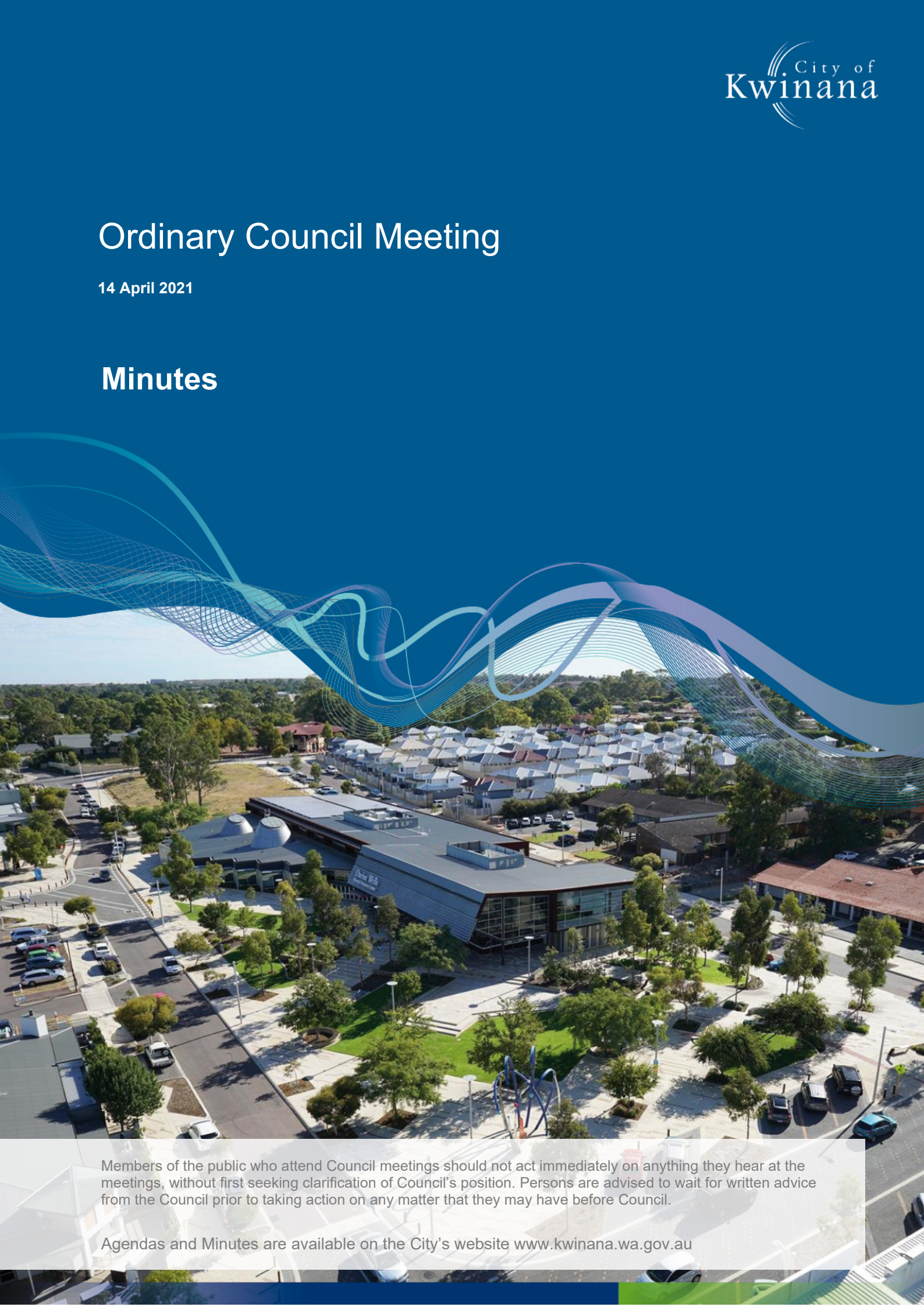


Ordinary Council Meeting

14 April 2021

Minutes

An aerial photograph of the Kwinana City Centre, showing a large modern building with a glass facade and a curved roof, surrounded by greenery, trees, and parking areas. The image is overlaid with a decorative blue and white wave graphic that flows across the top and middle of the page.

Members of the public who attend Council meetings should not act immediately on anything they hear at the meetings, without first seeking clarification of Council's position. Persons are advised to wait for written advice from the Council prior to taking action on any matter that they may have before Council.

Agendas and Minutes are available on the City's website www.kwinana.wa.gov.au

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Present:

MAYOR CAROL ADAMS, OAM
DEPUTY MAYOR PETER FEASEY
CR W COOPER
CR M KEARNEY
CR S LEE
CR M ROWSE
CR D WOOD

MR W JACK - Chief Executive Officer
MRS B POWELL - Director City Engagement
MRS M COOKE - Director City Development and Sustainability
MR D ELKINS - Director City Infrastructure / Acting Director City Business
MS A MCKENZIE - Council Administration Officer

Members of the Press 0
Members of the Public 0

1 Opening and announcement of visitors

Presiding Member declared the meeting open at 5:30pm and welcomed all in attendance.

2 Acknowledgement of country

Presiding Member read the Acknowledgement of country

"It gives me great pleasure to welcome you all here and before commencing the proceedings, I would like to acknowledge that we come together tonight on the traditional land of the Noongar people and we pay our respects to their Elders past and present."

3 Dedication

Councillor Wendy Cooper read the dedication

"May we, the Elected Members of the City of Kwinana, have the wisdom to consider all matters before us with due consideration, integrity and respect for the Council Chamber.

May the decisions made be in good faith and always in the best interest of the greater Kwinana community that we serve."

4 Attendance, apologies, Leave(s) of absence (previously approved)

Apologies

Nil

Leave(s) of Absence (previously approved):

Councillor Sherilyn Wood from 16 March 2021 to 17 April 2021 inclusive.

5 Public Question Time

Nil

6 Receiving of petitions, presentations and deputations:

6.1 Petitions:

Nil

6.2 Presentations:

Nil

6.3 Deputations:

Nil

7 Confirmation of minutes

7.1 Ordinary Meeting of Council held on 24 March 2021:

COUNCIL DECISION

393

MOVED CR S LEE

SECONDED CR D WOOD

That the Minutes of the Ordinary Meeting of Council held on 24 March 2021 be confirmed as a true and correct record of the meeting.

CARRIED
7/0

7.2 Special Council Meeting held on 31 March 2021:

COUNCIL DECISION

394

MOVED CR M ROWSE

SECONDED CR D WOOD

That the Minutes of the Special Council Meeting held on 31 March 2021 be confirmed as a true and correct record of the meeting.

CARRIED
7/0

8 Declarations of Interest (financial, proximity, impartiality – both real and perceived) by Members and City Officers

Mayor Carol Adams declared an impartiality interest in item 17.2, Parking Restrictions / Bus Zone Signs at Abingdon Crescent, Peter Carnley Anglican Community School, Wellard due to her grandson attending Peter Carnley Anglican Community School.

Councillor Matthew Rowse an impartiality interest in item 17.2, Parking Restrictions / Bus Zone Signs at Abingdon Crescent, Peter Carnley Anglican Community School, Wellard due to being President of the PCACS P&F Association, his children attending Peter Carnley Anglican Community School and his wife being a member of the PCACS Board.

Deputy Mayor Peter Feasey declared an impartiality interest in item 17.3, Proposed Amendment No. 162 to Local Planning Scheme No.2: Rezoning a portion of Lots 1, 7 - 11 and 88 Lyon Road, Wandi from 'Special Rural' to 'Residential' and introducing specific development and land use provisions to Schedule VII – Additional Uses due to being close friends with one of the landowners.

9 Requests for leave of absence

COUNCIL DECISION

395

MOVED CR W COOPER

SECONDED CR S LEE

That Councillor Merv Kearney be granted a leave of absence from 24 April 2021 to 29 April 2021 inclusive.

That Councillor Merv Kearney be granted a leave of absence from 1 July 2021 to 18 August 2021 inclusive.

**CARRIED
7/0**

10 Items brought forward for the convenience of those in the public gallery

Nil

11 Any business left over from previous meeting

Nil

12 Recommendations of committees

Nil

13 Enbloc reports

Nil

14 Reports - Community

Nil

15 Reports – Economic

Nil

16 Reports – Natural Environment

Nil

17 Reports – Built Infrastructure

17.1 Parking Restrictions / Drop-Off and Pick-Up Zone Signs at Kwinana Adventure Park, Walgreen Crescent, Calista

DECLARATION OF INTEREST:

There were no declarations of interest declared.

SUMMARY:

The City Operations team in charge of managing the Kwinana Adventure Park are seeking approval from the City of Kwinana to install '1/4 P' (15min parking) and 'Drop-Off and Pick-Up Zone Only' signs at the existing bus bays located along Walgreen Crescent, Calista. This parking prohibition is proposed to control double parking, long term bus parking and to enable more buses to use these bus bays during drop-off / pick-up times. A plan showing the proposed parking prohibition and drop-off / pick-up zone only sign is included as Attachment 'A'.

During the school holidays and summer season there are increased visitation numbers to the Kwinana Adventure Park. This creates an increased demand for bus parking facilities. To address this demand, the City's Engineering Services, in consultation with City Assist Officers and the Kwinana Adventure Park maintenance staff, have determined the need to install '1/4 P' (15min parking) and 'Drop Off and Pick Up Zone Only' signs.

The purpose of this report is for the Elected Members to consider, by way of resolution, regulating the parking of buses by installing '1/4 P' (15min parking) and 'Drop Off and Pick Up Zone Only' signs at the existing bus parking bays at the Kwinana Adventure Park on Walgreen Crescent, Calista.

OFFICER RECOMMENDATION:

That Council, in accordance with clause 1.8 of the City of Kwinana *Parking and Parking Facilities Local Law 2018*, approve implementation of ¼ hour parking limit and drop-off and pick-up zone only restrictions at the bus bays in front of the Kwinana Adventure Park, Walgreen Crescent, as shown at Attachment A.

DISCUSSION:

The City has been receiving numerous complaints regarding double parking, and long term and/or all day bus parking at the Kwinana Adventure Park bus bay facilities, on Walgreen Crescent, Calista.

There is currently no parking prohibition indicating a drop-off / pick-up zone only, and bus drivers are parking buses in the bus bays for long periods when bus parking is in high demand. Parking of buses in these bays for long durations prevents other buses accessing the bus drop-off / pick-up zone, preventing the maintenance of a safe environment for boarding and disembarkation of children.

17.1 PARKING RESTRICTIONS / DROP-OFF AND PICK-UP ZONE SIGNS AT KWINANA ADVENTURE PARK, WALGREEN CRESCENT, CALISTA

The City Operations team in charge of managing the Kwinana Adventure Park facility has requested the installation of drop-off / pick-up zone only signs to prevent bus parking for long durations at the bus embayment, to allow for safe access to other buses at the drop-off and pick-up zone. This will in turn ensure the safety of children and students when they board and disembark the buses.

The introduction of these parking restrictions will regulate the parking of buses at the bus embayment in accordance with the *City's Parking and Parking Facilities Local Law 2018* clause:

5.1 (1) . . . a person shall not park a vehicle in a thoroughfare or part of a thoroughfare . . . (d) by exceeding the length of time specified by a sign.

A desk top assessment of the existing parking facilities in the area has shown that there is an adequate number of parking bays in the area, and implementation of the proposed parking restrictions will not have a noticeable impact on existing parking capacity.

LEGAL/POLICY IMPLICATIONS:

The proposed parking restriction signs design, manufacturing and implementation will be in accordance with the *Road Traffic Code 2000* (Code), Australian Standard 1742.11 – Parking Controls, and the *City's Parking and Parking Facilities Local Law 2018*. The relevant section of the *City's Parking and Parking Facilities Local Law 2018*, is provided within the Discussion above.

FINANCIAL/BUDGET IMPLICATIONS:

The approximate cost of supply and installation of the '1/4 P' (15min parking) and 'Drop-Off and Pick-Up Zone Only' signs will be approximately \$700 which will be sourced from the approved 2020-21 operating budget.

The City of Kwinana will install and retain the responsibility for the maintenance and enforcement of these signs going forward.

ASSET MANAGEMENT IMPLICATIONS:

The '1/4 P' (15min parking) and 'Drop-Off and Pick-Up Zone Only' signs will be owned and maintained by the City of Kwinana. The whole of life cost of the signs will be negligible.

ENVIRONMENTAL IMPLICATIONS:

There are no environmental implications that have been identified as a result of this report or the recommendations.

17.1 PARKING RESTRICTIONS / DROP-OFF AND PICK-UP ZONE SIGNS AT KWINANA ADVENTURE PARK, WALGREEN CRESCENT, CALISTA

STRATEGIC/SOCIAL IMPLICATIONS:

This proposal will support the achievement of the following outcome and objective detailed in the Strategic Community Plan.

Plan	Outcome	Objective
Strategic Community Plan 2019 - 2029	A connected transport network	4.6 Provide a safe and efficient integrated network of roads, footpaths and cycle routes supported by a good public transport system

The recommendations in this report will ultimately increase the amenity and safety of the areas adjacent and fronting the school for residents, users of the PTA bus services and road users.

COMMUNITY ENGAGEMENT:

Consultation has been limited to the Kwinana Adventure Park facility as '1/4 P' (15min parking) and 'Drop-Off and Pick-Up Zone Only' signs are in front of the Kwinana Adventure Park, Walgreen Crescent, Calista.

PUBLIC HEALTH IMPLICATIONS:

There are no implications on any determinants of health as a result of this report.

RISK IMPLICATIONS:

The risk implications in relation to this proposal are as follows:

Risk Event	Non-compliance with the new parking regime, resulting in road safety and traffic issues.
Risk Theme	Failure to fulfil statutory regulations or compliance requirements
Risk Effect/Impact	Reputation
Risk Assessment Context	Operational
Consequence	Minor
Likelihood	Possible
Rating (before treatment)	Low
Risk Treatment in place	Reduce (mitigate the risk)
Response to risk treatment required/in place	Enforcement action, if problems emerge
Rating (after treatment)	Low

17.1 PARKING RESTRICTIONS / DROP-OFF AND PICK-UP ZONE SIGNS AT KWINANA ADVENTURE PARK, WALGREEN CRESCENT, CALISTA

COUNCIL DECISION

396

MOVED CR W COOPER

SECONDED CR M KEARNEY

That Council, in accordance with clause 1.8 of the City of Kwinana *Parking and Parking Facilities Local Law 2018*, approve implementation of ¼ hour parking limit and drop-off and pick-up zone only restrictions at the bus bays in front of the Kwinana Adventure Park, Walgreen Crescent, as shown at Attachment A.

CARRIED

7/0

LEGEND

EXISTING

PROPOSED

SINGLE POST SIGN



NOTES:

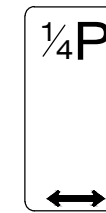
- 1. CADASTRAL INFORMATION APPROXIMATE ONLY.
- 2. ALL DIMENSIONS ARE IN METER UNLESS NOTED OTHERWISE

QUANTITIES

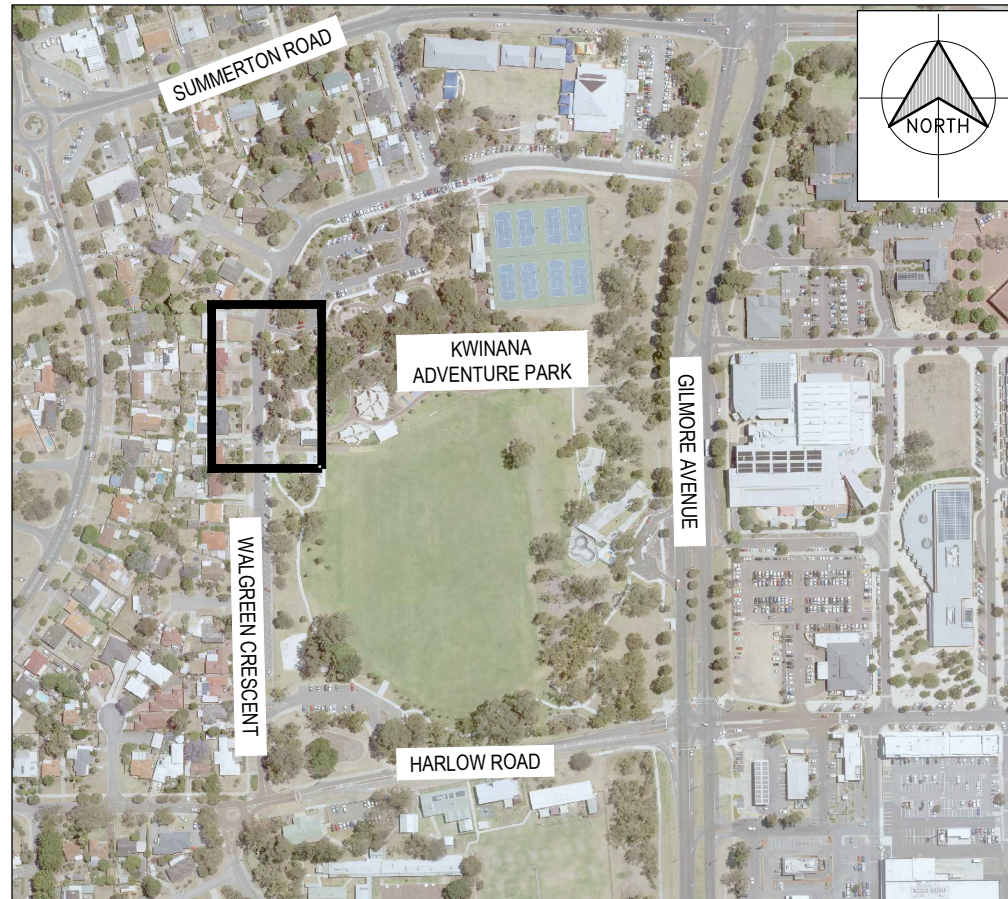
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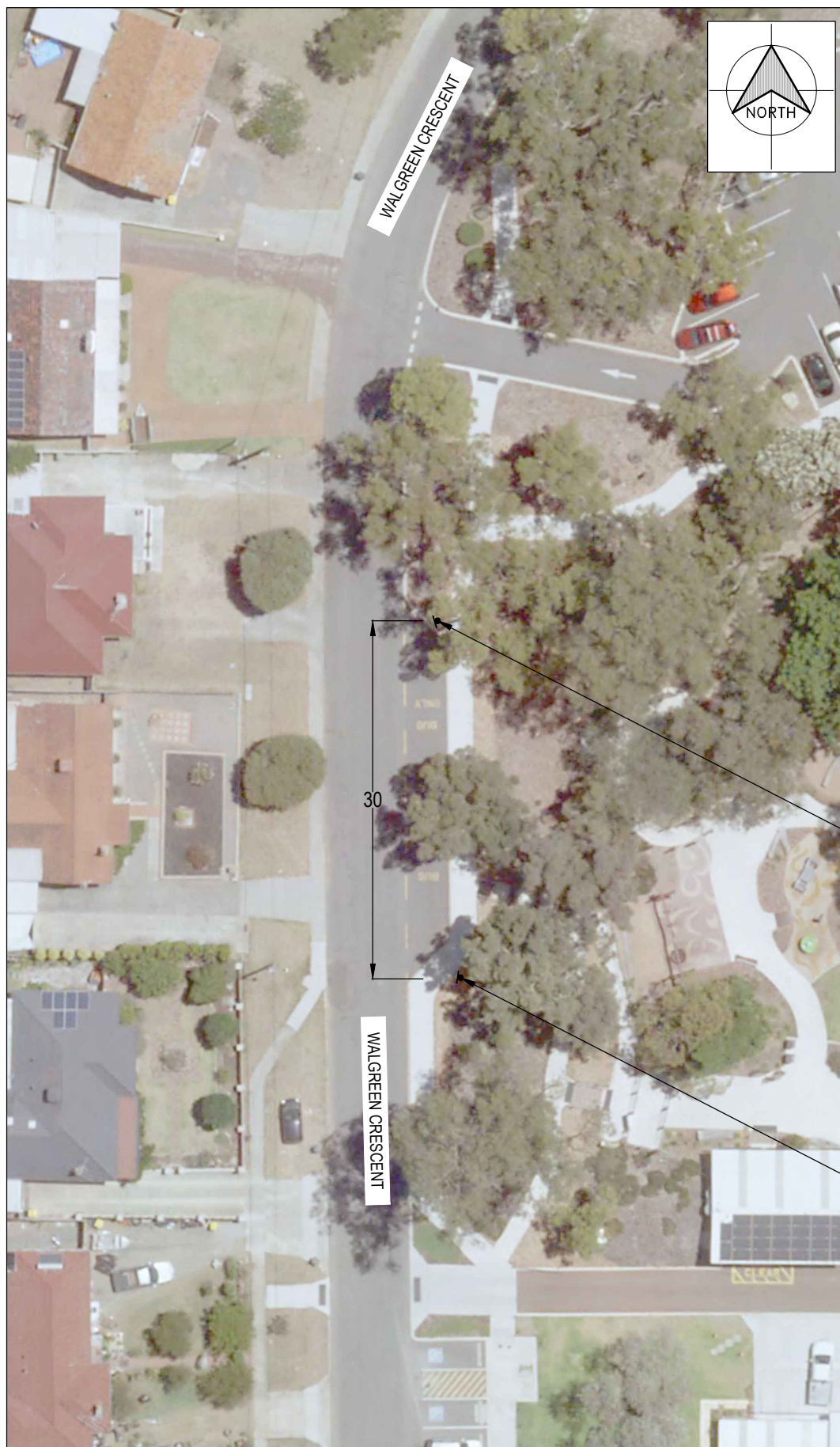
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LEFT - 1 OF
RIGHT - 1 OF
BOTH - 0 OF



LOCALITY PLAN



30

INSTALL

1/4P
R5-15(R)



INSTALL

1/4P
R5-15(L)



WALGREEN CRESCENT



0	12/20	ISSUE FOR CONSTRUCTION	S.S	ASSOCIATE CONSULTANT:		PROJECT: PROPOSED PARKING PROHIBITION AT WALGREEN CRESCENT, CALISTA	SCALE N.T.S	DRAWING TITLE PARKING PROHIBITION KWINANA ADVENTURE PARK
REVISION	DATE	DESCRIPTION	DRAWN			ADDRESS: Cnr Gilmore Avenue and Sulphur Road, Kwinana WA 6167 PHONE: (08) 9439 0200 FAX: (08) 9439 0222 EMAIL: admin@kwinana.wa.gov.au WEB: http://www.kwinana.wa.gov.au	DESIGN S.S CHECK S.H DRAWN S.S DATE 12/20	FILE NO. WALGC DRAWING NUMBER 21-049-01 REVISION 0
							AUTHORISED (MANAGER ENGINEERING SERVICES) R.NAJAFZADEH	

17.2 Parking Restrictions / Bus Zone Signs at Abingdon Crescent, Peter Carnley Anglican Community School, Wellard

DECLARATION OF INTEREST:

Mayor Carol Adams declared an impartiality interest due to her grandson attending Peter Carnley Anglican Community School.

Councillor Matthew Rowse an impartiality due to being President of the PCACS P&F Association, his children attending Peter Carnley Anglican Community School and his wife being a member of the PCACS Board.

SUMMARY:

The Principal of Peter Carnley Anglican Community School has requested the City of Kwinana give consideration to the provision of a dedicated bus bay and/or installation of parking prohibition 'Bus Zone 7.30am to 9am and 2.30pm to 4pm' sign at the existing car parking bays at Abingdon Crescent, Wellard. The proposed parking prohibition for bus zone is to reduce some of the pressure and to facilitate school buses at dedicated bus bays, during the school start and finish times. A plan showing the proposed parking prohibition 'Bus Zone 7.30am to 9am and 2.30pm to 4pm' sign is included as Attachment 'A'.

The purpose of this report is for the Elected Members to consider, by way of resolution, regulating the parking of buses by installing 'Bus Zone 7.30am to 9am and 2.30pm to 4pm' sign at the existing parking bays at Abingdon Crescent, Wellard.

OFFICER RECOMMENDATION:

That Council, in accordance with clause 1.8 of the City of Kwinana Parking and Parking Facilities Local Law 2018, approve implementation of parking prohibition and Bus zone sign at a portion of Abingdon Crescent car parking bays in front of Peter Carnley Anglican Community School, Abingdon Crescent, as shown at Attachment A.

DISCUSSION:

Peter Carnley Anglican Community School is a private co-educational school located in the suburb of Wellard. It is located on 9 hectares of land adjacent to public open space of almost 6 hectares.

The continuous growth in student numbers during the last several years has resulted in an increase in traffic and parking demand during drop off and pick up periods. This trend is anticipated to continue, and demand for parking is expected to increase in future as a result of continued residential development occurring at Wellard and surrounding suburbs. In addition, the number of staff employed at the school will also increase to meet the demands of the expanding school, which will in turn result in increased demand for parking. The school offers education from kindergarten to year 12. There are currently approximately 830 students, and 100 full-time employees employed at the Wellard Campus.

17.2 PARKING RESTRICTIONS / BUS ZONE SIGNS AT ABINGDON CRESCENT, PETER CARNLEY ANGLICAN COMMUNITY SCHOOL, WELLARD

As this school provides kindergarten to year 12 education, it is expected that the younger age group of students are more dependant, and require assistance from parents for transportation to and from the school. Accordingly, a higher proportion of the school community are travelling to and from school in private cars. The City encourages the school bus service to be used for drop off and pick up services, as it is safer for students, reduces congestion, and encourages parents towards active travel plan and using school bus services.

Currently, there are 81 standard parking bays for parents, 93 standard parking bays for staff, 10 to 15 Kiss & Drive bays, 3 loading bays, 4 ACROD parking bays, plus an unmarked hardstand parking area that would allow for parking in excess of 60 passenger vehicles within the school grounds. In addition, there are 57 on-street parking bays located on Abingdon Crescent of which 41 bays are located within the 40km school zone and 16 bays are located outside the 40km school zone.

The introduction of these parking restrictions will regulate the parking of buses at the bus zone in accordance with the *City's Parking and Parking Facilities Local Law 2018* clause:

5.3 (2) - A driver shall not stop in a bus zone unless the driver is driving a public bus, or a bus of a type that is permitted to stop at the bus zone by information on or with the "bus zone" sign applying to the bus zone.

A desk top assessment of the existing parking facilities in the area has shown that there are adequate number of parking bays in the area and implementation of the proposed parking restrictions will not have a noticeable impact on existing parking capacity.

LEGAL/POLICY IMPLICATIONS:

The proposed parking restriction signs design, manufacturing and implementation will be in accordance with the *Road Traffic Code 2000* (Code), Australian Standard 1742.11 – Parking Controls, and the *City's Parking and Parking Facilities Local Law 2018*. The relevant section of the *City's Parking and Parking Facilities Local Law 2018*, is provided within the Discussion above.

FINANCIAL/BUDGET IMPLICATIONS:

The approximate cost of supply and installation of the parking restriction signs will be approximately \$800.

There will be no financial implications to the City resulting from the initial supply and installation of the signs as the School has agreed to fund the full cost. However, the City of Kwinana will retain responsibility for the maintenance and enforcement of these signs going forward.

ASSET MANAGEMENT IMPLICATIONS:

The 'Bus Zone 7.30am to 9am and 2.30pm to 4pm' signs will be owned and maintained by the City of Kwinana. The whole of life cost of the signs will be negligible.

17.2 PARKING RESTRICTIONS / BUS ZONE SIGNS AT ABINGDON CRESCENT, PETER CARNLEY ANGLICAN COMMUNITY SCHOOL, WELLARD

ENVIRONMENTAL IMPLICATIONS:

There are no environmental implications that have been identified as a result of this report or the recommendations.

STRATEGIC/SOCIAL IMPLICATIONS:

This proposal will support the achievement of the following outcome and objective detailed in the Strategic Community Plan.

Plan	Outcome	Objective
Strategic Community Plan 2019 - 2029	A connected transport network	4.6 Provide a safe and efficient integrated network of roads, footpaths and cycle routes supported by a good public transport system

The recommendations in this report will ultimately increase the amenity and safety of the areas adjacent and fronting the school for residents and road users.

COMMUNITY ENGAGEMENT:

Consultation has been limited to the school as 'Bus Zone 7.30am to 9am and 2.30pm to 4pm' signs are in front of the Peter Carnley Anglican Community School, Wellard.

PUBLIC HEALTH IMPLICATIONS:

There are no implications on any determinants of health as a result of this report.

RISK IMPLICATIONS:

The risk implications in relation to this proposal are as follows:

Risk Event	Non-compliance with the new parking regime, resulting in road safety and traffic issues.
Risk Theme	Failure to fulfil statutory regulations or compliance requirements
Risk Effect/Impact	Reputation
Risk Assessment Context	Operational
Consequence	Minor
Likelihood	Possible
Rating (before treatment)	Low

17.2 PARKING RESTRICTIONS / BUS ZONE SIGNS AT ABINGDON CRESCENT, PETER CARNLEY ANGLICAN COMMUNITY SCHOOL, WELLARD

Risk Treatment in place	Reduce (mitigate the risk)
Response to risk treatment required/in place	Enforcement action, if problems emerge
Rating (after treatment)	Low

COUNCIL DECISION

397

MOVED CR S LEE

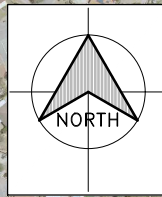
SECONDED CR D WOOD

That Council, in accordance with clause 1.8 of the City of Kwinana Parking and Parking Facilities Local Law 2018, approve implementation of parking prohibition and Bus zone sign at a portion of Abingdon Crescent car parking bays in front of Peter Carnley Anglican Community School, Abingdon Crescent, as shown at Attachment A.

**CARRIED
7/0**



LOCALITY PLAN



LEGEND

EXISTING PROPOSED

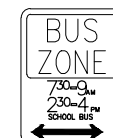
SINGLE POST SIGN

NOTES:

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- 2. ALL DIMENSIONS ARE IN METER UNLESS NOTED OTHERWISE

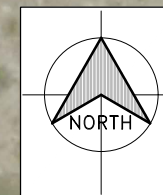
QUANTITIES

PROPOSED SIGN POST LOCATION - 2 OF

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	RIGHT	- 1 OF
	BOTH	- 0 OF
R5-20(B)		



ABINGDON CRESCENT



REV	DATE	DESCRIPTION	DRAWN
0	01/21	ISSUE FOR COMMENTS	S.S

ASSOCIATE CONSULTANT:



PROJECT: **BUS ZONE AT ABINGDON CRESCENT PCACS - WELLARD**
 ADDRESS: Cnr Gilmore Avenue and Sulphur Road, Kwinana WA 6167
 PHONE: (08) 94 39 0200
 FAX: (08) 94 39 0222
 EMAIL: admin@kwinana.wa.gov.au
 WEB: http://www.kwinana.wa.gov.au

SCALE: **N.T.S**
 DESIGN: **S.S** CHECK: **S.H**
 DRAWN: **S.S** DATE: **01/21**
 AUTHORISED (MANAGER ENGINEERING SERVICES)
R.NAJAFZADEH

DRAWING TITLE	
PARKING PROHIBITION ABINGDON CRESCENT	
FILE NO.	ABIN
DRAWING NUMBER	21-050-01
REVISION	0

17.3 Proposed Amendment No. 162 to Local Planning Scheme No.2: Rezoning a portion of Lots 1, 7 - 11 and 88 Lyon Road, Wandi from 'Special Rural' to 'Residential' and introducing specific development and land use provisions to Schedule VII – Additional Uses

DECLARATION OF INTEREST:

Deputy Mayor Peter Feasey declared an impartiality interest due to being close friends with one of the landowners.

SUMMARY:

The purpose of this report is for Council to adopt (initiate) proposed Scheme Amendment No. 162 (Amendment 162) to the City of Kwinana Local Planning Scheme No. 2 (LPS2) affecting Lots 1, 7 – 11 and 88 Lyon Road, Wandi (refer Attachment A). The affected lots are currently zoned 'Special Rural' under LPS2 and are zoned partly 'Urban' and 'Rural – Water Protection' under the Metropolitan Region Scheme (MRS) (see Figure 1 in the discussion below).

The 'Urban' zone, under the MRS, is considered inconsistent with the 'Special Rural' zone under LPS2. In this regard, the amendment seeks to amend LPS2 to a zone consistent with the MRS 'Urban' zone, in this case 'Residential', to provide consistency across schemes.

The proposed amendment seeks to:

- a) Rezone a portion of Lots 1, 7 -11 and 88 Lyon Road from 'Special Rural' to 'Residential'. The density coding of the Residential land is proposed to be a variety of R5, R10 and R12.5; and
- b) Introduce specific development provisions relating to the amendment area into Schedule VII – Additional Uses.

City Officers have reviewed the amendment proposal and are recommending that prior to advertising of the amendment, additional development controls be introduced that will require a native vegetation landscaping strip along the frontage of the properties facing Lyon Road and that as part of this amendment, the Development Contribution Area 5 boundary be realigned to include these lots. Further discussion is provided on these points below.

Accordingly, City Officers recommend that Amendment 162 be:

- a) considered a 'Complex' amendment under Regulation 35(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015* (PD Regulations);
- b) be referred to the Environmental Protection Authority as required; and
- c) Advertised for 42 days in accordance with Regulation 47(4) of the PD Regulations.

OFFICER RECOMMENDATION:

That Council:

1. Pursuant to Section 75 of the *Planning and Development Act 2005*, adopt an Amendment No.162 to the City of Kwinana Local Planning Scheme No. 2 (LPS2) for the purposes of:
 - a. Rezoning a portion of Lots 1, 7 -11 and 88 Lyon Road from 'Special Rural' to 'Residential'. The density coding of the Residential land is proposed to be a variety of R5, R10 and R12.5;

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

- b. Amend the Scheme Map accordingly; and
- c. Introduce specific development provisions relating to the amendment area into Schedule VII – Additional Uses as follows:

No.	Land Particulars	Base Zone	Permitted Uses	Development Standards/Conditions
4	Lots 1, 7 - 11 & 88 Lyon Road, Wandi	Residential Special Rural No. 13	<p>For Residential zone as per Residential zone</p> <p>For Special Rural No.13 as per Schedule II for SR13 zone</p>	<p>1. Existing development prior to gazettal of this amendment may continue to operate.</p> <p>2. Any subdivision and/or development of land from the date of gazettal of this amendment shall be undertaken in a manner so as to prevent any new dwelling from being located or developed within the Rural Water Protection zone.</p> <p>3. Replacement of the existing dwelling is discretionary subject to development approval being granted by the local authority.</p> <p>4. For lots zoned Residential with a density code of R5, measures to be taken at subdivision and/or development approval stage to ensure any trees worthy of retention are adequately retained and incorporated into development.</p> <p>5. No clearing of vegetation within the Rural Water Protection zone is permitted, except for the purpose of bushfire management, or with the approval of the local authority.</p>

2. Prior to referral of the amendment to the EPA (as per point 3 below), that the amendment documentation, as per Attachment A, be modified to:
 - a. Extend the boundary for Development Contribution Area No. 5 to incorporate the amendment area.
 - b. Insert an additional development provision no.6 into Schedule VII – Additional Uses, under the column titled: 'Development Standards/Conditions' as follows:

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

6. For R10 and R12.5 development, a minimum 10 metre primary street setback is required to accommodate landscaping to the satisfaction of the Local Authority.

3. Refer the amendment to the Environmental Protection Authority (EPA) as required by Section 81 of the Act, and on receipt of a response from the EPA indicating that the amendment is not subject to formal environmental assessment, forward the amendment to the Western Australian Planning Commission (WAPC). In the event that the EPA determines that the amendment requires modification, the City shall modify the amendment and forward it to the WAPC.
4. Pursuant to Regulation 38(3) of the *Planning and Development (Local Planning Scheme) Regulations 2015* and Section 82 of the *Planning and Development Act 2005*, Amendment 162 be advertised for 60 days.
5. Resolve that in the opinion of Council, Amendment No. 162 is a 'Complex Amendment' as it satisfies the following criteria of Regulation 34 of the *Planning and Development (Local Planning Schemes) Regulations 2015*:
 - a. There is no Local Planning Strategy applicable over the amendment area.
 - b. The amendment is significant in so far as it relates to environmental matters, such as clearing of vegetation and the Jandakot Water Mound Area. Additionally the amendment area is significant as it will be a critical transition area from existing urban development in the locality to the rural area.
 - c. The amendment will amend a development contribution area.

DISCUSSION:

Land Status

Metropolitan Region Scheme:	Urban & Rural – Water Protection
Local Planning Scheme No. 2:	Special Rural

Proposal

The City has received a request for Council to progress Amendment 162 which seeks to:

- a) Rezone a portion of lots 1, 7 -11 and 88 Lyon Road from 'Special Rural' to 'Residential'. The density coding of the Residential land is proposed to be a variety of R5, R10 and R12.5; and
- b) Introduce specific development provisions relating to the amendment area into Schedule VII – Additional Uses.

The formal amendment documentation is provided in Attachment A. This report elaborates on critical elements of Amendment 162 in addition to the documentation submitted by the proponent.

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

Context

The amendment area is located directly to the east of Lyon Road in Wandi. Lyon Road is designated as a Local Distributor road both currently and into the future. The amendment area is bound by the land currently zoned 'Urban' under the MRS (see Figure 1 below). This area is zoned 'Special Rural' under LPS2 (see Figure 2 below). The current 'Special Rural' zoning under LPS2 is inconsistent with the 'Urban' zoning under the MRS. Therefore, this amendment seeks to align the LPS2 zoning with the MRS. The current MRS zoning and LPS2 zoning can be seen in the comparison images: Figures 1 and 2.

As can be seen in Figures 1 and 2, the lots are divided by these two different zonings. The result of this amendment is to allow the MRS 'Urban' zoned land to be zoned consistently under the City's LPS2 to a 'Residential' zone and then further subdivided from the land that carries the MRS 'Rural – Water Protection' and LPS2 'Special Rural' zones. Additional Use provisions to deal with the resulting zoning and lot layout are proposed to ensure any issues with this arrangement are dealt with appropriately and are discussed below.

The two different zonings applying across one lot is an unusual situation brought about by the environmental boundary of the Jandakot Groundwater Protection Area, protected by the State Government under State Planning Policy 2.3 – Jandakot Groundwater Protection (SPP2.3). Those portions of the lots outside the groundwater mound are zoned Urban under the MRS (suitable for future residential land uses) while those portions remaining inside the Jandakot Groundwater Protection Area are zoned Rural – Water Protection under the MRS. While not an ideal situation, the split zoning across the lots is unavoidable and is addressed under the proposed scheme amendment in a pragmatic way to address the complexity of the planning issues.

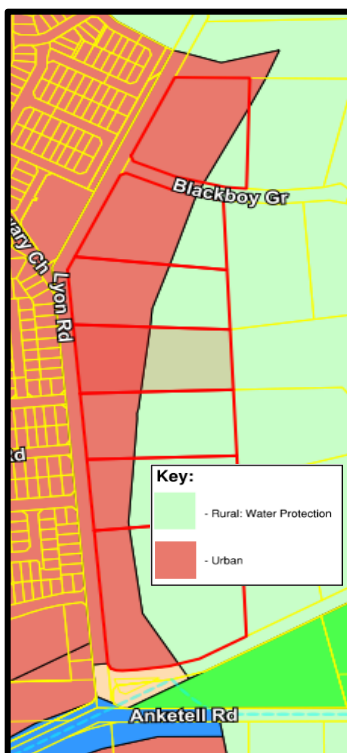


Figure 1 - Current MRS Zonina

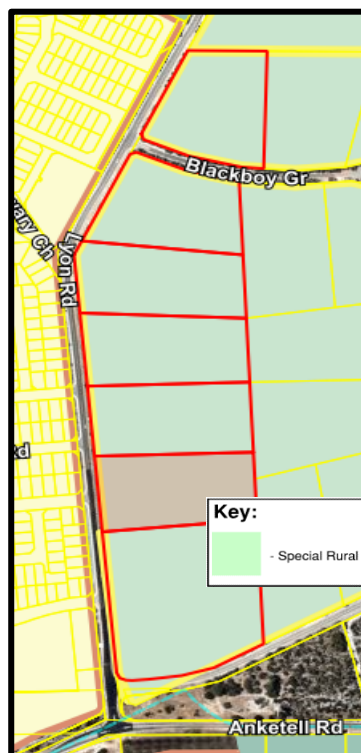


Figure 2 - Current LPS2 Zonina

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

Background

The planning history relating to the amendment area is briefly outlined in the table below:

Date	Event
Pre 2009	The entire Wandi cell adjacent to the Kwinana Freeway was rezoned from 'Rural' to 'Urban Deferred' under the MRS. This included the subject amendment area.
22 January 2009	The majority of the Wandi cell, bound by Lyon Road to the east and the Kwinana Fwy to the west was rezoned from 'Urban Deferred' to 'Urban' under MRS Scheme Amendment No. 1170/27. This amendment did not include the subject Amendment 162 area.
June 2017	An MRS amendment was submitted to the Western Australian Planning Commission (WAPC) to re-zone the area subject to this Amendment 162 (east of Lyon Road) from 'Urban Deferred' to 'Urban', to provide consistency with the remaining 'Urban' zoned Wandi cell which had now been local structure planned. The amendment documentation was referred to the City of Kwinana for comment. The WAPC reference was: MRS Amendment No. 1345/27.
4 August 2017	City of Kwinana Officers provided a response to the WAPC in relation to the proposed MRS Amendment No. 1345/27. As part of the amendment, a draft/indicative Local Structure Plan was provided showing the subject amendment area to be Residential R30 zoned land. In its response, City Officers identified a number of issues resulting from MRS Amendment No. 1345/27 as follows: <ul style="list-style-type: none"> • The environmental analysis insufficiently addressed issues relating to tree retention and bushfire management. • It was recommended that due to the environmental values of the site, the application be referred under the EPBC Act for assessment of Cockatoo Habitat and Threatened Ecological Communities. • The applicant was advised to liaise with the City regarding an appropriate local structure/subdivision plan. The draft/indicative Local Structure Plan that was provided as part of the MRS amendment was not supported by City Officers.
10 July 2018	The Minister for Planning gazetted MRS Amendment No. 1345/27. This meant the area subject to Amendment 162 was zoned 'Urban' under the MRS. The LPS2 'Special Rural' zoning was unchanged.
January 2020 to Current	The subject LPS2 Amendment 162 was prepared and submitted. The majority of the affected landowners were involved in the preparation of this amendment. City Officers have liaised with the applicant, Department of Water and Environmental Regulation (DWER) and the Department of Planning, Lands and Heritage (DPLH) to arrive at this current stage, where Officers are satisfied the amendment can be adopted (initiated) by Council. Further commentary regarding discussions with the proponent and resultant variations to Amendment 162 since it was submitted in January 2020, are found later in this report.

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

Amendment Type

As per Part 5, Division 1, Regulation 34 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Regulations), there are three scheme amendment types: basic, standard and complex. Under Regulation 35(2), the local government is required to specify what type of amendment is proposed in addition to providing an explanation for forming that opinion.

