installed at a pedestrian crossing on a road; or

(ii) from a device for warning of the passage of a train installed at a level crossing; or

(iii) from a safety warning device fitted to a building as a requirement of the Building Code as defined in the *Building Regulations 2012* regulation 3; or

(iv) for the purpose of giving a warning required under the *Mines Safety and Inspection Regulations 1995* regulation 8.26,

if every reasonable and practicable measure has been taken to reduce the effect of the noise emission consistent with providing an audible warning to people;

(f) noise emissions from –

(i) a reversing alarm fitted to a motor vehicle, mobile plant, or mining or earthmoving equipment; or

(ii) a startup or movement alarm fitted to plant,

if

(iii) it is a requirement under another written law that such an alarm be fitted; and

(iv) it is not practicable to fit an alarm that complies with the written law under which it is required to be fitted and emits noise that complies with these Regulations;

It is considered that reversing alarms fitted to commercial vehicles and mobile plant e.g. HV trucks or loaders, are not exempt under the Regulations since they are not specifically required under another written law. The commonly used fixed noise output tonal reversing alarms also known as 'reversing beeper' emit, by their very nature, tonal and modulating noise at high levels. As such, this type of reversing alarm generally cannot comply with the Regulations even at distant receivers.

If deemed to be required, an alternative reversing alarm type should be sourced. Such alternative, which can more readily comply with the Regulations, include alarms emitting a broadband signal in-lieu of a tonal 'beep'.

2.2 Vibration

With regards to vibration, there are two areas to consider being human annoyance and structural damage with the latter occurring at much higher vibration levels than human annoyance, since humans can perceive vibration at much lower levels.

Australian Standard 2670.2-1990 *Evaluation of human exposure to whole-body vibration Part 2: Continuous and shock induced vibration in buildings (1 to 80Hz)* offers guidance on levels of vibration that may cause adverse comment. A 'base curve' (Curve 1 in the standard) is provided at which point adverse comment is considered rare. It also states that at levels above the base curve, vibration may or may not give rise to adverse comment depending on circumstances. The measure of human annoyance is a r.m.s. velocity (mm/s) measured at the point of reception i.e. inside the dwelling, and which can be compared to the AS 2670.2 Curves. It is noted this standard has been withdrawn however, the curves are still accepted as being relevant.

Annex A of AS 2670.2-1990 provides multiplying factors applied to Curve 1 that are relevant to residences and shown in *Table 2-3*.

Table 2-7 Guidance on Human Annoyance from Vibration for Residences for Continuous Vibration

Time of Day	Multiplying Factor	R.M.S. Component (z-axis) Velocity (PCPV) mm/s
Day	2 to 4	0.20 to 0.40
Night	1.4	0.14

There are no Australian Standards that provide criteria in relation to structural damage to buildings and the Curves of AS2670.2 are not relevant in relation to structural damage. Structural damage measurements in WA are generally undertaken using peak component particle velocity (PCPV) and measured outside, close or on the dwelling's foundations. For instance for road construction projects, Main Roads Western Australia generally adopts a limit of 5mm/s PCPV for structurally sound dwellings (ref DIN 4150).

The following is a summary of the vibration criteria:

- Curve 1.4 (0.14mm/s rms) is the ideal limit for continuous night-time vibration with up to Curve 4 (0.40mm/s rms) tolerable during the day;
- Vibration of 5mm/s PCPV for continuous vibration.

3 METHODOLOGY

Computer modelling has been used to assess potential noise impacts at nearby residences. The advantage of modelling is that it is not affected by background noise sources and can provide the noise level for various weather conditions and operating scenarios if necessary.

The software used was *SoundPLAN 7.4* with the CONCAWE algorithms selected. These algorithms have been selected as they are one of the few that include the influence of wind and atmospheric stability. Input data required in the model are:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1 Meteorological Information

Meteorological information utilised is provided in *Table 3-1* and is considered to represent worst-case conditions for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1 Modelling Meteorological Conditions

Parameter	Night (1900-0700)	Day (0700-1900)
Temperature (°C)	15	20
Humidity (%)	50	50
Wind Speed (m/s)	3	4
Wind Direction*	All	All
Pasquil Stability Factor	F	E

* Note that the modelling package used allows for all wind directions to be modelled simultaneously.

It is generally considered that compliance with the assigned noise levels needs to be demonstrated for 98% of the time, during the day and night periods, for the month of the year in which the worst-case weather conditions prevail. In most cases, the above conditions occur for more than 2% of the time and therefore must be satisfied.

3.2 Topographical Data

Topographical data was based on that publicly available from *GoogleEarth* in the form of spot heights for the extent of the study area.

All future buildings in the development were modelled as 6 metres high.

3.3 Ground Absorption

Ground absorption varies from a value of 0 to 1, with 0 being for an acoustically reflective ground (e.g. water or bitumen) and 1 for acoustically absorbent ground (e.g. grass). In this instance, a value of 0 has been used across the site, including the access ways, and of 1 for land surrounding the receivers.

3.4 Source Sound Levels

The sound power levels used in the modelling are provided in *Table 3-2*.

Table 3-2 Source Sound Power Levels

Description	Octave Band Centre Frequency (Hz)							Overall dB(A)
	63	125	250	500	1k	2k	4k	
Large AC / refrigeration unit	82	77	74	72	70	67	63	**75**
Heavy Goods Vehicle (delivery)	108	103	99	97	97	94	91	**101**
Refrigerated Truck (delivery)	65	68	88	92	97	97	91	**101**
General Forklift Activities (L_w / m^2)	70	64	60	58	58	54	50	**62**
Waste collection (L_{max})	115	117	112	107	105	104	103	**112**

The following is noted in regard to the sound power levels used in the modelling:

- All sources represent L_{10} noise levels unless stated otherwise;
- Individual mechanical plant equipment (refrigeration condensers and A/C condensers) were modelled at 1 metre above the ground plane and assumed to operate simultaneously;
- Delivery and waste collection trucks and forklifts were modelled at 1.5 metres above the ground plane; and,
- Waste collection L_{max} noise sources were modelled 1.5 metres above the ground plane.

4 RESULTS

4.1 Ground Vibration

Ground vibrations can become an issue at sensitive receivers in cases where vibrating or impacting machinery, for example rock/gravel crushers, vibrating screens or some metal presses are used in close proximity to the receiver. However such machinery is generally associated with heavy industrial premises or construction sites and therefore not expected to be present on the future site.

As such, ground vibrations are not considered to be an issue.

4.2 Environmental Noise

A 'worst-case' scenario was modelled in order to assess the impact of various activities that are likely to occur at any future development. Based on previous experience and the location of the closest residences, this 'worst-case' scenario included:

- One AC unit condenser operating on the side of closest buildings to receivers and facing toward the closest noise-sensitive receiver;
- Heavy Goods (HG) trucks deliveries to developments on the eastern side of Lot 103 e.g. international courier or other goods delivery to large warehouse/depot;
- Forklift activity in east area of Lot 103 e.g. loading/off-loading of HG trucks;

- Frozen or refrigerated goods deliveries to the south-east and north-west of Lot 103; and,
- Waste collection from areas the south-east and north-west of Lot 103.

The results of the noise modelling are shown as noise level contour plots in *Figures 4-1* to *4-5* and summarised below in *Table 4-1* at the most affected receiver either to the east or west.

Table 4-1 Summary of Noise Modelling (Highest Levels)

Location	AC Units	Fork Lift Work	Frozen Delivery	HG Deliveries	Waste Collection
East	27 dB L_{A10}	43 dB L_{A10}	49 dB L_{A10}	48 dB L_{A1}	58 dB L_{max}
West	30 dB L_{A10}	35 dB L_{A10}	49 dB L_{A10}	41 dB L_{A1}	59 dB L_{max}

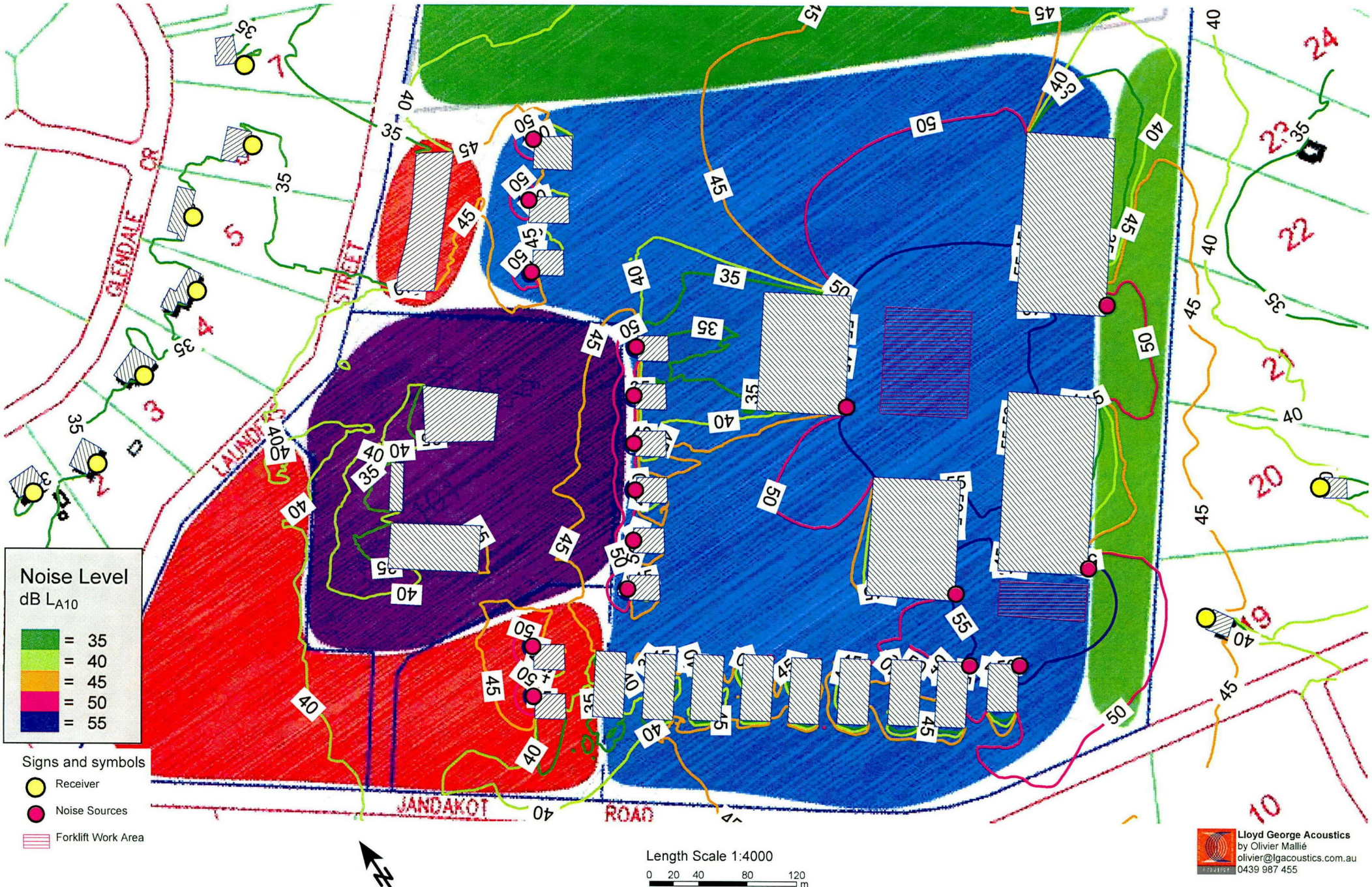
For this assessment, it was assumed that HG truck deliveries are not frequent enough to be considered under the L_{A10} noise criterion and are therefore considered against the L_{A1} assigned noise levels. In addition, it is assumed deliveries are somewhat staggered and therefore unlikely to occur at the same time, as such, both deliveries are assessed separately.

With refrigerated deliveries, it is required for the refrigeration plant to be operated while loading/off-loading goods and therefore it is possible noise from the refrigeration plant will be present for more than 10% of the representative assessment period. As such this noise was compared to the L_{A10} assigned noise levels.

Waste collections are expected to occur across the development and therefore waste collection on the closest future premises to sensitive receivers were modelled as worst-case.

Lot 103 Jandakot Road - Predicted L_{A10} Noise Emissions
AC units and forklift work

Figure 4-1



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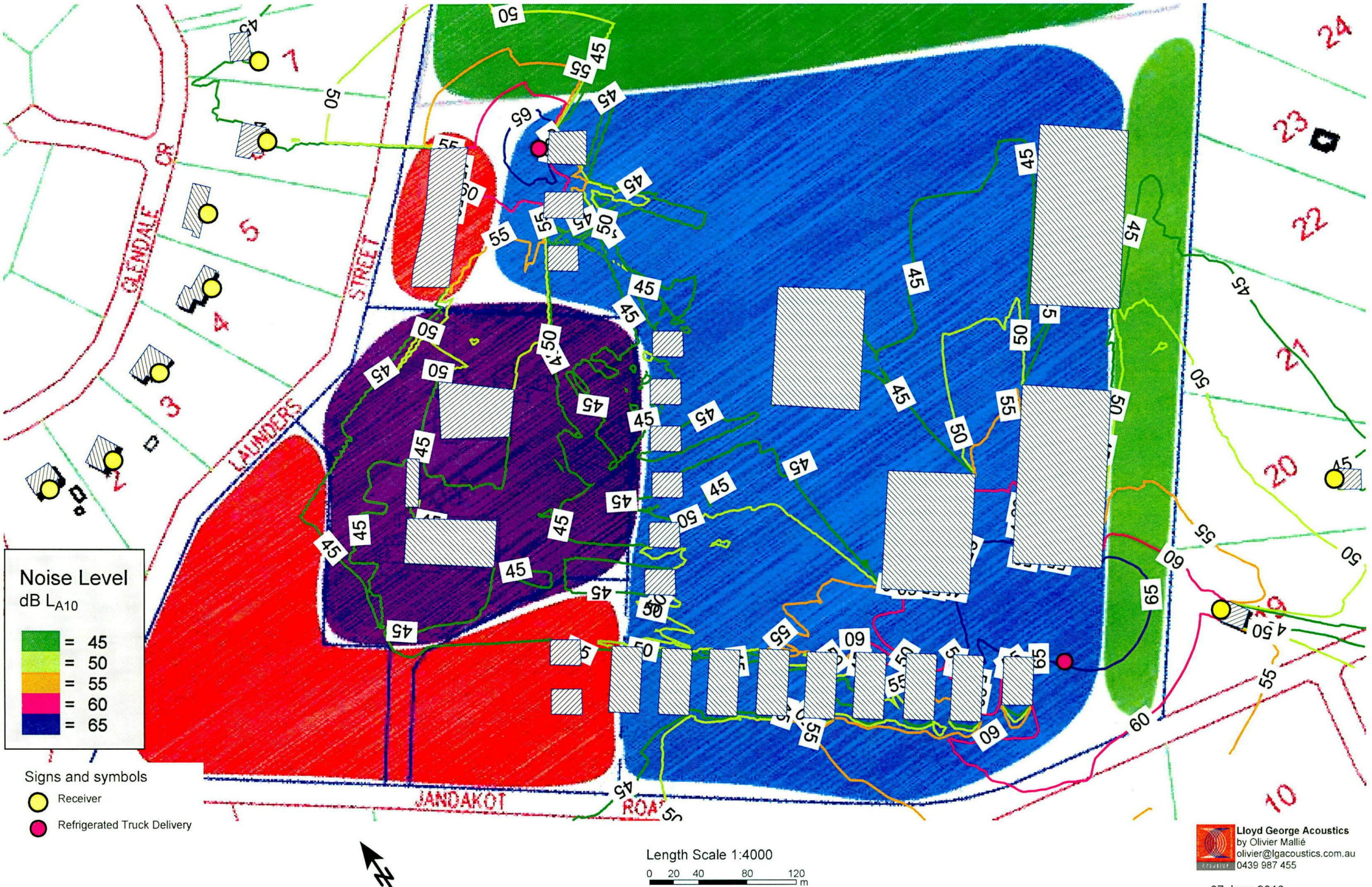
07 June 2016

Lot 103 Jandakot Road - Predicted L_{A10} Noise Emissions
Refrigerated Trucks Delivery

Figure 4-2



Lot 103 Jandakot Road - Predicted L_{A1} Noise Emissions
HG Trucks Delivery to East Side

Figure 4-3

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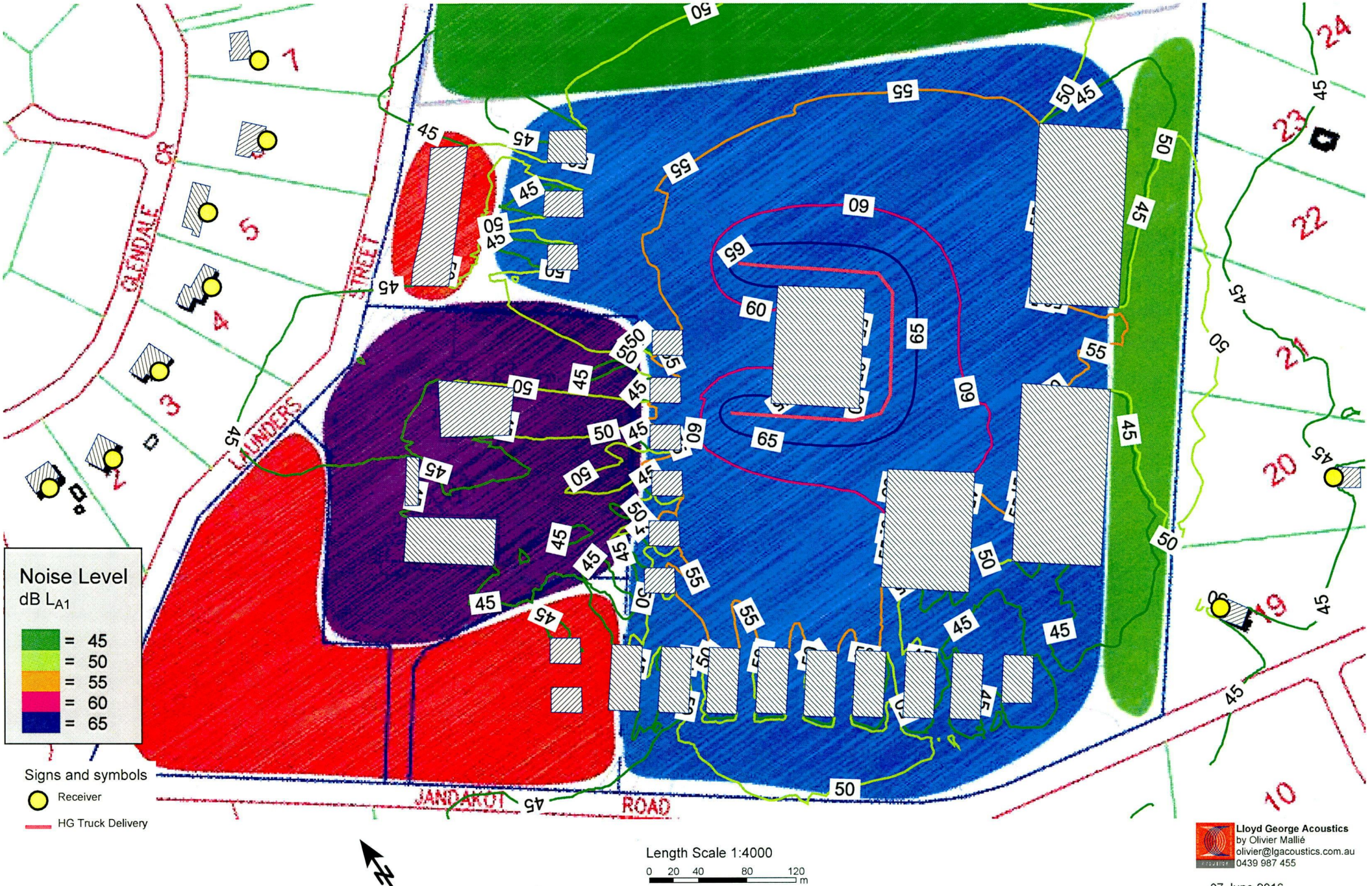
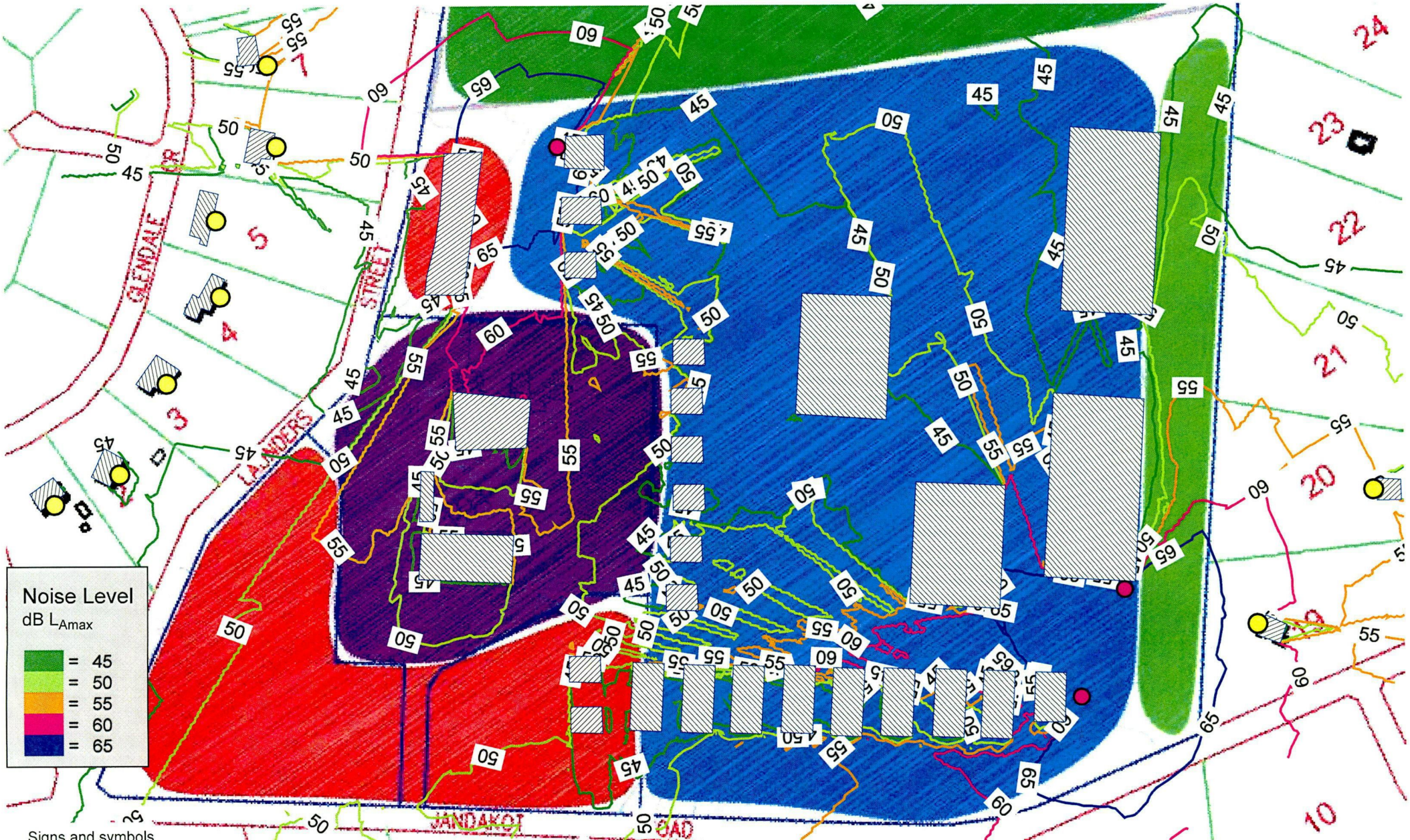
Lot 103 Jandakot Road - Predicted L_{A1} Noise Emissions
HG Trucks Delivery to Central Development

Figure 4-4



Lot 103 Jandakot Road - Predicted L_{Amax} Noise Emissions
Waste Collection

Figure 4-5



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07 June 2016

5 ASSESSMENT

An assessment of the predicted noise emissions from the development against their respective assigned noise level is presented in the next sections.

5.1 Assessment Against L_{A10}

This criterion is applicable to noise emissions which occur frequently overtime such as the continuous operation of AC units or other equipment on site.

In addition, as described in *Section 2.1*, the Regulations require for the noise emissions to be free of annoying characteristics such as tonality, modulation or impulsiveness. Given the separation distances to the receivers and the expected type of activities on-site, it was considered that modulation and impulsiveness would not be present in the noise emissions.

However, tonality is likely to be present, especially during night-time when background noise levels are low. Common sources of tonality include air-conditioning equipment for example condensers or cooling towers, and diesel driven equipment such as trucks or small mobile plant. The predicted noise levels of *Table 4-1* were therefore adjusted by +5 dB in accordance with *Table 2-1* when compared to the night-time noise levels.

Table 5-1 below assesses the noise levels at each location against the L_{A10} assigned noise levels for the combined noise emissions from AC units and forklift work.

Table 5-1 Assessment of Noise Levels Against L_{A10} (Excluding Refrigerated Trucks)

Location	Period[1]	Assigned Noise Level[2]	Predicted Noise Level[3]	Adjusted Noise Level[4]	Calculated Exceedance
East Receiver (Lot 20 Boeing Way)	Day (Mon-Sat)	45 dB L_{A10}	43 dB L_{A10}	43 dB L_{A10}	-
	Evening and Sunday and public holidays	40 dB L_{A10}		43 dB L_{A10}	3 dB
	Night	35 dB L_{A10}		48 dB L_{A10}	13 dB
West Receiver (Lot 6 Glendale Crescent)	Day (Mon-Sat)	50 dB L_{A10}	36 dB L_{A10}	36 dB L_{A10}	-
	Evening and Sunday and public holidays	45 dB L_{A10}		36 dB L_{A10}	-
	Night	40 dB L_{A10}		41 dB L_{A10}	1 dB

Notes:

1. Periods are as defined in *Table 2-4*.
2. The assigned noise level is as defined in *Table 2-4*.
3. Sum of the L_{A10} levels at each receiver from *Table 4-1*.
4. Night time noise is adjusted by + 5 dB for tonality.

The assessment above shows the Regulations could be exceeded in the evening at the east sensitive receivers, and also at night-time at both east and west sensitive receivers. Based on the assumptions made, it is noted that forklift activities are the most significant noise contributor at both east and west receivers. Therefore some noise mitigations would be required in relation to

forklift noise, for example, limiting to daytime hours Monday to Saturday, or ensuring activity occurs indoors.

The noise emissions from the refrigerated trucks were assessed separately and this is shown in *Table 5-2*. As per above, tonality is considered to be present only at night-time when background noise levels are lower than during the day.

Table 5-2 Assessment of Noise Levels Against L_{A10} (Refrigerated Trucks Only)

Location	Period[1]	Assigned Noise Level[2]	Predicted Noise Level[3]	Adjusted Noise Level[4]	Calculated Exceedance
East Receiver (Lot 20 Boeing Way)	Day (Mon-Sat)	45 dB L_{A10}	49 dB L_{A10}	49 dB L_{A10}	4 dB
	Evening and Sunday and public holidays	40 dB L_{A10}		49 dB L_{A10}	9 dB
	Night	35 dB L_{A10}		54 dB L_{A10}	19 dB
West Receiver (Lot 6 Glendale Crescent)	Day (Mon-Sat)	50 dB L_{A10}	49 dB L_{A10}	49 dB L_{A10}	-
	Evening and Sunday and public holidays	45 dB L_{A10}		49 dB L_{A10}	4 dB
	Night	40 dB L_{A10}		54 dB L_{A10}	14 dB

Notes:

1. Periods are as defined in *Table 2-4*.
2. The assigned noise level is as defined in *Table 2-4*.
3. Sum of the L_{A10} levels at each receiver from *Table 4-1*.
4. Adjusted by + 5 dB for tonality.

It can be seen from the above assessment that refrigerated deliveries could result in non-compliance with the Regulations during the daytime at the east sensitive receivers should this type of deliveries occur on the eastern side of the development. Refrigerated deliveries would not comply at either east or west receivers for the other time periods. Therefore some noise mitigations would be required in relation to refrigerated trucks delivery, for example, provide large separation distances between source and receiver, ensuring deliveries occur behind buildings away from receivers in order to provide significant noise barrier effects, or plan to have loading/off loading occurring indoors.

If considering the noise emission from the various AC plant only, compliance with the Regulations is predicted to be achieved even with the tonality penalty added therefore no adverse impacts are expected from such sources.

5.2 Assessment Against L_{A1}

This criterion is applicable to more intermittent noise emissions such as one off deliveries or pickups of goods e.g. truck drives ins, loads/unloads and then drives off. In the case of noise emissions to be considered against the L_{A1} assigned noise levels, it was considered that no annoying characteristics would be present in the noise emissions.

In addition to the above, it was considered unlikely for two 'worst-case' L_{A1} emissions to occur at the same time and therefore only the highest emission at each receiver was used in the assessment.

Table 5-3 below assesses the noise levels at each location against the L_{A1} assigned noise levels.

Table 5-3 Assessment of Noise Levels Against L_{A1}

Location	Period[1]	Assigned Noise Level[2]	Predicted Noise Level[3]	Adjusted Noise Level	Calculated Exceedance
East Receiver (Lot 20 Boeing Way)	Day (Mon-Sat)	55 dB L_{A1}	48 dB L_{A1}	48 dB L_{A1}	-
	Evening and Sunday and public holidays	50 dB L_{A1}		48 dB L_{A1}	-
	Night	45 dB L_{A1}		48 dB L_{A1}	3 dB
West Receiver (Lots 4 to 6 Glendale Crescent)	Day (Mon-Sat)	60 dB L_{A1}	41 dB L_{A1}	42 dB L_{A1}	-
	Evening and Sunday and public holidays	55 dB L_{A1}		42 dB L_{A1}	-
	Night	50 dB L_{A1}		42 dB L_{A1}	-

Notes:
1. Periods are as defined in *Table 2-4*.
2. The assigned noise level is as defined in *Table 2-4*.
3. Highest L_{A1} level at each receiver from *Table 4-1*.

The assessment above shows the Regulations can be complied with during the day and evening times at both the east and west receivers. However, should night-time deliveries occur the Regulations may be exceeded at the east receivers. From the modelling it is noted the predicted noise levels are dominated by deliveries occurring on the eastern most side of the development. Therefore, increasing the separation distance between source and receiver, ensuring deliveries occur behind buildings away from receivers in order to provide significant noise barrier effects, or plan to have loading/off loading occurring indoors, are mitigation measures to be considered to comply with the night-time assigned noise levels.

5.3 Assessment Against L_{Amax}

This criterion is applicable to short duration events such as the crashing noise from rubbish being emptied into the truck, or when the bins is lowered back on the ground during waste collection. In the case of noise emissions considered against the L_{Amax} assigned noise levels, it was considered that no annoying characteristics would be present in the noise emissions given the distance to the receivers.

In addition to the above, waste collection for the showrooms located on the west side of the development will occur behind the building therefore resulting in limited noise impacts and that it was considered unlikely for two 'worst-case' L_{max} emissions to occur at the same time and therefore only the highest emission at each receiver was used in the assessment.

Table 5-4 below assesses the noise levels at each location against the L_{Amax} assigned noise levels.

Table 5-4 Assessment of Noise Levels Against L_{Amax}

Location	Period[1]	Assigned Noise Level[2]	Predicted Noise Level[3]	Adjusted Noise Level	Calculated Exceedance
East Receiver (Lot 20 Boeing Way)	Day (Mon-Sat)	65 dB L_{Amax}	58 dB L_{Amax}	58 dB L_{Amax}	-
	Evening and Sunday and public holidays	55 dB L_{Amax}		58 dB L_{Amax}	3 dB
	Night	55 dB L_{Amax}		58 dB L_{Amax}	3 dB
West Receiver (Lot 2 Glendale Crescent)	Day inc. Sunday and public holidays	72 dB L_{Amax}	59 dB L_{Amax}	59 dB L_{Amax}	-
	Evening	62 dB L_{Amax}		59 dB L_{Amax}	-
	Night	62 dB L_{Amax}		9 dB L_{Amax}	-

Notes:

1. Periods are as defined in *Table 2-4*.
2. The assigned noise level is as defined in *Table 2-4*.
3. Highest L_{A1} level at each receiver from *Table 4-1*.

The assessment above shows the Regulations could be exceeded at the receivers to the sensitive receiver to the east should waste collection occurs after 19.00 Monday to Saturday or on Sundays and public holidays. However, it is noted rubbish collection generally occurs during daytime hours Monday to Saturday and therefore compliance with the Regulations should not be an issue.

6 DISCUSSION

It is understood the zoning of Lot 103 Jandakot will be changed to allow for showrooms and warehouse/logistics types of premises.

The potential for adverse impacts from ground vibration emanating from the site was considered negligible given that significant sources of vibration such as crushers, metal shredders or other heavy industrial equipment are not expected on the development site, and the separation distances to the nearest receivers.

In relation to noise, an assessment of typical noise emissions for the type of premises proposed was conducted. In relation to showrooms, the Regulations are expected to be complied with at all times since noise emissions from this type of premises would only include air conditioning noise, daytime deliveries and daytime waste collections.

In relation to warehouses, the type and location of activity dictates whether compliance with the Regulations can be achieved or not. Forklift work in an open yard associated with warehouses and outdoor storage areas, and the use of refrigerated trucks for deliveries can result in exceedances of the assigned noise levels at all times.

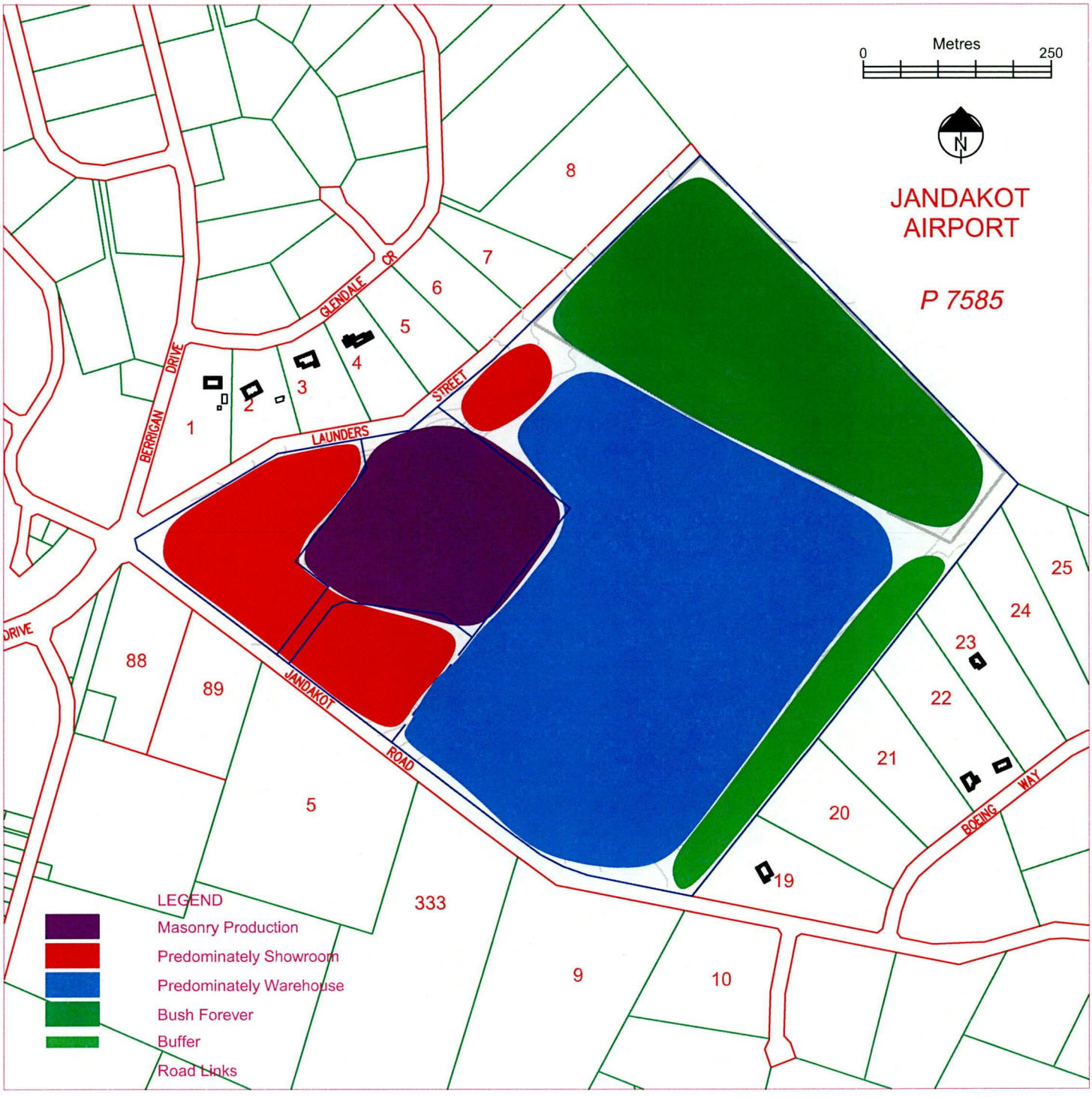
Based on preliminary planning and results of the assessment carried out, the following levels of acoustic assessment are recommended depending on the premises type:

- For the showroom premises in the north-west of the site, a site specific acoustic assessment is not expected to be required provided the relevant provisions of the Noise Management Plan shown in *Appendix B* are implemented.
- For warehouse/logistics premises located behind showrooms or other large buildings e.g. central to the development, a site specific acoustic assessment is not expected to be required provided the relevant provisions of the Noise Management Plan shown in *Appendix B* are implemented.
- For warehouse/logistics premises on the east side, or any premises where the relevant provisions of the Noise Management Plan shown in *Appendix B* cannot be implemented, a site specific acoustic assessment should be undertaken.

Finally, it is noted each premises occupier will be required to comply with the Regulations and, in accordance with the City of Cockburn local planning policy 1.12, detailed acoustic assessments may be required by the City for specific occupiers.

Appendix A

Preliminary Development Plan



Concept Plan

Appendix B

Noise Management Plan

This Plan presents generic noise control mitigation measures that are to be considered by each premises occupier in order to minimise noise impacts to adjacent premises and nearby residential receivers.

Air-Conditioning and Refrigeration Plant

- Locate plant on roof and/or away from residential receivers e.g. side or back of building
- Mechanical plant should be selected so as to be able to operate at lower capacity during evening / night-time

Deliveries

- All deliveries to occur Monday to Saturday between 07.00 and 19.00 and to maximise time between trucks in order to avoid multiple noise sources and trucks idling/queuing
- In addition to above, refrigeration plant mounted to delivery trucks are not to be operated for more than 24 minutes in any 4 hours
- Where reversing is required, delivery vehicles should have broadband type reversing alarms fitted rather than standard tonal alarms. Where a safe work practice can be provided, for example, route not requiring reversing or use of spotters, reversing alarms should be turned off.
- Consider impact noise mitigation in loading/off-loading areas such as rubber matting to minimise impact noise of bins, pallets, etc.

Plant Yard / Outdoor Storage Areas

- Open plant yards and outdoor storage areas within which forklifts or other mobile equipment will be used on a regular basis to be located behind large buildings and away from sensitive receivers to maximise noise barrier effects
- Forklift or similar mobile equipment operations in outdoor areas are to be daytime operations i.e. 07.00 to 19.00 Monday to Saturday
- Mobile equipment and trucks should have broadband type reversing alarms rather than standard tonal alarms
- Consider use of impact matting in lay down / storage areas, especially in cases where hollow metals are stored, to minimise impact noise

'Warehouse/Logistics' Building Design and Sitting

- Building(s) to be designed and oriented to maximise noise attenuation effects to nearby residential receivers and adjacent premises
- For building(s) on the east side of the development, large openings such as roller shutter doors will preferably be facing away from residential receivers

Appendix C

Terminology

The following is an explanation of the terminology used throughout this report.

Decibel (dB)
The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A-Weighting
An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A dB.

Sound Power Level (L_w)
Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure levels at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (L_p)
The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

L_{ASlow}
This is the noise level in decibels, obtained using the A frequency weighting and the S time weighting as specified in AS1259.1-1990. Unless assessing modulation, all measurements use the slow time weighting characteristic.

L_{AFast}
This is the noise level in decibels, obtained using the A frequency weighting and the F time weighting as specified in AS1259.1-1990. This is used when assessing the presence of modulation only.

L_{APeak}
This is the maximum reading in decibels using the A frequency weighting and P time weighting AS1259.1-1990.

L_{Amax}
An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

L_{A1}
An L_{A1} level is the A-weighted noise level which is exceeded for one percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

L_{A10}
An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the "*intrusive*" noise level.

L_{Aeq}
The equivalent steady state A-weighted sound level ("equal energy") in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the "average" noise level.

L_{A90}
An L_{A90} level is the A-weighted noise level which is exceeded for 90 percent of the measurement period and is considered to represent the "*background*" noise level.

One-Third-Octave Band
Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive.

L_{Amax} assigned level
Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded at any time.

L_{A1} assigned level
Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 1% of the representative assessment period.

L_{A10} assigned level
Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 10% of the representative assessment period.

Tonal Noise
A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

the presence in the noise emission of tonal characteristics where the difference between -

(a) the A-weighted sound pressure level in any one-third octave band; and

(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

Modulating Noise
A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

a variation in the emission of noise that —

(a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;

(b) is present for at least 10% of the representative.

Impulsive Noise

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness is:

a variation in the emission of a noise where the difference between $L_{A\ peak}$ and $L_{A\ Max\ slow}$ is more than 15 dB when determined for a single representative event;

Major Road

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

Secondary / Minor Road

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Influencing Factor (IF)

$$= \frac{1}{10}(\%\ \text{Type}\ A_{100} + \%\ \text{Type}\ A_{450}) + \frac{1}{20}(\%\ \text{Type}\ B_{100} + \%\ \text{Type}\ B_{450})$$

where:

$\%\ \text{Type}\ A_{100}$ = the percentage of industrial land within a100m radius of the premises receiving the noise

$\%\ \text{Type}\ A_{450}$ = the percentage of industrial land within a 450m radius of the premises receiving the noise

$\%\ \text{Type}\ B_{100}$ = the percentage of commercial land within a100m radius of the premises receiving the noise

$\%\ \text{Type}\ B_{450}$ = the percentage of commercial land within a 450m radius of the premises receiving the noise

+ Traffic Factor (maximum of 6 dB)

= 2 for each secondary road within 100m

= 2 for each major road within 450m

= 6 for each major road within 100m

Representative Assessment Period

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

Background Noise

Background noise or residual noise is the noise level from sources other than the source of concern. When measuring environmental noise, residual sound is often a problem. One reason is that regulations often require that the noise from different types of sources be dealt with separately. This separation, e.g. of traffic noise from industrial noise, is often difficult to accomplish in practice. Another reason is that the measurements are normally carried out outdoors. Wind-induced noise, directly on the microphone and indirectly on trees, buildings, etc., may also affect the result. The character of these noise sources can make it difficult or even impossible to carry out any corrections.

Ambient Noise

Means the level of noise from all sources, including background noise from near and far and the source of interest.

Specific Noise

Relates to the component of the ambient noise that is of interest. This can be referred to as the noise of concern or the noise of interest.

Peak Component Particle Velocity (PCPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and in one of the three orthogonal directions (x, y or z) measured as a peak response. Peak velocity is normally used for the assessment of structural damage from vibration.

Peak Particle Velocity (PPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and is the vector sum of the PCPV for the x, y and z directions measured as a peak response. Peak velocity is normally used for the assessment of structural damage from vibration.

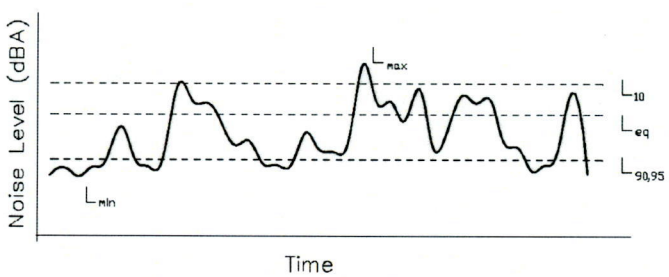
RMS Component Particle Velocity (PCPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and in one of the three orthogonal directions (x, y or z) measured as a root mean square (rms) response. RMS velocity is normally used for the assessment of human annoyance from vibration.

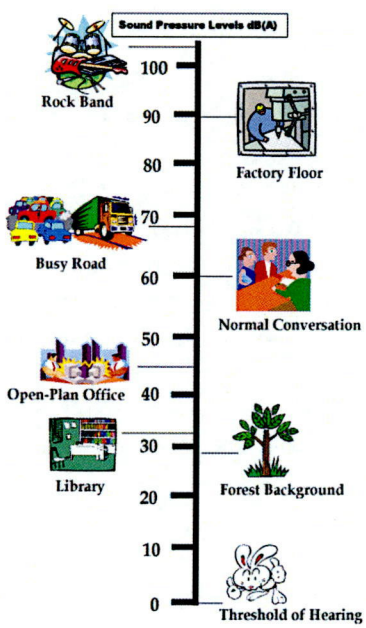
Peak Particle Velocity (PPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and is the vector sum of the PCPV for the x, y and z directions measured as a root mean square (rms) response. RMS velocity is normally used for the assessment of human annoyance from vibration.

Chart of Noise Level Descriptors



Typical Noise Levels



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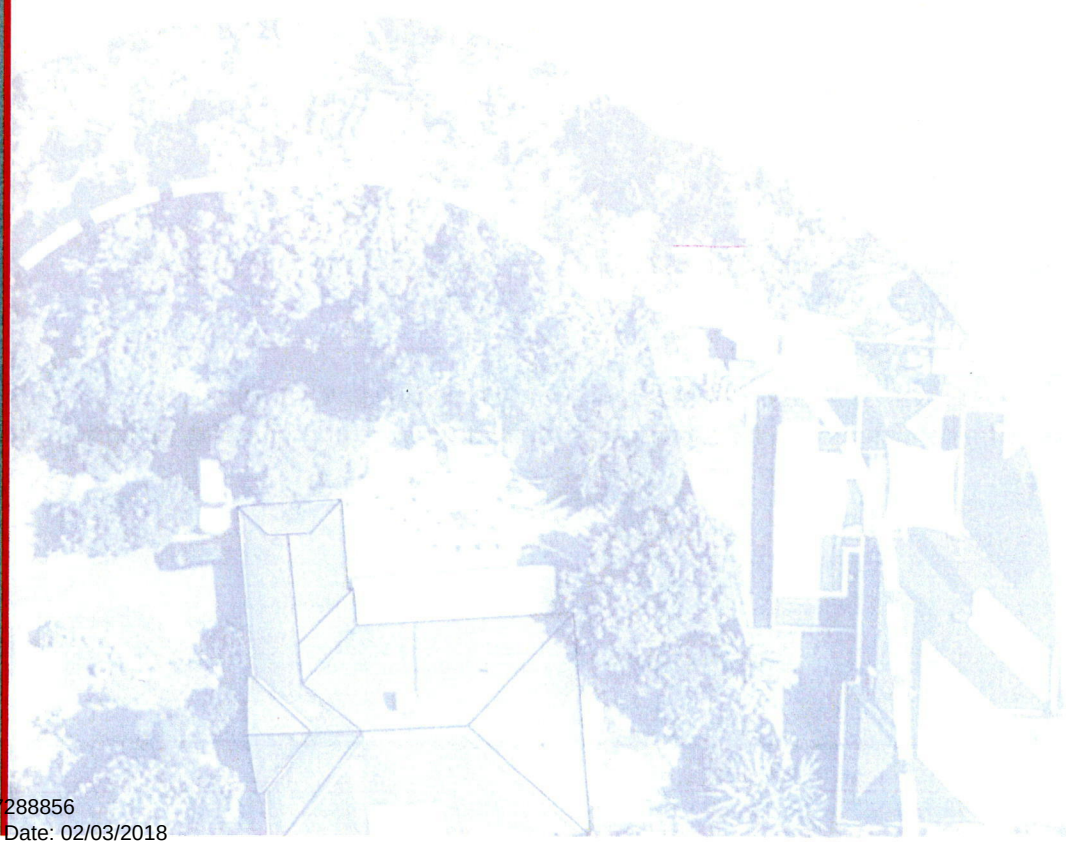
RUIC FIRE

BUSHFIRE MANAGEMENT PLAN

Strategic Planning Proposal

Lots 101, 103 and 104 Jandakot Road, Jandakot

Version: 1.0 Reference: 5305 July 2016



Project Number:	5305
Project Name:	Lots 101, 103 and 104 Jandakot Road, Jandakot
Author:	Louisa Robertson, MSc, BSc, BPAD36748 Level 1
Approved by:	Darrel Krammer, Grad Cert Bushfire Protection, BPAD33412 Level 1
Version:	1.0
Date of issue:	19th July 2016

LM Roberton

Author: Louisa Robertson
Date: 19th July 2016

Approved by: Darrel Krammer
Date: 19th July 2016

In the signing the above, the author declares that this Bushfire Management Plan meets the requirements of State Planning Policy 3.7. This report supersedes all previous Bushfire Management Plans for the site.

DISCLAIMER AND LIMITATION

This report is prepared solely for **the Shaffer Corporation** (the 'proponent') and any future landowners of the subject lot(s)and is not for the benefit of any other person and may not be relied upon by any other person.

The mitigation strategies contained in this Bushfire Management Plan are considered to be prudent minimum standards only, based on the writer's experience as well as standards prescribed by relevant authorities. It is expressly stated that RUIC Fire and the writer do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Fire is an extremely unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire.

Further, the growth, planting or removal of vegetation; poor maintenance of any fire prevention measures; addition of structures not included in this report; or other activity can and will change the bushfire threat to all properties detailed in the report. Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which RUIC Fire has no control. If the proponent becomes concerned about changing factors then a new Fire Risk Management Plan should be requested.

To the maximum extent permitted by the law, RUIC Fire, its employees, officers, agents and the writer ("RUIC Fire") excludes all liability whatsoever for:

1. claim, damage, loss or injury to any property and any person caused by fire or as a result of fire or indeed howsoever caused;
2. errors or omissions in this report except where grossly negligent; and

the proponent expressly acknowledges that they have been made aware of this exclusion and that such exclusion of liability is reasonable in all the circumstances.

If despite the provisions of the above disclaimer RUIC Fire is found liable then RUIC Fire limits its liability to the lesser of the maximum extent permitted by the law and the proceeds paid out by RUIC Fire's professional or public liability insurance following the making of a successful claim against such insurer.

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This report is valid for a period of three years only from the date of its issue. All BAL ratings identified in this report are indicative and are required to be verified at the time of construction of individual buildings to ensure appropriate setbacks identified in the proposed development have been achieved.

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ABN: 48 151 451 713

Contents Page

1.0 Introduction

1.1 Subject Site

The site the subject of this Bushfire Management Plan (BMP) is Lots 101, 103 and 104 Jandakot Road, Jandakot.

The site is located within the municipality of the City of Cockburn. Figure 1A illustrates the subject site and its immediate surrounds.

The site is identified as being Bushfire Prone on the State Bushfire Prone Maps.

The site includes Bushfire Forever site 388 as shown in Figure 4A. The Environmental Assessment Report by PGV Environmental (2016) concluded that the site consists mainly of revegetated areas that are not considered to be environmentally significant. The report identified small remnant patches of Banksia Woodland and remnant vegetation within a wetland buffer that are also not considered to be environmentally significant. Fragmentation of the remaining remnant vegetation is likely to be impacted by edge effects on the construction of Launders Street and required perimeter firebreaks. Consequently, no existing vegetation is proposed to be conserved within the site.