The amendment is considered to be Complex under the provisions of the Regulations for the following reason(s):

- There is no Local Planning Strategy applicable over the amendment area.
- The amendment is significant in so far as it relates to environmental matters, such as clearing of vegetation and the Jandakot Water Mound Area. Additionally, the amendment area is significant as it will be a critical transition area from existing urban development in the locality to the rural area.
- The amendment will amend a development contribution area.

Planning Discussion

Jandakot Groundwater Protection Area

In its rezoning of the Wandı area in January 2009, the WAPC determined that the 'Urban' zoned land under the MRS be defined by the Jandakot Groundwater Protection Area (JGPA) to the east. The JGPA provides a significant volume of high quality drinking water and is defined under SPP2.3. SPP2.3 aims to protect the JGPA from development and urban land uses that may have a detrimental impact on the underground water resource. This amendment does not include land within the JGPA zoned 'Rural – Water Protection' under the MRS and 'Special Rural' under LPS2. Figure 3 illustrates the boundary of the JGPA and Urban zone.



Figure 3 - JGPA

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

The existing properties subject to this amendment each contain an established Single House land use. A Single House land use is permissible within the JGPA under the provisions of SPP2.3. The proponent has sought to design the amendment to enable a number of established Single Houses to be retained. This will ensure minimal impact on the JGPA as the existing land use (Single House) is proposed to be retained and there will be no intensification of development or additional land uses located within the JGPA area.

Furthermore, SPP2.3 outlines a number of provisions relating to retention of vegetation and size of lots within the JGPA that have been considered in the preparation of this amendment. SPP2.3 encourages the retention of native vegetation within the JGPA and recommends individual lots within the JGPA be a minimum area of two hectares. As part of MRS amendment 1345/27 (previously referred to under the heading: Background) concerns were raised by City Officers and the Department of Water and Environment Regulation (DWER) regarding the creation of lots that would be less than the minimum two hectare lot size requirement for lots within the JGPA. Following discussions, it was considered appropriate that the subject amendment be prepared to encourage existing approved land uses in the amendment area (Single Houses) be retained to enable the preservation of existing vegetation and no intensification of development within the JGPA. No intensification of development, from existing, will therefore be permitted within the JGPA. Furthermore, the existing portion of the lots affected by the amendment and located in the JGPA is currently less than two hectares in area.

In summary, the existing lot area within the JGPA is less than two hectares and will be unchanged as part of this amendment. Minimal clearing of existing vegetation will occur within the JGPA as part of this amendment. This is further regulated through the incorporation of Additional Use provisions as part of this amendment – see discussion under the heading: Additional Use Provisions. The amendment is therefore considered to be consistent with the objectives of SPP2.3.

Additional Use Provisions

Concerns were initially raised regarding the potential to create lots that straddle both the amendment area and the 'Special Rural' zone. In order to provide consistency with SPP2.3 this amendment proposes to incorporate 'Additional Use' provisions into LPS2 to ensure no further intensification of development occurs within the JGPA. In seeking to prevent intensification of development within the JGPA, the 'Additional Use' provisions promote the retention of existing vegetation within the JGPA.

The "Additional Use" provisions seek to ensure:

- No further intensification of development (i.e. new dwellings) occurs within the JGPA (special rural zone).
- Existing dwellings can remain as currently approved on original lots, but that no further intensification of development (i.e. new dwellings) be permitted inside the JGPA (Special Rural zone).

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As part of the supporting documentation, the proponent submitted an indicative subdivision plan (Attachment C) to further understand the purpose of the proposed 'Additional Use' provisions. The 'Additional Use' provisions, as proposed, would apply to Lots 40 and 54 as indicated on the subdivision plan (current Lots 1 and 7 Lyon Road). The subject amendment would result in Lots 40 and 54 being straddled by both the 'Special Rural' zone and 'Residential' zone. The 'Additional Use' provisions therefore seek to retain existing dwellings within the amendment area and ensure no additional dwellings or intensification of development is proposed within the JGPA. An overlay of the subdivision plan, as seen in Figure 4, illustrates how the existing dwellings are able to be retained allowing for the retention of vegetation within the 'Special Rural' zone.

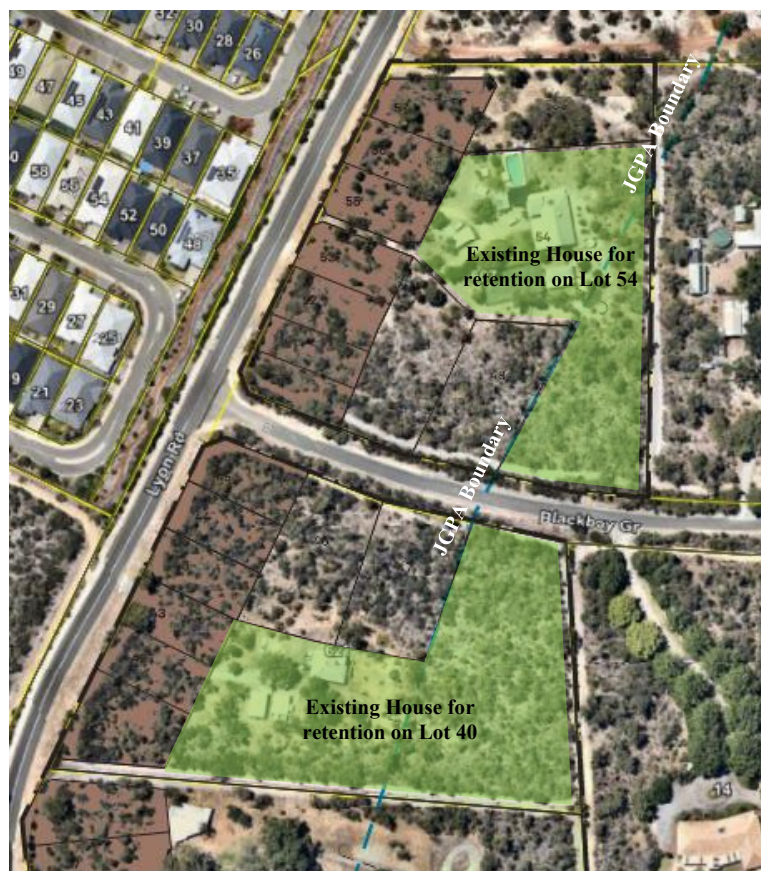


Figure 4 –Subdivision Plan Overlay

Transition Area

A critical part of this scheme amendment is to provide an appropriate transition in development density from the local structure planned Wandı area (west of Lyon Road) to the rural land, east of the amendment area. The land subject to this amendment is considered to be a 'transition area' from higher density urban living (R20/450m²) on the western side of Lyon Road, to the rural (20,000m²) zoned land east of the amendment area.

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When the amendment was initially submitted to the City in January 2020, the proponent proposed residential densities of R5, R12.5 and R25 across the amendment area. Following extensive discussions, both internally and with the DPLH, City Officers were not satisfied that the proposed densities provided for a sufficient transition between the urban and rural areas. This was further discussed with the proponent and it was considered appropriate for the amendment area to incorporate residential densities of R5, R10 and R12.5. The average lot areas required for each of the proposed densities (as per State Planning Policy 7.3 – Residential Design Codes) is listed below:

- R5: 2000m²
- R10: 1000m²
- R12.5: 800m²

R12.5/R5 Transition

Accordingly, the density transition from west to east (for the northern portion of the amendment area – current Lots 1, 7, 8 and 9) under LPS2 is as follows:

1. R20 – 450m² (as existing west of Lyon Road);
2. R12.5 – 800m² (part of the amendment area, east of, and fronting onto Lyon Road);
3. R5 – 2000m² (to the rear of the proposed R12.5 Lots/abutting the existing Special Rural); and
4. 'Special Rural' – 20,000m² (as existing east of the amendment area).

As outlined above, the proposed density transition on Lots 1, 7, 8 and 9 (northern portion of the amendment area) is for R12.5 adjacent to Lyon Road and R5 to the rear, adjacent to the Special Rural zone. This transition is considered to be a sensible transition from the existing R20 zoned lots on the western side of Lyon Road.

R10 Transition

The transition from west to east (for the southern portion of the amendment area – current Lots 10, 11 and 88) under LPS2 is a slightly different arrangement as follows:

1. R20 – 450m² (as existing west of Lyon Road)
2. R10 – 1000m² (part of the amendment area, east of, and fronting onto Lyon Road)
3. Special Rural – 20,000m² (as existing east of the amendment area).

Considering this portion of the amendment does not have R5 density to the rear of lots fronting Lyon Road, the proposal is for larger lots (R10 density) to be the transition between the Wandii urban area and the 'Special Rural' zone. The R10 density (average lot size of 1000m²) is considered an appropriate transitional zoning.

The proposed densities are considered to be an acceptable outcome and will provide for an adequate transition between the urban and rural zone. It is envisaged that larger lots zoned R12.5 and R10 have the ability to provide for a soft transition from the higher density Wandii local structure planned area to the lower density 'Special Rural' zone. The proposal has the potential to allow for a similar outcome, as existing transition lots located north of the amendment area on Lyon Road. This case study is explained below.

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Existing 'transition lots' in Wandi

Lots 155 – 160 Lyon Road were considered as part of the Wandi North Local Structure Plan (LSP) as transition lots between the Wandi urban area and the Wandi 'Special Rural' zone. These lots are zoned R10 and are subject to a Local Development Plan (LDP) that was approved by Council in 2010 (see Attachment B). The local structure plan for this area outlined the need for a 10 metre revegetation/landscape protection buffer to the front of Lots 155 – 160. The relevant subdivision approval therefore incorporated a condition as follows:

A revegetation plan being prepared and implemented for proposed lots 155 – 160 inclusive as per the requirements of the Wandi North Local Structure Plan to the satisfaction of the Western Australian Planning Commission.

A revegetation plan was subsequently prepared and an LDP was approved as a statutory mechanism to ensure the 10 metre landscaping area was implemented (Attachment B). The purpose of this 10 metre landscaping area was to provide for a sufficient transition between the urban and rural areas. As part of this amendment, it is envisaged a similar arrangement will be sought through subsequent planning mechanisms including subdivision approval and local development planning. At future planning stages, City Officers will pursue the requirement for a 10 metre revegetation/landscaping area to be implemented on the future R12.5 and R10 zoned lots fronting Lyon Road in the amendment area. An indicative plan showing the revegetation/landscaping buffer on the lots applicable to this amendment is seen in Figure 5.

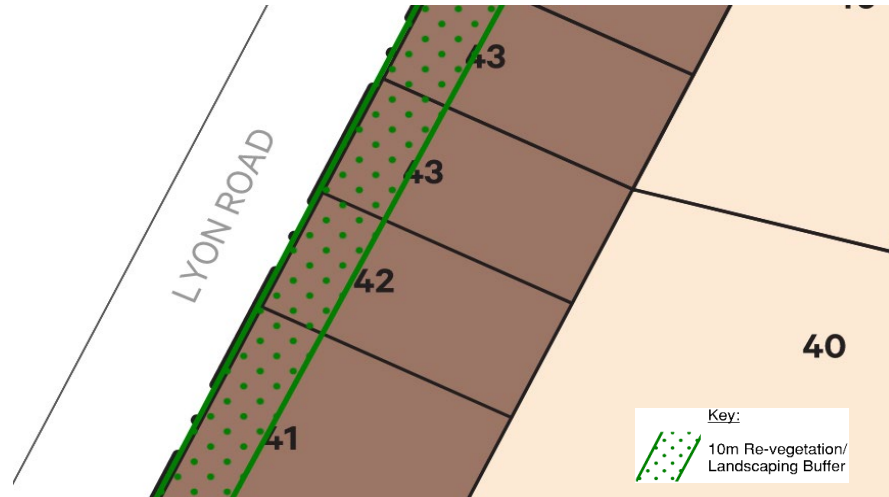


Figure 5 - 10m Revegetation/Landscaping Buffer

Environmental Considerations

Existing Vegetation

To support this amendment, the proponent provided an environmental report outlining the types of vegetation that exist within the amendment area and the potential for retention of trees within the proposed R5 and existing rural lots only. The R5 zoned lots are proposed to be parkland cleared to accommodate for bushfire management measures. Essentially, this means that significant trees can be retained within the proposed R5 lots with the understory being managed by the landowner. While a number of significant trees have been identified in the amendment area, tree retention will be confirmed at subdivision stage through a Landscape Feature and Tree Retention Plan, as required under the City's Local Planning Policy No.1.

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The environmental reporting also states that the amendment area consists of banksia woodland. When the amendment area was rezoned from 'Urban Deferred' to 'Urban' under the MRS (in 2016) the proponent referred the proposal to the Commonwealth Government for assessment under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) due to the presence of banksia woodland. This referral sought to inform future planning and decision making. In June 2017, the Commonwealth Government issued notice to the proponent that the vision for future residential development within the subject amendment area would not require further assessment and approval under the EPBC Act and development can proceed.

Bushfire Planning

State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP3.7) will apply to future residential subdivision within the amendment area. The applicant has provided a Bushfire Management Plan (refer to Appendix 4 of Attachment A) to demonstrate that the proposed amendment can support future residential land uses and that bushfire hazard risks can be adequately managed at future planning stages.

The submitted BMP correlates with the indicative subdivision plan (as seen in Attachment C). The BMP outlines all areas zoned R12.5 and R10 to be cleared of vegetation and requires a 10 metre 'firebreak' that is generally located to the east (rear) of the proposed R5 and R10 lots (see Figure 6/Page 15 of Attachment A). No development would be permitted within the 10 metre 'firebreak' and the landowner would be required to manage this area to contain low threat vegetation. The image below illustrates the constraints on the affected lot with a 10 metre re-vegetation area front of the lot and the provision of a 10 metre 'firebreak' to the rear. This is considered to be an acceptable outcome that is able to accommodate for future residential development. For example, a 50 metre deep, R10 zoned lot, would allow for 30 metres of development area. This outcome is considered appropriate and will not inhibit future development of these lots.



Figure 6 - 10m Firebreak

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Future Subdivision

Subdivision Plan

As part of this amendment, the applicant provided an indicative subdivision plan (Attachment C). It should be noted that this subdivision plan is indicative only and acts as supporting documentation for the proposed amendment. Prior to development commencing, a subdivision application is required to be submitted and considered by the WAPC following approval of the amendment. Notwithstanding, this indicative subdivision plan for 45 lots provides a base line for the subject amendment.

Local Structure Plan

Previously in this report, reference was made to MRS Amendment No. 1345/27. As part of MRS Amendment No. 1345/27, a draft local structure plan was provided. At the time, City Officers responded to the DPLH outlining the draft local structure plan would not be supported due to excessive clearing of vegetation and the lack of an appropriate transition from the Wandi urban to rural areas. Since this time, further discussions have been had with the applicant, DPLH and DWER resulting in the submission of the subject amendment and indicative subdivision plan (Attachment C). As part of these discussions it was also considered that a local structure plan is unnecessary for the amendment area for the following reasons:

- The amendment covers a small area of land with the proposed zonings of R12.5, R10 and R5 resulting in a yield of only 45 additional lots; and
- A subdivision application would appropriately address matters such as tree retention, revegetation/landscaping buffers and bushfire management.

Open Space

It should be noted that this amendment does not incorporate public open space (POS). The existing planning framework does not identify a requirement for regional or district open space within the amendment area. The Wandi South Local Structure Plan, adjacent to the amendment area, provides areas of local open space including the Wandi Playing Fields that are located in close proximity to the amendment area. Furthermore, the proposed low densities of R5, R10 and R12.5 provide future residents with larger private open spaces that are capable of active and passive recreation. For these reasons, City Officers are satisfied that POS is not required to be physically provided within the amendment area. In such situations, the planning framework provides the opportunity for the applicant to pursue a cash in lieu of POS contribution at subdivision stage. City Officers will pursue the cash in lieu of the POS contribution which is likely to be determined at the subdivision stage.

Development Contribution Area

Following further investigations, City Officers noted that the current development contribution area (DCA) boundary for DCA 5 does not incorporate the subject amendment area. This DCA boundary should therefore be amended to incorporate the subject amendment area. In this regard, the proponent has requested that City Officers request modifications be undertaken to the amendment as part of the Council Resolution.

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

The Development Contribution Plan for DCA 5 (as seen in LPS2) outlines the infrastructure and administrative items that are to be funded for this area. For example, Lyon Road is required to be upgraded and the undergrounding of power lines is to be undertaken as part of DCA 5. Furthermore, future residents within the amendment area will utilise POS areas as funded under DCA5. It should be noted that the amendment area has been incorporated into the DCA boundary for DCA 9 and as such development within the amendment area will be contributing to community facilities at a District and Local level. It is therefore considered appropriate to amend the DCA 5 boundary to incorporate the amendment area and align with DCA 9

It is acknowledged that these properties are being developed at a lower density than nearby residential estates that contribute under DCA5. Accordingly, whilst Amendment 162 is being advertised City Officers will investigate the most appropriate items of DCA 5 that these properties should contribute to and the rate that should be applied to the development of this land.

Conclusion

Amendment 162 seeks to provide consistency between LPS2 and the MRS. This amendment will allow for residential development of a lower density than the existing local structure planned area of Wandii (west of Lyon Road), providing an appropriate buffer between urban and rural land. City Officers are satisfied the amendment addresses relevant planning matters and recommend council initiate the amendment for advertising in accordance with the Regulations.

LEGAL/POLICY IMPLICATIONS:

For the purpose of Councillors considering a financial or impartiality interest only, the proponent is Element.

Acts and Regulations

- *Planning and Development Act 2005*
- *Planning and Development (Local Planning Schemes) Regulations 2015*

Schemes

- *Metropolitan Region Scheme*
- *City of Kwinana Local Planning Scheme No. 2*

State Government Policies

- Development Control Policy 2.2 – Residential Subdivision (WAPC, 2017)
- State Planning Policy 7.3 – Residential Design Codes Volume 1
- State Planning Policy 2.3 – Jandakot Ground Water Protection (January 2017)
- State Planning Policy 3.7 – Planning in Bushfire Prone Areas (November 2009)

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

City of Kwinana

- Community Infrastructure Plan 2018

FINANCIAL/BUDGET IMPLICATIONS:

Cost of advertising in local papers is estimated to be \$500 and this cost will be borne by the applicant in accordance with the *Planning and Development Regulations 2009*.

ASSET MANAGEMENT IMPLICATIONS:

There are no asset management implications as a result of this report.

ENVIRONMENTAL IMPLICATIONS:

There are no environmental implications as a result of this report.

STRATEGIC/SOCIAL IMPLICATIONS:

The officer recommendation seeks to support the achievement of the following outcome and objective detailed in the Strategic Community Plan.

Plan	Outcome	Objective
Strategic Community Plan	A well planned City	4.4 Create diverse places and spaces where people can enjoy a variety of lifestyles with high levels of amenity.

COMMUNITY ENGAGEMENT:

The following community engagement is proposed to take place:
The application will be advertised consistent with the *Planning and Development (Local Planning Schemes) Regulations 2015* and will include advertising in a local newspaper and a notification on the City's website. Public submissions will be invited for 42 days.

PUBLIC HEALTH IMPLICATIONS:

There are no implications on any determinants of health as a result of this report.

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

RISK IMPLICATIONS:

The risk implications in relation to this proposal are as follows:

Risk Event	The proposed amendment is not gazetted and the LPS2 zoning remains inconsistent with the MRS.
Risk Theme	Failure to fulfil statutory regulations or compliance requirements.
Risk Effect/Impact	Compliance
Risk Assessment Context	Strategic
Consequence	Moderate
Likelihood	Possible
Rating (before treatment)	Moderate
Risk Treatment in place	Avoid – Remove the risk
Response to risk treatment required/in place	The proposed amendment is gazetted and the site is rezoned to Residential which is consistent with the current MRS zoning.
Rating (after treatment)	Low

COUNCIL DECISION

398

MOVED CR D WOOD

SECONDED CR M KEARNEY

That Council:

1. Pursuant to Section 75 of the *Planning and Development Act 2005*, adopt an Amendment No.162 to the City of Kwinana Local Planning Scheme No. 2 (LPS2) for the purposes of:
 - a. Rezoning a portion of Lots 1, 7 -11 and 88 Lyon Road from 'Special Rural' to 'Residential'. The density coding of the Residential land is proposed to be a variety of R5, R10 and R12.5;
 - b. Amend the Scheme Map accordingly; and
 - c. Introduce specific development provisions relating to the amendment area into Schedule VII – Additional Uses as follows:

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

No.	Land Particulars	Base Zone	Permitted Uses	Development Standards/Conditions
4	Lots 1, 7 - 11 & 88 Lyon Road, Wandí	Residential Special Rural No. 13	<p>For Residential zone as per Residential zone</p> <p>For Special Rural No.13 as per Schedule II for SR13 zone</p>	<p>1. Existing development prior to gazettal of this amendment may continue to operate.</p> <p>2. Any subdivision and/or development of land from the date of gazettal of this amendment shall be undertaken in a manner so as to prevent any new dwelling from being located or developed within the Rural Water Protection zone.</p> <p>3. Replacement of the existing dwelling is discretionary subject to development approval being granted by the local authority.</p> <p>4. For lots zoned Residential with a density code of R5, measures to be taken at subdivision and/or development approval stage to ensure any trees worthy of retention are adequately retained and incorporated into development.</p> <p>5. No clearing of vegetation within the Rural Water Protection zone is permitted, except for the purpose of bushfire management, or with the approval of the local authority.</p>

2. Prior to referral of the amendment to the EPA (as per point 3 below), that the amendment documentation, as per Attachment A, be modified to:
 - a. Extend the boundary for Development Contribution Area No. 5 to incorporate the amendment area.
 - b. Insert an additional development provision no.6 into Schedule VII – Additional Uses, under the column titled: 'Development Standards/Conditions' as follows:

6. For R10 and R12.5 development, a minimum 10 metre primary street setback is required to accommodate landscaping to the satisfaction of the Local Authority.

17.3 PROPOSED AMENDMENT NO. 162 TO LOCAL PLANNING SCHEME NO.2: REZONING A PORTION OF LOTS 1, 7 - 11 AND 88 LYON ROAD, WANDI FROM 'SPECIAL RURAL' TO 'RESIDENTIAL' AND INTRODUCING SPECIFIC DEVELOPMENT AND LAND USE PROVISIONS TO SCHEDULE VII – ADDITIONAL USES

- 3. Refer the amendment to the Environmental Protection Authority (EPA) as required by Section 81 of the Act, and on receipt of a response from the EPA indicating that the amendment is not subject to formal environmental assessment, forward the amendment to the Western Australian Planning Commission (WAPC). In the event that the EPA determines that the amendment requires modification, the City shall modify the amendment and forward it to the WAPC.**
- 4. Pursuant to Regulation 38(3) of the *Planning and Development (Local Planning Scheme) Regulations 2015* and Section 82 of the *Planning and Development Act 2005*, Amendment 162 be advertised for 60 days.**
- 5. Resolve that in the opinion of Council, Amendment No. 162 is a 'Complex Amendment' as it satisfies the following criteria of Regulation 34 of the *Planning and Development (Local Planning Schemes) Regulations 2015*:**
 - a. There is no Local Planning Strategy applicable over the amendment area.**
 - b. The amendment is significant in so far as it relates to environmental matters, such as clearing of vegetation and the Jandakot Water Mound Area. Additionally the amendment area is significant as it will be a critical transition area from existing urban development in the locality to the rural area.**
 - c. The amendment will amend a development contribution area.**

**CARRIED
7/0**



City of Kwinana
Town Planning Scheme No. 2
(District Scheme)

Amendment No. 162

Rezoning a portion of Lots 1, 7 - 11 & 88 Lyon Road, Wandi
from 'Special Rural – 13' to 'Residential' with densities R5, R10
and R12.5 and additional use (development controls)

Planning and Development Act 2005
RESOLUTION TO ADOPT AMENDMENT TO LOCAL PLANNING SCHEME

City of Kwinana
District Town Planning Scheme No. 2
Amendment No. 162

Resolved that the Local Government pursuant to section 75 of the *Planning and Development Act 2005*, amend the above Local Planning Scheme by:

1. Rezoning a portion of Lots 1, 7 - 11 & 88 Lyon Road, Wandi from 'Special Rural' (SR13) to 'Residential' with densities R5, R10 and R12.5.
2. Insert into Schedule VII Additional Uses the following:

No.	Land Particulars	Base Zone	Permitted Uses	Development Standards/Conditions
4	Lots 1, 7 - 11 & 88 Lyon Road, Wandi	Residential Special Rural No. 13	For Residential zone as per Residential zone For Special Rural No.13 as per Schedule II for SP13 zone	<ol style="list-style-type: none"> 1. Existing development prior to gazettal of this amendment may continue to operate. 2. Any subdivision and/or development of land from the date of gazettal of this amendment shall be undertaken in a manner so as to prevent any new dwelling from being located or developed within the Rural Water Protection zone. 3. Replacement of the existing dwelling is discretionary subject to development approval being granted by the local authority. 4. For lots zoned Residential with a density code of R5, measures to be taken at subdivision and/or development approval stage to ensure any trees worthy of retention are adequately retained and incorporated into development. 5. No clearing of vegetation within the Rural Water Protection zone is permitted, except for the purpose of bushfire management, or with the approval of the local authority.

3. Amendment in the Scheme Map accordingly.

The amendment is Complex under the provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015* for the following reason(s):

- There is no Local Planning Strategy applicable over the amendment area.
- The amendment is significant in so far as it relates to environmental matters, such as clearing of vegetation and the Jandakot Water Mound Area. Additionally the amendment area is significant as it will be a critical transition area from existing urban development in the locality to the rural area.
- The amendment will amend a development contribution area.

Dated this _____ day of _____ 2020

(Chief Executive Officer)

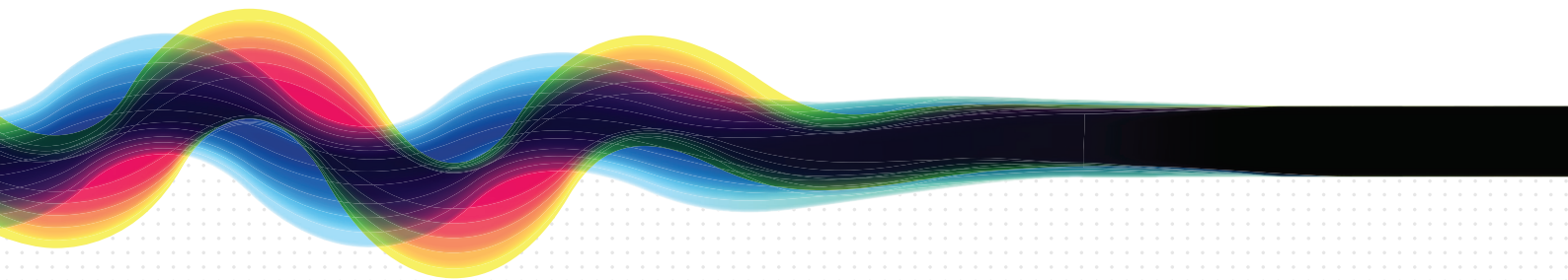
Lots 7-11 & 88 Lyon Road, Wandii

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

Lots 7-11 & 88 Lyon Road, Wandi

City of Kwinana | Town Planning Scheme No. 2 –
Local Scheme Amendment No.162

September 2020 | 19-360



We acknowledge the custodians of this land, the Whadjuk Noongar and their Elders past, present and emerging. We wish to acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region.

Document ID: PG Planning/PG 2019/19-360 Wandri, Lots 1, 7, 10, 11 & 88 Lyon Road/7 Final Documents/1 Lodged/City of Kwinana Local Planning Scheme Amendment draft report Folder/City of Kwinana Local Planning Scheme Amendment report FINAL.indd

Issue	Date	Status	Prepared by	Approved by
1	06.12.19	Draft	Justin Page	Murray Casselton
2	17.12.19	Final	Justin Page	Murray Casselton
3	07.01.20	Final edit	Justin Page	Murray Casselton
4	16.09.20	Final	Justin Page	Murray Casselton

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1. Introduction

element acts on behalf of the landowners of Lots 1, 7, 10, 11 & 88 Lyon Road, Wandi, whereby this report has been prepared to provide the planning rationale and justification to support a proposal for a local scheme amendment to the City of Kwinana Town Planning Scheme No. 2 (TPS 2). Lot 8 & 9 Lyon Road, Wandi have been included at the request of the City of Kwinana, though no detailed design over these lots has been undertaken.

It is proposed to rezone a portion of the subject site from 'Special Rural' (Special Rural - 13) to 'Residential' zone with densities ranging R5, R10 and R12.5 and with an 'Additional Use' to incorporate specific development controls. This scheme amendment follows a recent lifting of the urban deferred status to MRS Urban (MRS 1345/27) for the portion of the lots not affected by the MRS 'Rural - water protection' zone.

For those areas of Lots 7-11 & 88 that are zoned TPS 2 'Rural Water Resource' consistent with the MRS 'Rural - water protection' zone, no change is proposed by way of this amendment. Eastern portions of the lots within the groundwater protection area will remain 'Special Rural' zone. This is shown in the Subdivision Guide Plan which supports the amendment to demonstrate how the proposed residential densities correlate to future subdivision.

This report sets out the context of the proposed amendment in the planning framework, along with suitability and capability for rezoning. This report includes a description of the following matters:

- Site details and locational information;
- Background consultations in the formulation of the amendment request;
- Description of the existing land uses and site attributes;
- Consideration of relevant planning framework;
- Detailed explanation of the proposed amendment and potential future subdivision; and
- Justification for the proposed amendment.

Refer to Appendix 1 - Subdivision Guide Plan

Lots 7-11 & 88 Lyon Road, Wandii

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

2. The Amendment Area

The 'Amendment area' comprises the western portion of the following lots shown in Table 1:

Table 1. Lots comprising the amendment area

Lot	Description	Volume/Folio	Landowner	Area
1	Diagram 71485	1759/701	D & C Ham	2.0ha
7	Diagram 71485	1759/707	S Peng & M Xu	2.0ha
10	Diagram 71485	1766/983	P & R Murray	2.0ha
11	Diagram 71485	1766/984	F Adams	2.0ha
88	Diagram 92986	2213/157	R & A Cianciosi	3.87ha
8	Diagram 71485	1759/708	A. Meshkin & B. Meshkin	2.0ha
9	Diagram 71781	1766/982	S & Q Meshkin	2.0ha

Refer to Figure 1 – Amendment Area

2.1 Location

The subject site is located in the municipal of City of Kwinana approximately 27km south from the Perth CBD and 18km south-east of Fremantle Regional Centre and approximately 6km north-east of Kwinana Town Centre.

Refer to Figure 2 – Location Plan

2.2 Locality and Surrounding Context

The subject site is bound to the north and east by semi-rural land use within the MRS 'Rural – water protection' zone. There are no plans in the current planning framework for urban expansion into the surrounding semi-rural land use in the long term.

To the west the site is bound by Lyon Road, with new urban development occurring as part of the WAPC endorsed Wandi North Structure Plan and Wandi South Structure Plan. The Wandi urban growth area on the western side of Lyon Road will accommodate both low and medium density housing, with higher density expected around the future planned Wandi District Centre at Anketell Road. The Wandi District Centre will provide for daily and weekly services for residents in the locality.

The approved Wandi North and Wandi South Structure Plans provides for the necessary primary school and high school to serve Wandi. A sub-district active open space (Wandi Playing Fields) is proposed approximately 500m to the north of the site.

To the south the site is bound by De Haer Road, with Anketell Road (future major freight and transport route) intersecting with Lyon Road near Lot 88. On the southern side of Anketell Road is another substantial urban growth area within the locality of Anketell contained in the WAPC endorsed Anketell North Structure Plan and Anketell South Structure Plan.

Refer to Figure 3 – Context Plan

2.3 Existing Land Use

The subject site is currently used as semi-rural land use under the City of Kwinana Town Planning Scheme No. 2 'Special Rural 13' zone. Currently the lots are mostly vegetated with cleared areas for dwellings, sheds, access tracks and firebreaks.

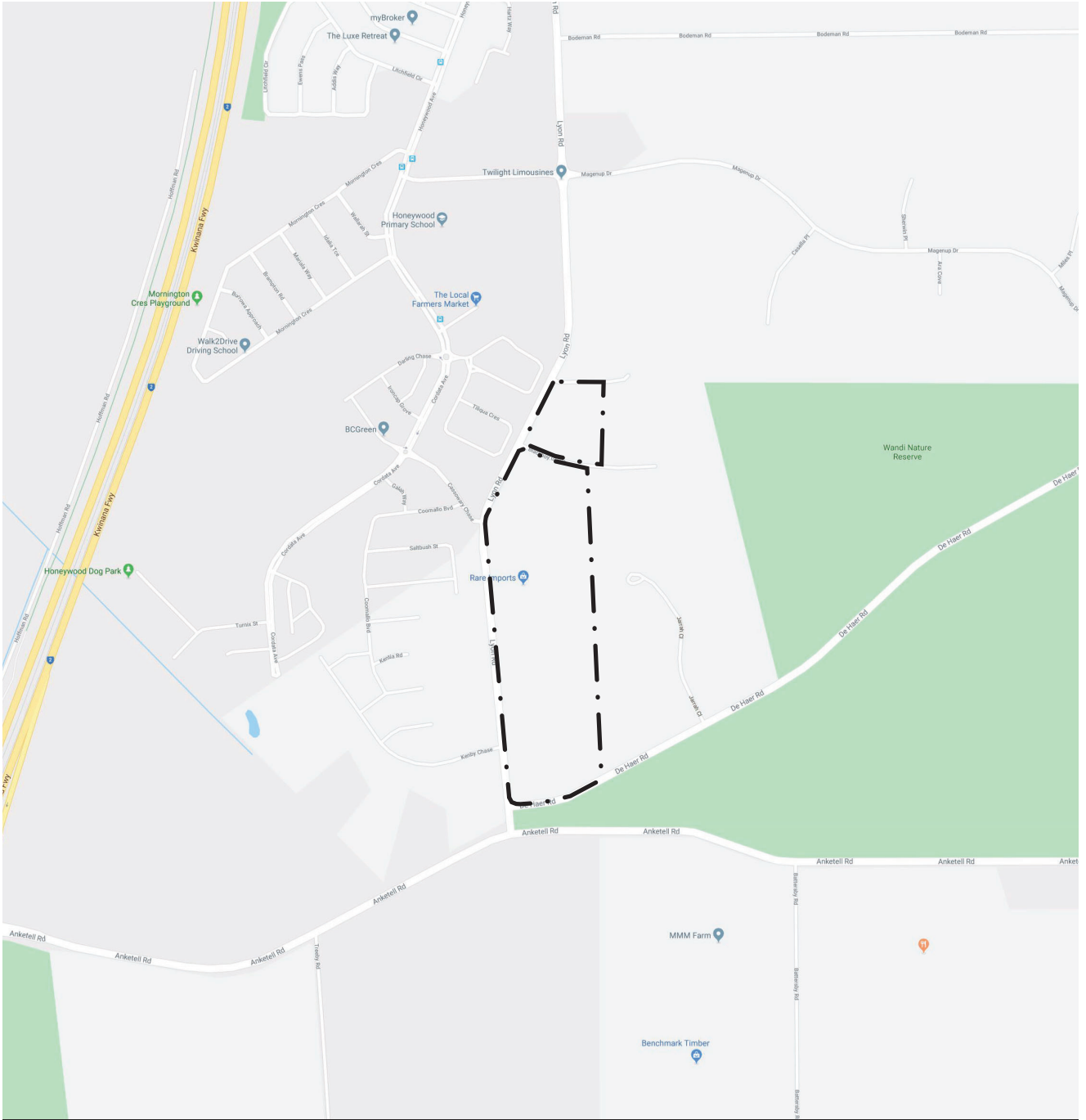


Subject Site



source: spookfish

Figure 1. Amendment Area

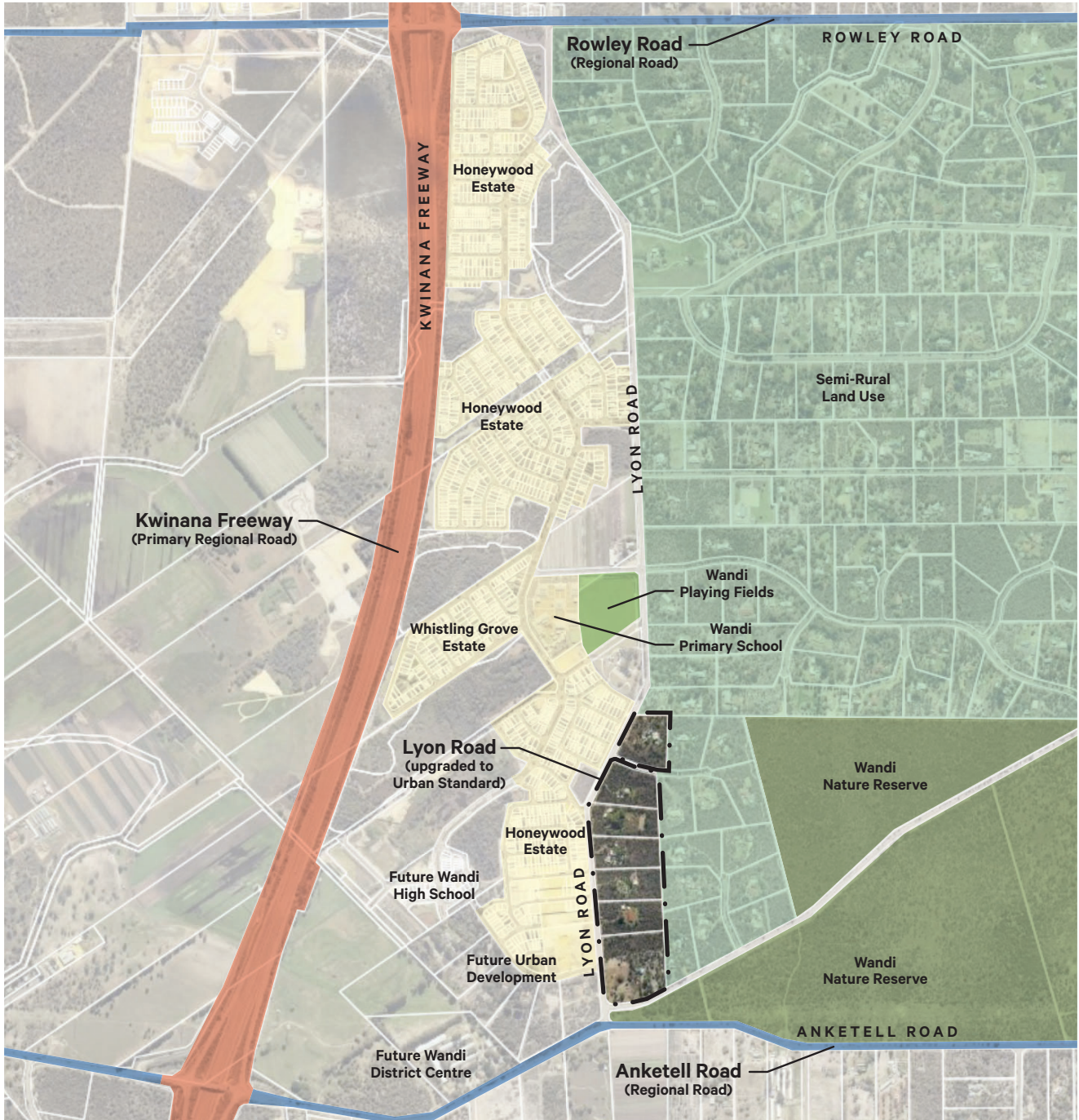


Subject Site



source: googlemaps

Figure 2. Location Plan



source: spookfish

Figure 3. Context Plan

3. Site Analysis

The following section is a general description of the site characteristics of the subject land area. The section demonstrates that there are no significant constraints to urban development. A broad opportunities and constraints analysis is provided in the Opportunities and Constraints Plan.

Refer to Figure 4 – Opportunities and Constraints Plan

3.1 Flora and Vegetation

A Level 2 Flora and Vegetation survey was undertaken by PGV Environmental in accordance with Guidance Statement 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia to inform the proposed amendment.

The Flora and Vegetation survey concluded the following for vegetation within the amendment area:

- The predominant vegetation type surveyed on the subject land is BaBmAf : Banksia attenuate/B. menziesii/Allocasuarina fraseriana Low Open Woodland over Xanthorrhoea preissii/Brachyloma preissii Open Low Heath.
- There were no Declared Rare or Priority Flora recorded on the site.
- The condition of the vegetation ranges from 'Degraded' condition to pockets of 'Good Condition'. The potential of the banksia woodland being considered a Threatened Ecological Community is low, given the degraded condition of the vegetation. When assessed against the criteria used to determine whether vegetation is a TEC, the 'patches' of banksia woodland in good condition (or better) are generally too small and scattered to form a large contiguous TEC site.
- Grand Spider Orchid (*Caladenia huegillii*) was not found to be present; and
- The foraging habitat for Black Cockatoos is small (around 3.5ha).
- The Flora and Vegetation Survey identifies no significant constraints to the rezoning of the subject land for residential use.

Refer to Appendix 2 – Environmental Assessment Report

3.2 Fauna

A Level 1 Fauna Survey was undertaken by PGV Environmental which provided for a reconnaissance survey for fauna on the subject land. The site contains banksia woodland in varying condition, with approximately 1.88ha of quality foraging habitat and 3.97 ha of poorer quality habitat. No evidence of foraging was observed on the site during the survey. Some significant trees were observed which may provide potential hollows for breeding.

The site may potentially contain other fauna such as Perth Slider and Southern Brown Bandicoot.

An Environmental Management Plan can outline the details and strategies for protection and improvement of fauna habitat within any areas identified for protection. In addition, the implementation of an appropriate construction management plan will allow for fauna relocation (via trapping) and mobile fauna to escape (or be relocated) into the retained habitat areas. Both the EMP and construction management plan can be implemented at the subdivision stage as a condition of subdivision approval. Accordingly there are no significant environmental constraints to the subject site being zoned for residential use.

Refer to Appendix 2 – Environmental Assessment Report



Figure 4. Opportunities and Constraints Plan

3.3 Commonwealth EPBC Act

Due to the presence of banksia woodland within the subject site, which is a known Black Cockatoo foraging habitat, the Proponent referred the intention for proposed urban development to occur to the Commonwealth State Government for assessment under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. The EPBC Act referral outcomes inform future planning decision making.

In June 2017 the Federal Department of Environment and Energy issued notice to the Proponent that the proposed residential development within the subject site is not a controlled action. This means that the proposed development does not require further assessment and approval under the EPBC Act before it can proceed.

3.4 Landform and Soils

The topography of the site varies with a high point approximately 38m AHD – 39.5m AHD at the north-western corner of Lot 1 falling generally to 26m AHD - 28m AHD at the eastern boundary of Lot 9. A ridge runs north-south to Lyon Road along the western boundary of the site with fall generally west to east. The average fall of the land is moderate (i.e. 5%) with varying falls between 3% - 7% across the site. The Environmental Assessment Report shows the general contours of the site.

A desktop review indicates that the subject site falls within the general surface geology Swan Coastal Plain 'Bassendean System'. The predominant soil type is 'Bassendean B1 Phase (212Bs_B1)' which is generally described as deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 metres. The predominant soils found on the subject land is very permeable allowing for good infiltration of stormwater on-site.

Further detailed geotechnical investigation would be a requirement at the subdivision approval stage, however existing development within the subject site and structure planning in the surrounding area would indicate that the subject site is suitable to support urban development. Accordingly there are no significant topographical or geological constraints that would impact residential subdivision of the amendment area.

3.5 Acid Sulfate Soils

A desktop assessment to determine the presence of Acid Sulfate Soils (ASS) indicates the possibility of ASS affecting the subject site. The Department of Planning ASS mapping shows the subject site within a 'Moderate to Low Risk of ASS' occurring within 3 metres of the natural soil surface.

The presence of ASS does not preclude development from occurring, provided that appropriate ASS management is undertaken. Should any development be proposed within areas found to be containing ASS, a detailed geotechnical acid sulfate soils investigation would be carried out (as a condition of subdivision approval) to inform the preparation and approval of an acid sulfate soils management, plan prior to works being undertaken. This is not a major constraint to the amendment area being zoned 'Residential'.

3.6 Contamination

The subject lots are not listed in the DER Contaminated Sites Database. There are no known contamination issues that would impact residential subdivision of the subject land.

3.7 Phytophthora Dieback

Environmental survey of the subject land found no presence of Phytophthora Dieback occurring within the existing vegetation communities. Given the healthy condition of vegetation species susceptible to Phytophthora Dieback, it is unlikely that infestation is an issue for the site.

3.8 Heritage

A search of the State Heritage Office's Register of Heritage Places confirms that the subject site contains no buildings or landmarks considered to be of European heritage significance.

According to the Department of Aboriginal Affairs (DAA) Aboriginal Heritage Inquiry System there are no registered heritage sites or heritage places located within or in proximity to the subject land. It is noted that a change in zoning has no impact on protection of indigenous heritage.

3.9 Groundwater

Groundwater generally flows from the east to the west towards the coast with contours approximately 18.5m AHD on the western boundary and 20.5m AHD on the eastern boundary. At the low points in the subject site, the minimum depth to groundwater is approximately 4.0m from the natural ground surface level. Preliminary engineering investigations indicate that proposed lot post-development levels would be around 7.0m, which exceeds the minimum requirement of 1.2m for groundwater clearance.

3.10 Surface Water and Wetlands

There are no permanent surface water bodies within the subject site area. Sheet drainage across the development site is generally from west to east. Sheet drainage is however limited due to the reasonably high soil permeability and infiltration at source.

The Department of Environment Regulation (DER) database Geomorphic Wetlands of the Swan Coastal Plain shows no mapped wetlands impacting the subject site. The absence of any wetland was confirmed by PGV Environmental during inspection of the site. There are no hydrological constraints that impact residential subdivision of the amendment area.

3.11 Stormwater Management

A District and Local Water Management Strategy has been prepared to demonstrate that the subject site can satisfactorily accommodate urban development and address stormwater management in accordance with WAPC 'Better Urban Water Management'. The DLWMS provides the framework to guide the preparation of an Urban Water Management Plan at the subdivision approval stage.

Refer to Appendix 3 – District and Local Water Management Strategy

3.12 Bushfire

A Bushfire Management Plan has been prepared for the subject land to demonstrate that the proposed amendment and potential subdivision of the land can comply with the bushfire framework. The BMP has been based on the Subdivision Guide Plan for the amendment area, with the following bushfire mitigation measures:

- All land zoned R10 and R12.5 will be fully cleared of vegetation.
- Land zoned R5 will be parkland cleared to reduce fuel loading but retain trees worthy of retention.
- A 10.0m wide fully cleared asset protection zone installed along the sides and rear of all areas zoned R5, R10 and R12.5.

The BMP demonstrates that the risk of bushfire can be appropriately managed.

Subject to the necessary clearing required for servicing, proposed urban development for residential lots could achieve BAL ratings of predominantly BAL-LOW to BAL 12.5, with no BAL rating exceeding BAL 29.

There are no issues with provision of secondary emergency access from the amendment area. Overall there are no bushfire constraints that cannot be adequately managed to accommodate residential subdivision.

Refer to Appendix 4 – Bushfire Management Plan

3.13 Servicing

An Engineering Servicing Report has been prepared for the amendment that demonstrates the site can be developed for residential use through provision of the necessary servicing. Accordingly there are no significant servicing constraints impacting the amendment.

Refer to Appendix 5 – Engineering Servicing Report

Reticulated Sewer and Water

The site is currently not connected to Water Corporation reticulated sewer and water services, but consultation with Water Corporation indicates that the development can be serviced by extension and upgrading from existing infrastructure in Lyon Road.

Refer to Appendix 7 – Reticulated Sewer Plan

Power, Gas and Telecommunications

There is existing 22kV high voltage and low voltage aerial power line located within the eastern verge of Lyon Road. There is sufficient capacity in the Medina zone substation to service the development without the need for upgrading of infrastructure.

There is existing telecommunications infrastructure in Lyon Road and some upgrading is likely to be required to service the development. The developer will install the required NBN ‘pipe and pit’ to allow for future installation of cables for the NBN.

Reticulated gas can be made available to the development via extension of existing infrastructure in Lyon Road.

Earthworks

Preliminary civil engineering investigations indicate that the subject land can accommodate urban development without the need for excessive earthworks. Earthworks on-site will involve localised cut and fill and removal of topsoil to create the necessary levels for servicing.

Land grading and stabilisation (using stockpiled topsoil and hydromulch) will be required to provide for level and free draining lots. Retaining walls will be used where necessary to create and absorb level differences to the satisfaction of the local authority.

Refer to Appendix 6 – Earthworks and Clearing Plan

3.14 Transport Noise

The southern portion of the amendment area is within 130 metres of Anketell Road (MRS ‘Other Regional Roads’ reservation). Anketell Road is planned to be upgraded as a major transport and freight route in future. The 130m buffer is substantial, however on its own is insufficient to protect sensitive residential use from transport noise associated with traffic using Anketell Road. The future design for the subdivision and development of the land abutting De Haer Road will need to consider transport noise.

For instance, future dwellings may require some form of ‘Quiet House Design’ package. Alternatively, should future lots be subdivided to be orientated towards Lyon Road, an acoustic wall could be installed along the secondary street (De Haer Road).

It is considered that as a condition of subdivision and/or development approval an Acoustic Assessment be prepared to demonstrate compliance with transport noise mitigation in accordance with State Planning Policy 5.4 ‘Road and rail noise’. At this local scheme amendment level of planning it is considered an Acoustic Assessment is not critical and should be undertaken to support a specific subdivision/development design outcome.

3.15 Transport

The subject land is located approximately 1km to the east of the Kwinana Freeway/Anketell Road interchange. The Kwinana Freeway/Rowley Road interchange is located approximately 2.5km to the north. The main access road to the subject land is Lyon Road. The subject land is already serviced by existing sealed roads and no new roads are necessary to support residential subdivision. Table 2 shows the classification of the key roads servicing the amendment area.

Table 2. Main Roads WA Functional Road Hierarchy

ROAD	MRAW ROAD HIERARCY CLASSIFICATION
Anketell Road	District Distributor A Road
Rowley Road	District Distributor A Road
Lyon Road	District Distributor B Road
Blackboy Grove	Local Access Road
De Haer Road	Local Access Road

Both Anketell Road and Rowley Road are proposed to be upgraded to dual carriageway and become future Primary Distributor roads in the Perth and Peel@3.5million – South Metropolitan Peel Sub-Regional Planning Framework.

The majority of Lyon Road has already been upgraded from rural standard to urban standard as part of the urbanisation in Wandí. Only the southern portion of Lyon Road remains at rural standard. The final upgrades to Lyon Road to urban standard are expected to be completed in due course upon further urbanisation in the southern portion of Wandí. The upgrading of Lyon Road is included as a common infrastructure item in the Development Contribution Area No. 5 (DCA5) – Wandí.

The existing and planned regional and local road network provides adequate access to the subject land to accommodate future residential development. Any upgrades to local access roads (i.e. Blackboy Grove, De Haer Road and Lyon Road) would be a consideration as a condition of subdivision and/or development.

Traffic Generation and distribution

The Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Development 2016 suggests a daily traffic generation rate of eight vehicle trips per day (vpd) per dwelling. Based on the Subdivision Guide Plan, the total dwelling yield would be approximately 45 dwellings equating to 360 vpd.

Transport Impact

Existing transport studies have been undertaken as part of approved Wandí North Local Structure Plan and approved Wandí South Local Structure Plan, in relation to traffic usage of Lyon Rd. Lyon Rd is forecast to ultimately carry less than 3,000vpd and is proposed to be an Access Road. Honeywood Avenue is proposed to carry the bulk of residential traffic in Wandí. Honeywood Avenue is identified in the DCA5 infrastructure items as a main internal collector road.

The additional forecast 360 vpd generated by the amendment will not adversely impact on the existing and planned local and regional road network. Cost contributions for the upgrading of Lyon Rd and Anketell Rd have already been included in DCA5 from Wandí & Anketell greenfield urban developments, with the majority of upgrading works to be funded by other source(s).

The additional 360 vpd will not adversely impact on the future traffic management at the intersection of Lyon Rd/Anketell Rd. This matter was considered resolved as part of the MRS amendment 1345/27 lifting of urban deferment and the proposed amendment is bringing the current local zoning into consistency with the urban zone.

4. Planning Framework

4.1 Metropolitan Region Scheme

The subject site is presently dual zoned Urban and Rural – water protection under the MRS.

The Amendment area was zoned Urban under the MRS through the lifting of urban deferment in July 2018 under MRS 1345/27 (see Figure 5). The proposed local scheme amendment will bring the current TPS 2 rural zoning into consistency with the urban zone.



Signed for and on behalf of the
Western Australian Planning Commission

An officer duly authorised by the Commission
pursuant to section 24 of the
Planning and Development Act 2005
for that purpose in the presence of :

Witness

Date

Metropolitan Region Scheme
Clause 27 - Transfer of land
from urban deferred zone to urban zone
Amendment No. 1345/27

Legend
 Excluded from urban deferred
and included in urban zone

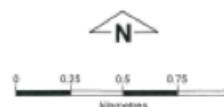


Figure 5. MRS Amendment 1345/27 gazetted 10 July 2018

4.2 Perth and Peel @ 3.5 Million

Perth and Peel @3.5million 2018 is the latest strategic framework to guide land use planning and delivery of infrastructure to accommodate anticipated population growth. The framework divides the metropolitan region into four sub-regions, with the Amendment area being located within the **South Metropolitan Sub-Regional Planning Framework**.

The South Metropolitan Sub-Regional Planning Framework identifies the Amendment area as urban deferred. With the recent MRS amendment 1345/27 lifting the urban deferment to urban, the amendment is consistent with the principles underlying the South Metropolitan Sub-Regional Planning Framework.

4.3 Directions 2031 and Beyond

Directions 2031: Spatial Policy for Perth and Peel provides strategic direction for the future growth of the Perth and Peel regions. Directions 2031 compliments the Perth and Peel@3.5million planning document in terms of strategic land use planning for the Perth and Peel. A target density of 15 dwellings per hectare is set, however in this instance as the subject site is in a transition area between urban land to the west and rural land to the east (and is on the edge of the rural water protection zone), a lower density is proposed. This will also add to increase diversity in housing accommodation within the locality.

4.4 Jandakot District Structure Plan

The Jandakot Structure Plan was finalised in August 2007 and identifies potential development areas, road networks, conservation wetlands, Bush Forever sites, main community facilities and general neighbourhood structure. The structure plan also acknowledges the boundaries of the Jandakot Underground Water Pollution Control Area, providing strategic planning direction to protect groundwater resources. The structure plan therefore coordinates and sets out the land use and development expectations of the region, whilst balancing environmental & conservational values and planning for necessary key infrastructure to support urbanisation.

Notwithstanding, the structure plan is now considered dated and the subject site is identified as rural-smallholdings land use, despite its now MRS urban zoning. The proposed residential densities and form of development in the Subdivision Guide Plan are consistent with the objectives of the Jandakot Structure Plan, whereby no changes are proposed to the current MRS 'Rural – water protection' zone. The proposed amendment will provide for a transition in density between the urban and rural land uses on either side of Lyon Road.

4.5 State Planning Policy 2.3 'Jandakot Groundwater Protection'

The Policy's primary objective is to protect the Jandakot Groundwater Protection Area from development and land uses that may have detrimental impact on the water resource. The amendment is consistent with the objectives of the Policy whereby no changes are proposed to the current MRS 'Rural – water protection' zone. The current MRS urban falls on the eastern side of the Jandakot Underground Water Pollution Control Area boundary.

No change is proposed in terms of the current land uses within the groundwater protection area. Following future subdivision of urban zoned land, there will be balance areas inside the rural water protection zone which will fall below the minimum two hectare lot size prescribed under SPP 2.3. This is unavoidable and will be further discussed in this report.

Refer to Figure 6 – Balance areas in rural water protection zone

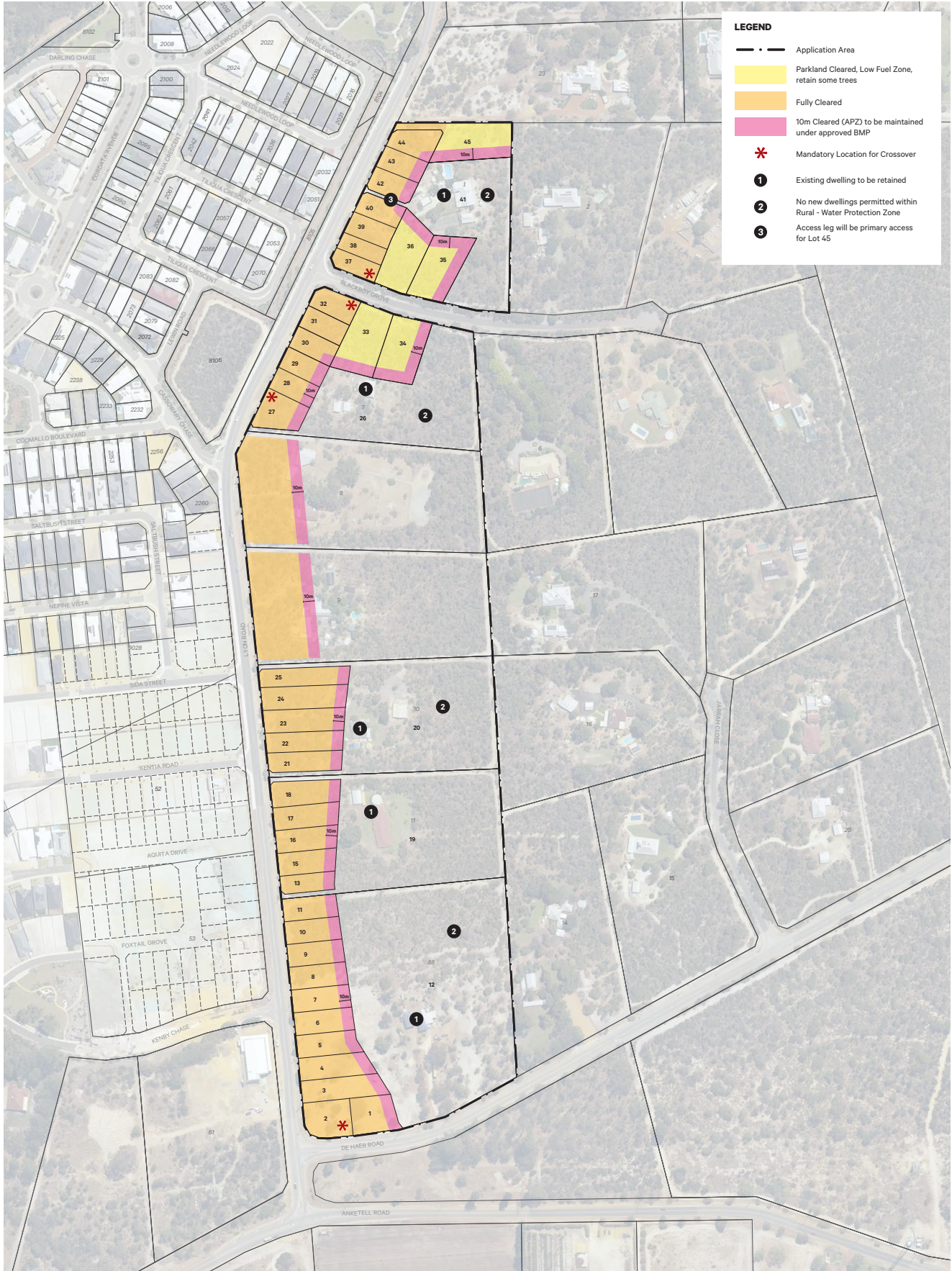


Figure 6. Balance areas in rural water protection zone

4.6 State Planning Policy 2.5 ‘Special Residential zones’

Whilst the amendment does not specify a special residential zone, the underlying principles of SPP 2.5 relate to the portion of the proposal being zoned R5. The R5 zone provides for minimum 2,000m² lot size and the Subdivision Guide Plan includes seven proposed R5 lots, with two of those lots including existing dwellings - of which lots will also incorporate residual special rural zoned land in the groundwater protection area. As previously mentioned above, the public open space contribution for future subdivision and/or development of the amendment area for residential use will need to be considered. For lots zoned R5, there would not be an expectation for a public open space contribution, due to the low density and large spacious lot size.

4.7 State Planning Policy 3.7 ‘Planning in Bushfire Prone Areas’

The provisions of the Policy, including the WAPC Guidelines for Planning in Bushfire Prone Areas apply to residential subdivision within the amendment area. The Bushfire Management Plan (refer to appendix) demonstrates that the subject site can support urban land use and that bushfire hazard risks can be adequately managed as part of a condition of subdivision and/or development approval.

4.8 City of Kwinana Town Planning Scheme No. 2

The subject site is currently zoned ‘Special Rural 13’ under TPS 2. The amendment proposes to rezone portions of the subject site to ‘Residential’ with a range of densities R5, R10 and R12.5 and with an ‘Additional Use’ to incorporate specific development controls. Some parts of the existing parent lots will remain Special Rural – 13, where no change is proposed regarding zoning and development controls under TPS 2 for the special rural zone.

Further detail regarding the specific zoning and densities proposed under this amendment is provided in this report.

4.9 City of Kwinana Eastern Residential Intensification Concept

The ERIC was prepared by the City of Kwinana in 2005 to provide strategic planning direction for the eastern part of the municipal, in particular the urban growth areas as identified in the Jandakot (District) Structure Plan. Notwithstanding the ERIC is considered dated, but the subject land in the ERIC is identified for future residential use.

4.10 Wandí South Local Structure Plan

The Wandí South Local Structure Plan provides the framework for the urbanisation on the western side of Lyon Road opposite the subject land. The subject land is an extension of the urban front that is occurring under the approved structure plan. In the context of the urban development that has and is occurring in Wandí (and Anketell North) the subject land provides for a logical downward transition in density for the rural land to the east.

5. Amendment Planning Rationale

5.1 Balance areas in rural water protection zone under 2ha

As part of MRS amendment 1345/27 there were concerns raised by Department of Water and Environment Regulation (DWER) and the City of Kwinana regarding the creation of lots that would be less than the minimum two hectare lot size requirement for lots within the TPS 2 rural water resource zone. However, this was seen to be inevitable as the existing two hectare parent lots were straddled by the MRS rural water protection zone and this would result in fragmented undersized balance lots.

Following workshops held with the Proponent and key stakeholders (i.e. City of Kwinana, Department of Planning, Lands & Heritage and DWER), the land use outcomes in the Subdivision Guide Plan was supported. This was on the basis that:

- Existing dwellings can remain as currently approved on original lots, but that no further intensification of development (i.e. new dwellings) would be permitted inside the rural water protection zone - refer to Figure 8.
- Development controls be included in the amendment to ensure no further intensification of development (i.e. new dwellings) be located within the rural water protection zone. Hence the inclusion of the 'Additional Use' provisions in the amendment.
- A rezoning to create the intended Residential R5, R10 and R12.5 zones as per the Subdivision Guide Plan would provide certainty and a suitable statutory implementation mechanism under the local scheme.
- The scheme amendment should align with the Subdivision Guide Plan. If at subdivision final approval stage for whatever reason subdivision boundaries do not follow exactly the same alignment as the residential code boundaries, the subdivision could be allowed with any R-Code boundary anomalies being rectified later on as part of the town planning scheme review process (if necessary).
- With regards to the above, ideally a subdivision application lodged concurrently with the amendment would be ideal. Subdivision approval would be granted after approval of the amendment.

Figure 6 shows the balance fragmented lot areas in the groundwater protection zone and Table 3 shows how these balance areas are to be integrated into the planned development outcome.

Table 3. Planning outcome for balance fragmented areas within groundwater protection area.

Original Lot	Proposed Subdivision Guide Plan	Planning Outcome	Future Land Use of balance areas within Rural Water Protection Zone
Lot 1 Lyon Rd	Residential (R5 & R12.5) and Special Rural - 13	<ul style="list-style-type: none"> 0.35ha area within rural water protection zone to form rear part of larger balance lot Lot 45 combined area of 0.83ha. Continued use of existing dwelling located in Residential zone. All proposed R5 and R12.5 lots to be connected to reticulated sewer. 	Restricted – current bushland to be conserved with no future dwellings permitted and no clearing of vegetation except for bushfire management, or with the approval of the local authority.
Lot 7, 8 & 9 Lyon Rd	Residential (R5 & R12.5) and Special Rural - 13	<ul style="list-style-type: none"> Residual balance areas within rural water protection zone to form rear part of proposed balance lots. Potential continued use of existing dwelling/s is located in Residential zone. All proposed R5 and R12.5 lots to be connected to reticulated sewer. 	Restricted – current bushland to be conserved with no future dwellings permitted and no clearing of vegetation except for bushfire management, or with the approval of the local authority.
Lot 10 Lyon Rd	Residential (R10) and Special Rural – 13	<ul style="list-style-type: none"> 1.30ha area within rural water protection zone forming majority of proposed balance lot. Balance lot combined area of 1.50ha. Continued use of existing dwelling located in Rural Water Protection zone. All proposed R10 lots to be connected to reticulated sewer. 	Restricted – current use of existing dwelling and outbuildings permitted. Use to be in accordance with Special Rural – 13 zone. Current bushland to be conserved with no future dwellings permitted and no clearing of vegetation except for bushfire management, or with the approval of the local authority.
Lot 11 Lyon Rd	Residential (R10) and Special Rural - 13	<ul style="list-style-type: none"> 1.43ha area within rural water protection zone forming majority of proposed balance lot. Balance lot combined area of 1.49ha. Continued use of existing dwelling located in Rural Water Protection zone. All proposed R10 lots to be connected to reticulated sewer. 	Restricted – current use of existing dwelling and outbuildings permitted. Use to be in accordance with Special Rural – 13 zone. Current bushland to be conserved with no future dwellings permitted and no clearing of vegetation except for bushfire management, or with the approval of the local authority.
Lot 88 Lyon Rd	Residential (R10) and Special Rural - 13	<ul style="list-style-type: none"> 2.65ha area within rural water protection zone forming majority of proposed balance lot. Balance lot combined area of 2.65ha Continued use of existing dwelling located in Rural Water Protection zone. All proposed R10 lots to be connected to reticulated sewer. 	Restricted – current use of existing dwelling and outbuildings permitted. Use to be in accordance with Special Rural – 13 zone. Current bushland to be conserved with no future dwellings permitted and no clearing of vegetation except for bushfire management, or with the approval of the local authority.

5.2 Residential densities and special rural zone

The amendment provides for a suitable transition from the higher density urban areas in Wandii west of Lyon Road to the rural land uses on the eastern side of Lyon Road within the groundwater protection area. This transition of the subject site is consistent with the transition principle in the Jandakot District Structure Plan.

The R5, R10 and R12.5 densities are appropriate based on the following rationale in Table 4.

Table 4. Proposed Residential Densities

R-Code density	Planning Rationale
R5	<p>Transition density between Rural Water Protection zone and R12.5 lots fronting Lyon Road.</p> <p>Allow for existing dwellings to continue under Residential zoning.</p> <p>These larger lots (>2,000m²) will provide potential for tree retention through restrictions on clearing. At subdivision and/or development approval stage any trees worthy of conservation will be identified and appropriate conditions of approval put in place to ensure retention of trees.</p>
R10 & R12.5	<p>Transition between Honeywood Estate (Wandii) on western side of Lyon Road and rural land uses on eastern side of Lyon Road.</p> <p>Larger lots will provide greater diversity in housing accommodation and suit lifestyle living.</p>

Refer to Figure 6 – Balance areas in rural water protection zone

5.3 Retention of vegetation

Opportunities for retention of vegetation have been considered within the urban context of the subject site. The original planning for the urban zoned land was to fully clear the land to make way for lots and roads.

A draft structure plan was submitted with the proposal under MRS amendment 1345/27. This included a new local access road and pockets of public open space/drainage areas within the groundwater protection zone, in order to maximise potential to use the urban zoned land for residential development. The estimated lot yield from the draft structure plan was 175 residential lots and 6 residual special rural lots.

The draft structure plan was generally not supported by the City of Kwinana, Department of Planning, Lands & Heritage, Department of Water and Environment Regulation as part of determining MRS amendment. Consideration of retention of vegetation was required. Following workshops held with the Proponent and key stakeholders (i.e. CoK, DPLH and DWER), the proposal in the Subdivision Guide Plan was supported, as this would allow for greater vegetation retention.

Vegetation retention is provided in the Subdivision Guide Plan as follows:

- R5 lots would be parkland cleared, allowing for trees worthy of retention to be kept in the surrounds of a residential dwelling. This would be determined as part of conditions of subdivision and/or development approval.
- No clearing, except for bushfire management, would be undertaken in the existing special rural zoned portion of the subject site. Existing vegetation would therefore be retained.

5.4 Public Open Space

Under the existing planning framework there is no identified requirement for regional or district open space within the subject site. The proposed low densities of R5, R10 and R12.5 provide for residential development that have large backyards and open space. There is less of a need to provide for local open space. The Wandii South Structure Plan provides for local open space parks near the intersection of Lyon Road and Blackboy Grove and Aquita Drive.

Land zoned R5 would fall under the category of Special Residential development consistent with WAPC Development Control Policy 2.5. Because of the spacious character and large lot sizes, WAPC does not specify a standard open space contribution.

The requirements for POS cash in lieu contribution could be determined at the subdivision and/or development approval stage.

5.5 Future planning - Lots 8, 9 & 23 Lyon Road

Lots 8, 9 & 23 Lyon Road have land in the MRS Urban zone but have not been investigated for subdivision potential to the same context as Lot 1, 7, 10, 11 & 88 Lyon Road. However, general planning considerations such as servicing indicate that these other lots could be further developed for residential use. These landowners will undertake their own separate planning in future.

This amendment does not adversely impact or prejudice the planning for the portions of Lots 8, 9 & 23 Lyon Road. The amendment will provide guidance as to how these other land areas should be planned in future, once the landowners are in a position to undertake further planning.

6. Conclusion

The Amendment is a planning response to the recent MRS Amendment 1345/27 which lifted the urban deferment to urban zone for the western portion of the subject site. The landowners of Lots 1, 7-11 & 88 Lyon Road have coordinated to seek a local scheme amendment to rezone their respective land to 'Residential' with a range of densities R5, R10 and R12.5.

The amendment and Subdivision Guide Plan contained in this report has been the work of close consultation with key stakeholders, including Department of Planning, Lands & Heritage, Department of Environmental and Regulation and City of Kwinana.

Planning Outcomes of the Amendment

- The Amendment area will provide a transition in residential density from the higher urban densities west of Lyon Road to the rural land uses to the east within the Jandakot Groundwater Protection area. This is consistent with the current planning framework.
- The amendment proposes land uses and residential densities that can utilise the existing road network with minimal impact and given the low scale nature of development, these will not place a significant burden on the existing and planned infrastructure and facilities in the locality.
- The amendment will provide opportunities to retain vegetation within the urban zone, through the use of low density coding and the insertion of 'additional use' provisions in the amendment to set up the necessary development controls.
- The amendment adequately considers and addresses the matter of undersize balance lots within the Rural Water Protection zone against the provisions of SPP 2.3 – matters relating to protection of groundwater quality.
- The amendment provides the foundational planning guidance for the future planning of other land within the MRS amendment 1345/27 urban zone (i.e. Lots 8, 9 & 23 Lyon Road and Lot 2 Blackboy Grove), which will be subject to their own separate planning in future, which are not part of the proponent's future subdivision plan for Lots 1, 7, 10, 11 & 88 Lyon Road.

Lots 7-11 & 88 Lyon Road, Wandii

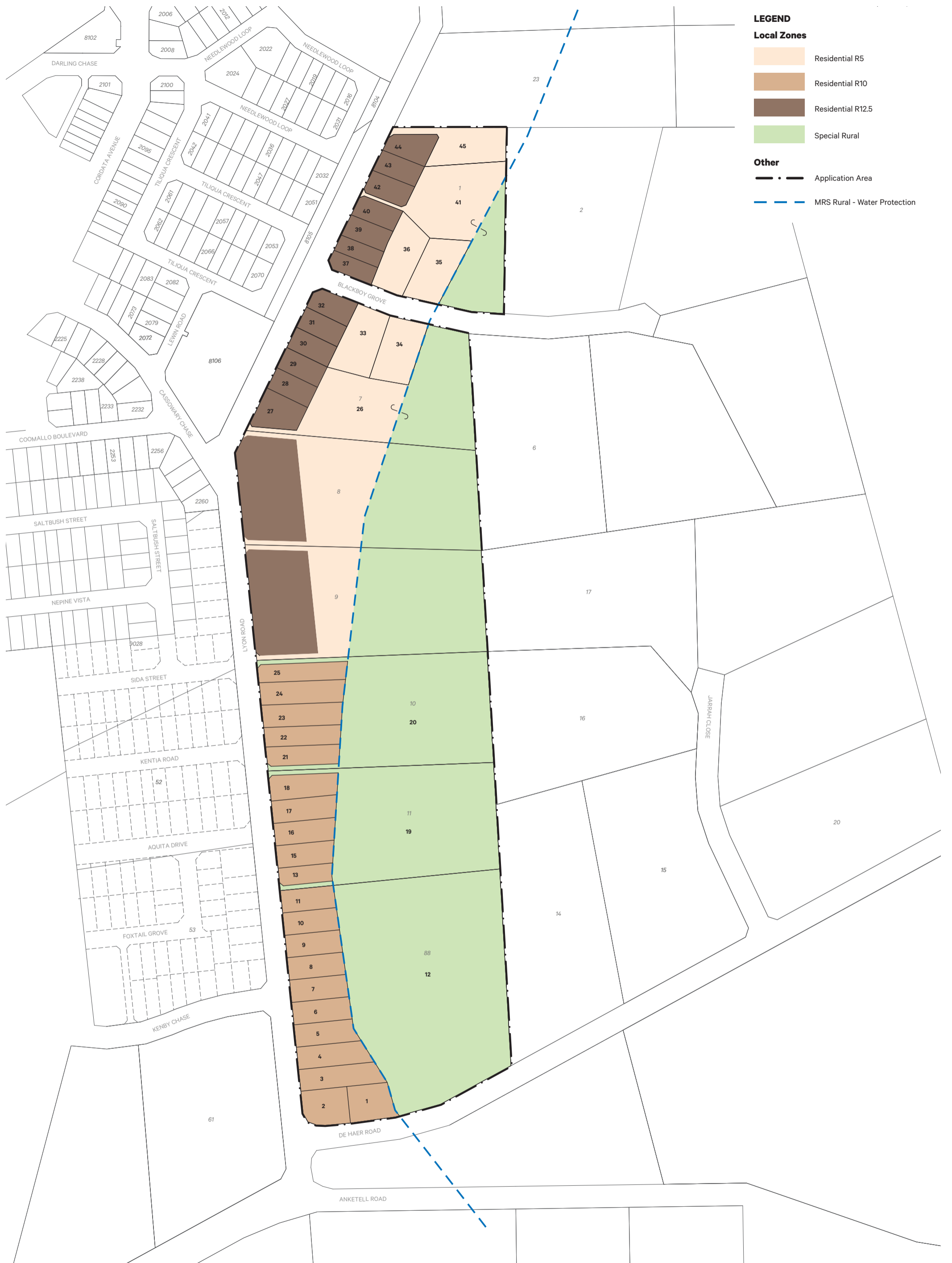
City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

Appendix 1

Subdivision Guide Plan

Lots 7-11 & 88 Lyon Road, Wandri

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162



LEGEND

Local Zones

- Residential R5
- Residential R10
- Residential R12.5
- Special Rural

Other

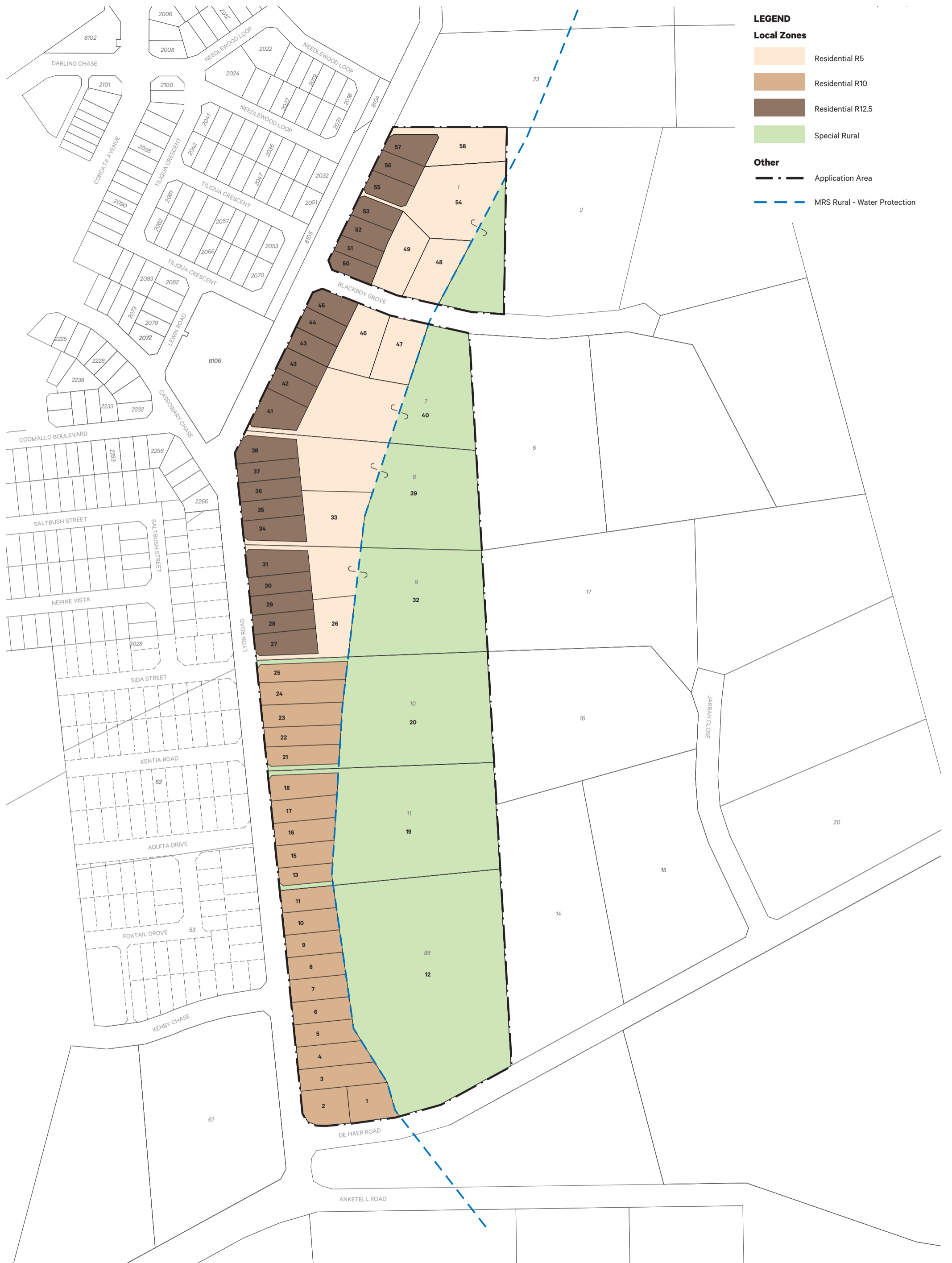
- Application Area
- MRS Rural - Water Protection

Subdivision Guide Plan

Lyon Road, Wandí

Date: 24 Jul 2020 Scale: 1:3000@A3 File: 19-360 SU-2 A Staff: JP GW Checked: GW

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Subdivision Guide Plan

Lyon Road, Wandí

Date: 15 Jul 2020 Scale: 1:3000@ A3 File: 19-360 SU-1 A Staff: JP GW Checked: GW



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Appendix 2

Environmental Assessment Report

Lots 7-11 & 88 Lyon Road, Wandri

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

LOTS 1 AND 7-11 LYON ROAD AND LOT 88 DE HAER ROAD, WANDI

ENVIRONMENTAL ASSESSMENT REPORT

Prepared for: Terranovis on behalf of the Landowners

Report Date: 29 July 2020

Version: 4

Report No. 2016-300

The logo for PGV Environmental is located in the bottom right corner of the page. It features the letters 'PGV' in a large, bold, white sans-serif font. Below 'PGV', the word 'ENVIRONMENTAL' is written in a smaller, white, all-caps sans-serif font. The background of the logo area is a vibrant orange with a subtle, curved white line that sweeps across the bottom of the page.

PGV
ENVIRONMENTAL

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1 INTRODUCTION

1.1 Background

Lots 1, 7-11 Lyon Road and Lot 88 De Haer Road, Wandi (the site) are located in the City of Kwinana approximately 27km south of the Perth Business District and 15km north-east of Rockingham City Centre (Figure 1).

The western portion of the site is zoned Urban under the Metropolitan Region Scheme (MRS) and as a Future Residential Area in the City of Kwinana draft Local Planning Strategy (LPS). The eastern portion is zoned Rural – Water Protection in the MRS and Special Rural in Town Planning Scheme No.2.

The owners of the lots 1, 7-11 Lyon Road and Lot 88 De Haer Road are planning to develop the site for residential purposes in accordance with the site's zoning and are currently preparing a Local Scheme Amendment (Appendix 1).

The owners commissioned PGV Environmental to undertake an environmental assessment of the site to assist preparation of a Subdivision Guide Plan (Appendix 2) which will be used to prepare a Local Scheme Amendment for the site. The Scope of Works for the environmental studies is listed below.

1.2 Scope of Work

1.2.1 Detailed Vegetation Survey

A Detailed Flora survey was undertaken in accordance with *EPA Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016a).

The survey included the following:

- Desktop search and review of the Department of Parks and Wildlife's (DBCA'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;
- Field survey in spring using quadrats to record native and introduced species as well as a thorough site walkover of any areas of native vegetation;
- Field survey to search for Threatened and Priority species;
- Recording of any significant plant species using a hand-held GPS;
- Description and mapping of vegetation types and vegetation condition; and
- Compilation of a flora list.

The survey was undertaken in three parts as a result of an evolving subdivision concept plan. The initial survey was undertaken in the Urban part of the site with the timing in late spring due to the timing of instructions. The second survey of land in the Rural part of the site was undertaken in March 2017. A targeted orchid survey of the whole site was undertaken in September 2017.

1.2.2 Significant Tree Survey

A Significant Tree Survey was undertaken as per requirements of the City of Kwinana in accordance with Local Planning Policy No. 1 Landscape Feature and Tree Retention (City of Kwinana, 2016). The objectives of the policy are as follows:

To ensure that:

- a) an appropriate level of information concerning significant trees and landscape features is provided at each stage of the planning framework;*
- b) retention of significant trees and landscape features are optimised through the strategic and statutory planning framework to retain the character of the area.*

The significant tree survey did not include Lots 8 and 9 Lyon Road. However, the Black Cockatoo significant tree assessment did include both lots.

1.2.3 Level 1 Fauna Survey

A Level 1 fauna survey was undertaken in accordance with *EPA Technical Guidance: Fauna Surveys for Environmental Impact Assessment* (EPA, 2016b).

The survey included:

- Desktop searches and review of DBCA's Threatened Fauna database and the Commonwealth EPBC Act Listed Fauna;
- Field survey to identify fauna habitat types and quality;
- Black Cockatoo Habitat assessment; and
- Description and mapping of fauna habitat.

1.2.4 Other Information

The Environmental Assessment Report also includes the results of the following tasks:

- A search of DWER Contaminated Sites database;
- Description of the Site geology and geomorphology based on existing mapping;
- Description of surrounding land uses and potential buffer requirements;
- Information on groundwater;
- Information relating to wetlands on or nearby to the site;
- A search of Aboriginal and Cultural Heritage databases; and
- Other public information available.

2 EXISTING ENVIRONMENT

2.1 Land Use

The site was undeveloped and fully vegetated in 1953 except the southern part of Lot 88 De Haer Road (shown as 11 on Plate 1) (Landgate, 2016a). The current 'Special Rural' development was undertaken between 1985 and 1995 (Plate 2) (Landgate, 2016a).

Plate 1: Aerial photography from 1953



Plate 2: Aerial photography from 1995



Currently the lots are largely vegetated with cleared areas for access tracks, firebreaks, dwellings and sheds.

The site is not listed as a Contaminated Site in the Contaminated Sites Database (DWER, 2016) and does not contain any land uses that are potentially contaminating.

2.2 Topography

The site slopes from a high point at the northern end of around 39m AHD down to the south and east. The lowest point is around 26m AHD at the eastern end of Lot 10 (Figure 2).

2.3 Geomorphology and Soils

2.3.1 Geology

The site is mapped as part of the Bassendean System, the oldest of the three dune systems on the Swan Coastal Plain (Bolland, 1998). The Bassendean System consists of very low relief, leached, grey siliceous Pleistocene sand dunes, intervening sandy and clayey swamps and gently undulating plains. These occur immediately west of, and partly overlie, the Pinjarra Plain. These soils are very leached, infertile and mildly acidic (DAFWA, 2016).

2.3.2 Soil Types

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 (DAFWA, 2014).

2.3.3 Acid Sulphate Soils

Acid sulphate soils (ASS) are wetland soils and unconsolidated sediments that contain iron sulphides which, when exposed to atmospheric oxygen in the presence of water, form sulphuric acid. ASS form in protected low energy environments such as barrier estuaries and coastal lakes and commonly occurs in low-lying coastal lands such as Holocene marine muds and sands. When disturbed, these soils are prone to produce sulphuric acid and mobilise iron, aluminium, manganese and other heavy metals. The release of these reaction products can be detrimental to biota, human health and built infrastructure (WAPC, 2008a).