1.2 Development Description

The site includes an existing 'Additional Uses' Area currently used for the manufacture of masonary products and a nursery. The proponent is seeking to extend the 'Additional Use' zoning over the remaining areas of Lots 101, 103 and 104 Jandakot Road, excluding the Bush Forever site, through a Strategic Scheme Amendment.

It is proposed to develop the site for showrooms, warehousing and logistics. The development will not include the bulk storage of hazardous substances as the land sits on the Jandakot Groundwater Mound. The Concept Development Plan, showing the indicative distribution of uses for the land shown in Figure 1B.

1.3 Previous Bushfire Assessments

A previous Bushfire Management Plan (BMP) was prepared for the proposed subdivision of Lot 77 Jandakot Road into two separate lots by FirePlan WA in 2007. This report has not been considered in the current Bushfire Management Plan.

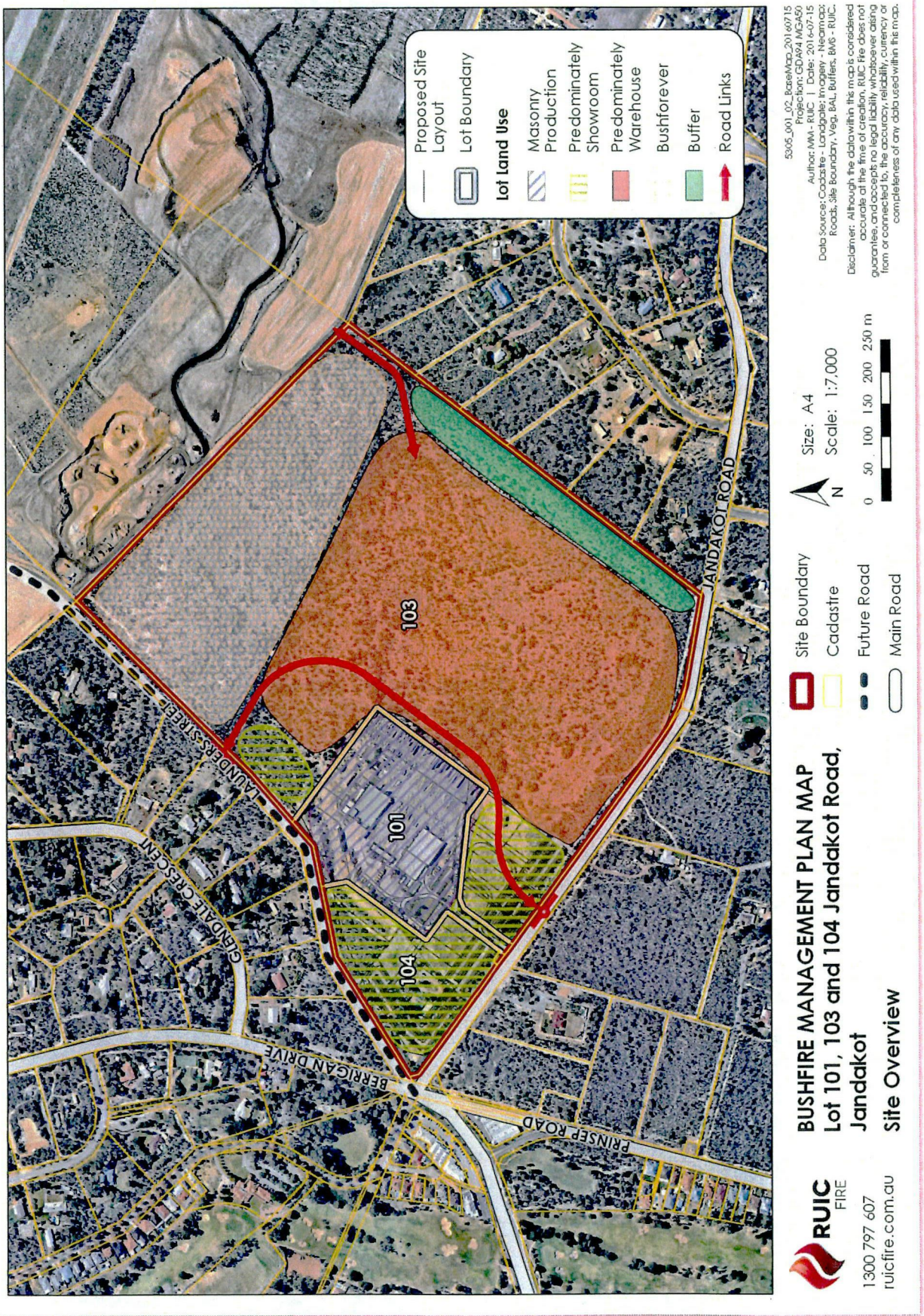


Figure 1A: Site Overview

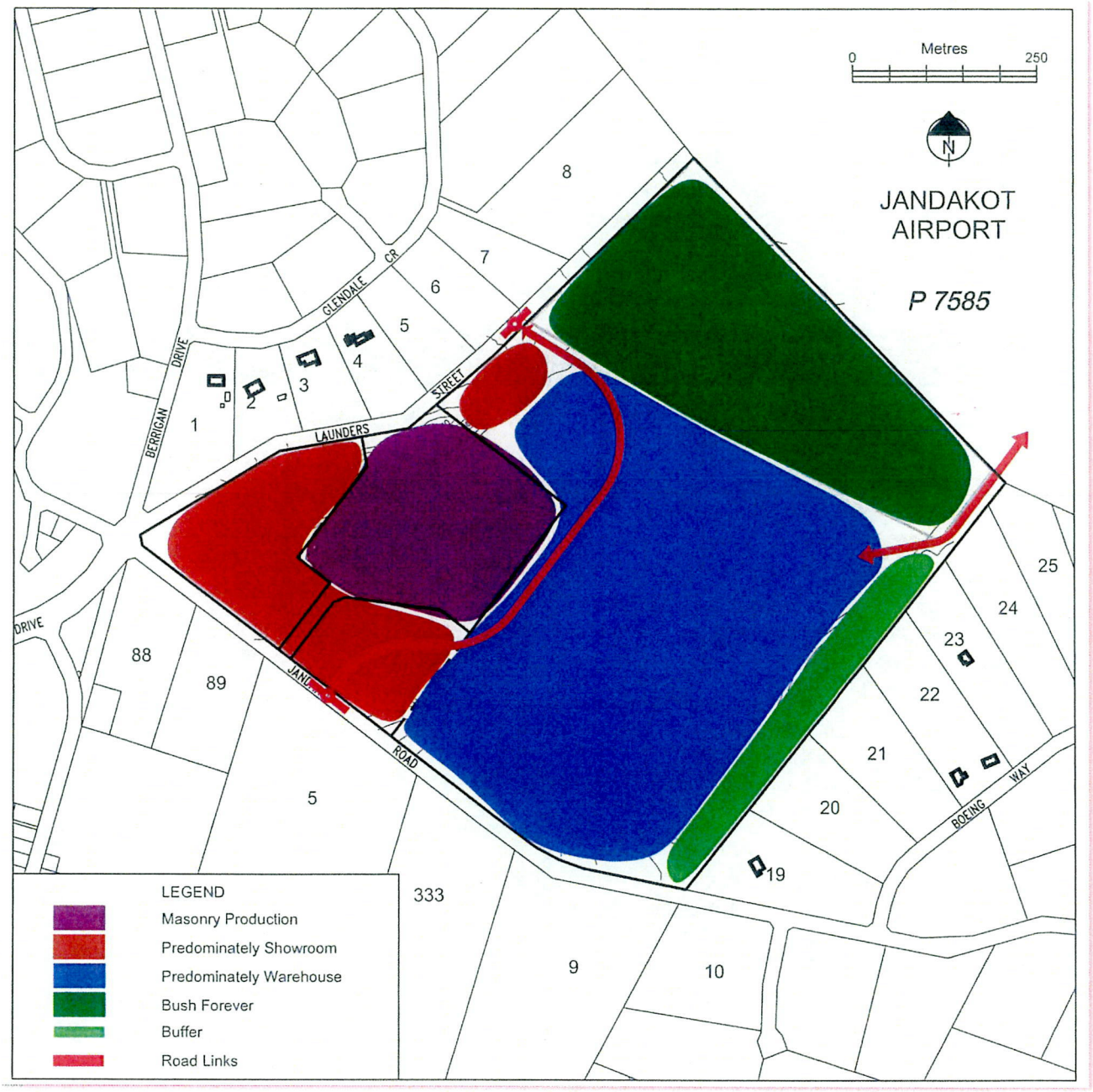


Figure 1B: Concept Development Plan (MGA Town Planners, 2016)

2.0 Spatial consideration of bushfire threat

2.1 Strategic Bushfire Hazard Level Assessment

2.1.1 Assessment Methodology

The Bushfire Hazard Level Assessment was undertaken within 100 metres of the proposed development area in accordance with *Guidelines for Planning in Bushfire Prone Areas* (the Guidelines) Appendix Two. Table 1A details the vegetation characteristics and associated hazard levels identified in the Guidelines Appendix 2.

Table 2A: Vegetation characteristics and associate hazard levels

Vegetation characteristics	Hazard level
• devoid of standing vegetation (less than 0.25ha cumulative area); • areas which, due to climatic conditions or vegetation (e.g. rainforest), do not experience bushfires; • inner urban or suburban areas with maintained gardens and very limited standing vegetation (less than 0.25ha cumulative area); • low threat vegetation, including grassland managed in a minimal fuel condition (i.e. to a nominal height of 100mm), maintained lawns, vineyard and orchards; and • pasture or cropping areas with very limited standing vegetation that is shrubland, woodland or forest with an effective up slope*, on flat land or an effective down slope* of less than 10 degrees, for a distance greater than 100 metres.	**Low**
• areas containing pasture or cropping with an effective down slope* in excess of 10 degrees for a distance greater than 100 metres; • unmanaged grasslands; • open woodlands; • open shrublands; • low shrubs on areas with an effective up slope*, on flat land or an effective down slope* of less • than 10 degrees, for a distance greater than 100 metres or flat land; • suburban areas with some tree cover; and • forest and woodlands with a permanent grass understorey or at most, a scrub understory structure consisting of multiple	**Moderate**

Vegetation characteristics	Hazard level
areas of <0.25ha and not within 20 metres of each other or single areas of <1ha and not within 100 metres of other scrub areas.	
• forests with a scrub understorey which is multi-tiered; • woodlands with a scrub understorey which is multi-tiered; • tall shrubs; and • any area of vegetation not otherwise categorised as low or moderate.	**Extreme**
*NOTE Effective slope refers to the slope under the classified vegetation in relation to the subject site. Distances less than 100 metres will be deemed to be undulating land, rather than a nominated slope.	

2.1.2 Vegetation and Hazard Level

A strategic pre-development Bushfire Hazard Level Assessment was undertaken for the proposed development area as well as all land within 100 metres of the external boundary of the subject site (the assessment area).

Figure 2A illustrates the location of each vegetation plot identified within the assessment area and the bushfire hazard level applicable to each plot.

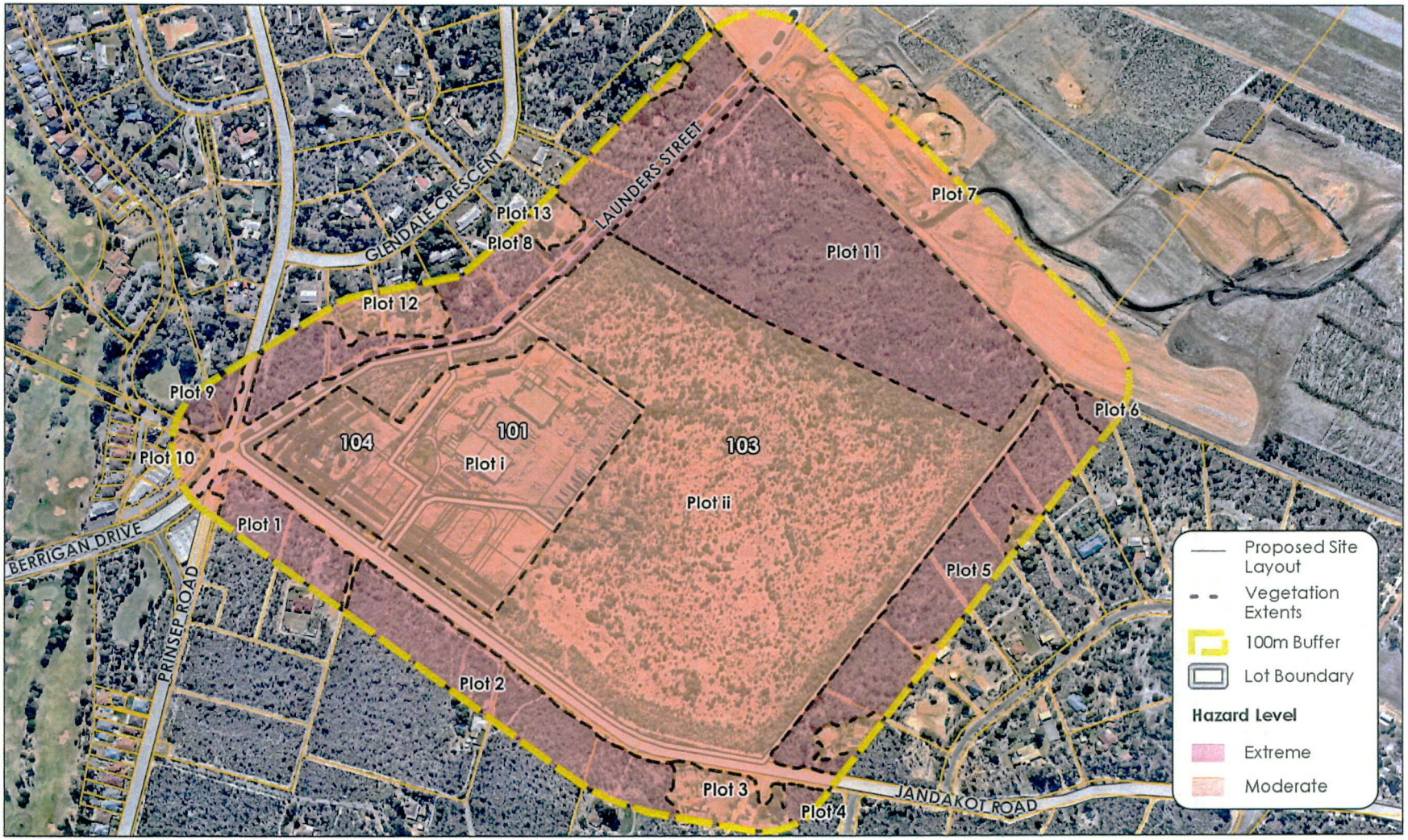
The vegetation classes applicable to each vegetation plot and the associated hazard levels are listed in Table 2B.

Photos of each of vegetation plot are include below in Section 2.3

Table 2B: Vegetation classes and bushfire hazard levels

Vegetation plot	Vegetation class	Bushfire Hazard Level
Plot i.	Low Threat vegetation	Moderate*
Plot ii.	Open Woodland	Moderate
Plot 1	Tall Shrubs	Extreme
Plot 2	Tall Shrubs	Extreme
Plot 3	Open Woodland	Moderate
Plot 4	Tall Shrubs	Extreme
Plot 5	Woodlands with scrub understorey which is multi-tiered	Extreme
Plot 6	Tall Shrubs	Extreme
Plot 7	Devoid of native standing vegetation	Moderate*
Plot 8	Woodlands with scrub understorey which is multi-tiered	Extreme

Vegetation plot	Vegetation class	Bushfire Hazard Level
Plot 9	Forests with scrub understorey which is multi-tiered	Extreme
Plot 10	Low Threat vegetation	Moderate*
Plot 11	Woodlands with scrub understorey which is multi-tiered	Extreme
Plot 12	Low Threat vegetation	Moderate*
Other non-classified areas of low threat	Low Threat vegetation	Moderate*
*NOTE: Plot classified as Moderate as is it located within 100 metres of Moderate or Extreme Hazard Level vegetation		



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BUSHFIRE MANAGEMENT PLAN MAP
Lot 101, 103 and 104 Jandakot Road, Jandakot
Bushfire Hazard Level Assessment

Site Boundary
Cadastre
Future Road
Main Road

N
Size: A4
Scale: 1:7,000
0 50 100 150 200 250 m

5305_004_01_BHLA_20160715
Projection: GDA94 MGA50
Author: MM - RUIC | Date: 2016-07-15
Data Source: Cadastre - Landgate; Imagery - Nearmap; Roads, Site Boundary, Veg, BAL, Buffers, BMS - RUIC.

Disclaimer: Although the data within this map is considered accurate at the time of creation, RUIC Fire does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any data used within this map.

Figure 2A: BHLA Map

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2.2 Bushfire Attack Level Assessment

2.2.1 Vegetation classifications

The location and extent of AS 3959 vegetation structures, including clause 2.2.3.2 exclusions, within 100 metres of the site are mapped in Figure 2B and shown in the photos below. Bushfire fuel loads are identified as consistent with AS 3959 Table B2 for radiant heat flux modelling purposes. All bushfire structures and fuel loads are assessed in their mature states (including revegetation and rehabilitation areas) unless otherwise identified.

At this stage, it is expected that all vegetation on site will be removed as part of the development, with the exception of the Bush Forever site. Should any vegetation be retained within the site, the BAL Contour map is to be updated to reflect this.

As part of the staging of the development, all vegetation within 100 metres of habitable buildings will be reduced to low threat vegetation in accordance with AS 3959 clause 2.2.3.2. This will ensure that any remaining vegetation within the site will not contribute to the BAL ratings applicable to future habitable buildings.

Figure 1B shows a vegetated buffer area. Vegetation within the buffer will be managed in a low threat state in accordance with AS 3959 clause 2.2.3.2(f) and be subject to a Landscape Management Plan at the subdivision stage of planning.

Access to Plots 12 and 13 and the other plots identified as "Low Threat (not classified)" in Figure 2B was not available. The classifications were based on satellite imagery; therefore no photos are included below.

The future construction of Launders Street will result in the removal of vegetation along the western boundary of the site. This future removal of vegetation can be considered during a Bushfire Attack Level Assessment conducted during future subdivision or development application stages as appropriate.

2.2.2 BAL Analysis

Potential bushfire impact analysis was undertaken in accordance with AS 3959 Methodology 1 to determine the potential worst case scenario radiant heat impact on the development area. In accordance with SPP 3.7, a BAL Contour Map has been prepared to illustrate the potential radiant heat impacts and associated BAL ratings for the assessment area after the development is completed (see Figure 2B).

Figure 2B illustrates that the worst case BAL for any of the existing buildings in the site is BAL-12.5.

Table 2C outlines the worst case BAL for each of the vegetation plots post development, based on the separation distance to the external site boundaries. The worst case BAL applicable to the external site boundary is BAL-FZ.

Table 2C: Worst case BAL that applies to the external site boundary Post Development

Vegetation Plot	Vegetation Classification	Effective Slope	Separation (m)	BAL
Subject site	Exclusion 2.2.3.2(e) and (f)	N/A	N/A	N/A
1	Class D Scrub	Upslope	19 to <27	BAL-19
2	Class B Woodland	Upslope	19 to <27	BAL-19
3	Class G Grassland	Upslope	12 to <17	BAL-19

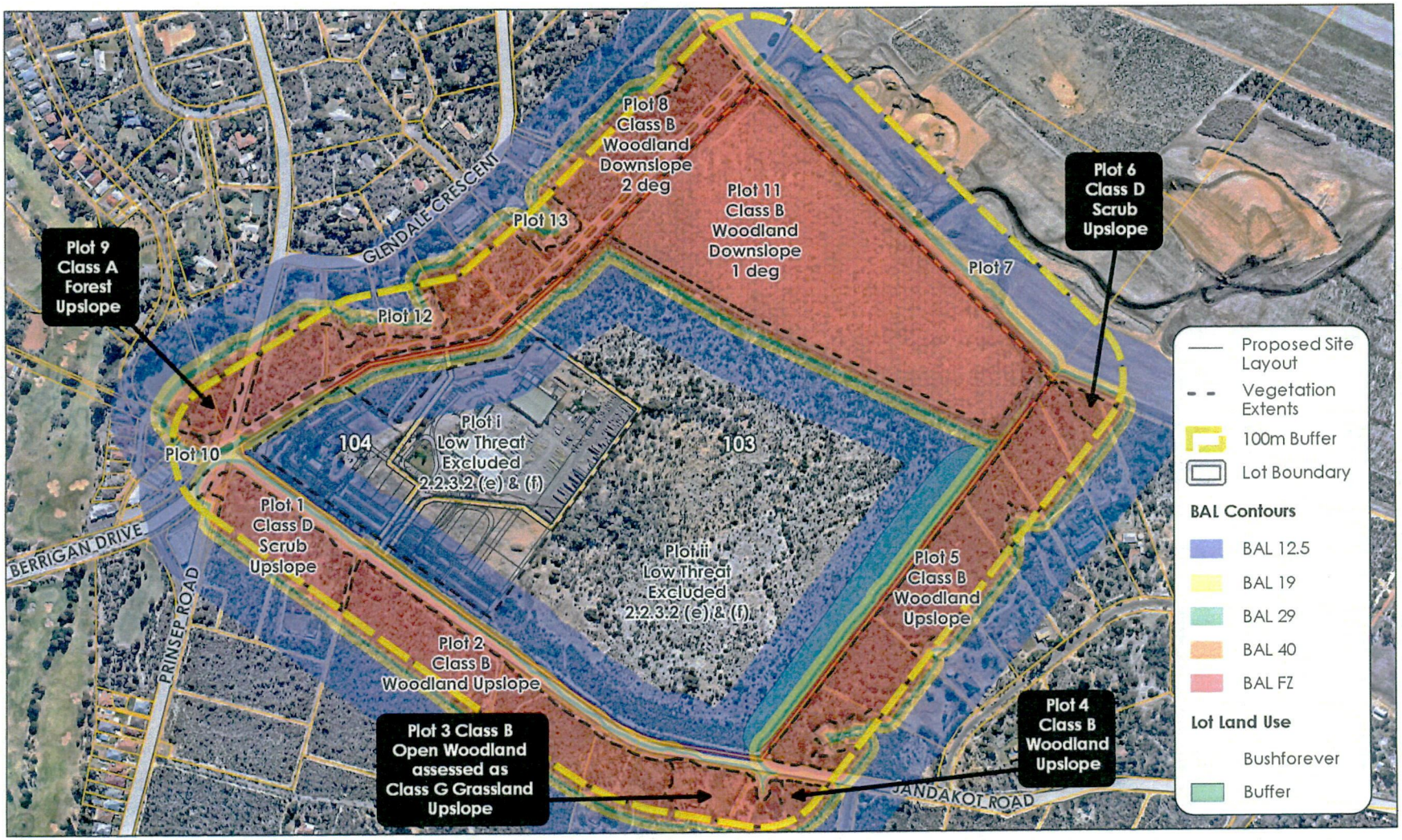
Vegetation Plot	Vegetation Classification	Effective Slope	Separation (m)	BAL
Subject site	Exclusion 2.2.3.2(e) and (f)	N/A	N/A	N/A
4	Class B Woodland	Upslope	29 to <100	BAL-12.5
5	Class B Woodland	Upslope	<10	**BAL-FZ**
6	Class D Scrub	Upslope	<10	**BAL-FZ**
7	Exclusion 2.2.3.2(e)	N/A	N/A	N/A
8	Class B Woodland	Downslope 2°	<13	BAL-FZ
9	Class A Forest	Flat	31 to >42	BAL-19
10	Exclusion 2.2.3.2(e)	N/A	N/A	N/A
11	Class B Woodland	Downslope 1°	0 (within site)	**BAL-FZ**
12	Exclusion 2.2.3.2(e) and (f)	N/A	N/A	N/A
13	Exclusion 2.2.3.2(e) and (f)	N/A	N/A	N/A

Table 2D details the worst case BAL applicable to each existing lot within the development. Future habitable buildings require a building setback to achieve BAL-29.

Table 2D: Worst case BAL that applies to each existing lot Post Development and setbacks required to achieve BAL-29

Lot	BAL	Setback required	Revised BAL
101	BAL-FZ	17 metres from northern lot boundary (Plot 8)	BAL-29
103	BAL-FZ	14 metres from eastern boundary (Plot 5) 14 metres from southern boundary (Plots 2 & 4) 17 metres from northern boundary (Plot 11) 17 metres from western boundary (Plot 18)	BAL-29
104	BAL-FZ	17 metres from north western boundary (Plot 8) 14 metres from south western boundary (Plot 1)	BAL-29

Notes:
*All BALs are based on the entire site being managed in a low threat state in accordance with AS 3959 clause 2.2.3.2 **AND/ OR** a 100 metre wide (or until the site boundary) low threat zone being established around each habitable building during staged development.



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BUSHFIRE MANAGEMENT PLAN MAP
Lot 101, 103 and 104 Jandakot Road, Jandakot
BAL Contours

Site Boundary
Cadastre
Main Road
Future Road

N
Size: A4
Scale: 1:7,000
0 50 100 150 200 250 m

5305_001_02_BAL_Contours_20160715
Projection: GDA94 MGA50
Author: MM - RUIC | Date: 2016-07-15
Data Source: Cadastre - Landgate; Imagery - Nearmap; Roads, Site Boundary, Veg, BAL, Buffers, BMS - RUIC.

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Figure 2B: BAL Contour Map

2.3 Vegetation plot photos and classifications

Plot i. (Subject site)

Pre Development
Existing industrial development and managed vegetation

BHLA – Low Threat vegetation
BAL – Exclusion 2.2.3.2(e)(f)

Post Development
Existing industrial development and managed vegetation

BHLA – Low Threat vegetation
BAL – Exclusion 2.2.3.2(e)(f)

Plot ii. (Subject site)

Pre Development
BHLA – Tall Shrubs
BAL – Class B Woodland

Post Development
All vegetation cleared or landscaped for development

BHLA - Devoid of native standing vegetation
BAL - Exclusion s2.2.3.2(e) and (f)

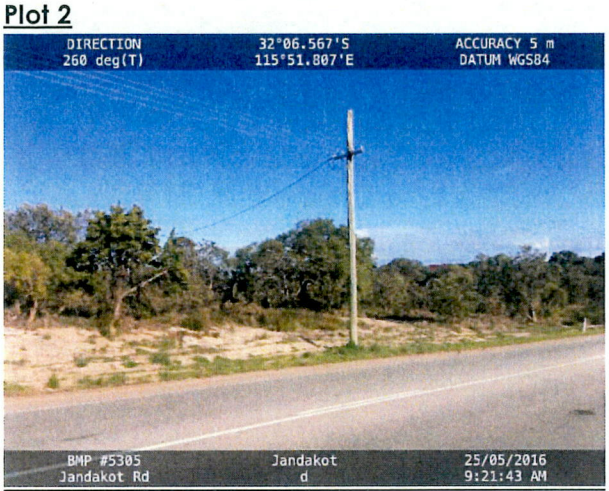
Note: During staging, all vegetation within 100 metres of habitable buildings will be reduced to low threat vegetation in accordance with AS 3959 clause 2.2.3.2.

Plot 1

Pre Development
BHLA - Tall Shrubs
BAL - Class D Scrub

Post Development
BHLA - Tall Shrubs
BAL - Class D Scrub

Plot 2



Pre Development
BHLA - Tall Shrubs
BAL - Class B Woodland

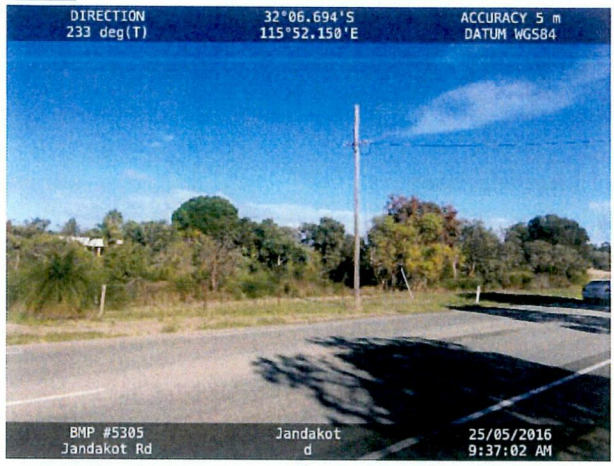
Post Development
BHLA - Tall Shrubs
BAL - Class B Woodland

Plot 3

Pre Development
BHLA - Open Woodland
BAL - Class B Open Woodland assessed on the understorey vegetation as Class G Grassland

Post Development
BHLA - Open Woodland
BAL - Class B Open Woodland assessed on the understorey vegetation as Class G Grassland

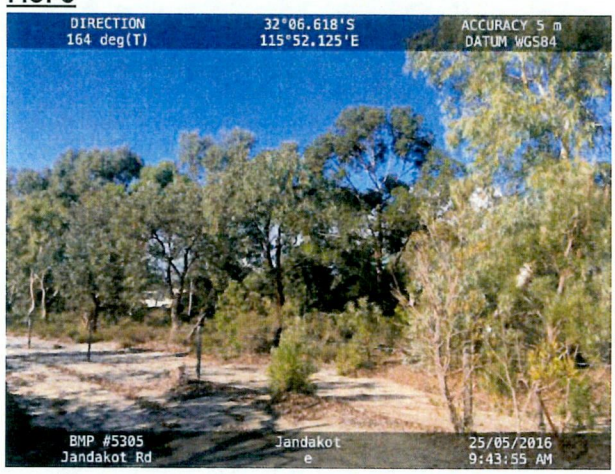
Plot 4



Pre Development
BHLA – Tall Shrubs
BAL – Class B Woodland

Post Development
BHLA - Tall Shrubs
BAL - Class B Woodland

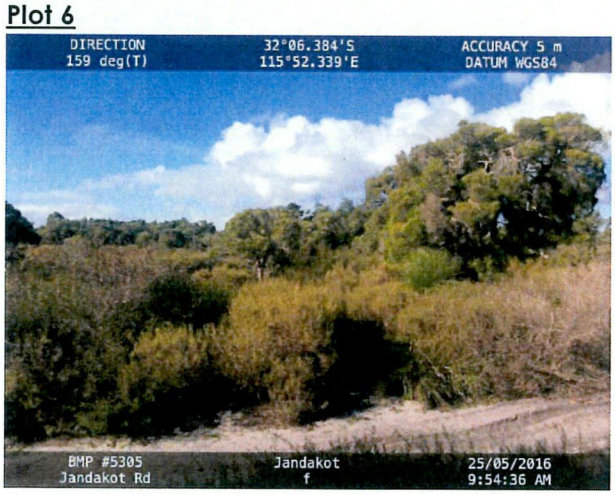
Plot 5



Pre Development
BHLA - Woodlands with scrub understorey which is multi-tiered
BAL - Class B Woodland

Post Development
BHLA - Woodlands with scrub understorey which is multi-tiered
BAL - Class B Woodland

Plot 6



Pre Development
BHLA - Tall Shrubs
BAL - Class D Scrub

Post Development
BHLA - Tall Shrubs
BAL - Class D Scrub

Plot 7

Pre Development

BHLA - Devoid of native standing vegetation

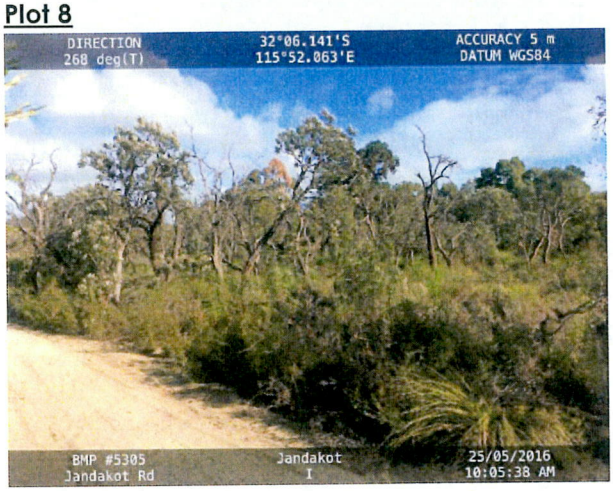
BAL - Non-vegetated area - Exclusion 2.2.3.2(e)

Post Development

BHLA - Devoid of native standing vegetation

BAL - Non-vegetated area - Exclusion 2.2.3.2(e)

Plot 8



Pre Development

BHLA - Woodlands with scrub understorey which is multi-tiered

BAL - Class B Woodland

Post Development

BHLA - Woodlands with scrub understorey which is multi-tiered

BAL - Class B Woodland

Plot 9

Pre Development

BHLA - Forests with scrub understorey which is multi-tiered

BAL - Class A Forest

Post Development

BHLA - Forests with scrub understorey which is multi-tiered

BAL - Class A Forest

Plot 10

Pre Development
BHLA - Low Threat vegetation
BAL - Non-vegetated area - Exclusion 2.2.3.2(e)

Post Development
BHLA - Low Threat vegetation
BAL - Non-vegetated area - Exclusion 2.2.3.2(e)

Plot 11

Pre Development

BHLA - Woodlands with scrub understorey which is multi-tiered
BAL - Class B Woodland

Post Development

BHLA - Woodlands with scrub understorey which is multi-tiered
BAL - Class B Woodland

2.4 Bushfire Hazard Issues

2.4.1 Bushfire Hazard Level Assessment

From the Bushfire Hazard Level Assessment, the following bushfire hazard issues have been identified.

- Land within the site consists of moderate and extreme bushfire hazard level. It is expected that the hazard level of land within the site will be reduced to low and moderate hazard level through the removal of all vegetation within the site (excluding the Bush Forever site).
- Land surrounding the site comprises both moderate and extreme bushfire hazard levels. These plots have the potential to increase the radiant heat impact on the subject site in the event of a bushfire occurring through this vegetation. Future subdivisions/ developments are to be designed to ensure the BALs from these vegetation plots do not result in future development being located in an area exceeding BAL-29.
- Section 4 details compliance with the bushfire protection criteria of the Guidelines to address the potential bushfire hazard issues.

2.4.2 Bushfire Attack Level Assessment

From the BAL Contour Map, the following bushfire hazard issues have been identified.

- During construction (staging of development), a separation of at least 100 metres will be provided to any classifiable vegetation on site.

- Should habitable buildings be constructed with existing Lots 101, 103 (pre-subdivision) and 104 and proposed Lot 35, a setback will be required to achieve BAL-29 as outlined in Table 2B.
- The development is subject to BAL-12.5 and higher; the relevant bushfire protection criteria are addressed in Section 4.

3.0 Proposal compliance and justification

3.1 State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7)

SPP3.7 applies to all development applications in designated bushfire prone areas.

3.1.1 Objectives

Policy Measure 5 contains the objectives of SPP3.7. The following demonstrates how the proposed development meets each of the objectives.

Objective 1: ***Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount.***

Development Response

Objective 1 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed below and all GPBPA Performance Principles as detailed in Section 4 of this report.

Objective 2: ***Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.***

Development Response

Objective 2 is satisfied through the appropriate identification and assessment of all relevant bushfire hazards as detailed in Section 2 of this report, specifically the BAL Contour Mapping.

Objective 3: ***Ensure that higher order strategic planning documents, strategic planning proposals, subdivision and development applications take into account bushfire protection requirements and include specified bushfire protection measures.***

Development Response

Objective 3 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed below and all GPBPA Performance Principles as detailed in Section 4 of this report.

Objective 4: ***Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.***

Development Response

Objective 4 is satisfied through the appropriate consideration of all biodiversity and environmental assets as detailed in Section 1 of this report in the development of bushfire related risk mitigation strategies detailed in Section 4 of this report.

3.1.2 Policy Measures

3.1.2.1 Strategic Planning Proposals

Policy Measure 6.2 requires that strategic planning proposals within designated bushfire prone areas and that have a BAL above BAL-LOW are to comply with Policy Measure 6.3.

3.1.2.2 Information to Accompany Strategic Planning Proposals

Policy Measure 6.3 applies to Strategic Planning Proposals. It requires certain information to be provided with such applications. The following outlines where the required information has been provided.

Table 3A: Compliance of the proposed development with the Policy Measures of SPP 3.7.

Policy Measure	Description	Development Response
a	(i) the results of a BHL assessment determining the applicable hazard level(s) across the subject land, in accordance with the methodology set out in the Guidelines. BHL assessments should be prepared by an accredited Bushfire Planning Practitioner; or (ii) where the lot layout of the proposal is known, a BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. The BAL Contour Map should be prepared by an accredited Bushfire Planning Practitioner; and	Figure 2A provides the BHLA Map. Figure 2B provides the BAL Contour Map.
b	The identification of any bushfire hazard issues arising from the relevant assessment; and	Section 2.4 addresses the bushfire hazard issues.
c	Clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages.	Section 4 provides an assessment of the development against the bushfire protection criteria.

3.1.2.3 Vulnerable or High Risk Land Uses

The proposed development, at this stage, is not known to contain any vulnerable or high risk land uses and will be subject to re-assessment at the subdivision and development application stages of planning.

3.1.2.4 Applications in BAL-40/BAL-FZ Areas

On completion of development, the developable land would not be subject to BAL-40 or BAL-FZ as outlined in Section 2.1.

3.1.2.5 Advice of State/Relevant Authority/s for Emergency Services to be Sought

The proposed development:

- Complies with the SPP3.7 Policy measures;
- Does not propose any additional/alternative measures; and
- Does not contain unavoidable development, vulnerable or high risk land uses.

Therefore, the advice of State/Relevant Authorities for Emergency Services is not required to be sought for this application.

3.1.2.6 Advice of State/Relevant Agencies/Authorities for Environmental Protection to be Sought

The proposed development:

- Does not propose clearing of vegetation within environmentally sensitive areas protected under State or Federal legislation;
- May propose clearing of locally significant native vegetation; and
- Abuts vegetated land managed by that authority.

Therefore, the advice of State/Relevant Agencies/Authorities for Environmental Protection is required to be sought for this application.

3.2 Guidelines for Planning in Bushfire Prone Areas (the Guidelines)

The Guidelines apply to development applications located within designated bushfire prone areas. The Guidelines provide supporting information for implementation of SPP3.7. Specifically, they provide the Bushfire Protection Criteria to be address for all applications.

This report has also been developed in order to comply with the requirements of all referenced and applicable documents. No non-compliances have been identified.

4.0 Bushfire Risk Management Measures

The bush fire risk mitigation strategies detailed in this report are designed to comply with the Bushfire Protection Criteria detailed in Guidelines for Planning in Bushfire Prone Areas (the Guidelines) Appendix 4 (2015).

i. The notation (P3) refers to Performance Principle 3 of the Guidelines Appendix 4.

ii. The notation (A3.1) refers to Acceptable Solution 3.1 of GPB the Guidelines PA Appendix 4.

iii. The notation (E3.1) refers to Explanatory Note 3.1 of the Guidelines Appendix 4.

iv. Where discrepancy occurs between State and Local bushfire planning provisions the higher standard of mitigation has been selected.

4.1 Element 1 - Location

Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.

Performance Principle (P1): The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL–29 or below, and the risk can be managed. For minor or unavoidable development in areas where BAL–40 or BAL–FZ applies, demonstrating that the risk can be managed to the satisfaction of the Department of Fire and Emergency Services and the decision-maker.

Acceptable Solution A1.1 Development location

The strategic planning proposal, subdivision and development application is located in an area that on completion will be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.

Development Response/Recommendations

On completion of the development, the entire site will be reduced to moderate or low bushfire hazard level through the clearing and management of all existing vegetation on site.

As outlined in Figure 2A and Table 2A, the development would ensure that all future habitable development areas are, upon completion of development, located in an area subject to BAL-29 or lower.

4.2 Element 2 - Siting and design of Development

Intent: To ensure that the siting of development minimises the level of bushfire impact.

Performance Principle (P2): The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. That it minimises the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.

Acceptable Solution A2.1 Asset Protection Zone (APZ)

Every building is surrounded by an Asset Protection Zone (APZ), depicted on submitted plans, which meets the following requirements:

a. Width: 20 metres measured from any external wall of future buildings. Where the slope increases above 10 degrees, the APZ should be increased to ensure the potential radiant heat impact of a fire does not exceed 29kW/m^2;

b. Location: within the boundaries of the lot on which the building is situated;

c. Fine fuel load: reduced to and maintained at 2 tonnes per hectare;

d. Trees (crowns) are a minimum distance of ten metres apart. A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species;

e. No tall shrubs or trees located within 2 metres of a building;

f. No tree crowns overhanging the building;

g. Fences and sheds within APZ are constructed using non-combustible materials (eg. iron, brick, limestone, metal post and wire); and

h. Sheds within the APZ should not contain flammable materials.

Development Response/Recommendations

As illustrated in Figure 4A, the *entire site*, excluding the Bush Forever site will be managed as an APZ.

Table 2C lists the specific setbacks required for future habitable buildings abutting vegetation external to the site. Once the Launders Street road reserve has been cleared road reserve has been cleared, this may reduce the need for a boundary setback.

Implementation

i. APZ to be implemented prior to the clearance of subdivision for affected lots in accordance with Figure 4A and provisions c-h above.

ii. It is the responsibility of the developer to ensure the APZ standard is established.

iii. It is the responsibility of the individual property owner (private land)/local government (in road reserves/reserves) to ensure the APZ standard continues to be achieved post completion of the construction.

Acceptable Solution A2.2 Hazard Separation Zone (HSZ)

Every building and its contiguous APZ is surrounded by a Hazard Separation Zone (HSZ), depicted on submitted plans, that meets the following requirements:

a. Minimum width: 80 metres, measured from the outer edge of the APZ, for any vegetation classified in AS 3959 as forests, woodlands, closed shrub, open shrub, mallee/mulga and rainforest; OR 30 metres, measured from the outer edge of the APZ, for unmanaged grassland;

b. Location: within the boundaries of the lot on which the building is situated or, where this is not possible or desirable, within the boundaries of the development precinct in which the building is proposed to be located; and

c. Fine Fuel load (Dead Material <6mm diameter and <3mm for live material): reduced to and maintained at between five and eight tonnes per hectare for jarrah/marri dominated forest and woodlands, below 12-15 tonnes per hectare in mallee heath and below 15 tonnes per hectare in karri forest.

Note: A HSZ may not be required if the proposed construction meets the standard appropriate to the BAL for that location, and does not exceed BAL–29.

Development Response/Recommendations

Due to the commercial nature of the proposed development, it is expected that the future buildings will be classified as a class other than 1, 2, 3 or associated 10a buildings. Accordingly, the *Building Code of Australia* (BCA) does not require compliance of these buildings with AS 3959.

As it is likely that future buildings will not be constructed in accordance with AS 3959, a Hazard Separation Zone is required. The entire site is proposed to be maintained as a HSZ as illustrated in Figure 4A. As the APZ is proposed to cover the entire area of the development site, the APZ and HSZ will overlap.

4.3 Element 3 - Vehicular Access

Intent: To ensure that the vehicular access serving a subdivision/ development is safe in the event of a bush fire occurring.

Performance Principle (P3): The internal layout, design and construction of public and private vehicular access in the subdivision/development allows emergency and other vehicles to move through it easily and safely at all times.

Solution		AS	PS	N/A	Comment
A4.1	Two Access Routes	☒	☐	☐	
A4.2	Public Road	☒	☐	☐	
A4.3	Cul-de-sac	☒	☐	☐	
A4.4	Battle-axe	☐	☐	☒	
A4.5	Private Driveway longer than 50 metres	☒	☐	☐	
A4.6	Emergency Access Way	☐	☐	☒	
A4.7	Fire Service Access Routes	☐	☐	☒	
A4.8	Firebreak width	☒	☐	☐	Applicable during construction

Acceptable Solution A3.1 Two access routes

Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.

Development Response/Recommendations

Figure 4B illustrates the wider public road network and access points into the site. The development achieves at least two different vehicular access routes, both connecting to the public road network to provide egress to two different destinations at all times.

The site is accessible by one existing access point and two proposed access points from Jandakot Road as well as one future access point from the future Launders Street. Jandakot Road provides direct access to the east and access to the north and west via Berrigan Drive, and to the south via Prinsep Road.

Construction staging will ensure at least two access routes are provided at all times. Therefore, the development will comply with A4.1.

Acceptable Solution A3.2 Public roads

A public road is to meet the requirements in Table 4A, Column 1.

Table 4A: Vehicular access technical requirements

Technical Requirement	Public road	Cul-de-sac	Private driveway	Emergency access way	Fire service access routes
Minimum trafficable surface (m)	6	6	4	6	6
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4	N/A	4.5	4.5	4.5
Maximum grade over <50m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

Development Response/Recommendations

All public roads will be designed to meet the requirements of Table 4A.

Implementation

i. Public roads are to be constructed prior to the clearance of subdivision for affected lots serviced by the public road.

ii. It is the responsibility of the developer to ensure the public road standard is established in accordance with Table 4A.

iii. It is the responsibility of Local Government to ensure the maintenance of public roads vested within their jurisdiction.

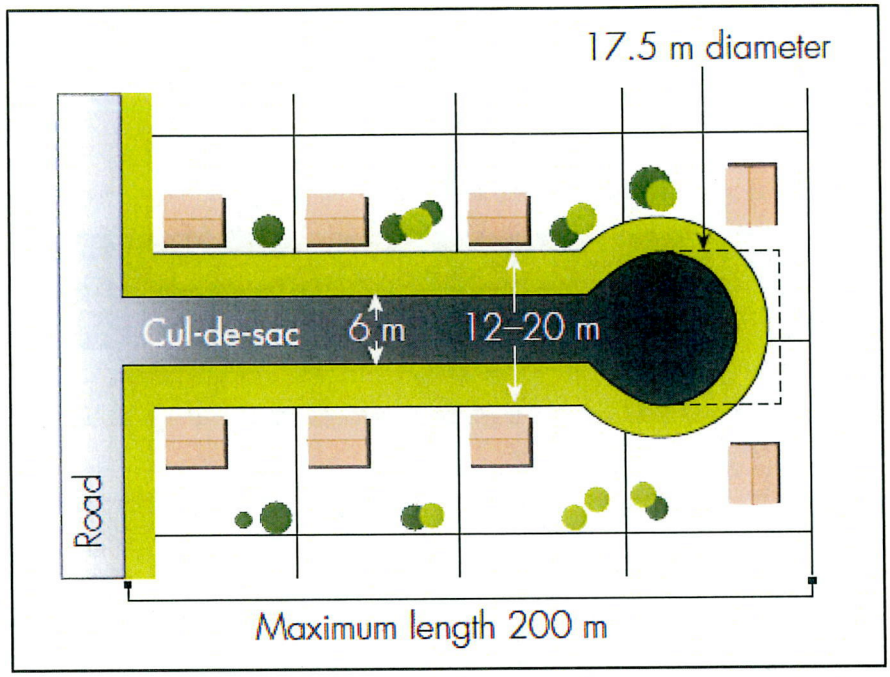
Acceptable Solution A3.3 Cul-de-sac (including a dead-end road)

A cul-de-sac and/or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), the following requirements are to be achieved:

a. Requirements in Table 4A, Column 2;

b. Maximum length: 200 metres (if public emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than eight lots are serviced and the emergency access way is no more than 600 metres); and

c. Turn-around area requirements, including a minimum 17.5 metre diameter head.



Source: Guidelines for Planning in Bushfire Prone Areas, Appendix 4, Fig. 18

Development Response/Recommendations

The proposed development does not include any permanent cul-de-sacs. A temporary turnaround will be constructed at the end of the temporary dead end in the north east corner of the site as shown in Figure 2A. This road will connect with future imminent development north of the site (see Figure 1B for future road linkages).

Any dead end roads will be provided with temporary cul-de-sacs during construction will be provided to comply with Table 4A, Column 2.

Implementation

i. To be implemented prior to the clearance of subdivision for affected lots that the cul-de-sac services.

ii. It is the responsibility of the developer to ensure the cul-de-sacs meets the required standard in accordance with Table 4A.

iii. It is the responsibility of the Local Government to ensure the cul-de-sacs continue to meet the required standard for any permanent cul-de-sacs.

Acceptable Solution A3.4 Battle-axe

Battle-axe access leg should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) all of the following requirements are to be achieved:

a. Requirements in Table 4A, Column 3;

b. Maximum length: 600 metres; and

c. Minimum width: six metres.

Development Response/Recommendations

No battle-axe lots are to be provided as part of the development. Therefore, A3.4 is not applicable to this development.

Acceptable Solution 3.5 Private Driveway longer than 50 metres

A private driveway is to meet all of the following requirements:

a. Requirements in Table 4A, Column 3;

b. Required where a house site is more than 50 metres from a public road;

c. Passing bays: every 200 metres with a minimum length of 20 metres and a minimum width of two metres (i.e. the combined width of the passing bay and constructed private driveway to be a minimum six metres);

d. Turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres (i.e. kerb to kerb 17.5 metres) and within 50 metres of a house; and

e. Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes.

f. All-weather surface (i.e. compacted gravel, limestone or sealed).

Development Response/Recommendations

Where private driveways longer than 50 metres are proposed as part of the development, they are to comply with A3.5.

Implementation

i. To be implemented prior to the occupation of future habitable buildings.

ii. It is the responsibility of the individual property owner to ensure private driveway meets the required standard in accordance with Table 4A.

iii. It is the responsibility of the individual property owner to ensure the cul-de-sacs continue to meet the required standard.

Acceptable Solution 3.6 Emergency Access Way

An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet all of the following requirements:

a. Requirements in Table 4, Column 4;

b. No further than 600 metres from a public road;

c. Provided as right of way or public access easement in gross to ensure accessibility to the public and fire services during an emergency; and

d. Must be signposted.

Development Response/Recommendations

No Emergency Access Ways are proposed as part of the development. Therefore, A3.6 is not applicable to the development.

Acceptable Solution 3.7 Fire Service Access Routes (Perimeter Roads)

Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for firefighting purposes. Fire service access routes are to meet the following requirements:

a. Requirements Table 4, Column 5;

b. Provided as right of ways or public access easements in gross to ensure accessibility to the public and fire services during an emergency;

c. Surface: all-weather (i.e. compacted gravel, limestone or sealed)

d. Dead end roads are not permitted;

e. Turn-around areas designed to accommodate type 3.4 appliances and to enable them to turn around safely every 500 metres (i.e. kerb to kerb 17.5 metres);

f. No further than 600 metres from a public road;

g. Allow for two-way traffic and;

h. Must be signposted.

Development Response/Recommendations

No Fire Service Access Routes are proposed as part of the development. Therefore, A3.7 is not applicable to the development.

Acceptable Solution A3.8 Firebreak width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government.

Development Response/Recommendations

Any balance title lots are required to have a fire break installed in accordance with the requirements of A3.8 unless otherwise required to be an APZ or low threat vegetation area.

4.4 Element 4 – Water

Intent: To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Performance Principle (P4): The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.

	Solution	AS	PBS	N/A	Comment
A4.1	Reticulated Areas	☒	☐	☐	
A3.2	Non-reticulated Areas	☐	☐	☒	
A3.3	Individual lots within non-reticulated areas	☐	☐	☒	

Acceptable Solution A4.1 Reticulated areas

The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.

Development Response/Recommendations

The site will be serviced by reticulated scheme water and firefighting hydrants, satisfying Acceptable Solution A4.1.

Acceptable Solution A4.2 Non-reticulated areas

Water tanks for fire fighting purposes with a hydrant or standpipe are provided and meet the following requirements:

a. Volume: minimum 50,000 litres per tank;

b. Ratio of tanks to lots: minimum one tank per 25 lots (or part thereof);

c. Tank location: no more than two kilometres to the further most house site within the residential development to allow a 2.4 fire appliance to achieve a 20 minute turnaround time at legal road speeds;

d. Hardstand and turn-around areas suitable for a type 3.4 fire appliance (i.e. kerb to kerb 17.5 metres) are provided within three metres of each water tank; and

e. Water tanks and associated facilities are vested in the relevant local government.