The ASS Risk on the site has been mapped by the Department of Water and Environmental Regulation (DWER) (Landgate, 2015b) as being Moderate to Low (<3m from the surface)

2.3.4 Phytophthora Dieback

Phytophthora Dieback (*Phytophthora cinnamomi*) is a soil-borne pathogen that infects the roots of vulnerable species, limiting the roots ability to take up water, thereby weakening or killing the host plant. The spores of Phytophthora Dieback are transported by water and in soil (DBCA, 2013).

The *Common Indicator Species for the Presence of Disease caused by Phytophthora cinnamomi* list compiled by the Department of Biodiversity, Conservation and Attractions (DBCA, 2013) (then the Department of Environment and Conservation, DEC) gives a number of species that are impacted by Phytophthora Dieback. A number of these species occur on the site, including many Banksia trees and were healthy indicating that Dieback infestation is unlikely.

2.4 Hydrology

2.4.1 Groundwater

Groundwater is at 19 to 20m AHD, which is approximately 7 to 19m below surface level (DoW, 2016). Groundwater moves from east to west (DoW, 2016).

2.4.2 Wetlands

There are no wetlands mapped on the site in the Geomorphic Wetlands of the Swan Coastal Plain Dataset (Landgate, 2016b). Site assessments undertaken for this EAR confirm that no wetlands occur on the site.

3 Flora and Vegetation

3.1 Methodology

A flora and vegetation survey of the Urban part of the site was conducted by Dr Paul van der Moezel on 14 November 2016 with a follow-up survey of the eastern Rural area on 8 March 2017. A targeted survey for Threatened orchid species was undertaken on 26 September 2017.

The flora and vegetation survey included sampling from five non-permanent 10m x 10m quadrats in the area zoned as Urban, three 10m x 10m quadrats from the eastern Rural area, as well as a thorough walk through the site. Site coverage was high due to the small size of the site and easily navigable terrain.

The targeted orchid survey included walking transects on the site spaced approximately 10m apart and at a very slow walking speed. The main target species, *Caladenia huegelii* (Grand Spider Orchid), is a tall and conspicuous spider orchid that stands up to 0.6m tall and is readily identifiable from 10m by the experienced observer. The Banksia and Sheoak vegetation on the lots has an open low heath which made walking parallel transects relatively easy and visibility for orchid species was relatively high.

3.2 Database Searches

A search of the DBCA Databases (Appendix 3), DBCA Naturemap database (Appendix 4) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (Appendix 5) identified a number of species listed as either Endangered, Threatened or Priority located within a 5km radius of the site. The results from these database searches are in Table 1.

Table 1: List of Flora Species Identified from Database Searches within 5km of the Site.

Species	Common Name	Conservation Status, WA	Status under EPBC Act
<i>Andersonia gracilis</i>	Slender Andersonia	Threatened	Endangered
<i>Caladenia huegelii</i>	Grand Spider Orchid	Threatened	Endangered
<i>Centrolepis caespitosa</i>		Priority 4	Endangered
<i>Darwinia foetida</i>	Muchea Bell	Threatened	Endangered
<i>Diuris micrantha</i>	Dwarf Bee Orchid	Threatened	Endangered
<i>Diuris purdiei</i>	Purdie's Donkey Orchid	Threatened	Endangered
<i>Drakaea elastica</i>	Glossy-leaved Hammer Orchid	Threatened	Endangered
<i>Drakaea micrantha</i>	Dwarf Hammer Orchid	Threatened	Vulnerable
<i>Lepidosperma rostratum</i>	Beaked Lepidosperma	Threatened	Endangered
<i>Verticordia plumosa</i> var. <i>pleiobotrya</i>	Narrow-petalled Feather-flower	Threatened	Endangered
<i>Cyathochaeta teretifolia</i>		Priority 3	
<i>Jacksonia gracillima</i>		Priority 3	
<i>Pithocarpa corymbulosa</i>	Corymbosa Pithocarpa	Priority 3	
<i>Stylidium paludicola</i>		Priority 3	
<i>Aponogeton hexatepalus</i>	Stalked Water Ribbons	Priority 4	
<i>Dodoniaeae hackettiana</i>	Hackett's Hopbush	Priority 4	
<i>Stylidium ireneae</i>	Irene's Triggerplant	Priority 4	

Definitions of the Conservation Codes are in Appendix 6.

Table 2 examines the preferred habitat of each species and the likelihood of them being present on the site. In summary, one Threatened orchid species (*Caladenia huegelii*) and one Priority 4 species (*Dodonea hackettiana*) could possibly occur on the site.

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

Species	Preferred Habitat*	Likelihood to be present on the site
<i>Andersonia gracilis</i>	White/grey sand, sandy clay, gravelly loam near winter wet swamps	No – the site is too dry for this species
<i>Caladenia huegelii</i>	Sand or clay loam. Does not survive in disturbed areas.	Possible in areas of Good quality vegetation
<i>Centrolepis caespitosa</i>	White sand, clay. Salt flats, wet areas	No – there are no salt flats on the site
<i>Darwinia foetida</i>	Grey-white sand on swampy, seasonally wet sites near Muchea	No – not in the known range of this species
<i>Diuris micrantha</i>	Dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps	No – there are no wetlands on the site
<i>Diuris purdiei</i>	Grey-black sand, moist. Winter-wet swamps	No – there are no wetlands on the site
<i>Drakaea elastica</i>	Low-lying situations adjoining winter-wet swamps. Does not survive in disturbed areas	No – there are no wetlands on the site
<i>Drakaea micrantha</i>	Usually found on cleared firebreaks or open sandy patches that have been disturbed in wetter soils.	No – the soils are generally too sandy and dry on the site
<i>Lepidosperma rostratum</i>	Peaty and clay soils	No – the soils are sandy
<i>Verticordia plumosa</i> var. <i>pleiobotrya</i>	Clay, sandy loam. Seasonally inundated swamps, road verges.	No – No swampy areas on the site
<i>Cyathochaeta teretifolia</i>	Grey sand, sandy clay. Swamps, creek edges	No – the site is too dry for this species
<i>Jacksonia gracillima</i>	Winter wet flats; brown clay, Flat of grey sand+	No – The soils are sandy and not suitable for this species
<i>Pithocarpa corymbulosa</i>	Gravelly or sandy loam. Amongst granite outcrops	No – The soils are sandy and not suitable for this species
<i>Stylidium paludicola</i>	Peaty sand over clay. Winter wet habitats	No – there are no wetlands on the site
<i>Aponogeton hexatpalus</i>	Freshwater: ponds, rivers, claypans	No – No surface water features on the site
<i>Dodonea hackettiana</i>	Sand. Outcropping limestone	Possible
<i>Stylidium ireneae</i>	Sandy loam. Valleys near creek lines, woodland, often with Agonis.	No – the site does not have the preferred habitat of this species

* sourced from Florabase (DBCAs, 2015), DoE SPRAT Database (DoE, 2015). + sourced from GBIF, 2015.

Table 3 lists the Threatened and Priority Ecological Communities (TEC and PEC) likely to occur within 5km of the site as determined by DBCA (Reference No. 05-0316EC).

Table 3: Threatened and Priority Ecological Communities likely to occur within 5km of the Site

Ecological Community	Description	State Conservation Status	Status under the EPBC Act
SCP 8	Herb rich shrublands in clay pans	TEC	TEC
SCP 10a	Shrublands on clay flats	TEC	TEC
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	TEC
SCP 22	<i>Banksia ilicifolia</i> woodlands	Priority 2	
21c	Low lying <i>Banksia attenuata</i> woodlands or shrublands	Priority 3	
SCP24	Northern Spearwood shrublands and woodlands	Priority 3	

The two TECs, SCP8 and SCP10a, are both wetland community types and would not occur on the site due to the absence of any wetlands. The Banksia Woodland of the Swan Coastal Plain community occurs on dry sandy soils and potentially occurs on the site.

The other three Priority Ecological Communities occur on sandy soils and could occur on the site.

3.3 Survey Conditions

The conditions that the survey was undertaken in are presented in Table 4 in order to assess the adequacy of the survey. In summary, there were no constraints to the survey.

Table 4: Statement of Botanical Survey Conditions

Issue	Constraints (Y/N)*	Comment
Competency/experience of the consultant conducting the survey	No	Dr Paul van der Moezel has extensive botanical survey experience in the Perth Metropolitan Region.
Proportion of the flora identified^	No	The timing of the surveys in mid-November early March and mid-September would have recorded most of the species on the site.
Sources of information (historic/recent or new data)	No	The flora of the Perth Metropolitan Region is well documented.
Proportion of the task achieved and further work that may need to be undertaken	No	No follow-up survey required.
Timing/weather/season/cycle	No	The timing of the surveys in mid-November early March and mid-September would have recorded most of the species on the site.
Disturbances (Fire)	No	The fire age of the vegetation was greater than 5 years.
Intensity of survey (e.g. In retrospect was the intensity adequate)	No	The small site and ease of access made for a full coverage.

Issue	Constraints (Y/N)*	Comment
Completeness (e.g. was relevant area fully surveyed)	No	
Resources (e.g. degree of expertise available for plant identification)	No	Experienced botanist undertook plant identifications on site.
Remoteness and/or access problems	No	Easily accessible site in the Perth Metropolitan Region.
Availability of contextual (e.g. bioregional) information for the study area.	No	Perth's Bush Forever

*Constraints have been rated as Significant, Moderate or No constraints

^Fungi and nonvascular flora (e.g. algae, mosses and liverworts) were not specifically surveyed for during the survey.

3.4 Flora

3.4.1 Species Recorded

A total of 133 plant species were recorded during the flora surveys (Appendix 7). This total consisted of 110 native species and 23 introduced species.

The plant Families with the highest representation of species were the Fabaceae (wattles and peas - 15 species, including 11 native and 4 introduced), Orchidaceae (orchids - 12 species, including 11 native and one introduced), Poaceae (grasses – 10 species, including 3 native and 7 introduced), and the Proteaceae (Banksia family - 10 species, all native).

The quadrat data are shown in Appendix 8. The number of species recorded in the five 10m x 10m quadrats sampled in November 2016 ranged from 29 - 35 (average 33.4) with an average weed frequency of 5.8 per quadrat (17.4%). The number of species recorded in the three 10m x 10m quadrats sampled in March 2017 ranged from 25 - 31 (average 28.7) with an average weed frequency of 3.0 per quadrat (10.5%).

The total number of species is considered average in comparison to similar vegetation types in Excellent condition.

3.4.2 Conservation Significant Flora

There were no Threatened (Declared Rare) or Priority species recorded on the site.

One shrub species which was common on the site, *Brachyloma preissii*, was considered unusual in Bush Forever as it does not normally occur in Bassendean Dunes. The species was also present in the nearby Wandri Nature Reserve (Bush Forever Site 347).

The targeted orchid survey did not record any Threatened species on the site (Appendix 9). The timing of the targeted orchid survey on 26 September 2017 was considered adequate for the identification of Threatened orchid species, particularly the Grand Spider Orchid (*Caladenia huegelii*).

Prior to the survey a reference site was assessed in nearby Treeby that contains a population of *Caladenia huegelii*. The reference population is monitored by PGV Environmental annually to ensure that surveys for this species are done within the flowering period of the species for that particular

year. The plants in the reference population flowered well in 2017, starting in early September and finishing mid-October. Many plants were still flowering in later September at the time of the Lyon Road survey.

Twelve common orchid species were recorded on the site during the various surveys, none of which have conservation significance.

3.5 Vegetation

3.5.1 Vegetation Complex

Vegetation complexes are a broad description of the vegetation based on the underlying soil types and geomorphology. The vegetation on the site is mapped as being part of the Bassendean – Central and South vegetation complex which is described as ‘Vegetation ranging from woodland of *Eucalyptus marginata*-*Allocasuarina fraseriana*-*Banksia* species to low woodland of *Melaleuca* species and sedgelands on the moister sites. This area includes the transition of *E. marginata* to *E. todtiana* in the vicinity of Perth’ (Hedde *et al.*, 1980).

The Bassendean – Central and South vegetation complex occurs on Bassendean sands from Wellard north to Gngara.

3.5.2 Vegetation Types

Vegetation types are a fine level of describing vegetation and is based on the dominant species in each stratum, eg. trees, shrubs and groundcover.

One vegetation type, based on the composition of the dominant plant strata, was described and mapped (Figure 3) on the site as follows:

BaBmAf *Banksia attenuata*/*B. menziesii*/*Allocasuarina fraseriana* Low Open Woodland over *Xanthorrhoea preissii*/*Brachyloma preissii* Open Low Heath

This vegetation type, with some minor variations, was considered to cover the whole of the area surveyed. The *Banksia* and Sheoak (*Allocasuarina fraseriana*) trees range from 3-6m tall and in varying densities. *Banksia ilicifolia* was present as scattered individual trees in places. Only a few Jarrah (*Eucalyptus marginata*) trees were recorded on the site. Woolly Bush (*Adenanthos cygnorum*) was abundant on parts of the site where trees had been thinned out.

Common understorey species included *Xanthorrhoea preissii*, *Brachyloma preissii*, *Burchardia congesta*, *Gompholobium tomentosum*, *Dampiera linearis*, *Amphipogon turbinatus*, *Chamaescilla corymbosa*, *Lyginia barbata*, *Conostylis aculeata* and *Lomandra hermaphrodita*.

Common weed species included Veldtgrass (*Ehrharta calycina*), Gladiolus (*Gladiolus caryophyllaceus*), Blowfly Grass (*Briza maxima*) and Flatweed (*Hypochaeris glabra*).

The soil type is grey-brown sand at the surface.

Quadrats W1 – W8 represent the range of variations in this vegetation type on the site (Appendix 8).

3.5.3 Floristic Community Types

Floristic Community Types (FCT) are based on the whole floristic composition of the vegetation rather than being determined by soil type and geomorphology (Vegetation Complex) or the nature

of the dominant species (Vegetation Types). The FCT level of vegetation is required to identify whether any of the vegetation on the site is a Threatened or Priority Ecological Community.

The FCT of the two quadrats was determined using the spreadsheet method corresponding to Table 12 in Gibson *et al.* (1994). The quadrats corresponded closely to FCT 21 (both a and c sub-types) and FCT 23a which are described as follows:

- FCT21a – Central *Banksia attenuata* – *E. marginata* woodlands (Bassendean and Spearwood soil)
- FCT21c – Low lying *Banksia attenuata* woodlands or shrublands (Bassendean soil)
- FCT23a - Central *Banksia attenuata* and *B. menziesii* woodlands (Bassendean soil)

Based on the deep sandy soils (not low-lying as for FCT 21c) and the absence of Jarrah (*E. marginata* in 21a) the vegetation is considered most likely to be representative of FCT 23a.

3.5.4 Vegetation Condition

The vegetation condition over the site was assessed using the condition scale adopted in Bush Forever (Table 5).

Table 5: 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 disturbance. 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.
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.

The condition of the native vegetation in the western part of the site was mostly rated as Degraded with some areas Degraded – Good and one area of Good on the southern part of Lot 1 (Figure 3).

The condition of the vegetation was rated low due to the abundance of aggressive weed species, in particular Veldtgrass (*Ehrharta calycina*) and Wild Oats (*Avena fatua*). Plate 3 shows a typical area with a dense cover of grassy weeds.

Plate 3: Degraded vegetation on Lot 10 with abundant grassy weeds.



The condition of the vegetation in the eastern part of the site was rated as Very Good due to a lower presence of weed species. The difference in vegetation condition over the lots is probably due to the vegetation at the front of the lots (western side) being exposed to more use by residents and their pets as well as edge effects from cleared land to the west.

3.5.5 Conservation Significant Vegetation

Vegetation Complex

The vegetation on the site is considered to be representative of the Bassendean – Central and South vegetation complex (Heddle *et al.* 1980). According to Bush Forever (Government of Western Australia, 2000) approximately 10,919ha (24%) of the original 46,220ha on the Southern Swan Coastal Plain remains of which 5,883ha (13%) will have some protection with the full implementation of Bush Forever. The percentage protection is above the 10% minimum criteria for vegetation complexes in the Perth Metropolitan Region Constrained Area.

The vegetation on the site was not recognised as a Bush Forever site (Government of Western Australia 2000).

Bush Forever Site 347 'Wandi Nature Reserve and Anketell Road Bushland, Wand/Oakford' is located approximately 250m east of the site and immediately to the south of Lot 88 across De Haer Road. Bush Forever Site is 412.3ha in size and contains native vegetation from the Bassendean – Central and South Complex.

Floristic Community Type

The vegetation on the site was considered to be representative of FCT 23a 'Central *Banksia attenuata* and *B. menziesii* woodlands'. FCT 23a is not a Threatened or Priority Ecological Community at the State or Commonwealth level.

FCT 23a has also been recorded in the nearby Bush Forever Site 347.

Banksia Woodland TEC

The vegetation types mapped on the site contains Banksia trees in a woodland structure. Therefore, there is potential for the Commonwealth listed Threatened Ecological Community 'Banksia Woodlands of the Swan Coastal Plain' to occur on the site.

An area of vegetation containing *Banksia* trees on the Swan Coastal Plain is not necessarily the TEC unless it meets certain criteria. The key diagnostic characteristics of the Banksia Woodland TEC are contained in the Approved Conservation Advice for the TEC published at the time of the listing on 16 September 2016.

The Conservation Advice contains the following step-wise approach to use in determining if the TEC occurs on a site:

- Step 1: use the key diagnostic characteristics to determine if the ecological community is present
- Step 2: determine the condition of the patch
- Step 3: consider if the patch meets a minimum size threshold
- Step 4: the surrounding context

The assessment of the vegetation on the Lyon Road site according to the four steps is outlined below.

Step 1: use the key diagnostic characteristics to determine if the ecological community is present

The vegetation on the site contains *Banksia attenuata* and *B. menziesii* and some *B. ilicifolia* which are three of the four Banksia species that occur in the TEC. The *Banksia* species are found on site in association with other trees species, specifically *Allocasuarina fraseriana*, which is recognised as being present as an emergent species above the *Banksia* trees in the TEC.

The vegetation structure of the TEC can be quite variable with the Conservation Advice stating that the term woodland is the most typical structure, but the community may also include examples of shrubland, open woodland or forest. The vegetation type on the site containing *Banksia* trees is described as Open Woodlands and Woodland.

The species in the understorey are typical of the Families recorded for the TEC. The understorey is moderately rich with the average species richness in the quadrats, up to 40 if done in peak spring compared to the average number of plant species (59.0) recorded in 100m² plots in the FCT 23a.

The inferred Floristic Community Type (FCT) for the vegetation on site is FCT 23a 'Central *Banksia attenuata* and *B. menziesii* woodlands' which is one of the sub-communities recognised as a component of the Banksia Woodland TEC.

Therefore, according to Step 1, the vegetation type on the site could be identified as the Banksia Woodland TEC, subject to the further steps below.

Step 2: determine the condition of the patch

The vegetation on the western part of the site is mostly rated as being Degraded or Degraded to Good condition with one area in Good condition at the northern part of the site on Lot 1. The vegetation in the eastern parts of the site are generally in better condition with some areas on Lots 7 and 9 rated as Very Good. The vegetation outside the study area but within the lots is also considered to be in Very Good condition.

An area of *Banksia* woodland needs to be at least in Good condition to be considered the TEC. Any Degraded *Banksia* woodlands do not qualify as the TEC.

Therefore, the Degraded and Degraded-Good, Good-Degraded areas on the site do not meet the minimum condition required for the TEC. The areas in Good and Very Good condition do meet the minimum required condition.

Step 3: consider if the patch meets a minimum size threshold

The Banksia woodland TEC needs to meet a minimum 'patch' size depending on its condition to qualify as the TEC, as follows:

'Pristine' – no minimum patch size

'Excellent' – 0.5ha

'Very Good' – 1ha

'Good' – 2ha

The area occupied by the area of Good Banksia woodland on Lot 1 is estimated to be around 0.75ha and the area of Good Banksia woodland over Lots 11 and 88 is around 0.5ha. By themselves the areas are not large enough to qualify as the Banksia Woodland TEC. However, the areas proposed to be cleared are contiguous with other Banksia woodlands in Good condition or better further east.

Similarly, the individual areas mapped in Very Good condition on Lots 7 and 9 are only around 0.3ha and 0.4ha, respectively which is too small to qualify as the TEC. However, these areas are also contiguous with similar quality Banksia woodland on the eastern part of both lots.

The total area of Banksia woodland on the site in Good to Very Good condition that is likely to be cleared is calculated as 1.98ha. The combined area is large enough to be considered one patch of Banksia Woodland TEC. Therefore, the individual parcels on each lot in Good to Very Good condition are part of the Banksia Woodland TEC.

Step 4: the surrounding context

The Conservation Advice for the Banksia Woodland TEC requires at Step 4 consideration of other factors in determining the presence of the TEC on a site.

The Advice describes a 'patch' of Banksia woodland TEC as a discrete and mostly continuous area of the ecological community. The patch may include variations of less than 30m such as gaps caused by tracks/paths, watercourses or localised differences in vegetation types provided that the gap does

not significantly alter the overall functionality of the ecological community. Gaps of more than 30m wide usually indicate that separate patches are present.

Similar to the argument above, the areas mapped as Good and Very Good quality Banksia woodland on the site are more or less contiguous with other areas of Banksia woodland on Lots to the east which further connect to Banksia woodland in the Wandi Nature Reserve, around 250m to the east. The firebreaks between the lots are narrower than 30m. Therefore, the areas of Good and Very Good condition Banksia woodland could be considered as part of a much larger patch of Banksia woodland in the Wandi area and could be considered part of the TEC.

3.6 Significant Tree Survey

3.6.1 Methodology

A Significant Tree Survey was undertaken by PGV Environmental on 5 November 2019. Each tree was assessed according to:

- Location;
- Species;
- Size;
- Structural health;
- habitat value; and
- landscape amenity value.

The measurement of trunk diameter followed the method shown in Appendix A of Australian Standard 4970 *Protection of Trees on Development Sites*. According to AS 4970 trees can have single trunk diameter measured at breast height or, for trees with multiple trunks, each trunk can be measured and the formula specified in AS 4970 applied to achieve a minimum 500mm measurement.

3.6.2 Trees Recorded on the Site

The significant tree survey recorded 50 trees that had a diameter at breast height greater than 500mm using the AS 4970 methodology (Figure 4). The trees consisted of six species, of which Sheoak (*Allocasuarina fraseriana*) and Jarrah (*Eucalyptus marginata*) were the most abundant (Table 6). All except one of the species are native and endemic to the area (Table 6). Full details of the trees are in Appendix 10.

Table 6: Significant Trees on the Site

Species	Common Name	Native/Introduced	Number
<i>Allocasuarina fraseriana</i>	Sheoak	Native	29
<i>Eucalyptus marginata</i>	Jarrah	Native	12
<i>Eucalyptus todtiana</i>	Coastal Blackbutt	Native	4
<i>Nuytsia floribunda</i>	Christmas Tree	Native	3
<i>Eucalyptus gomphocephala</i>	Tuart	Native	1
<i>Eucalyptus</i> sp.	Eucalypt	Introduced	1
Total			50

3.6.3 Tree Characteristics

Condition

Of the 50 trees, there were 35 in healthy condition. The remaining trees were in Fair or Poor condition with dead branches, leaning or coppiced at the base.

Height

All trees were between 4 and 10m in height.

Diameter

Four trees had a calculated DBH greater than 1000 mm and nine between 750 and 1000mm. The remaining were between 500 and 750mm using the AS 4970 method.

Habitat Values

All the trees would provide some habitat for birds, including Black Cockatoos, and bats. There were few small hollows and none with large hollows.

Landscape Amenity Values

The 35 significant trees in healthy condition have some landscape value. The remaining 15 are either in fair or poor condition and have low amenity value.

3.7 Fauna

3.7.1 Fauna Habitat

The native fauna habitat on the site is described as a Low Open Woodland habitat which is interspersed with buildings, cleared and garden areas. Fauna habitat can be assessed according to the following categories: (Coffey Environments, 2009)

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.

The habitat on the site is disturbed by the development of houses and the likely presence of domestic pets. The vegetation on the site is mostly described as Degraded or Degraded to Good. The habitat has limited connectivity to the east through similar rural development and connecting to Bush Forever site 347 (Wandi Nature Reserve and Anketell Road Bushland). Therefore, the site is considered to be Good Fauna Habitat.

3.7.2 Conservation Significant Fauna

A search of DBCA's Naturemap (Appendix 4) and the EPBC Act Protected Matters Search Tool (Appendix 5) identified 28 threatened species of fauna listed as potentially occurring within a 4km radius of the site (Table 7).

Table 7: List of Fauna Species Identified from Database Searches

Scientific Name	Common Name	Conservation Status, WA	Status under EPBC Act
<i>Botaurus poiciloptilus</i>	Australasian bittern	Schedule 2 - EN	Endangered
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	Schedule 2 - EN	Vulnerable
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	Schedule 2 - EN	Endangered
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum, Nguara	Schedule 2 - EN	Vulnerable
<i>Rostratula benghalensis australis</i>	Australian Painted Snipe	Schedule 2 - EN	Endangered Marine/ Migratory
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	Schedule 3 - VU	Vulnerable
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	Schedule 3 - VU	Vulnerable
<i>Leipoa ocellata</i>	Mallee Fowl	Schedule 3 - VU	Vulnerable
<i>Phascogale tapoatafa subsp. (WAM M434)</i>	South-western Brush-tailed Phascogale, Wambenger	Schedule 3 - VU	
<i>Calidris ferruginea</i>	Curlew Sandpiper	Schedule 3 - VU Schedule 5 - IA	Critically Endangered
<i>Numenius madagascariensis</i>	Eastern Curlew	Schedule 3 - VU Schedule 5 - IA	Critically Endangered
<i>Apus pacificus</i>	Fork-tailed Swift	Schedule 5 - IA	Marine/Migratory
<i>Ardea alba (also listed as Ardea modesta)</i>	Great Egret, White Egret	Schedule 5 - IA	Migratory/ Wetland
<i>Ardea ibis</i>	Cattle Egret	Schedule 5 - IA	Migratory/ Wetland

Scientific Name	Common Name	Conservation Status, WA	Status under EPBC Act
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Schedule 5 - IA	Marine/ Migratory
<i>Merops ornatus</i>	Rainbow Bee-eater	Schedule 5 - IA	Marine/ Migratory
<i>Motacilla cinerea</i>	Grey Wagtail	Schedule 5 - IA	Migratory/ Marine
<i>Pandion haliaetus (also listed as Pandion cristatus)</i>	Osprey	Schedule 5 - IA	Marine/ Migratory
<i>Plegadis falcinellus</i>	Glossy Ibis	Schedule 5 - IA	Marine/Migratory
<i>Tringa nebularia</i>	Common Greenshank	Schedule 5 - IA	Marine/ Migratory
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle		Marine
<i>Leista lineata</i>	Perth Slider, Lined Skink	Priority 3	
<i>Macropus irma</i>	Western Brush Wallaby	Priority 4	
<i>Oxyura australis</i>	Blue-billed Duck	Priority 4	
<i>Synemon gratiosa</i>	Graceful Sun-moth	Priority 4	
<i>Thinornis rubricollis (also listed as Charadrius rubricollis)</i>	Hooded Plover	Priority 4	Marine
<i>Isodon obesulus fusciventer</i>	Southern Brown Bandicoot, Quenda	Priority 4	
<i>Macropus eugenii derbianus</i>	Tammar Wallaby	Priority 5	

DBCA classifies fauna under five different Priority codes and rare and endangered fauna are classified under the *Wildlife Conservation (Specially Protected Fauna) Notice 2014* into five schedules of taxa (DBCA, 2015). These are outlined in Appendix 6.

Outlined below in Table 8 is a short description of each of the species that were identified in the NatureMap Species Report search and the EPBC Protected Matters Search Tool in Table 7. The preferred habitat has been compared to the habitats on the site described above and the likelihood of each species to be present was determined.

Table 8: Likelihood of Conservation Significant Species being Present on the Site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Botaurus poiciloptilus</i>	Australasian bittern	The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands.	No – no wetlands on the site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	Baudin's Black-Cockatoo mainly occurs in eucalypt forests, especially Jarrah (<i>E. marginata</i>), Marri (<i>Corymbia calophylla</i>), also Karri (<i>E. diversicolor</i>) forest, often feeding in the understorey on proteaceous trees and shrubs, especially banksias (SEWPaC, 2012).	Unlikely – outside of modelled range
<i>Calyptorhynchus latirostris</i>	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 <i>Banksia</i> , <i>Dryandra</i> , <i>Hakea</i> , <i>Eucalyptus</i> , <i>Grevillea</i> , <i>Pinus</i> and <i>Allocasuarina</i> 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)	Potentially – Foraging habitat on the site
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum, Nguara	The Western Ringtail Possum is a medium sized nocturnal marsupial. This species occurs in and near coastal Peppermint Tree (<i>Agonis flexuosa</i>) forest and Tuart (<i>Eucalyptus gomphocephala</i>) dominated forest with a Peppermint Tree understorey.	Highly Unlikely – preferred habitat does not occur on the site
<i>Rostratula benghalensis australis</i>	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.	No – no wetlands on the site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Calyptorhynchus banksii naso</i>	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 (<i>Corymbia calophylla</i>), Jarrah (<i>Eucalyptus marginata</i>) and Karri (<i>E. diversicolor</i>) and it feeds primarily on the seeds of Marri.	Potentially – Foraging habitat on the site (Sheoak and some Jarrah)
<i>Dasyurus geoffroii</i>	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.	Unlikely due to human disturbance and domestic predators
<i>Leipoa ocellata</i>	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 mallee habitat on the site
<i>Phascogale tapoatafa subsp. (WAM M434)</i>	South-western Brush-tailed Phascogale, Wambenger	Southern Brush-tailed Phascogales are arboreal marsupials which require tree hollows in suitable woodland or forest and rely on abundant invertebrate prey to sustain populations (Pescott, 2012).	Highly unlikely due to human disturbance and domestic predators
<i>Calidris ferruginea</i>	Curlew Sandpiper	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	No – no suitable habitat on the site
<i>Numenius madagascariensis</i>	Eastern Curlew	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets.	No – no suitable habitat on the site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Apus pacificus</i>	Fork-tailed Swift	The Fork-tailed Swift is almost exclusively aerial and is not known to breed in Australia. They are seen in inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. <i>Apus pacificus</i> subsp. <i>pacificus</i> is the only subspecies to migrate to Australia.	No – no suitable habitat on the site – this species may fly over the site but is unlikely to land
<i>Ardea alba</i> (also listed as <i>Ardea modesta</i>)	Great Egret, White Egret	The Eastern Great Egret has been reported in a wide range of wetland habitats and usually frequents shallow waters. This species feeds on fish, insects, crustaceans, molluscs, frogs, lizards, snakes and small birds and mammals.	No – no suitable habitat on the site
<i>Ardea ibis</i>	Cattle Egret	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands with breeding in Western Australia recorded in the far north in Wyndham in colonies in wooded swamps such as mangrove forest. This species forages away from water on low lying grasslands, improved pastures and croplands generally in areas that have livestock eating insects, frog, lizards and small mammals.	No – no suitable habitat on the site
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	No – no suitable habitat on the site
<i>Merops ornatus</i>	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.	Possible intermittent visitors but unlikely to breed due to the lack of open water
<i>Motacilla cinerea</i>	Grey Wagtail	The Grey Wagtail is mostly recorded in coastal areas in Western Australia (ALA, 2015) however is widespread.	No – no suitable habitat on the site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Pandion haliaetus</i> (also listed as <i>Pandion cristatus</i>)	Osprey	Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They feed on fish, especially mullet where available, and rarely take molluscs, crustaceans, insects, reptiles, birds and mammals.	No – no suitable habitat on the site
<i>Plegadis falcinellus</i>	Glossy Ibis	The Glossy Ibis is the smallest ibis known in Australia. This species preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation but do not breed in South-west Western Australia..	No – no suitable wetland habitat on the site
<i>Tringa nebularia</i>	Common Greenshank	The Common Greenshank is a wader and does not breed in Australia. This species can be found in many types of wetlands and has the widest distribution of any shorebird in Australia. This species typically feeds on molluscs, crustaceans, insects, and occasionally fish and frogs.	No – no suitable wetland habitat on the site
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	The White-bellied Sea-Eagle is found in coastal habitats with large areas of open water, especially those close to the sea-shore. This species feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion and offal.	No – the site is not coastal habitat – may fly over the site
<i>Lerista lineata</i>	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).	Possible – often found in Banksia habitat
<i>Macropus irma</i>	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 due to human habitation and the disturbed understorey vegetation

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Oxyura australis</i>	Blue-billed Duck	The Blue-billed Duck is found on terrestrial wetlands in temperate regions, that are freshwater to saline, and may be natural or artificial. It nests in rushes, sedges, Lignum Muehlenbeckia cunninghamii and paperbark Melaleuca (Birdlife International, 2015). The species is almost completely aquatic, and is seldom seen on land. Non-breeding flocks, often with several hundred individuals, congregate on large, deep open freshwater dams and lakes in autumn. The daylight hours are spent alone in small concealed bays within vegetation or communally in large exposed rafts far from the shore (Birds in Backyards, 2015).	No – no suitable wetland habitat on the site
<i>Synemon gratiosa</i>	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 <i>et al.</i> , 2011).	No – no suitable <i>Lomandra</i> habitat on the site
<i>Thinornis rubricollis</i> (also listed as <i>Charadrius rubricollis</i>)	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
<i>Isoodon obesulus fusciventer</i>	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, 2012a).	Possible
<i>Macropus eugenii derbianus</i>	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, 2012b).	Highly Unlikely as the understorey is too disturbed.

* Habitat descriptions from DotEE (2016) SPRAT Database

Species identified in the database searches possibly present on the site were:

- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*);
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*);
- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*);
- Perth Slider, Lined Skink (*Lerista lineata*); and
- Southern Brown Bandicoot, Quenda (*Isoodon obesulus fusciventer*).

The amount of foraging habitat for Black Cockatoos in the survey area is calculated to be around 5.95ha. More than half of the habitat, 3.66ha (61%) is in Degraded or Degraded to Good condition due to a very weedy understorey.

The surveyed area contains 11 Jarrah trees with a diameter greater than 50cm at breast height (Figure 4). These trees are identified as potential breeding trees for Black Cockatoos.

A Chuditch was recorded in 2009 in Leslie Road, Wandi approximately 2km east of the site and at the eastern end of the Wandi Nature Reserve. The Chuditch is unlikely to occur on the site due to the degraded and weedy vegetation and the presence of domestic cats and dogs.

3.7.3 Biodiversity Value

From a fauna perspective, the vegetation on the site consists of Disturbed Fauna Habitat that would not support many native fauna species. The site is located in the vicinity of Bush Forever site 347 (Wandi Nature Reserve and Anketell Road Bushland). The Bush Forever sites provide a much larger area for fauna with higher quality habitat.

Native fauna assemblages on the site are likely to be impacted by the presence of introduced feral species such as feral Cats, Foxes, Rabbits, Black Rats and House Mice.

It is not possible to assess the biodiversity value at a genetic level based on the information available, however due to the disturbed nature of the site and the presence of the much larger and better quality Bush Forever sites in the vicinity the biodiversity value at the genetic level is highly unlikely to be impacted as a result of developing the site.

3.8 Heritage

3.8.1 Aboriginal Heritage

There are no registered heritage sites or heritage places located on the site (DAA, 2016) (Appendix 11).

3.8.2 Cultural Heritage

The historical Mandogalup School, commemorated by a stone marker, is located to the south of the site. There are no sites within the proposed urban development area (Heritage Council, 2016).

4 LEGISLATION, POLICY AND GUIDELINES

The environmental assessment of this site has taken into consideration the following legislation, policy and guidelines and these will guide the required and expected management outcomes from the Commonwealth, State and Local government agencies.

4.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important heritage places, ecological communities, flora and fauna that are defined in the Act as matters of national environmental significance.

The EPBC Act applies to the following seven matters of national environmental significance:

- World heritage sites;
- National heritage places;
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed);
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas; and
- Nuclear actions.

The EPBC Act applies to 'actions' which:

- Have a 'significant impact' on 'matters of national environmental significance';
- Are undertaken by Commonwealth government agencies and have a significant impact on the environment anywhere in the world; or
- Are undertaken by any person and have a significant impact on Commonwealth land (even if the activity is not actually carried out on the Commonwealth land).

A significant impact, under the EPBC Act, is determined by the value, quality and sensitivity of the environment which is to be impacted and the magnitude, duration, intensity and geographic extent of the impacts (DoE, 2013). *The Matters of National Environmental Significance. Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DoE, 2013) provides a guide for determining the significance of an impact. Proposed actions that are deemed to have a significant impact should be referred to the Minister.

The two species of Black Cockatoos identified as possibly utilising the site are listed under the EPBC Act. Guidance as to whether an action should be referred under the Act is provided in the *EPBC Act referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii Forest red-tailed Black Cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines).

Under these guidelines clearing more than 1ha of foraging habitat for any of these species has a 'high risk' of a significant impact and should be referred under the Act for assessment by the Department of the Environment and Energy (DotEE). The amount of foraging habitat for Black Cockatoos in the survey area was calculated to be around 5.95ha.

Clearing more than one Black Cockatoo breeding habitat tree is also considered a potential significant impact under the Referral Guidelines. The surveyed area contains 11 Jarrah trees with a diameter greater than 50cm at breast height (Figure 4). These trees are identified as potential breeding trees for Black Cockatoos. Six of the trees are within the urban development footprint and are highly likely to be cleared. The other five trees are outside of the development footprint.

The Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC) occurs on the site, if the vegetation is considered part of a larger 'patch' that includes surrounding properties and the Wandii Nature Reserve. There are no specific guidelines to assist with determining the level of impact on the TEC which would be considered significant. The significance of the impact of clearing any Good or Very Good quality Banksia woodland on the site could be determined at the same time the proposed development is referred for reasons of Black Cockatoo impacts.

The proposal to clear the foraging habitat and potential breeding habitat trees was referred under the EPBC Act in 2017. The Commonwealth Department of the Environment and Energy determined on 16 June 2017 that the proposed clearing of Black Cockatoo habitat and Banksia woodland was Not a Controlled Action which did not need to be assessed (Appendix 12).

4.2 Environmental Protection Act 1986

Under the EP Act, clearing of native vegetation requires a permit from the DER unless there is an exemption under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Proposals that have approval by means of a Ministerial Statement and which are implemented in accordance with that Statement are exempt from requiring a clearing permit to clear native vegetation. Clearing in accordance with an approved subdivision is also exempt.

The site will most likely not require a clearing permit as clearing will be undertaken after an approved subdivision has been granted.

5 ENVIRONMENTAL ASSESSMENT

5.1 Landuse

The previous and current land uses do not provide an impediment to the proposed urban development.

5.2 Topography

The site is undulating and slopes down to the south and east. The slope is not steep and is not an impediment to the proposed urban development.

5.3 Geomorphology and Soils

The Bassendean dune soils are not an impediment to the proposed urban development.

The ASS risk for the site is mapped as Moderate to Low. Therefore, the WAPC Acid Sulphate Soils Planning Guidelines (WAPC, 2009) will need to be followed. The Guidelines indicate that “acid sulphate soils are technically manageable in the majority of cases”. ASS Investigation and, if required, Management Plans should be prepared at subdivision stage once the detailed design of the site is finalised. This will be undertaken in accordance with the Acid Sulphate Soils Guideline Series: Identification and Investigation of Acid Sulphate Soils and Acidic Landscapes (DEC, 2009) and Treatment and Management of Soils and Water in Acid Sulphate Soil Landscapes (DEC, 2011).

Development on the site will also likely require hygiene protocols in place prior to earthworks to ensure that any spread of Dieback to the nearby Bush Forever Site does not occur.

5.4 Drainage and Stormwater Management

Groundwater is several metres below the surface and is unlikely to be impacted as a result of urban development. There are no surface water features on the site or in close proximity. Stormwater management on the site will be required to be undertaken in accordance with *Better Urban Water Management* (WAPC, 2008b). An Urban Water Management Plan (UWMP) will be required at subdivision stage. The UWMP will need to outline the drainage and stormwater management for the site.

5.5 Flora and Vegetation

No Declared Rare or Priority flora species have been recorded on the site.

The vegetation on the western part of the site is mainly in Degraded or Good-Degraded condition made up of a Banksia/Sheoak Low Open Woodland. The vegetation in the western part is not in good enough condition or of sufficient size in the small area rated as Good to be considered to be representative of the Banksia Woodlands of the Swan Coastal Plain TEC. The Banksia/Sheoak Low Open Woodland vegetation in the eastern part is in better condition and could be considered large enough as one ‘patch’ to qualify as the Banksia Woodlands of the Swan Coastal Plain PEC at State level and TEC at Commonwealth level.

Clearing of the Banksia woodland in the Urban zoned part of the site has been approved according to the Not a Controlled Action decision made under the EPBC Act on 16 June 2017 (Appendix 12).

The vegetation complex and Floristic Community Types are both well protected and reserved and are not regionally or locally significant.

The significant trees identified using the AS 4970 Standard should be considered for retention where lot size and road construction allow. The size, health and overall value of the trees should be taken into consideration for any retention.

5.6 Fauna

5.6.1 Significant Fauna

Carnaby's, Baudin's and Forest Red-tailed Black Cockatoos

The area included in the flora, vegetation and Black Cockatoo habitat surveys is slightly larger than the Urban zoning. The area surveyed contains around 1.88ha of quality foraging habitat for Black Cockatoos and a further 3.97ha of poorer quality habitat. No evidence of foraging was observed on the site. The area surveyed contains six Jarrah trees with a diameter at breast height greater than 500mm that are considered potential breeding trees for Black Cockatoos and may be cleared.

Clearing of Black Cockatoo foraging habitat and potential breeding habitat trees on the site was referred under the EPBC Act. The area referred and extent of habitat proposed to be cleared was slightly larger than the Urban zoned land. The proposed clearing was deemed to be Not a Controlled Action on 16 June 2017 (Appendix 12). Clearing of the Black Cockatoo habitat in the Urban area is therefore approved under the EPBC Act.

The Perth Slider and Southern Brown Bandicoot may occur on the site.

During development if these species are present, a fauna relocation exercise targeting these species should be undertaken immediately prior to clearing by an appropriately qualified zoologist with the fauna relocated to a site approved by the Department of Biodiversity, Conservation and Attractions.

5.6.2 Other Fauna

Many birds breed during spring therefore it is recommended that clearing should be undertaken outside of the spring-early summer nesting season to mitigate potential impacts on young chicks. There are also birds that breed during the remainder of the year therefore if any nests containing eggs or chicks are discovered during clearing an appropriately qualified fauna specialist should be contacted.

Immediately prior to clearing, the fauna relocation exercise should also target any reptile species located during the search.

5.7 Heritage Management

There are no registered Aboriginal Heritage or Cultural Heritage sites within the proposed urban development boundary. Heritage is not an impediment to the proposed urban development.

6 CONCLUSION

The Environmental Assessment Report concludes that development of the Urban zoned portion of the site should be supported for the following reasons:

1. The physical characteristics of the site (topography, slope, soil type) are all suitable for urban development;
2. Stormwater can be managed such that urban development will not impact on groundwater or any wetlands nearby;
3. The vegetation is mostly in degraded to good condition and does not contain any Threatened or Priority flora;
4. The vegetation in the Urban part of the site is too degraded to be considered a Threatened or Priority Ecological Community. Clearing of Banksia Woodland on the site was considered Not a Controlled Action under the EPBC Act (EPBC 2017/7908) with no assessment required;
5. The foraging habitat for Black Cockatoos is small, less than 3.5ha. The number of potential breeding habitat trees for Black Cockatoos is low, with eleven Jarrah trees recorded, of which six are in the development footprint and likely to be cleared for development. Clearing of Black Cockatoo habitat was considered Not a Controlled Action under the EPBC Act (EPBC 2017/7908) with no assessment required;
6. A number of other significant trees were identified on the site and consist mostly of Sheoak and some multi-stemmed Jarrah trees. Retention of any of the healthy individuals of these trees should be considered where lot size and road construction allow;
7. Other fauna can be managed prior to clearing; and
8. There are no heritage sites that impact on development.

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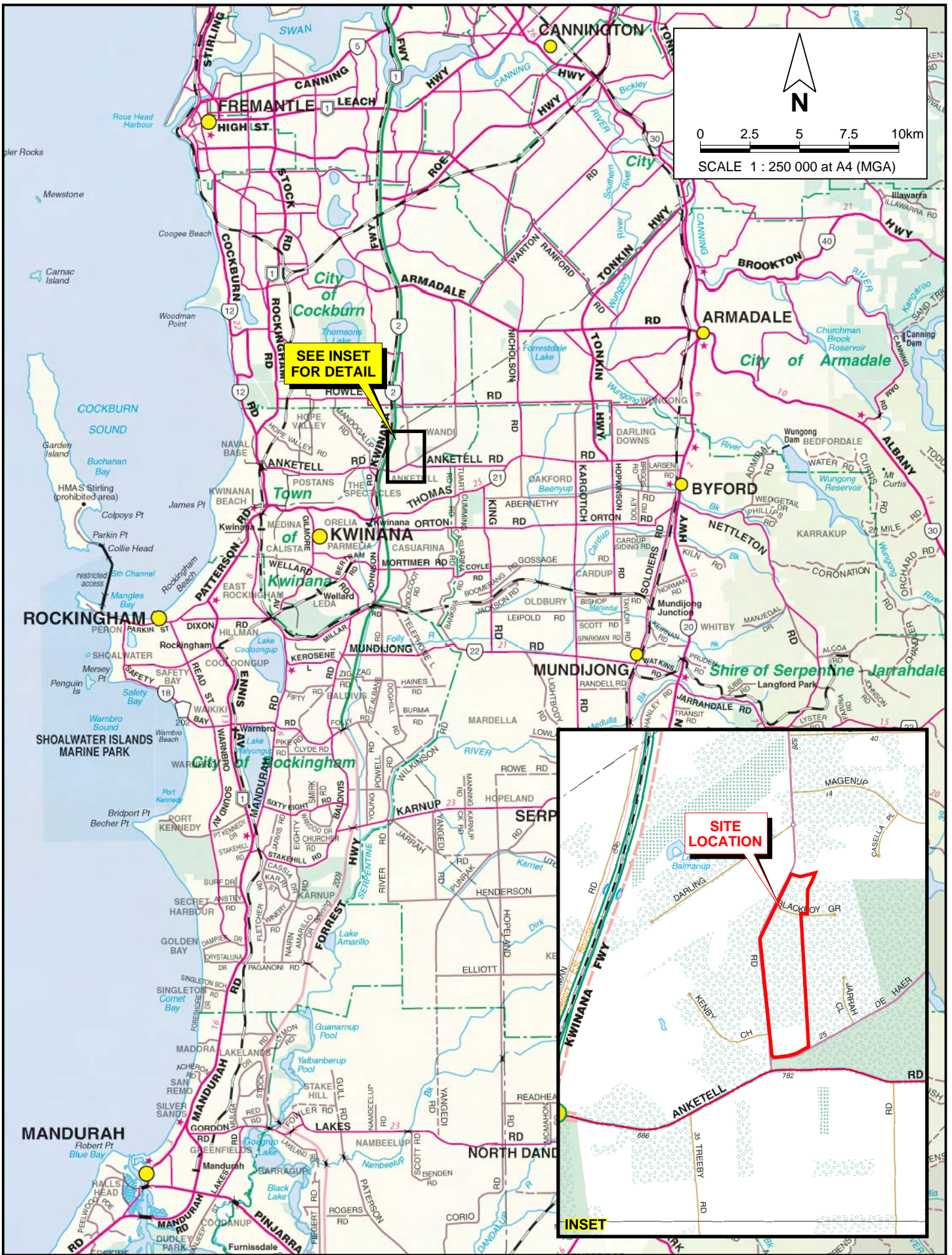
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FIGURES



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SCALE 1 : 250 000 at A4 (MGA)

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SITE LOCATION

INSET

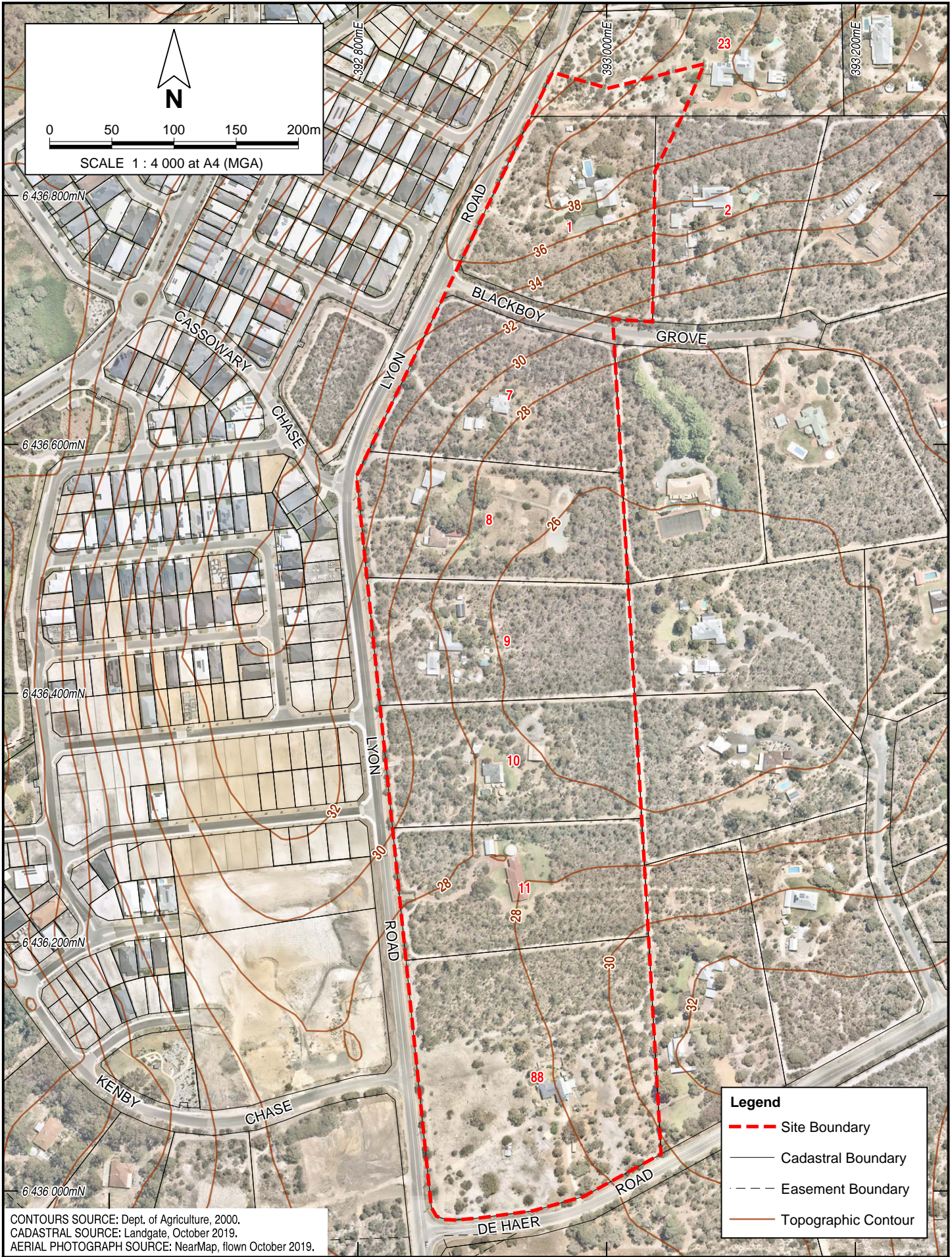
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Job: 10273 Rpt: 2016-300	Revision: A

Terranovis on behalf of the Landowners
 ENVIRONMENTAL ASSESSMENT REPORT
 LOTS 1 AND 7-11 LYON ROAD AND LOT 88 DE HAER ROAD, WANDU

SITE LOCATION

Figure 1



Legend

- - - Site Boundary
- Cadastral Boundary
- - - Easement Boundary
- Topographic Contour

CONTOURS SOURCE: Dept. of Agriculture, 2000.
 CADASTRAL SOURCE: Landgate, October 2019.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown October 2019.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2016-300-402.dgn

pgv ENVIRONMENTAL

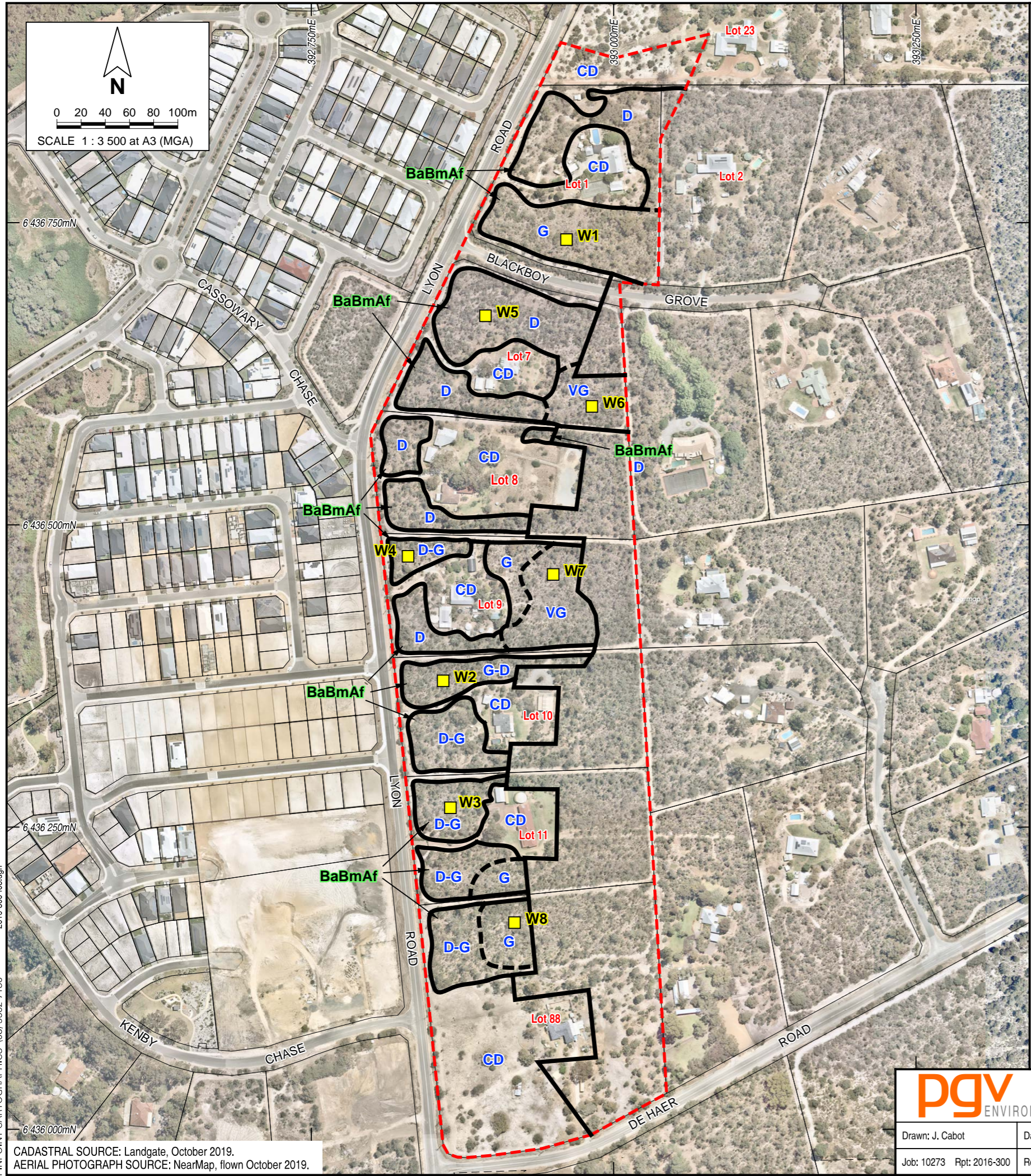
Drawn: J. Cabot Date: 25 Nov 2019

Job: 10273 Rpt: 2016-300 Revision: A

Terranovis on behalf of the Landowners
 ENVIRONMENTAL ASSESSMENT REPORT
 LOTS 1 AND 7-11 LYON ROAD AND LOT 88 DE HAER ROAD, WANDU

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



Legend

- - - Site Boundary
- Cadastral Boundary
- Easement Boundary
- Quadrat Location
- Vegetation Type Boundary
- BaBm Vegetation Type
- Vegetation Condition Boundary
- G Vegetation Condition

Vegetation Types

BaBmAf
Banksia attenuata/B. menziesii/Allocasuarina fraseriana Low Open Woodland over *Xanthorrhoea preissii/Brachyloma preissii* Open Low Heath

Vegetation Condition
 (SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
 Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
 Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - 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.

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

D - 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.

CD - Completely Degraded
 The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

CI - Cleared
 No native vegetation remaining.

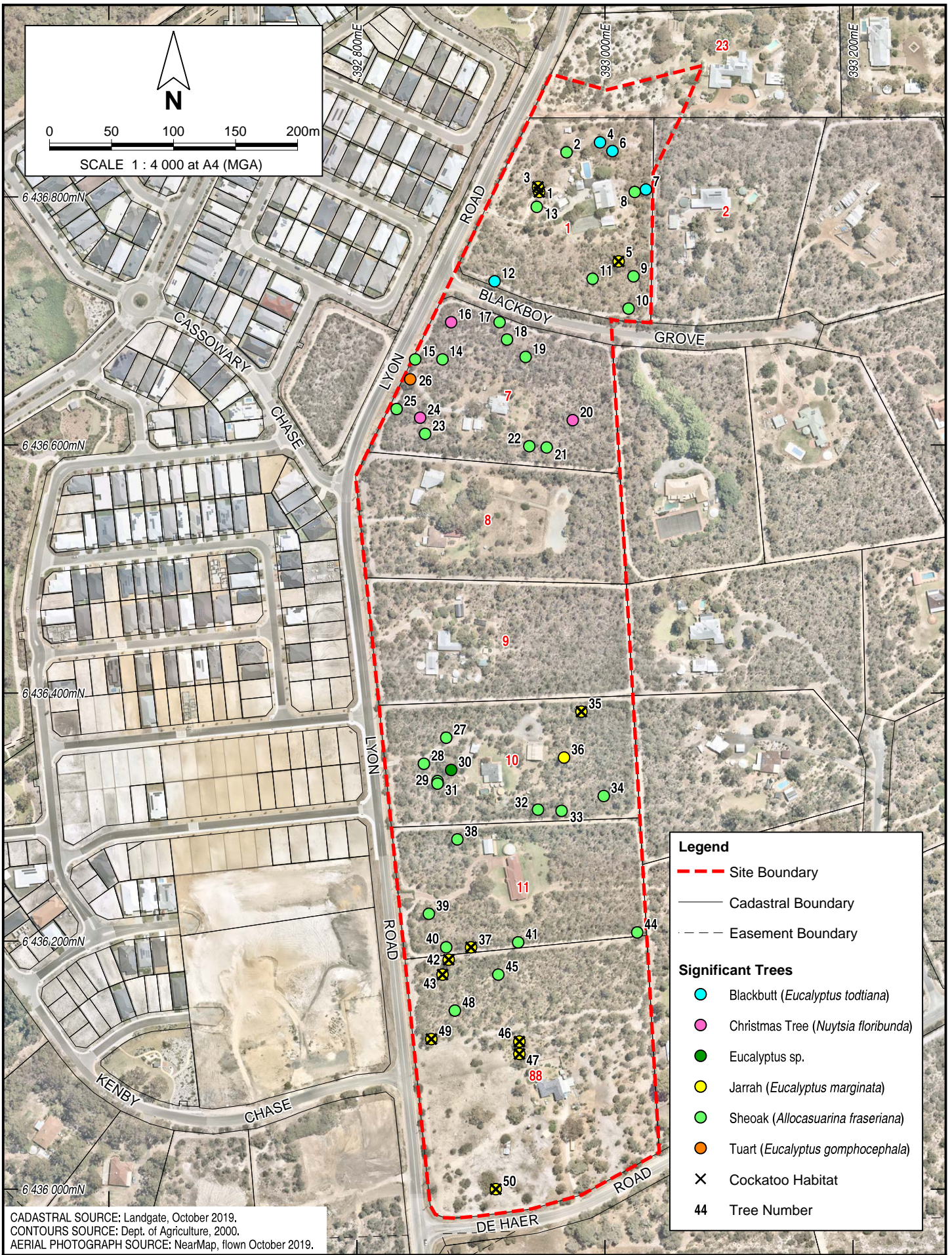
2016-300-103.dgn
PINPOINT CARTOGRAPHICS (08) 9562 7136

CADASTRAL SOURCE: Landgate, October 2019.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown October 2019.

pgv ENVIRONMENTAL	
Drawn: J. Cabot	Date: 25 Nov 2019
Job: 10273 Rpt: 2016-300	Revision: A

Terranovis on behalf of the Landowners ENVIRONMENTAL ASSESSMENT REPORT LOTS 1 AND 7-11 LYON ROAD AND LOT 88 DE HAER ROAD, WANDI
VEGETATION TYPES AND CONDITION

Figure 3



2016-300-104.dgn
 2016-300-104.dgn
 PINPOINT CARTOGRAPHICS (08) 9562 7136

CADASTRAL SOURCE: Landgate, October 2019.
 CONTOURS SOURCE: Dept. of Agriculture, 2000.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown October 2019.

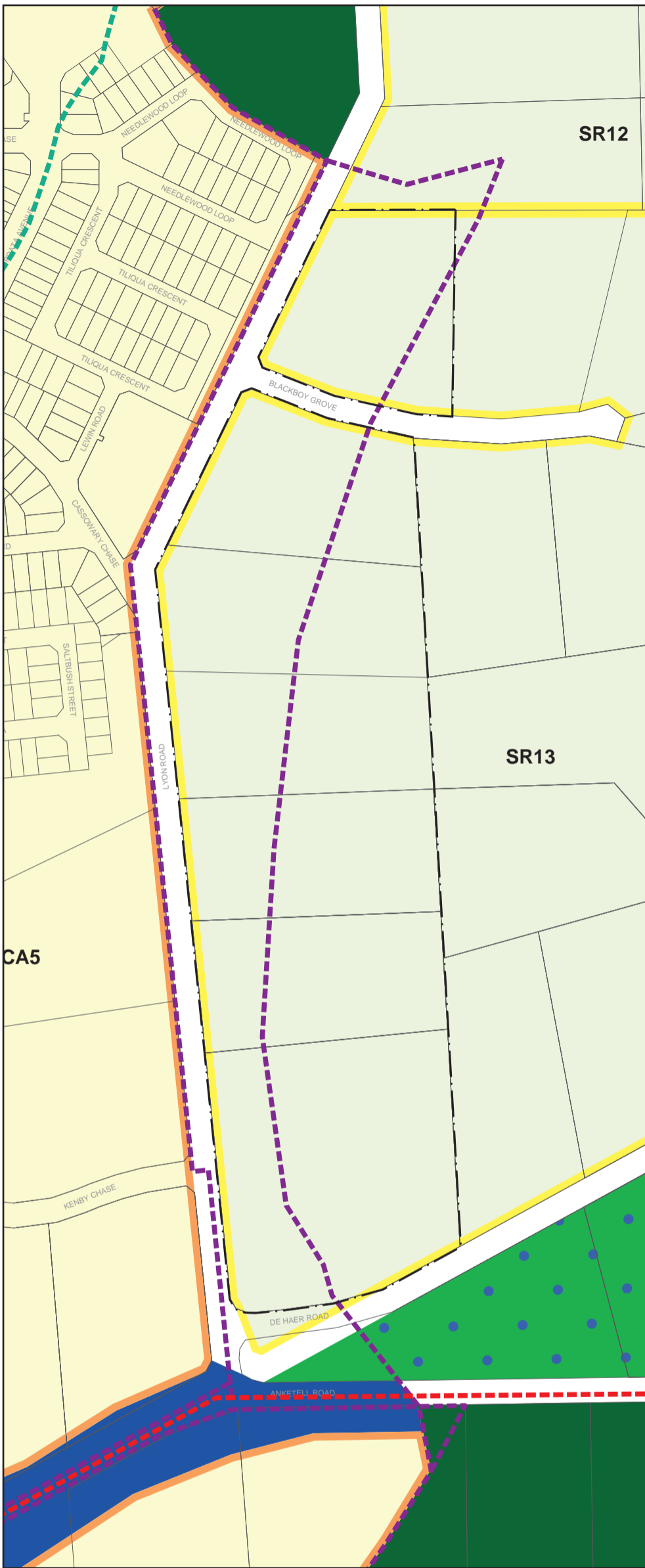
pgv ENVIRONMENTAL
 Drawn: P. van der Moezel Date: 25 Nov 2019
 Job: 10273 Rpt: 2016-300 Revision: A

Terranovis on behalf of the Landowners
 ENVIRONMENTAL ASSESSMENT REPORT
 LOTS 1 AND 7-11 LYON ROAD AND LOT 88 DE HAER ROAD, WANDU

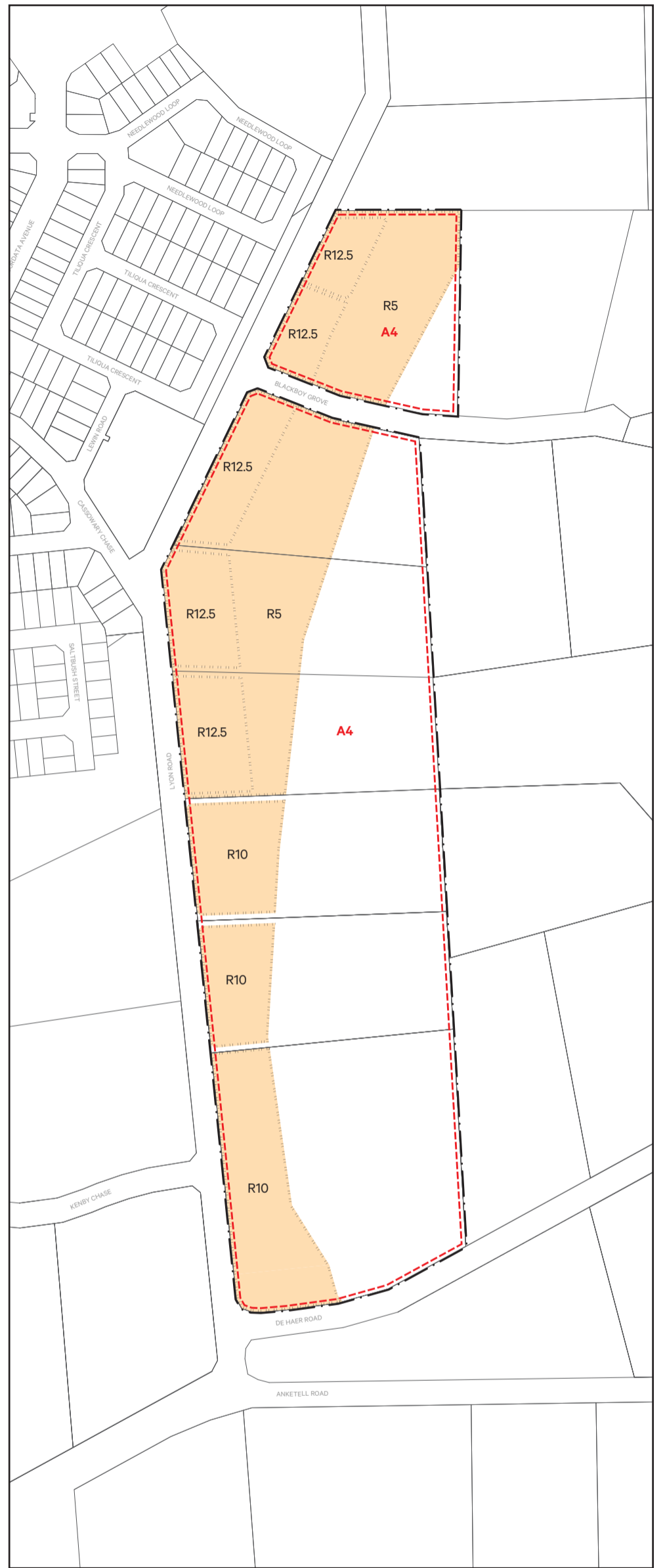
SIGNIFICANT TREES

Figure 4

APPENDIX 1
Local Scheme Amendment



Existing Zoning



Proposed Zoning

LEGEND		Other	
MRS Reserves		R20 R Codes	
	Other Regional Road		SR1 Special Rural Area
	Parks and Recreation		DCA 1 Development Contributor
	Water Catchments		1 Policy Areas
MRS Zones			Area of Landscape Protection
	Development		No Zone
	Residential		A4 Additional Use
	Rural Water Resource		Amendment Area
	Special Rural		

PLANNING AND DEVELOPMENT ACT 2005



TOWN PLANNING SCHEME NO. 2
SCHEME AMENDMENT NO. ____

APPENDIX 2

Subdivision Guide Plan (Element 20 July 2020 Rev A)



LEGEND

Local Zones

- Residential R5
- Residential R10
- Residential R12.5
- Special Rural

Other

- Application Area
- MRS Rural - Water Protection

Subdivision Guide Plan

Lyon Road, Wandí

Date: 20 Jul 2020 Scale: 1:3000@ A3 File: 19-360 SU-1 A Staff: JP GW Checked: GW



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APPENDIX 3
DBCA Flora Databases

FID_	Sheet	NameID	Taxon	Cons_Cod e	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality
	8063621	12938	<i>Diuris micrantha</i>	T	Plants tall, flowers very small, yellow with red-brown markings.	Swamp. Black peaty soil.	Miscellaneous rushes and sedges.			Mandogolup, Johnsons Road, Darling District
	231282	1639	<i>Drakaea elastica</i>	T		In deep grey sand on gradual slopes in undulating plain.	Low woodland of <i>Banksia attenuata</i> , <i>B. menziesii</i> , <i>B. ilicifolia</i> , and Jarrah over scrub of <i>Adenanthos cygnorum</i> and <i>Kunzea</i> over herbs.	ca 60 plants.	Abundance: ca 60 plants.	Mandogalup, S of Perth, 0.8 km S of Hope Valley Road, along Treeby Road
	4463781	20462	<i>Jacksonia gracillima</i>	3	Swamp Form. Low spreading shrub.	Soil: Grey sand. Topography/drainage: Well drained flat. Geomorphology: Bassendean sands.	Vegetation: <i>Banksia attenuata</i> , <i>B. ilicifolia</i> Low Forest A over <i>Melaleuca thymoides</i> , <i>Kunzea ericifolia</i> Scrub over <i>Patersonia occidentalis</i> , <i>Dasypogon bromilifolius</i> Herbs over <i>Lepidosperma angustatum</i> Very Open Low Sedges.			Location: Modong Nature Reserve, S of Thomas Rd, 10 km W of Byford (plot modo-5).
	7332416	25800	<i>Stylidium paludicola</i>	3	Small herb to 400 mm high. Just finished flowering.	Gentle slope with a south east aspect. Surface soil is a very dark brown sandy loam and the subsurface soil is a very dark brown sandy loam/loam. Wetland - winter wet. Litter cover 90% with 10% bare ground.	<i>Melaleuca preissiana</i> woodland over <i>Astartea scoparia</i> open heath over <i>Lepidosperma longitudinale</i> open sedgeland.	occasional.		Miyak Court, Anketell
	7279906	25800	<i>Stylidium paludicola</i>	3	Herb to 0.4 m high. Flowers pink/red.	Gentle slope, south aspect, surface soil is dark grey loamy sand and sub surface soil is very dark grey brown sandy loam, drainage is poor and wet during winter and spring only.	<i>Melaleuca preissiana</i> , <i>Kunzea glabrescens</i> low open forest over <i>Astartea scoparia</i> , <i>Hypocalymma angustifolium</i> open shrubland over <i>Lepidosperma longitudinale</i> open sedgeland. Vegetation is in a pristine to excellent condition with some rabbit diggings and pot	scattered.		Robinson Road, Wandii

FID_	Popid	Nameid	Taxon	Cons Statu s	WAR ank	PopN umb er	SubP opCo de	PopS tatus	Location	District	Vesting	Purpose1	Purpose 2	CountDate	Method	MatureCo un	JuvenileC o	SeedlingC o	LiveTotal	PlantType C	AreaOccu pi	inFlower	Populatio n	
84399	141		Aponogeton hexatepalus	4		22			ca 600m S of Orton Rd on Johnson Rd, W side. W side of swamp, almost adj drain on E side.	SWAN COASTAL	NON	UCL		16/09/1993 0:00	ESTMT	0			100			N		
84970	1596		Caladenia huegelii	T	CR	9			West of Johnson Road, 200m west and then 120m south of intersection (roundabout) of Holden Close (extension of Orton Road). Opposite Johnson Rd and Orton Rd intersection.	SWAN COASTAL	RDL	UCL		1/10/2004 0:00		0		0				N		
97306	1596		Caladenia huegelii	T	CR	59	A		The north western boundary of Wandii Nature Reserve (Reserve No. 36110), within the Town of Kwinana. Approximately 100m NE of 30 Blackboy Grove, Wandii.	SWAN COASTAL	CC	CFF		21/09/2004 0:00		1		1				N		
97307	1596		Caladenia huegelii	T	CR	59	B		Wandii Nature Reserve (Reserve No. 36110), from 30 Blackboy Grove, Wandii head south along Wandii NR boundary fence for ca. 150m, then east ca. 200m (ca. 130m NW of the southern boundary fence).	SWAN COASTAL	CC	CFF		21/09/2004 0:00		1		1				Y		
97308	1596		Caladenia huegelii	T	CR	59	C		Western boundary of Wandii Nature Reserve (Reserve No. 36110). Halfway down track along W boundary. Approx 320m in from De Haer Rd. ~5m E of track. Town of Kwinana.	SWAN COASTAL	CC	CFF		4/10/2010 0:00	ACT_IND	0		0					N	
97309	1596		Caladenia huegelii	T	CR	59	D		The southern boundary of Wandii Nature Reserve (Reserve No. 36110). Approx 440m SW down De Haer Rd from E corner of Reserve, approx 40m in from Road verge. Within the Town of Kwinana.	SWAN COASTAL	CC	CFF		4/10/2010 0:00	ACT_IND	1	1	1					Y	
97310	1596		Caladenia huegelii	T	CR	59	E		Approx 150m SW down De Haer Rd from E corner of Wandii Nature Reserve (Reserve No. 36110). Approx 10m in from Road verge. Within the Town of Kwinana.	SWAN COASTAL	CC	CFF		4/10/2010 0:00	ACT_IND	26	14	26					Y	
97312	1596		Caladenia huegelii	T	CR	60	A		Private Property, 36 (Lot 149) Stefanelli Road, Wandii.	SWAN COASTAL	PRI			11/10/2005 0:00	ACT_IND	6		6					Y	
97313	1596		Caladenia huegelii	T	CR	60	B		Private Property, Lot 51 (previously part of Lot 137 which was subdivided) Rowley Road, Wandii, scattered in bush in southern half of block.	SWAN COASTAL	PRI			11/10/2005 0:00	ACT_IND	11		0					Y	
97314	1596		Caladenia huegelii	T	CR	60	C		Private Property, Lot 1 (previously part of Lot 132) Wandii Road, Wandii, scattered in bush in northern half of block.	SWAN COASTAL	PRI			16/10/2005 0:00	ACT_IND	3		3					Y	
106221	1596		Caladenia huegelii	T	CR	60	D		Private Property, Lot 52 (previously part of Lot 137 which was subdivided) Rowley Road, Wandii, scattered in bush in southern half of block.	SWAN COASTAL	PRI			10/10/2005 0:00	ACT_IND	5		0					Y	

FID_	Popid	Nameid	Taxon	Cons Statu s	WAR ank	PopN umb er	SubP opCo de	PopS tatus	Location	District	Vesting	Purpose1	Purpose 2	CountDate	Method	MatureCo un	JuvenileC o	SeedlingC o	LiveTotal	PlantType C	AreaOccu pi	inFlower	Populatio n
84968	1596		Caladenia huegelii	T	CR	76			Private property. 22 Robinson Rd (Lot 31), Wandi. Remnant bush/garden bed close to house within 1m of driveway. Town of Kwinana.	SWAN COASTAL	PRI			1/10/2009 0:00	ACT_IND	1	0	1				Y	
106981	1596		Caladenia huegelii	T	CR	78	A		Private Property Lot 674 Lyon Road, Wandi. Site is 720m north of Anketell Road. Plant is on the disturbed edge of the eastern firebreak that runs parallel to Lyon Road.	SWAN COASTAL	PRI			25/09/2012 0:00	ACT_IND	1	1	0		PLANTS	1	Y	HEALTHY
107683	1596		Caladenia huegelii	T	CR	78	B		Private Property Lot 52 Lyon Road, Wandi. Site is 430m north of Anketell Road. Plants are on the disturbed edge of the eastern firebreak that runs parallel to Lyon Road and approx 20m in the bushland.	SWAN COASTAL	PRI			25/09/2013 0:00	ACT_IND	3		0		PLANTS		Y	HEALTHY
93196	16245		Cyathochaeta teretifolia	3		12			Private Property. Lot 100, Treeby Rd. Anketell. Kwinana.	SWAN COASTAL	PRI			24/10/2007 0:00		0		0				N	
101444	12938		Diuris micrantha	T	VU	1	A		UCL, Lot 9206. Johnson Road, Bertram. Population occurs within swamp on western side of Johnson Road approximately 630m south of Holden and Johnson intersection, and approximately 70m west of eastern boundary fence	SWAN COASTAL	NON	UCL		20/09/2010 0:00	ACT_IND	6		0		PLANTS	3.75	Y	HEALTHY
101445	12938		Diuris micrantha	T	VU	1	B		UCL. Ca 600m S of Orton Rd on Johnson Rd, W side. On W side of drain (previously known as Lot 1201, State Housing Commission).	SWAN COASTAL	NON	UCL		24/09/2002 0:00		0		0				N	
85052	1637		Diuris purdiei	T	EN	5			PP, Lot 112 `Jandakot Regional Park`. NW side of Thomas Rd, 900m SW of Anketell Rd.	SWAN COASTAL	PRI			14/01/2004 0:00		0		0				N	
87256	4763		Dodonaea hackettiana	4		15			Near the Spectacles, Peel Estate. W side of Johnson Rd, 1 km N of Thomas Rd.	SWAN COASTAL	PRI			5/01/1987 0:00	ESTMT	3		3				N	
97391	1639		Drakaea elastica	T	CR	2	A	X	**Extinct - Cleared for housing** Mandogalup, south west of Perth. 0.8km south of Hope Valley Rd on west side of Treeby Rd, on Lot 33.	SWAN COASTAL	PRI			28/07/2005 0:00		0		0				N	
97392	1639		Drakaea elastica	T	CR	2	B	X	**Extinct - cleared for housing** Mandogalup, south west of Perth. 0.8km south of Hope Valley Rd on west side of Treeby Rd, on Lot 34.	SWAN COASTAL	PRI			28/07/2005 0:00		0		0				N	
97393	1639		Drakaea elastica	T	CR	2	C	X	**Extinct - cleared for housing** Mandogalup, south west of Perth. 0.8km south of Hope Valley Rd on west side of Treeby Rd, on Lot 35.	SWAN COASTAL	PRI			28/07/2005 0:00		0		0				N	
85074	1639		Drakaea elastica	T	CR	31			Private Property, Lot 129 Bodeman Road, Wandi. Plants scattered in bush in rear of block near western boundary. Shire of Kwinana.	SWAN COASTAL	PRI			17/08/2010 0:00		0		0				N	

Taxon	Status	Rank	IUCNCriteria	EPBC	DPaWRegion	DPaWDistrict	Distribution	Flowering Period	RecoveryPlan
Aponogeton hexatepalus		4			SWAN,SWST	PERTH HILLS,SWAN COASTAL,BLACKWOOD,WELLINGTON	Perth, Pinjarra, Capel, Bunbury, Boyanup, Nannup, Bertram, Mundijong	Aug-Sep	
Diuris micrantha	T	VU	D1	VU	SWAN,SWST	PERTH HILLS,SWAN COASTAL,WELLINGTON	Medina, Yarloop, Yunderup, Manjimup, Bowelling, Meelon, Bertram	Aug-Oct	
Dodonaea hackettiana		4			SWAN	SWAN COASTAL	Wattleup, Thompson Lake, Kings Park, Jandakot, Bibra Lake-The Spectacles, Gingin, Peron, Baldivis, Beeliar, Baldivis, Harry Waring Marsupial Reserve	Jul-Oct	
Jacksonia gracillima		3			SWAN,SWST	SWAN COASTAL,BLACKWOOD	Mundijong, Forrestdale, Capel, Elgin, Modong N.R., Forrestfield, Ambergate	Oct-Nov	
Stylidium ireneae		4			SWAN,SWST	SWAN COASTAL,BLACKWOOD,WELLINGTON	Waroona, Lane Poole, Serpentine Dam, North Dandalup, Augusta, Kwinana	Oct-Nov	
Stylidium paludicola MS		3			SWAN,SWST	SWAN COASTAL,BLACKWOOD,WELLINGTON	Bullsbrook, Ruabon, Mandogalup, Lake Clifton, Cookernup, Capel, Dardanup		

APPENDIX 4
Naturemap Report

NatureMap Species Report

Created By Jackalyn Hams on 06/12/2016

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 51' 59" E, 32° 12' 02" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	649	4503
Priority 3	6	21
Priority 4	6	24
Priority 5	3	282
Protected under international agreement	6	29
Rare or likely to become extinct	8	161
TOTAL	678	5020