Development Response/Recommendations

The development will be connected to reticulated water supply. Therefore, A4.2 is not applicable to this development.

Acceptable Solution A4.3 Individual lots within non-reticulated areas

Single lots above 500 square metres need a dedicated static water supply on the lot that has the effective capacity of 10,000 litres.

Note - Only for use if creating one additional lot and cannot be applied cumulatively.

Development Response/Recommendations

The development will be connected to reticulated water supply. Therefore, A4.3 is not applicable to this development.

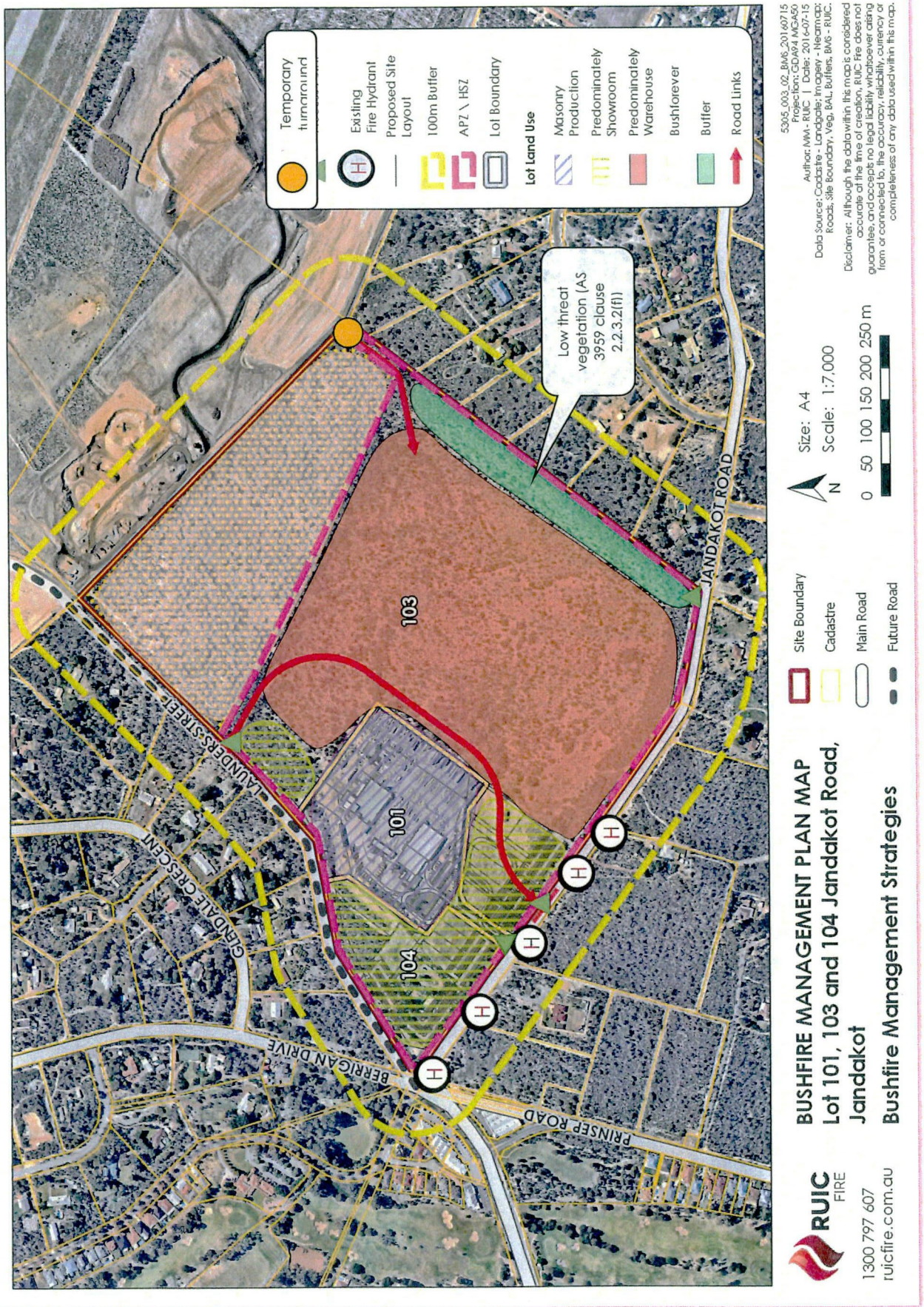


Figure 4B: Bushfire Management Strategies Map

5.0 Implementation and Enforcement

Table 5A: Developer Schedule of Works

Strategy	Implementation		Maintenance	
	Responsible	Time Frame	Responsible	Time Frame
Amendments to BMP	Any amendments to this BMP shall be approved by the relevant Jurisdiction Having Authority			
Asset Protection Zone	Developer	Prior to subdivision clearance	Individual Land Owners (private land) /local government (public land)	Ongoing
Hazard Separation Zone	N/A	N/A	N/A	N/A
Construction to AS 3959	Individual Land Owners & Local Government	On construction of all habitable buildings	Individual Land Owners	Ongoing
Cul-de-sacs	Developer (where required)	Prior to subdivision clearance	Local Government	Ongoing
Battle Axes	N/A	N/A	N/A	N/A
Private Driveways & Turnaround Area	Individual property owner	Prior to occupation of building	Individual property owner	Ongoing
Emergency Access Ways	N/A	N/A	N/A	N/A
Fire Service Access Routes	N/A	N/A	N/A	N/A
Firebreaks	Developer (where required)	Prior to subdivision clearance	Developer (private land) local government (public land)	Ongoing
Firefighting Water (hydrants)	Developer	Prior to subdivision clearance	Water Corporation	Ongoing
Firefighting Water (private tanks)	N/A	N/A	N/A	N/A
Firefighting Services & Response	DFES and Local Government	Ongoing	DFES and Local Government	Ongoing
Fuel Load Reduction and Fire Break Notice	Local Government	In accordance with firebreak notice	Local Government	In accordance with firebreak notice

Strategy	Implementation		Maintenance	
	Responsible	Time Frame	Responsible	Time Frame
Inspection and Issue of Works Orders or Fines	Local Government	Ongoing	Local Government	Ongoing

6.0 Conclusion

The proposed development, on completion, will ensure that all habitable development is located in an area that has a low to moderate bushfire hazard level or i.e. BAL-29 or below. With the implementation of the Bushfire Management Strategies, as outlined in Section 4 and shown in Figure 4A, the proposed development is considered to be appropriately protected from bushfire and complies with the requirements of SPP3.7 and the Guidelines. The proposed development is not expected to increase the bushfire risk.

7.0 References

FirePlan WA. (2007). Fire Management Plan. Lot 77 Jandakot Road. FirePlan WA, Perth.

PGV Environmental. (2016). Lots 101, 103 and 104 Jandakot Road, Jandakot. Environmental Assessment. PGV Environmental, Perth.

Standards Australia. (2009). AS 3959:2009 Construction of buildings in bushfire prone areas: SAI Global.

WAPC. (2015a). State Planning Policy 3.7 Planning in Bushfire Prone Areas. Western Australian Planning Commission & Department of Planning.

WAPC. (2015b). Guidelines for Planning in Bushfire Prone Areas. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.

WAPC. (2015c). Guidelines for Planning in Bushfire Prone Areas Appendices. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.

WAPC. (2015d). Planning Bulletin 111/2015 Planning in Bushfire Prone Areas. Western Australian Planning Commission.

3

File Ref: Master Plan / General Correspondence
Doc ref: 6247/2014

JANDAKOT AIRPORT

1 September 2014

Schaffer Corporation Pty Ltd
1305 Hay Street
WEST PERTH WA 6005

Attention: Mr John Schaffer

Dear John

Re: Jandakot Airport and Adjacent Land – Specialised Activity Centre

Thank you for meeting with us on 26 August to discuss the relationship between your land on Jandakot Road and Jandakot Airport.

As advised, Jandakot Airport Holdings (JAH) has prepared a draft Master Plan for the Airport which is posted on our website for public comment, prior to submitting it for the Minister's approval. The draft Master Plan highlights the importance of your land to the operation and future economic development of the Airport as a Specialised Activity Centre.

Jandakot Specialised Activity Centre

There are some commercial considerations linking your land to the development of the Airport. As you are aware, Jandakot Airport is a rapidly developing Oil and Gas hub as well as a centre for logistics and general commercial activities. The Oil and Gas hub is of particular importance to the State's economy and is located at Jandakot Airport because of the infrastructure at and around the airport. We are finding that smaller storage/logistics industries which service the oil and gas hub are seeking accommodation at Jandakot Airport but, due to the large size of the lots at our development, we are unable to accommodate their needs. These uses could potentially be accommodated on your land. Achievement of this objective would be a major support to the development of the Oil and Gas hub at Jandakot Airport as well as to the State's economy.

To have suppliers to the main players, such as GE, Halliburton and the likes, located within minutes of these companies is efficient, cost effective and ecologically sensible.

With respect to the "Specialised Centre" designation, State Planning Policy 4.2 notes "Specialised centres provide opportunities for the development of complementary activities, particularly knowledge-based businesses. A range of land uses that complement the primary function of these centres will be encouraged on a scale that will not detract from other centres in the hierarchy."

Road Connections

We believe you are already familiar with the need for Launders Street, the road reserve forming your land's western boundary, to be constructed providing a direct connection between the Airport and the Kwinana Freeway. At full development, Jandakot City and the Airport will employ in excess of 8,000 people. In addition to commuter traffic, there will be heavy vehicle movements, visitors and traffic generated by the Airport as a transport hub. We have previously discussed land requirements for widening the Launders Street reserve and we appreciate your cooperation in reaching an understanding over this matter.

You will also note that in the draft Master Plan, provision has been made for a new road along the Airport's southern boundary, adjacent to your land's northern boundary. In addition to Launders Street, this road provides potential for a link between your land and the Airport, providing possible integration between the two sites. (see photo p10 of the revised Master Plan)

Airport Operation

Your land is towards the south-west of the airport's main runways. These runways service most of the air traffic because of the prevailing winds, particularly during the day time. Noise issues associated with land under flight paths are well known but, there are other factors which add to the potential use of your land in relation to the operations of the Airport. These factors include such issues as the height of permanent and temporary structures as well as the reflection of sunlight and potential to create turbulence. In addition, there is a need to control the intensity of artificial light.

For the above reasons, we view the development of your land as being important to the Airport, both operationally and economically. As advised, the draft Master Plan is now available for public comment and we ask that you give careful consideration to the Plan and its influence on your land. Should you have any comments or questions in relation to the Master Plan, we would be happy to discuss them with you. We also look forward to the possibility of working with you to realise the development potential our joint estates have to the state's economy.

Yours faithfully

JOHN FRASER
MANAGING DIRECTOR

4

From: Lorenzo Santoriello <lsantoriello@cockburn.wa.gov.au>
To: 'MGA Town Planners' <mga@global.net.au>
Subject: RE: Jandakot

Hi Peter

Thank you for the letter. I have attached the comments from the DoW to this email; it appears as though DoW are satisfied with the proposal as we have discussed this morning in addition to making one more minor change. Accordingly I have provided two versions of the final draft for your inclusion into the Scheme amendment proposal.

Upon further reflection I agree with you in that the amendment is more appropriately defined as a complex amendment. I have also discussed with Robert Cull of the DoP and he agrees also that it is more appropriately classified as a complex amendment. As such please find attached the complex amendment template for your action please. You may seek to contact Brett (DoW) to obtain a lengthier email consent to what he has provided under the attached.

Please progress with the amendment proposal document, as discussed, and submit a draft electronic version for the City's review prior to printing and submitting hard copies.

Kind regards

Lorenzo Santoriello
Senior Strategic Planner
Strategic Planning Services

9 Coleville Crescent, Spearwood WA 6163
PO Box 1215, Bibra Lake DC WA 6965
P 08 9411 3530 **F** 08 9411 3333

lsantoriello@cockburn.wa.gov.au
www.cockburn.wa.gov.au

stay connected

From: MGA Town Planners [mailto:mga@global.net.au]
Sent: Friday, 8 April 2016 10:53 AM
To: Lorenzo Santoriello
Subject: Jandakot

Hi Lorenzo

Copy of letter as discussed.

Regards
Peter

MGA Town Planners
26 Mayfair Street
West Perth WA 6005

PO Box 104
West Perth

WA 6872

Ph: (08) 9321 3011
Fx: (08) 9324 1961

Received: from AB-PRD-EXC-01.cockburn.wa.gov.au (10.200.5.170) by AB-PRD-EXC-02.cockburn.wa.gov.au (10.100.5.171) with Microsoft SMTP Server (TLS) id 15.0.1104.5 via Mailbox Transport; Fri, 8 Apr 2016 09:32:07 +0800
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Received: from [216.82.242.179] by server-4.bemta-8.messagelabs.com id 7E/38-14732-41A07075; Fri, 08 Apr 2016 01:32:04 +0000
Received: (qmail 118308 invoked from network); 8 Apr 2016 01:32:02 -0000
Received: from spice.water.wa.gov.au (HELO spice.water.wa.gov.au) (203.20.251.110) by server-10.tower-86.messagelabs.com with SMTP; 8 Apr 2016 01:32:02 -0000
Received: from unknown (HELO margaret.infrastructure.local) ([172.16.5.29]) by spice.water.wa.gov.au with ESMTP/TLS/AES128-SHA; 08 Apr 2016 09:31:46 +0800
Received: from MARGARET.infrastructure.local ([fe80::3507:216d:d2b6:67be]) by margaret.infrastructure.local ([fe80::3507:216d:d2b6:67be%10]) with mapi id 14.03.0266.001; Fri, 8 Apr 2016 09:31:46 +0800
From: DUNN Brett <Brett.Dunn@water.wa.gov.au>
To: Lorenzo Santoriello <lsantoriello@cockburn.wa.gov.au>
Subject: V4 Draft Scheme Text CoC.docx
Thread-Topic: V4 Draft Scheme Text CoC.docx
Thread-Index: AdGRNIRGledLgLR4RJy7mvuEeVVRnQ==
Date: Fri, 8 Apr 2016 01:31:45 +0000
Message-ID: <DBE68D8C960FEC4B862371157479AAB1844246A8@margaret.infrastructure.local>
Accept-Language: en-AU, en-US
Content-Language: en-US
X-MS-Exchange-Organization-AuthSource: AB-PRD-EXC-01.cockburn.wa.gov.au
X-MS-Has-Attach: yes
X-MS-TNEF-Correlator:
Content-Type: multipart/mixed;
boundary="_004_DBE68D8C960FEC4B862371157479AAB1844246A8margaretinfrast_"
MIME-Version: 1.0

Hi Lorenzo, thanks for that. One very minor change.

Cheers

Brett

 V4 Draft Scheme Text CoC1.docx

 V5 Draft Scheme Text CoC - Blue text.docx

 V5 Draft Scheme Text CoC - Black text.docx

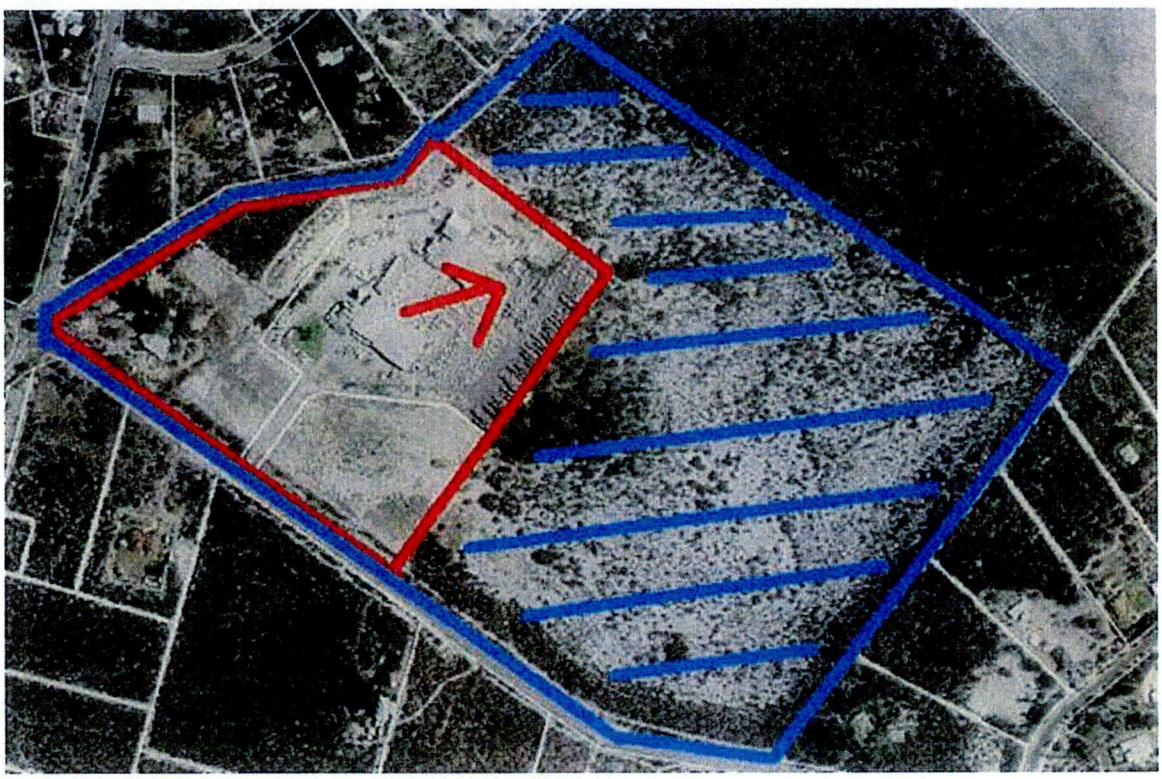
 4.1aCOMPLEX_Scheme Amendment document template.docx

From: Lorenzo Santoriello <lsantoriello@cockburn.wa.gov.au>
To: 'DUNN Brett' <Brett.Dunn@water.wa.gov.au>
Subject: RE: Urban Stone - New Proposal (your ref: RF3770-02)

Hi Brett

Thank you for speaking with me regarding this application. Further to our discussion I have made the changes to the draft scheme text as per our discussion. I hope I have correctly interpreted what you were referring to; could you please confirm that you are seeking to delete the ~~green strike through text~~ from the draft amendment?

The other thing worth clarifying is that the current Additional Use area applies to a smaller area see red below than what is proposed under the attached text. Please see below for an image of the current AU1 provision area in red and the proposed expanded area (which covers a large portion of Lot 103) in blue.



Kind regards

Lorenzo

From: DUNN Brett [mailto:Brett.Dunn@water.wa.gov.au]
Sent: Thursday, 31 March 2016 4:12 PM
To: Lorenzo Santoriello
Subject: RE: Urban Stone - New Proposal (your ref: RF3770-02)

Hi Lorenzo,

Sorry to have missed your call. I am comfortable with what is contained in the Scheme Amendment text. I would not think an Urban Water Management Plan would be necessary given the showroom/storage usage.

I'll call you tomorrow to discuss.

Kind Regards,

Brett Dunn
Program Manager – Urban Water Management

Department of Water
Peel Region
PH: (08) 9550 4202
Email: brett.dunn@water.wa.gov.au

From: Lorenzo Santoriello [mailto:lsantoriello@cockburn.wa.gov.au]
Sent: Thursday, 31 March 2016 2:26 PM
To: DUNN Brett
Cc: 'MGA Town Planners'
Subject: RE: Urban Stone - New Proposal (your ref: RF3770-02)

Hi Brett

I just left a message on your answering machine, I'm hoping to have a chat with you regarding the below email. Please give me a call on 9411 3530 when you are available.

Thanks

Lorenzo

From: Lorenzo Santoriello
Sent: Friday, 18 March 2016 10:14 AM
To: 'DUNN Brett'
Cc: 'MGA Town Planners'; Andrew Trosic
Subject: RE: Urban Stone - New Proposal (your ref: RF3770-02)

Hi Brett

I apologise for all these emails. Please refer to this email (and the below email) and disregard the other emails that I sent you. The City's draft text is attached as Version 2. The applicant is seeking your further consideration of the additional red text within Version 3. Once you return from leave please contact me so that we can discuss this further.

Looking forward to your response/ discussing with you.

Kind regards

Lorenzo

From: Lorenzo Santoriello
Sent: Thursday, 10 March 2016 10:12 AM
To: 'DUNN Brett'
Cc: 'MGA Town Planners'; Andrew Trosic
Subject: Urban Stone - New Proposal (your ref: RF3770-02)

Hi Brett

I hope this email finds you well.

I understand you have previously provided formal comment on the then Scheme Amendment 91, which I have attached to this email for ease of reference (your ref: RF3770-02).

As you may be aware, Amendment 91 has since been Gazetted and formally included into Town Planning Scheme No. 3. Since this time the applicant has lodged a separate amendment/ proposal to expand the ar to which Additional Use 1 applies as well as amending the land use permissibility aspects. For a quick background to the discussions and meetings regarding the new proposal please refer to the 'Meeting Mem attached to this email.

In light of the Meeting Memo and your previous comments the City and the applicant have put together the first stage draft scheme text provisions and attached to this email for your preliminary comment. Please note within the word document attachment, the black text and the blue ~~strike through text~~ is the current scheme text. The blue and red text is what has been drafted for discussion purposes.

I was hoping to discuss the above with you once you have had a chance to digest? Following that perhaps a meeting with yourself, the applicant and my manager may be appropriate.

Thank you for your time, and I look forward to hearing from you.

Kind regards

Lorenzo Santoriello
Senior Strategic Planner
Strategic Planning Services
9 Coleville Crescent, Spearwood WA 6163
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www.cockburn.wa.gov.au

stay connected

V4 Draft Scheme Text CoC.docx

Planner for WAPC | Town Planners <mga@global.net.au> 8/07/2016

5

Western Australian Planning Commission

Mr Peter Goff
MGA Town Planners
P O Box 104
WEST PERTH WA 6872

Dear Peter

LOT 103 JANDAKOT RAOD, JANDAKOT – SCHAFFER CORPORATION LTD

Further to our discussion held on Thursday, 18 June 2015 relating to the above property, I confirm that you should make a submission on the above proposed Open Space – Sport classification for the property by 31 July 2015. I also acknowledge our discussion where you outlined the existing uses of the property carried out by your client and the proposed future land use being considered by your client, having regard for the land's proximity to Jandakot Airport and the Kwinana Freeway and the discussion on other attributes of the site for future industrial use.

Having examined your proposals, I believe from a planning perspective, your approach to the site has strong merits in terms of its current and future uses for industrial purposes. I also acknowledge that the proposed site which has been depicted on the sub-regional planning framework for proposed public open space is not fixed or strongly advocated as a future site by the Department of Sport and Recreation.

In my view, it will be necessary for the Department of Planning to evaluate further sites to facilitate this proposed recreational area, having regard to the existence of the Canning Vale Sports Master Plan and its location and that the sub-regional planning frameworks are without any statutory significance at this time. I consider that a more even distribution of the proposed sporting complexes would be desirable throughout the south metropolitan area to achieve a more sustainable outcome.

Schaffer Corporation should not be constrained by these plans in refinancing its business operations, including Jandakot's UrbanStone plant which undertakes manufacturing, sales, transport and administration functions. It is apparent that the Department and subsequently the Commission, will need to re-examine its proposals to not only reallocate the recreation site but also to give consideration to your submission made during our meeting for land owned by the Schaffer Corporation Ltd to be strengthened as an industrial site due to its proximity to Jandakot Airport, Roe Highway and Kwinana Freeway and the proposed freight link extension network of the Government.

I understand Jandakot Airport Holdings (JAH) believes that the land should be regarded as part of the airport site for operational and commercial reasons and in conjunction with the proposed freight link extension has planning merit. I would support that this view and this approach should be also included as part of your submission on the sub-regional planning framework.

Postal address: Locked Bag 2506 Perth WA Street address: 140 William Street Perth WA 6000
Tel: (08) 655 19000 Fax: (08) 655 19001 TTY: 655 19007 Infoline: 1800 626 477
corporate@planning.wa.gov.au www.planning.wa.gov.au
ABN 35 482 341 493

wa.gov.au

I trust this correspondence clarifies the current and future situation relating to the land which will be given due consideration by the Commission at some time in the near future.

Yours sincerely

Eric Lumsden PSM
Chairperson
Western Australian Planning Commission

23/6/2015

Western Australian Planning Commission

Mr Peter Goff
MGA Town Planners
P O Box 104
WEST PERTH WA 6872

Dear Peter

LOT 103 JANDAKOT RAOD, JANDAKOT – SCHAFFER CORPORATION LTD

I note in your correspondence of 19 June 2015 that you have referred to the existing UrbanStone plant which is on land zoned to facilitate the factory and warehousing. Notwithstanding the current use zoning, I believe there is merit in the site encapsulating both the nursery and showroom floor space and that the City of Cockburn should consider removing scheme restrictions to restrict the uses of the showrooms to display/sale of masonry products and ancillary uses.

I would suggest you again take up this matter with the City of Cockburn to facilitate initiation of scheme amendments to enable development of a marketing centre but you should also approach the City of Cockburn with a wider agenda which shows the portion of the site to be an extension of the Jandakot Specialised Activity Centre and make a separate submission on this matter to the Commission as part of any response to the sub-regional planning framework.

I trust this correspondence will assist you in your further deliberations.

Yours sincerely

Eric Lumsden PSM
Chairperson
Western Australian Planning Commission

23 / 6 / 2015

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ABN 35 482 341 493

Urbanstone, Jandakot - Proposed Scheme Amendment and Rezoning

Traffic Report

PREPARED FOR:
Schaffer Corporation Limited

November 2016 report
Revised June 2017

Document history and status

Author	Revision	Approved by	Date approved	Revision type
R White	r02	B Bordbar	26/04/2016	
R White	r02a	B Bordbar	28/04/2016	Final
R White	r02b	B Bordbar	30/06/2016	Revised
R White	r02c	B Bordbar	5/11/2016	Revised
R White	r02d	B Bordbar	20/06/2017	Revised

File name: t15281-rw-r02d.docx

Author: Robin White

Project manager: Behnam Bordbar

Client: Schaffer Corporation Limited

Project: Urbanstone, Jandakot

Document revision: r02d

Project number: t15.281

TABLE OF CONTENTS

REPORT FIGURES

REPORT TABLES

1.0 Introduction

This Traffic Report has been prepared by Transcore on behalf of Schaffer Corporation Limited. The subject of this report is a proposed amendment to City of Cockburn Town Planning Scheme No 3 (TPS3) to amend Additional Use AU1 to remove the existing restriction on type of showroom developments permitted on a portion of the Schaffer landholding in Jandakot and to rezone adjacent land for showroom and warehouse development.

The Schaffer landholding consists of Lots 101, 103 and 104 located between Jandakot Road and Jandakot Airport (outlined in red in **Figure 1**). The AU1 area (shaded blue in **Figure 1**) in TPS3 consists of Lots 101, 104 and a portion of Lot 103.

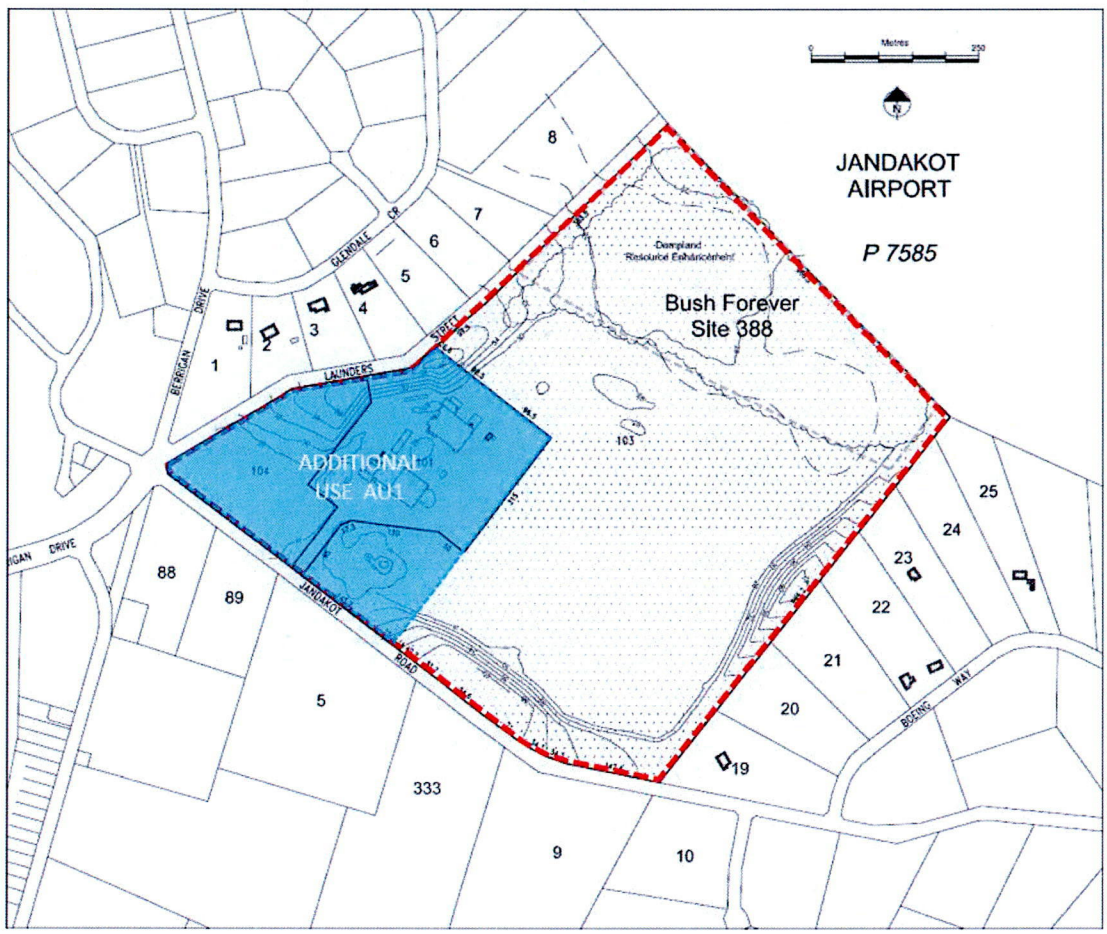


Figure 1: Site location

Key issues that will be addressed in this report include the potential traffic generation of full development of this site under the proposed amendment and rezoning, and the implications in terms of access arrangements and traffic impact on the adjoining road network.

2.0 Existing Situation

2.1 Existing Land Use

Existing land use in the AU1 area (as at June 2017) is shown in **Figure 2**.

Figure 2: Existing land use

Existing land use on each lot is as follows:

- Lot 101 – contains the Urbanstone plant, with current access from Jandakot Rd plus frontage to the future Pilatus St 'South Link' to Jandakot Airport;
- Lot 103 – currently vacant 46.6ha site with frontage to Jandakot Rd and future Pilatus St, although the northern half of the Pilatus St frontage is constrained by a Bush Forever site. It should also be noted that the 2.6ha southwest corner portion (frontage to Jandakot Rd only) has approval for

showroom development and nursery (see approved development plan at **Appendix A**); and
- Lot 104 – existing Soil City nursery operation – with current access from Jandakot Rd plus frontage to the future Pilatus St.

2.2 Existing Road Network

Pilatus St is now the proposed name for the planned 'South Link' to Jandakot Airport but is labelled as Launders St on **Figure 1** and also previously referred to as Orion Rd in some previous documents. Pilatus Street has been constructed within the Jandakot Airport site (north of the subject site) but was not constructed from the airport boundary to Jandakot Rd. The construction of this last section of Pilatus Street is now almost complete.

East of the subject site Jandakot Rd is constructed as a two-lane, undivided rural road with a posted speed limit of 80km/h. It is classified as a regional distributor in the Main Roads WA functional road hierarchy and the authority responsible for Jandakot Rd is the City of Cockburn.

Berrigan Drive is constructed as a dual carriageway road (only one lane each way) from Kwinana Fwy to Jandakot Rd but narrows to a two-lane, undivided rural road north of Jandakot Rd. It has a posted speed limit of 70km/h. It is classified as a district distributor A in the Main Roads WA functional road hierarchy and the authority responsible for Berrigan Drive is the City of Cockburn.

Traffic counts undertaken for Jandakot Airport in September 2015 (after completion of Kwinana Fwy southbound road widening) recorded the following average weekday traffic flows:

- 13,605vpd on Jandakot Rd east of Berrigan Dr
- 18,032vpd on Berrigan Dr west of Jandakot Rd
- 14,517vpd on Berrigan Dr south of Karel Ave

The Berrigan Dr / Jandakot Rd / Dean Rd intersection was previously controlled by a 4-way, single-lane roundabout but has recently been upgraded to a 4-way signalised intersection as discussed in section 2.3 of this report.

The periods of highest traffic flows on the road network were identified from these traffic counts to be the weekday 7-8AM and 4-5PM peak periods, so turn movement traffic counts were undertaken by Transcore at the existing Urbanstone and Soil City driveways on Jandakot Rd on Wednesday 20 January 2016. Those peak hour traffic flows are summarised in **Table 1**.

Table 1: Existing peak hour traffic flows from the subject site

7-8AM	Soil City				Urbanstone			
Vehicle type	Left in	Right in	Left out	Right out	Left in	Right in	Left out	Right out
Light vehicle	4	2		3	8	1	1	
Rigid truck			1	7	2			1
Truck & trailer				1				
Semi-trailer								2
Total	**4**	**2**	**1**	**11**	**10**	**1**	**1**	**3**

4-5PM	Soil City				Urbanstone			
Vehicle type	Left in	Right in	Left out	Right out	Left in	Right in	Left out	Right out
Light vehicle			3	6	1	1	5	7
Rigid truck	2			1				
Truck & trailer								
Semi-trailer								1
Total	**2**	**0**	**3**	**7**	**1**	**1**	**5**	**8**

2.3 Planned Road Network Changes

Representatives of Schaffer Corporation and their town planning and traffic engineering consultants have had a number of meetings with City of Cockburn engineers and planners between December 2015 and June 2017 to discuss road planning and access issues.

The City of Cockburn invited tenders and awarded the contract in 2016 for construction of the remaining section of Pilatus St from Jandakot Rd to the airport boundary.

This project also includes upgrading of Berrigan Drive to dual carriageway standard (2 lanes each way) from Jandakot Rd to Kwinana Fwy, construction of a signalised 4-

way intersection at Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd and realignment of Berrigan Drive south of Glendale Crescent to form a priority-controlled T-intersection at Pilatus Street.

Pilatus St has now been constructed as a single carriageway, two-lane road but land requirements have been identified for widening the road reserve eastwards onto the three lots of the subject site to accommodate future widening to dual carriageway, if required in future. Projected 2034 traffic volumes presented in the Jandakot Airport Master Plan 2014 indicate 10,300vpd on this section of Pilatus St and 16,100vpd on the adjacent section of Berrigan Drive.

Other traffic projections for 2034 from the Jandakot Airport Master Plan 2014 include 28,200vpd on Jandakot Rd which will ultimately require upgrading to dual carriageway standard (two lanes each way).

The Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd intersection upgrade is now constructed and has included a raised median on Jandakot Rd for about 400m east of the intersection. Jandakot Rd has initially been constructed as one lane westbound and two lanes eastbound over this section.

This construction includes a median opening and right turn lane at the existing Urbanstone driveway intersection on Jandakot Rd designed to accommodate B-double trucks on all turn movements into and out of the site. In the longer term when Jandakot Road is upgraded to dual carriageway with two-lanes each way the City has advised it is likely that right turn access will need to be restricted.

The Soil City nursery on Lot 104 is now restricted to left in / left out only (LILO) on Jandakot Rd. The discussion with City of Cockburn engineers agreed that the existing nursery driveway location is undesirably close to the future signalised intersection and it would therefore be desirable to relocate that nursery LILO driveway to a point midway between Pilatus St and the Urbanstone driveway, which would be near the eastern end of the current nursery operation.

The City engineers suggested that an appropriate access agreement should be established between Lots 101, 103 and 104 with an internal road or driveway connection parallel to Jandakot Rd to allow all three lots to access the Urbanstone driveway intersection on Jandakot Rd, although further development in line with the rezoning assessed in this current report may also lead to further rationalisation of accesses along Jandakot Road for the ultimate development of this landholding.

In the future when right turn truck access at the Jandakot Rd Urbanstone driveway intersection is restricted it will be vital for the subject site to have full movement access on Pilatus Street capable of accommodating the B-double trucks that transport Urbanstone products manufactured on this site. This is acknowledged by the City engineers and the City's preliminary plans included a full movement T-intersection on Pilatus Street, located at the southern edge of the Bush Forever site shown on **Figure 1**, which all parties agree to be the most appropriate location because of existing ground levels in the road reserve and on the subject site. At other locations along the Pilatus St alignment there will be much larger height

differences between the road alignment and the subject site, which would make access impractical at other locations. Following further negotiations this intersection was subsequently constructed as a single-lane roundabout as part of the Pilatus Street construction in 2016.

It was acknowledged by all parties that this Pilatus St access location is within Lot 103 and does not connect directly to the Urbanstone site, Lot 101. An internal access road link to the Urbanstone operation would therefore be required. It is anticipated that this would be the responsibility of Urbanstone and/or the landowner to provide this internal road link.

The resultant proposed access strategy is illustrated in **Figure 3**. It should be noted that this includes a driveway connection to Jandakot Rd east of the Urbanstone driveway intersection, which is already part of a showroom - nursery development approval on the southwest corner portion of Lot 103.

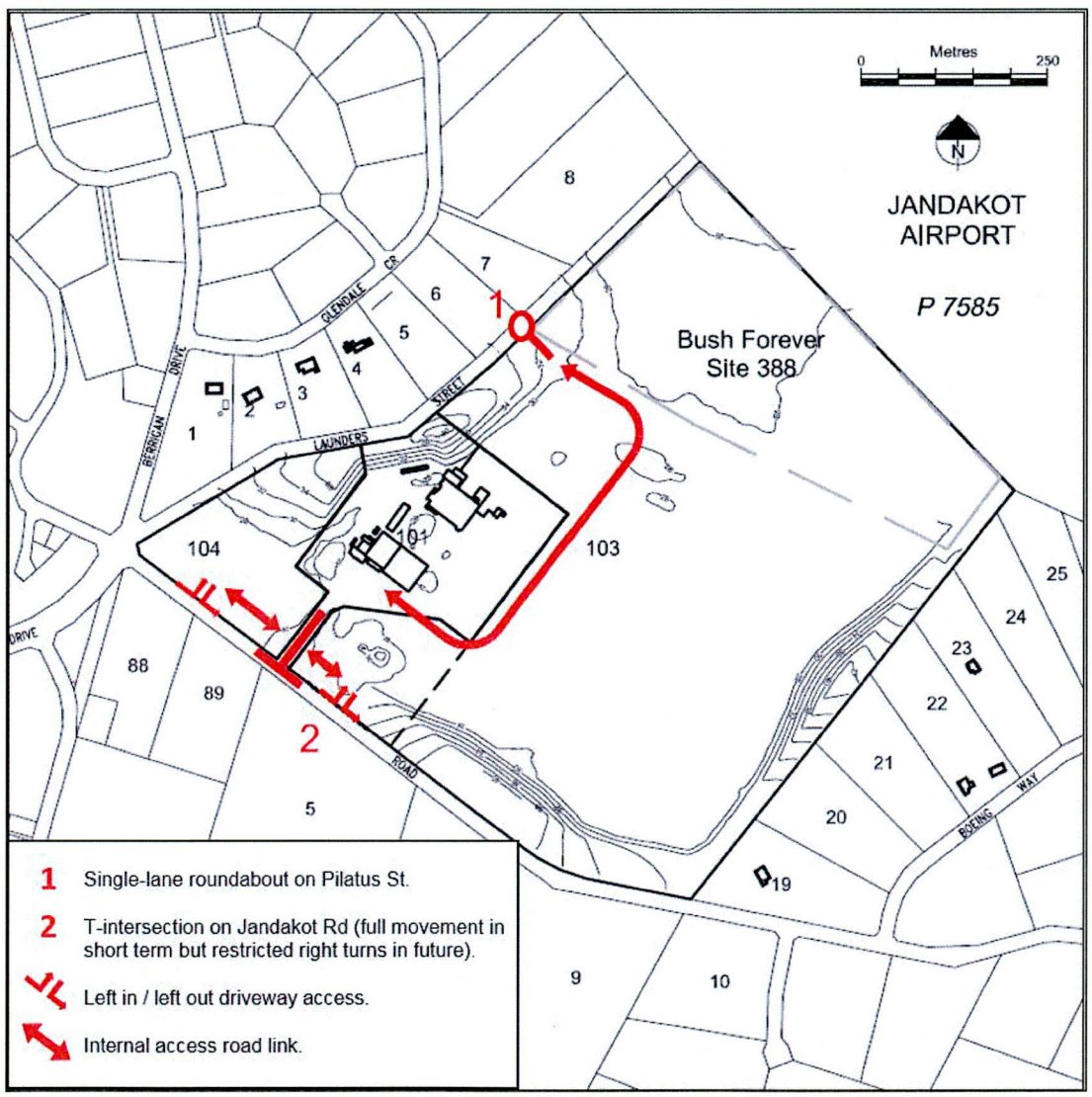


Figure 3: Proposed Access Strategy (Stage 1)

The proposed access strategy (Stage 1) shown in **Figure 3** would provide full movement access to the remainder of Lot 103 from Pilatus St. Longer term modifications to this access strategy are discussed in Section 3.2 and will be investigated further in this report.

3.0 Proposed Scheme Amendment and Rezoning

The proposed scheme amendment and rezoning that is the subject of this report consists of two components.

The first component is a proposed amendment to City of Cockburn Town Planning Scheme No 3 (TPS3) to amend Additional Use AU1 to remove the existing restriction on type of showroom developments permitted on this site.

The current wording of Additional Use AU1 in Schedule 2 of TPS3 allows the following additional uses on the AU1 area:

- Nursery;
- Masonry Production;
- Warehouse only where ancillary to Masonry Production;
- Showroom only where ancillary to Masonry Production

Provided that the Use Classes "Masonry Production" and "Warehouse" are restricted to Lot 101.

The proposed scheme amendment would delete the text "only where ancillary to Masonry Production" from the additional use "Showroom".

The second component of the proposals for the Schaffer landholding is rezoning of the remaining, larger portion of Lot 103 (excluding the Bush Forever Site) for predominantly warehouse development and a smaller component of showroom development adjacent to Pilatus Street, as indicated conceptually in **Figure 4**.

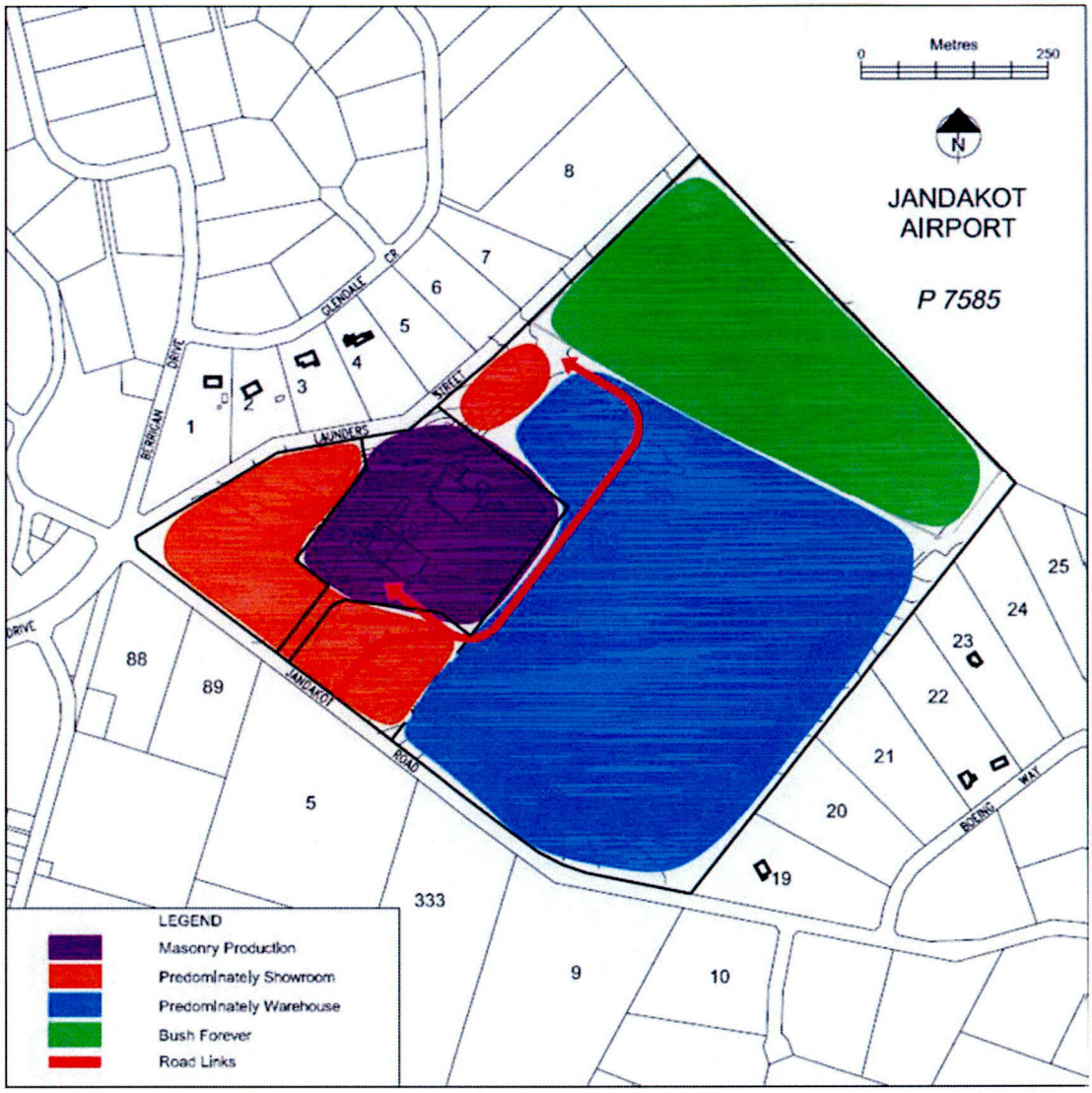


Figure 4: Proposed Concept Plan

3.1 Existing Development Approval

The Urbanstone showroom – nursery development approved in 2014 under the existing AU1 provisions on part of Lot 103 will create 1550m^2 of showroom floor space, 166m^2 of office space at mezzanine level and a 2461m^2 nursery site.

The approved development plan at **Appendix A** includes a new driveway crossover on Jandakot Rd approximately 80m east of the existing Urbanstone driveway.

3.2 Proposed Access Strategy

The proposed short-term (or Stage 1) access strategy is discussed in Section 2.3 and illustrated in **Figure 3**.

With full development under the proposed scheme amendment and rezoning of Lot 103 it is proposed to create additional connections to the north and south as indicated in **Figure 5.**

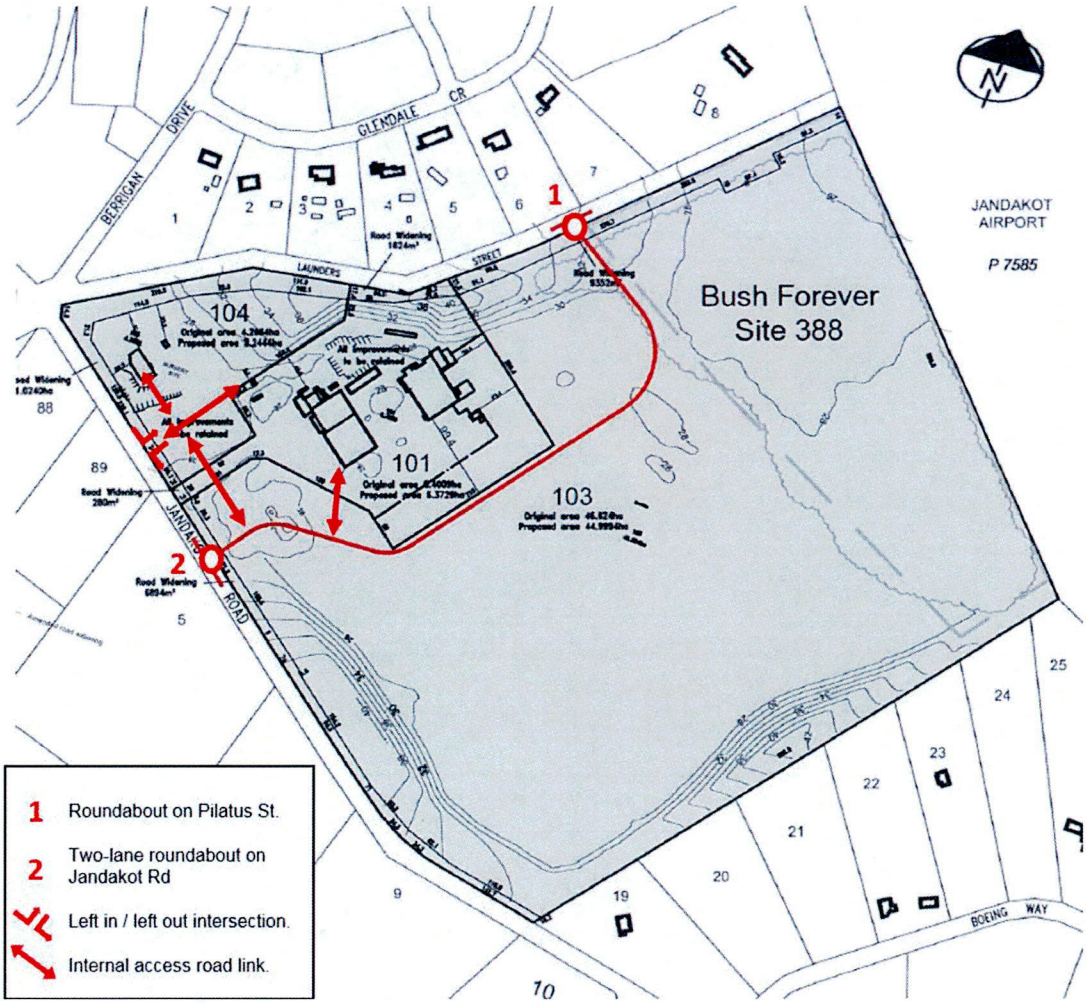


Figure 5: Proposed Access Strategy (Full Development)

4.0 Traffic Assessment

4.1 Assessment Period

This traffic assessment has considered the weekday 7-8AM and 4-5PM peak periods, which are currently the peak periods of existing traffic on the adjacent road network and are expected to remain the overall peak periods regardless of future development on the subject site. Therefore these weekday AM and PM peak hours are the assessment periods used in this analysis.

An assessment year of 2031 has been adopted for this analysis based on guidance in the WAPC *Transport Assessment Guidelines for Developments*.

4.2 Trip Generation

Traffic generation rates used in this analysis are based on information sourced from the NSW Roads and Traffic Authority *Guide to Traffic Generating Developments* (2002) as updated by NSW Roads & Maritime Services *Guide to Traffic Generating Developments Updated Traffic Surveys* (TDT 2013/04a) and the Institute of Transportation Engineers *Trip Generation Manual* (9th Edition, 2012).

The appropriate land uses for analysis in this report are showroom, warehouse and nursery.

Showroom (bulky goods retail stores) trip rates have been sourced from NSW TDT 2013/04a and additional road network peak period trip rate details obtained from those NSW surveys. Average weekday trip generation of showrooms is 17vpd/100m^2 GFA and 19vpd/100m^2 GFA on Saturdays. Road network AM peak trip rates are indicated as 1.0vph/100m^2 GFA and road network PM peak trip rates are 2.2vph/100m^2 GFA. In this case the road network AM peak period of 7-8AM is earlier than the opening hours of typical showroom uses so the PM peak is considered the critical period for this land use.