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	1596 <i>Caladenia huegellii</i> (Grand Spider Orchid)		T	
2.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)		T	
3.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
4.	24092 <i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)		T	
5.	12938 <i>Diuris micrantha</i>		T	
6.	1637 <i>Diuris purdiei</i> (Purdie's Donkey Orchid)		T	
7.	1639 <i>Drakaea elastica</i> (Glossy-leaved Hammer Orchid)		T	
8.	24099 <i>Phascogale tapoatafa</i> subsp. <i>tapoatafa</i> (Southern Brush-tailed Phascogale, Wambenger)		T	
Protected under international agreement				
9.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
10.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
11.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)		IA	
12.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
13.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
14.	24808 <i>Tringa nebularia</i> (Common Greenshank)		IA	
Priority 3				
15.	16245 <i>Cyathochaeta teretifolia</i>		P3	
16.	20462 <i>Jacksonia gracillima</i>		P3	
17.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
18.	5237 <i>Pimelea calcicola</i>		P3	
19.	8163 <i>Pithocarpa corymbulosa</i> (Corymbose Pithocarpa)		P3	
20.	25800 <i>Stylidium paludicola</i>		P3	
Priority 4				
21.	141 <i>Aponogeton hexatepalus</i> (Stalked Water Ribbons)		P4	
22.	4763 <i>Dodonaea hackettiana</i> (Hackett's Hopbush)		P4	
23.	24133 <i>Macropus irma</i> (Western Brush Wallaby)		P4	
24.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
25.	33992 <i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	
26.	14714 <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>		P4	
Priority 5				
27.	25478 <i>Isoodon obesulus</i> (Southern Brown Bandicoot)		P5	
28.	24153 <i>Isoodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)		P5	
29.	24131 <i>Macropus eugenii</i> subsp. <i>derbianus</i> (Tamar Wallaby (WA subsp))		P5	
Non-conservation taxon				
30.	15466 <i>Acacia applanata</i>			
31.	11731 <i>Acacia browniana</i> var. <i>browniana</i>			
32.	3262 <i>Acacia cochlearis</i> (Rigid Wattle)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
33.	3282 <i>Acacia cyclops</i> (Coastal Wattle)			
34.	3374 <i>Acacia huegelii</i>			
35.	3502 <i>Acacia pulchella</i> (Prickly Moses)			
36.	15481 <i>Acacia pulchella</i> var. <i>glaberrima</i>			
37.	30032 <i>Acacia saligna</i> subsp. <i>saligna</i>			
38.	3557 <i>Acacia stenoptera</i> (Narrow Winged Wattle)			
39.	3602 <i>Acacia willdenowiana</i> (Grass Wattle)			
40.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
41.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
42.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
43.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
44.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
45.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
46.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
47.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
48.	6203 <i>Actinotus glomeratus</i>			
49.	1775 <i>Adenanthos cygnorum</i> (Common Woollybush)			
50.	11837 <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> (Common Woollybush)			
51.	1791 <i>Adenanthos obovatus</i> (Basket Flower)			
52.	17202 <i>Agonis flexuosa</i> var. <i>flexuosa</i>			
53.	184 <i>Aira caryophyllea</i> (Silvery Hairgrass)	Y		
54.	<i>Aira caryophyllea/cupaniiana</i> group			
55.	185 <i>Aira cupaniiana</i> (Silvery Hairgrass)	Y		
56.	187 <i>Aira praecox</i> (Early Hairgrass)	Y		
57.	1728 <i>Allocasuarina fraseriana</i> (Sheoak, Kondil)			
58.	198 <i>Amphipogon laguroides</i>			
59.	20184 <i>Amphipogon laguroides</i> subsp. <i>laguroides</i>			
60.	200 <i>Amphipogon turbinatus</i>			
61.	<i>Aname mainae</i>			
62.	1060 <i>Anarthria laevis</i>			
63.	24312 <i>Anas gracilis</i> (Grey Teal)			
64.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
65.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
66.	7833 <i>Angianthus preissianus</i>			
67.	25553 <i>Anhinga melanogaster</i> (Darter)			
68.	<i>Anhinga novaehollandiae</i>			
69.	1411 <i>Anigozanthos manglesii</i> (Mangles Kangaroo Paw, Kurulbrang)			
70.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
71.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
72.	<i>Antichiropus variabilis</i>			
73.	3686 <i>Aotus cordifolia</i>			
74.	3688 <i>Aotus gracillima</i>			
75.	3692 <i>Aotus procumbens</i>			
76.	1117 <i>Aphelia cyperoides</i>			
77.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			
78.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
79.	<i>Araneus cyphoxis</i>			
80.	<i>Araneus senicaudatus</i>			
81.	7838 <i>Arctotheca calendula</i> (Cape Weed, African Marigold)	Y		
82.	38964 <i>Arcyria cinerea</i>			
83.	38967 <i>Arcyria incarnata</i>			
84.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
85.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
86.	<i>Argiope protensa</i>			
87.	1264 <i>Arnocrinum preissii</i>			
88.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
89.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
90.	<i>Artoria flavimana</i>			
91.	<i>Artoria linnaei</i>			
92.	<i>Artoriopsis expolita</i>			
93.	8779 <i>Asparagus asparagoides</i> (Bridal Creeper)	Y		
94.	20283 <i>Astartea scoparia</i>			
95.	<i>Asteraceae</i> sp.			Y
96.	<i>Asterella drummondii</i>			
97.	7851 <i>Asteridea pulverulenta</i> (Common Bristle Daisy)			
98.	6334 <i>Astroloma pallidum</i> (Kick Bush)			
99.	2471 <i>Atriplex prostrata</i> (Hastate Orache)	Y		
100.	17234 <i>Austrostipa compressa</i>			
101.	17240 <i>Austrostipa flavescens</i>			
102.	17245 <i>Austrostipa mollis</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
103.	233 <i>Avena barbata</i> (Bearded Oat)	Y		
104.	24318 <i>Aythya australis</i> (Hardhead)			
105.	18280 <i>Babiana nana</i>	Y		
106.	36441 <i>Babingtonia camphorosmae</i> (Camphor Myrtle)			
107.	<i>Backbournia brounii</i>			
108.	38979 <i>Badhamia utricularis</i>			
109.	1800 <i>Banksia attenuata</i> (Slender Banksia, Piara)			
110.	32580 <i>Banksia dallanneyi</i> var. <i>dallanneyi</i>			
111.	1822 <i>Banksia ilicifolia</i> (Holly-leaved Banksia)			
112.	1830 <i>Banksia littoralis</i> (Swamp Banksia, Pungura)			
113.	1834 <i>Banksia menziesii</i> (Firewood Banksia)			
114.	32077 <i>Banksia sessilis</i> var. <i>cygnorum</i>			
115.	1852 <i>Banksia telmatiaea</i> (Swamp Fox Banksia)			
116.	<i>Barnardius zonarius</i>			
117.	741 <i>Baumea articulata</i> (Jointed Rush)			
118.	743 <i>Baumea juncea</i> (Bare Twigrush)			
119.	24319 <i>Biziura lobata</i> (Musk Duck)			
120.	749 <i>Bolboschoenus caldwellii</i> (Marsh Club-rush)			
121.	4413 <i>Boronia crenulata</i> (Aniseed Boronia)			
122.	16636 <i>Boronia crenulata</i> subsp. <i>viminea</i>			
123.	11503 <i>Boronia crenulata</i> var. <i>crenulata</i>			
124.	4417 <i>Boronia dichotoma</i>			
125.	3710 <i>Bossiaea eriocarpa</i> (Common Brown Pea)			
126.	6341 <i>Brachyloma preissii</i> (Globe Heath)			
127.	30142 <i>Brachyloma preissii</i> subsp. <i>obtusifolium</i>			
128.	30136 <i>Brachyloma preissii</i> subsp. <i>preissii</i>			
129.	42381 <i>Brachyurophis semifasciatus</i> (Southern Shovel-nosed Snake)			
130.	3000 <i>Brassica tournefortii</i> (Mediterranean Turnip)	Y		
131.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
132.	245 <i>Briza minor</i> (Shivery Grass)	Y		
133.	1383 <i>Burchardia bairdiae</i>			
134.	12770 <i>Burchardia congesta</i>			
135.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
136.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
137.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
138.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
139.	1276 <i>Caesia micrantha</i> (Pale Grass Lily)			
140.	1277 <i>Caesia occidentalis</i>			
141.	<i>Caesia</i> sp.			
142.	1586 <i>Caladenia discoidea</i> (Dancing Orchid)			
143.	1592 <i>Caladenia flava</i> (Cowslip Orchid)			
144.	1599 <i>Caladenia latifolia</i> (Pink Fairy Orchid)			
145.	15361 <i>Caladenia longicauda</i> subsp. <i>calcigena</i>			
146.	17760 <i>Caladenia nobilis</i>			
147.	<i>Caladenia</i> sp.			
148.	2848 <i>Calandrinia corrigioloides</i> (Strap Purslane)			
149.	19309 <i>Calectasia narragara</i>			
150.	36600 <i>Callitris pyramidalis</i> (Swamp Cypress)			
151.	5411 <i>Calothamnus hirsutus</i>			
152.	5415 <i>Calothamnus lateralis</i>			
153.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
154.	5439 <i>Calytrix angulata</i> (Yellow Starflower)			
155.	5458 <i>Calytrix flavescens</i> (Summer Starflower)			
156.	5460 <i>Calytrix fraseri</i> (Pink Summer Calytrix)			
157.	5476 <i>Calytrix sapphirina</i>			
158.	2795 <i>Carpobrotus edulis</i> (Hottentot Fig)	Y		
159.	1162 <i>Cartonema philydroides</i>			
160.	2951 <i>Cassytha flava</i> (Dodder Laurel)			
161.	2952 <i>Cassytha glabella</i> (Tangled Dodder Laurel)			
162.	2954 <i>Cassytha micrantha</i>			
163.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
164.	11799 <i>Cassytha racemosa</i> forma <i>racemosa</i>			
165.	41568 <i>Cenchrus setaceus</i> (Fountain Grass)	Y		
166.	6542 <i>Centaurium tenuiflorum</i>	Y		
167.	1121 <i>Centrolepis aristata</i> (Pointed Centrolepis)			
168.	1125 <i>Centrolepis drummondiana</i>			
169.	1132 <i>Centrolepis mutica</i>			
170.	1134 <i>Centrolepis polygyna</i> (Wiry Centrolepis)			
171.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
172.	18156 <i>Chamaecytisus palmensis</i> (Tagasaste)	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
173.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
174.	24373 <i>Charadrius melanops</i> (Black-fronted Dotterel)			
175.	43380 <i>Chelodina colliei</i> (Oblong Turtle)			
176.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
177.	2490 <i>Chenopodium glaucum</i> (Glaucous Goosefoot)	Y		
178.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
179.	<i>Chroicocephalus novaehollandiae</i>			
180.	24288 <i>Circus approximans</i> (Swamp Harrier)			
181.	7937 <i>Cirsium vulgare</i> (Spear Thistle, Scotch Thistle)	Y		
182.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
183.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
184.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
185.	4550 <i>Comesperma calymega</i> (Blue-spike Milkwort)			
186.	4555 <i>Comesperma integerrimum</i>			
187.	15611 <i>Conospermum stoechadis</i> subsp. <i>stoechadis</i> (Common Smokebush)			
188.	6348 <i>Conostephium pendulum</i> (Pearl Flower)			
189.	6349 <i>Conostephium preissii</i>			
190.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
191.	11826 <i>Conostylis aculeata</i> subsp. <i>aculeata</i>			
192.	1436 <i>Conostylis juncea</i>			
193.	1454 <i>Conostylis setigera</i> (Bristly Cottonhead)			
194.	11597 <i>Conostylis setigera</i> subsp. <i>setigera</i>			
195.	7941 <i>Conyza parva</i>	Y		
196.	<i>Conyza</i> sp.			
197.	20074 <i>Conyza sumatrensis</i>	Y		
198.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
199.	277 <i>Cortaderia selloana</i> (Pampas Grass)	Y		
200.	38776 <i>Cortinarius phalarus</i>			
201.	25592 <i>Corvus coronoides</i> (Australian Raven)			
202.	1285 <i>Corynotheca micrantha</i> (Sand Lily)			
203.	7945 <i>Cotula coronopifolia</i> (Waterbuttons)	Y		
204.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
205.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
206.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
207.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
208.	3137 <i>Crassula colorata</i> (Dense Stonecrop)			
209.	11563 <i>Crassula colorata</i> var. <i>colorata</i>			
210.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
211.	30893 <i>Cryptoblepharus buchananii</i>			
212.	25027 <i>Ctenotus australis</i>			
213.	25039 <i>Ctenotus fallens</i>			
214.	<i>Cyclosa trilobata</i>			
215.	24322 <i>Cygnus atratus</i> (Black Swan)			
216.	806 <i>Cyperus polystachyos</i> (Bunchy Sedge)	Y		
217.	816 <i>Cyperus tenuiflorus</i> (Scaly Sedge)	Y		
218.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
219.	38781 <i>Dacryopinax spathularia</i>			
220.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
221.	7462 <i>Dampiera pedunculata</i>			
222.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
223.	35618 <i>Darwinia</i> sp. <i>Karonie</i> (K. Newbey 8503)			
224.	1218 <i>Dasypogon bromeliifolius</i> (Pineapple Bush)			
225.	3807 <i>Daviesia divaricata</i> (Marno)			
226.	3832 <i>Daviesia physodes</i>			
227.	3845 <i>Daviesia triflora</i>			
228.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
229.	38785 <i>Descomyces angustisporus</i>			
230.	17691 <i>Desmocladius fasciculatus</i>			
231.	16595 <i>Desmocladius flexuosus</i>			
232.	299 <i>Deyeuxia quadriseta</i> (Reed Bentgrass)			
233.	1259 <i>Dianella revoluta</i> (Blueberry Lily)			
234.	39019 <i>Didymium clavus</i>			Y
235.	17838 <i>Dielsia stenostachya</i>			
236.	9027 <i>Diplolaena drummondii</i>			
237.	19649 <i>Disa bracteata</i>	Y		
238.	7054 <i>Dischisma arenarium</i>	Y		
239.	7055 <i>Dischisma capitatum</i> (Woolly-headed Dischisma)	Y		
240.	11049 <i>Diuris corymbosa</i>			
241.	<i>Diuris corymbosa/magnifica</i>			
242.	12939 <i>Diuris magnifica</i>			

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243.	3095 <i>Drosera erythrorhiza</i> (Red Ink Sundew)			
244.	3097 <i>Drosera gigantea</i> (Giant Sundew)			
245.	16244 <i>Drosera gigantea</i> subsp. <i>geniculata</i>			
246.	3098 <i>Drosera glanduligera</i> (Pimpernel Sundew)			
247.	3106 <i>Drosera macrantha</i> (Bridal Rainbow)			
248.	14298 <i>Drosera macrantha</i> subsp. <i>macrantha</i>			
249.	3109 <i>Drosera menziesii</i> (Pink Rainbow)			
250.	13216 <i>Drosera menziesii</i> subsp. <i>penicillaris</i>			
251.	3117 <i>Drosera paleacea</i> (Dwarf Sundew)			
252.	13188 <i>Drosera paleacea</i> subsp. <i>paleacea</i>			
253.	3118 <i>Drosera pallida</i> (Pale Rainbow)			
254.	29178 <i>Drosera porrecta</i>			
255.	8911 <i>Drosera rosulata</i>			
256.	<i>Drosera</i> sp. "climbing"			
257.	3135 <i>Drosera zonaria</i> (Painted Sundew)			
258.	25100 <i>Egernia napoleonis</i>			
259.	<i>Egretta novaehollandiae</i>			
260.	<i>Ehrharta</i> ? <i>longiflora</i>			Y
261.	347 <i>Ehrharta calycina</i> (Perennial Veldt Grass)	Y		
262.	349 <i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
263.	<i>Ehrharta</i> sp.			
264.	<i>Elanus axillaris</i>			
265.	<i>Euseyornis melanops</i>			
266.	1643 <i>Elythranthera brunonis</i> (Purple Enamel Orchid)			
267.	<i>Eolophus roseicapillus</i>			
268.	11756 <i>Epilobium billardioreanum</i> subsp. <i>cinereum</i> (Variable Willow Herb)			
269.	6132 <i>Epilobium ciliatum</i>	Y		
270.	6133 <i>Epilobium hirtigerum</i> (Hairy Willow Herb)			
271.	13950 <i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i>			
272.	5541 <i>Eremaea pauciflora</i>			
273.	14104 <i>Eremaea pauciflora</i> var. <i>pauciflora</i>			
274.	<i>Eriophora biapicata</i>			
275.	6219 <i>Eryngium pinnatifidum</i> (Blue Devils)			
276.	15446 <i>Eryngium pinnatifidum</i> subsp. <i>pinnatifidum</i>			
277.	24379 <i>Erythronys cinctus</i> (Red-kneed Dotterel)			
278.	5615 <i>Eucalyptus decipiens</i> (Limestone Marlock, Moit)			
279.	5708 <i>Eucalyptus marginata</i> (Jarrah, Djara)			
280.	13547 <i>Eucalyptus marginata</i> subsp. <i>marginata</i> (Jarrah)			
281.	5763 <i>Eucalyptus rudis</i> (Flooded Gum, Kulurda)			
282.	5790 <i>Eucalyptus todtiana</i> (Coastal Blackbutt)			
283.	3872 <i>Euchilopsis linearis</i> (Swamp Pea)			
284.	15137 <i>Euchiton sphaericus</i>			
285.	20014 <i>Euphorbia hyssopifolia</i>	Y		
286.	4638 <i>Euphorbia peplus</i> (Petty Spurge)	Y		
287.	4648 <i>Euphorbia terracina</i> (Geraldton Carnation Weed)	Y		
288.	3880 <i>Eutaxia virgata</i>			
289.	835 <i>Evandra pauciflora</i>			
290.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
291.	25623 <i>Falco longipennis</i> (Australian Hobby)			
292.	24041 <i>Felis catus</i> (Cat)	Y		
293.	1747 <i>Ficus carica</i> (Common Fig)	Y		
294.	25727 <i>Fulica atra</i> (Eurasian Coot)			
295.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
296.	2969 <i>Fumaria capreolata</i> (Whiteflower Fumitory)	Y		
297.	<i>Fumaria</i> sp.			
298.	7323 <i>Galium murale</i> (Small Goosegrass)	Y		
299.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
300.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
301.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
302.	20475 <i>Gastrolobium capitatum</i>			
303.	3936 <i>Genista linifolia</i> (Flaxleaf Broom)	Y		
304.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
305.	1520 <i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
306.	6587 <i>Gomphocarpus fruticosus</i> (Narrowleaf Cottonbush)	Y		
307.	3957 <i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
308.	6161 <i>Gonocarpus pithyoides</i>			
309.	7538 <i>Goodenia pulchella</i>			
310.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
311.	14282 <i>Gratiola pubescens</i>			
312.	<i>Gymnopilus allantopus</i>			

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313.	<i>Haemodorum</i> sp.			
314.	1475 <i>Haemodorum spicatum</i> (Mardja)			
315.	2197 <i>Hakea prostrata</i> (Harsh Hakea)			
316.	2216 <i>Hakea varia</i> (Variable-leaved Hakea)			
317.	24295 <i>Haliastur spheurnus</i> (Whistling Kite)			
318.	3961 <i>Hardenbergia comptoniana</i> (Native Wisteria)			
319.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
320.	29594 <i>Helichrysum luteoalbum</i> (Jersey Cudweed)			
321.	6839 <i>Hemiandra pungens</i> (Snakebush)			
322.	38320 <i>Hemiandra</i> sp. Jurien (B.J. Conn & M.E. Tozer BJC 3885)			
323.	25119 <i>Hemiergis quadrilineata</i>			
324.	1293 <i>Hensmania turbinata</i>			
325.	<i>Heurodes turritus</i>			
326.	5134 <i>Hibbertia huegelii</i>			
327.	5135 <i>Hibbertia hypericoides</i> (Yellow Buttercups)			
328.	45534 <i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			
329.	5162 <i>Hibbertia racemosa</i> (Stalked Guinea Flower)			
330.	5173 <i>Hibbertia subvaginata</i>			
331.	5176 <i>Hibbertia vaginata</i>			
332.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
333.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
334.	<i>Holasteron perth</i>			
335.	444 <i>Holcus lanatus</i> (Yorkshire Fog)	Y		
336.	445 <i>Holcus setiger</i> (Annual Fog)	Y		
337.	<i>Holoplatys dejongi</i>			
338.	6222 <i>Homaloscadium homalocarpum</i>			
339.	3966 <i>Hovea pungens</i> (Devil's Pins, Puyenak)			
340.	12859 <i>Hovea trisperma</i> var. <i>trisperma</i>			
341.	12741 <i>Hyalosperma cotula</i>			
342.	5216 <i>Hybanthus calycinus</i> (Wild Violet)			
343.	6224 <i>Hydrocotyle blepharocarpa</i>			
344.	6226 <i>Hydrocotyle callicarpa</i> (Small Pennywort)			
345.	6240 <i>Hydrocotyle scutellifera</i>			
346.	5817 <i>Hypocalymma angustifolium</i> (White Myrtle, Kudjid)			
347.	35070 <i>Hypocalymma angustifolium</i> subsp. Swan Coastal Plain (G.J. Keighery 16777)			
348.	5825 <i>Hypocalymma robustum</i> (Swan River Myrtle)			
349.	8086 <i>Hypochoeris glabra</i> (Smooth Catsear)	Y		
350.	9352 <i>Hypochoeris radicata</i> (Flat Weed, Cats-ear)	Y		
351.	1070 <i>Hypolaena exsulca</i>			
352.	17841 <i>Hypolaena pubescens</i>			
353.	<i>Idiommata blackwalli</i>			
354.	40870 <i>Inocybe rufuloides</i>	Y		
355.	<i>Iridaceae</i> sp.			Y
356.	20200 <i>Isolepis cernua</i> var. <i>setiformis</i>			
357.	917 <i>Isolepis marginata</i> (Coarse Club-rush)			
358.	919 <i>Isolepis oldfieldiana</i>			
359.	924 <i>Isolepis stellata</i> (Star Club-rush)			
360.	<i>Isopeda leishmanni</i>			
361.	3992 <i>Isotropis cuneifolia</i> (Granny Bonnets)			
362.	4012 <i>Jacksonia furcellata</i> (Grey Stinkwood)			
363.	4029 <i>Jacksonia sternbergiana</i> (Stinkwood, Kapur)			
364.	1178 <i>Juncus bufonius</i> (Toad Rush)	Y		
365.	1186 <i>Juncus microcephalus</i>	Y		
366.	1188 <i>Juncus pallidus</i> (Pale Rush)			
367.	1190 <i>Juncus planifolius</i> (Broadleaf Rush)			
368.	4044 <i>Kennedia prostrata</i> (Scarlet Runner)			
369.	5832 <i>Kunzea ericifolia</i> (Spearwood, Pondil)			
370.	15498 <i>Kunzea glabrescens</i> (Spearwood)			
371.	20019 <i>Lachnagrostis filiformis</i>			
372.	8096 <i>Lactuca serriola</i> (Prickly Lettuce)	Y		
373.	18585 <i>Lagenophora huegelii</i>			
374.	<i>Lampona cylindrata</i>			
375.	4052 <i>Latrobea tenella</i>			
376.	<i>Latrodectus hasseltii</i>			
377.	1307 <i>Laxmannia ramosa</i> (Branching Lily)			
378.	11911 <i>Laxmannia ramosa</i> subsp. <i>ramosa</i>			
379.	11464 <i>Laxmannia sessiliflora</i> subsp. <i>australis</i>			
380.	1309 <i>Laxmannia squarrosa</i>			
381.	7574 <i>Lechenaultia floribunda</i> (Free-flowering Leschenaultia)			
382.	39038 <i>Leocarpus fragilis</i>			

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383.	44490 <i>Leontodon rhagadioloides</i>	Y		
384.	925 <i>Lepidosperma angustatum</i>			
385.	937 <i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
386.	940 <i>Lepidosperma pubisquamum</i>			
387.	944 <i>Lepidosperma scabrum</i>			
388.	<i>Lepidosperma</i> sp. <i>Baldivis</i>			Y
389.	945 <i>Lepidosperma squamatum</i>			
390.	946 <i>Lepidosperma striatum</i>			
391.	1653 <i>Leporella fimbriata</i> (Hare Orchid)			
392.	1077 <i>Leptocarpus canus</i> (Hoary Twine-rush)			
393.	1080 <i>Leptocarpus scariosus</i>			
394.	2342 <i>Leptomeria cunninghamii</i>			
395.	2344 <i>Leptomeria empetriformis</i>			
396.	2350 <i>Leptomeria pauciflora</i> (Sparse-flowered Currant Bush)			
397.	5850 <i>Leptospermum laevigatum</i> (Coast Teatree)	Y		
398.	25133 <i>Lerista elegans</i>			
399.	6360 <i>Leucopogon australis</i> (Spiked Beard-heath)			
400.	6374 <i>Leucopogon conostephioides</i>			
401.	6436 <i>Leucopogon propinquus</i>			
402.	7676 <i>Levenhookia pusilla</i> (Midget Stylewort)			
403.	<i>Levenhookia pusilla</i> / <i>stipitata</i>			
404.	7677 <i>Levenhookia stipitata</i> (Common Stylewort)			
405.	25005 <i>Lialis burtonis</i>			
406.	31280 <i>Lichenomphalia chromacea</i>			
407.	31333 <i>Lichenomphalia umbellifera</i>			
408.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
409.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
410.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
411.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
412.	9289 <i>Lobelia anceps</i> (Angled Lobelia)			
413.	6515 <i>Logania vaginalis</i> (White Spray)			
414.	476 <i>Lolium perenne</i> (Perennial Ryegrass)	Y		
415.	478 <i>Lolium rigidum</i> (Wimmera Ryegrass)	Y		
416.	<i>Lomandra</i> ? <i>caespitosa</i>			
417.	<i>Lomandra</i> ? <i>preissii</i>			
418.	1223 <i>Lomandra caespitosa</i> (Tufted Mat Rush)			
419.	1228 <i>Lomandra hermaphrodita</i>			
420.	1232 <i>Lomandra micrantha</i> (Small-flower Mat-rush)			
421.	1234 <i>Lomandra nigricans</i>			
422.	1239 <i>Lomandra preissii</i>			
423.	1243 <i>Lomandra sericea</i> (Silky Mat Rush)			
424.	1246 <i>Lomandra suaveolens</i>			
425.	<i>Lophoictinia isura</i>			
426.	8564 <i>Lotus subbiflorus</i>	Y		
427.	1198 <i>Luzula meridionalis</i> (Field Woodrush)			
428.	<i>Lycidas michaelsoni</i>			
429.	39048 <i>Lycogala epidendrum</i>			
430.	<i>Lycosa ariadnae</i>			
431.	1097 <i>Lyginia barbata</i>			
432.	<i>Lyginia barbata</i> / <i>imberbis</i>			
433.	18049 <i>Lyginia imberbis</i>			
434.	1656 <i>Lyperanthus serratus</i> (Rattle Beak Orchid)			
435.	36375 <i>Lysimachia arvensis</i> (Pimpernel)	Y		
436.	6456 <i>Lysinema ciliatum</i> (Curry Flower)			
437.	6458 <i>Lysinema elegans</i>			
438.	5281 <i>Lythrum hyssopifolia</i> (Lesser Loosestrife)	Y		
439.	2839 <i>Macarthuria australis</i>			
440.	18119 <i>Macrozamia fraseri</i>			
441.	85 <i>Macrozamia riedlei</i> (Zamia, Djiridji)			
442.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
443.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
444.	<i>Maratus pavonis</i>			
445.	4079 <i>Medicago polymorpha</i> (Burr Medic)	Y		
446.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
447.	5900 <i>Melaleuca cuticularis</i> (Saltwater Paperbark)			
448.	13271 <i>Melaleuca huegelii</i> subsp. <i>huegelii</i>			
449.	13273 <i>Melaleuca incana</i> subsp. <i>incana</i>			
450.	5926 <i>Melaleuca lateritia</i> (Robin Redbreast Bush)			
451.	5946 <i>Melaleuca pauciflora</i>			
452.	5952 <i>Melaleuca preissiana</i> (Moonah)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
453.	5964 <i>Melaleuca seriata</i>			
454.	18598 <i>Melaleuca systema</i>			
455.	5978 <i>Melaleuca teretifolia</i> (Banbar)			
456.	5980 <i>Melaleuca thymoides</i>			
457.	4085 <i>Melilotus indicus</i>	Y		
458.	25184 <i>Menetia greyii</i>			
459.	955 <i>Mesomelaena pseudostygia</i>			
460.	957 <i>Mesomelaena tetragona</i> (Semaphore Sedge)			
461.	<i>Microcarbo melanoleucos</i>			
462.	25693 <i>Microeca fascinans</i> (Jacky Winter)			
463.	485 <i>Microlaena stipoides</i> (Weeping Grass)			
464.	1658 <i>Microtis atrata</i> (Swamp Mignonette Orchid)			
465.	10954 <i>Microtis media</i> (Tall Mignonette Orchid)			
466.	15419 <i>Microtis media</i> subsp. <i>media</i>			
467.	19179 <i>Moraea flaccida</i> (One-leaf Cape Tulip)	Y		
468.	25192 <i>Morethia obscura</i>			
469.	24223 <i>Mus musculus</i> (House Mouse)	Y		
470.	6199 <i>Myriophyllum tillaeoides</i>			
471.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
472.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
473.	492 <i>Neurachne alopecuroidea</i> (Foxtail Mulga Grass)			
474.	6974 <i>Nicotiana glauca</i> (Tree Tobacco)	Y		
475.	25748 <i>Ninox novaeseelandiae</i> (Boobook Owl)			
476.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
477.	2401 <i>Nuytsia floribunda</i> (Christmas Tree, Mudja)			
478.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
479.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
480.	<i>Ommatoiulus moreletii</i>			
481.	18255 <i>Opercularia vaginata</i> (Dog Weed)			
482.	36177 <i>Ornduffia albiflora</i>			
483.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
484.	4358 <i>Oxalis purpurea</i> (Largeflower Wood Sorrel)	Y		
485.	25679 <i>Pachycephala pectoralis</i> (Golden Whistler)			
486.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
487.	25253 <i>Parasuta gouldii</i>			
488.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
489.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
490.	7090 <i>Parentucellia viscosa</i> (Sticky Bartsia)	Y		
491.	527 <i>Paspalum dilatatum</i>	Y		
492.	24642 <i>Passer montanus</i> (Eurasian Tree Sparrow)	Y		
493.	1550 <i>Patersonia occidentalis</i> (Purple Flag, Koma)			
494.	30471 <i>Patersonia occidentalis</i> var. <i>angustifolia</i>			
495.	30472 <i>Patersonia occidentalis</i> var. <i>occidentalis</i>			
496.	4343 <i>Pelargonium capitatum</i> (Rose Pelargonium)	Y		
497.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
498.	40423 <i>Pentameris airoides</i> (False Hairgrass)	Y		
499.	6006 <i>Pericalymma ellipticum</i> (Swamp Teatree)			
500.	16477 <i>Pericalymma ellipticum</i> var. <i>ellipticum</i>			
501.	2273 <i>Persoonia saccata</i> (Snottygobble)			
502.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
503.	2299 <i>Petrophile linearis</i> (Pixie Mops)			
504.	2301 <i>Petrophile macrostachya</i>			
505.	2312 <i>Petrophile striata</i>			
506.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
507.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
508.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
509.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
510.	18529 <i>Philoteca spicata</i> (Pepper and Salt)			
511.	<i>Phlebia subceracea</i>			
512.	1478 <i>Phlebocarya ciliata</i>			
513.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
514.	16177 <i>Phyllangium paradoxum</i>			
515.	4675 <i>Phyllanthus calycinus</i> (False Boronia)			
516.	39071 <i>Physarum luteolum</i>			Y
517.	39079 <i>Physarum viride</i>			
518.	2793 <i>Phytolacca octandra</i> (Red Ink Plant)	Y		
519.	<i>Phytophthora cinnamomi</i>			
520.	18117 <i>Pimelea rosea</i> subsp. <i>rosea</i>			
521.	<i>Pinkifloydia harveii</i>			
522.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
523.	6249 <i>Platysace compressa</i> (Tapeworm Plant)			
524.	6253 <i>Platysace filiformis</i>			
525.	25509 <i>Pletholax gracilis</i> (Keeled Legless Lizard)			
526.	25007 <i>Pletholax gracilis</i> subsp. <i>gracilis</i> (Keeled Legless Lizard)			
527.	<i>Pluteus atromarginatus</i>			
528.	38825 <i>Pluteus pauperculus</i>			
529.	<i>Poaceae</i> sp.			
530.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
531.	8175 <i>Podolepis gracilis</i> (Slender Podolepis)			
532.	<i>Podotheca ?gnaphalioides</i>			
533.	8182 <i>Podotheca angustifolia</i> (Sticky Longheads)			
534.	8183 <i>Podotheca chrysantha</i> (Yellow Podotheca)			
535.	8184 <i>Podotheca gnaphalioides</i> (Golden Long-heads)			
536.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
537.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
538.	24681 <i>Poliocephalus poliocephalus</i> (Hoary-headed Grebe)			
539.	582 <i>Polypogon monspeliensis</i> (Annual Beardgrass)	Y		
540.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
541.	4691 <i>Poranthera microphylla</i> (Small Poranthera)			
542.	<i>Poranthera microphylla</i> /moorokatta			
543.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
544.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
545.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
546.	1670 <i>Prasophyllum drummondii</i> (Swamp Leek Orchid)			
547.	1676 <i>Prasophyllum hians</i> (Yawning Leek Orchid)			
548.	10853 <i>Prasophyllum plumiforme</i>			
549.	25511 <i>Pseudonaja affinis</i> (Dugite)			
550.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
551.	<i>Pterostylis</i> aff. <i>nana</i>			
552.	<i>Pterostylis</i> aff. <i>nana</i> long sepal			Y
553.	1693 <i>Pterostylis recurva</i> (Jug Orchid)			
554.	12217 <i>Pterostylis sanguinea</i>			
555.	11260 <i>Ptilotus drummondii</i> var. <i>drummondii</i> (Pussytail)			
556.	4177 <i>Pultenaea ochreatea</i>			
557.	4181 <i>Pultenaea reticulata</i>			
558.	<i>Purpurecephalus spurius</i>			
559.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
560.	16367 <i>Pyrorchis nigricans</i> (Red beaks, Elephants ears)			
561.	8195 <i>Quinetia urvillei</i>			
562.	24243 <i>Rattus fuscipes</i> (Western Bush Rat)			
563.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
564.	<i>Raveniella peckorum</i>			
565.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
566.	6012 <i>Regella ciliata</i>			
567.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
568.	13300 <i>Rhodanthe citrina</i>			
569.	<i>Rickenella fibula</i>			
570.	14485 <i>Romulea flava</i> var. <i>minor</i>	Y		
571.	1556 <i>Romulea rosea</i> (Guildford Grass)	Y		
572.	14924 <i>Romulea rosea</i> var. <i>communis</i>	Y		
573.	40426 <i>Rytidosperma occidentale</i>			
574.	11647 <i>Samolus repens</i> var. <i>repens</i>			
575.	7603 <i>Scaevola canescens</i> (Grey Scaevola)			
576.	978 <i>Schoenus brevisetis</i>			
577.	982 <i>Schoenus clandestinus</i>			
578.	984 <i>Schoenus curvifolius</i>			
579.	986 <i>Schoenus efoliatus</i>			
580.	992 <i>Schoenus grandiflorus</i> (Large Flowered Bogrush)			
581.	1017 <i>Schoenus subbulbosus</i>			
582.	6033 <i>Scholtzia involucrata</i> (Spiked Scholtzia)			
583.	6 <i>Selaginella gracillima</i> (Tiny Clubmoss)			
584.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
585.	<i>Servaea melaina</i>			
586.	<i>Servaea spinibarbis</i>			
587.	2909 <i>Silene gallica</i> (French Catchfly)	Y		
588.	8225 <i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
589.	<i>Siloxerus humifusus</i> /filifolius			
590.	30948 <i>Smicornis brevirostris</i> (Weebill)			
591.	7020 <i>Solanum linnaeanum</i> (Apple of Sodom)	Y		
592.	7022 <i>Solanum nigrum</i> (Black Berry Nightshade)	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
593.	8231 <i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
594.	1312 <i>Sowerbaea laxiflora</i> (Purple Tassels)			
595.	4211 <i>Sphaerolobium vimineum</i> (Leafless Globe Pea)			
596.	<i>Steatoda grossa</i>			
597.	39085 <i>Stemonitis lignicola</i>			
598.	39087 <i>Stemonitis splendens</i>			
599.	2316 <i>Stirlingia latifolia</i> (Blueboy)			
600.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
601.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
602.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
603.	25831 <i>Stylidium araeophyllum</i> (Stilt Walker)			
604.	<i>Stylidium araeophyllum/neurophyllum</i>			
605.	7693 <i>Stylidium brunonianum</i> (Pink Fountain Triggerplant)			
606.	7696 <i>Stylidium calcaratum</i> (Book Triggerplant)			
607.	7699 <i>Stylidium carnosum</i> (Fleshy-leaved Triggerplant)			
608.	7717 <i>Stylidium divaricatum</i> (Daddy-long-legs)			
609.	7718 <i>Stylidium diversifolium</i> (Touch-me-not)			
610.	7734 <i>Stylidium guttatum</i> (Dotted Triggerplant)			
611.	7774 <i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
612.	7785 <i>Stylidium repens</i> (Matted Triggerplant)			
613.	25806 <i>Stylidium scariosum</i>			
614.	7798 <i>Stylidium schoenoides</i> (Cow Kicks)			
615.	1260 <i>Stypandra glauca</i> (Blind Grass)			
616.	15532 <i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>			
617.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
618.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
619.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
620.	<i>Tamopsis perthensis</i>			
621.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
622.	1702 <i>Thelymitra campanulata</i> (Shirt Orchid)			
623.	1705 <i>Thelymitra crinita</i> (Blue Lady Orchid)			
624.	11143 <i>Thelymitra graminea</i>			
625.	20731 <i>Thelymitra vulgaris</i>			
626.	20728 <i>Thelymitra xanthotricha</i>			
627.	24844 <i>Threskiornis molucca</i> (Australian White Ibis)			
628.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
629.	1318 <i>Thysanotus arbuscula</i>			
630.	1319 <i>Thysanotus arenarius</i>			
631.	1328 <i>Thysanotus dichotomus</i> (Branching Fringe Lily)			
632.	1338 <i>Thysanotus manglesianus</i> (Fringed Lily)			
633.	<i>Thysanotus manglesianus/patersonii</i> complex			
634.	1339 <i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
635.	1343 <i>Thysanotus patersonii</i>			
636.	1351 <i>Thysanotus sparteus</i>			
637.	1357 <i>Thysanotus thyrsoides</i>			
638.	1358 <i>Thysanotus triandrus</i>			
639.	25519 <i>Tiliqua rugosa</i>			
640.	25204 <i>Tiliqua rugosa</i> subsp. <i>aspera</i>			
641.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
642.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
643.	6280 <i>Trachymene pilosa</i> (Native Parsnip)			
644.	38845 <i>Trechispora farinacea</i>			
645.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
646.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
647.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
648.	1361 <i>Tricoryne elatior</i> (Yellow Autumn Lily)			
649.	1363 <i>Tricoryne tenella</i>			
650.	1038 <i>Tricostularia neesii</i>			
651.	17145 <i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Y		
652.	14738 <i>Trifolium resupinatum</i> var. <i>resupinatum</i>	Y		
653.	4360 <i>Tropaeolum majus</i> (Garden Nasturtium)	Y		
654.	Unknown Annual Grasses			
655.	8254 <i>Urospermum picroides</i> (False Hawkbit)	Y		
656.	8255 <i>Ursinia anthemoides</i> (Ursinia)	Y		
657.	38388 <i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
658.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
659.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
660.	<i>Venatrix pullastra</i>			
661.	7107 <i>Verbascum virgatum</i> (Twiggy Mullein)	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
662.	15432 <i>Verticordia densiflora</i> var. <i>densiflora</i>			
663.	11474 <i>Vicia sativa</i> subsp. <i>nigra</i>	Y		
664.	722 <i>Vulpia bromoides</i> (<i>Squirrel Tail Fescue</i>)	Y		
665.	724 <i>Vulpia myuros</i> (<i>Rat's Tail Fescue</i>)	Y		
666.	<i>Vulpia</i> sp.			
667.	7384 <i>Wahlenbergia capensis</i> (<i>Cape Bluebell</i>)	Y		
668.	7389 <i>Wahlenbergia preissii</i>			
669.	8282 <i>Waitzia suaveolens</i> (<i>Fragrant Waitzia</i>)			
670.	18118 <i>Watsonia meriana</i> var. <i>meriana</i>	Y		
671.	12072 <i>Wurmbea dioica</i> subsp. <i>alba</i>			
672.	1256 <i>Xanthorrhoea preissii</i> (<i>Grass tree, Palga</i>)			
673.	<i>Xanthorrhoea</i> sp.			
674.	<i>Xanthosia</i> ? <i>huegelii</i>			Y
675.	6289 <i>Xanthosia huegelii</i>			
676.	2331 <i>Xylomelum occidentale</i> (<i>Woody Pear, Djandin</i>)			
677.	1049 <i>Zantedeschia aethiopica</i> (<i>Arum Lily</i>)	Y		
678.	25765 <i>Zosterops lateralis</i> (<i>Grey-breasted White-eye, Silvereye</i>)			

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 wholly 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

Protected Matters Search Tool Report



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: 06/12/16 19:46:48

[Summary](#)

[Details](#)

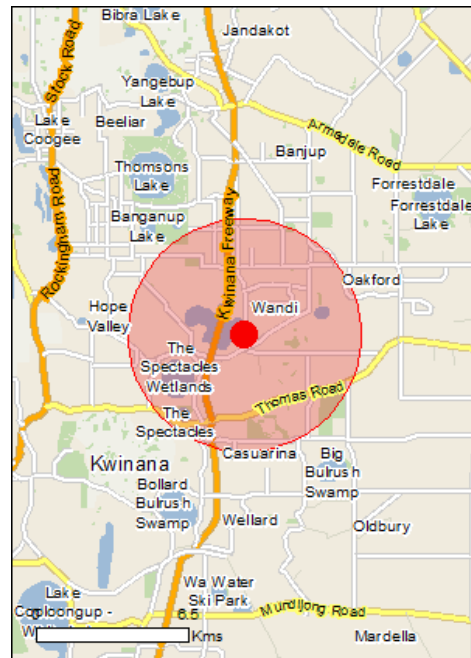
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

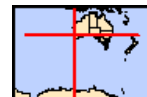
[Acknowledgements](#)



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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:	2
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	18
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. 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:	12
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:	4
Regional Forest Agreements:	None
Invasive Species:	44
Nationally Important Wetlands:	2
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 10km of Ramsar
Peel-yalgorup system	30 - 40km upstream

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain	Endangered	Community likely to occur within area

Listed Threatened Species	[Resource Information]
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Name	Status	Type of Presence
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Birds

Botaurus poiciloptilus		
Australasian Bittern [1001]	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 known to occur within area

Calyptorhynchus baudinii		
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Roosting known to occur within area

Calyptorhynchus latirostris		
Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area

Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area

Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Mammals

Dasyurus geoffroi		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area

Pseudocheirus occidentalis		
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence 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 Spider-orchid [7309]	Endangered	Species or species habitat known to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leafed Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species	[Resource Information]
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* 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		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land -

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 ferruginea Curlew Sandpiper [856]	Critically Endangered	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
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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely 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 may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Harry Waring Marsupial Reserve	WA
Modong	WA
Unnamed WA48291	WA
Wandi	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 Resources 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 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

Name	Status	Type of Presence
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
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana 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		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sage, Wild Sage [10892] <i>Lycium ferocissimum</i> African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
<i>Olea europaea</i> Olive, Common Olive [9160]		Species or species habitat may occur within area
<i>Opuntia</i> spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
<i>Pinus radiata</i> Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
<i>Protasparagus densiflorus</i> Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
<i>Protasparagus plumosus</i> Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
<i>Sagittaria platyphylla</i> Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
<i>Salix</i> spp. except <i>S.babylonica</i> , <i>S.x calodendron</i> & <i>S.x reichardtii</i> Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
<i>Salvinia molesta</i> Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
<i>Solanum elaeagnifolium</i> Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323] <i>Tamarix aphylla</i> 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		
<i>Hemidactylus frenatus</i> 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	
Spectacles Swamp	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.