Nursery (garden centre) trip rates have been obtained from the ITE Trip Generation Manual. Average weekday trip generation of nurseries is 267vpd/hectare of site area and 383vpd/ha on Saturdays. Road network AM peak trip rates are 7.0vph/ha and road network PM peak trip rates are 19.9vph/ha.

Trip rates for warehousing have also been sourced from the ITE Trip Generation Manual. Average weekday trip generation of warehousing is 141vpd/hectare of site area and 33vpd/ha on Saturdays. Road network AM peak trip rates are 25vph/ha and road network PM peak trip rates are 21vph/ha.

For this analysis the subject site has been divided into 6 zones, as shown in **Figure 6**, based on proposed type of land use in each area.

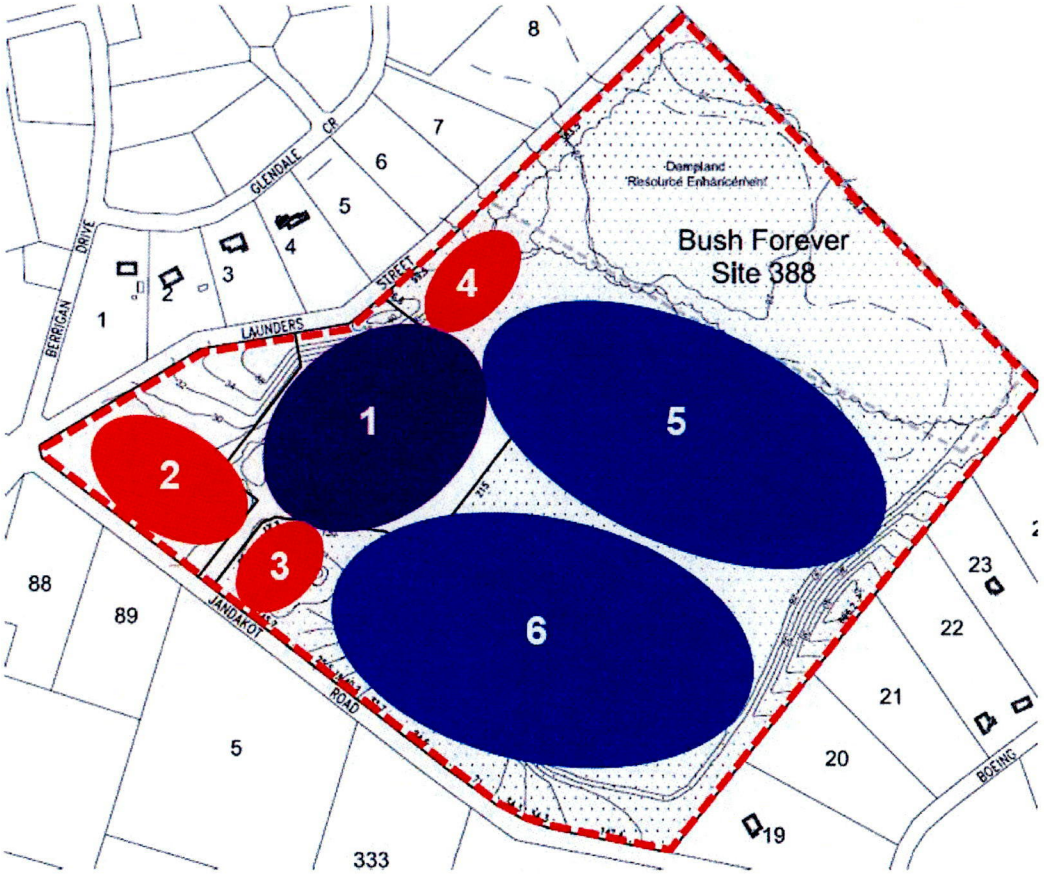


Figure 6: Traffic zones

The resultant traffic generation from each zone is summarised in **Table 2**.

Table 2: Traffic Generation

Land Use by Zone	Weekday 7-8AM	Weekday 4-5PM	Daily
1: Urbanstone factory (existing)	15vph	15vph	~300vpd
2: Showrooms (approx. 2.8ha net area)	114vph	250vph	1900vpd
3: Approved showroom / nursery development	21vph	42vph	350vpd
4: Showrooms (approx. 1.1ha net area)	45vph	98vph	750vpd
5 and 6: Warehousing (approx. 17.5ha net area total)	438vph	368vph	2470vpd
Total	**633vph**	**773vph**	**5770vpd**

Analysis of Table 1 and Table 2 indicates a net increase of 585vph and 701vph in the 7-8AM and 4-5PM peak hour traffic flows respectively, and 5,470vpd between the existing development on the site (including the approved showroom / nursery development) and the full development scenario in this proposed amendment.

4.3 Trip Distribution

Trip distribution for the potential future development of the subject site has been determined from Transcore's EMME traffic model of this subregional area, which was previously used for traffic modelling of the Jandakot Airport precinct for the Jandakot Airport Master Plan 2014. The distribution for each zone varies depending on road network connections and type of trips generated by each land use but the overall trip distribution was approximately 25% east (Jandakot Rd), 39% south (Berrigan Drive) and 36% north.

A separate trip distribution was assumed for truck movements based on the dominance of distribution centres north of this area. The resultant truck distribution is approximately 10% east (Jandakot Rd), 30% south (Berrigan Drive) and 60% north.

4.4 Future Traffic Flows

Future traffic flows on Jandakot Rd, Berrigan Dr and Pilatus St have previously been assessed by Transcore for the City of Cockburn for analysis and funding application for the signalised, 4-way intersection. That analysis was based on interpolation between existing traffic counts on those roads and the forecast future traffic flows documented in the Jandakot Airport Master Plan 2014.

Future daily traffic flows for 2031 with and without full development of this landholding (after the proposed rezoning) are shown in **Figure 7**.

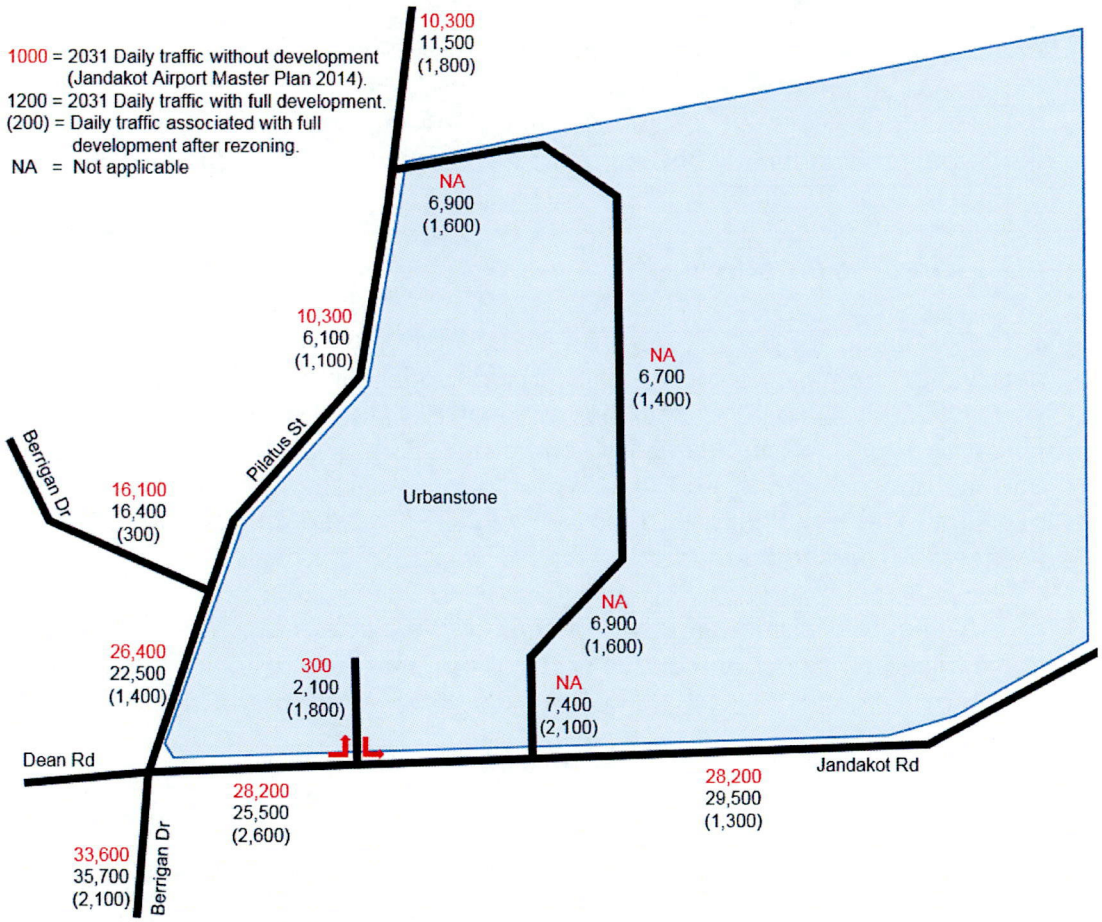


Figure 7: 2031 Daily Traffic Flows with and without Development

Future peak hour traffic flows for 2031 at key intersections adjacent to the subject site on Pilatus Street and Jandakot Road are shown in **Figure 8** (without development of the subject site) and in **Figure 9** and **Figure 10** (with development).

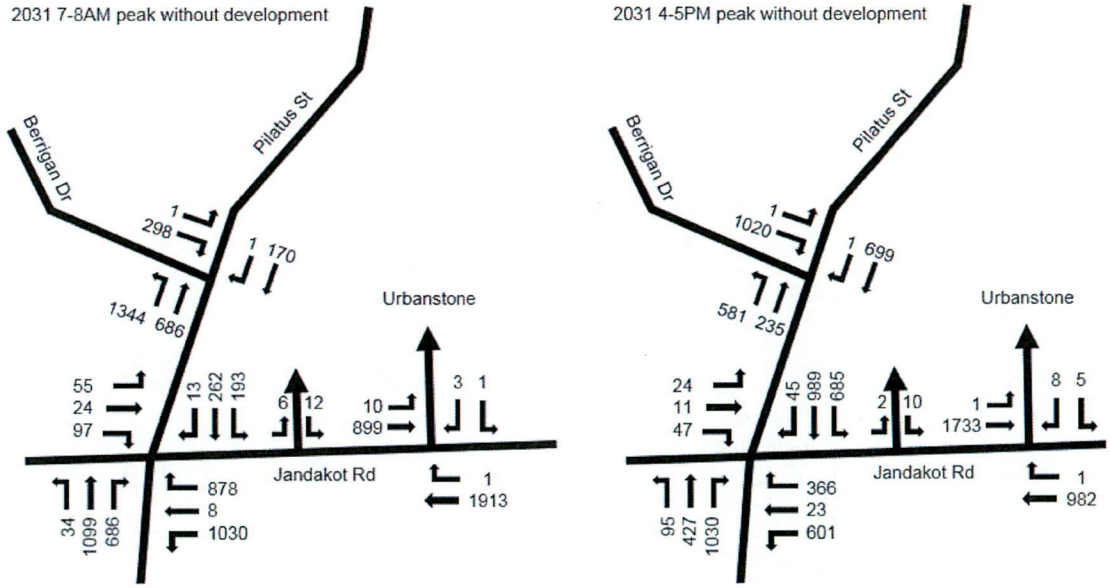


Figure 8: 2031 Peak Hour Traffic Flows without Development

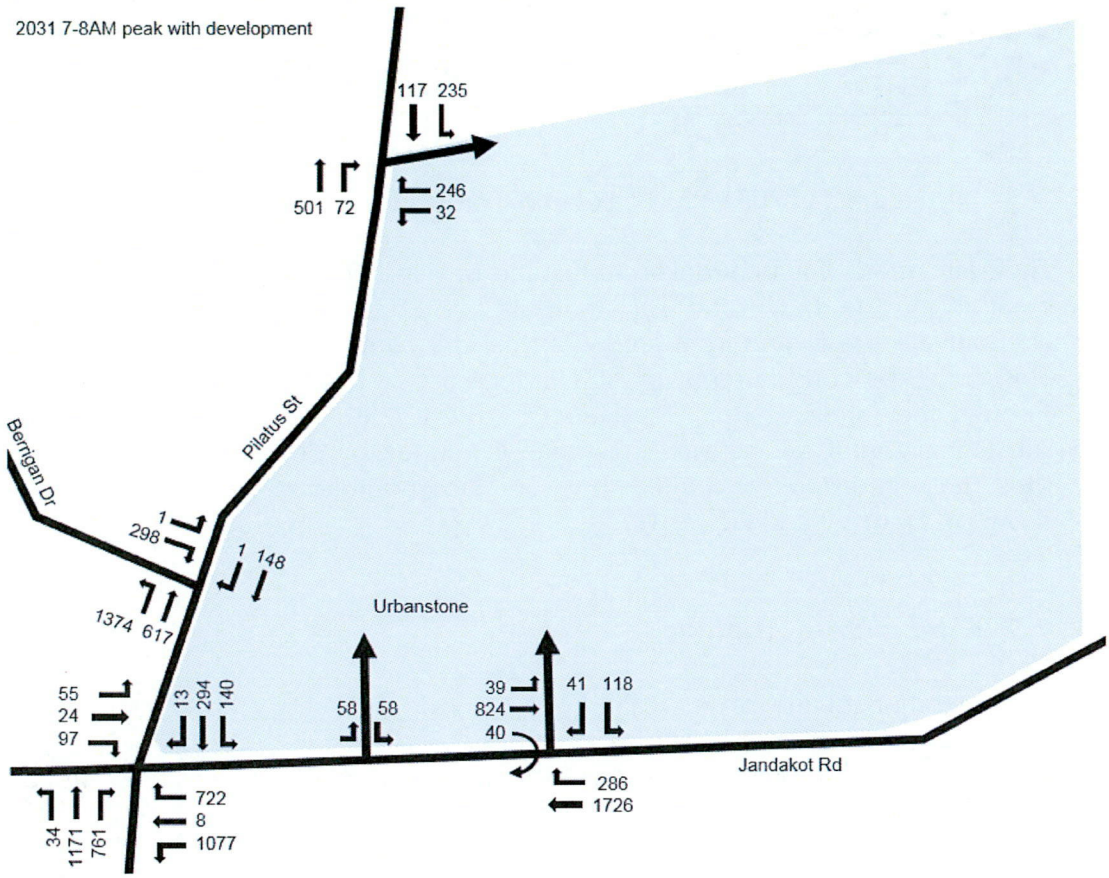


Figure 9: 2031 AM Peak Hour Traffic Flows with Development

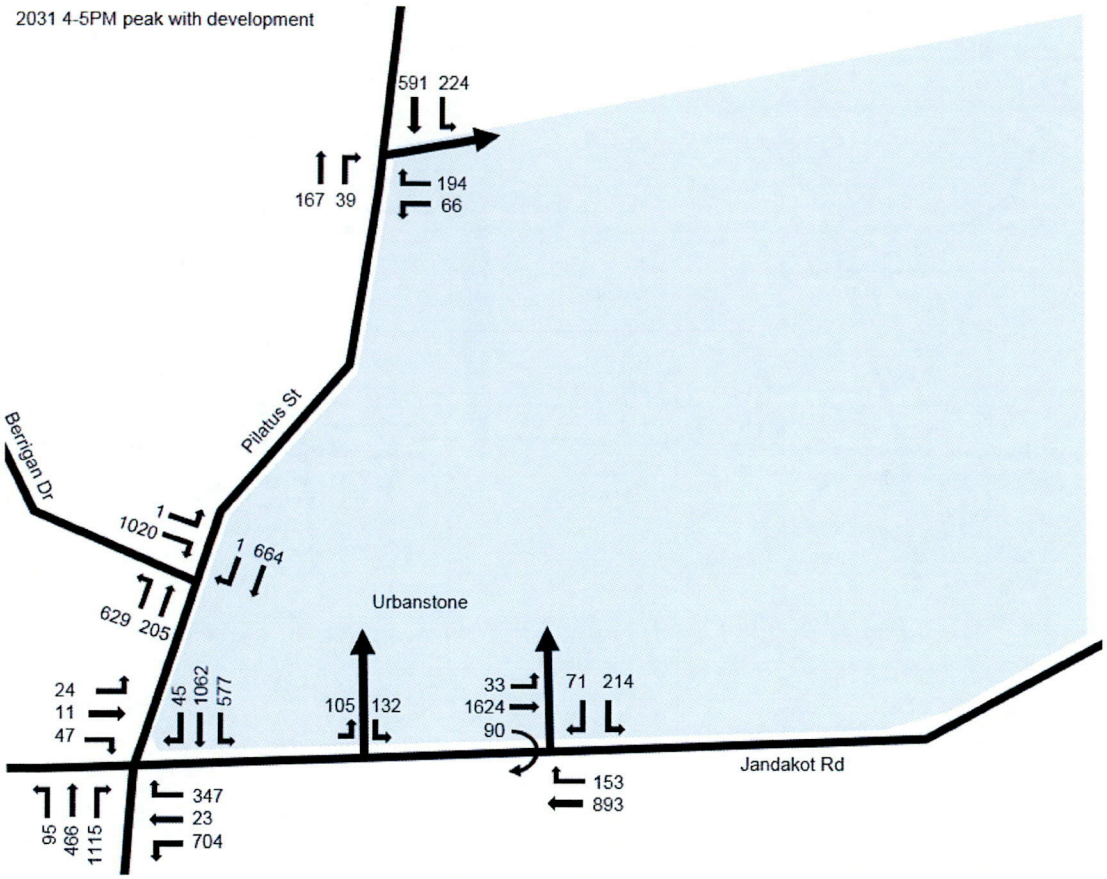


Figure 10: 2031 PM Peak Hour Traffic Flows with Development

The traffic modelling undertaken to test this development scenario indicated that the creation of the new road link through Lot 103 would become an attractive alternative route to and from Jandakot Road for some traffic from Jandakot Airport. This should be considered favourably in this case as it will reduce some traffic flows through the Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd intersection and substantially mitigate the effect of traffic generated by development of the subject site. These redistributed traffic flows are incorporated in the 2031 traffic flows shown in **Figure 9** and **Figure 10.**

4.5 Intersection Analysis

The operation of the planned Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd signalised intersection in 2031 has been analysed for the 2031 AM and PM peak hour traffic flows shown in **Figure 8** (without development of the subject site) and in **Figure 9** and **Figure 10** (with development).

The operation of the main proposed access intersections into the subject site have been analysed for 2031 AM and PM peak hour traffic flows with development to confirm an appropriate access strategy for development of the subject site.

Capacity analysis of the intersections has been undertaken using the SIDRA computer software package. SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- Degree of Saturation is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for infrequent traffic flow up to one for saturated flow or capacity.
- Level of Service is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- Average Delay is the average of all travel time delays for vehicles through the intersection.
- 95% Queue is the queue length below which 95% of all observed queue lengths fall.

The results of the SIDRA analysis are included at **Appendix B.**

Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd signalised intersection (without development): The SIDRA analysis labelled *Berrigan-Jandakot-Dean-Orion 2031 AM sigs – mod 1* is an updated version of analysis that had previously been prepared on behalf of the City of Cockburn to analyse the operation of the proposed signalised intersection under projected 2031 AM and PM peak hour traffic flows (updated to reflect intersection geometry as constructed and current signal phasing). Some minor modifications to the current intersection are incorporated in this analysis in accordance with principles that were incorporated in the previously analysed signalised intersection layout. The SIDRA results show this intersection will be able to operate at level of service D in both periods at 89.6% and 97.6% of capacity in the AM and PM peak hours respectively.

Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd signalised intersection (with development): Analysis of the signalised intersection layout with the additional traffic generated by future development of the subject site indicated that the intersection would be able to operate at quite a similar overall degree of saturation and level of service but would result in excessive increase in queue lengths on some approaches. Following feedback from the City the intersection analysis has been revised "to identify how the extensive queue lengths expected by 2031 can be reduced by maybe providing additional road capacity on the approaches to the intersection, and/or other measures."

The additional intersection modifications that are proposed are as follows:

- Signalised double left turn lanes on the Jandakot Rd east approach; and
- Longer left turn slip lane (150m) on the Pilatus St north approach.

The SIDRA analysis labelled *Berrigan-Jandakot-Dean-Orion 2031 AM sigs-mod2-with rezoning* analyses the operation of that modified signalised intersection layout under the projected 2031 AM and PM peak hour traffic flows with full development of the subject site. The SIDRA results show this intersection will still operate at level of service D in both peak periods. It would be at 90.7% and 96.7% of capacity in the 2031 AM and PM peak hours respectively, which represents an improved outcome in the critical PM peak period compared to the intersection operation in the "no development, no intersection modification" scenario. Queue lengths have been significantly improved compared to the previous "with development, no intersection modification" scenario, particularly on the Jandakot Rd east approach.

Table B1 in Appendix B provides a comparison of the SIDRA results for the Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd signalised intersection with and without development of the subject site.

Pilatus St / Access road intersection (with development): The SIDRA analysis labelled *Site: 3v [Pilatus-Urbanstone 2031 AM with rezoning - roundabout]* models the new roundabout that has now been constructed in 2016 during construction of Pilatus Street. The SIDRA results show that this single-lane roundabout would operate at level of service A in both the 2031 AM and PM peak hours. It would be at 40.7% and 49.3% of capacity in the 2031 AM and PM peak hours respectively, which means it would have a significant amount of spare capacity to accommodate additional traffic flows on Pilatus Street, if required. This is a significant advantage as the proportion of north-south traffic flows on Pilatus Street versus Berrigan Drive could vary significantly in future depending on future intersection treatments at Karel Ave / Berrigan Drive and Pilatus St / Berrigan Drive, which could potentially increase the proportion of this north-south traffic that will utilise Pilatus Street instead of Berrigan Drive.

Jandakot Rd / Urbanstone main access road intersection (with development): The SIDRA analysis labelled Site: 101 *[Jandakot-Urbanstone 2031 AM with rezoning]* analyses the operation of a future two-lane roundabout on Jandakot Road on the eastern side of the approved Urbanstone showroom/nursery development site, which is approximately 100m east of the existing Urbanstone factory driveway. This roundabout would provide the only right turn access in and out of the subject site when Jandakot Road is upgraded to dual carriageway in future. The SIDRA results show this roundabout will operate very satisfactorily with all movements at level of service A or B in the 2031 AM and PM peak hours. It would be at 59.6% and 52.9% of capacity in the 2031 AM and PM peak hours respectively.

The alternative of a channelised T-intersection (Give-way control) has also been assessed in SIDRA for the 2031 PM peak (results not presented in this report). This analysis confirmed that a priority-controlled intersection treatment would not have sufficient capacity to service the modelled right turn demand at that intersection in 2031, so the roundabout treatment is considered necessary at this location.

Jandakot Rd / Urbanstone western access road intersection (with development): The SIDRA analysis labelled *Site: 102 [Jandakot-Urbanstone LILO 2031 AM with rezoning]* analyses the operation of a proposed left in / left out T-intersection on

Jandakot Rd. This intersection would replace the existing Urbanstone factory driveway and nursery driveway as a secondary access point for the existing Urbanstone factory and proposed showroom / nursery developments along the AU1 area frontage on Jandakot Rd. The SIDRA results show this intersection will operate very satisfactorily with all movements at level of service A in the 2031 AM and PM peak hours. It would be at 22.7% and 43.1% of capacity in the 2031 AM and PM peak hours, respectively.

5.0 Conclusions

This traffic report relates to a proposed amendment to City of Cockburn Town Planning Scheme No 3 (TPS3) to amend Additional Use AU1 to remove the existing restriction on type of showroom developments permitted on Lot 104 and part of Lot 103 Jandakot Rd, Jandakot. The proposed amendment also seeks to rezone additional land within Lot 103 for showroom and warehouse development.

The traffic generated by full development of the subject site in accordance with the proposed amendment has been evaluated in this report.

Full development of the subject site following the proposed amendment and rezoning would potentially increase the daily traffic generation from the subject site by approximately 5,500vpd, and peak hour flows by 585vph and 700vph in the 7-8AM and 4-5PM peak hours, respectively.

Development of the subject site is proposed to include a new road link from Pilatus Street, around the eastern side of the existing Urbanstone factory and connecting to Jandakot Road. This new link from Pilatus Street will provide improved heavy vehicle access from Pilatus Street to the Urbanstone factory when access from Jandakot Road is downgraded in future.

This new road link would also create an alternative access route from Jandakot Road to Pilatus Street. This would help to reduce some of the future traffic flows through the planned Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd signalised intersection, which will significantly mitigate the traffic impact at that intersection of traffic generated by future development of the subject site.

The traffic analysis undertaken in this report indicates the Jandakot Rd / Berrigan Dr / Pilatus St / Dean Rd signalised intersection would be at 97.6% of capacity in the 2031 PM peak hour without development of the subject site. Additional improvements to this intersection (a longer left turn lane on the north approach and signalised double left turn lanes on the Jandakot Rd east approach) have been identified to address concerns about excessive queue lengths. These improvements would improve the intersection operation to 96.7% of capacity in the 2031 PM peak hour with the additional traffic flows generated by full development of the subject site as proposed in this scheme amendment.

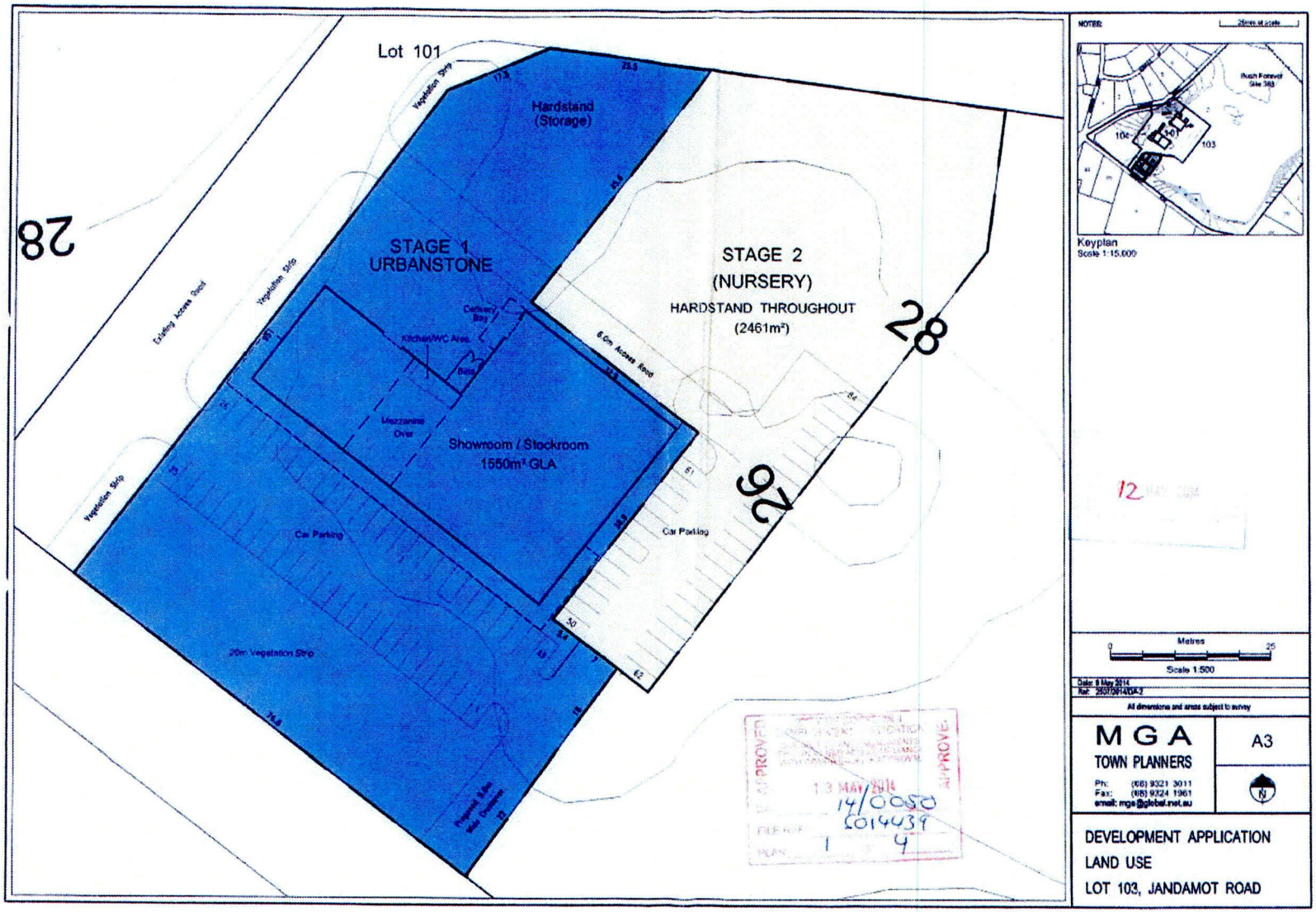
Analysis of other intersections proposed for access to the subject site, with Jandakot Road upgraded to dual carriageway in future, indicates that the following access strategy (illustrated in **Figure 5**) would provide satisfactory intersection capacity to service full development of the subject site:

- The recently constructed roundabout on Pilatus St south of the Bush Forever site at the northern edge of proposed development on Lot 103 has more than sufficient capacity and provides a robust solution to accommodate higher future traffic flows on Pilatus Street in future, if required;

- Two-lane roundabout on Jandakot Rd east of the approved Urbanstone showroom / nursery development site; and
- Left in / left out intersection on Jandakot Rd halfway between Berrigan Dr and the proposed roundabout (replacing the existing Urbanstone driveway intersection and nursery driveway crossover on Jandakot Rd).

Appendix A

APPROVED URBANSTONE
SHOWROOM - NURSERY DEVELOPMENT



Appendix B

SIDRA INTERSECTION ANALYSIS

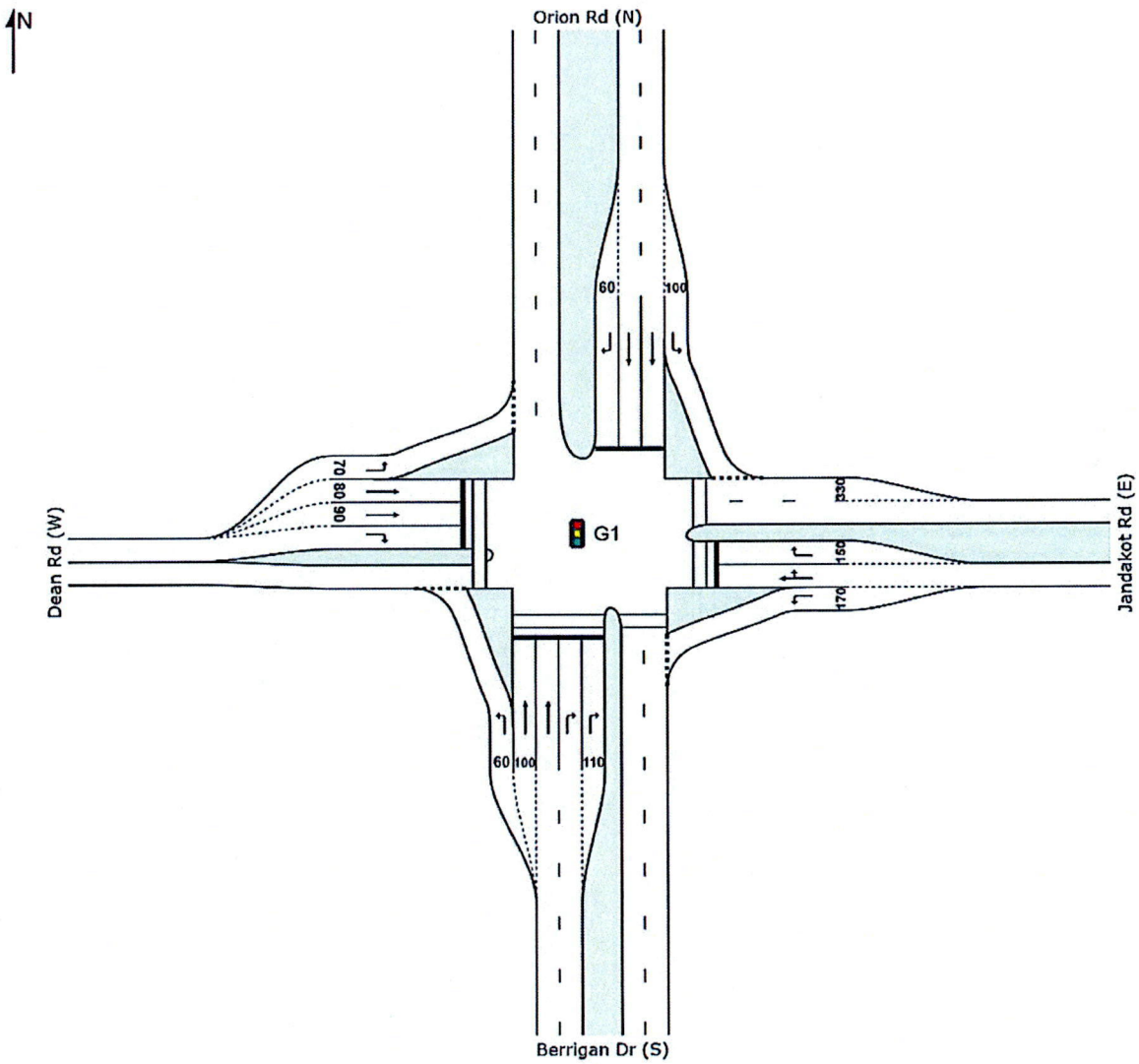
Table B1: Summary of 2031 SIDRA Analysis for Berrigan Dr / Jandakot Rd / Dean Rd / Pilatus St Signalised Intersection

Approach		Degree of Saturation		Average delay (sec)		Level of Service		95% back of queue (m)	
		Without developm't	With developm't & left turn upgrades	Without developm't	With developm't & left turn upgrades	Without developm't	With developm't & left turn upgrades	Without developm't	With developm't & left turn upgrades
2031 7-8AM Peak Hour									
Berrigan Dr	S	0.884	0.876	48	36	D	D	219	221
Jandakot Rd	E	0.896	0.907	33	33	C	C	191	158
Orion Rd (Pilatus St)	N	0.352	0.762	23	33	C	C	37	54
Dean Rd	W	0.868	0.824	50	46	D	D	38	36
Total intersection		**0.896**	**0.907**	**39**	**35**	**D**	**D**	**219**	**221**
2031 4-5PM Peak Hour									
Berrigan Dr	S	0.976	0.967	64	55	E	E	209	313
Jandakot Rd	E	0.959	0.933	43	50	D	D	139	122
Orion Rd (Pilatus St)	N	0.965	0.917	35	36	C	D	249	302
Dean Rd	W	0.432	0.477	44	60	D	E	23	25
Total intersection		**0.976**	**0.967**	**47**	**47**	**D**	**D**	**249**	**313**

SITE LAYOUT

Site: G1 [Berrigan-Jandakot-Dean-Orion 2031AM sigs - mod1]

Berrigan Dr / Jandakot Rd / Dean Rd
Signalised intersecton (as con, modified, 2-stage peds)
2031 AM peak (7-8am) without rezoning
Signals - Fixed Time Coordinated



Organisation: TRANSCORE PTY LTD | Created: Monday, 19 June 2017 9:32:58 PM
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MOVEMENT SUMMARY

Site: G1 [Berrigan-Jandakot-Dean-Orion 2031AM sigs - mod1]

Berrigan Dr / Jandakot Rd / Dean Rd
Signalised intersecton (as con, modified, 2-stage peds)
2031 AM peak (7-8am) without rezoning
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berrigan Dr (S)											
7	L2	34	1.0	0.023	7.0	LOS A	0.1	0.8	0.14	0.61	52.7
8	T1	1099	9.0	0.879	42.4	LOS D	29.0	219.0	0.97	1.01	38.7
9	R2	686	9.0	0.884	59.4	LOS E	19.3	145.5	1.00	0.98	32.2
Approach		1819	8.9	0.884	48.1	LOS D	29.0	219.0	0.97	0.99	36.1
East: Jandakot Rd (E)											
10	L2	1030	9.0	0.783	11.6	LOS B	21.7	163.3	0.62	0.80	56.3
11	T1	8	1.0	0.896	54.8	LOS D	25.4	191.0	1.00	0.98	31.2
12	R2	878	9.0	0.896	58.7	LOS E	25.4	191.0	1.00	0.98	32.8
Approach		1916	9.0	0.896	33.4	LOS C	25.4	191.0	0.80	0.88	42.3
North: Orion Rd (N)											
1	L2	193	9.0	0.165	8.0	LOS A	0.8	5.8	0.10	0.61	58.9
2	T1	262	9.0	0.352	31.4	LOS C	4.9	37.0	0.79	0.64	43.8
3	R2	13	1.0	0.116	57.2	LOS E	0.6	4.4	0.96	0.68	30.7
Approach		468	8.8	0.352	22.5	LOS C	4.9	37.0	0.51	0.63	48.3
West: Dean Rd (W)											
4	L2	55	1.0	0.085	22.1	LOS C	1.5	10.9	0.67	0.68	42.0
5	T1	24	1.0	0.102	50.4	LOS D	0.6	4.1	0.97	0.66	33.3
6	R2	97	1.0	0.868	64.7	LOS E	5.4	38.4	1.00	0.98	28.3
Approach		176	1.0	0.868	49.4	LOS D	5.4	38.4	0.89	0.85	32.3
All Vehicles		4379	8.6	0.896	39.0	LOS D	29.0	219.0	0.84	0.90	39.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Pedestrian Back of Queue ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P31	South Stage 1	50	16.9	LOS B	0.1	0.1	0.58	0.58
P32	South Stage 2	50	8.9	LOS A	0.1	0.1	0.58	0.58
P41	East Stage 1	50	9.7	LOS A	0.1	0.1	0.44	0.44
P42	East Stage 2	50	12.5	LOS B	0.1	0.1	0.50	0.50
P2	West Full Crossing	50	29.7	LOS C	0.1	0.1	0.77	0.77
All Pedestrians		250	15.5	LOS B			0.58	0.58

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: G1 [Berrigan-Jandakot-Dean-Orion 2031PM sigs - mod1]

Berrigan Dr / Jandakot Rd / Dean Rd
Signalised intersecton (as con, modified, 2-stage peds)
2031 PM peak (4-5pm) without rezoning
Signals - Fixed Time Coordinated Cycle Time = 105 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berrigan Dr (S)											
7	L2	95	1.0	0.066	7.1	LOS A	0.4	2.7	0.15	0.62	52.7
8	T1	427	9.0	0.376	30.9	LOS C	8.6	64.9	0.83	0.70	44.0
9	R2	1030	9.0	0.976	83.3	LOS F	37.7	284.6	1.00	1.09	26.6
Approach		1552	8.5	0.976	64.2	LOS E	37.7	284.6	0.90	0.95	30.9
East: Jandakot Rd (E)											
10	L2	601	9.0	0.584	17.1	LOS B	15.7	118.3	0.64	0.80	52.0
11	T1	23	1.0	0.959	79.5	LOS E	13.1	98.2	1.00	1.08	25.9
12	R2	366	9.0	0.959	83.4	LOS F	13.1	98.2	1.00	1.07	26.9
Approach		990	8.8	0.959	43.1	LOS D	15.7	118.3	0.78	0.90	38.0
North: Orion Rd (N)											
1	L2	685	9.0	0.678	15.6	LOS B	11.7	88.0	0.49	0.82	52.5
2	T1	989	9.0	0.965	48.2	LOS D	31.3	236.1	0.98	1.07	36.5
3	R2	45	1.0	0.082	34.8	LOS C	1.4	10.1	0.65	0.70	37.7
Approach		1719	8.8	0.965	34.9	LOS C	31.3	236.1	0.77	0.96	41.6
West: Dean Rd (W)											
4	L2	24	1.0	0.019	8.1	LOS A	0.3	2.1	0.32	0.57	50.0
5	T1	11	1.0	0.049	52.6	LOS D	0.3	2.0	0.97	0.63	32.7
6	R2	46	1.0	0.432	59.8	LOS E	2.4	17.3	1.00	0.74	29.4
Approach		81	1.0	0.432	43.5	LOS D	2.4	17.3	0.79	0.67	34.0
All Vehicles		4342	8.6	0.976	47.4	LOS D	37.7	284.6	0.82	0.94	36.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

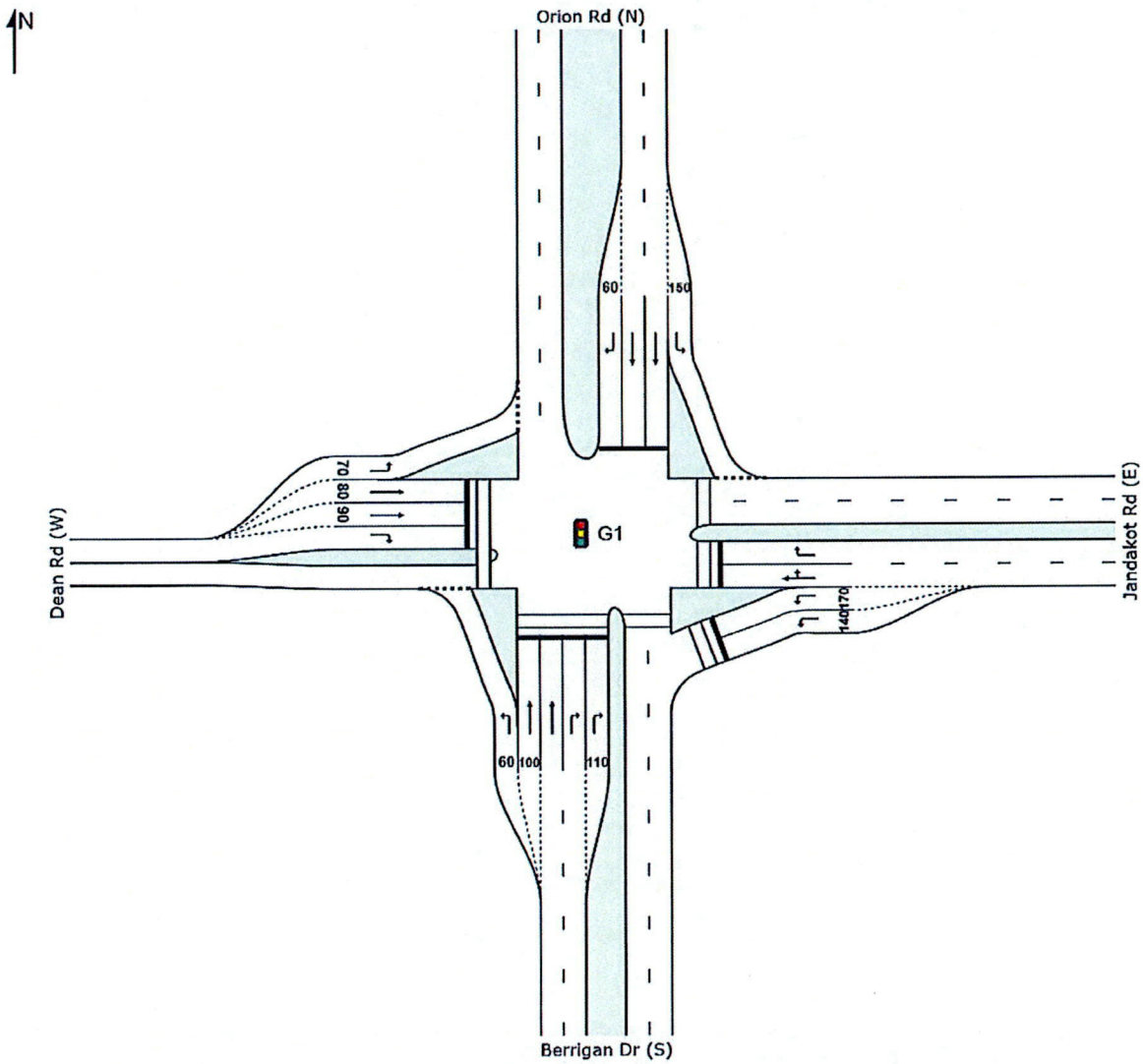
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Pedestrian Back of Queue ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P31	South Stage 1	50	13.9	LOS B	0.1	0.1	0.52	0.52
P32	South Stage 2	50	12.9	LOS B	0.1	0.1	0.66	0.66
P41	East Stage 1	50	3.7	LOS A	0.0	0.0	0.27	0.27
P42	East Stage 2	50	17.2	LOS B	0.1	0.1	0.57	0.57
P2	West Full Crossing	50	35.3	LOS D	0.1	0.1	0.82	0.82
All Pedestrians		250	16.6	LOS B			0.57	0.57

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: G1 [Berrigan-Jandakot-Dean-Orion 2031AM sigs-mod2-with rezoning]

Berrigan Dr / Jandakot Rd / Dean Rd
Signalised intersecton (as con, further mods, 2-stage peds)
2031 AM peak (7-8am) with rezoning (revised June 2017)
Signals - Fixed Time Coordinated



Organisation: TRANSCORE PTY LTD | Created: Monday, 19 June 2017 9:33:00 PM
Project: F:\TRANSCORE 2015\Charge Files\t15.281 - Urbanstone, Jandakot\SIDRA\Urbanstone Jandakot 2031 revision 4.sip7

MOVEMENT SUMMARY

Site: G1 [Berrigan-Jandakot-Dean-Orion 2031AM sigs-mod2-with rezoning]

Berrigan Dr / Jandakot Rd / Dean Rd
Signalised intersecton (as con, further mods, 2-stage peds)
2031 AM peak (7-8am) with rezoning (revised June 2017)
Signals - Fixed Time Coordinated Cycle Time = 95 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berrigan Dr (S)											
7	L2	34	0.0	0.023	7.0	LOS A	0.1	0.7	0.13	0.61	52.7
8	T1	1175	9.3	0.876	38.5	LOS D	29.3	221.3	0.96	1.00	40.4
9	R2	761	8.9	0.621	34.7	LOS C	14.8	111.5	0.89	0.84	41.3
Approach		1970	9.0	0.876	36.5	LOS D	29.3	221.3	0.92	0.93	40.9
East: Jandakot Rd (E)											
10	L2	1077	9.4	0.529	14.2	LOS B	8.6	64.9	0.65	0.79	54.2
11	T1	8	0.0	0.907	57.5	LOS E	20.6	157.6	1.00	1.00	30.5
12	R2	722	11.4	0.907	61.4	LOS E	20.6	157.6	1.00	1.00	31.8
Approach		1807	10.1	0.907	33.3	LOS C	20.6	157.6	0.79	0.87	42.2
North: Orion Rd (N)											
1	L2	140	8.6	0.136	7.7	LOS A	0.5	3.5	0.09	0.61	59.3
2	T1	294	11.6	0.762	44.6	LOS D	7.0	53.8	1.00	0.84	37.9
3	R2	13	0.0	0.110	54.3	LOS D	0.6	4.1	0.95	0.68	31.4
Approach		447	10.3	0.762	33.3	LOS C	7.0	53.8	0.71	0.76	42.5
West: Dean Rd (W)											
4	L2	55	1.8	0.080	20.5	LOS C	1.4	10.2	0.66	0.68	42.7
5	T1	24	0.0	0.096	47.5	LOS D	0.6	3.9	0.97	0.66	34.3
6	R2	97	1.0	0.824	59.6	LOS E	5.1	35.7	1.00	0.94	29.5
Approach		176	1.1	0.824	45.7	LOS D	5.1	35.7	0.89	0.82	33.3
All Vehicles		4400	9.3	0.907	35.2	LOS D	29.3	221.3	0.84	0.88	41.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Pedestrian Back of Queue ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P31	South Stage 1	50	18.4	LOS B	0.1	0.1	0.62	0.62
P32	South Stage 2	50	6.1	LOS A	0.0	0.0	0.51	0.51
P41	East Stage 1	50	7.6	LOS A	0.1	0.1	0.40	0.40
P42	East Stage 2	50	19.6	LOS B	0.1	0.1	0.64	0.64
P4S	East Slip/Bypass Lane Crossing	50	18.8	LOS B	0.1	0.1	0.88	0.88
P2	West Full Crossing	50	26.6	LOS C	0.1	0.1	0.75	0.75
All Pedestrians		300	16.2	LOS B			0.63	0.63

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

MOVEMENT SUMMARY

Site: G1 [Berrigan-Jandakot-Dean-Orion 2031PM sigs-mod2-with rezoning]

Berrigan Dr / Jandakot Rd / Dean Rd
Signalised intersecton (as con, further mods, 2-stage peds)
2031 PM peak (4-5pm) with rezoning (revised June 2017)
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berrigan Dr (S)											
7	L2	95	1.1	0.059	7.1	LOS A	0.5	3.4	0.12	0.61	52.7
8	T1	466	10.1	0.233	10.1	LOS B	5.3	40.2	0.56	0.47	58.8
9	R2	1115	8.9	0.967	78.0	LOS E	41.5	312.6	1.00	1.06	27.8
Approach		1676	8.8	0.967	55.1	LOS E	41.5	312.6	0.83	0.87	33.6
East: Jandakot Rd (E)											
10	L2	704	8.5	0.415	24.9	LOS C	12.7	95.5	0.69	0.79	47.0
11	T1	23	0.0	0.933	95.5	LOS F	16.1	122.5	1.00	0.99	23.3
12	R2	347	11.2	0.933	99.5	LOS F	16.1	122.5	1.00	0.99	24.0
Approach		1074	9.2	0.933	50.5	LOS D	16.1	122.5	0.80	0.86	35.3
North: Orion Rd (N)											
1	L2	577	8.7	0.562	15.6	LOS B	13.7	103.3	0.39	0.70	52.5
2	T1	1062	9.3	0.917	45.1	LOS D	40.0	302.3	0.96	0.94	37.7
3	R2	45	0.0	0.225	73.7	LOS E	3.0	20.8	0.92	0.74	27.0
Approach		1684	8.8	0.917	35.7	LOS D	40.0	302.3	0.76	0.86	41.3
West: Dean Rd (W)											
4	L2	24	0.0	0.019	7.6	LOS A	0.3	2.3	0.25	0.56	50.6
5	T1	11	0.0	0.052	74.6	LOS E	0.4	2.7	0.97	0.63	27.4
6	R2	47	2.1	0.477	82.9	LOS F	3.5	25.2	1.00	0.74	24.8
Approach		82	1.2	0.477	59.7	LOS E	3.5	25.2	0.78	0.67	29.6
All Vehicles		4516	8.8	0.967	46.9	LOS D	41.5	312.6	0.80	0.86	36.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