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-32.20287 115.86376

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](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [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, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

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

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

APPENDIX 6

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 7
Flora Species List

SPECIES LIST – Lots 1, 7-11 Lyon Road and 88 De Haer Rd, Wandri

* = Introduced species

GYMNOSPERMS

ZAMIACEAE

Macrozamia fraseri

MONOCOTYLEDONS

ANARTHRIACEAE

Lyginia barbata

ARACEAE

**Zantedeschia aethiopica*

ASPARAGACEAE

Chamaescilla corymbosa

Laxmannia squarrosa

Lomandra hermaphrodita

Lomandra caespitosa

Thysanotus arenarius

Thysanotus patersonii

Thysanotus sparteus

Thysanotus triandrus

COLCHICACEAE

Burchardia congesta

CYPERACEAE

Lepidosperma leptostachyum

Lepidosperma pubisquamum

Mesomelaena pseudostygia

Schoenus curvifolius

Schoenus latitans

DASYPOGONACEAE

Calectasia narragara

Dasypogon bromeliifolius

HAEMODORACEAE

Anigozanthos humilis

Anigozanthos manglesii

Conostylis aculeata

Conostylis setigera

Haemodorum spicatum

Phlebocarya ciliata

HEMEROCALLIDACEAE

Caesia micrantha

Corynotheca micrantha

Dianella revoluta var. *divaricata*

Tricoryne elatior

IRIDACEAE

**Freesia alba* x *leichtlinii*

**Gladiolus caryophyllaceus*

Patersonia occidentalis

**Romulea rosea*

ORCHIDACEAE

Caladenia discoidea

Caladenia flava subsp. *flava*

Caladenia latifolia

Caladenia longicauda subsp. *longicauda*

**Disa bracteata*

Diuris corymbosa

Elythranthera brunonis

Microtis media subsp. *media*

Pterostylis recurva

Pterostylis vittata

Pyrorchis nigricans

Thelymitra crinita

POACEAE

**Aira caryophyllea*

Amphipogon turbinatus

Austrostipa elegantissima

Austrostipa flavescens

**Avena fatua*

**Briza maxima*

**Ehrharta calycina*

**Ehrharta longiflora*

**Lagurus ovatus*

**Lolium perenne*

RESTIONACEAE

Desmocladus flexuosus

XANTHORRHOEACEAE
Xanthorrhoea brunonis
Xanthorrhoea preissii

DICOTYLEDONS

AIZOACEAE
**Carpobrotus edulis*

APIACEAE
Platysace compressa
Xanthosia huegelii

ARALIACEAE
Trachymene pilosa

ASTERACEAE
Hyalosperma cotula
Podolepis lessonii
**Hypochaeris glabra*
**Sonchus oleraceus*
**Urospermum picroides*
**Ursinia anthemoides*

CAMPANULACEAE
**Wahlenbergia capensis*

CASUARINACEAE
Allocasuarina fraseriana
Allocasuarina humilis

CRASSULACEAE
Crassula colorata

DILLENIACEAE
Hibbertia hypericoides
Hibbertia racemosa
Hibbertia subvaginata

DROSERACEAE
Drosera erythrorhiza
Drosera menziesii subsp. *penicillaris*

ERICACEAE
Astroloma pallidum
Conostephium pendulum
Brachyloma preissii
Leucopogon conostephioides

EUPHORBIACEAE
**Euphorbia terracina*

FABACEAE
Acacia huegelii
**Acacia iteaphylla*
**Acacia longifolia*
Acacia pulchella
Acacia stenoptera
Bossiaea eriocarpa
Daviesia divaricata
Daviesia triflora
Gompholobium tomentosum
Hardenbergia comptoniana
Hovea pungens
Hovea trisperma
Jacksonia furcellata
**Lupinus cosentinii*
**Trifolium campestre*

GOODENIACEAE
Dampiera linearis
Lechenaultia floribunda
Scaevola canescens

HALORAGACEAE
Gonocarpus pithyoides

LAMIACEAE
Hemiandra pungens

LOBELIACEAE
Lobelia tenuior

LORANTHACEAE
Nuytsia floribunda

MOLLUGINACEAE
Macarthuria australis

MYRTACEAE

Calytrix flavescens

Calytrix fraseri

Eremaea beaufortioides

Eucalyptus marginata

Eucalyptus todtiana

Hypocalymma robustum

Kunzea glabrescens

Scholtzia involucrata

PHYLLANTHACEAE

Phyllanthus calycinus

POLYGALACEAE

Comesperma calymega

PROTEACEAE

Adenanthos cygnorum

Banksia attenuata

Banksia ilicifolia

Banksia menziesii

Grevillea crithmifolia

Hakea lissocarpha

Persoonia saccata

Petrophile linearis

Stirlingia latifolia

Synaphea spinulosa

RUBIACEAE

Opercularia vaginata

RUTACEAE

Philothea spicata

STYLIDIACEAE

Levenhookia stipitata

Stylidium brunonianum

Stylidium piliferum

Stylidium repens

Stylidium schoenoides

VIOLACEAE

Hybanthus calycinus

APPENDIX 8

Quadrat Data

QUADRAT W1

50 392961 E 6436736 N

Vegetation: *Allocasuarina fraseriana*/*Banksia ilicifolia*/*B. menziesii*/*B. attenuata*
Low Woodland over *Xanthorrhoea preissii*/*Hibbertia hypericoides*
Open Low Heath

Condition: Good

Soil Type: Grey sand

Landform: Gentle slope down to the south



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Allocasuarina fraseriana</i>	6	20
<i>Banksia ilicifolia</i>	5	10
<i>Jacksonia furcellata</i>	1.5	1
* <i>Ehrharta calycina</i>	1.2	4
<i>Adenanthos cygnorum</i>	1.1	<1
* <i>Gladiolus caryophyllaceus</i>	1.1	<1
<i>Brachyloma preissii</i>	1	2
<i>Banksia attenuata</i>	1	1
<i>Xanthorrhoea brunonis</i>	1	1
<i>Caesia micrantha</i>	0.8	<1
* <i>Ehrharta longiflora</i>	0.6	1
<i>Philothea spicata</i>	0.6	<1
<i>Leucopogon conostephioides</i>	0.5	1
<i>Burchardia congesta</i>	0.5	1
<i>Gompholobium tomentosum</i>	0.4	2
<i>Hypocalymma robustum</i>	0.4	1
<i>Lyginia barbata</i>	0.4	<1
<i>Stylidium brunonianum</i>	0.4	<1

SPECIES	HEIGHT (m)	COVER (%)
<i>Petrophile linearis</i>	0.4	<1
<i>Phlebocarya ciliata</i>	0.3	5
* <i>Briza maxima</i>	0.3	2
<i>Hibbertia hypericoides</i>	0.3	1
<i>Desmocladius flexuosus</i>	0.3	1
<i>Dampiera linearis</i>	0.3	<1
<i>Amphipogon turbinatus</i>	0.3	<1
<i>Schoenus curvifolius</i>	0.3	<1
<i>Calytrix fraseri</i>	0.3	<1
<i>Calytrix flavescens</i>	0.3	<1
<i>Dasyogon bromeliifolius</i>	0.3	<1
* <i>Disa bracteata</i>	0.3	<1
<i>Gonocarpus pithyoides</i>	0.2	1
<i>Xanthosia huegelii</i>	0.2	1
<i>Chamaescilla corymbosa</i>	0.1	5
<i>Stylidium repens</i>	0.1	<1
<i>Laxmannia squarrosa</i>	0.1	<1

* introduced species

QUADRAT W2

50 392859 E 6436371 N

Vegetation: *Allocasuarina fraseriana*/*Banksia attenuata*/*B. menziesii* Low Open Woodland over *Xanthorrhoea preissii*/*Brachyloma preissii* Open Low Heath

Condition: Good-Degraded

Soil Type: Greyish-brown sand

Landform: Gentle slope down to the south-east



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Banksia attenuata</i>	5	10
<i>Allocasuarina fraseriana</i>	5	5
<i>Banksia menziesii</i>	3	5
<i>Adenanthos cygnorum</i>	3	5
* <i>Ehrharta calycina</i>	1.2	20
* <i>Gladiolus caryophyllaceus</i>	1.1	<1
<i>Xanthorrhoea preissii</i>	1	2
<i>Xanthorrhoea brunonis</i>	0.8	<1
<i>Caesia micrantha</i>	0.8	<1
<i>Acacia pulchella</i>	0.7	2
* <i>Briza maxima</i>	0.6	10
<i>Brachyloma preissii</i>	0.5	2
<i>Burchardia congesta</i>	0.5	1
<i>Dianella revoluta</i> var. <i>divaricata</i>	0.5	<1
<i>Hypocalymma robustum</i>	0.5	<1
<i>Conostylis aculeata</i>	0.4	2
<i>Petrophile linearis</i>	0.4	<1
<i>Microtis media</i>	0.4	<1
<i>Amphipogon turbinatus</i>	0.4	<1

SPECIES	HEIGHT (m)	COVER (%)
<i>Bossiaea eriocarpa</i>	0.4	<1
* <i>Ursinia anthemoides</i>	0.3	10
<i>Lyginia barbata</i>	0.3	4
<i>Gompholobium tomentosum</i>	0.3	2
<i>Lomandra hermaphrodita</i>	0.3	<1
<i>Calytrix fraseri</i>	0.2	<1
<i>Dampiera linearis</i>	0.2	<1
<i>Hemiandra pungens</i>	0.2	<1
<i>Chamaescilla corymbosa</i>	0.1	10
* <i>Hypochaeris glabra</i>	flat	2

* introduced species

QUADRAT W3

50 392865 E 6436266 N

Vegetation: *Banksia attenuata*/*B. menziesii*/*Allocasuarina fraseriana* Low Open Woodland over *Xanthorrhoea preissii*/*Brachyloma preissii* Open Low Heath
Condition: Degraded - Good
Soil Type: Dark grey sand
Landform: Gentle slope down to the east



Quadrat (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Banksia menziesii</i>	6	15
<i>Banksia attenuata</i>	4	10
<i>Xanthorrhoea preissii</i>	1.5	2
* <i>Ehrharta calycina</i>	1.2	20
* <i>Gladiolus caryophyllaceus</i>	1.1	<1
<i>Caesia micrantha</i>	0.8	<1
<i>Daviesia triflora</i>	0.6	5
<i>Burchardia congesta</i>	0.6	1
<i>Hypocalymma robustum</i>	0.6	1
<i>Lyginia barbata</i>	0.6	<1
<i>Brachyloma preissii</i>	0.5	2
<i>Dianella revoluta</i> var. <i>divaricata</i>	0.5	<1
* <i>Ursinia anthemoides</i>	0.4	10
<i>Gompholobium tomentosum</i>	0.4	5
* <i>Briza maxima</i>	0.4	5
<i>Lomandra hermaphrodita</i>	0.4	<1
<i>Conostylis aculeata</i>	0.4	<1
<i>Hovea trisperma</i>	0.4	<1
<i>Tricoryne elatior</i>	0.4	<1

<i>Phlebocarya ciliata</i>	0.4	<1
<i>Dasyogon bromeliifolius</i>	0.4	<1
<i>Amphipogon turbinatus</i>	0.3	1
<i>Acacia stenoptera</i>	0.3	<1
<i>Dampiera linearis</i>	0.3	<1
<i>Chamaescilla corymbosa</i>	0.2	10
<i>Desmocladius flexuosus</i>	0.2	2
<i>Macarthuria australis</i>	0.2	1
* <i>Sonchus oleraceus</i>	0.2	<1
* <i>Carpobrotus edulis</i>	0.1	1
* <i>Hypochaeris glabra</i>	flat	<1

* introduced species

QUADRAT W4

50 392830 E 6436474 N

Vegetation: *Banksia attenuata*/*B. menziesii* Low Open Woodland over *Jacksonia sternbergiana* Tall Shrubland over *Xanthorrhoea preissii*/*Brachyloma preissii* Open Low Heath

Condition: Good - Degraded

Soil Type: Greyish-brown sand

Landform: Sloping down to the south-east



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Banksia attenuata</i>	6	15
<i>Banksia menziesii</i>	4	10
<i>Adenanthos cygnorum</i>	3	5
<i>Jacksonia furcellata</i>	2.5	1
<i>Allocasuarina fraseriana</i>	1.2	1
* <i>Ehrharta calycina</i>	1.1	10
<i>Xanthorrhoea preissii</i>	1	2
<i>Haemodorum spicatum</i>	1	<1
<i>Caesia micrantha</i>	0.8	<1
* <i>Gladiolus caryophyllaceus</i>	0.7	<1
<i>Brachyloma preissii</i>	0.6	2
<i>Dianella revoluta</i> var. <i>divaricata</i>	0.6	<1
* <i>Briza maxima</i>	0.5	20
<i>Daviesia triflora</i>	0.5	2
<i>Burchardia congesta</i>	0.5	1
<i>Anigozanthos manglesii</i>	0.5	<1
* <i>Ursinia anthemoides</i>	0.4	10
<i>Dampiera linearis</i>	0.4	2
<i>Gompholobium tomentosum</i>	0.4	1

SPECIES	HEIGHT (m)	COVER (%)
<i>Dasypogon bromeliifolius</i>	0.4	<1
<i>Stylidium brunonianum</i>	0.4	<1
<i>Lepidosperma leptostachyum</i>	0.4	<1
<i>Hibbertia hypericoides</i>	0.4	<1
<i>Conostylis aculeata</i>	0.3	2
<i>Amphipogon turbinatus</i>	0.3	2
<i>Lomandra hermaphrodita</i>	0.3	<1
<i>Microtis media</i>	0.3	<1
<i>Lechenaultia floribunda</i>	0.3	<1
<i>Bossiaea eriocarpa</i>	0.3	<1
* <i>Aira caryophyllea</i>	0.3	<1
<i>Patersonia occidentalis</i>	0.3	<1
<i>Chamaescilla corymbosa</i>	0.2	5
<i>Calytrix flavescens</i>	0.2	1
<i>Laxmannia squarrosa</i>	0.2	1
<i>Conostephium pendulum</i>	0.2	<1
<i>Desmocladius flexuosus</i>	0.2	<1
* <i>Freesia alba x leichtlinii</i>	0.2	<1
<i>Lomandra caespitosa</i>	0.1	<1
<i>Trachymene pilosa</i>	0.1	<1

* introduced species

QUADRAT W5

50 392894 E 6436673 N

Vegetation: *Allocasuarina fraseriana*/*Banksia attenuata*/*B. menziesii*/*Adenanthos cygnorum* Low Open Woodland over weeds
Condition: Degraded
Soil Type: Greyish-brown sand
Landform: Gentle slope down to the south-east



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Adenanthos cygnorum</i>	4	10
<i>Allocasuarina fraseriana</i>	4	5
<i>Banksia menziesii</i>	4	5
<i>Banksia attenuata</i>	2	5
<i>Kunzea glabrescens</i>	2	1
* <i>Ehrharta calycina</i>	1.2	30
<i>Nuytsia floribunda</i>	1	<1
* <i>Gladiolus caryophyllaceus</i>	1	<1
<i>Xanthorrhoea preissii</i>	0.8	2
<i>Gompholobium tomentosum</i>	0.5	1
<i>Lepidosperma pubisquameum</i>	0.5	<1
* <i>Briza maxima</i>	0.4	4
<i>Lyginia barbata</i>	0.4	1
<i>Dasypogon bromeliifolius</i>	0.4	1
<i>Scholtzia involucrata</i>	0.4	1
<i>Calytrix flavescens</i>	0.4	<1
* <i>Sonchus oleraceus</i>	0.4	<1
* <i>Ursinia anthemoides</i>	0.3	15
<i>Conostylis aculeata</i>	0.3	2
<i>Lechenaultia floribunda</i>	0.3	2

SPECIES	HEIGHT (m)	COVER (%)
<i>*Lagurus ovatus</i>	0.3	2
<i>Dampiera linearis</i>	0.3	1
<i>Brachyloma preissii</i>	0.3	<1
<i>Amphipogon turbinatus</i>	0.3	<1
<i>Gonocarpus pithyoides</i>	0.3	<1
<i>Burchardia congesta</i>	0.3	<1
<i>Thysanotus triandrus</i>	0.3	<1
<i>Lomandra hermaphrodita</i>	0.3	<1
<i>Leucopogon conostephioides</i>	0.3	<1
<i>Laxmannia squarrosa</i>	0.2	<1
<i>Desmocladius flexuosus</i>	0.2	<1
<i>Laxmannia squarrosa</i>	0.1	<1
<i>Hemiandra pungens</i>	0.1	<1
<i>Thysanotus patersonii</i>	climber	<1

* introduced species

QUADRAT W6

50 392982 E 6436598 N

Vegetation: *Allocasuarina fraseriana*/*Banksia attenuata*/*B. menziesii* Low Open Woodland over *Brachyloma preissii*/*Xanthorrhoea preissii* Open Low Heath
Condition: Very Good
Soil Type: yellowish-grey sand
Landform: Flat



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Allocasuarina fraseriana</i>	5	5
<i>Banksia attenuata</i>	4	5
<i>Banksia menziesii</i>	4	2
<i>Nuytsia floribunda</i>	4	1
<i>Banksia ilicifolia</i>	3	2
<i>Adenanthos cygnorum</i>	2.5	2
<i>Xanthorrhoea preissii</i>	1.8	2
<i>Xanthorrhoea brunonis</i>	1.1	1
<i>Brachyloma preissii</i>	1	10
<i>Burchardia congesta</i>	0.5	1
* <i>Briza maxima</i>	0.5	<1
<i>Mesomelaena pseudostygia</i>	0.4	5
<i>Bossiaea eriocarpa</i>	0.4	1
<i>Leucopogon conostephioides</i>	0.4	1
<i>Gompholobium tomentosum</i>	0.4	<1
<i>Thysanotus sparteus</i>	0.4	<1
<i>Hibbertia hypericoides</i>	0.3	6
<i>Amphipogon turbinatus</i>	0.3	4
<i>Scaevola canescens</i>	0.3	<1

SPECIES	HEIGHT (m)	COVER (%)
<i>Petrophile linearis</i>	0.3	<1
<i>Dasypogon bromeliifolius</i>	0.2	3
<i>Desmocladius flexuosus</i>	0.2	1
<i>Acacia stenoptera</i>	0.2	1
<i>Conostylis setigera</i>	0.2	<1
<i>Chamaescilla corymbosa</i>	flat	<1

* introduced species

QUADRAT W7

50 392950 E 6436459 N

Vegetation: *Banksia menziesii*/*B. attenuata*/*Allocasuarina fraseriana* Low Open Woodland over *Brachyloma preissii*/*Mesomelaena pseudostygia*/*Amphipogon turbinatus* Low Open Heath

Condition: Very Good

Soil Type: yellowish-grey sand

Landform: Flat



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Banksia menziesii</i>	4.5	10
<i>Banksia attenuata</i>	4	5
<i>Allocasuarina fraseriana</i>	3	4
<i>Xanthorrhoea preissii</i>	1.5	4
<i>Brachyloma preissii</i>	1	6
* <i>Ehrharta calycina</i>	1	<1
* <i>Gladiolus caryophyllaceus</i>	0.8	<1
<i>Austrostipa elegantissima</i>	0.8	<1
<i>Xanthorrhoea brunonis</i>	0.8	<1
<i>Mesomelaena pseudostygia</i>	0.5	25
* <i>Briza maxima</i>	0.5	1
<i>Rytidosperma occidentale</i>	0.5	<1
<i>Gompholobium tomentosum</i>	0.5	<1
<i>Amphipogon turbinatus</i>	0.4	10
<i>Burchardia congesta</i>	0.4	1
<i>Hibbertia hypericoides</i>	0.4	<1
<i>Conostephium pendulum</i>	0.4	<1
<i>Thysanotus sparteus</i>	0.4	<1
<i>Dianella revoluta</i> var. <i>divaricata</i>	0.4	<1

SPECIES	HEIGHT (m)	COVER (%)
<i>Dasypogon bromeliifolius</i>	0.3	<1
<i>Acacia stenoptera</i>	0.3	<1
<i>Lomandra hermaphrodita</i>	0.2	<1
<i>Bossiaea eriocarpa</i>	0.2	<1
<i>Desmocladius flexuosus</i>	0.2	<1
<i>Lomandra caespitosa</i>	0.2	<1
<i>Dampiera linearis</i>	0.1	<1
<i>Astroloma pallidum</i>	0.1	<1
<i>Stylidium brunonianum</i>	0.1	<1
<i>Chamaescilla corymbosa</i>	Flat	<1
<i>Thysanotus patersonii</i>	Climber	<1

* introduced species

QUADRAT W8

50 392918 E 6436171 N

Vegetation: *Allocasuarina fraseriana*/*Banksia attenuata*/*B. menziesii* Low Open Woodland over *Brachyloma preissii*/*Xanthorrhoea preissii*/*Gompholobium tomentosum* Open Low Heath

Condition: Good

Soil Type: Grey sand

Landform: Flat



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Allocasuarina fraseriana</i>	6	10
<i>Banksia attenuata</i>	5	5
<i>Banksia menziesii</i>	4	15
<i>Xanthorrhoea preissii</i>	1.1	10
<i>Kunzea glabrescens</i>	1	1
* <i>Gladiolus caryophyllaceus</i>	1	<1
* <i>Acacia longifolia</i>	1	<1
<i>Brachyloma preissii</i>	0.6	5
<i>Xanthorrhoea brunonis</i>	0.6	<1
* <i>Ehrharta calycina</i>	0.6	<1
<i>Burchardia congesta</i>	0.5	1
<i>Lyginia barbata</i>	0.5	<1
<i>Daviesia triflora</i>	0.5	<1
<i>Patersonia occidentalis</i>	0.4	5
<i>Amphipogon turbinatus</i>	0.4	2
<i>Gompholobium tomentosum</i>	0.4	2
<i>Lepidosperma pubisquameum</i>	0.4	<1
* <i>Briza maxima</i>	0.4	<1
<i>Macarthuria australis</i>	0.4	<1

SPECIES	HEIGHT (m)	COVER (%)
<i>Dasypogon bromeliifolius</i>	0.3	1
<i>Desmocladius flexuosus</i>	0.3	<1
<i>Acacia stenoptera</i>	0.3	<1
<i>Petrophile linearis</i>	0.3	<1
* <i>Ursinia anthemoides</i>	0.3	<1
<i>Conostylis aculeata</i>	0.2	2
<i>Hibbertia racemosa</i>	0.2	<1
<i>Xanthosia huegelii</i>	0.1	<1
<i>Stylidium repens</i>	0.1	<1
<i>Microtis media (dead flowers)</i>	0.1	<1
<i>Chamaescilla corymbosa</i>	Flat	2
<i>Thysanotus patersonii</i>	Climber	<1

* introduced species

APPENDIX 9

Targeted Rare Orchid Survey

29 September 2017

James Priestley

Owners of Lots 1 & 7-11 Lyon Road & Lot 88 De Haer Road,
Wandi

C/- Terranovis Pty Ltd

PO Box 1320

CANNING BRIDGE WA 6153

Dear James,

RE: Lots 1, 7-11 Lyon Road and Lot 88 De Haer Road, Wandu – Targeted Rare Orchid Survey

Following are the results of the targeted rare orchid survey for portions of Lots 1, 7-11 Lyon Road and Lot 88 De Haer Road, Wandu.

The report is an Addendum to the Environmental Assessment Report prepared by PGV Environmental for the lots on 16 March 2017.

1 Background

The Environmental Assessment report contained the results of flora surveys undertaken by PGV Environmental on 14 November 2016 and 8 March 2017. The survey concluded that the Banksia and Sheoak vegetation type and dry, sandy soils are suitable for the Threatened (Declared Rare) Grand Spider Orchid (*Caladenia huegelii*) to occur. However, the timing of the survey in November and March was outside the flowering period for this species. The report recommended a spring survey between mid-September to mid-October 2017 to verify whether the species occurs on the site.

2 Methods

The area surveyed is outlined on the attached Figure. Prior to the survey a reference site was visited in nearby Treeby that contains a population of *Caladenia huegelii*. The reference population is monitored by PGV Environmental annually to ensure that surveys for this species are done within the flowering period of the species for that particular year and in good seasons. The plants in the reference population flowered well in 2017 but slightly earlier than normal, starting in early September rather than mid-September. Many plants were still flowering in later September.

The survey of the Wandi site was undertaken by Dr Paul van der Moezel on 26 September 2017. The survey included walking transects on the site spaced approximately 10m apart and at a very slow walking speed.

Caladenia huegelii is a tall and conspicuous spider orchid that stands up to 0.6m tall and is readily identifiable from 10m by the experienced observer. The Banksia and Sheoak vegetation on the lots has an open low heath which made walking parallel transects relatively easy and visibility for orchid species was relatively high.

3 Results

A total of 9 orchid species were recorded during the targeted orchid survey. Adding to the three previously recorded makes a total of 12 orchid species for the site. The orchid species are listed in Table 1 by Lot number.

The Grand Spider Orchid (*Caladenia huegelii*) was not recorded during the survey. None of the 12 species recorded are Threatened or Priority species.

Table 1 Orchid Species Recorded on the Site

Species	Lot 1	Lot 7	Lot 8	Lot 9	Lot 10	Lot 11	Lot 88
<i>Caladenia discoidea</i>	✓	✓		✓	✓	✓	✓
<i>Caladenia flava</i> subsp. <i>flava</i>	✓	✓	✓	✓	✓	✓	✓
<i>Caladenia latifolia</i>				✓			
<i>Caladenia longicauda</i> subsp. <i>longicauda</i>	✓		✓	✓			
* <i>Disa bracteata</i>	✓						
<i>Diuris corymbosa</i>	✓						
<i>Elythranthera brunonis</i>	✓	✓		✓			
<i>Microtis media</i> subsp. <i>media</i>				✓	✓		✓
<i>Pterostylis recurva</i>	✓			✓			
<i>Pterostylis vittata</i>	✓						
<i>Pyrorchis nigricans</i>	✓	✓	✓	✓	✓	✓	✓
<i>Thelymitra crinita</i>	✓			✓			

Several other plant species were recorded during the orchid survey that had not previously been recorded on the site. An updated plant species list is appended to the report. A total of 133 species have now been recorded on the site, up from 120 in the Environmental Assessment report.

4 Conclusion

The targeted orchid survey conducted on the site on 26 September 2017 was undertaken at the time of the year when Threatened orchid species, in particular *Caladenia huegelii* were known to be flowering in 2017 and in the correct manner for orchid surveys in Banksia woodlands. No Threatened (Declared Rare) orchid species were recorded.

A total of 12 orchid species have been recorded on the site, all of them common species.

Please contact me if you require any clarification of this report.

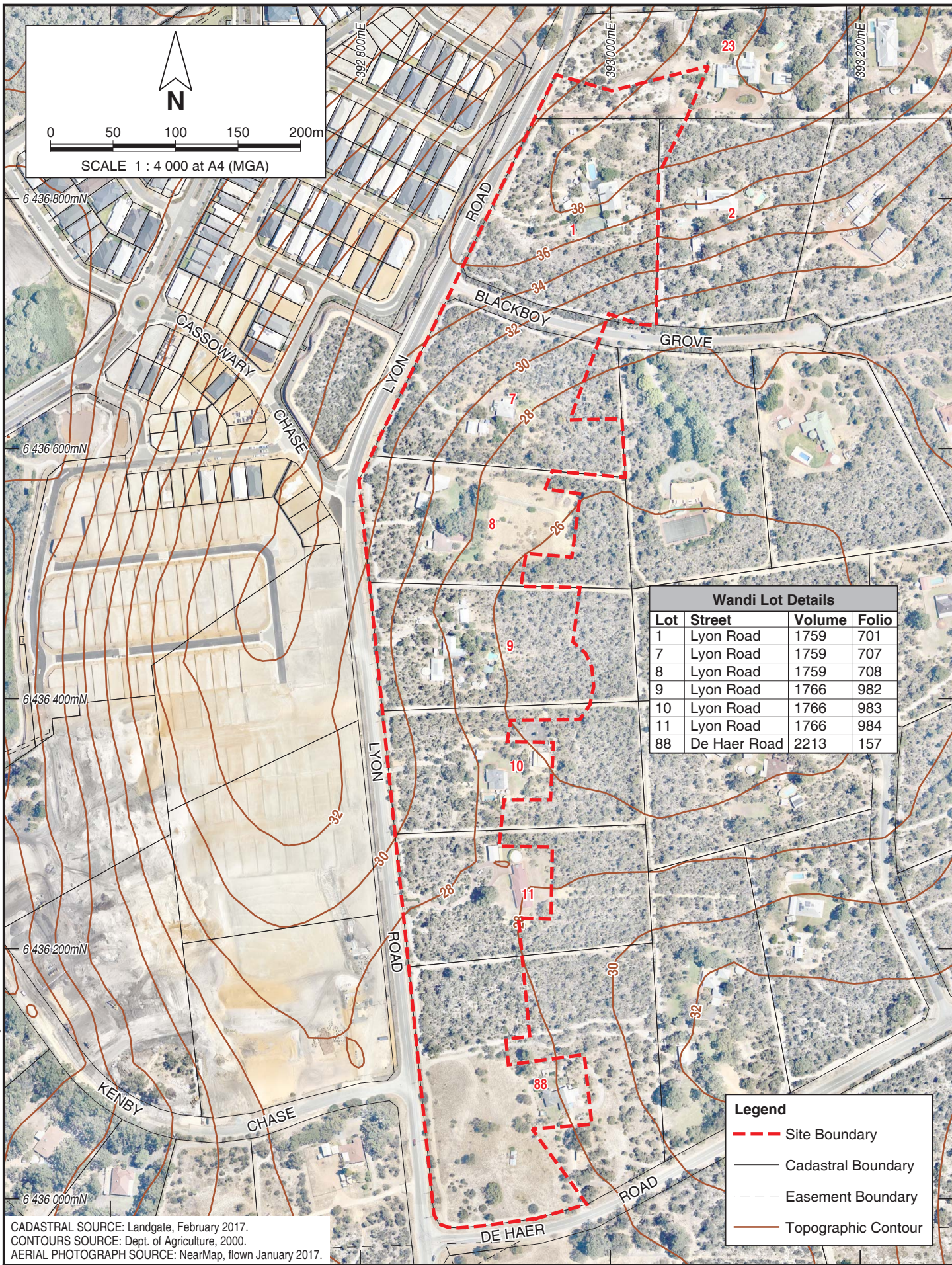
Yours sincerely



Paul van der Moezel
Managing Director

Attachment 1 Targeted Flora Survey Area

Attachment 2 Updated Species List



CADASTRAL SOURCE: Landgate, February 2017.
 CONTOURS SOURCE: Dept. of Agriculture, 2000.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown January 2017.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2016-300-402.dgm

pgv ENVIRONMENTAL

Drawn: P. van der Moezel Date: 17 Mar 2017

Job: 10273 Rpt: 2016-300 Revision: A

Terranovis on behalf of the Landowners
 ENVIRONMENTAL ASSESSMENT REPORT
 LOTS 1 AND 7-11 LYON ROAD AND LOT 88 DE HAER ROAD, WANDRI

SITE BOUNDARY AND TOPOGRAPHY

Figure 2

Attachment 2

SPECIES LIST – Lots 1, 7-11 Lyon Road and 88 De Haer Rd, Wandri

* = Introduced species

GYMNOSPERMS

ZAMIACEAE

Macrozamia fraseri

MONOCOTYLEDONS

ANARTHRIACEAE

Lyginia barbata

ARACEAE

**Zantedeschia aethiopica*

ASPARAGACEAE

Chamaescilla corymbosa

Laxmannia squarrosa

Lomandra hermaphrodita

Lomandra caespitosa

Thysanotus arenarius

Thysanotus patersonii

Thysanotus sparteus

Thysanotus triandrus

COLCHICACEAE

Burchardia congesta

CYPERACEAE

Lepidosperma leptostachyum

Lepidosperma pubisquamum

Mesomelaena pseudostygia

Schoenus curvifolius

Schoenus latitans

DASYPOGONACEAE

Calectasia narragara

Dasypogon bromeliifolius

HAEMODORACEAE

Anigozanthos humilis

Anigozanthos manglesii

Conostylis aculeata

Conostylis setigera

Haemodorum spicatum

Phlebocarya ciliata

HEMEROCALLIDACEAE

Caesia micrantha

Corynotheca micrantha

Dianella revoluta var. *divaricata*

Tricoryne elatior

IRIDACEAE

**Freesia alba* x *leichtlinii*

**Gladiolus caryophyllaceus*

Patersonia occidentalis

**Romulea rosea*

ORCHIDACEAE

Caladenia discoidea

Caladenia flava subsp. *flava*

Caladenia latifolia

Caladenia longicauda subsp. *longicauda*

**Disa bracteata*

Diuris corymbosa

Elythranthera brunonis

Microtis media subsp. *media*

Pterostylis recurva

Pterostylis vittata

Pyrorchis nigricans

Thelymitra crinita

POACEAE

**Aira caryophylla*

Amphipogon turbinatus

Austrostipa elegantissima

Austrostipa flavescens

**Avena fatua*

**Briza maxima*

**Ehrharta calycina*

**Ehrharta longiflora*

**Lagurus ovatus*

**Lolium perenne*

RESTIONACEAE

Desmocladus flexuosus

XANTHORRHOEACEAE

Xanthorrhoea brunonis

Xanthorrhoea preissii

DICOTYLEDONS

AIZOACEAE

**Carpobrotus edulis*

APIACEAE

Platysace compressa

Trachymene pilosa

Xanthosia huegelii

ASTERACEAE

Hyalosperma cotula

Podolepis lessonii

**Hypochaeris glabra*

**Sonchus oleraceus*

**Urospermum picroides*

**Ursinia anthemoides*

CAMPANULACEAE

**Wahlenbergia capensis*

CASUARINACEAE

Allocasuarina fraseriana

Allocasuarina humilis

CRASSULACEAE

Crassula colorata

DILLENACEAE

Hibbertia hypericoides

Hibbertia racemosa

Hibbertia subvaginata

DROSERACEAE

Drosera erythrorhiza

Drosera menziesii subsp. *penicillaris*

ERICACEAE

10273_010_pvdm

Astroloma pallidum

Conostephium pendulum

Brachyloma preissii

Leucopogon conostephioides

EUPHORBIACEAE

**Euphorbia terracina*

FABACEAE

Acacia huegelii

**Acacia iteaphylla*

**Acacia longifolia*

Acacia pulchella

Acacia stenoptera

Bossiaea eriocarpa

Daviesia divaricata

Daviesia triflora

Gompholobium tomentosum

Hardenbergia comptoniana

Hovea pungens

Hovea trisperma

Jacksonia furcellata

**Lupinus cosentinii*

**Trifolium campestre*

GOODENIACEAE

Dampiera linearis

Lechenaultia floribunda

Scaevola canescens

HALORAGACEAE

Gonocarpus pithyoides

LAMIACEAE

Hemiandra pungens

LOBELIACEAE

Lobelia tenuior

LORANTHACEAE

Nuytsia floribunda

MOLLUGINACEAE

Macarthuria australis

MYRTACEAE

Calytrix flavescens

Calytrix fraseri

Eremaea beaufortioides

Eucalyptus marginata

Eucalyptus todtiana

Hypocalymma robustum

Kunzea glabrescens

Scholtzia involucrata

PHYLLANTHACEAE

Phyllanthus calycinus

POLYGALACEAE

Comesperma calymega

PROTEACEAE

Adenanthos cygnorum

Banksia attenuata

Banksia ilicifolia

Banksia menziesii

Grevillea crithmifolia

Hakea lissocarpha

Persoonia saccata

Petrophile linearis

Stirlingia latifolia

Synaphea spinulosa

RUBIACEAE

Opercularia vaginata

RUTACEAE

Philothea spicata

STYLIDIACEAE

Levenhookia stipitata

Stylidium brunonianum

Stylidium piliferum

Stylidium repens

Stylidium schoenoides

VIOLACEAE

Hybanthus calycinus

APPENDIX 10
Significant Trees

Various Lots Lyon Road, Wandri

Lot No.	Tree No.	Easting	Northing	Species	Height	DBH1	DBH2	DBH3	DBH4	Calculated DBH	Condition
1	1	392947	6436804	Jarrah (<i>Eucalyptus marginata</i>)	8	750				750	Healthy
	2	392969	6436836	Sheoak (<i>Allocasuarina fraseriana</i>)	6	840				840	Some dead branches
	3	392946	6436808	Jarrah (<i>Eucalyptus marginata</i>)	9	1000				1000	Healthy, burnt out base
	4	392996	6436844	Blackbutt (<i>Eucalyptus todtiana</i>)	4	530	460	370		702	Healthy
	5	393011	6436748	Jarrah (<i>Eucalyptus marginata</i>)	8	1000				1000	Healthy
	6	393006	6436837	Blackbutt (<i>Eucalyptus todtiana</i>)	6	720	180			742	Healthy
	7	393033	6436806	Blackbutt (<i>Eucalyptus todtiana</i>)	5	510	310	150		597	Healthy
	8	393024	6436804	Sheoak (<i>Allocasuarina fraseriana</i>)	5	550	250			604	Sick, many dead branches
	9	393023	6436736	Sheoak (<i>Allocasuarina fraseriana</i>)	6	570				570	Leaning, fair condition
	10	393019	6436710	Sheoak (<i>Allocasuarina fraseriana</i>)	5	410	370			552	Fair
	11	392990	6436734	Sheoak (<i>Allocasuarina fraseriana</i>)	5	580	310			658	Sick, many dead branches
	12	392911	6436732	Blackbutt (<i>Eucalyptus todtiana</i>)	4	370	360	260		516	Healthy
	13	392945	6436792	Sheoak (<i>Allocasuarina fraseriana</i>)	4	840				840	Sick, many dead branches
7	14	392869	6436669	Sheoak (<i>Allocasuarina fraseriana</i>)	5	510	340			613	Lots of dead branches
	15	392847	6436669	Sheoak (<i>Allocasuarina fraseriana</i>)	6	740	510	470		899	Healthy, has side cut out for powerlines
	16	392876	6436699	Christmas Tree (<i>Nuytsia floribunda</i>)	4	550	320			636	Healthy
	17	392915	6436699	Sheoak (<i>Allocasuarina fraseriana</i>)	5	530	210			570	Healthy
	18	392921	6436685	Sheoak (<i>Allocasuarina fraseriana</i>)	6	670				670	Lots of dead branches
	19	392936	6436671	Sheoak (<i>Allocasuarina fraseriana</i>)	7	520	420			668	Fair
	20	392974	6436620	Christmas Tree (<i>Nuytsia floribunda</i>)	4	330	300	240	150	507	Healthy
	21	392953	6436598	Sheoak (<i>Allocasuarina fraseriana</i>)	7	510				510	Healthy
	22	392939	6436599	Sheoak (<i>Allocasuarina fraseriana</i>)	6	580				580	Healthy
	23	392855	6436609	Sheoak (<i>Allocasuarina fraseriana</i>)	7	400	340			525	Fair, dead branches
	24	392851	6436622	Christmas Tree (<i>Nuytsia floribunda</i>)	5	570	180			598	Healthy
	25	392832	6436629	Sheoak (<i>Allocasuarina fraseriana</i>)	5	450	280	160		530	Healthy
	26	392843	6436653	Tuart (<i>Eucalyptus gomphocephala</i>)	6	470	210			515	Fair
10	27	392872	6436364	Sheoak (<i>Allocasuarina fraseriana</i>)	7	730				730	Fair
	28	392854	6436343	Sheoak (<i>Allocasuarina fraseriana</i>)	7	580				580	Healthy
	29	392865	6436329	Sheoak (<i>Allocasuarina fraseriana</i>)	6	350	300	260	170	534	Healthy
	30	392876	6436338	Eucalyptus sp.	10	590				590	Healthy
	31	392865	6436327	Sheoak (<i>Allocasuarina fraseriana</i>)	7	360	320	270	160	548	Healthy
	32	392946	6436306	Sheoak (<i>Allocasuarina fraseriana</i>)	6	530				530	Healthy
	33	392965	6436305	Sheoak (<i>Allocasuarina fraseriana</i>)	6	440	310	300	290	679	Healthy
	34	392999	6436317	Sheoak (<i>Allocasuarina fraseriana</i>)	4	710				710	Nearly dead
	35	392981	6436385	Jarrah (<i>Eucalyptus marginata</i>)	6	1440				1440	Healthy
	36	392967	6436348	Jarrah (<i>Eucalyptus marginata</i>)	7	400	370			545	Healthy base, cut top
11	37	392892	6436195	Jarrah (<i>Eucalyptus marginata</i>)	9	850				850	Healthy, leaning
	38	392881	6436282	Sheoak (<i>Allocasuarina fraseriana</i>)	6	410	350	230		539	Healthy
	39	392858	6436222	Sheoak (<i>Allocasuarina fraseriana</i>)	6	850				850	Healthy
	40	392872	6436195	Sheoak (<i>Allocasuarina fraseriana</i>)	5	620	420	200		749	Healthy
	41	392930	6436199	Sheoak (<i>Allocasuarina fraseriana</i>)	6	550				550	Healthy

Lot No.	Tree No.	Easting	Northing	Species	Height	DBH1	DBH2	DBH3	DBH4	Calculated DBH	Condition
88	42	392874	6436185	Jarrah (<i>Eucalyptus marginata</i>)	10	700				700	Dead top branches
	43	392869	6436173	Jarrah (<i>Eucalyptus marginata</i>)	10	700	700			990	Dead top branches
	44	393026	6436207	Sheoak (<i>Allocasuarina fraseriana</i>)	6	650				650	Healthy
	45	392914	6436173	Sheoak (<i>Allocasuarina fraseriana</i>)	6	500	280	200		573	Healthy
	46	392931	6436119	Jarrah (<i>Eucalyptus marginata</i>)	8	1160				1160	Healthy, burnt base
	47	392931	6436109	Jarrah (<i>Eucalyptus marginata</i>)	9	970				970	Healthy
	48	392879	6436144	Sheoak (<i>Allocasuarina fraseriana</i>)	6	570				570	Healthy
	49	392860	6436121	Jarrah (<i>Eucalyptus marginata</i>)	7	530	350			635	Healthy
	50	392912	6436000	Jarrah (<i>Eucalyptus marginata</i>)	6	550	500			743	Healthy

APPENDIX 11

Aboriginal Heritage Inquiry System Reports



Search Criteria

0 Registered Aboriginal Sites in Custom search area (2); 392771.65mE, 6436092.70mN z50 (MGA94) : 393091.75mE, 6436890.73mN z50 (MGA94)

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South West Settlement ILUA Disclaimer

Your heritage enquiry is on land **within or adjacent to** the following Indigenous Land Use Agreement(s): Gnaala Karla Booja People ILUA

On 8 June 2015, six identical Indigenous Land Use Agreements (ILUAs) were executed across the South West by the Western Australian Government and, respectively, the Yued, Whadjuk People, Gnaala Karla Booja, Ballardong People, South West Boojarah #2 and Wagyl Kaip & Southern Noongar groups, and the South West Aboriginal Land and Sea Council (SWALSC).

The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site. The Aboriginal Heritage Due Diligence Guidelines, which are referenced by the NSHA, provide guidance on how to assess the potential risk to Aboriginal heritage.

Likewise, from 8 June 2015 the Department of Mines and Petroleum (DMP) in granting Mineral, Petroleum and related Access Authority tenures within the South West Settlement ILUA areas, will place a condition on these tenures requiring a heritage agreement or a NSHA before any rights can be exercised.

If you are a State Government Department, Agency or Instrumentality, or have a heritage condition placed on your mineral or petroleum title by DMP, you should seek advice as to the requirement to use the NSHA for your proposed activity. The full ILUA documents, maps of the ILUA areas and the NSHA template can be found at <https://www.dpc.wa.gov.au/lantu/Claims/Pages/SouthWestSettlement.aspx>.

Further advice can also be sought from the Department of Aboriginal Affairs (DAA) at heritageenquiries@daa.wa.gov.au.



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Accuracy is shown as a code in brackets following the coordinates. Map coordinates (Latitude/Longitude and Easting/Northing) are based on the GDA 94 Datum. The Easting/Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '500000mE:Z50' means Easting=500000, Zone=50.

Terminology (NB that some terminology has varied over the life of the legislation)

Place ID/Site ID: This a unique ID assigned by the Department of Aboriginal Affairs to the place

Status:

- o **Registered Site:** The place has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*
- o **Other Heritage Place which includes:**
 - **Stored Data / Not a Site:** The place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972*
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Status Reason: e.g. Exclusion - Relates to a portion of an Aboriginal site or heritage place as assessed by the Aboriginal Cultural Material Committee (ACMC). e.g. such as the land subject to a section 18 notice.

Origin Place ID: Used in conjunction with Status Reason to indicate which Registered Site this Place originates from.