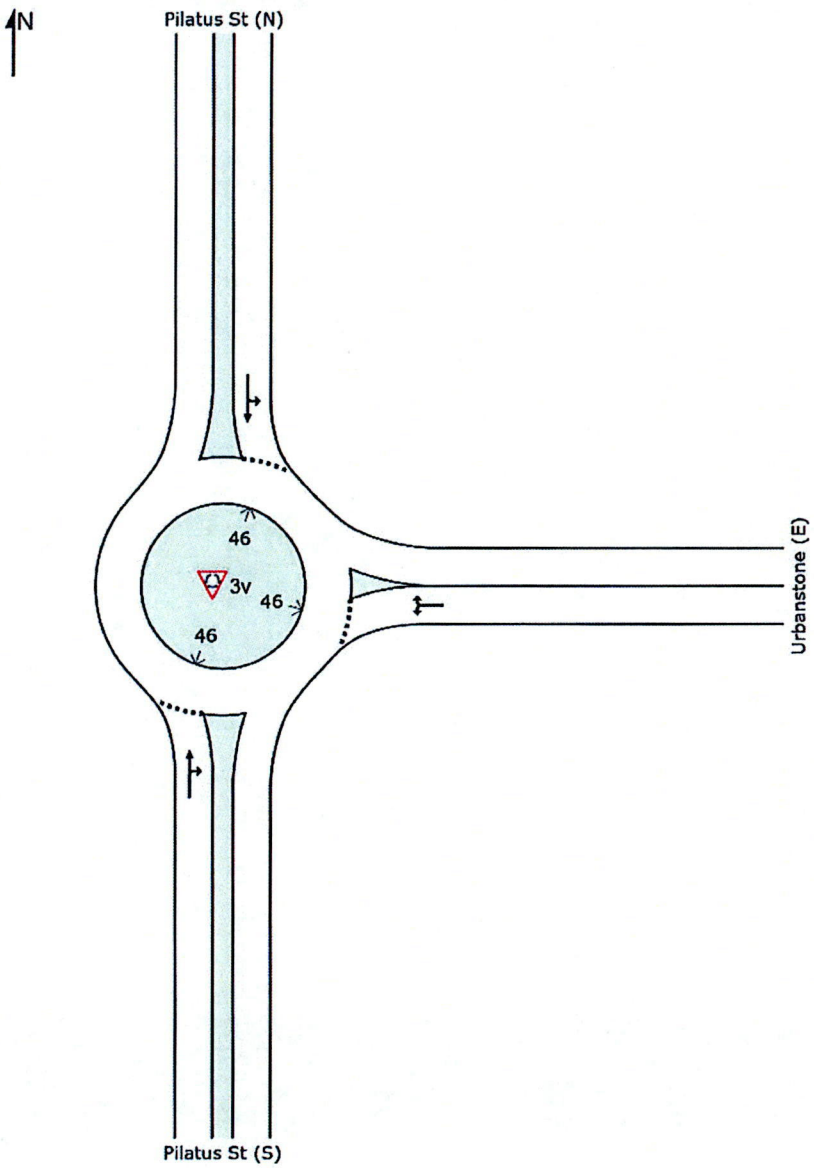
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P31	South Stage 1	50	25.3	LOS C	0.1	0.1	0.82	0.82
P32	South Stage 2	50	39.1	LOS D	0.2	0.2	0.86	0.86
P41	East Stage 1	50	3.6	LOS A	0.0	0.0	0.22	0.22
P42	East Stage 2	50	14.6	LOS B	0.1	0.1	0.62	0.62
P4S	East Slip/Bypass Lane Crossing	50	20.2	LOS C	0.1	0.1	0.67	0.67
P2	West Full Crossing	50	15.4	LOS B	0.1	0.1	0.63	0.63
All Pedestrians		300	19.7	LOS B			0.64	0.64

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

SITE LAYOUT

Site: 3v [Pilatus-Urbanstone 2031AM with rezoning - roundabout]

Pilatus St / Urbanstone access (single-lane roundabout)
Pilatus St two lanes undivided
2031 7-8AM peak hour with Urbanstone rezoning (revised June 2017)
Roundabout



Organisation: TRANSCORE PTY LTD | Created: Monday, 19 June 2017 9:32:54 PM
Project: F:\TRANSCORE 2015\Charge Files\t15.281 - Urbanstone, Jandakot\SIDRA\Urbanstone Jandakot 2031 revision 4.sip7

MOVEMENT SUMMARY

Site: 3v [Pilatus-Urbanstone 2031AM with rezoning - roundabout]

Pilatus St / Urbanstone access (single-lane roundabout)
Pilatus St two lanes undivided
2031 7-8AM peak hour with Urbanstone rezoning (revised June 2017)
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pilatus St (S)											
11	T1	501	9.0	0.407	4.7	LOS A	1.9	14.5	0.34	0.47	64.2
12	R2	72	13.9	0.407	12.2	LOS B	1.9	14.5	0.34	0.47	58.3
Approach		573	9.6	0.407	5.6	LOS A	1.9	14.5	0.34	0.47	63.4
East: Urbanstone (E)											
1	L2	32	31.3	0.191	2.1	LOS A	0.7	5.9	0.20	0.53	50.4
3	R2	246	14.6	0.191	7.8	LOS A	0.7	5.9	0.20	0.53	50.8
Approach		278	16.5	0.191	7.1	LOS A	0.7	5.9	0.20	0.53	50.7
North: Pilatus St (N)											
4	L2	235	18.3	0.231	4.3	LOS A	1.1	8.4	0.18	0.41	55.6
5	T1	117	7.7	0.231	4.0	LOS A	1.1	8.4	0.18	0.41	66.4
Approach		352	14.8	0.231	4.2	LOS A	1.1	8.4	0.18	0.41	58.7
All Vehicles		1203	12.7	0.407	5.6	LOS A	1.9	14.5	0.26	0.46	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3v [Pilatus-Urbanstone 2031PM with rezoning - roundabout]

Pilatus St / Urbanstone access (single-lane roundabout)
Pilatus St two lanes undivided
2031 4-5PM peak hour with Urbanstone rezoning (revised June 2017)
Roundabout

Movement Performance - Vehicles

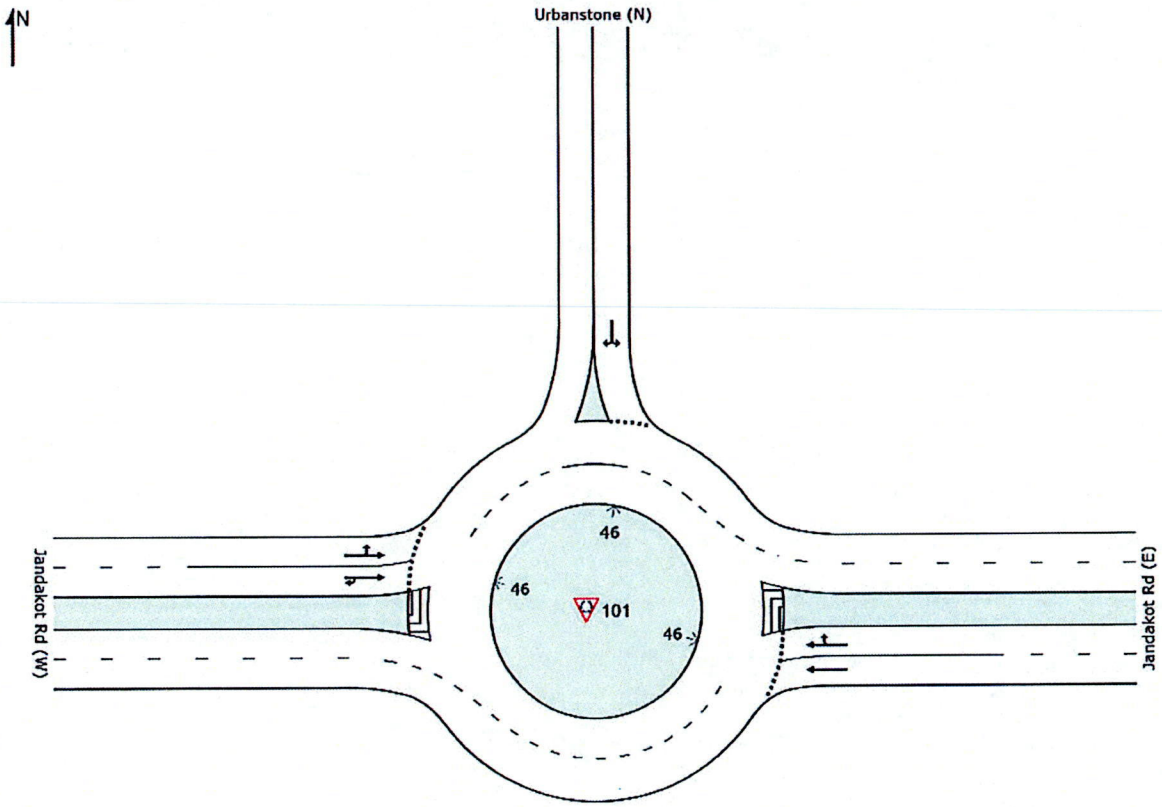
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pilatus St (S)											
11	T1	167	9.0	0.149	4.3	LOS A	0.6	4.6	0.27	0.45	64.4
12	R2	39	20.5	0.149	12.0	LOS B	0.6	4.6	0.27	0.45	58.5
Approach		206	11.2	0.149	5.7	LOS A	0.6	4.6	0.27	0.45	63.2
East: Urbanstone (E)											
1	L2	66	12.1	0.224	3.8	LOS A	1.1	8.7	0.54	0.67	50.6
3	R2	194	10.3	0.224	9.5	LOS A	1.1	8.7	0.54	0.67	51.2
Approach		260	10.8	0.224	8.1	LOS A	1.1	8.7	0.54	0.67	51.0
North: Pilatus St (N)											
4	L2	224	17.0	0.493	4.3	LOS A	3.1	23.9	0.17	0.37	55.7
5	T1	591	8.6	0.493	4.0	LOS A	3.1	23.9	0.17	0.37	66.4
Approach		815	10.9	0.493	4.0	LOS A	3.1	23.9	0.17	0.37	63.1
All Vehicles		1281	10.9	0.493	5.1	LOS A	3.1	23.9	0.26	0.44	60.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Jandakot-Urbanstone 2031AM with rezoning]

Jandakot Rd / Urbanstone intersection (2-lane roundabout)
Jandakot Rd dual carriageway
2031 7-8AM peak hour with Urbanstone rezoning (revised June 2017)
Roundabout



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MOVEMENT SUMMARY

Site: 101 [Jandakot-Urbanstone 2031AM with rezoning]

Jandakot Rd / Urbanstone intersection (2-lane roundabout)
Jandakot Rd dual carriageway
2031 7-8AM peak hour with Urbanstone rezoning (revised June 2017)
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Jandakot Rd (E)											
5	T1	1726	9.2	0.596	5.9	LOS A	4.8	36.5	0.31	0.47	67.6
6	R2	286	7.3	0.596	13.4	LOS B	4.8	36.3	0.35	0.53	59.9
Approach		2012	8.9	0.596	7.0	LOS A	4.8	36.5	0.32	0.47	66.3
North: Urbanstone (N)											
7	L2	118	9.3	0.165	3.2	LOS A	0.6	5.4	0.51	0.54	54.0
9	R2	41	58.5	0.165	9.9	LOS A	0.6	5.4	0.51	0.54	47.0
Approach		159	22.0	0.165	4.9	LOS A	0.6	5.4	0.51	0.54	52.0
West: Jandakot Rd (W)											
10	L2	39	15.4	0.297	6.1	LOS A	1.5	11.5	0.34	0.48	56.7
11	T1	824	8.9	0.297	6.3	LOS A	1.5	11.5	0.35	0.50	67.4
12u	U	40	2.5	0.297	16.8	LOS B	1.4	10.5	0.36	0.53	67.0
Approach		903	8.9	0.297	6.7	LOS A	1.5	11.5	0.35	0.50	66.9
All Vehicles		3074	9.6	0.596	6.8	LOS A	4.8	36.5	0.34	0.49	65.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Jandakot-Urbanstone 2031PM with rezoning]

Jandakot Rd / Urbanstone intersection (2-lane roundabout)
Jandakot Rd dual carriageway
2031 4-5PM peak hour with Urbanstone rezoning (revised June 2017)
Roundabout

Movement Performance - Vehicles

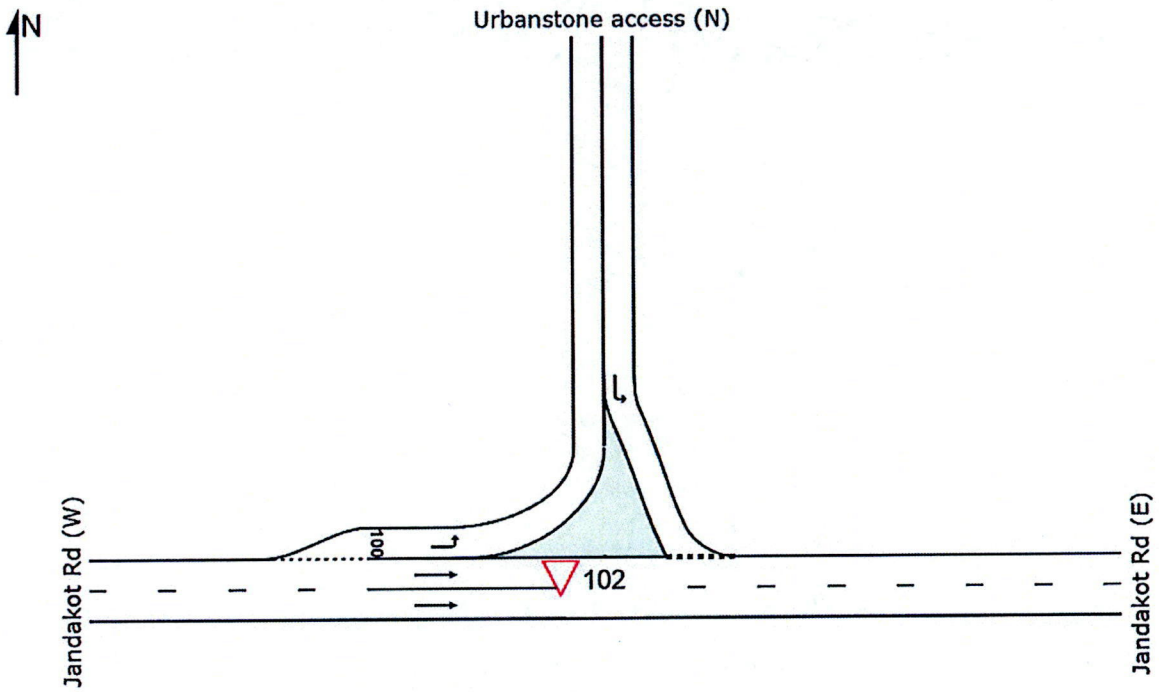
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Jandakot Rd (E)											
5	T1	893	8.7	0.323	6.0	LOS A	2.0	15.2	0.33	0.49	67.5
6	R2	153	6.5	0.323	13.5	LOS B	1.9	14.2	0.35	0.56	59.8
Approach		1046	8.4	0.323	7.1	LOS A	2.0	15.2	0.33	0.50	66.3
North: Urbanstone (N)											
7	L2	214	7.9	0.393	8.2	LOS A	2.8	21.9	0.88	0.92	50.9
9	R2	71	26.8	0.393	14.5	LOS B	2.8	21.9	0.88	0.92	49.3
Approach		285	12.6	0.393	9.8	LOS A	2.8	21.9	0.88	0.92	50.5
West: Jandakot Rd (W)											
10	L2	15	33.3	0.529	6.2	LOS A	3.6	27.4	0.30	0.46	56.9
11	T1	1624	8.7	0.529	6.0	LOS A	3.6	27.4	0.31	0.48	67.7
12u	U	90	2.2	0.529	16.5	LOS B	3.4	25.2	0.34	0.51	67.0
Approach		1729	8.6	0.529	6.5	LOS A	3.6	27.4	0.31	0.48	67.5
All Vehicles		3060	8.9	0.529	7.0	LOS A	3.6	27.4	0.37	0.53	65.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

▽ Site: 102 [Jandakot-Urbanstone LILO 2031AM with rezoning]

Jandakot Rd / Urbanstone - left in/left out only
Jandakot Rd dual carriageway
2031 7-8AM peak hour with Urbanstone rezoning (revised June 2017)
Giveway / Yield (Two-Way)



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MOVEMENT SUMMARY

▽ Site: 102 [Jandakot-Urbanstone LILO 2031AM with rezoning]

Jandakot Rd / Urbanstone - left in/left out only
Jandakot Rd dual carriageway
2031 7-8AM peak hour with Urbanstone rezoning (revised June 2017)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Urbanstone access (N)											
7	L2	58	1.7	0.055	6.2	LOS A	0.2	1.5	0.45	0.60	52.7
Approach		58	1.7	0.055	6.2	LOS A	0.2	1.5	0.45	0.60	52.7
West: Jandakot Rd (W)											
10	L2	58	1.7	0.031	7.6	LOS A	0.0	0.0	0.00	0.60	65.7
11	T1	845	9.3	0.227	0.0	LOS A	0.0	0.0	0.00	0.00	79.9
Approach		903	8.9	0.227	0.5	NA	0.0	0.0	0.00	0.04	78.8
All Vehicles		961	8.4	0.227	0.9	NA	0.2	1.5	0.03	0.07	76.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 102 [Jandakot-Urbanstone LILO 2031PM with rezoning]

Jandakot Rd / Urbanstone - left in/left out only
Jandakot Rd dual carriageway
2031 4-5PM peak hour with Urbanstone rezoning (revised June 2017)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Urbanstone access (N)											
7	L2	132	1.5	0.214	9.7	LOS A	0.8	5.7	0.67	0.84	50.5
Approach		132	1.5	0.214	9.7	LOS A	0.8	5.7	0.67	0.84	50.5
West: Jandakot Rd (W)											
10	L2	105	1.9	0.057	7.6	LOS A	0.0	0.0	0.00	0.60	65.6
11	T1	1601	9.4	0.431	0.1	LOS A	0.0	0.0	0.00	0.00	79.8
Approach		1706	8.9	0.431	0.5	NA	0.0	0.0	0.00	0.04	78.7
All Vehicles		1838	8.4	0.431	1.2	NA	0.8	5.7	0.05	0.09	75.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Cossill & Webley
CONSULTING ENGINEERS

LOTS 101, 103 & 104 Jandakot Road, Jandakot
ENGINEERING SERVICING REPORT
JULY 2016

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Contents

1. INTRODUCTION

MGA Town Planners requested Cossill & Webley (CW) to provide an Engineering Servicing Report for Lot 101, 103 &104 Jandakot Road, Jandakot (The Site). Our investigation is summarised below. Our report takes into consideration the proposed development plan which has been provided to CW as shown in **Figure 1** below.

It is understood the owner is contemplating development of the site to facilitate the development for service/commercial uses, consistent with the sort of uses that are occurring within the recent developments adjacent to Jandakot airport to the north.

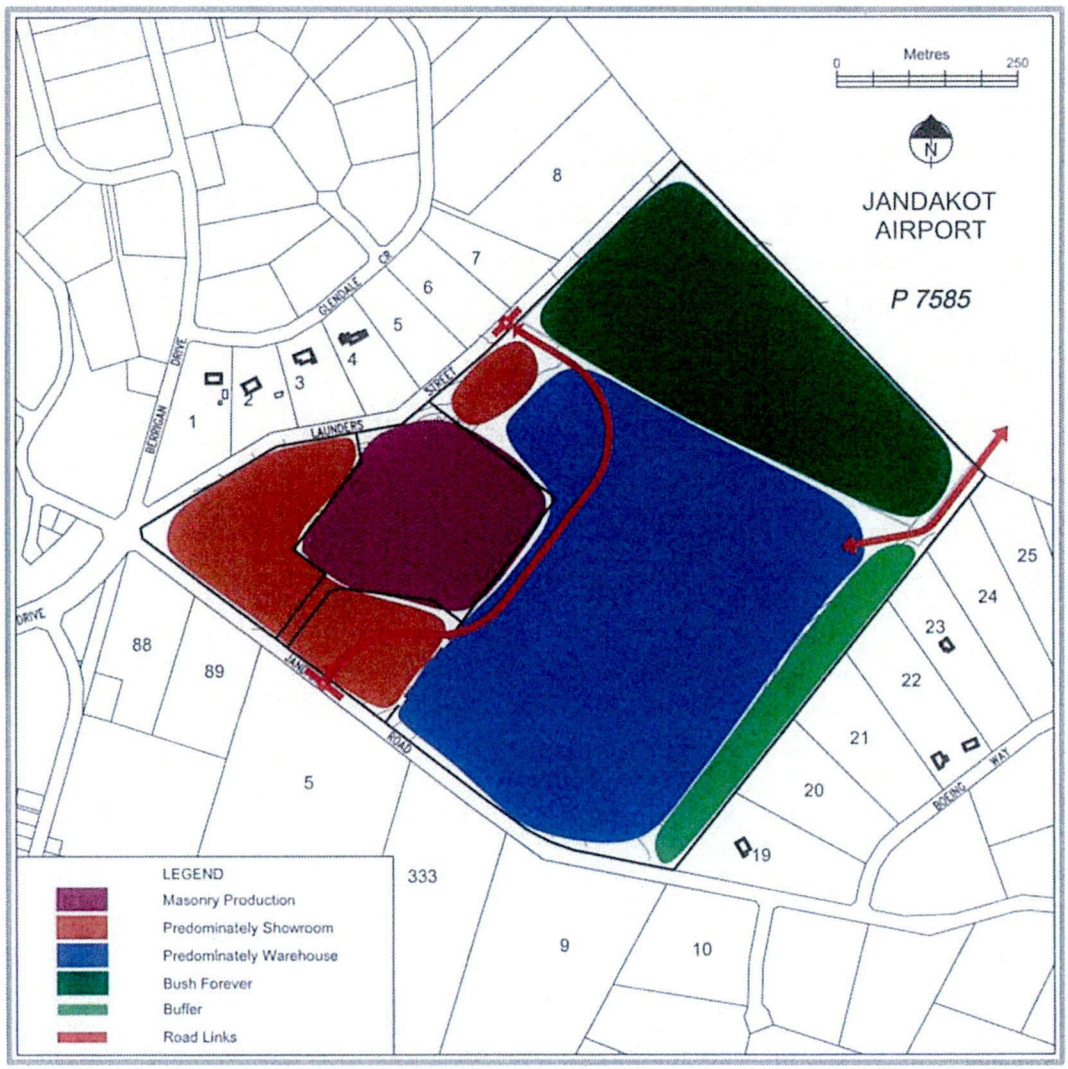


Figure 1 – Development Plan (MGA-2016)

2. PLANNING & ZONING

City of Cockburn Town Planning Scheme No 3 shows the land is currently zoned "Resource" as depicted in ***Figure 2*** below. The land is zoned "Rural" within the Metropolitan Region Scheme(MRS).

It is recommended that advice is sought from a planning consultant to confirm the permissible uses and likely rezoning requirements for this development.

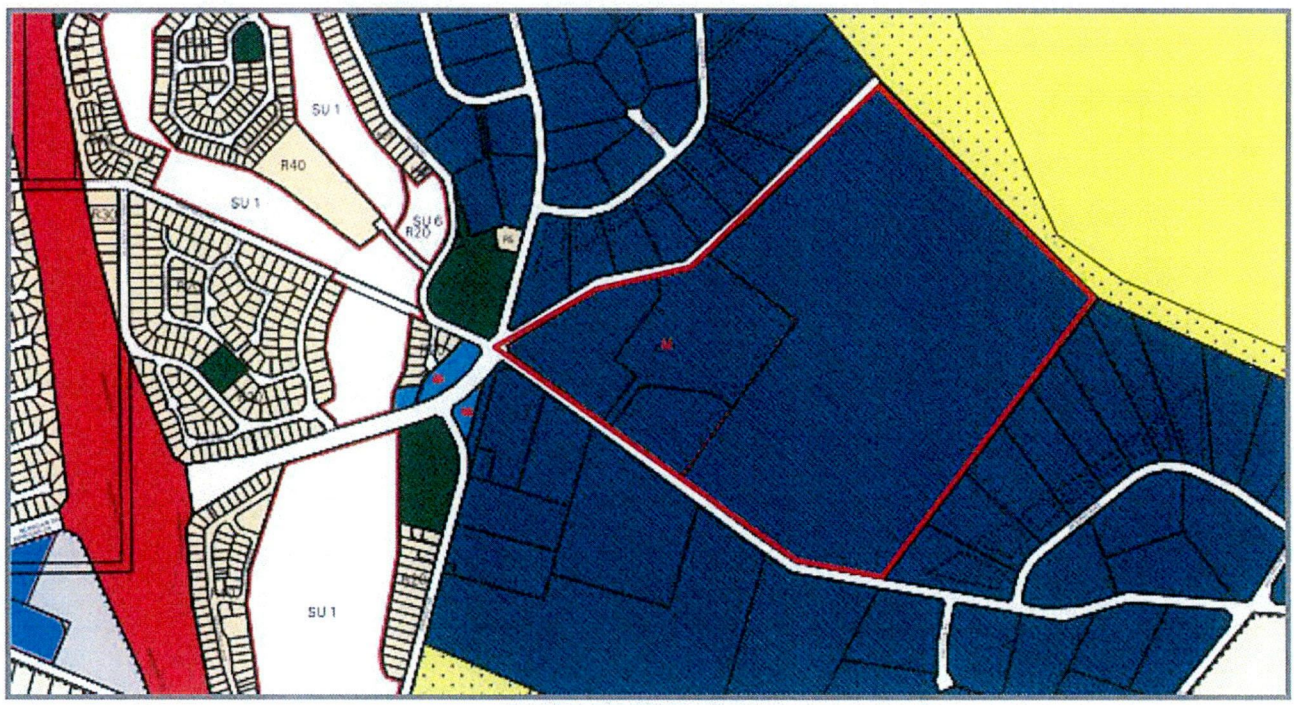


Figure 2 - City of Cockburn Town Planning Scheme (WAPC, 2014)

3. SITEWORKS & EARTHWORKS

The Site adjoins unmade Pilatus Street to the north-west, Jandakot Road to the south-west, Jandakot Airport and large properties to the south-east.

Lots 101, 103 and 104 Jandakot Road are 64,157m^2, 464,092m^2 and 42,492m^2 in area respectively and have been partly cleared, as depicted in ***Figure 3*** overleaf. The lots contain several businesses. Natural vegetation covers the northern portion of the site, and there are a number of large trees scattered around the existing businesses as depicted overleaf.

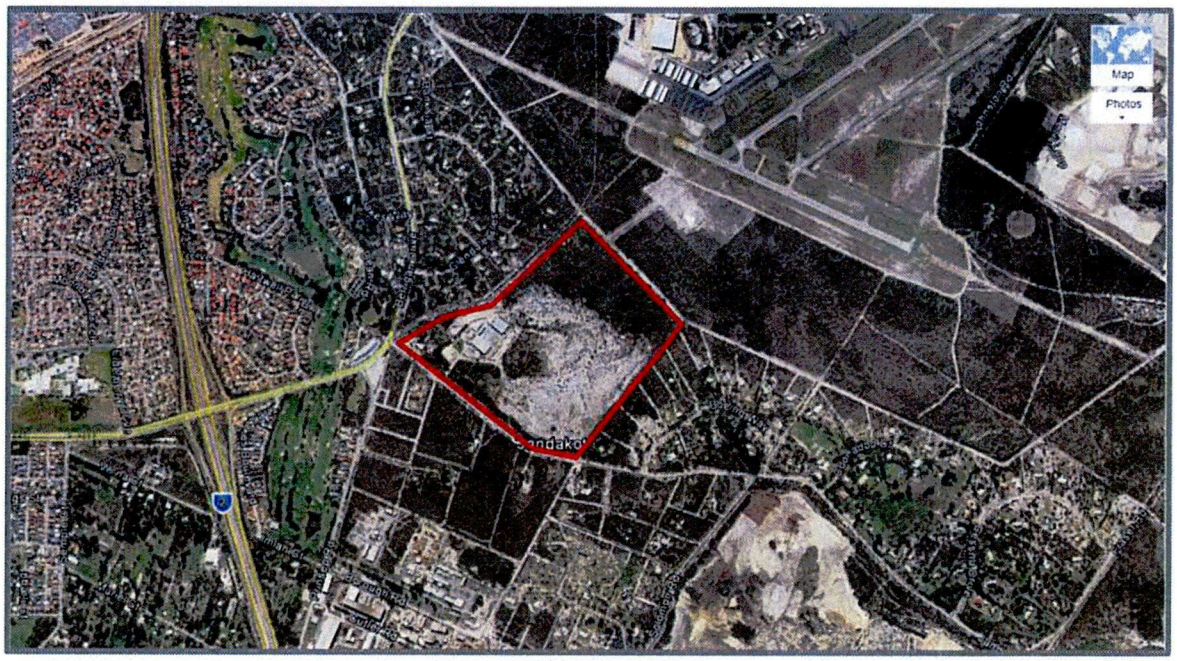


Figure 3 – Aerial Photo (Google Maps, 2013)

The Site varies in elevation from RL48m AHD at the southern boundary to RL 27m at the northern end of the Site as presented in ***Figure 4*** below.

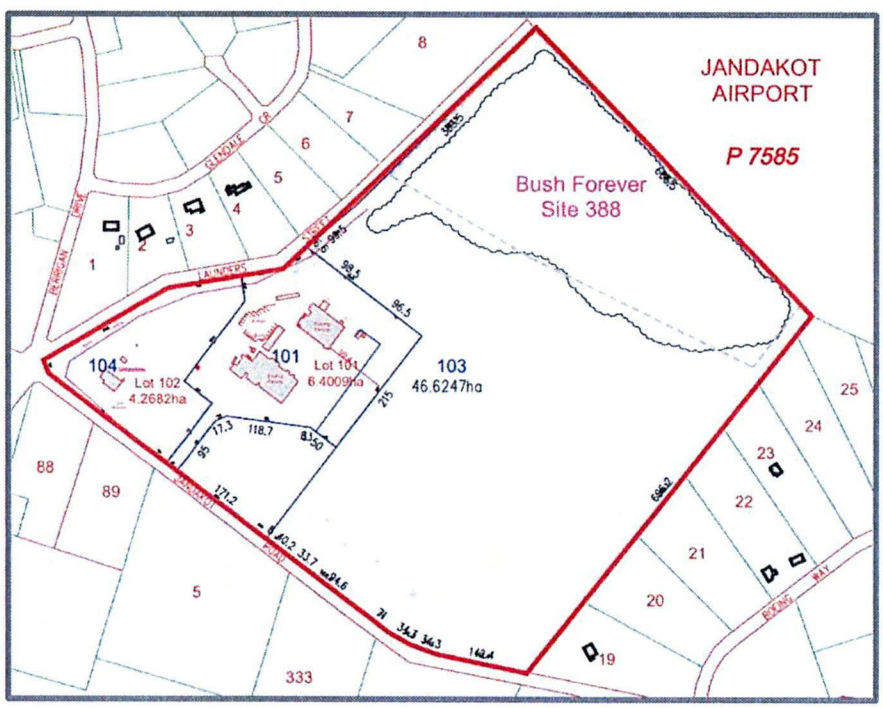


Figure 4: Existing ground contours (MGA, 2016)

3.1 Groundwater

A review of available groundwater contour information from the Department of Water Groundwater Atlas (May 2003) indicates the maximum recorded groundwater across the Site is between approximately RL22.5m AHD and

RL24m AHD as depicted in ***Figure 5*** below. These levels are often 0.5 to 1 metre greater than the average annual maximum groundwater levels.

Existing surface elevation contours presented in Figure 3 above indicates there will be at least 4 metres separation between the ground water and the natural surface, which should facilitate the effective disposal of stormwater drainage through soakwells or drainage swales.

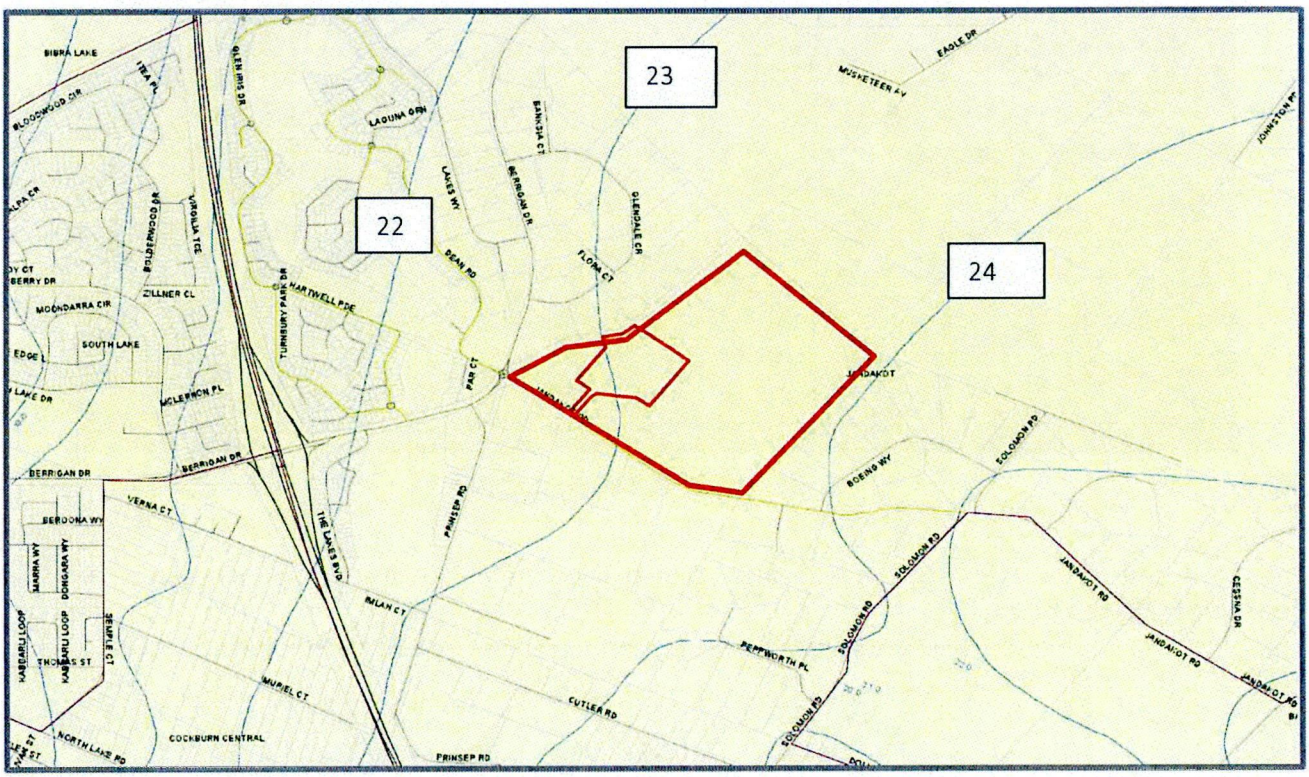


Figure 5: Groundwater Contours at May 2003 (Perth Groundwater Atlas DoW, 2013)

3.2 Geological Mapping

The 1:50,000 Environmental Urban Geology Series Fremantle Sheet indicates that The Site consists of S_8 – a fine to medium grained light grey sand of Aeolian origin and Cps – a soft peaty clay of variable organic content and of lacustrine origin. An excerpt of the geological mapping is presented in ***Figure 6*** overleaf.

Given the proposed extent of the Site to be developed falls exclusively over sands, there should be few geotechnical constraints associated with development. It should be possible to achieve a site classification equivalent to "A" in accordance with AS2870-1996 "Residential Slabs and Footings".

Nevertheless, prior to the site being subdivided it is recommended that a geotechnical investigation be completed over the Site to confirm its suitability. Amongst other things, the investigation should check the density of the in situ soils to ensure they are not abnormally loose. If loose soils are encountered it is likely they can be cost effectively improved by proof rolling the site or through the use of high impact compaction equipment.

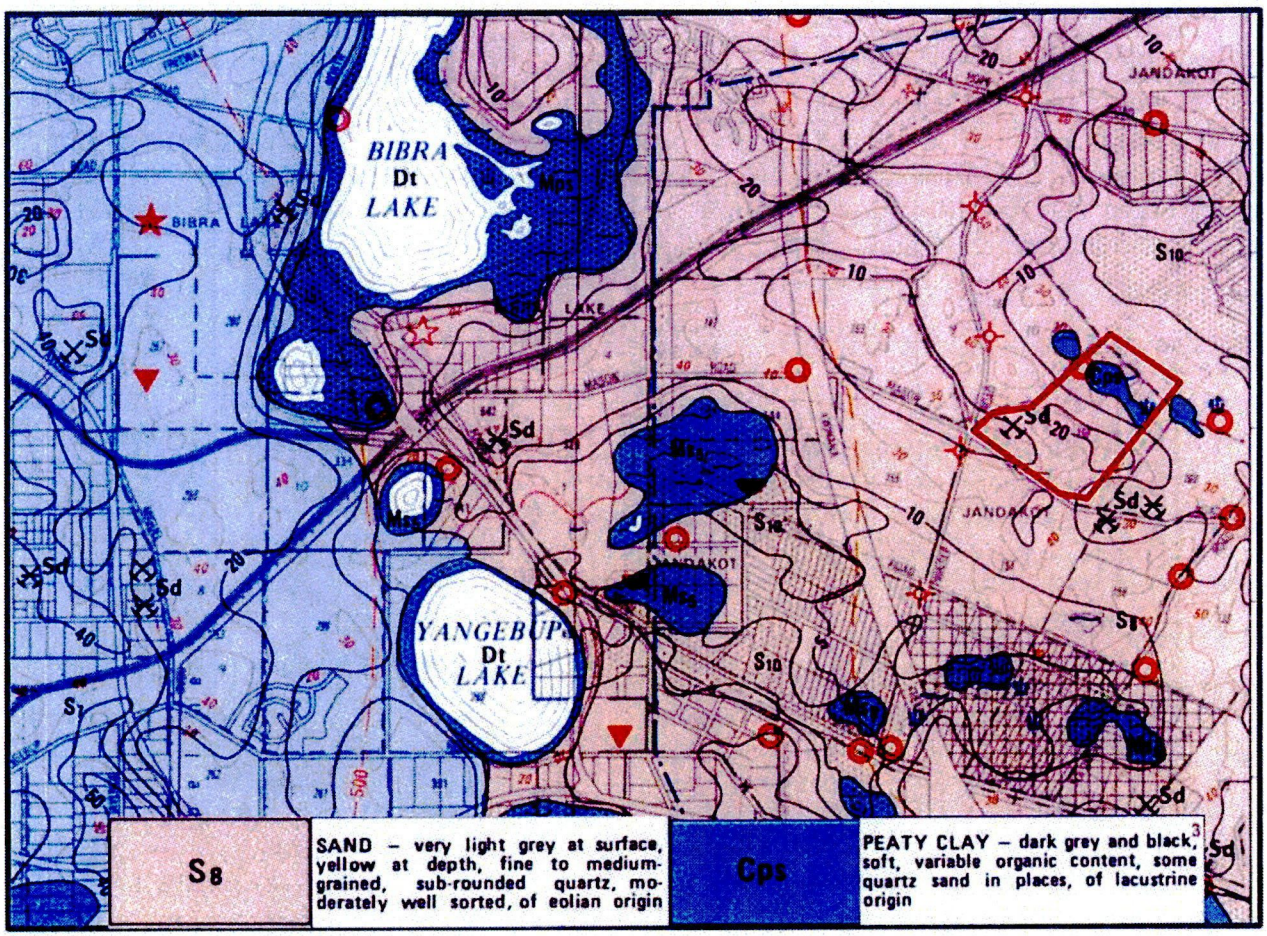


Figure 6: 1:50,000 Environmental Geology Series Mapping (Fremantle Sheet)

3.3 Contamination

We are unsure of and we have not investigated past land uses. It is recommended an environmental consultant undertake a preliminary site investigation to confirm whether any remedial works are required prior to development. Demolition of existing buildings may require remediation of residual pesticides below the slabs or the clean-up of asbestos or underground pipework.

The existing lots currently have septic sewer systems which will require decommissioning, removal, backfill and compaction as part of the development process.

3.4 Acid Sulfate Soils

The WA Atlas Shared Land Information Platform mapping suggests that the Site is predominantly Class 2 – moderate to low ASS disturbance risk at depths greater than 3m below the ground surface. ***Figure 7*** below provides an excerpt from the Department of Environment & Conservation's ASS maps. Based on this site classification, it is unlikely that any further acid sulfate soil investigations will be required.

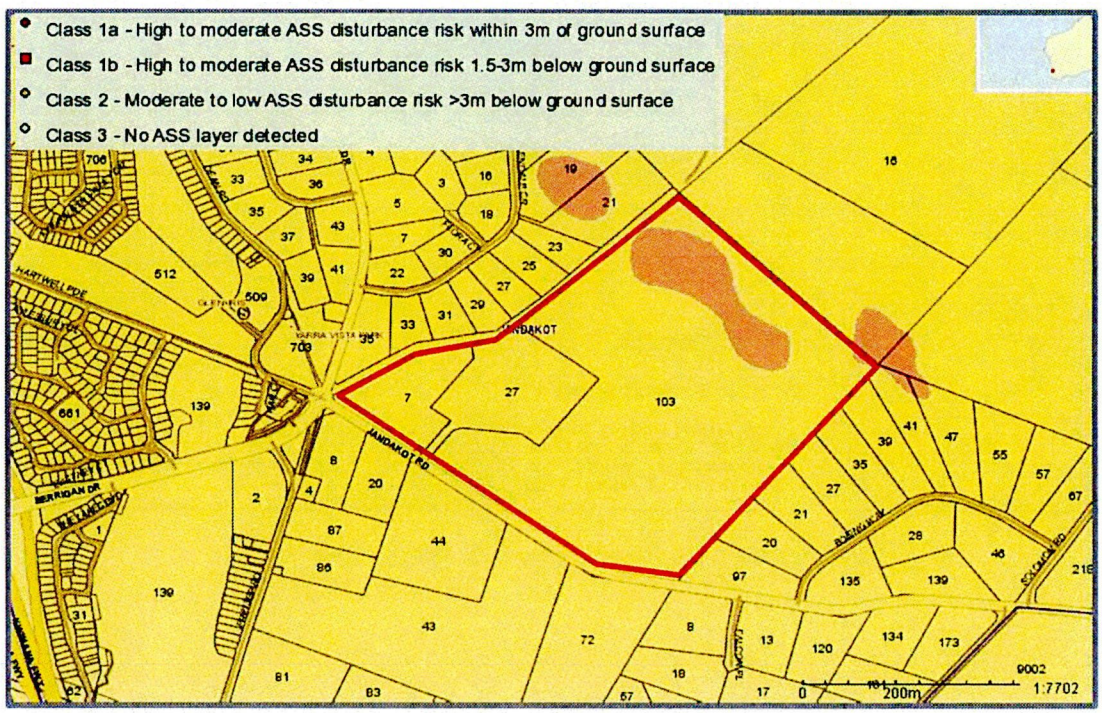


Figure 7: Acid Sulfate Soils Map (WA Atlas, SLIP 2013)

3.5 Wetland Mapping

The WA Atlas Shared Land Information Platform mapping suggests that the Site does contain one geomorphic wetland of significance portrayed below by the area indicated by the Damp land Resource Enhancement. Figure ***8*** overleaf presents an excerpt of the Department of Environment and Conservation wetland mapping.

There appears to be sufficient separation to the wetland to mitigate any impacts during or post development construction. However, it is recommended advice be sought from an environmental consultant in relation to this matter, particularly if clearing and winning of fill from the northern parts of lot 103 is to be considered as part of the development.

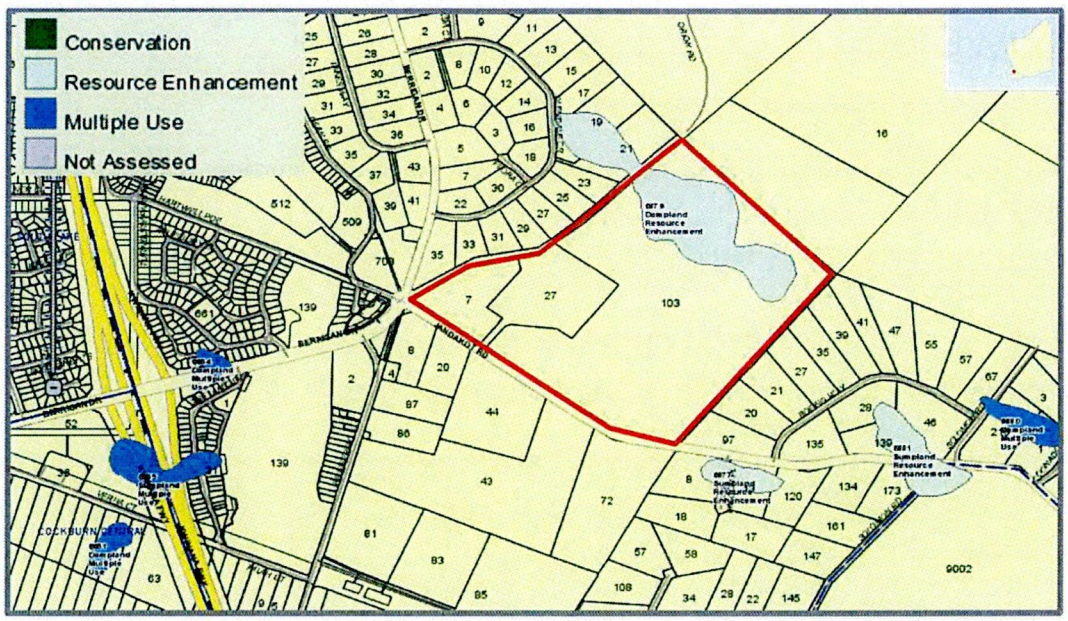


Figure 8: Geomorphic Wetland Mapping, Swan Coastal Plain (WA Atlas, SLIP 2013)

3.6 Fill Requirements

Based on our desktop investigation it is anticipated that it should be possible to satisfy likely development conditions relating to site-works through undertaking cut to fill and site grading operations to generate a Class A Site Classification.

3.7 Bush Forever

A Bush Forever Site (No 388) has been identified on the eastern portion of the site. A portion of this area is being ceded to allow for the Pilatus Street road reserve to be extended so it will ultimately be wide enough for a dual carriageway, a portion is also being ceded for creation of a sump. **Figure 9** below shows the extent of the bush forever site on Lot 103.

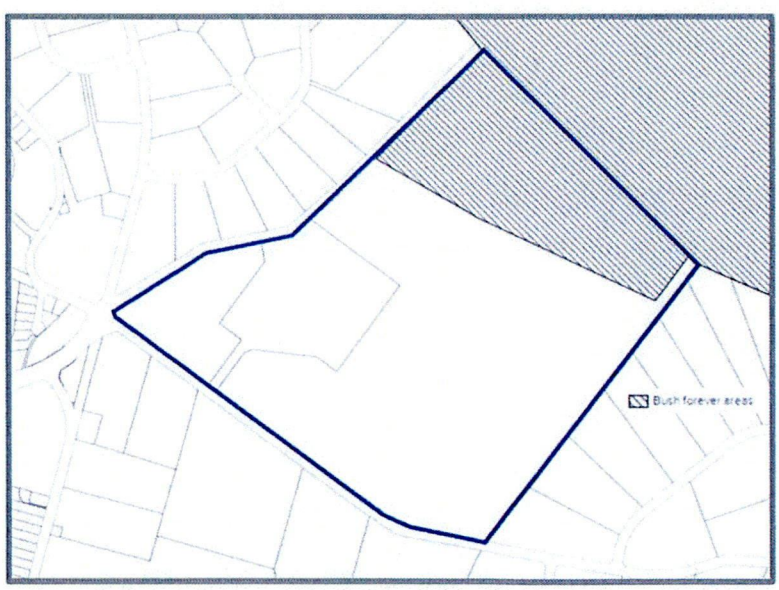


Figure 9: Geomorphic Wetland Mapping, Swan Coastal Plain (WA Atlas, SLIP 2013)

4. ROADWORKS

4.1 Existing Road Network

The Site is located adjacent to existing Jandakot Road to the south and unmade Pilatus (formerly known as Launders) Street to the west.

There is a 4-way roundabout at intersection of Jandakot Road, Berrigan Drive, Dean Road adjacent to the south-west corner of the site.

The existing businesses that occupy Lots 101 and 104, respectively, each have access from Jandakot Road.

There are no footpaths of cycleways in Jandakot road except for short lengths of path adjacent to the roundabout. **Figure 10** below presents the existing street network.

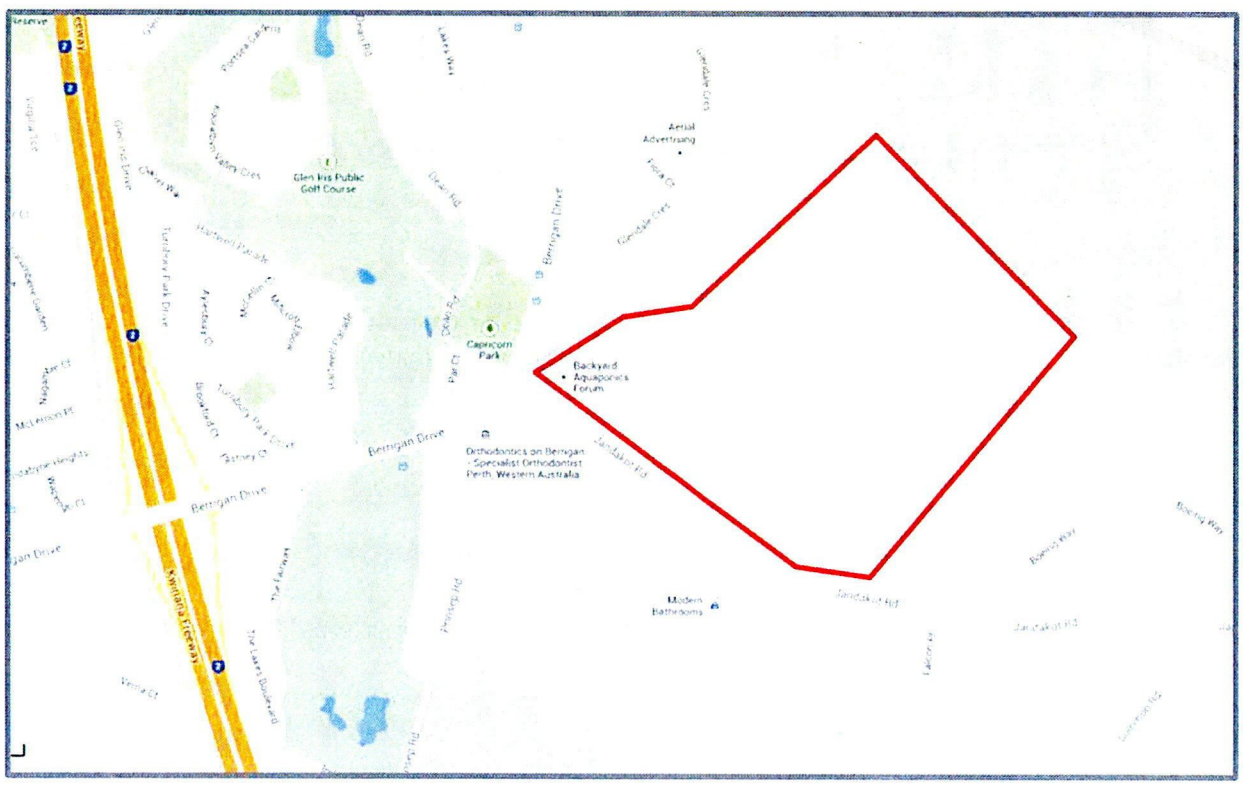


Figure 10: Existing street network (Google Maps, 2013)

4.2 Proposed Roadworks Adjacent to the Site

The City of Cockburn is proposing significant roadworks adjacent to the site in the period from August 2016 to March 2017, this work will involve

1. Altering the roundabout at Berrigan Drive and Jandakot Road to a signalized intersection.
2. Construction of Pilates Street adjacent to the development plan area to meet Orion Road within Jandakot Airport.
3. Adjustments and partial duplication of Jandakot Road adjacent to the development plan area.

Figure 11 below presents the modifications planned by the City of Cockburn adjacent to the development site.

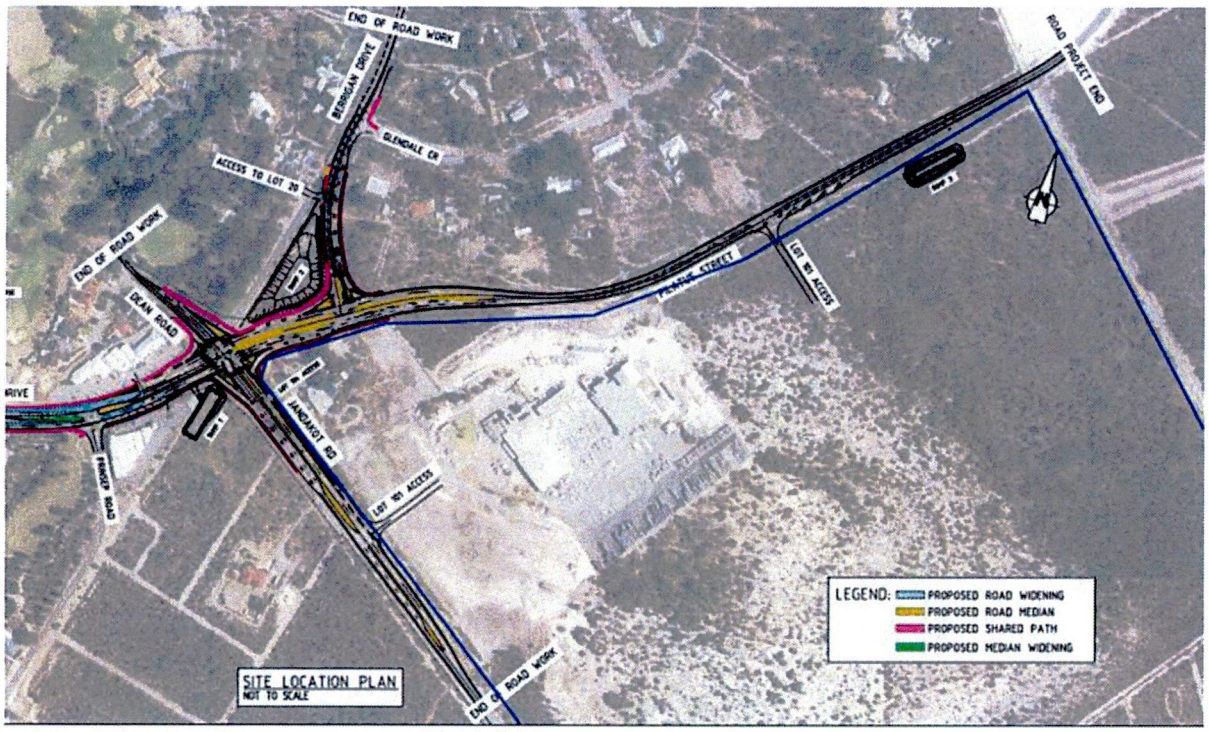


Figure 11: City of Stirling Proposed Roadworks (City of Cockburn, 2016)

The land areas required to complete the roadworks for Pilatus Street and Jandakot Road are subject to an agreement between Schaffer Corporation, Jandakot Airport and City of Cockburn.

The ceding of land on Pilatus Street has resulted in sufficient road reserve width to allow for future duplication of Pilatus Street although it is possible further areas may be required for intersection works. It is envisaged that further ceding of land may be required on Jandakot Road to allow for future duplication works towards the southern boundary and to allow for a future roundabout.

The creation of new intersections on Jandakot Road and Pilatus Street, particularly roundabouts, in the future is likely to be costly and inconvenient to traffic movements. Consideration should be given whether it would be practical to install these intersections as part of the City of Cockburn upgrade works.

4.3 Proposed Roads

The creation of the development area will require the construction of internal roads. It is assumed that some or off of the roads will be required to cater for semi trailer or B-double movments.

5. STORMWATER DRAINAGE

5.1 Stormwater Collection and Disposal

Drainage from any newly created public roads and lanes will need to be collected via conventional gullies and pipe systems and disposed into drainage swales. The drainage collection and conveyance system will need to be designed to cater for the runoff from storms with up to a 1 in 5 year recurrence interval.

Council will also likely require all newly created lots to dispose of roof runoff and runoff generated from car-parks and the like to be disposed via soakwells or swales located within the boundary of each individual lot.

Drainage from the future Pilatus Street pavement will ultimately need to be disposed somewhere adjacent to Pilatus Street. Two sites have been noted on the Pilatus Street alignment, one within the subject site and the other on the north side of Pilatus Street near Berrigan Drive.

6. SEWERAGE RETICULATION

The excerpt presented in ***Figure 12*** below shows a portion of the sewer planning for the Jandakot Sewer District. As is evident, the site is outside the Jandakot Sewer District and there is no current planning for the area to the east because it has historically been in the Jandakot Water Protection Zone. No allowance has been made in the Jandakot planning for additional flows coming from the east.

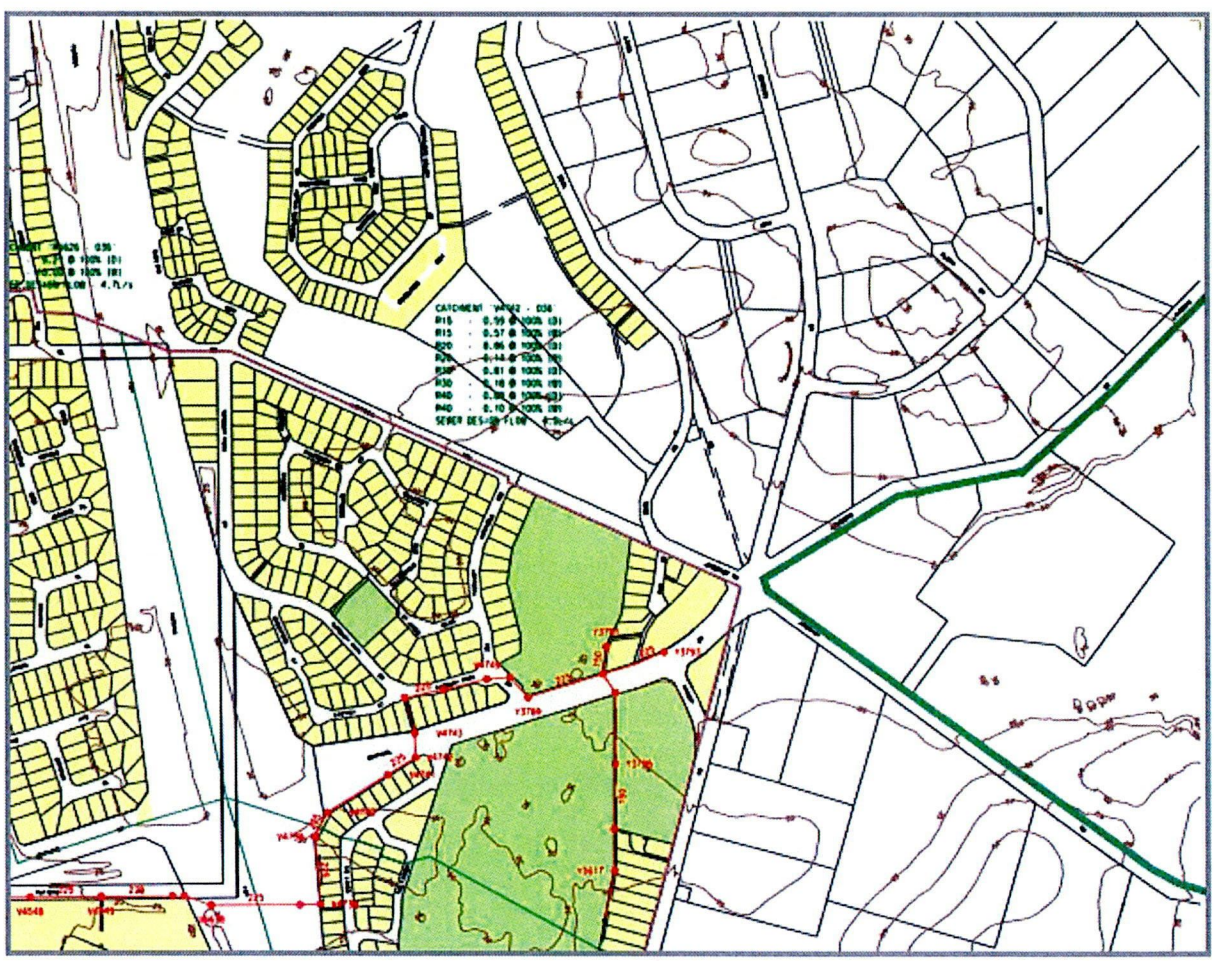
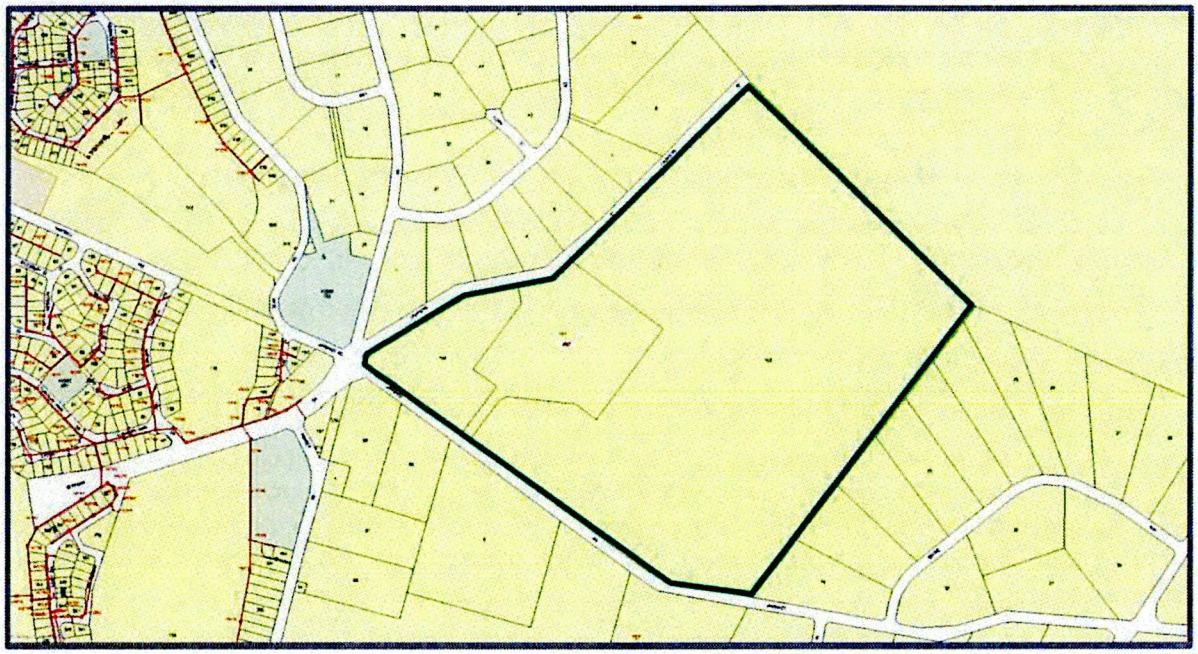


Figure 12: Water Corporation Sewerage Planning (Water Corporation, 2014)

Whilst the forward sewer planning has not allowed for flows from the site we are of the view that there should be adequate capacity in the downstream infrastructure to accommodate flows from the proposed development.

There is an existing 225mm diameter sewer main in Berrigan Drive near the intersection with Princep Road as depicted in ***Figure 13*** overleaf. However, the invert of this main is at RL 25.30, rendering it too high to service the Site without the site being filled, except for perhaps a small portion in the extreme south west corner.



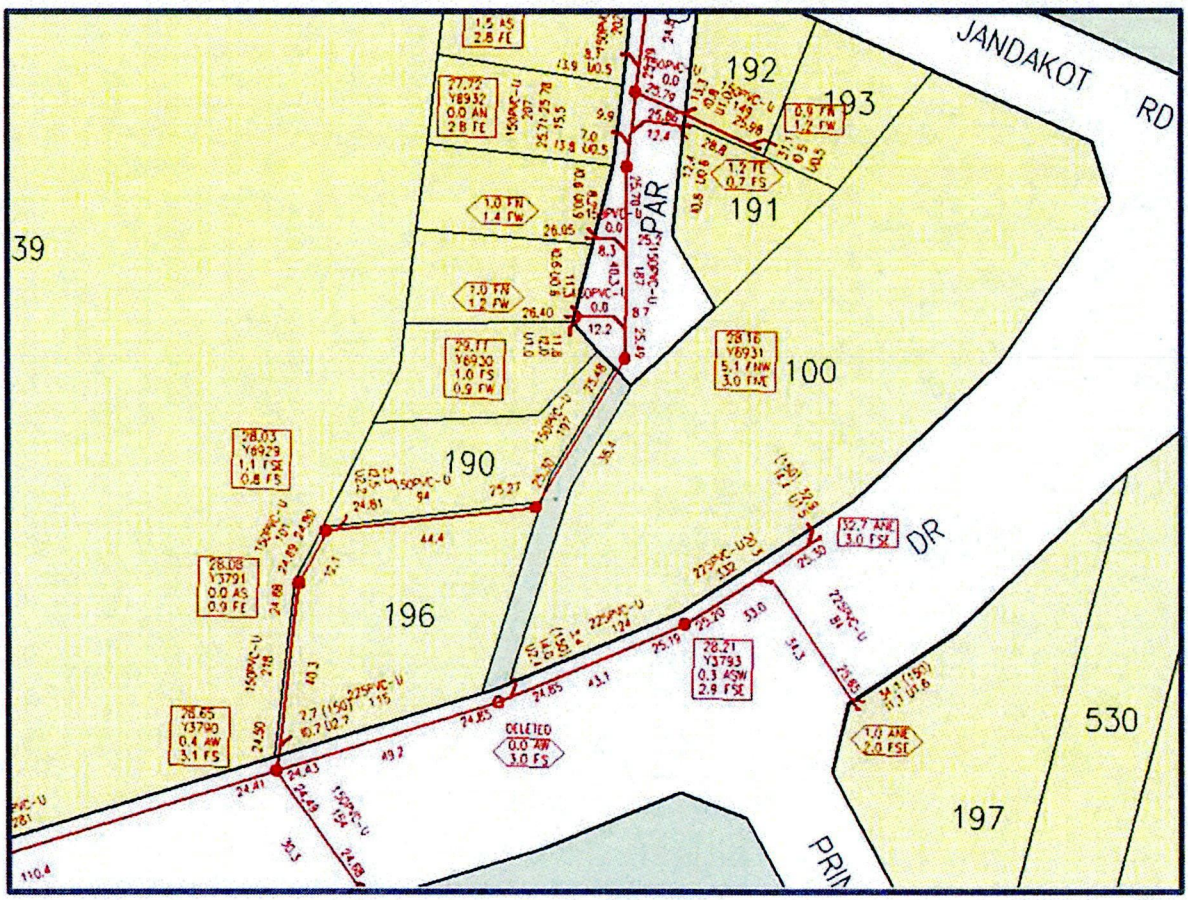


Figure 13: Water Corporation Sewerage Infrastructure with accompanying enlargement (Water Corp Esinet, 2013)

Subject to Water Corporation approval, it may be possible to gravity sewer all lots except existing Lot 101 into the sewer in Berrigan Drive by placing fill on the lots highlighted on the MGA development plan to a depth of up to approximately 1.5m. To prove the viability and cost of this option it would be necessary to complete a preliminary sewer design and undertake the following -

1 Refine lot layout, road layout and carpark/lots interface to minimise fill requirements,

2 Survey ground levels in Jandakot Road to confirm the to be sewer to be extended from the intersection of Princep Road and Berrigan Drive can be built with sufficient cover over it,

3 Survey of existing services at locations where the proposed sewer would cross them,

4 Survey of ground levels on site,

5 Determination of source of fill (ie from within the boundaries of lots 101, 103 and 104 or from off-site).

In the event that the sewering of the project by gravity is not cost effective then it would be necessary to construct a small pumping station and pressure main which would discharge into the sewer in Berrigan Drive. Assuming environmental agencies support and the downstream infrastructure is capable of receiving pumped flows associated with the development, it may be feasible for the developer to build an internal sewer reticulation system, pumping station and pressure main owned and operated by the body corporate.

7. WATER SUPPLY

As depicted in ***Figure 14,*** overleaf, there is an existing 150 PVC reticulation main Jandakot Road.

We understand an additional Water main is proposed to be built by Jandakot Airport along Pilatus Road, this main is understood to be 200mm diameter and we consider that by utilising the various mains it will ensure the project will be fed with sufficient water.

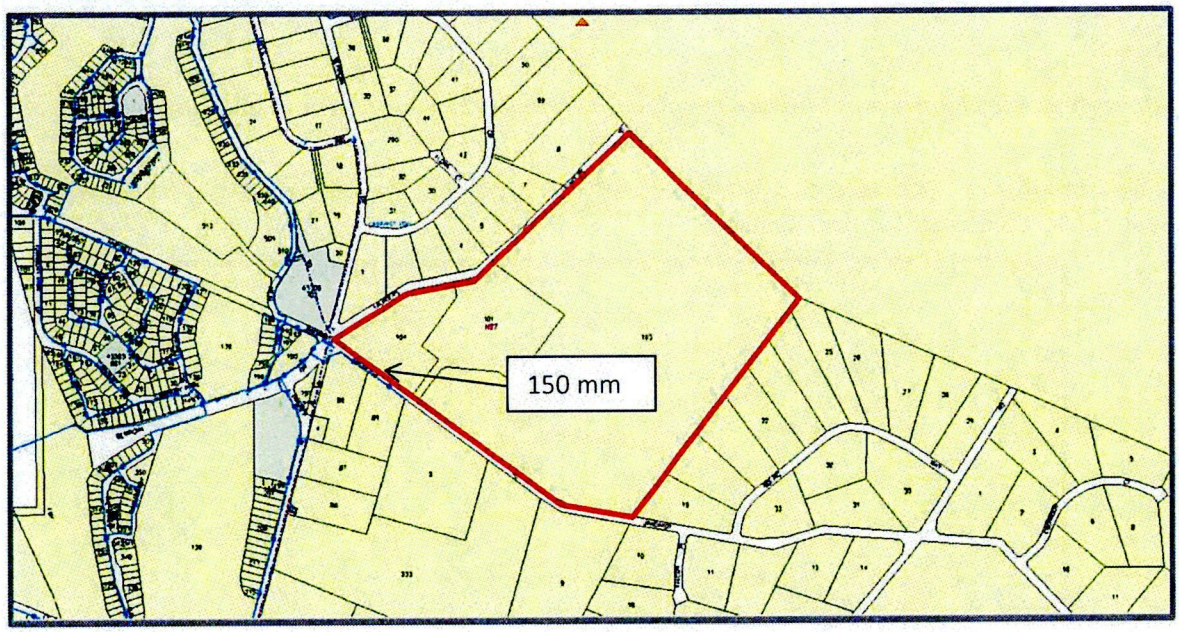


Figure 14: Water Corporation Existing Infrastructure (Water Corporation Esinet, 2013)

8. POWER

There are existing 22kV overhead power lines along Jandakot Road which, based upon discussion with our power sub-consultant, UPD, should have sufficient capacity to service the proposed development as depicted in ***Figure 15*** below. There is no requirement to underground these lines as they are not on the same side of the road as the development.

Any overhead power lines which supply the existing dwellings would need to be decommissioned or undergrounded as part of the development.

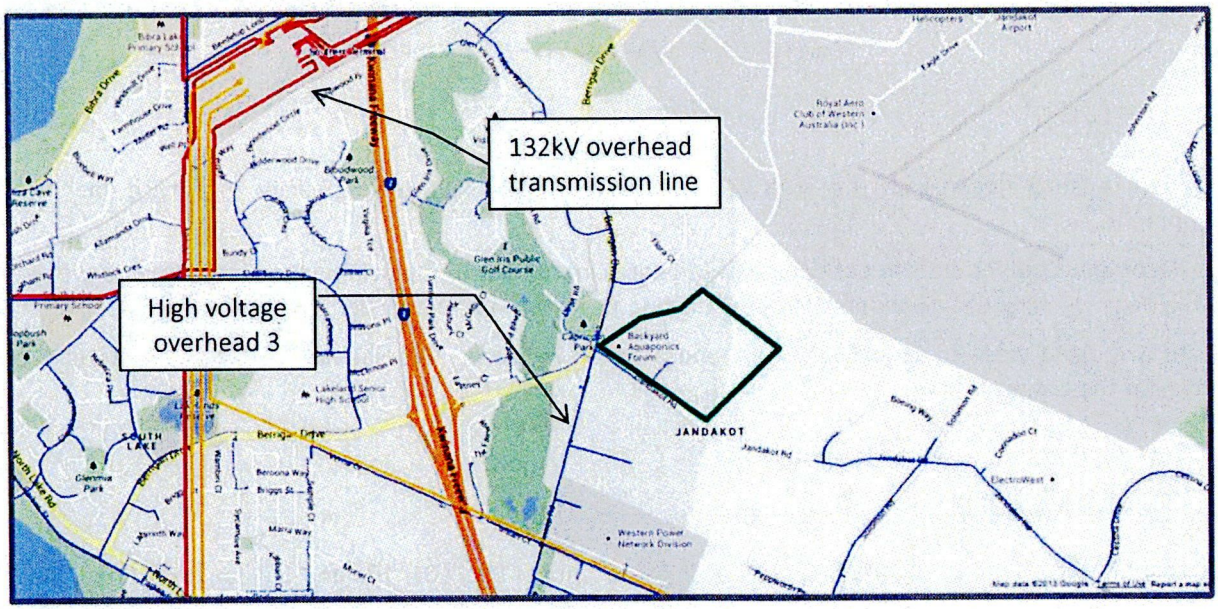


Figure 15: Western Power Existing Infrastructure (WP Network Capacity Mapping, 2013)

9. GAS

There are existing 155mm medium pressure gas mains in Berrigan Drive and Dean Road as presented in ***Figure 16*** below.

Preliminary consultation with Atco Gas (Nathan Lude) has indicated that the existing network has sufficient capacity to support the proposed development.

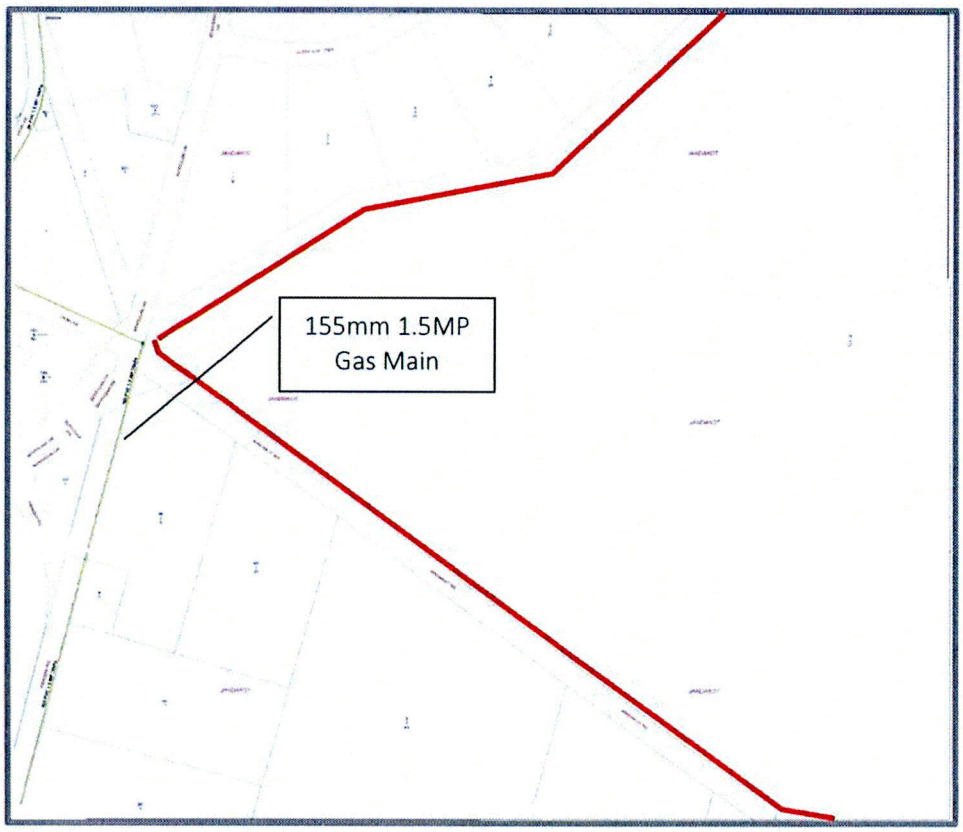


Figure 16: Gas Reticulation Network (Atco Gas, 2013)

10. OTHER

Telstra has existing network in the area which we assume has sufficient capacity to service the proposed development.

NBN telecommunications current policy is to provide optic fibre telecommunications to developments greater than 100 dwellings meaning this development would need to be serviced by a provider other than NBN Co.

The site is located close to Jandakot airport and affected by noise. This should be considered as part of the planning for the project.

11. SUMMARY

Based on our assessment of the existing services in the vicinity of Lots 101, 103 and 104 Jandakot Road, Jandakot, we consider there are no major impediments to the development of the Site for service/commercial purposes. We do not anticipate significant service headwork upgrades will be required.

The main engineering and servicing issues and constraints would appear to be the following-

1 Determination of a cost effective sewer reticulation strategy,

2 Determining if additional works should be included in current City of Cockburn upgrades of the road network which will be of long term benefit to the Development area.

We recommend that further information is obtained in relation to geotechnical and environmental matters and survey be undertaken to assist with determining the viability of a gravity sewer reticulation system for the project.

LOTS 101,103 AND 104 JANDAKOT ROAD, JANDAKOT

ENVIRONMENTAL ASSESSMENT

Prepared for:	Schaffer Corporation
Report Date:	26 August 2016
Version:	4
Report No.	2016-267

pgv ENVIRONMENTAL

CONTENTS

LIST OF ATTACHMENTS

Tables

Plates

Appendices

Appendix 7: DPaW Fauna Database Search

1 INTRODUCTION

1.1 Background

PGV Environmental has been commissioned by the Schaffer Corporation to undertake an Environmental Assessment of Lots 101, 103 and 104 Jandakot Road, Jandakot that is under investigation for future development and requires rezoning (Appendix 1). Currently the site is zoned as 'Rural – Water Protection' under the Perth Metropolitan Region Scheme (MRS) and 'Resource' under the City of Cockburn Local Planning Scheme No. 3 (WAPC, 2002).

The site contains approximately 0.5ha of native vegetation located to the west of the existing Urban Stone facilities and adjacent to the unmade Launders Street road reserve. A triangular area, about 0.3ha in size, to the west and 25ha of revegetated sand quarry (Appendix 1).

Some of the adjoining native vegetation to the west of the lot has been approved for clearing to construct Launders Street. These works are anticipated to occur in 2016 and construction of firebreaks will be required in the Balance Lot.

1.2 Site Location

The site is located in Jandakot in the City of Cockburn approximately 14km south of the Perth Central Business District. The site is bounded by Jandakot Road and Special Rural lots the south, the Urban Stone factory site to the west, Bush Forever Site 388 'Jandakot Airport, Jandakot' to the north and Special Rural lots to the east.

The portion of Bush Forever Site 388 that occurs on Lots 101, 103 and 104 remains in the ownership of Schaffer Corporation but is not part of this Environmental Assessment.

1.3 Scope of Works

PGV Environmental was commissioned to undertake an Environmental Assessment of Lots 101, 103 and 104 Jandakot Road, Jandakot. The assessment includes information on the following environmental factors.

- Physical characteristics including a description of:
  - Landform of the site;
  - Drainage and water bodies;
  - Geological, hydrogeological and hydrological characteristics; and
  - Acid Sulphate Soil Risk Mapping.
- Recent and present land use including:
  - Surrounding land uses; and
  - Assessment of current and historical activities on the subject site and surrounding areas which have the potential to result in contamination issues at the site
- Flora and Vegetation including:

- A Level 1 Flora and Vegetation Survey undertaken in accordance with Guidance Statement 51: *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* and includes:
    - Desktop search and review of the Department of Parks and Wildlife's (DPaW's) Declared Rare and Priority Flora database and Threatened Ecological Communities database;
    - Examination of recent aerial photography and contour maps to provisionally identify vegetation types and condition;
    - A thorough site walkover, recording of any significant plant species using a hand-held GPS;
    - Description of vegetation types and vegetation condition; and
    - Compilation of a preliminary flora list.

- Fauna including:
    - A Level 1 fauna survey undertaken in accordance with Guidance Statement 56: *Terrestrial* Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004b) including:
        - The results from Declared Rare and Priority Fauna searches of the DPaW Databases;
        - Results from the Commonwealth Protected Matters Search Tool which will identify possible matters of Environmental Significance listed under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) that may occur on the sites;
        - A thorough site walkover to describe fauna habitats and condition on the site; and
        - An assessment of the likelihood of conservation significant fauna being present on the sites.

The impact of the proposed rezoning has been assessed in the context of impacts on the above factors.

2 EXISTING ENVIRONMENT

2.1 Land Use

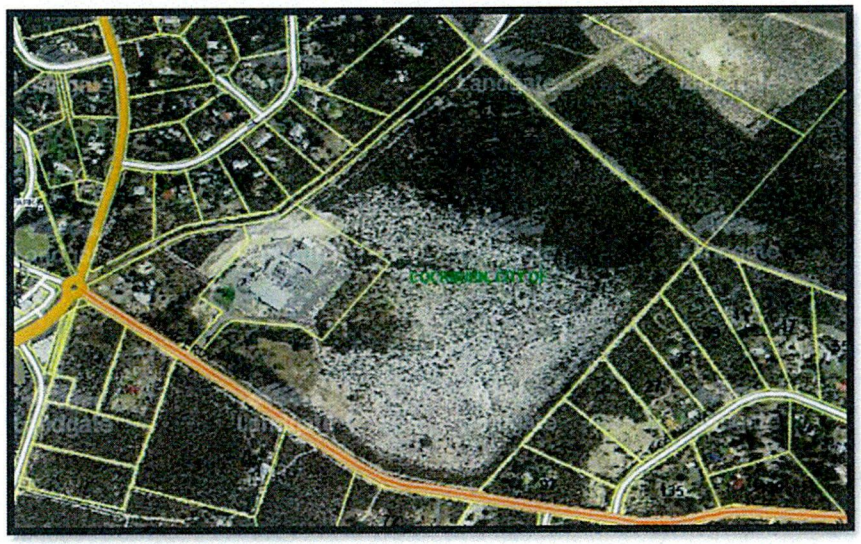
2.1.1 Previous Land Use

According to historic aerial photography available on-line (Landgate, 2012a) the site remained fully vegetated until sometime after 1981 (Plate 1) (Landgate, 2012a). The 1985 aerial photograph (Plate 2) shows that the south-western part of the site was cleared as part of sand quarrying operations on the larger landholding. A buffer strip of native vegetation adjacent to Jandakot Road remained uncleared as is normal practice for sand quarries in the Perth Metropolitan Region. Plate 3 shows the revegetation in the previously cleared area establishing in 2011. The photo also shows small pockets of remnant native vegetation that are described later in the report.

Plate 1: 1981 – The site is fully vegetated

Plate 2: 1985 – The site has been cleared in the northern half

Plate 3: 2011 – The previously cleared eastern area has been replanted.



2.1.2 Surrounding Land Use

To the north of the site is Bush Forever Site 388 which abuts Jandakot Airport and to the east are existing 'Rural' lots. The current Urban Stone operations are located within the western part of the proposed rezoning area. On the western boundary is the unconstructed Launders Street which has a Clearing Permit approval (CPS 4399/1) for the road reserve. To the south is Jandakot Road.

2.2 Topography

The site is flat to gently sloping with a few steeper areas of batter slopes between the area previously mined and the unmined areas. The western side of the site is approximately 8m higher than the low point in the centre of the site (Appendix 1). The elevation of the site varies between approximately 40-28m Australian Height Datum (AHD). Most of the site has been disturbed and there are some small piles of sand present.

2.3 Geomorphology and Soils

The geology of the area is described as basement rocks of the Leeuwin Complex which are granitic with an overlying weathering profile overlain by coastal limestone (DoW, 2012a). The soils on the site are part of the Bassendean Dune System and are very sandy, leached, infertile and mildly acidic.

The soils on the site has been described by the Department of Agriculture and Food Western Australia (DAFWA) as:

- Bassendean B1 Phase (212Bs_B1) which are described as deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2m. These soils occur on extremely low to very low relief dunes, undulating sandplain and discrete sand rises; and
- Bassendean B2 Phase (212Bs_B2) which are located on flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2m (DAFWA, 2016).

2.4 Hydrology

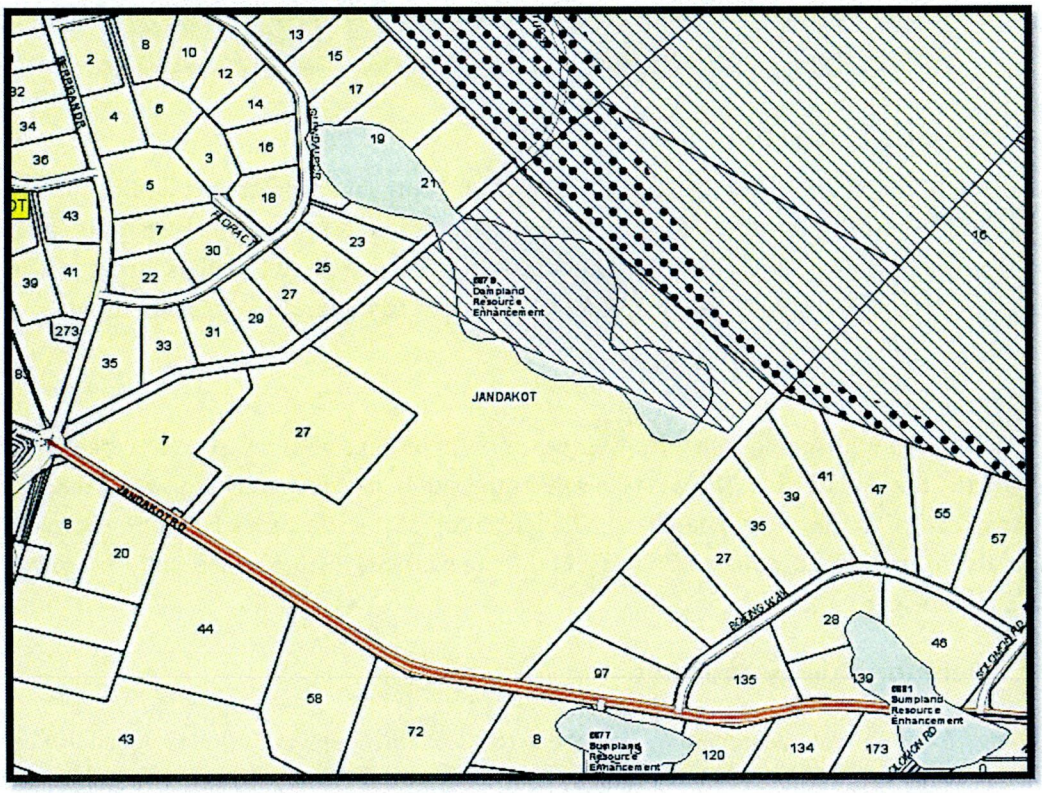
2.4.1 Groundwater

The Perth Groundwater Atlas shows the top of the groundwater table at 23 to 24mAHD which is approximately 3m to 11m below the ground surface. Groundwater is generally flowing to the west (DoW, 2012b).

2.4.2 Surface Water and Wetlands

There is a small portion of Resource Enhancement Wetland mapped on the site with the remainder in Bush Forever Site 388 on the northern boundary. There are no other wetlands on the site as mapped in the Geomorphic Wetlands of the Swan Coastal Plain Database (Landgate, 2016) (Plate 4).

Plate 4: Wetland Mapping on the site



A site inspection by PGV Environmental on 1 June 2016 showed the areas of wetland mapped within the site are part of the area mined as a sand quarry and do not have the wetland species or soil typical of wetlands. Therefore, it is PGV Environmental's assessment that the wetland boundary has not been accurately mapped on the site. The wetland does not appear to extend beyond the boundary of Bush Forever site 388. Accurate determination of the wetland boundary will be required as part of the rezoning process.

2.5 Flora

2.5.1 Flora Desktop Studies

A search of the DPaW Threatened Flora Database, the WA Herbarium database and the Declared Rare and Priority Flora Species List identified 3 Threatened and 18 Priority plant species that have been located in the vicinity of the site (Table 1 and Appendix 2). The three Threatened species under the *Wildlife Conservation Act 1950* are also listed as Endangered under the EPBC Act. Three additional Endangered species were identified by the EPBC Act Protected Matters Search Tool (Appendix 3) and the Naturemap database search (Appendix 4).

Table 1: List of Flora Species Identified from Database Searches.

Species	Common Name	Status under Wildlife Cons. Act	Status under EPBC Act
Andersonia gracilis	Slender Andersonia	Threatened	Endangered
Caladenia huegelii	Grand Spider Orchid	Threatened	Endangered
Diuris purdiei	Purdie's Donkey Orchid	Threatened	Endangered
Drakaea elastica	Glossy-leaved Hammer Orchid	Threatened	Endangered
Drakaea micrantha	Dwarf Hammer Orchid	Threatened	Endangered
Lepidosperma rostratum		Threatened	Endangered
Thelymitra dedmaniarum	Cinnamon Sun Orchid	Threatened	Endangered
Dampiera triloba		Priority 1	
Acacia lasiocarpa var. bracteolata long peduncle variant (GJ Keighery 5026)	Panjang	Priority 1	
Amanita carneiphylla	Pink-gilled Amanita (fungus)	Priority 2	
Amanita griseibrunnea	(fungus)	Priority 2	
Thelymitra variegata	Queen of Sheba	Priority 3	
Amanita drummondii	Drummond's Grisette	Priority 3	
Amanita fibrillopes		Priority 3	
Amanita wadjukiorum		Priority 3	
Byblis gigantea	Rainbow Plant	Priority 3	
Eryngium pinnatifidum subsp. *palustre*	Blue Devils	Priority 3	
Jacksonia gracillima		Priority 3	
Stylidium paludicola		Priority 3	
Cyathochaeta teretifolia		Priority 3	
Phlebocarya pilosissima subsp. *pilosissima*		Priority 3	
Dodonaea hackettiana	Hackett's Hopbush	Priority 4	
Thysanotus glaucus		Priority 4	
Microtis quadrata		Priority 4	
Ornduffia submersa		Priority 4	
Grevillea thelemanniana subsp. *thelemanniana*	Spider Net Grevillea	Priority 4	

Species	Common Name	Status under Wildlife Cons. Act	Status under EPBC Act
Microtis quadrata	South Coast Mignonette Orchid	Priority 4	
Stylidium longitubum	Jumping Jacks	Priority 4	
Tripterococcus sp. *Brachylobus* (A.S. George 14234) (also listed as *Tripterococcus paniculatus* in Database Searches)		Priority 4	
Verticordia lindleyi subsp. *lindleyi*		Priority 4	

A list of the Conservation codes is in Appendix 5.

The species identified in the database searches have been examined to rate the likelihood of their presence on the site (Table 2).

Table 2: Likelihood of Identified Significant Flora Species occurring on the Site

Species	Preferred Habitat*	Likelihood to occur on the site
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	Highly Unlikely – no wetland habitat on the site
Caladenia huegelii	Sand or clay loam. Does not survive in disturbed areas.	Possible
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps	Highly Unlikely – no wetland habitat on the site
Drakaea elastica	Low-lying situations adjoining winter-wet swamps. Does not survive in disturbed areas	Highly Unlikely – no wetland habitat on the site
Drakaea micrantha	Grey sands over dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps	Highly Unlikely – no suitable soils on the site
Lepidosperma rostratum	Peaty and clay soils	Highly Unlikely – no wetland habitat on the site
Thelymitra dedmaniarum (Thelymitra manginii)	Cinnamon sun orchid is known from only two locations in the Gidgegannup area. It is confined to open wandoo woodland on red-brown sandy loam associated with dolerite and granite outcropping (DEC, 2012).	No
Dampiera triloba	Damp peaty sand	Highly Unlikely – no Dampland habitat on the site
Acacia lasiocarpa var. bracteolata long peduncle variant (GJ Keighery 5026)	Grey or black sand over clay. Swampy areas, winter-wet lowlands.	Highly Unlikely – no wetland habitat on the site
Amanita carneiphylla	Deep rooting in sandy soils with Eucalyptus Banksia and Sheoak	Possible
Amanita griseibrunnea	Sandy soil with Jarrah and pine trees	Unlikely – No pines present

Species	Preferred Habitat*	Likelihood to occur on the site
Thelymitra variegata	Sandy clay, sand, laterite. Does not survive in disturbed areas	No – no lateritic sand present
Amanita drummondii	Solitary to gregarious in leaf litter in association with *Agonis flexuosa*, *A. theiformis*, *Allocasuarina fraseriana*, *Corymbia calophylla*, *Eucalyptus marginata*, *E. patens*, *E. staeri*, *Jacksonia furcellata*, *Kunzea glabrescens*, *Melaleuca* sp., *Podocarpus drouynianus*, *Taxandria parviceps*. (Davidson et al., 2015) growing in sandy soil (Amanitaceae Org, 2015)	Unlikely – Dominant Banksia is not preferred by this species
Amanita fibrillopes	Grey sand on track	Possible
Amanita wadjukiorum	Solitary to gregarious, in sandy soil in degraded native vegetation of *Allocasuarina fraseriana*, *Corymbia calophylla*, *C. citriodora* and *Brachychiton* sp. (Davidson *et al.*, 2013)	Unlikely due to vegetation types
Byblis gigantea	Sandy-peat swamps in seasonally wet areas	Highly Unlikely – no wetland habitat on the site
Eryngium pinnatifidum subsp. *palustre*	Clay, sandy clay. Claypans, seasonally wet flats	Highly Unlikely – no wetland habitat on the site
Jacksonia gracillima	Grey and brown well-drained sand	Unlikely – not recorded during the thorough site walkover
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.	Highly Unlikely – no wetland habitat on the site
Cyathochaeta teretifolia	Grey sand, sandy clay. Swamps, creek edges	Highly Unlikely – no wetland habitat on the site
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand and lateritic gravel	Unlikely – no laterite on the site
Dodonaea hackettiana	Sandy soils with outcrops of limestone.	Unlikely – no outcropping limestone
Thysanotus glaucus	White, grey or yellow sand, sandy gravel	Unlikely -
Microtis quadrata	Black, peaty soil	Highly Unlikely – no wetland habitat on the site
Ornduffia submersa	Pools, lakes, swamps, winter-wet depressions, claypans	No – no suitable habitat on the site
Grevillea thelemanniana subsp. *thelemanniana*	Sand or clay, occupying swamps, heathland	Highly Unlikely – no wetland habitat on the site
Stylidium longitubum	Sandy clay, clay. Seasonal wetlands	Highly Unlikely – no wetland habitat on the site

Species	Preferred Habitat*	Likelihood to occur on the site
Tripterococcus sp. Brachylobus (A.S. George 14234) (also listed as *Tripterococcus paniculatus* in Database Searches)	Grey, black or peaty sand. Winter-wet flats	Highly Unlikely – no wetland habitat on the site
Verticordia lindleyi subsp. *lindleyi*	Grey, black or peaty sand. Winter-wet depressions	Highly Unlikely – no wetland habitat on the site

* sourced from Florabase as well as the DPaW database searches unless otherwise denoted

The Grand Spider Orchid (*Caladenia huegelii*) is the only Threatened or Endangered species considered to potentially occur on the site in the areas of native vegetation remaining on the site outside of the Bush Forever area. There is also a small possibility that the orchid could occur in the vegetated buffer along Jandakot Road. The remainder of the Threatened or Endangered species are not likely to occur due either to the inappropriate soil types, the previous clearing of a large portion of the site or the high density of weeds in the native vegetation buffer.

Two priority species of fungi were considered to possibly be present on the site *Amanita carneiphylla* and *Amanita fibrillopes*.

2.5.2 Preliminary Flora List

A Level 1 Flora and Vegetation survey does not require a full spring flora survey to be conducted, however a site walkover was undertaken by Dr Paul van der Moezel of PGV Environmental on 6 May 2016. Opportunistic recordings were made of the native species observable during the site inspection. The list of species recorded in the native bushland on the site is contained in Appendix 6.

The preliminary flora list recorded in areas of remnant vegetation included 42 native and 3 introduced species. Given the high quality of the vegetation, many additional annual and ephemeral species would be expected to be recorded in spring and early summer.

None of the species recorded in May 2016 is a Threatened (Declared Rare) or Priority listed species. Of the conservation significant species that have been recorded in the vicinity of the site the Threatened orchid species *Caladenia huegelii* could potentially occur due to the presence of Banksia woodland on dry sandy soils in very good condition. The likelihood of the species occurring, however, is considered very low due to the very small size of the remnant vegetation, around 1ha. *Caladenia huegelii* can only be positively identified in the field when it is in flower from mid-September to mid-October.

A spring (mid-September to mid-October) survey will be undertaken in 2016 to identify whether the Grand Spider Orchid, or any other conservation significant plant species occurs on the site.

2.5.3 Threatened or Priority Ecological Communities Database Searches

A search of DPaW's Threatened (TEC) and Priority Ecological Communities (PEC) database was conducted for the site (11-0212EC). There are no known occurrences of any TECs or PECs on the site.

There are occurrences of the following Priority Ecological Communities within 1km of the site. These are:

- The 'Priority 3' ecological community – 'Low lying *Banksia attenuata* woodlands or shrublands (SCP21c)'
- The 'Priority 2' ecological community – 'Wooded wetlands which support colonial waterbird nesting areas'.

Neither of these two ecological communities is expected to occur on the site due to the absence of suitable site conditions.

2.6 Vegetation

2.6.1 Vegetation Types

Revegetated Sand Mine

The types of vegetation in the revegetated sand mine varies across the site, presumably indicating different rehabilitation methods at each stage following sand mining operations.

A central portion of the site, adjacent to the eastern boundary of the Urban Stone laydown area, contains a denser stand of trees than elsewhere on the site. The trees mostly consist of species not local to the Jandakot area such as *Eucalyptus camaldulensis* (River Red Gum) and WA Peppermint (*Agonis flexuosa*) (Plate 5). Other taller species in this area include *Acacia rostellifera, Banksia menziesii* and a few *Eucalyptus gomphocephala* (Tuart).

The native understorey in this area is almost completely lacking and consists of Annual Veldtgrass (*Ehrharta calycina*) and Couch Grass (*Cynodon dactylon*).

Plate 5: *Eucalyptus camaldulensis* planted east of the Urban Stone lay down area.

The remainder of the rehabilitation area contains a broader mix of native shrub and tree species, planted in a random fashion. Common species include *Agonis flexuosa, Eucalyptus camaldulensis, Corymbia calophylla* (Marri) in an area close to the Bush Forever site, *Eucalyptus rudis* (Flooded Gum), *Acacia rostellifera, Eucalyptus decipiens, Callistemon* sp. (Bottlebrush) and *Jacksonia furcellata* (Plate 6).

Plate 6: Replanted vegetation

A number of native understorey species are present throughout this part of the rehabilitated area, presumably self-seeded rather than planted or seeded by hand, including *Leucopogon conostephioides, Leschenaultia floribunda* and *Scholtzia involucrata*. Weed species in these areas are uncommon. The woody weed species Victorian Tea Tree (*Leptospermum laevigatum*) is common on some batter slopes.

Remnant Native Vegetation

Several small areas of remnant native vegetation occur on the site. One area is a triangular-shaped stand and is located to the north west of the existing Urban Stone facilities and adjacent to the unmade Launders Street road reserve. Another area is also adjacent to the unmade Launders Street road reserve to the north east of the Urban Stone facilities.

Another area of native vegetation is located on the southeastern end of the Bush Forever site and forms a narrow strip of vegetation about 0.4ha in size between the Bush Forever site and the property boundary.

Some native vegetation is also likely to occur between the southwestern boundary of the Bush Forever site and the rehabilitated sand quarry. The extent of this is subject to further on-ground verification.

The remnant vegetation is predominantly a *Banksia attenuata/B. menziesii* Low Open Woodland to 5m over an *Allocasuarina humilis/Acacia pulchella* Open Low Heath (Plate 7) on dry sand soils.

Eucalyptus todtiana is common in parts of the vegetation (Plate 8) and Marri (*Corymbia calophylla*) may also occur as a natural stand adjacent to the Bush Forever site.

Other common native understorey species include *Lyginia barbata, Beaufortia elegans, Amphipogon turbinatus* and *Leucopogon conostephioides*.

Plate 7: Remnant Banksia Woodland in the Triangular Stand

Plate 8: Banksia Woodland with *Eucalyptus todtiana*

The vegetated buffer is described as *Banksia attenuata/ B. menziesii* Woodland over *Eremaea pauciflora/ Hibbertia hypericoides/Lyginia barbata* and *Allocasuarina humilis* shrubland (Plate 9).

Plate 9: Buffer vegetation

Based on the species recorded during the site inspection, the areas of native vegetation are most likely representative of FCT 23a "Central *Banksia attenuata – B. menziesii* Woodlands".

2.6.2 Vegetation Condition

The vegetation condition over the site ranged from Completely Degraded in the eastern part of the site that had been previously cleared and planted with exotic species to Good to Degraded for the strip of native buffer vegetation adjacent to Jandakot Road. The other areas of remnant native vegetation are mostly in Very Good to Excellent condition. The definitions of the ratings are outlined in Table 3.

Table 3: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

Condition	Description
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: Government of Western Australia, 2000.

2.6.3 Conservation Significant Vegetation

The areas of native vegetation are likely to be representative of Floristic Community Type 23a which is not a Threatened or Priority Ecological Community. The vegetation does not resemble 'Low lying *Banksia attenuata* woodlands or shrublands (SCP21c)' or 'Wooded wetlands which support colonial waterbird nesting areas' that have been identified within 1km of the site by the DPaW database search.

2.7 Fauna

2.7.1 Fauna Habitats

The site inspection conducted by PGV Environmental on 6 February 2012 identified two fauna habitats on the site, as follows:

- Replanted woodland/shrubland; and
- Banksia woodland.

The replanted woodland/shrubland occurs on the site of the old sand mine. The understorey is sparse (Plate 10).

Plate 10: Replanted woodland/shrubland Habitat

The small areas of remnant native vegetation are described as Banksia woodland and are in Very Good to Excellent condition (Plate 11). The vegetation in the Jandakot Road buffer is Degraded (Plate 12). None of the native trees or tall replanted trees on the site contain hollows.

Plate 11: Banksia Woodland Habitat in Very Good Condition

Plate 12: Banksia Woodland Habitat in Degraded Condition

2.7.2 Habitat Condition

Fauna habitat can be assessed using a number of factors including, the size of the habitat, the level of habitat connectivity, availability of specific resources (e.g. tree hollows) and overall vegetation quality. The habitat was assessed according to the following categories:

High quality fauna habitat *– These areas closely approximate the vegetation mix and quality that would have been in the area prior to any disturbance. The habitat has connectivity with other habitats and is likely to contain the most natural vertebrate fauna assemblage.*

Very good fauna habitat *- These areas show minimal signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) and generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be minimally affected by disturbance.*

Good fauna habitat *– These areas showed signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be affected by disturbance.*

Disturbed fauna habitat *– These areas showed signs of significant disturbance. Many of the trees, shrubs and undergrowth are cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain weeds or have been damaged by vehicle or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.*

Highly degraded fauna habitat *– These areas often have a significant loss of vegetation, an abundance of weeds, and a large number of vehicle tracks or are completely cleared. Limited or no fauna habitat connectivity. Faunal assemblages in these areas are likely to be significantly different to what might have been in the area pre-disturbance* (Coffey Environments, 2009).

The revegetated sand mine is considered to be Disturbed Fauna habitat while the areas of Banksia woodland in Very good to Excellent condition are considered to be Good Fauna habitat.

2.7.3 Fauna Database Searches

A search of the DPaW Threatened and Priority fauna database (Appendix 7), the EPBC Act Protected Matters Search Tool (Appendix 2) and search results Naturemap (Appendix 3) identified 20 species that have been recorded in the general vicinity of the site (Table 4). Marine fauna that were identified in the desktop searches have been discarded from further consideration.

Table 4: Conservation Significant Fauna Species Possibly Occurring in the Region

Scientific Name	Common Name	Status under Wildlife Cons. Act	Status under EPBC Act
Botaurus poiciloptilus	Australasian bittern	Schedule 2 - EN	Endangered
Calyptorhynchus latirostris	Carnaby's Black Cockatoo	Schedule 2 - EN	Endangered
Myrmecobius fasciatus	Numbat, Walpurti	Schedule 2 - EN	Vulnerable
Rostratula benghalensis australis	Australian Painted Snipe	Schedule 2 - EN	Endangered / Marine/ Migratory
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Schedule 3 - VU	Vulnerable
Dasyurus geoffroii	Chuditch, Western Quoll	Schedule 3 - VU	Vulnerable

Scientific Name	Common Name	Status under Wildlife Cons. Act	Status under EPBC Act
Leipoa ocellata	Mallee Fowl	Schedule 3 - VU	Vulnerable
Setonix brachyurus	Quokka	Schedule 3 - VU	Vulnerable
Merops ornatus	Rainbow Bee-eater	Schedule 5 - IA	Marine/ Migratory
Phascogale calura	Red-tailed Phascogale, Kenngoor	Schedule 6 - CD	Endangered
Falco peregrinus	Peregrine Falcon	Schedule 7 - OS	Marine/ Migratory
Throscodectes xiphos	Cricket	Priority 1	
Lerista lineata	Perth Slider, Lined Skink	Priority 3	
Neelaps calonotos	Black-striped Snake	Priority 3	
Falsistrellus mackenziei	Western False Pipistrelle	Priority 4	
Isoodon obesulus fusciventer	Southern Brown Bandicoot, Quenda	Priority 4	
Macropus eugenii derbianus	Tammar Wallaby	Priority 4	
Macropus irma	Western Brush Wallaby	Priority 4	
Synemon gratiosa	Graceful Sun-moth	Priority 4	
Thinornis rubricollis (also listed as Charadrius rubricollis)	Hooded Plover	Priority 4	Marine

2.7.4 Likely Occurrence of Significant Species

Outlined below is a short description of each of the species that were identified in the DPaW database searches and Protected Matters Search Tool search in Table 4. The preferred habitat has been compared to the habitats on the site described above and the likelihood of each species to be present on the site (Table 5).

Table 5: Likelihood of Conservation Significant species being present on the site

Scientific Name	Common Name	Habitat	Likelihood to occur on the site
Botaurus poiciloptilus	Australasian bittern	The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands.	Highly Unlikely – No wetland habitat

Scientific Name	Common Name	Habitat	Likelihood to occur on the site
Calyptorhynchus latirostris	Carnaby's Black Cockatoo	Carnaby's Cockatoo is found in the south-west of Australia from Kalbarri through to Ravensthorpe. It has a preference for feeding on the seeds of Banksia, Dryandra, Hakea, Eucalyptus, Grevillea, Pinus and Allocasuarina spp. It is nomadic often moving toward the coast after breeding. It breeds in tree hollows that are 2.5 - 12m above the ground and have an entrance 23-30cm with a depth of 1-2.5m. Nesting mostly occurs in smooth-barked trees (e.g. Salmon Gum, Wandoo, Red Morrell) (SEWPaC, 2012)	Likely
Myrmecobius fasciatus	Numbat, Walpurti	Numbats occur in eucalypt forests and woodlands dominated by *Eucalyptus marginata, Corymbia calophylla* and *Eucalyptus wandoo*.	Highly Unlikely – Habitat not a Eucalypt Woodland
Rostratula benghalensis australis	Australian Painted Snipe	The Australian Painted Snipe has been recorded at wetlands in all states of Australia but is most common in eastern Australia. It generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. It also uses inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include a cover of vegetation, including grasses.	Highly Unlikely – No wetland habitat
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Forest Red-tailed Black Cockatoos frequent the humid to sub-humid south-west of Western Australia from Gingin in the north, to Albany in the south and west to Cape Leeuwin and Bunbury (SEWPaC, 2012). It nests in tree hollows with a depth of 1-5m, that are predominately Marri (Corymbia calophylla), Jarrah (Eucalyptus marginata) and Karri (E. diversicolor) and it feeds primarily on the seeds of Marri.	Possible – limited foraging on the site

Scientific Name	Common Name	Habitat	Likelihood to occur on the site
Dasyurus geoffroii	Chuditch, Western Quoll	The Chuditch have been known to occupy a wide range of habitats including woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. They are opportunistic feeders, and forage on the ground at night, feeding on invertebrates, small mammals, birds and reptiles.	Highly Unlikely due to surrounding disturbance
Leipoa ocellata	Mallee Fowl	Mallee fowl have been found in mallee regions of southern Australia from approximately the 26th parallel of latitude southwards in mallee bushland.	No – No suitable habitat is present on the site
Setonix brachyurus	Quokka	Quokkas were originally very common on the Swan Coastal Plain, however, their distribution is now limited to Rottnest Island and a few isolated areas in the south-west of WA. On the mainland, they prefer densely vegetated areas around wetlands and streams, whereas on Rottnest Island they inhabit low scrubby coastal vegetation where water is not readily available year-round.	No - this species is locally extinct
Merops ornatus	Rainbow Bee-eater	Populations that breed in northern Australia are considered to be resident, and in many northern localities the Rainbow Bee-eater is present throughout the year. The Rainbow Bee-eater nests in a burrow dug in the ground. It is found across the better-watered parts of WA including islands preferring lightly wooded, sandy country near water.	Likely – Intermittent visitor but highly unlikely to rely on the site for survival
Phascogale calura	Red-tailed Phascogale, Kenngoor	The Red-tailed Phascogale is a small, arboreal, carnivorous marsupial. The preferred habitats for this species are Allocasuarina woodlands with hollow-containing eucalypts (e.g. Eucalyptus wandoo) and Gastrolobium spp..	Highly Unlikely due to surrounding disturbance
Falco peregrinus	Peregrine Falcon	The Peregrine Falcon is found in a variety of habitats but nests on high cliff ledges or artificial structures. It feeds primarily on small-medium sized birds, but occasionally taking insects, such as moths, cicadas and locusts (Birdlife Australia, 2012).	Unlikely – This species is flighty and the site too disturbed for the species to occur on the site

Scientific Name	Common Name	Habitat	Likelihood to occur on the site
Throscodectes xiphos	Cricket	This species of cricket was described in the Jandakot region in Melaleuca dominated vegetation (ENV, 2009).	No – no suitable habitat on the site
Lerista lineata	Perth Slider, Lined Skink	The Lined Skink is a burrowing species that occurs in pale sandy soils with coastal heath and shrubland areas in isolated populations in the south-west and mid-west coast of Western Australia. It feeds on termites and other small insects (AROD, 2014).	Unlikely – the habitat on the site is not preferred by this species
Neelaps calonotos	Black-striped Snake	The Black-striped snake has a limited distribution, inhabiting areas with sandy soils that support heathlands and Banksia/Eucalypt Woodlands (Nevill, 2005) on the Swan Coastal Plain generally in the lower west coast from Lancelin to Mandurah (Storr et al, 1999).	Unlikely due to the surrounding disturbance
Falsistrellus mackenziei	Western False Pipistrelle	This species occurs in high rainfall Jarrah, Karri and Tuart forests and coastal woodlands. They roost in hollows of trees, branches and stumps, and are insectivorous, feeding at night between the canopy and understorey of tall forest trees (Environment Australia, 1999).	No – No suitable habitat on the site
Isoodon obesulus fusciventer	Southern Brown Bandicoot, Quenda	Southern Brown Bandicoots are small grey marsupials that prefer dense scrub (up to one metre high). Their diet includes invertebrates (including earthworms, adult beetles and their larvae), underground fungi, subterranean plant material, and very occasionally, small vertebrates (DEC, 2012).	Likely – evidence has been recorded recently in the vicinity of the site
Macropus eugenii derbianus	Tammar Wallaby	The Tammar Wallaby prefers dense, low vegetation for daytime shelter and open grassy areas for feeding. This species inhabits coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland (DEC, 2012).	Unlikely – may occur in the adjacent Bush Forever site
Macropus irma	Western Brush Wallaby	The Western Brush Wallaby is a medium sized marsupial and its optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DEC, 2012).	Unlikely – may occur in the adjacent Bush Forever site

Scientific Name	Common Name	Habitat	Likelihood to occur on the site
Synemon gratiosa	Graceful Sun-moth	The Graceful Sun-moth is a diurnal moth with dull coloured brown to black forewings and brightly coloured orange hind wings. The larvae burrow into the rhizomes of *Lomandra maritima* and *Lomandra hermaphrodita* exclusively and therefore require the presence of one or both of these species to be present in an area (Bishop et al., 2011).	Unlikely – habitat not present on the site
Thinornis rubricollis (also listed as Charadrius rubricollis)	Hooded Plover	The Hooded Plover primarily inhabits sandy, ocean beaches, with the highest densities on beaches with large amounts of beach-washed seaweed that are backed by extensive open dunes. In Western Australia the species also inhabits inland and coastal salt lakes (Birdlife International 2014)	No – not coastal habitat

It is possible that Carnaby's Black-Cockatoo forages on the areas containing *Banksia* trees on the site and possibly the Marri trees. There are no trees with hollows suitable for Carnaby's Black-Cockatoo breeding currently. No native trees occur on the site with a diameter of greater than 500mm that might produce suitable hollows in the near future. There are extensive areas of foraging habitat in the Jandakot area particularly in the nearby Jandakot Airport. Clearing of the remnant vegetation is highly unlikely to cause a significant impact on Carnaby's Black-Cockatoo and is unlikely to trigger the need to refer the action under the EPBC Act.

There are a few Marri trees on the site used by Forest Red-tailed Black Cockatoos for foraging. The number of trees is so small that the species is highly unlikely to be impacted by the proposed change in land use on the site.

The Rainbow Bee-eater can utilise relatively degraded areas as well as natural areas and therefore the species may use the site as habitat. Development of the site would be highly unlikely to cause a significant impact on the species due to the abundance of similar disturbed sandy areas immediately adjacent to the site and extensive areas of natural vegetation on sandy soils in the Jandakot area.

There was potential evidence of bandicoots being present on the site recorded in 2012 with cone like diggings. Development of the site is highly unlikely to cause a significant impact on the Bandicoot due to the large amount of suitable native vegetation remaining in the Jandakot area.

The areas of *Banksia* woodland are suitable habitat for the Black-striped Snake and may be present on the site. Development of the site is highly unlikely to cause a significant impact on the Black-striped Snake due to the large amount of suitable native vegetation remaining in the Jandakot area.

3 ENVIRONMENTAL IMPACT ASSESSMENT

3.1 Previous Land Use

The site has largely been cleared in the past and the activity on the site is not likely to have contaminated the site. The site is not used for public purposes and therefore is not an impediment to the proposed change in land use.

3.2 Topography

The site is undulating and the final contours will be in accordance with the detailed design of the proposed hardstand area and will comply with the Development Application requirements. There are no topographical features on the site that would provide an impediment to the proposed development.

3.3 Geomorphology and Soils

The site has appropriate sand for the uses proposed and the soils on the site are not an impediment to the proposed development.

3.4 Hydrology

Groundwater is not at the surface of the site. Appropriate drainage methods in accordance with Better Urban Water Management (WAPC, 2008) will be required to be incorporated into the design of the hardstand. Details required will be the management of stormwater in swales up to the 1 in 100 Annual Recurrence Interval (ARI) for contaminants and gross pollutants. The design will also have to address the protection of groundwater quality and levels in the surrounding areas.

Although management of the hydrology of the site will be required the risks to the environment can be mitigated through appropriate planning and design therefore, the hydrology of the site is not an impediment to development. The wetland in the nearby Bush Forever site 388 will also need to be considered in the final design of the proposed development. A buffer of 30-50m as measured from the edge of the wetland is likely to be required. PGV Environmental considers that the boundary of the wetland is not accurately mapped on the DPaW geomorphic wetland database and the imposition of any buffer on the currently mapped wetland could adversely impact on the development potential. A wetland assessment has been scheduled to be undertaken to accurately determine the boundary.

3.5 Flora

There were no Declared Rare species recorded on the site however the areas of remnant native Banksia woodland vegetation could possibly contain *Caladenia huegelii.* A Level 2 Flora and Vegetation survey has been scheduled for Spring 2016 and will include a targeted search for this species. No priority species were recorded on the site and are not likely to occur on the site.

3.6 Vegetation

The vegetation in the revegetated area that is the majority of the site is not considered to be environmentally significant. The revegetation is a mixture of endemic and non-endemic species that is considered to be Completely Degraded.

The areas of remnant native vegetation are not considered to be representative of a TEC or PEC. Two of the areas have connectivity with Bush Forever site 388. The areas of vegetation are small compared to the amount of similar vegetation in the adjoining Bush Forever site. Therefore, the vegetation is not considered to be environmentally significant.

The vegetation in the buffer area is Degraded and is not considered to be representative of a TEC or PEC. The vegetation is isolated to approximately 12m to the east and 20m to the south in width and has a high proportion of weeds and therefore is not considered to be environmentally significant. The remainder of the vegetation is fragmented into small areas and likely to be impacted by edge effects upon the construction of Launders Street and the associated required firebreaks.

3.7 Fauna

There are two Schedule 1 species identified on the database searches that are likely to, or have been recorded utilising the site. These are:

- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii* subsp. *naso*)
- Carnaby's Black Cockatoo (short-billed black-cockatoo) (*Calyptorhynchus latirostris)*

These species are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as well as the *Wildlife Protection Act 1950*. The site has limited foraging for Forest Red-tailed Black Cockatoos. The site is in the range of Carnaby's Black Cockatoos however there are no recorded roosting sites within approximately 3km of the site and no recorded breeding sites within 10km (DoP, 2011).

The Rainbow Bee-eater (Schedule 3) were considered to possibly be intermittently present on the site. Quenda, or Southern Brown Bandicoot, a Priority 4 species, were identified in the database search as being possibly intermittently present on the site. These species are quite mobile and are highly unlikely to rely on the site for survival, given the large areas of habitat to the north.

A Level 2 Fauna survey as outlined by *Guidance for Assessment of Environmental Factors: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia, No. 56.* (EPA, 2004b) is not recommended for the site for general fauna assemblages. Two Schedule 1 listed species (Carnaby's Black Cockatoo and Forest Red-tailed Black-Cockatoo) have been determined to be present on the site. The habitat requirements for Carnaby's Black Cockatoo include foraging (*Banksia* species, Parrot Bush and other Proteaceous shrubs), roosting (tall eucalypts and pines) or breeding habitat (Eucalypt trees). There are some Banksia trees in the areas of remnant native vegetation and along the Jandakot Road buffer strip. There are no significant trees on the site which are suitable habitat for Carnaby's Black Cockatoo. If clearing of the vegetation were proposed, the clearing of native vegetation containing foraging habitat under 1ha is not likely to be significant and therefore will not require referral under the EPBC Act.

4 CONCLUSIONS AND SUMMARY

This Environmental Assessment concludes the following with respect to the future development of Lots 101, 103 and 104 Jandakot Road:

- The previous land use is not an impediment to the proposed change in land use;
- The topography of the site is not an impediment to the proposed zoning;
- The soils on the site are not an impediment to the proposed land use;
- Stormwater will need to be managed in accordance with DoW policy and Better Urban Water Management (WAPC, 2008).
- The wetlands in the Bush Forever site 388 that are mapped as extending into the proposed redevelopment area are not mapped accurately and are highly likely to not occur on the redevelopment site. A wetland boundary and buffer study is scheduled to be undertaken in Spring 2016 to determine whether any buffer could impact on the development site;
- The majority of the site has been previously cleared of native vegetation and now consists of replanted Australian native species, generally not locally native to the site;
- The areas of remnant *Banksia* woodland are rated as being in Very Good to Excellent condition. All areas of remnant native vegetation on the site will be assessed during a spring 2016 flora and vegetation survey. Any areas assessed as having conservation significance will be considered in future planning of the site;
- The small amount of remnant *Banksia* woodland (approximately 1.5ha) adjacent to Jandakot Road is rated as being in Degraded condition due to the abundance of weeds;
- One Threatened or Endangered flora species, the Grand Spider Orchid, may occur on the site in the areas of *Banksia* woodland, although it is highly unlikely given the small area of vegetation. A Level 2 flora and vegetation survey will be undertaken in September/October in all areas of remnant vegetation outside of the Bush Forever site and particularly targeting any potential conservation significant species;
- Three Priority flora species and two Priority fungi species may possibly occur on the site due to the right habitat type. However, given the small area of native vegetation the potential for the species to occur on the site is considered very low;
- The remnant *Banksia* woodland areas are considered to be representative of Floristic Community Type 23a which is not listed as a Threatened or Priority Ecological Community. This will be further assessed during the Level 2 flora and vegetation survey to be conducted in 2016;
- The site mostly contains Disturbed fauna habitat in the replanted area small areas of Good fauna habitat in the *Banksia* woodland;
- The site has potential habitat for one Endangered fauna species (Carnaby's Black Cockatoo), one Vulnerable species (Forest Red-tailed Black Cockatoo) one Migratory species (Rainbow Bee-eater) and one Priority species (Southern Brown Bandicoot), however due to the small area of habitat and abundance of better quality habitat in the Jandakot region, it is considered that development would not have a significant impact on any of these species. Referral under the Commonwealth EPBC Act should not be required.

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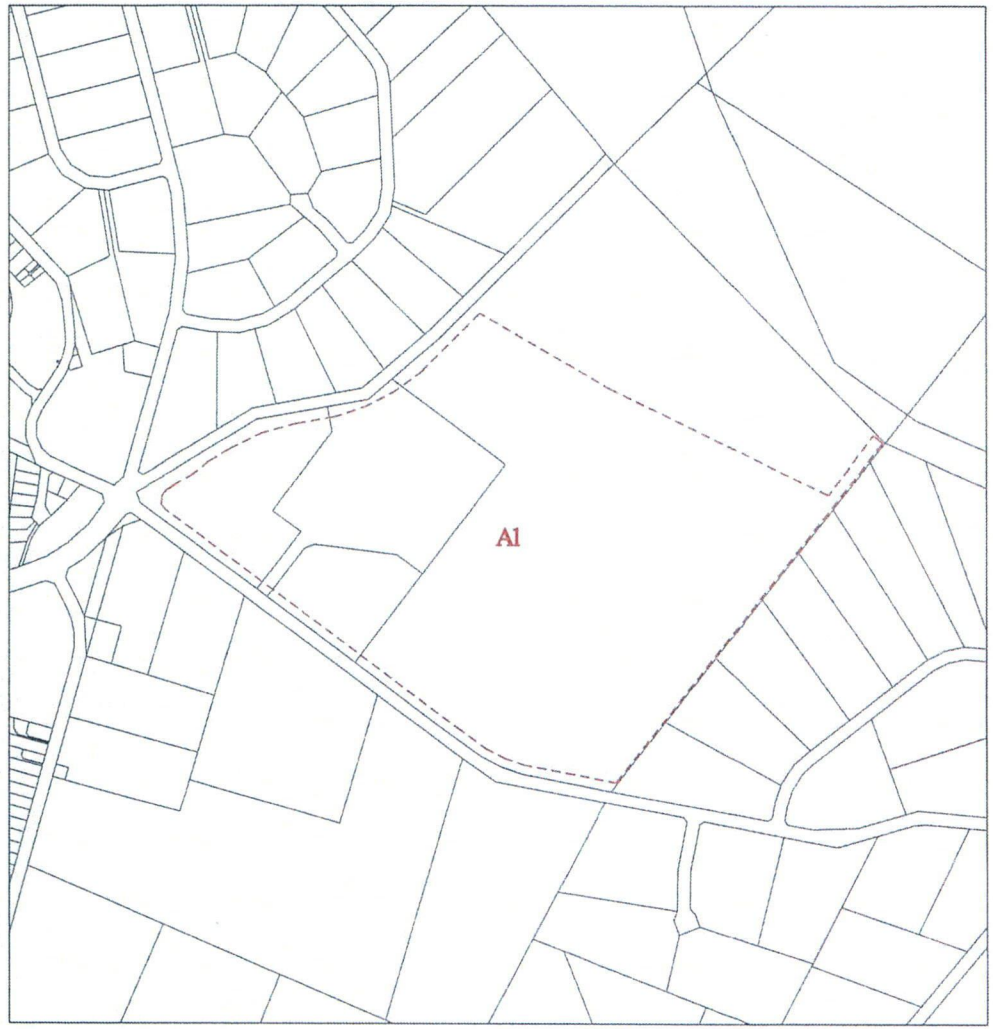
APPENDIX 1

Proposed Rezoning Footprint

EXISTING ZONING MAP



PROPOSED ZONING MAP

Region Scheme Reserves

- CG Commonwealth Government
- SEC Commonwealth Government
- Water Catchments

Local Scheme Reserves

- Parks and Recreation
- Local Road

Local Scheme Zones

- Development
- Residential
- Resource
- Special Use

Other Categories

- R20 R Codes
- A1 Additional Uses
- R1 Restricted Uses
- SU1 Special Use Area
- Building Envelopes
- BVA Bushfire Vulnerability Area
- JA Jandakot Airport
- DCA Development Contribution Area
- No Zone

CITY OF COCKBURN

AMENDMENT No. __

DISTRICT PLANNING SCHEME No. 3

Scale 1:8000

A3

MGA
TOWN PLANNERS
Ph: (08) 9321 3011
Fax: (08) 9324 1961
email: mga@global.net.au

APPENDIX 2

DPaW Flora Database Searches

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DECLARED RARE AND PRIORITY FLORA LIST
16 September 2010

SPECIES / TAXON	CONS CODE	DEC REGION	DISTRIBUTION	FLOWER PERIOD
Acacia lasiocarpa var. bracteolata long peduncle variant (GJ Keighery 5026)	1	SW	North Dandalup, Mundijong, Gosnells, Jandakot, Serpentine, Mundijong	My,Aug
Amanita carneiphylla	2	SW,WB	Murdoch, Dryandra	
Amanita griseibrunnea	2	SW	Murdoch, Kings Park	May
Byblis gigantea	3	SW,MW	Yule Brook, Cannington, Jandakot, Brookton Highway, Cervantes	Sep-Jan
Dodonaea hackettiana	4	SW	Wattleup, Thompson Lake, Kings Park, Jandakot, Bibra Lake-The Spectacles, Gingin, Peron, Baldivis, Beeliar, Baldivis, Harry Waring Marsupial Reserve	Jul-Oct
Eryngium pinnatifidum subsp. palustre ms	3	SW	Serpentine, Kenwick, Upper Swan, Gingin, Forrestdale, Bullsbrook, Mandurah, Arrowsmith, Capel	-
Grevillea thelemanniana subsp. thelemanniana	4	SW	Cannington, Kenwick, Wattle Grove, Forrestdale, Jervoise Bay, Joondalup	Jun-Sep
Jacksonia gracillima	3	SW,SR	Mundijong, Forrestdale, Capel, Elgin, Modong N.R., Forrestfield, Ambergate	Oct-Nov
Lepidosperma rostratum	T	SW	Cannington, Kenwick, Forrestdale Lake NR	Aug
Microtis quadrata	4	SC,WA,SW, WB	Pinjarra, Jandakot, Albany, Lake Barker, Denamrk , Baufort Inlet	Dec-Jan
Ornduffia submersa	4	SR,WA,SC, SW	Gunapin, Boyanup, Lake Muir, Denmark, Forrestdale, Kenwick, Frankland River, Lane Poole	Sep-Oct
Stylidium longitubum	3	SW,WB,SR	Upper Swan, Bullsbrook, Bunbury, Midland, Busselton, Arthur River, Jandakot, Mundijong, Karnup	Nov
Thysanotus glaucus	4	MW,SR,SW, SC,WB	Regans Ford, Forrestdale, Busselton, Lake King, West Mt Barren, Lesueur NPk	Nov-Feb
Tripterococcus paniculatus ms	4	SW,SR	Cannington, Armadale, Leeming, Forrestfield, Upper Swan, Willeton, Forrestdale, Busselton	Nov
Verticordia lindleyi subsp. lindleyi	4	SW,MW	Gillingarra-Forrestdale, Cannington, Guildford, Muchea, Gingin, Murray River, Moore River, Serpentine	Nov-Jan

OID_	SHEET	SPNAME	CONSVCODE	POPID1	POPID2	GDA94LAT	GDA94LONG	VESTING	PURPOSE1	PURPOSE2	STATUS	OWNERDATE
	23556	Amanita carneiphylla	2	1		-32.075	115.83889	PRI	EDE			3/06/1995 0:00
	23557	Amanita griseibrunnea	2	1		-32.075	115.83889	PRI	EDE			3/06/1995 0:00
	21652	Caladenia huegelii	T	3		-32.07628	115.85676	PRI			X	1/01/2004 0:00
	21627	Caladenia huegelii	T	4		-32.07889	115.85833	SHI	OTH		X	22/09/2004 0:00
	25096	Caladenia huegelii	T	6		-32.08261	115.87642	SHI	CON			18/10/2005 0:00
	41414	Caladenia huegelii	T	18		-32.07667	115.90075	SHI				1/09/2009 0:00
	21616	Caladenia huegelii	T	21	A	-32.08184	115.89121	SHI	CON			11/10/2004 0:00
	15598	Caladenia huegelii	T	21	B	-32.07989	115.89093	SHI	RUB			2/10/1998 0:00
	21650	Caladenia huegelii	T	28	A	-32.06611	115.85236	MTR	CPK		X	19/03/2005 0:00
	21651	Caladenia huegelii	T	28	B	-32.06631	115.85108	MTR				28/01/2005 0:00
	23848	Caladenia huegelii	T	41		-32.12758	115.8575	MRD	VER		X	23/10/2006 0:00
	25097	Caladenia huegelii	T	42	A	-32.12703	115.8775	HOW	GVT			14/10/2005 0:00
	21637	Caladenia huegelii	T	42	B	-32.12608	115.87778	PRI				9/10/2004 0:00
	21638	Caladenia huegelii	T	42	C	-32.12458	115.88528	PRI				9/10/2004 0:00
	21639	Caladenia huegelii	T	42	D	-32.12675	115.87694	SHI	VER			9/10/2004 0:00
	21624	Caladenia huegelii	T	56	A	-32.09778	115.88569	COM	AIR			24/09/2004 0:00
	21230	Caladenia huegelii	T	56	B	-32.08636	115.88925	COM	AIR			24/09/2004 0:00
	21847	Caladenia huegelii	T	56	C	-32.08653	115.87594	COM	AIR			29/09/2005 0:00
	21848	Caladenia huegelii	T	56	D	-32.09511	115.87478	COM	AIR			29/09/2005 0:00
	21849	Caladenia huegelii	T	56	E	-32.09047	115.86894	COM	AIR			29/09/2005 0:00
	21850	Caladenia huegelii	T	56	F	-32.08711	115.86797	COM	AIR			29/09/2005 0:00
	21851	Caladenia huegelii	T	56	G	-32.0875	115.87539	COM	AIR			28/09/2005 0:00
	21852	Caladenia huegelii	T	56	H	-32.08264	115.88142	COM	AIR			28/09/2005 0:00
	31753	Caladenia huegelii	T	57		-32.07564	115.87303	SHI	GOL			25/09/2008 0:00
	21112	Caladenia huegelii	T	58		-32.07628	115.85492	SHI	REC			7/10/2004 0:00
	25092	Caladenia huegelii	T	61		-32.14725	115.88689	PRI				5/10/2005 0:00
	6246	Dodonaea hackettiana	4	4	A	-32.13212	115.83065	PRI				15/10/1980 0:00
	6247	Dodonaea hackettiana	4	4	B	-32.13767	115.83065	SHI	VER			15/10/1980 0:00
	6245	Dodonaea hackettiana	4	4	C	-32.14045	115.82926	NON	OTH			15/10/1980 0:00
	6255	Dodonaea hackettiana	4	6		-32.10573	115.82926	PRI				11/11/1981 0:00
	21846	Drakaea elastica	T	29		-32.08628	115.87856	COM	AIR			27/09/2005 0:00
	5218	Tripterococcus paniculatus	4	2		-32.10989	115.91482	UNK				24/11/1980 0:00
	18826	Tripterococcus paniculatus	4	8		-32.08017	115.90037	UNK	UNK			21/03/1999 0:00

OID_	SHEET_NO	SPECIES	CONSCODE	SITE	VEGETATION	LOCALITY	LAT	LONG_	DATE_
	PERTH 00190705	Acacia lasiocarpa var. bracteolata	1	Black sandy swampy area.	Jarrah.	1 mile past bridge, Nicholson	-32.09333	115.82333	26 08 1957
	PERTH 255955	Caladenia huegelii	T	Sand.	Open low woodland, heath;	Leeming, 400 metres S of South	-32.06666	115.85	21 09 1983
	PERTH 256021	Caladenia huegelii	T	In sandy soil.	Jarrah - Banksia woodland.	Bartram Road, Jandakot	-32.11666	115.83333	07 09 1958
	PERTH 256013	Caladenia huegelii	T	In sand.	Open low woodland, heath;	Leeming, Finlay Road, 1.5 km S of	-32.06666	115.85	21 09 1983
	PERTH 04421213	Caladenia huegelii	T	Coastal plain. Grey sand.	Closed Banksia woodland.	300 m E (right) on sand track, 300	-32.12544	115.87926	20 09 1996
	PERTH 04421205	Caladenia huegelii	T	Coastal plain. Grey sand.	Closed Banksia woodland.	300 m E (right) on sand track, 300	-32.12544	115.87926	20 09 1996
	PERTH 06752624	Caladenia huegelii	T	Grey sand.	Low open woodland of	Bush Forever Site 390, Fraser	-32.12619	115.88513	30 10 2003
	PERTH 06534163	Cyathochaeta teretifolia	3			In or adjacent to Emma Treeby	-32.13333	115.86667	10 12 1995
	PERTH 08298815	Dampiera triloba	1	Coastal plain. Damp peaty sand.		North Lake, Pylon track	-32.08274	115.83335	26 10 2010
	PERTH 01157663	Dodonaea hackettiana	4	Grey sand.		Intersection Mason and Forrest	-32.11666	115.83333	20 12 1980
	PERTH 01157566	Dodonaea hackettiana	4			Bibra Lakes	-32.1	115.81667	11 11 1981
	PERTH 01157655	Dodonaea hackettiana	4			Thomson's Lake Reserve,	-32.13333	115.83333	09 1962
	PERTH 01157132	Dodonaea hackettiana	4	Disturbed area, in sandy	Eucalyptus marginata open	20 km S of Perth, 1 km S of Bibra	-32.11666	115.81667	05 12 1978
	PERTH 01157124	Dodonaea hackettiana	4	Disturbed area, in sandy	Eucalyptus marginata open	20 km S of Perth, 1 km S of Bibra	-32.11666	115.81667	05 12 1978
	PERTH 06533345	Jacksonia gracillima	3	Flat ground, grey and brown	Low Forest A, Associated species:	East of Roe Swamp to north of	-32.0848	115.83499	25 10 1994
	PERTH 00282235	Microtis quadrata	4	In black peaty soil.	Under paperbarks.	NW side of Lake Jandakot	-32.11666	115.83306	11 11 1960
	PERTH 1084135	Phlebocarya pilosissima subsp.	3	Sand ridge.	In Banksia woodland.	Prinsep Road, Jandakot	-32.10833	115.85	23 05 1978
	PERTH 03172805	Stylidium longitubum	3			Bartram Road, Jandakot	-32.11666	115.83306	22 11 1973
	PERTH 00279188	Thelymitra variegata	3	In yellow sand.	With Banksia attenuata,	Russel Road, Jandakot	-32.11666	115.83306	16 08 1959
	PERTH 02521296	Tripterococcus paniculatus	4	Winter wet flats, peaty sand over	Hypocalymma angustifolium low	Gazetted Reserve 418 [Reserve	-32.15	115.88333	21 02 1992
	PERTH 05678749	Tripterococcus paniculatus	4	Coastal plain (winter damp). Bare	Low Heath C (Muir, 77).	Remnant bushland between	-32.08017	115.90037	21 03 1999

APPENDIX 3

Protected Matters Search Tool Report

Australian Government
Department of the Environment

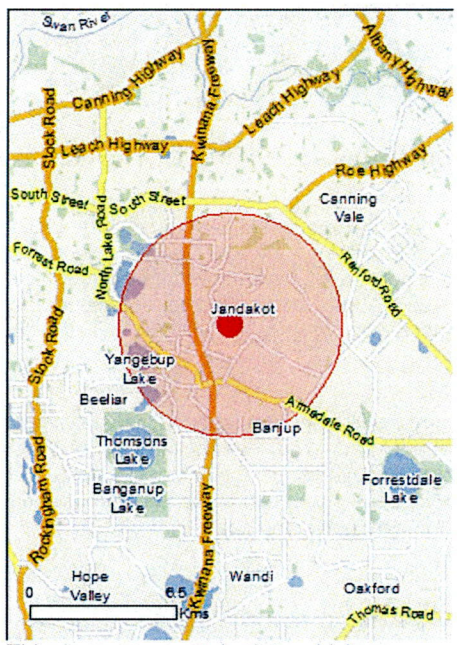
EPBC Act Protected Matters Report

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: 08/06/16 13:04:17



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
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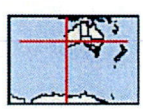

Summary

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:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	18
Listed Migratory Species:	18

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	24
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.

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	40
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Forrestdale and thomsons lakes	Within Ramsar site

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat 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 may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty	Endangered	Species or species

Name	Status	Type of Presence
Spider-orchid [7309]		habitat known to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat known to occur within area
Drakaea elastica Glossy-leafed Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat known to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may 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 Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known 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 -

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 Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Thomsons Lake	WA
Unnamed WA49561	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		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Gibbs Road Swamp System	WA

Caveat

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

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

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

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

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.

Coordinates

-32.10783 115.86699

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:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Parks and Wildlife Commission NT, Northern Territory Government
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian 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
Forestry Corporation, 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 4

Naturemap Report

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Jackalyn Hams on 08/06/2016

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 51' 51" E,32° 06' 30" S
Buffer 5km

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	15466	*Acacia applanata*			
2.	3307	*Acacia divergens*			
3.	3374	*Acacia huegelii*			
4.	14932	*Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)*		P1	
5.	17861	*Acacia longifolia*	Y		
6.	3502	*Acacia pulchella (Prickly Moses)*			
7.	15481	*Acacia pulchella var. glaberrima*			
8.	30032	*Acacia saligna subsp. saligna*			
9.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
10.	3602	*Acacia willdenowiana (Grass Wattle)*			
11.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
12.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
13.	24262	*Acanthiza inornata (Western Thornbill)*			
14.		*Acantholophus hypoleucus*			
15.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
16.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
17.	25536	*Accipiter fasciatus (Brown Goshawk)*			
18.	24282	*Accipiter fasciatus subsp. fasciatus (Brown Goshawk)*			
19.	17774	*Acetosella vulgaris*	Y		
20.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
21.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
22.	24831	*Acrocephalus australis subsp. gouldi (Australian Reed Warbler)*			
23.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
24.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
25.	1791	*Adenanthos obovatus (Basket Flower)*			
26.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
27.		*Agaricus sp.*			
28.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
29.		*Akamptogonus novarae*			
30.		*Albugo sp.*			
31.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
32.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
33.		*Allothereua maculata*			
34.	2652	*Alternanthera nodiflora (Common Joyweed)*			
35.	18195	*Amanita carneiphylla*		P2	
36.	38754	*Amanita conicobulbosa*			
37.	45013	*Amanita drummondii*		P3	
38.	43543	*Amanita fibrillopes*		P3	
39.	18196	*Amanita griseibrunnea*		P2	
40.	38755	*Amanita ochroterrea*			
41.		*Amanita sp.*			
42.	43542	*Amanita wadjukiorum*		P3	
43.		*Amaranthus sp.*			
44.	200	*Amphipogon turbinatus*			
45.		*Aname mainae*			
46.		*Aname tepperi*			
47.	24310	*Anas castanea (Chestnut Teal)*			
48.	24312	*Anas gracilis (Grey Teal)*			
49.	24313	*Anas platyrhynchos (Mallard)*			
50.	24315	*Anas rhynchotis (Australasian Shoveler)*			
51.		*Anas sp.*			
52.	24316	*Anas superciliosa (Pacific Black Duck)*			
53.	25553	*Anhinga melanogaster (Darter)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
54.		*Anhinga novaehollandiae*			
55.	1409	*Anigozanthos humilis (Catspaw)*			
56.	11434	*Anigozanthos humilis subsp. humilis*			
57.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
58.	44629	*Anilios australis*			
59.		*Anser anser*			
60.		*Anser sp.*			
61.	24561	*Anthochaera carunculata (Red Wattlebird)*			
62.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
63.	12724	*Anthotium junciforme*			
64.		*Antichiropus variabilis*			
65.	3686	*Aotus cordifolia*			
66.	3692	*Aotus procumbens*			
67.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
68.	24285	*Aquila audax (Wedge-tailed Eagle)*			
69.		*Araneus cyphoxis*			
70.		*Araneus eburneiventris*			
71.		*Araneus senicaudatus*			
72.		*Archiargiolestes parvulus*			
73.		*Archiargiolestes pusillus*			
74.	38963	*Arcyria affinis*			Y
75.	38964	*Arcyria cinerea*			
76.	38965	*Arcyria denudata*			
77.	38966	*Arcyria ferruginea*			
78.	38967	*Arcyria incarnata*			
79.	38970	*Arcyria obvelata*			
80.	38973	*Arcyria pomiformis*			
81.	38974	*Arcyria stipata*			Y
82.	25556	*Ardea alba (Great Egret)*			
83.	24337	*Ardea garzetta subsp. nigripes (Little Egret)*			
84.	41324	*Ardea modesta (Eastern Great Egret)*		IA	
85.	24340	*Ardea novaehollandiae (White-faced Heron)*			
86.	24341	*Ardea pacifica (White-necked Heron)*			
87.	1264	*Arnocrinum preissii*			
88.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
89.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
90.		*Artoria flavimana*			
91.		*Artoria linnaei*			
92.		*Artoria taeniifera*			
93.	20752	*Asparagus aethiopicus*	Y		
94.	1364	*Asphodelus fistulosus (Onion Weed)*	Y		
95.	20283	*Astartea scoparia*			
96.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
97.	6334	*Astroloma pallidum (Kick Bush)*			
98.	6339	*Astroloma xerophyllum*			
99.		*Austracantha minax*			
100.		*Austroagrion cyane*			
101.		*Austrolestes annulosus*			
102.		*Austropeplea lessoni*			
103.		*Austropsocus occidentalis*			
104.	17234	*Austrostipa compressa*			
105.	17240	*Austrostipa flavescens*			
106.	233	*Avena barbata (Bearded Oat)*	Y		
107.		*Aythya (Nyroca) australis*			
108.	24318	*Aythya australis (Hardhead)*			
109.	17737	*Azolla pinnata*			
110.	42902	*Azolla rubra*			
111.		*Backobourkia heroine*			
112.		*Badhamia affinis*			
113.	38975	*Badhamia capsulifera*			Y
114.	38976	*Badhamia foliicola*			
115.	38977	*Badhamia goniospora*			Y
116.		*Badhamia sp.*			
117.		*Ballarra longipalpus*			
118.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
119.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
120.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
121.	1834	*Banksia menziesii (Firewood Banksia)*			
122.		*Banksiamyces sp.*			
123.		*Barnardius zonarius*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
124.	15037	*Bartsia trixago*	Y		
125.	741	*Baumea articulata (Jointed Rush)*			
126.	743	*Baumea juncea (Bare Twigrush)*			
127.	744	*Baumea laxa*			
128.	745	*Baumea preissii*			
129.	748	*Baumea vaginalis (Sheath Twigrush)*			
130.	5382	*Beaufortia elegans*			
131.	25788	*Billardiera fraseri (Elegant Pronaya)*			
132.		*Biphyllocera kirbyana*			
133.	24319	*Biziura lobata (Musk Duck)*			
134.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
135.	4413	*Boronia crenulata (Aniseed Boronia)*			
136.	16636	*Boronia crenulata subsp. viminea*			
137.	4417	*Boronia dichotoma*			
138.	4420	*Boronia fastigiata (Bushy Boronia)*			
139.	4438	*Boronia ramosa*			
140.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
141.		*Botelloides ludbrookae*			Y
142.	30131	*Brachyloma preissii subsp. lanceolatum*			
143.	30142	*Brachyloma preissii subsp. obtusifolium*			
144.	30136	*Brachyloma preissii subsp. preissii*			
145.	7867	*Brachyscome bellidioides*			
146.	7878	*Brachyscome iberidifolia*			
147.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
148.	244	*Briza maxima (Blowfly Grass)*	Y		
149.	245	*Briza minor (Shivery Grass)*	Y		
150.	249	*Bromus diandrus (Great Brome)*	Y		
151.	12770	*Burchardia congesta*			
152.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
153.	25715	*Cacatua roseicapilla (Galah)*			
154.	25716	*Cacatua sanguinea (Little Corella)*			
155.		*Cacatua sp.*			
156.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
157.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
158.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
159.	1276	*Caesia micrantha (Pale Grass Lily)*			
160.		*Cairina moschata*			
161.	15330	*Caladenia arenicola*			
162.	1586	*Caladenia discoidea (Dancing Orchid)*			
163.	1592	*Caladenia flava (Cowslip Orchid)*			
164.	15348	*Caladenia flava subsp. flava*			
165.	15502	*Caladenia footeana*			
166.	1596	*Caladenia huegelii (Grand Spider Orchid)*		T	
167.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
168.	15361	*Caladenia longicauda subsp. calcigena*			
169.	1604	*Caladenia macrostylis (Leaping Spider Orchid)*			
170.	1605	*Caladenia marginata (White Fairy Orchid)*			
171.	17589	*Caladenia occidentalis*			
172.	15503	*Caladenia paludosa*			
173.		*Caladenia sp.*			
174.	2848	*Calandrinia corrigioloides (Strap Purslane)*			
175.	2856	*Calandrinia liniflora (Parakeelya)*			
176.	19309	*Calectasia narragara*			
177.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
178.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
179.	24786	*Calidris melanotos (Pectoral Sandpiper)*		IA	
180.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
181.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
182.		*Calocera guepinioides*			
183.	38981	*Calomyxa metallica*			Y
184.	5415	*Calothamnus lateralis*			
185.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
186.		*Calvatia sp.*			
187.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
188.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)*		T	
189.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)*		T	
190.		*Calyptorhynchus sp.*			
191.	5439	*Calytrix angulata (Yellow Starflower)*			
192.	5458	*Calytrix flavescens (Summer Starflower)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
194.		*Calytrix sp.*			
195.	38767	*Campanella gregaria*			
196.		*Campanella sp.*			
197.	32338	*Campylopus introflexus*	Y		
198.		*Carassius auratus*			
199.	18555	*Cardamine sp. Jandakot (P. Luff s.n. 4/7/1969)*	Y		
200.	2794	*Carpobrotus aequilaterus (Angular Pigface)*	Y		
201.	2795	*Carpobrotus edulis (Hottentot Fig)*	Y		
202.	1162	*Cartonema philydroides*			
203.		*Castiarina crenata*			
204.		*Castiarina darkinensis*			Y
205.		*Castiarina rufipennis*			
206.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
207.		*Catasarcus bilineatus*			
208.		*Catasarcus intermedius*			
209.		*Catasarcus spinipennis*			
210.	6214	*Centella asiatica*			
211.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
212.	1125	*Centrolepis drummondiana*			
213.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
214.	38982	*Ceratiomyxa fruticulosa*			
215.	17685	*Chaetanthus aristatus*			
216.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
217.	18156	*Chamaecytisus palmensis (Tagasaste)*	Y		
218.	1280	*Chamaescilla corymbosa (Blue Squill)*			
219.	25574	*Charadrius dubius (Little Ringed Plover)*		IA	
220.	24373	*Charadrius melanops (Black-fronted Dotterel)*			
221.	24376	*Charadrius rubricollis (Hooded Plover)*		P4	
222.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
223.	43380	*Chelodina colliei (Oblong Turtle)*			
224.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
225.	2483	*Chenopodium album (Fat Hen)*	Y		
226.	2491	*Chenopodium macrospermum*	Y		
227.		*Cheramoeca leucosterna*			
228.		*Chiloscyphus semiteres var. semiteres*			
229.	7925	*Chondrilla juncea (Skeleton Weed)*	Y		
230.	17706	*Chordifex sinuosus*			
231.	8971	*Chorizema cordatum*			
232.	24980	*Christinus marmoratus (Marbled Gecko)*			
233.		*Chroicocephalus novaehollandiae*			
234.	25601	*Chrysococcyx lucidus (Shining Bronze Cuckoo)*			
235.	24288	*Circus approximans (Swamp Harrier)*			
236.	24289	*Circus assimilis (Spotted Harrier)*			
237.	7937	*Cirsium vulgare (Spear Thistle, Scotch Thistle)*	Y		
238.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
239.	38983	*Clastoderma debaryanum*			
240.		*Clitocybe sp.*			
241.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
242.	24399	*Columba livia (Domestic Pigeon)*	Y		
243.	38986	*Comatricha elegans*			
244.	38988	*Comatricha laxa*			
245.	38990	*Comatricha nigra*			
246.	38991	*Comatricha pulchella*			
247.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
248.	1858	*Conospermum amoenum (Blue Smokebush)*			
249.	6348	*Conostephium pendulum (Pearl Flower)*			
250.	6349	*Conostephium preissii*			
251.	1418	*Conostylis aculeata (Prickly Conostylis)*			
252.	11826	*Conostylis aculeata subsp. aculeata*			
253.	1427	*Conostylis candicans (Grey Cottonhead)*			
254.	11438	*Conostylis candicans subsp. candicans*			
255.	1436	*Conostylis juncea*			
256.	1453	*Conostylis serrulata*			
257.	1455	*Conostylis setosa (White Cottonhead)*			
258.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
259.	20074	*Conyza sumatrensis*	Y		
260.		*Coptotermes michaelseni*			
261.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
262.	24363	*Coracina novaehollandiae subsp. subpallida (Black-faced Cuckoo-shrike)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
263.		*Cormocephalus aurantiipes*			
264.		*Cormocephalus novaehollandiae*			
265.		*Cormocephalus rubriceps*			
266.		*Cortinarius sp.*			
267.	24416	*Corvus bennetti (Little Crow)*			
268.	25592	*Corvus coronoides (Australian Raven)*			
269.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
270.		*Corvus sp.*			
271.	17104	*Corymbia calophylla (Marri)*			
272.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
273.		*Coxiella (Coxiella) striatula*			
274.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
275.	25595	*Cracticus tibicen (Australian Magpie)*			
276.	24422	*Cracticus tibicen subsp. dorsalis (White-backed Magpie)*			
277.	25596	*Cracticus torquatus (Grey Butcherbird)*			
278.	3137	*Crassula colorata (Dense Stonecrop)*			
279.	3139	*Crassula exserta*			
280.	3140	*Crassula glomerata*	Y		
281.	38997	*Craterium leucocephalum*			
282.	38998	*Craterium minutum*			
283.	38780	*Crepidotus eucalyptorum*			
284.	39001	*Cribraria cancellata*			
285.	39002	*Cribraria microcarpa*			
286.	39003	*Cribraria minutissima*			
287.	39006	*Cribraria tenella*			
288.	25398	*Crinia georgiana (Quacking Frog)*			
289.	25399	*Crinia glauerti (Clicking Frog)*			
290.	25400	*Crinia insignifera (Squelching Froglet)*			
291.	13527	*Croninia kingiana*			
292.	30893	*Cryptoblepharus buchananii*			
293.	25020	*Cryptoblepharus plagiocephalus*			
294.		*Cryptoerithus quobba*			
295.	1627	*Cryptostylis ovata (Slipper Orchid)*			
296.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
297.	25027	*Ctenotus australis*			
298.	25039	*Ctenotus fallens*			
299.	25040	*Ctenotus gemmula (Jewelled South-west Ctenotus (Swan Coastal Plain pop P3), skink)*			
300.	25047	*Ctenotus impar*			
301.		*Cubicorhynchus crenicollis*			
302.	6663	*Cuscuta epithymum (Lesser Dodder, Greater Dodder)*	Y		
303.	16245	*Cyathochaeta teretifolia*		P3	
304.	40660	*Cycnogeton huegelii*			
305.		*Cygnus (Chenopis) atratus*			
306.	24322	*Cygnus atratus (Black Swan)*			
307.	283	*Cynodon dactylon (Couch)*	Y		
308.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
309.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
310.		*Cyrtophora parnasia*			
311.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
312.	7454	*Dampiera linearis (Common Dampiera)*			
313.	7462	*Dampiera pedunculata*			
314.	7485	*Dampiera triloba*		P3	
315.		*Daphnella (Hemidaphne) souverbiei*			
316.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
317.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
318.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
319.	18560	*Daviesia divaricata subsp. divaricata*			
320.	3832	*Daviesia physodes*			
321.	3845	*Daviesia triflora*			
322.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
323.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
324.	25296	*Demansia psammophis subsp. reticulata (Yellow-faced Whipsnake)*			
325.		*Dermocybe clelandii*			
326.		*Dermocybe sp.*			
327.		*Descolea maculata*			
328.	16595	*Desmocladus flexuosus*			
329.		*Dexerra angularis*			
330.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
331.	1259	*Dianella revoluta (Blueberry Lily)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
332.	11636	*Dianella revoluta var. divaricata*			
333.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
334.	1287	*Dichopogon capillipes*			
335.	32344	*Dicranoloma diaphanoneuron*			
336.	44064	*Dictydiaethalium plumbeum*			Y
337.	39011	*Diderma asteroides*			
338.	39015	*Diderma hemisphaericum*			Y
339.		*Diderma sp.*			Y
340.	39017	*Didymium anellus*			Y
341.	39023	*Didymium perforatum*			Y
342.	39024	*Didymium serpula*			
343.	39025	*Didymium squamulosum*			
344.	32345	*Didymodon australasiae*			
345.	17838	*Dielsia stenostachya*			
346.		*Dingosa serrata*			
347.	19649	*Disa bracteata*	Y		
348.	11049	*Diuris corymbosa*			
349.	1636	*Diuris pauciflora*			
350.	1637	*Diuris purdiei (Purdie's Donkey Orchid)*		T	
351.	4763	*Dodonaea hackettiana (Hackett's Hopbush)*		P4	
352.	1639	*Drakaea elastica (Glossy-leaved Hammer Orchid)*		T	
353.	11156	*Drakaea livida*			
354.	13635	*Drakaea micrantha*		T	
355.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
356.	13217	*Drosera erythrorhiza subsp. erythrorhiza*			
357.	15453	*Drosera gigantea subsp. gigantea*			
358.	3106	*Drosera macrantha (Bridal Rainbow)*			
359.	3109	*Drosera menziesii (Pink Rainbow)*			
360.	13216	*Drosera menziesii subsp. penicillaris*			
361.	13188	*Drosera paleacea subsp. paleacea*			
362.	3118	*Drosera pallida (Pale Rainbow)*			
363.	29178	*Drosera porrecta*			
364.	3133	*Drosera subhirtella (Sunny Rainbow)*			
365.	3135	*Drosera zonaria (Painted Sundew)*			
366.		*Dysmicoccus macrozamiae*			
367.	33500	*Dysphania ambrosioides (Mexican Tea)*	Y		
368.	11105	*Echinochloa crus-galli*	Y		
369.	39029	*Echinostelium minutum*			
370.		*Ecnomus pansus*			
371.	25100	*Egernia napoleonis*			
372.		*Egretta garzetta*			
373.		*Egretta novaehollandiae*			
374.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
375.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
376.	42241	*Elaeomyxa reticulospora*			Y
377.		*Elanus axillaris*			
378.	25540	*Elanus caeruleus (Black-shouldered Kite)*			
379.	25250	*Elapognathus coronatus (Crowned Snake)*			
380.	5187	*Elatine gratioloides (Waterwort)*			
381.		*Elseyornis melanops*			
382.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
383.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
384.	39030	*Enerthenema papillatum*			
385.		*Entoloma sp.*			
386.		*Eodelena convexa*			
387.		*Eolophus roseicapillus*			
388.	1645	*Epiblema grandiflorum (Babe-in-a-cradle)*			
389.	6133	*Epilobium hirtigerum (Hairy Willow Herb)*			
390.	24567	*Epthianura albifrons (White-fronted Chat)*			
391.	376	*Eragrostis curvula (African Lovegrass)*	Y		
392.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
393.	13962	*Eremaea atala*			
394.	13951	*Eremaea hadra*			
395.	5541	*Eremaea pauciflora*			
396.	14104	*Eremaea pauciflora var. pauciflora*			
397.	5543	*Eremaea violacea (Violet Eremaea)*			
398.	15412	*Eriochilus dilatatus subsp. multiflorus*			
399.	15414	*Eriochilus helonomos*			
400.	15415	*Eriochilus scaber subsp. scaber*			
401.		*Eriophora biapicata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
402.	6219	*Eryngium pinnatifidum (Blue Devils)*			
403.		*Erythracarus decoris*			
404.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
405.	5659	*Eucalyptus gomphocephala (Tuart, Duart)*			
406.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
407.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
408.	5739	*Eucalyptus patens (Swan River Blackbutt, Dwuda)*			
409.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
410.	13511	*Eucalyptus rudis subsp. rudis*			
411.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
412.	3872	*Euchilopsis linearis (Swamp Pea)*			
413.	4627	*Euphorbia helioscopia (Sun Spurge)*	Y		
414.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
415.	3880	*Eutaxia virgata*			
416.	25621	*Falco berigora (Brown Falcon)*			
417.	25622	*Falco cenchroides (Australian Kestrel)*			
418.	25623	*Falco longipennis (Australian Hobby)*			
419.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
420.	24041	*Felis catus (Cat)*	Y		
421.	27748	*Flavoparmelia rutidota*			
422.		*Frankliniella schultzei*			
423.	18392	*Freesia alba x leichtlinii*	Y		
424.	25727	*Fulica atra (Eurasian Coot)*			
425.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			
426.	39033	*Fuligo septica*			
427.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
428.	11571	*Galenia pubescens var. pubescens*	Y		
429.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
430.	24763	*Gallinula tenebrosa subsp. tenebrosa (Dusky Moorhen)*			
431.	24764	*Gallinula ventralis (Black-tailed Native-hen)*			
432.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
433.	20475	*Gastrolobium capitatum*			
434.	20483	*Gastrolobium linearifolium*			
435.	20482	*Gastrolobium nervosum*			
436.	3921	*Gastrolobium reticulatum*			
437.	3924	*Gastrolobium spinosum (Prickly Poison)*			
438.	42314	*Gavicalis virescens (Singing Honeyeater)*			
439.	24959	*Gehyra variegata*			
440.		*Gelochelidon nilotica*			
441.	25530	*Gerygone fusca (Western Gerygone)*			
442.	24271	*Gerygone fusca subsp. fusca (Western Gerygone)*			
443.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
444.	24735	*Glossopsitta porphyrocephala (Purple-crowned Lorikeet)*			
445.		*Glyptophysa (Glyptophysa) georgiana*			
446.	10909	*Gompholobium confertum*			
447.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
448.	6161	*Gonocarpus pithyoides*			
449.		*Goodenia sp.*			
450.	24443	*Grallina cyanoleuca (Magpie-lark)*			
451.	37500	*Grammatotheca bergiana var. bergiana*	Y		
452.		*Gymnopilus allantopus*			
453.	38789	*Gymnopilus junonius*			
454.		*Gymnopilus purpuratus*			
455.		*Gymnopilus sp.*			
456.	1470	*Haemodorum paniculatum (Mardja)*			
457.	1475	*Haemodorum spicatum (Mardja)*			
458.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
459.	2197	*Hakea prostrata (Harsh Hakea)*			
460.	2216	*Hakea varia (Variable-leaved Hakea)*			
461.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*		IA	
462.	24295	*Haliastur sphenurus (Whistling Kite)*			
463.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
464.		*Hebeloma sp.*			
465.	25410	*Heleioporus eyrei (Moaning Frog)*			
466.	29594	*Helichrysum luteoalbum (Jersey Cudweed)*			
467.		*Helicoverpa punctigera*			
468.	6710	*Heliotropium europaeum (Common Heliotrope)*	Y		
469.		*Hellyethira litua*			
470.	16933	*Hemiandra glabra*			
471.	6838	*Hemiandra linearis (Speckled Snakebush)*			

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472.	6839	*Hemiandra pungens (Snakebush)*			
473.		*Hemicordulia tau*			
474.	25119	*Hemiergis quadrilineata*			
475.		*Hemisaga denticulata*			
476.	1293	*Hensmania turbinata*			
477.		*Heterorotula multiformis*			
478.	5112	*Hibbertia aurea*			
479.	5134	*Hibbertia huegelii*			
480.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
481.	45534	*Hibbertia hypericoides subsp. hypericoides*			
482.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
483.	43280	*Hibbertia sericosepala*			
484.		*Hibbertia sp. Bankstown (R.T.Miller & C.P.Gibson s.n. 18/10/06)*			
485.	5173	*Hibbertia subvaginata*			
486.	25734	*Himantopus himantopus (Black-winged Stilt)*			
487.	24775	*Himantopus himantopus subsp. leucocephalus (Black-winged Stilt)*			
488.	24491	*Hirundo neoxena (Welcome Swallow)*			
489.	25629	*Hirundo nigricans (Tree Martin)*			
490.		*Hogna crispipes*			
491.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
492.	6222	*Homalosciadium homalocarpum*			
493.	449	*Hordeum leporinum (Barley Grass)*	Y		
494.	3966	*Hovea pungens (Devil's Pins, Puyenak)*			
495.	3968	*Hovea trisperma (Common Hovea)*			
496.	12859	*Hovea trisperma var. trisperma*			
497.	12741	*Hyalosperma cotula*			
498.	5216	*Hybanthus calycinus (Wild Violet)*			
499.	6240	*Hydrocotyle scutellifera*			
500.	38795	*Hygrocybe conica*			
501.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
502.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
503.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
504.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
505.		*Hypocrea sp.*			
506.	1070	*Hypolaena exsulca*			
507.		*Idiommata blackwalli*			
508.		*Inocybe sp.*			
509.	20200	*Isolepis cernua var. setiformis*			
510.	913	*Isolepis fluitans (Floating Club Rush)*			
511.	917	*Isolepis marginata (Coarse Club-rush)*			
512.	921	*Isolepis producta*			
513.	10831	*Isolepis prolifera (Budding Club-rush)*	Y		
514.	25478	*Isoodon obesulus (Southern Brown Bandicoot)*		P5	
515.	24153	*Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)*		P5	
516.		*Isopeda leishmanni*			
517.	8092	*Ixiolaena viscosa (Sticky Ixiolaena)*			
518.		*Ixobrychus dubius*			
519.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
520.	20462	*Jacksonia gracillima*		P3	
521.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
522.	1178	*Juncus bufonius (Toad Rush)*	Y		
523.	1188	*Juncus pallidus (Pale Rush)*			
524.		*Kangarosa properipes*			
525.	17506	*Kunzea ericifolia subsp. ericifolia*			
526.	15498	*Kunzea glabrescens (Spearwood)*			
527.		*Laccocephalum mylittae*			
528.	13562	*Lachenalia aloides*	Y		
529.	1370	*Lachenalia reflexa*	Y		
530.	20019	*Lachnagrostis filiformis*			
531.	6777	*Lachnostachys albicans*			
532.	38803	*Lachnum virgineum*			
533.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
534.		*Lampona cylindrata*			
535.	25637	*Larus novaehollandiae (Silver Gull)*			
536.	4052	*Latrobea tenella*			
537.		*Latrobiella guttatus*			
538.		*Latrodectus hasseltii*			
539.	1307	*Laxmannia ramosa (Branching Lily)*			
540.	11911	*Laxmannia ramosa subsp. ramosa*			
541.	1309	*Laxmannia squarrosa*			

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542.	7572	*Lechenaultia expansa*			
543.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
544.	33982	*Leioproctus contrarius (bee)*		P3	
545.	1051	*Lemna disperma (Duckweed)*			
546.	39038	*Leocarpus fragilis*			
547.	44490	*Leontodon rhagadioloides*	Y		
548.	8099	*Leontodon saxatilis (Hairy Hawkbit)*	Y		
549.	925	*Lepidosperma angustatum*			
550.	45753	*Lepidosperma oldhamii (Oldham's Sword Sedge)*			
551.	940	*Lepidosperma pubisquameum*			
552.	41649	*Lepidosperma rigidulum*			
553.	944	*Lepidosperma scabrum*			
554.		*Lepidosperma sp.*			
555.	945	*Lepidosperma squamatum*			
556.	1653	*Leporella fimbriata (Hare Orchid)*			
557.	15418	*Leptoceras menziesii*			
558.	2344	*Leptomeria empetriformis*			
559.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
560.	5847	*Leptospermum erubescens (Roadside Teatree)*			
561.	25133	*Lerista elegans*			
562.	25147	*Lerista lineata (Perth Slider, Lined Skink)*		P3	
563.	6374	*Leucopogon conostephioides*			
564.	6425	*Leucopogon oxycedrus*			
565.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
566.	6434	*Leucopogon polymorphus*			
567.	6436	*Leucopogon propinquus*			
568.	6439	*Leucopogon pulchellus (Beard-heath)*			
569.	6440	*Leucopogon racemulosus*			
570.		*Leucopogon sp.*			
571.	19579	*Leucopogon sp. Murdoch (M. Hislop 1037)*			
572.	40803	*Leucopogon squarrosus subsp. squarrosus*			
573.	6451	*Leucopogon tenuis*			
574.	7677	*Levenhookia stipitata (Common Stylewort)*			
575.	25005	*Lialis burtonis*			
576.	39042	*Licea minima*			
577.	39046	*Licea rufocuprea*			Y
578.		*Licea sp.*			
579.	25661	*Lichmera indistincta (Brown Honeyeater)*			
580.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
581.	38808	*Limacella pitereka*			
582.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
583.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
584.	36179	*Liparophyllum violifolium*			
585.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
586.	25388	*Litoria moorei (Motorbike Frog)*			
587.	7408	*Lobelia tenuior (Slender Lobelia)*			
588.	10957	*Lolium perenne x rigidum*	Y		
589.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
590.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
591.	1228	*Lomandra hermaphrodita*			
592.	1234	*Lomandra nigricans*			
593.	1236	*Lomandra odora (Tiered Matrush)*			
594.	1239	*Lomandra preissii*			
595.	25683	*Lonchura castaneothorax (Chestnut-breasted Mannikin)*			
596.		*Longepi woodman*			
597.		*Lophoictinia isura*			
598.	8564	*Lotus subbiflorus*	Y		
599.	4063	*Lotus uliginosus (Greater Lotus)*	Y		
600.	4066	*Lupinus cosentinii*	Y		
601.	39048	*Lycogala epidendrum*			
602.		*Lycosa gilberta*			
603.	1097	*Lyginia barbata*			
604.	18049	*Lyginia imberbis*			
605.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
606.	6456	*Lysinema ciliatum (Curry Flower)*			
607.	6458	*Lysinema elegans*			
608.	34736	*Lysinema pentapetalum*			
609.	2838	*Macarthuria apetala*			
610.	2839	*Macarthuria australis*			
611.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			

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612.	24133	*Macropus irma (Western Brush Wallaby)*		P4	
613.	18119	*Macrozamia fraseri*			
614.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
615.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
616.		*Malurus (Malurus) splendens*			
617.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
618.	25654	*Malurus splendens (Splendid Fairy-wren)*			
619.	24583	*Manorina flavigula (Yellow-throated Miner)*			
620.		*Maratus pavonis*			
621.		*Marchantia berteroana*			
622.	4079	*Medicago polymorpha (Burr Medic)*	Y		
623.	17747	*Meeboldina decipiens*			
624.	17843	*Meeboldina tephrina*			
625.	25758	*Megalurus gramineus (Little Grassbird)*			
626.		*Megalurus sp.*			
627.	34676	*Meionectes brownii (Swamp Raspwort)*			
628.	5917	*Melaleuca hamulosa*			
629.	13273	*Melaleuca incana subsp. incana*			
630.	18394	*Melaleuca parviceps*			
631.	5952	*Melaleuca preissiana (Moonah)*			
632.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
633.	5964	*Melaleuca seriata*			
634.	5978	*Melaleuca teretifolia (Banbar)*			
635.	5980	*Melaleuca thymoides*			
636.	5983	*Melaleuca trichophylla*			
637.	5987	*Melaleuca viminea (Mohan)*			
638.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
639.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
640.	24736	*Melopsittacus undulatus (Budgerigar)*			
641.	25184	*Menetia greyii*			
642.	6884	*Mentha spicata (Spearmint)*	Y		
643.	24598	*Merops ornatus (Rainbow Bee-eater)*		IA	
644.	955	*Mesomelaena pseudostygia*			
645.		*Metaballus frontalis*			
646.		*Metaballus litus*			
647.		*Microcarbo melanoleucos*			
648.	25693	*Microeca fascinans (Jacky Winter)*			
649.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
650.	8814	*Microtis brownii*			
651.	31713	*Microtis cupularis*			
652.	10954	*Microtis media (Tall Mignonette Orchid)*			
653.	12761	*Microtis media subsp. densiflora*			
654.	15419	*Microtis media subsp. media*			
655.	33742	*Microtis quadrata*		P4	
656.		*Microtis sp.*			
657.	8106	*Millotia tenuifolia (Soft Millotia)*			
658.	25542	*Milvus migrans (Black Kite)*			
659.		*Missulena granulosa*			
660.		*Missulena occatoria*			
661.		*Mituliodon tarantulinus*			
662.		*Mitzoruga insularis*			
663.	37440	*Monopsis debilis var. depressa*	Y		
664.	4666	*Monotaxis occidentalis*			
665.	25191	*Morethia lineoocellata*			
666.	25192	*Morethia obscura*			
667.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
668.	24223	*Mus musculus (House Mouse)*	Y		
669.		*Mycena carmeliana*			
670.		*Mycena nargan*			
671.		*Mycena sp.*			
672.	38813	*Mycena subgalericulata*			
673.		*Mycenastrum corium*			
674.	25420	*Myobatrachus gouldii (Turtle Frog)*			
675.	7291	*Myoporum insulare (Blueberry Tree, boobialla)*			
676.	14187	*Myriocephalus occidentalis*			
677.	6199	*Myriophyllum tillaeoides*			
678.		*Myrmecia chasei*			
679.		*Myrmecia infima*			
680.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
681.		*Nebothriomyrmex majeri*			

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682.	25249	*Neelaps calonotos (Black-striped Snake)*		P3	
683.	24738	*Neophema elegans (Elegant Parrot)*			
684.	25747	*Ninox connivens (Barking Owl)*			
685.	25748	*Ninox novaeseelandiae (Boobook Owl)*			
686.	25252	*Notechis scutatus (Tiger Snake)*			
687.		*Notoncus hickmani*			
688.		*Notoperata syncope*			
689.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
690.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
691.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
692.		*Occasitermes occasus*			
693.		*Occiperipatoides sp.*			
694.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
695.		*Oecetis pechana*			
696.	14293	*Oenothera indecora subsp. bonariensis*	Y		
697.	20052	*Oenothera jamesii*	Y		
698.	16347	*Oenothera laciniata*	Y		
699.	6140	*Oenothera mollissima*	Y		
700.	39054	*Oligonema schweinitzii*			
701.		*Onthophagus vermiculatus*			
702.	36177	*Ornduffia albiflora*			
703.		*Orthetrum caledonicum*			
704.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
705.	6005	*Osbornia octodonta (Myrtle Mangrove)*			
706.	17756	*Osteospermum ecklonis*	Y		
707.	168	*Ottelia ovalifolia (Swamp Lily)*			
708.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
709.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
710.	24624	*Pachycephala rufiventris subsp. rufiventris (Rufous Whistler)*			
711.		*Pachysaga australis*			
712.		*Pandion cristatus*			
713.	24299	*Pandion haliaetus subsp. cristatus (Osprey)*			
714.		*Paralamyctes cammooensis*			Y
715.		*Paramphisopus sp.*			
716.	25253	*Parasuta gouldii*			
717.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
718.	25682	*Pardalotus striatus (Striated Pardalote)*			
719.	24628	*Pardalotus striatus subsp. murchisoni (Striated Pardalote)*			
720.	7090	*Parentucellia viscosa (Sticky Bartsia)*	Y		
721.	30458	*Parmotrema reticulatum*			
722.	532	*Paspalum urvillei (Vasey Grass)*	Y		
723.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
724.	30471	*Patersonia occidentalis var. angustifolia*			
725.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
726.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
727.	16477	*Pericalymma ellipticum var. ellipticum*			
728.	16478	*Pericalymma ellipticum var. floridum*			
729.	39057	*Perichaena corticalis*			
730.	39058	*Perichaena depressa*			
731.		*Peripsocus maoricus*			
732.		*Peronospora sp.*			
733.	13911	*Persicaria decipiens*			
734.	2273	*Persoonia saccata (Snottygobble)*			
735.		*Petrochelidon (Hylochelidon) nigricans*			
736.	24659	*Petroica goodenovii (Red-capped Robin)*			
737.	2299	*Petrophile linearis (Pixie Mops)*			
738.	19825	*Petrorhagia dubia*	Y		
739.		*Peziza sp.*			
740.	25697	*Phalacrocorax carbo (Great Cormorant)*			
741.	24665	*Phalacrocorax fuscescens (Black-faced Cormorant)*			
742.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
743.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
744.	25699	*Phalacrocorax varius (Pied Cormorant)*			
745.	24409	*Phaps chalcoptera (Common Bronzewing)*			
746.	25587	*Phaps elegans (Brush Bronzewing)*			
747.		*Phenasteron longiconductor*			
748.	18529	*Philotheca spicata (Pepper and Salt)*			
749.	1478	*Phlebocarya ciliata*			
750.	1479	*Phlebocarya filifolia*			
751.	11557	*Phlebocarya pilosissima subsp. pilosissima*		P3	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
752.	25669	*Phylidonyris nigra (White-cheeked Honeyeater)*			
753.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
754.	4675	*Phyllanthus calycinus (False Boronia)*			
755.	4	*Phylloglossum drummondii (Pigmy Clubmoss)*			
756.	4141	*Phyllota gracilis*			
757.	39061	*Physarum bitectum*			
758.	39062	*Physarum bivalve*			
759.	39063	*Physarum cinereum*			
760.	39064	*Physarum citrinum*			Y
761.	39065	*Physarum compressum*			
762.	39069	*Physarum famintzinii*			Y
763.	39072	*Physarum melleum*			
764.	39074	*Physarum pusillum*			
765.	39076	*Physarum sessile*			
766.		*Physarum sp.*			
767.	39079	*Physarum viride*			
768.		*Phytophthora cinnamomi*			
769.	5243	*Pimelea ferruginea*			
770.	11402	*Pimelea imbricata var. piligera*			
771.	5254	*Pimelea leucantha*			
772.	5261	*Pimelea rosea (Rose Banjine)*			
773.	18117	*Pimelea rosea subsp. rosea*			
774.	12041	*Pimelea suaveolens subsp. suaveolens*			
775.		*Pinkfloydia harveii*			
776.	42281	*Pithocarpa cordata*			
777.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
778.	18353	*Pithocarpa pulchella var. pulchella*			
779.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
780.	24747	*Platycercus spurius (Red-capped Parrot)*			
781.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
782.	24750	*Platycercus zonarius subsp. semitorquatus (Twenty-eight Parrot)*			
783.	6249	*Platysace compressa (Tapeworm Plant)*			
784.	6253	*Platysace filiformis*			
785.	4524	*Platytheca galioides*			
786.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
787.	25509	*Pletholax gracilis (Keeled Legless Lizard)*			
788.	25007	*Pletholax gracilis subsp. gracilis (Keeled Legless Lizard)*			
789.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
790.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
791.	578	*Poa porphyroclados*			
792.	25703	*Podargus strigoides (Tawny Frogmouth)*			
793.	25704	*Podiceps cristatus (Great Crested Grebe)*			
794.	8175	*Podolepis gracilis (Slender Podolepis)*			
795.	8182	*Podotheca angustifolia (Sticky Longheads)*			
796.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
797.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
798.		*Podykipus collinus*			
799.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
800.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
801.		*Pogona sp.*			
802.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
803.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
804.	25722	*Polytelis anthopeplus (Regent Parrot)*			
805.	4691	*Poranthera microphylla (Small Poranthera)*			
806.	44729	*Porostereum crassum*			
807.		*Porphyrio (Porphyrio) porphyrio*			
808.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
809.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			
810.	24769	*Porzana fluminea (Australian Spotted Crake)*			
811.	25732	*Porzana pusilla (Baillon's Crake)*			
812.	24771	*Porzana tabuensis (Spotless Crake)*			
813.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
814.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
815.	1673	*Prasophyllum gibbosum (Humped Leek Orchid)*			
816.	1677	*Prasophyllum macrostachyum (Laughing Leek Orchid)*			
817.	10853	*Prasophyllum plumiforme*			
818.	1681	*Prasophyllum regium (King Leek Orchid)*			
819.		*Prionosternum scutatum*			
820.	25511	*Pseudonaja affinis (Dugite)*			
821.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
822.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
823.	15426	*Pterostylis aspera*			
824.		*Pterostylis sp.*			
825.	1698	*Pterostylis vittata (Banded Greenhood)*			
826.	2718	*Ptilotus drummondii (Narrowleaf Mulla Mulla)*			
827.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
828.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
829.		*Ptycta cornigera*			Y
830.		*Ptycta emarginata*			Y
831.		*Ptycta improcera*			Y
832.	4177	*Pultenaea ochreata*			
833.	4181	*Pultenaea reticulata*			
834.		*Pulvinaria sp.*			
835.		*Purpureicephalus spurius*			
836.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
837.	16367	*Pyrorchis nigricans (Red beaks, Elephants ears)*			
838.	8195	*Quinetia urvillei*			
839.	24243	*Rattus fuscipes (Western Bush Rat)*			
840.	24244	*Rattus norvegicus (Brown Rat)*	Y		
841.	24245	*Rattus rattus (Black Rat)*	Y		
842.		*Rattus sp.*			
843.		*Raveniella cirrata*			
844.		*Raveniella peckorum*			
845.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
846.	6012	*Regelia ciliata*			
847.	6014	*Regelia inops*			
848.	39081	*Reticularia lycoperdon*			
849.	4822	*Rhamnus alaternus (Buckthorn)*	Y		
850.	25613	*Rhipidura fuliginosa (Grey Fantail)*			
851.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
852.	24454	*Rhipidura leucophrys subsp. leucophrys (Willie Wagtail)*			
853.		*Rostratula australis*			
854.	44608	*Rosulabryum billarderii*			
855.	2433	*Rumex crispus (Curled Dock)*	Y		
856.		*Rybaxis sp.*			
857.	40425	*Rytidosperma caespitosum*			
858.	7603	*Scaevola canescens (Grey Scaevola)*			
859.	13182	*Scaevola repens var. repens*			
860.	978	*Schoenus brevisetis*			
861.	979	*Schoenus caespititius*			
862.	982	*Schoenus clandestinus*			
863.	984	*Schoenus curvifolius*			
864.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
865.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
866.		*Scleroderma sp.*			
867.		*Sclerorrhinella crawshawi*			
868.		*Scolopendra laeta*			
869.		*Scutellinia scutellata*			
870.	6	*Selaginella gracillima (Tiny Clubmoss)*			
871.	25878	*Senecio condylus*			
872.	20663	*Senecio multicaulis subsp. multicaulis*			
873.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
874.		*Servaea melaina*			
875.	24145	*Setonix brachyurus (Quokka)*		T	
876.	15972	*Silene gallica var. gallica*	Y		
877.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
878.		*Simaetha tenuior*			
879.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
880.		*Smeringopus natalensis*			
881.	30948	*Smicrornis brevirostris (Weebill)*			
882.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
883.	9259	*Solanum nodiflorum (Glossy Nightshade)*			
884.	7037	*Solanum symonii*			
885.	45036	*Solidago chilensis*	Y		
886.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
887.	1560	*Sparaxis pillansii (Harlequin Flower)*	Y		
888.	4205	*Sphaerolobium linophyllum*			
889.	4211	*Sphaerolobium vimineum (Leafless Globe Pea)*			
890.		*Sphenophorus brunnipennis*			
891.	4828	*Spyridium globulosum (Basket Bush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
892.	9069	*Stackhousia huegelii*			
893.		*Steatoda capensis*			
894.	2918	*Stellaria media (Chickweed)*	Y		
895.	39083	*Stemonitis fusca*			
896.	39088	*Stemonitis virginiensis*			
897.	39090	*Stemonitopsis gracilis*			
898.	24528	*Sterna hybrida subsp. javanica (Whiskered Tern)*			
899.	24329	*Stictonetta naevosa (Freckled Duck)*			
900.	2316	*Stirlingia latifolia (Blueboy)*			
901.	25597	*Strepera versicolor (Grey Currawong)*			
902.	24426	*Strepera versicolor subsp. plumbea (Grey Currawong)*			
903.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
904.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
905.	44492	*Stuckenia pectinata*			
906.	25831	*Stylidium araeophyllum (Stilt Walker)*			
907.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
908.	7756	*Stylidium longitubum (Jumping Jacks)*		P4	
909.	25800	*Stylidium paludicola*		P3	
910.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
911.	7777	*Stylidium preissii (Lizard Triggerplant)*			
912.	7785	*Stylidium repens (Matted Triggerplant)*			
913.	25806	*Stylidium scariosum*			
914.	7798	*Stylidium schoenoides (Cow Kicks)*			
915.		*Succinea (succinea)*			
916.		*Supunna funerea*			
917.		*Supunna picta*			
918.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
919.	15532	*Synaphea spinulosa subsp. spinulosa*			
920.	33992	*Synemon gratiosa (Graceful Sunmoth)*		P4	
921.		*Synemon sp.*			
922.		*Synothele michaelseni*			
923.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
924.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
925.	24185	*Tadarida australis (White-striped Freetail-bat)*			
926.	25552	*Tadorna radjah (Radjah Shelduck)*			
927.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
928.		*Talaurinus carbonarius*			
929.		*Talaurinus sp.*			
930.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
931.	4535	*Tetratheca hirsuta (Black Eyed Susan)*			
932.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
933.	1702	*Thelymitra campanulata (Shirt Orchid)*			
934.	1710	*Thelymitra mucida (Plum Orchid)*			
935.	1716	*Thelymitra tigrina (Tiger Orchid)*			
936.	1717	*Thelymitra variegata (Queen of Sheba)*		P2	
937.	24844	*Threskiornis molucca (Australian White Ibis)*			
938.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
939.	33994	*Throscodectes xiphos (cricket)*		P1	Y
940.	1318	*Thysanotus arbuscula*			
941.	1319	*Thysanotus arenarius*			
942.	1338	*Thysanotus manglesianus (Fringed Lily)*			
943.	1351	*Thysanotus sparteus*			
944.	1357	*Thysanotus thyrsoideus*			
945.	1358	*Thysanotus triandrus*			
946.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
947.	25519	*Tiliqua rugosa*			
948.	25204	*Tiliqua rugosa subsp. aspera*			
949.	25207	*Tiliqua rugosa subsp. rugosa*			
950.		*Tinytrema yarra*			
951.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
952.	24309	*Todiramphus sanctus subsp. sanctus (Sacred Kingfisher)*			
953.		*Tomentella sp.*			
954.	6280	*Trachymene pilosa (Native Parsnip)*			
955.		*Tribonyx ventralis*			
956.	4383	*Tribulus terrestris (Caltrop)*	Y		
957.	39094	*Trichia affinis*			
958.	39095	*Trichia botrytis*			
959.	39096	*Trichia contorta*			
960.	39097	*Trichia decipiens*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
961.	39100	*Trichia persimilis*			
962.		*Trichia sp.*			
963.	39101	*Trichia varia*			
964.	39102	*Trichia verrucosa*			
965.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
966.		*Tricholoma sp.*			
967.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
968.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
969.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
970.	4292	*Trifolium campestre (Hop Clover)*	Y		
971.	4309	*Trifolium scabrum (Rough Clover)*	Y		
972.	150	*Triglochin stowardii*			
973.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
974.	24808	*Tringa nebularia (Common Greenshank)*		IA	
975.	44444	*Tripterococcus sp. Brachylobus (A.S. George 14234)*		P4	
976.	39103	*Tubifera ferruginosa*			
977.	25761	*Turnix varia (Painted Button-quail)*			
978.	98	*Typha domingensis (Bulrush, Djandjid)*			
979.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
980.		*Urabunana sp.*			
981.		*Urodacus novaehollandiae*			
982.	8255	*Ursinia anthemoides (Ursinia)*	Y		
983.	25577	*Vanellus miles (Masked Lapwing)*			
984.	24386	*Vanellus tricolor (Banded Lapwing)*			
985.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
986.		*Venator immansueta*			
987.		*Venatrix pullastra*			
988.	6077	*Verticordia drummondii (Drummond's Featherflower)*			
989.	24206	*Vespadelus regulus (Southern Forest Bat)*			
990.	11474	*Vicia sativa subsp. nigra*	Y		
991.	4325	*Viminaria juncea (Swishbush, Koweda)*			
992.	24040	*Vulpes vulpes (Red Fox)*	Y		
993.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
994.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
995.	7389	*Wahlenbergia preissii*			
996.		*Wahlenbergia sp.*			
997.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
998.	1567	*Watsonia meriana (Bulbil Watsonia)*	Y		
999.	39104	*Willkommlangea reticulata*			
1000.		*Xanthagrion erythroneurum*			
1001.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1002.		*Xanthorrhoea sp.*			
1003.	6289	*Xanthosia huegelii*			
1004.	2331	*Xylomelum occidentale (Woody Pear, Djandin)*			
1005.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX 5

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such.

Categories of specially protected fauna and flora are:

T **Threatened species – Schedules 1-4**

Published as Specially Protected under the *Wildlife Conservation Act 1950,* and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

- ***Threatened fauna*** is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the Wildlife Conservation Act.
- ***Threatened flora*** is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the Wildlife Conservation Act.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species – Schedule 1**

Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

EN **Endangered species – Schedule 2**

Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

VU **Vulnerable species - Schedule 3**

Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

EX **Presumed extinct species - Schedule 4**

Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.

IA **Migratory birds protected under an international agreement - Schedule 5**

Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.

CD **Conservation dependent fauna - Schedule 6**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.

OS **Other specially protected fauna - Schedule 7**

Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

P **Priority species**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

1 **Priority 1: Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

2 **Priority 2: Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

3 **Priority 3: Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

4 **Priority 4: Rare, Near Threatened and other species in need of monitoring**

(a) Rare: Species 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 species are usually represented on conservation lands.

(b) Near Threatened: Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

A list of the current rankings can be downloaded from the Parks and Wildlife Threatened Species and Communities webpage at http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities

Commonwealth of Australia Conservation Codes

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or

b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or

b) the following subparagraphs are satisfied:

i. the species is a species of fish;

ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;

iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;

iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

APPENDIX 6

Native species recorded on the site

Lot 101/102 Jandakot Road – Provisional Flora List (Site inspection 6 May 2016)

Species Recorded in the Triangle of Banksia Woodland to the north of the factory and east of the nursery.

Monocotyledons

Amphipogon turbinatus
**Avena fatua*
Burchardia congesta
Conostylis aculeata
Dasypogon bromeliifolius
Desmocladus flexuosus
**Gladiolus caryophyllaceus*
Laxmannia squarrosa
Lepidosperma pubisquameum
Lomandra preissii
Lomandra ?suaveolens
Lyginia barbata
Patersonia occidentalis
Schoenus curvifolius
Thysanotus triandrus
**Ursinia anthemoides*

Dicotyledons

Acacia pulchella
Acacia stenoptera
Adenanthos cygnorum
Allocasuarina humilis
Banksia attenuata
Banksia menziesii
Beaufortia elegans
Bossiaea eriocarpa
Conostephium pendulum
Dampiera linearis
Eremaea pauciflora
Gompholobium tomentosum
Hemiandra pungens
Hibbertia hypericoides
Hibbertia subvaginata
Hypocalymma robustum
Jacksonia furcellata

Leucopogon conostephioides
Nuytsia floribunda
Petrophile linearis
Pimelea sp.
Scholtzia involucrata
Stirlingia latifolia
Stylidium repens

Additional local native species (not planted) recorded in revegetation areas including northern batter slopes and flat excavated area.

Eucalyptus todtiana
Synaphea spinulosa

APPENDIX 7

DPaW Fauna Database Search

NAME	SOURCE_CODE	SOURCE_ID	NAME_ID	FAMILY	GENUS	SPECIES	INFRARANK	INFRANAME	AUTHOR	VERNACULAR	KINGDOM	CONSERVATION_CODE	CLASS	SITE_NAME	DAY	MONTH	YEAR	LOCALITY_NAME
Botaurus poiciloptilus	TFAUNA	8405	24345	Ardeidae	Botaurus	poiciloptilus			(Wagler)	Australasian Bittern	Animalia	T	BIRD	Lake Jandabup	01	12	1983	JANDABUP
Botaurus poiciloptilus	TFAUNA	8404	24345	Ardeidae	Botaurus	poiciloptilus			(Wagler)	Australasian Bittern	Animalia	T	BIRD	Lake Jandabup	01	07	1982	JANDABUP
Calyptorhynchus baudinii	BIRDATLAS2	708181	24733	Psittacidae	Calyptorhynchus	baudinii			Lear	Baudin's Cockatoo	Animalia	T	BIRD	Jandabup Lake	01	09	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	586877	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	25	03	2001	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	936418	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Jandabup Lake southeast	15	02	2008	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	686725	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Jandabup Lake	11	01	2003	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	604003	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	18	01	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	670733	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Jandabup Lake	14	07	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	624953	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Hawkins Road	05	05	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	604001	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	18	01	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	501066	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	19	05	2001	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	680303	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Hawkins Rd, Jandabup	01	01	2003	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	501059	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	14	04	2001	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	604077	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	02	03	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	501051	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	09	03	2001	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	501074	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	16	06	2001	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	627742	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Jandabup Lake	14	04	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	627746	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Jandabup Lake	19	05	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	608346	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	28	12	2001	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	624950	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Jandabup	14	04	2002	JANDABUP
Calyptorhynchus latirostris	BIRDATLAS2	199660	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	18	01	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	268014	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	01	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	686724	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Gnangara	11	01	2003	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	470175	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	01	2001	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	466649	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	08	2000	GNANGARA
Calyptorhynchus latirostris	TFAUNA	8184	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Gnangara, Alexander Dr (8399, 27278, 27279, 43901) (Site Number 20)	01	09	2003	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	277703	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	04	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	268009	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	12	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	469472	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	12	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	466644	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	07	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	167211	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	04	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	257837	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangarra	30	07	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	469467	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	11	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	317441	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	04	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	469461	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	10	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	164400	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	10	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	199656	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	18	10	1998	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	277694	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	29	02	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	167215	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	09	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	470187	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	05	2001	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	469477	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	01	2001	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	317446	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	05	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	470181	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	04	2001	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	277698	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	31	03	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	268004	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	11	1999	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	466654	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	30	09	2000	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	470168	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Gnangara	28	02	2001	GNANGARA
Calyptorhynchus latirostris	BIRDATLAS2	636345	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Gnangara	03	08	2002	GNANGARA
Calyptorhynchus latirostris	TFAUNA	8187	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Landsdale Park, Landsdale Rd (24794) (Site Number 17)	01	09	2003	DARCH
Calyptorhynchus latirostris	BIRDATLAS2	773305	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Caravan Park	31	07	2004	MADELEY
Calyptorhynchus latirostris	WAMSPECIMENS	A28018	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD		08	02	2001	WANGARA
Calyptorhynchus latirostris	BIRDATLAS2	1027729	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Belgrade Park	15	04	2005	WANNEROO
Calyptorhynchus latirostris	BIRDATLAS2	708187	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Badgerup Lake	01	09	2002	WANNEROO
Calyptorhynchus latirostris	TFAUNA	8205	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Mary St Park, Mary St (44168) (Site Number 80)	01	09	2003	WANNEROO
Calyptorhynchus latirostris	BIRDATLAS2	680299	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Badgerup	21	12	2002	WANNEROO
Calyptorhynchus latirostris	TFAUNA	8204	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Edgar Griffiths Park, Garden Park Dr (36601) (Site Number 76)	01	09	2003	WANNEROO
Calyptorhynchus latirostris	BIRDATLAS2	529117	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Goollelal, Kingsley	26	06	2001	KINGSLEY
Calyptorhynchus latirostris	BIRDATLAS2	914916	24734	Psittacidae	Calyptorhynchus	latirostris			Carnaby	Carnaby's Cockatoo	Animalia	T	BIRD	Lake Goollelal	10	07	2007	KINGSLEY
Synemon gratiosa	FAUNASURVEY	214990	33992	Castniidae	Synemon	gratiosa				Graceful Sunmoth	Animalia	T	INVERT	Site 1	18	03	2011	GNANGARA
Synemon gratiosa	FAUNASURVEY	214989	33992	Castniidae	Synemon	gratiosa				Graceful Sunmoth	Animalia	T	INVERT	Site 1	03	11	2011	GNANGARA
Isoodon obesulus subsp. fusciventer	TFAUNA	1512	24153	Peramelidae	Isoodon	obesulus	subsp	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	Snake Swamp	12	12	1997	LANDSDALE
Isoodon obesulus subsp. fusciventer	TFAUNA	8185	24153	Peramelidae	Isoodon	obesulus	subsp	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	Lake Gnangara, Alexander Dr (8399, 27278, 27279, 43901) (Site Number 20)	01	09	2003	GNANGARA
Isoodon obesulus subsp. fusciventer	TFAUNA	8183	24153	Peramelidae	Isoodon	obesulus	subsp	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	Landsdale Park, Landsdale Rd (24794) (Site Number 17)	01	09	2003	DARCH
Isoodon obesulus subsp. fusciventer	TFAUNA	8206	24153	Peramelidae	Isoodon	obesulus	subsp	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	176 Mary St, Wanneroo (Site Number 82)	01	09	2003	PEARSALL
Isoodon obesulus subsp. fusciventer	TFAUNA	8202	24153	Peramelidae	Isoodon	obesulus	subsp.	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	Little Bagerup Swamp, Badgerup Rd (8162 & 42870) (Site Number 69)	01	09	2003	WANNEROO
Isoodon obesulus subsp. fusciventer	TFAUNA	5730	24153	Peramelidae	Isoodon	obesulus	subsp	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	Badgerup Lake	12	12	1997	WANNEROO
Isoodon obesulus subsp. fusciventer	TFAUNA	8203	24153	Peramelidae	Isoodon	obesulus	subsp	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	Lake Joondalup, Ocean Reef Rd (Site Number 72)	01	09	2003	WANNEROO
Isoodon obesulus subsp. fusciventer	TFAUNA	8207	24153	Peramelidae	Isoodon	obesulus	subsp.	fusciventer	(Gray)	Southern Brown Bandicoot	Animalia	S	MAMMAL	212 Mary St, Wanneroo (Site Number 82)	01	09	2003	WANNEROO
Falcunculus frontatus subsp. leucogaster	TFAUNA	3870	24616	Pachycephalidae	Falcunculus	frontatus	subsp.	leucogaster	Gould		Animalia	4	BIRD	Wanneroo area	01	05	1943	SINAGRA
Hydromys chrysogaster	WAMSPECIMENS	M56790	24215	Muridae	Hydromys	chrysogaster			Geoffroy	Water rat	Animalia	4	MAMMAL	LAKE GOOLLELAL	20	05	2004	KINGSLEY
Hydromys chrysogaster	FAUNASURVEY	73642	24215	Muridae	Hydromys	chrysogaster			Geoffroy	Water rat	Animalia	4	MAMMAL	Lake Goollelal	06	07	2009	KINGSLEY
Ixobrychus minutus	TFAUNA	3270	25563	Ardeidae	Ixobrychus	minutus			(Linnaeus)	Little Bittern	Animalia	4	BIRD	Jandabup Lake, Wanneroo	01	01	1986	JANDABUP
Ixobrychus minutus	TFAUNA	6585	25563	Ardeidae	Ixobrychus	minutus			(Linnaeus)	Little Bittern	Animalia	4	BIRD	Jandabup Lake	19	11	1983	JANDABUP
Ixobrychus minutus	TFAUNA	5817	25563	Ardeidae	Ixobrychus	minutus			(Linnaeus)	Little Bittern	Animalia	4	BIRD	James spiers Drive, Wanneroo. Edge of artificial pond.	29	10	2001	WANNEROO
Ixobrychus minutus	TFAUNA	6465	25563	Ardeidae	Ixobrychus	minutus			(Linnaeus)	Little Bittern	Animalia	4	BIRD	James Spiers Drive	21	12	2001	WANNEROO
Neelaps calonotos	WAMSPECIMENS	R88057	25249	Elapidae	Neelaps	calonotos			(A M C. DumOril, Bibron & A. DumOril)	Black-striped Snake	Animalia	3	REPTILE	GNANGARA	02	06	1983	GNANGARA
Neelaps calonotos	TFAUNA	15149	25249	Elapidae	Neelaps	calonotos			(A M C. DumOril, Bibron & A. DumOril)	Black-striped Snake	Animalia	3	REPTILE	Gnangara	07	06	1983	GNANGARA
Tyto novaehollandiae subsp. novaehollandiae	WAMSPECIMENS	A15473	24855	Tytonidae	Tyto	novaehollandiae	subsp	novaehollandiae	(Stephens)		Animalia	3	BIRD		23	03	1978	GNANGARA

PLANNING AND DEVELOPMENT ACT 2005

CITY OF COCKBURN

TOWN PLANNING SCHEME NO. 3

AMENDMENT NO. 112

The City of Cockburn under and by virtue of the powers conferred upon it by the Planning and Development Act 2005, hereby amend the above Town Planning Scheme by:

1. Extending the Additional Use area AU1 covering Lots 701, 702 and portion of Lot 703, Jandakot Road, corner of Pilatus Street, Jandakot to include the whole of Lots 701, 702 and 703 excluding road widenings and Bush Forever Site 388 C.

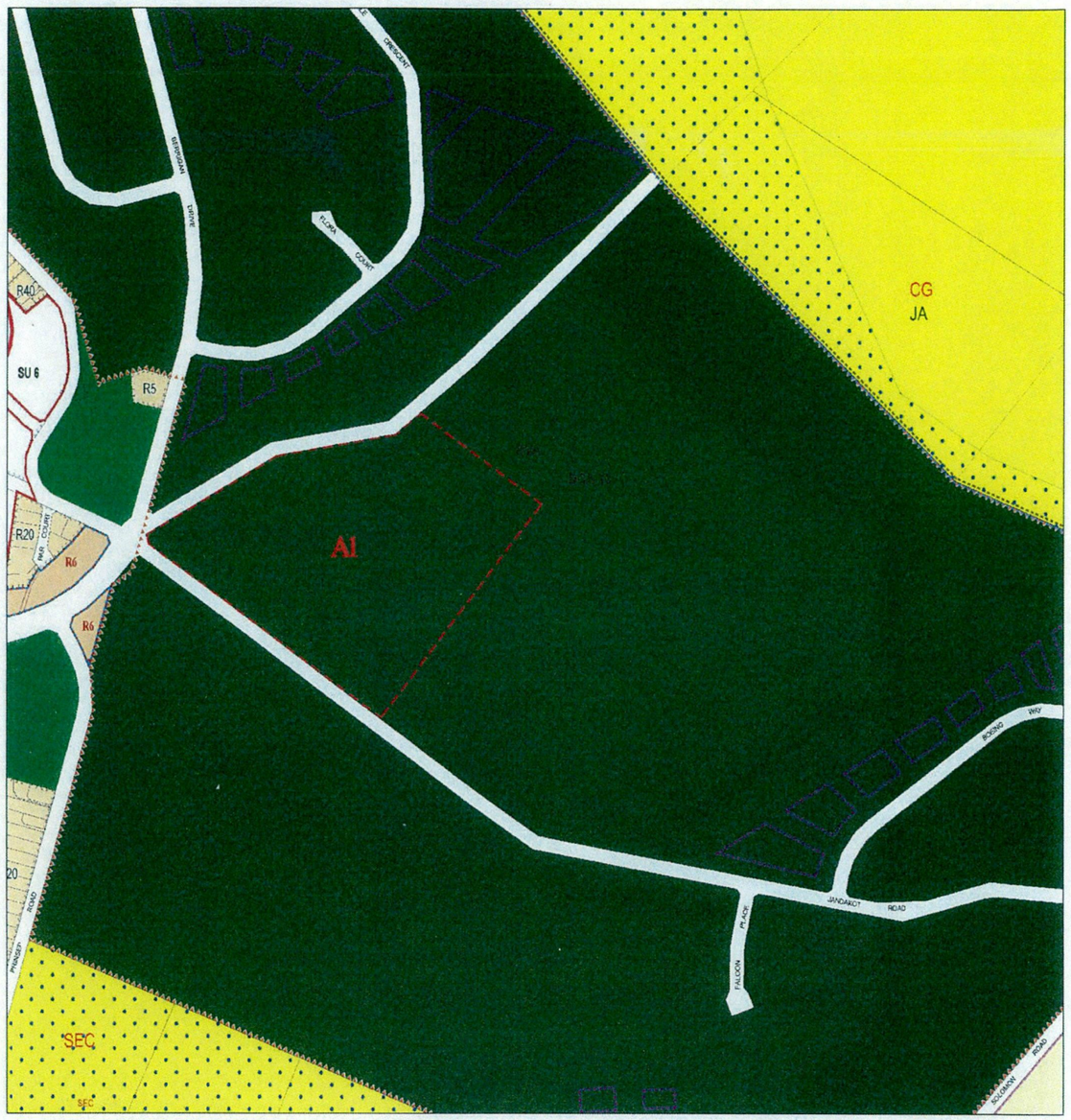
2. Amending the Scheme map accordingly.

3. Amending Table 6 – Additional Uses of the Scheme Text by deleting the provisions relating to Additional Use AU 1 and replacing them with the following:

No.	Description of Land	Additional Use	Conditions
AU 1	Lots 701, 702 and 703 (excluding Bush Forever Area 388 C) Jandakot Road, Jandakot. [Formerly Lots 101, 103 and 104 Jandakot Road, Jandakot]	• Nursery; • Masonry Production; • Warehouse, Showroom and Storage where the display, selling, hiring or storage of goods, equipment, plant or materials and the incidental site activities do not pose risk of pollution to the below ground public drinking water source. The Use Class Definitions for 'Warehouse', 'Showroom' and 'Storage' are defined in Part 6 of the Scheme inclusive of the supplementary restrictions as mentioned	1. All development is to have due regard to a Local Development Plan prepared for the Additional Use No. 1 area. The Local Development Plan is to address the following: a. The standards to be applied for physical development in order to ensure the protection of the below ground public drinking water source; b. Building design, and vehicle access and egress arrangements to minimise the amenity impact to surrounding properties; c. Noise mitigation measures pursuant to the details of an acoustic report where required; d. Interface controls and/ or measures with regard to Bush Forever Area 388, including, but

		above which limit the nature of the permissible goods, equipment, plant or materials to those which do not pose risk of pollution to the below ground public drinking water source.	not limited to; a hard road edge within the AU1 area abutting the Bush Forever area and/or bushland identified for protection; Bushfire mitigation measures being provided outside the Bush Forever area within the AU1 area; an appropriate wetland buffer, if considered relevant by the assessing authority, and; drainage to be contained within the AU1 area; e. Identify revegetation areas to be used as a buffer between adjoining environmental and rural living land uses; and f. Identify land on Lot 703 required for the upgrade of Jandakot Road, which may form part of the Additional Use No. 1 area. 2. No bulk storage of green-waste, compost or Toxic or Hazardous Substances (THS) are permitted above 25 litres in total volume, excluding fuel within vehicle fuel tanks. THS includes pesticides, herbicides, fuel (storage), explosives, flammable liquids, cleaners, alcohol, fertilisers (other than on Lot 702 under current development approvals), medical or veterinary chemicals, pool chemicals and corrosive substances; inclusive of the substances listed in the Poisons Act 1964 (Appendix B). These substances may only be stored in volumes above 25 litres if contained within domestic sized packages ready for end use in domestic situations. 3. Development of any Warehouse, Showroom, or Storage land use must be connected to reticulated sewer. 4. Any application for the development of any Warehouse,

			Showroom or Storage land use is subject to the preparation, implementation and update the following documents to the satisfaction of the Local Government: a. Site Chemical Risk Assessment report; b. Dust Management Plan; and c. Acoustic report. 5. No below ground storage is permitted. 6. As part of any future application for subdivision and/or development, land identified for the upgrade of Jandakot Road is to be ceded free of cost and constructed by the Applicant as follows: a. The amount of land to be ceded from the Additional Use No. 1 area is to form a single carriage way as depicted on an approved Local Development Plan; and b. The Applicant is required to construct the ceded land as one additional carriage way to Jandakot Road. 7. As part of the first application for subdivision and/or development, the Applicant shall cede land within the Bush Forever Site free of cost to the Crown. 8. Notwithstanding any subdivision provisions in the Scheme, the minimum lot size for subdivision is 2 hectares.



EXISTING ZONING MAP

PROPOSED ZONING MAP

Region Scheme Reserves

- CG Commonwealth Government
- SEC Commonwealth Government
- Water Catchments

Local Scheme Reserves

- Parks and Recreation
- Local Road

Local Scheme Zones

- Development
- Residential
- Resource
- Special Use

Other Categories

- R20 R Codes
- A1 Additional Uses
- R1 Restricted Uses
- SU1 Special Use Area
- Building Envelopes
- BVA Bushfire Vulnerability Area
- JA Jandakot Airport
- DCA Development Contribution Area
- No Zone

CITY OF COCKBURN

AMENDMENT No. 112

DISTRICT PLANNING SCHEME No. 3

MGA
TOWN PLANNERS
Ph: (08) 9321 3011
Fax: (08) 9324 1961
email: mga@global.net.au

0 Metres 250

Scale 1:8000

A3

2507 Jandakot\2017\Zoning Nov 2017.dwg
30 November 2017

ADOPTION

Adopted by resolution of the Council of the City of Cockburn at the ordinary meeting of the Council held on the ....8th..... day of ...September..... 2016

.....
MAYOR

.....
CHIEF EXECUTIVE OFFICER

FINAL APPROVAL

Adopted for final approval by resolution of the City of Cockburn at the Meeting of the Council held on the ....8th..... day of ...June..... 2017 and the Common Seal of the City of Cockburn was hereunto affixed by the authority of a resolution of the Council in the presence of:

.....
MAYOR

(Seal)

CITY OF COCKBURN
VIAS • TUTAS • CUPIMUS
COMMON SEAL

.....
CHIEF EXECUTIVE OFFICER

Recommended/Submitted for Final Approval

Lee O'Donohue
.....
DELEGATED UNDER S.16 PLANNING AND DEVELOPMENT ACT 2005

It is hereby certified that this is a true copy of the ~~Scheme~~/Amendment, final approval to which was endorsed by the Minister for Planning on 23/2/18.

Certified by .....

Officer of the Commission Duty authorised pursuant to Section 24 of the Planning and Development Act 2005 and Regulation 32(3) Scheme and Regulation 63(3) (Amendment) of the Planning and Development (Local Planning Scheme) Regulations 2015.

DATE 13-2-18

Final Approval Granted

.....
MINISTER FOR PLANNING

DATE .....