Access and Restrictions:

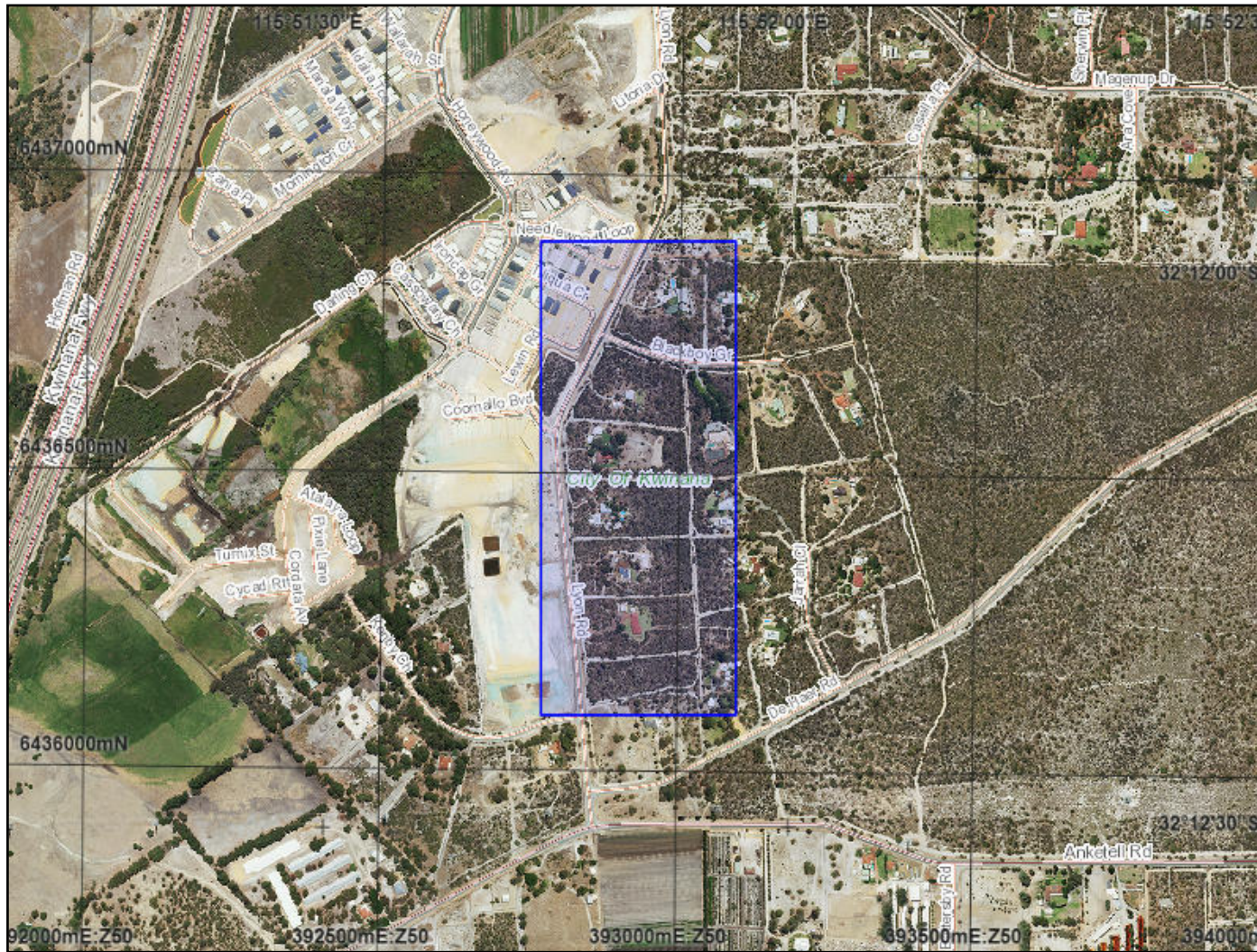
- o **File Restricted = No:** Availability of information (other than boundary) that the Department of Aboriginal Affairs holds in relation to the place is not restricted in any way.
- o **File Restricted = Yes:** Some of the information that the Department of Aboriginal Affairs holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Aboriginal Affairs receives written approval from the informants who provided the information. Download the [Request to Access Restricted Information](#) letter and form.
- o **Boundary Restricted = No:** place location is shown as accurately as the information lodged with the Registrar allows.
- o **Boundary Restricted = Yes:** To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km²) provides a general indication of where the place is located. If you are a landowner and wish to find out more about the exact location of the place, please contact DAA.
- o **Restrictions:**
 - **No Restrictions:** Anyone can view the information.
 - **Male Access Only:** Only males can view restricted information.
 - **Female Access Only:** Only females can view restricted information

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.








List of Registered Aboriginal Sites with Map

No Results



Legend

Selected Heritage Sites

-  Registered Sites
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

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Search Criteria

1 Other Heritage Places in Custom search area (5); 392777.14mE, 6436094.60mN z50 (MGA94) : 393094.00mE, 6436890.75mN z50 (MGA94)

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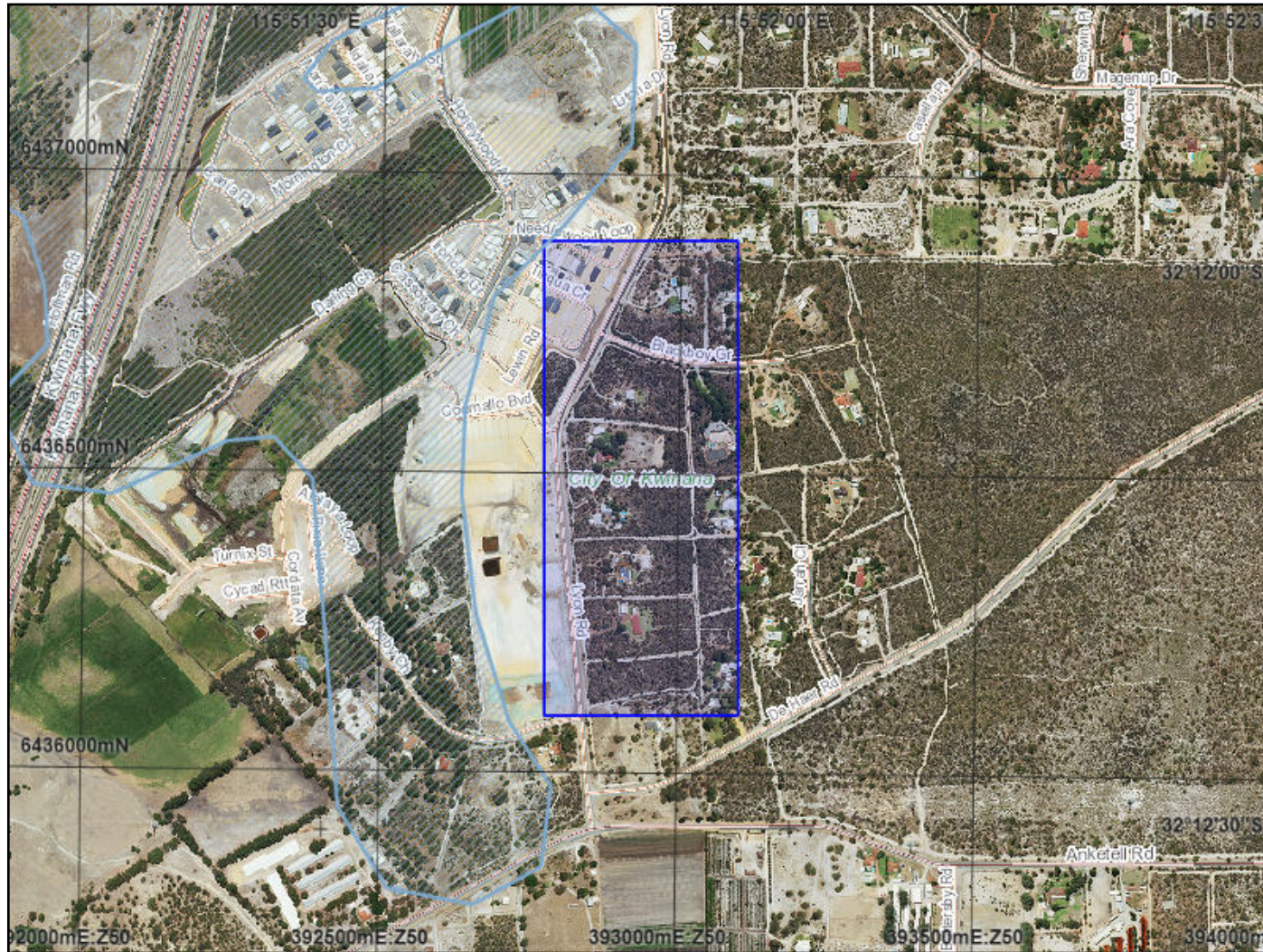
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- o **File Restricted = Yes:** Some of the information that the Department of Aboriginal Affairs holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Aboriginal Affairs receives written approval from the informants who provided the information. Download the [Request to Access Restricted Information](#) letter and form.
- o **Boundary Restricted = No:** place location is shown as accurately as the information lodged with the Registrar allows.
- o **Boundary Restricted = Yes:** To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km²) provides a general indication of where the place is located. If you are a landowner and wish to find out more about the exact location of the place, please contact DAA.
- o **Restrictions:**
 - **No Restrictions:** Anyone can view the information.
 - **Male Access Only:** Only males can view restricted information.
 - **Female Access Only:** Only females can view restricted information

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.







List of Other Heritage Places with Map

ID	Place Name	File Restricted	Boundary Restricted	Restrictions	Status	Status Reason	Origin Place ID	Type	Knowledge Holders	Coordinates	Legacy ID
3427	MANDOGALUP SWAMP/SPECTACLES.	No	No	No Gender Restrictions	Stored Data / Not a Site			Mythological, Hunting Place, Water Source	*Registered Knowledge Holder names available from DAA	391457mE 6436663mN Zone 50 [Unreliable]	S0272 9



Legend

Selected Heritage Places

-  Other Heritage Places
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

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APPENDIX 12
EPBC Act Decision



Notification of

REFERRAL DECISION – not controlled action

Residential development, Lots 1 and 7-11 Lyon Rd and Lot 88 De Haer Rd, Wandi, WA (EPBC 2017/7908)

This decision is made under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed action

Person proposing to take the action Terranovis PTY LTD
ACN: 58 107 738 563

proposed action Development of Lots 1 and 7-11 Lyon Road and Lot 88 De Haer Road, Wandi for residential purposes; as described in the referral received by the Department on 21 March 2017 [See EPBC Act referral 2017/7908].

Referral decision: Not a controlled action

status of proposed action The proposed action is not a controlled action.

Person authorised to make decision

Name and position Tim Wyndham
A/g Assistant Secretary
Assessments (WA, SA, NT) and Air Branch

signature

date of decision 16 June 2017

Lots 7-11 & 88 Lyon Road, Wandii

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

Appendix 3

Local Water Management Plan

Lots 7-11 & 88 Lyon Road, Wandi

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

REPORT

**TERRANOVIS PTY LTD
LOTS 1, 7-11 & 88 LYON ROAD, WANDI**

**DISTRICT AND LOCAL WATER MANAGEMENT
STRATEGY**

AUGUST 2020



DEVELOPMENT
ENGINEERING
CONSULTANTS

Revision History:

Revision	Description	Checked	Approved	Date
0	Original Issue	JPF	SRA	8 th May 2017
1	Revised to Incorporate Client Comments	SRA	SRA	16 th May 2017
2	Revised to suit new Precal	DMN	SRA	18 th November 2019
2	Revised to suit updated Plan and Area	SRA	SRA	24 th August 2020



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LOTS 1, 7-11 & 88 LYON ROAD, WANDI

DISTRICT AND LOCAL WATER MANAGEMENT STRATEGY (DLWMS)

Executive Summary

Estate Scale

- Existing roads abutting the proposed development will be upgraded to kerbed roads with drainage pits connected to soakwells to contain up to the 1% AEP storm.
- Given the grade of the land, lots abutting Lyon Road on the eastern side will be set at a lower level than the road. However, soakwells and lawn/garden areas will provide storage and soakage for up to the 10% AEP storm without outflow, and the small excess beyond this will overflow into the R5 zoned lots which will provide sufficient soakage for the 1% AEP given the minimum 6m building setback which is required for these lots.
- Information Packages will be provided to all lot purchasers to: (a) fully inform lot owners of the requirement to install two 1,200mm diameter by 1,200mm deep soakwells prior to overflow to the street drainage system; (b) encourage the use of rainwater tanks; (c) utilise water efficient devices and appliances throughout their homes; and (d) maximise the use of water- and nutrient-wise plants, and minimise the use of lawns.

Access Street Scale

- Side entry pits connected to soakwells along Lyon Road will provide storage for up to the 1% AEP storm.

Allotment Scale

- All lot owners will be encouraged to install rainwater tanks plumbed into their homes for household use in order to assist to contain the 1 EY – 1 hour event on site in lieu of soakwells.
- All urban lots are required to install the equivalent of two 1,200mm by 1,200mm deep soakwells to hold the relevant storm events on site.
- R5 zoned and special rural lots will hold the whole of the 1% AEP on site.

1 Introduction

This DLWMS report has been prepared as a stand-alone document to support the proposed Structure Plan, Urban Deferred Lifting Request and rezoning of Lots 1, 7-11 & 88 Lyon Road, Wandu and will be used to guide the design and construction of the proposed drainage solutions for subdivision within the area.

The location of the site is shown in Appendix A, together with an aerial photograph of the existing site.

The site is located on the eastern side of Lyon Road from the northern corner of the intersection with De Haer Road to approximately 150m north of the intersection with Blackboy Grove.

1.1 Drainage / Water Management Principles and Design Objectives

The following water sensitive design criteria, principles and objectives are to be pursued and/or implemented as part of the proposed development:

- *Water Conservation & Water Efficiency*

Objective: To minimise the use of scheme water outside of the home and to use water as efficiently as possible – both within and outside of the home.

Objective: All lot purchasers will be encouraged to install rain water tanks plumbed into their home; to use water efficient devices and appliances throughout their homes and to plant “water-wise” and “nutrient-wise” gardens.

- *Water Quantity Management*

Principle: To ensure that post development discharge is retained on site.

Objective: All runoff from road reserve to be contained in roadside soakwells up to the 1% AEP storm. All runoff from lots to be detained in soakwells with runoff up to the 1% AEP storm from R25 and R12.5 lots overflowing into R5 and special rural lots to be soaked away over large open areas as is the current status quo.

Objective: Roadside soakwells to be provided to ensure that the 1% AEP storm is disposed of on-site via infiltration.

- *Water Quality Management*

Principle: To maintain and if possible improve the overall surface and groundwater quality of the water leaving the estate.

Objective: Ensure that surface water is routed into underground drainage pits and soakwells to be retained on site.

1.2 Planning Background

The subject land is Lots 1, 7-11 and 88 Lyon Road, Wandu, which forms the proposed Structure Plan under the City of Kwinana (CoK) Town Planning Scheme (TPS) No. 2. The LWMS will support the proposed TPS Amendment to rezone the site from ‘Special Rural – SR13’ zone to ‘Development’ zone, and the proposed Metropolitan Region Scheme (MRS) Amendment for lifting the ‘Urban Deferred’ zone to ‘Urban’ zone.

The proposal requires the preparation and approval of this document prior to rezoning and Structure Plan approval.

The proposed Structure Plan, TPS Scheme Amendment Map and MRS Scheme Amendment Map are detailed in Appendix A.

2 Proposed Development

2.1 Key Elements of the Local Structure Plan (LSP)

The site is located within the suburb of Wandi within the City of Kwinana and covers an area of approximately 15.2ha of undeveloped land. The site is located on the east side of Lyon Road immediately north of the intersection between Lyon Road and De Haer Road.

The development proposal consists of Some 58 lots with the following range:

- 23 Lots R12.5 – Average Area 800 square metres.
- 21 Lots R10 – Average Area 900 square metres.
- 11 Lots R5 – Average Area 2,500 square metres of which 4 lots are partially special rural with an average additional area of 7,000 square metres.
- 3 Special Rural Lots with an average area of some 1.75ha.

2.2 Previous Land Use

The land is currently undeveloped, and contains seven existing homesteads – one on each lot – surrounded by mostly degraded bushland. The land has had no previous use other than for residential purposes.

2.3 Finished Lot Levels

Finished lot levels will be set so that any overflow from the R12.5 and R25 zoned lots for the larger storms will overflow onto the larger R5 zoned lots and special rural lots which will have sufficient areas along their boundaries for the 1% AEP storm to soak away due to a minimum setback of 6.0m. Any flow in excess of the 1% AEP storm will outflow onto the road system.

A further criterion is that lots are to be at least 1.2m above AAMGL, although the groundwater is well below (some 7.0m minimum) proposed surface levels.

3 Design Criteria

The drainage requirements for developments within this area are controlled by the requirements of the City of Kwinana, which are outlined below.

Item	Description	Requirement	Source / Comment
1	Water quality	1 EY (63.2% AEP) 1 hour storm to be retained on site.	DoW requirements
2	AEP for pipe design	20% AEP	Standard Council requirement
3	AEP for drainage retention	1% AEP without outflow from site	Standard Council requirement – no predevelopment flows currently exit the site
4	Allowable design discharge from site	2.5L/s/Ha	Per Water Corporation requirement for the Mundijong Drainage District ¹ – see Section 4.5.1

4 Predevelopment Environment

4.1 Topography and Landform

The site rises from a low point at around RL26.0mAHD in the centre of the eastern boundary to a ridge that runs generally north/south along Lyon Road on the western boundary of the subject land. The highest point in the ridge is in the north-eastern corner of the site at around RL39.5mAHD, falling to around RL29.0mAHD in the south-western corner of the site.

The average fall of the land is moderate at around 5%, varying from 7% at its steepest in the northern half of the site to 3% at its flattest in the southern half of the site.

4.2 Soil Characteristics

The Perth Environmental Geology Mapping² indicates that the site area is underlain by Bassendean Sands, which are noted as being a good groundwater recharge area. The sands are well graded and of high permeability, meaning that soakage will be effective on site.

The Department of Water and Environment Regulation³ identifies the subject site as having moderate to low risk of acid sulfate soils and potential acid sulfate soils occurring within 3.0m of natural soil surface.

4.3 Geotechnical

Given the homogeneous sand on the site and excavations in the peripheral areas to the site being consistent with the environmental mapping, no geotechnical investigations have been undertaken on the site. Adjacent developments and quarries also assist in demonstrating the types of soil in the area.

It is proposed that further investigations will be undertaken as part of the Urban Water Management Plan (UWMP) to confirm the soil profile for the area.

4.4 Groundwater Aspects

No groundwater monitoring has been undertaken over this site; however two nearby Department of Water and Environmental Regulation (DWER) bores were used to establish Average Annual Maximum Groundwater Level (AAMGL) contours for the site, in conjunction with the contours shown by the 2004 Groundwater Atlas⁵. There are no known environmental risks to the site and no previous activities have occurred on the site to cause risk to groundwater.

As per the excerpt in Appendix D, the 2004 Groundwater Atlas indicates groundwater levels of a minimum RL18.5mAHD on the western boundary and a maximum RL20.5mAHD on the eastern boundary of the site. The contours shown in the 2004 Atlas correlate well with the DWER bore records of that year, thus they were used to inform the shape of the established AAMGL contours for the site.

As shown in Appendix D, DWER bore JM42 (#61410109) lies some 900m to the north-east of the site, and has records to 1975. The AAMGL for JM42 was calculated to be RL22.38mAHD. DWER bore Anketell Site 1A (#61410706) lies some 400m to the south of the site, and has records to 1995. The AAMGL based on 1995-2016 for Anketell Site 1A was RL20.40mAHD. Due to its lower calculated AAMGL on account of lacking older records, the Anketell Site 1A AAMGL was adjusted to

reflect records to 1975 by using the difference in calculated AAMGL at JM42 for both 1975-2016 and 1995-2016 datasets. The difference between the AAMGL calculated for the two datasets was 0.66m, therefore, the Anketell Site 1A AAMGL was adjusted to RL21.06mAHD.

The AAMGL at the DWER bore locations was on average 1.02m higher than the 2004 Atlas GWLs, thus the AAMGL contours were established by adding this difference to the 2004 Atlas contours.

The minimum separation distance between AAMGL and proposed lot levels is some 7.0m, significantly exceeding the minimum requirement of 1.2m.

The DWER monitoring bore records for bores JM42 and Anketell Site 1A showing AAMGLs and an excerpt from the 2004 Groundwater Atlas showing groundwater contours and bore locations are shown in Appendix D.

It should be noted that the 1997 Groundwater Atlas⁴ indicates that the peak GWL in the area is around RL23.0mAHD; however the contours shown by the 1997 Atlas do not correlate with the bore records in the area. The contours were 2.5m higher than the 1997 MGL according to DWER bore records, and 1.3m higher than the historical MGL. As a result, the 1997 Atlas contours were not considered accurate for the site.

4.5 Surface Water Aspects

4.5.1 General

As shown in Drawing L03 in Appendix B, there is a ridge generally running along the western site boundary and a low point in the centre of the eastern boundary, meaning that all surface water from this site will grade east to the low point. The soil is very permeable and in the rare event that runoff occurs, each catchment will drain to suitable low areas and infiltrate.

The northern portion of the site is moderately steep, grading down at an average of around 7% from the ridge. Apart from infiltration during the rainfall event, any collected runoff will be directed to flatter terrain in the southern portion of the site, grading at around 3-5%, with sufficient depth and capacity for infiltration to occur.

The site falls within 'Region 1' of the Water Corporation controlled Rural Mundijong Drainage District, permitting a maximum outflow of 2.5L/s/Ha. Given the permeable soil conditions and the location of isolated low areas throughout the catchments, outflow is unnecessary. As a result, drainage facilities within this development have been designed to hold all events up to 1% AEP storm without outflow.

4.5.2 Predevelopment Groundwater Monitoring

Given the significant depth between the site surface levels and the existing groundwater levels in addition to the low risk predevelopment land use, no predevelopment monitoring has been undertaken on the site or is required for the purposes of drainage disposal and water management.

Nonetheless, it would be appropriate to undertake some testing to prove up groundwater quality for irrigation purposes and this will be done as part of the UWMP.

4.6 Environmental Assets and Water-Dependent Ecosystems

According to the Department of Parks and Wildlife⁶, there are four Conservation category wetlands in the vicinity of the site. The Mandogalup Swamp South Sumpland (UFI #12980) is the closest environmental asset to site, lying 400m north-west. The groundwater contours beneath the site grade in the south-west direction, however, away from Mandogalup South and towards the Spectacles North Sumpland (UFI #6539), which is some 2.3km away. Sandy Lake (UFI #15290) and Sumpland UFI #15333 both lie upstream some 1.3km south some 1.5km east, respectively. The proposed development poses little to no threat to any of these sumplands on account of groundwater flow direction and distance.

The Wandji Nature Reserve lies some 400m to the east of the site. Due to the distance and the absence of an overland flow path into the reserve from site, the proposed development poses no risk to the reserve.

4.7 Existing Infrastructure and Design Constraints

Sufficient capacity is available in the neighbouring development to service the development of the subject land. There will be some service infrastructure extensions required to facilitate the development of the land, primarily from the development on the western side of Lyon Road.

The site is proposed to be connected into the existing sewerage infrastructure on the western side of Lyon Road, which currently has sufficient capacity to service the development. The proposed sewer levels of the neighbouring development as a result of the ridge line between the two developments provided significant constraints on the sewer design. Thus, a single deepened crossing is proposed at Kenby Chase to serve the entire subject development, as it provides the best outcome for lot levels and construction costs. Some fill will be required for the proposed lots in the low area in the centre of the site to enable servicing of the northern portion of the site.

The site is proposed to be connected into the 200mm water reticulation main to be constructed along the western verge of Lyon Road by other developers in early 2017. This line will run from Cassowary Chase to Anketell Road and will provide sufficient supply to the subject development through a number of connections along Lyon Road.

Being relatively steep limits the use of soakage in the northern portion of the site, other than through the use of baseless manholes. This necessitates the location of the majority of the drainage infiltration area in the flatter south-eastern portion of the site.

5 Water Sustainability Initiatives

5.1 General

The current state government requirement to increase the efficiency of water use in new developments to a target of less than 100kL per person per year is proposed to be implemented within the development.

This is proposed to be achieved by:

- Increased water efficiency in the household by encouraging the use of waterwise appliances through regulation and financial incentives.

- Encouragement of the use of rainwater tanks to supplement scheme water for irrigation.
- The use of low water requirement plants and minimising turf areas for gardens and POS areas.

5.2 Individual Lot Owner Initiatives

Water conservation will be encouraged by the developer through the promotion of native, water-wise gardens and water efficient household devices and appliances. All requirements for the purchaser will be outlined in their purchase contract and associated information handouts.

The information will also outline the case for all lot owners to use rainwater tanks plumbed into their homes to assist with the retention of the 63.2% AEP event.

5.3 Estate Street Tree Initiatives

Establishment irrigation for street trees is expected to be used for a period of between 2 and 3 years after planting then disconnected.

Typically, watering will start with 10mm three times per day for initial establishment over a period of around 1 month, depending on the weather and the time of the year. This should then be reduced to 10mm once per day for a period of around 2 months – dependent on the time of year. The watering is then reduced to 10mm applied 2 to 3 times a week.

Irrigation should be programmed and maintained to minimise the water used across the site, with the following mechanisms to minimise water use.

- The system should be checked regularly to detect faults and ensure water is being used effectively and efficiently.
- In general the system should be checked at a frequency of:
 - November to April – Once per fortnight.
 - May to October – Once per month.
- All sprinklers will be checked to fully pop-up and retract, as well as provide adequate coverage, and bubblers and nozzles will be checked to be free of blockages. Particular attention will be paid to irrigation of transplanted mature trees and street trees to ensure they are receiving adequate water.
- The watering regime for planted areas should reflect the plants needs appropriate to the plant type and natural rainfall, in accordance with the Water Corporation's "Waterwise" guidelines. Watering should be monitored throughout the year and adjusted accordingly to ensure appropriate watering. Watering should only take place within the hours stipulated by the Water Corporation (currently 6.00pm to 9.00am).

The Irrigation Schedule is expected to be as follows (based on landscape hydrozones):

- Low water use plants should be scheduled to receive a lesser amount of water than areas of higher water use; and,
- Irrigation should be progressively withdrawn from areas of native shrubbery.

As part of the landscape works, the topsoil in the landscaped areas will be improved to ensure free drainage and nutrient retention properties prior to planting.

6 Stormwater Management Strategy

6.1 Pre-Development Hydrology

As outlined in Section 4, the site consists of sand with excellent soakage characteristics and variable grades from 3-7%; the average being at around 5%.

Based on the fact that little or no runoff occurs and all rainfall is infiltrated in the sites undeveloped state, it has been assumed that there is no predevelopment flow from the site. A plan detailing the predevelopment catchment boundaries is shown in Drawing L03 in Appendix B.

The entire area drains east away from Lyon Road, but due to the high permeability of the soil, the water is likely to infiltrate prior to reaching the sites eastern boundary.

6.2 Pre- & Post-Development Hydrology

The drainage strategy proposes to infiltrate all stormwater on site as close to the source as possible. The soils on site are not noted as being particularly effective in the treatment of runoff; however the significant depth to groundwater will provide sufficient opportunities for nutrient uptake.

The site is proposed to be captured in sub-catchments along the existing roads which will be retained in soakwells connected to the side entry pits. Drawing L04 shows the overall catchment layout plan and locations of the soakwells and drainage pits.

Soakage at source will be employed for all allotments without outflow for small storm events and overflow for up to the 1% AEP storm will be soaked away in the R5 and special rural lots within the 6m minimum setbacks.

Calculations as shown in Appendix C show that soakwells will contain up to the 1% AEP storm for the development. On average, the drainage pits and soakwells will contain approximately 1 cubic metre of storage for every 31 square metres of road reserve.

6.3 1 EY (63.2% AEP) event

6.3.1 General

The 63.2% AEP event is typically seen as the storm where most nutrients and particulate matter is generated from.

It is proposed that the 63.2% AEP – 1 hour storm will be retained on site without outflow in accordance with DoW requirements. This is proposed to be undertaken at the various levels as outlined in the following sections.

6.3.2 Lots

Lots will either retain water on site in rainwater tanks in conjunction with soakwells or install soakwells to infiltrate water to ensure no outflow into the street drainage system.

Standard residential lots will be required to provide a minimum soakage volume of 2.71 cubic metres of onsite storage to achieve full retention of the 63.2% AEP – 1 hour storm. This can be provided in two ways as follows:

- Install two 1,200mm diameter by 1,200mm deep soakwells.
- Install an equivalent volume in rainwater tanks with an overflow.

Any overflow from the major event will infiltrate in garden areas with a small proportion reaching the street drainage system.

Calculations detailing the 1% AEP outflow for standard residential allotments and group housing sites are included in Appendix C.

6.3.3 Streets

All storms up to the 1% AEP storm for roadways will be contained within side entry pits and soakwells along the roadsides.

Drainage pits will be laid with open bases to permit soakage for small rainfall events thereby encouraging further soakage “at source.” The baseless pits will cater for around 1.5-2.0mm of rainfall. The pits will have geotextile installed at soakage points to assist with the retention of nutrients and other contaminants.

6.3.4 Non-structural measures

Non structural measures will also be employed to reduce the sources of nutrients. These measures involve providing advice to lot purchasers and stakeholders to reduce nutrient sources from the application of garden fertilisers and eroded particulate matter, particularly from the new urban areas during the housing construction phase and in establishment of gardens.

Minimisation of nutrient loading can obviously be achieved through:

- Education of local residents and Council maintenance personnel;
- Implementing frequent street and storm water maintenance programs – particularly during housing construction, and;
- Planting and using appropriate native species.

6.4 20% AEP event

All drainage systems will be designed to accommodate the 20% AEP event, without any inundation of roadways.

6.5 1% AEP event

All drainage pits and soakwells will be designed to accommodate the 1% AEP event without overflow. Drainage calculations for soakwells and drainage pits have been included in Appendix C.

6.6 Finished Lot Levels (Relative to the 1% AEP Flood Levels)

The smaller residential lots (R25 and R12.5) will have small amounts of overflow for the 1% AEP, with a maximum of some 1.0l/s. Due to the grade of the land, the lots

abutting Lyon Road will be lower than the road level, but the overflow will be routed into the larger R5 lots where it will soak away.

There is a minimum 6.0m setback on the R5 lots for buildings, which will provide sufficient area for the 1% AEP storm to soak away without issue. If a storm is in excess of the 1% AEP storm, the overflow will be routed towards the Blackboy Grove and De Haer Road roadways. Calculations for the lot drainage are included in Appendix C.

6.7 Best Management Practices Water Quality Targets

The DWER's Stormwater Manual provides guidelines and information on best management practices that may be applied at land development and construction sites to improve stormwater management and environmental performance.

Poorly managed land development sites can often be a major source of stormwater pollution. Certain construction activities can allow pollutants to be transported (via existing stormwater systems or overland flow) to adjoining receiving water bodies.

The major source of pollutants from construction activities in this instance will potentially be from:

- Eroded materials in the interim period between opening up the surface of the site and implementing the drainage management measures.
- Litter and waste storage areas that allow materials to be blown by wind or washed away by rainfall into existing stormwater systems.
- Wash-down areas – poor practices can allow materials to enter stormwater systems.
- Placement and storage of delivered products, particularly sand and soil stockpiles where such materials may be tracked by vehicles, blown, or washed onto roads which then get into existing stormwater systems.
- Dewatering activities which can cause sedimentation of downstream water bodies.

Consequently no construction activities will commence on the site until an appropriate approved Environmental Management Plan (EMP) is prepared that fully addresses:

- litter and waste management practices (non-hazardous and hazardous materials);
- vehicle and equipment washing-down practices;
- water conservation practices;
- product placement and storage practices;
- dewatering activities (if applicable), and;
- any other practices that may adversely impact upon receiving water bodies.

This will be prepared by the contractor undertaking the civil works on the subdivision together with the engineering consultant.

The Best Management measures proposed for this area are proposed to be:

- Non-structural measures to be implemented to reduce applied nutrient loading.
- On site, at source detention of 63.2% AEP – 1 hour storm.

7 Groundwater Management Strategy

7.1 Groundwater Level Management

Groundwater levels for the site location are at least 7.0m below proposed development levels. There is no need for control of groundwater levels and all drainage pipework will be laid well above the current groundwater levels.

7.2 Actions to Address Acid Sulphate Soils or Contamination

The ASS mapping for the area indicates that there is a moderate to low chance of ASS soils being present on the site. There will be no requirement for dewatering on site and all excavations will be within 3.0m of the surface, therefore there is little or no risk of the development proposal encountering any ASS soils.

8 The Next Stage – Subdivisions and Urban Water Management Plans

The structure plan area is under separate ownership arrangements; however is being co-ordinated through one project manager, which may simplify the physical implementation of the proposals. The design has taken this into account, so that the outcomes stipulated in this report can still be achieved regardless of the sequencing of the development works. A UWMP will be required for the subdivision proposal, but will generally fit within the framework of this DLWMS.

The UWMP will build on the concepts of this report providing ongoing monitoring results and addressing the following major points:

- Further detail in the design of the drainage system.
- Further detail in landscape proposals.
- Additional environmental test data and geotechnical investigations.
- Testing of groundwater quality for irrigation purposes.

Once this data is received, the approach outlined herein will be reviewed with detailed work required to:

- Review the drainage calculations relative to final planning proposals for the site to ensure that the land use assumptions within the drainage calculations herein are consistent.

9 Monitoring

9.1 General

Given the height of the site above the water table and the significant distance of the site from any environmental assets, it is not proposed to undertake further monitoring, other than to confirm the suitability of groundwater for irrigation purposes.

10 Implementation

10.1 Commitments

The developers are committed to

- 1) Physical outcomes – To be undertaken at the time of construction.
 - Ensuring that all stormwater drainage from the estate is infiltrated on site.
- 2) Non-structural outcomes – To be undertaken as part of sales documentation, by providing Information Packages to all lot purchasers to:
 - Fully inform lot owners of the requirement to install a minimum of two 1,200mm diameter by 1,200mm deep soakwells prior to outflow into the road drainage system in the event a rainwater tank is not installed or a single soakwell if a rainwater tank is used.
 - To encourage the use of rainwater tanks (plumbed into their homes), and;
 - To utilise water efficient devices and appliances throughout their homes, and to encourage all purchasers to install water- and nutrient-wise plants.
- 3) Further investigation and reporting:
 - Prepare UWMPs to support further detailed subdivision planning.
 - Undertake further geotechnical investigations.

10.2 Maintenance Schedules (Incl. Roles & Responsibilities)

Maintenance schedules and arrangements will be resolved as part of the Urban Water Management planning and will be dependent on the detailed design and operation of the mechanisms required. As a brief summary, Table 10.1 has been included to provide guidelines for likely maintenance responsibilities.

Table 10.1 – Proposed Maintenance Programme for the Development

#	Drainage Element	Possible Maintenance and Inspection Frequency	Responsibility
1	Rainwater tank(s); trapped underground soakage / connection pit(s)	Annual inspection & clean-out (as necessary) – just prior to winter rains	Lot owner
2	Drainage culverts, pipes and pits	<u>During developer maintenance period:</u> Inspect, clean-out & maintain structures annually – just prior to winter (& then again in Aug / Sept if necessary)	Developer
		<u>After developer maintenance period:</u> Inspect, clean-out & maintain structures at least annually – just prior to winter – but inspection frequency will need to be higher during home construction phase	Council

#	Drainage Element	Possible Maintenance and Inspection Frequency	Responsibility
3	Trapped pits and GPT's	<u>During developer maintenance period:</u> Inspect, clean-out & maintain pits tri-annually – just prior to winter & then around June / July & again in Oct / Nov for the first two years <u>After developer maintenance period:</u> Inspect, clean-out & maintain pits tri-annually – just prior to winter & then around June / Aug – but inspection frequency will need to be higher during home construction phase.	Developer Council

10.3 Funding

The cost for the implementation of the capital water management measures will be borne by the developers. Maintenance and monitoring costs will be borne by the developers for the periods as outlined in the maintenance schedule table in Section 10.2 above.

10.4 Review

Following the approval of this document, it is not expected that the LWMS for this development will need to be reviewed as this forms the broad structure of the approach for the drainage in the area.

In general minor amendments can be made at UWMP stage, provided they meet the outcomes sought within this report. In the event that the management measures used within the state have significantly changed or the first subdivision application following the expiration of 4 years from the first subdivision approval whichever is the later, the measures used for management of stormwater should be reviewed.

11 References:

1. Mundijong Drainage District – Rural Drainage Criteria, Water Corporation May, 2000.
2. Environmental Geology Mapping – Fremantle: Part Sheets 2033 I and 2133 IV, Gozzard JR 1983.
3. Acid Sulphate Soil Risk Map, Swan Coastal Plain (DWER-003), Department of Water and Environment Regulation, 2016, accessed online through SLIP by Landgate.
4. Perth Groundwater Atlas, Waters and Rivers Commission, October 1997.
5. Perth Groundwater Atlas (Edition 4), Department of Environment, 2004.
6. Geomorphic Wetlands, Swan Coastal Plain (DPAW-017), Department of Parks and Wildlife, 2016, accessed online through SLIP by Landgate.
7. Australian Rainfall and Runoff: A Guide to Flood Estimation Volume 1, Institute of Engineers, 1987. *{for calculations}*

APPENDIX A – OVERALL PLANS

- **L01: Locality Plan**
- **L02: Aerial Photo with Development Superimposed Thereon**
- **Local Structure Plan**
- **Scheme Amendment Plan with additional Use**



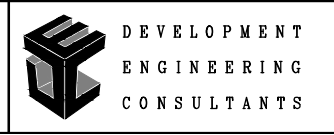
LEGEND

--- SITE AREA

1:2000
(A1)
0 20m 40 60 80 100 120 140 160 180 200 220 240 260 280 300

No.	DATE	BY	REVISION
D	19/08/20	PMS	AMENDED TO SUIT LATEST LAYOUT
C	12/11/19	BVS	LAYOUT AMENDED
B	16/5/17	JEG	UPDATED LAYOUT
A	16/3/17	JEG	INITIAL ISSUE

CLIENT: **TERRANOVIS PTY LTD**



SUITE 3, 123A COLIN ST,
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 94.81 1900
Fax: (08) 94.81 1700

PROJECT: **LOTS 1, 7-11 & 88
LYON ROAD
WANDOO**

W.A.P.C. No. -

DRAWING: **LOCALITY PLAN**

SCALE	DRAWN	CHECK	REV No.
1:2000	JEG	SRA	D
DATE	DESIGNED	APPROVED	
16/3/17	JEG	SRA	
PROJECT NUMBER		DRAWING NUMBER	
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CAD DRAWING DO NOT MANUALLY ALTER
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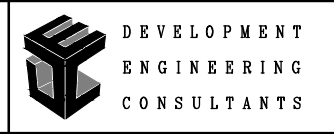


LEGEND
 ■■■■■ SITE AREA



No.	DATE	BY	REVISION
D	19/08/20	PMS	AMENDED TO SUIT LATEST LAYOUT
C	12/11/19	BVS	LAYOUT AMENDED
B	16/5/17	JEG	UPDATED LAYOUT
A	16/3/17	JEG	INITIAL ISSUE

CLIENT: **TERRANOVIS PTY LTD**



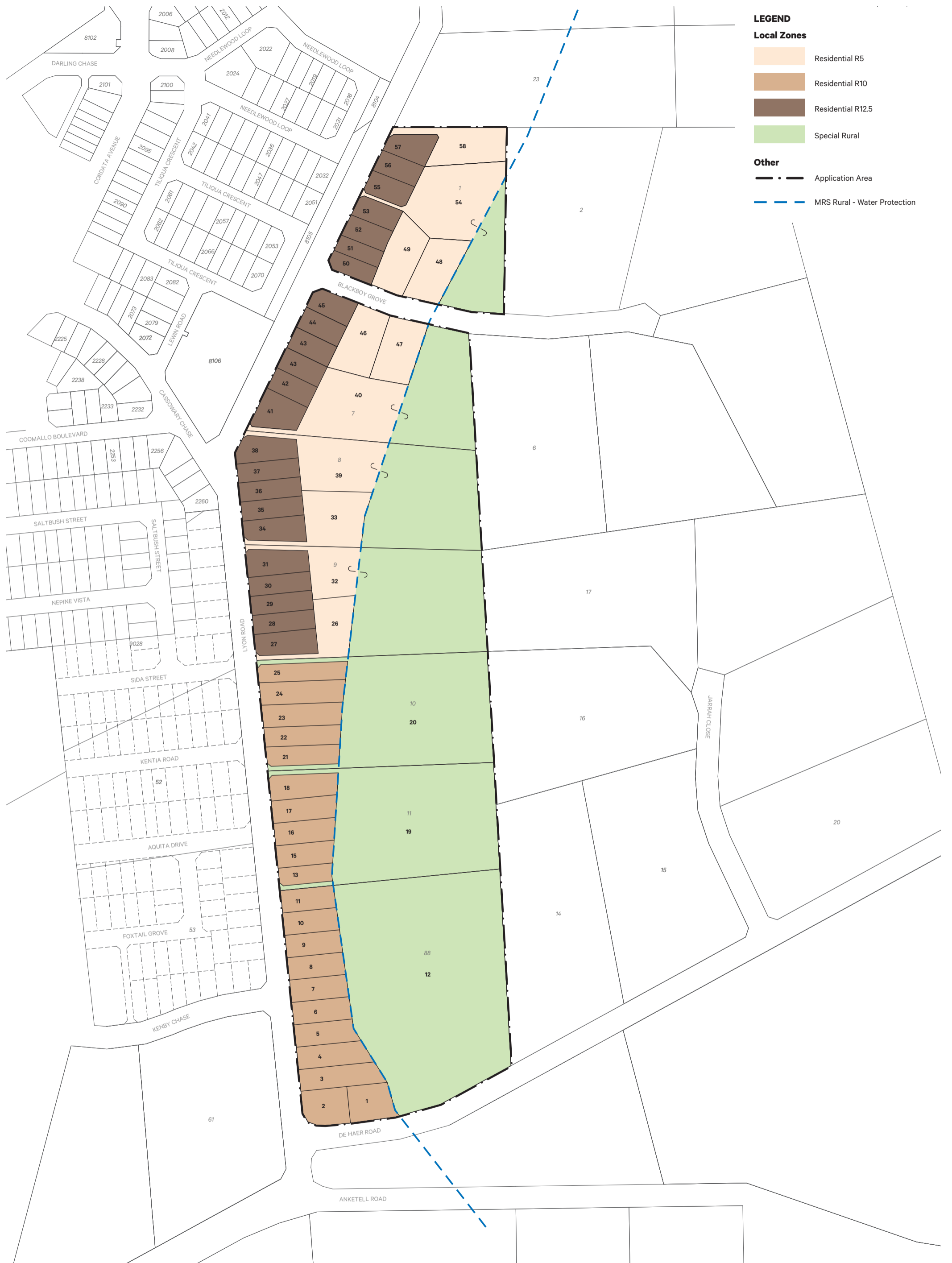
SUITE 3, 123A COLIN ST.
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

PROJECT: **LOTS 1, 7-11 & 88
LYON ROAD
WANDI**

DRAWING: **AERIAL PHOTO**

SCALE	DRAWN	CHECK	REV No.
1:2000	JEG	SRA	D
DATE	DESIGNED	APPROVED	
16/3/17	JEG	SRA	
PROJECT NUMBER		DRAWING NUMBER	
WDITER02		L02	

CAD DRAWING DO NOT MANUALLY ALTER



LEGEND

Local Zones

- Residential R5
- Residential R10
- Residential R12.5
- Special Rural

Other

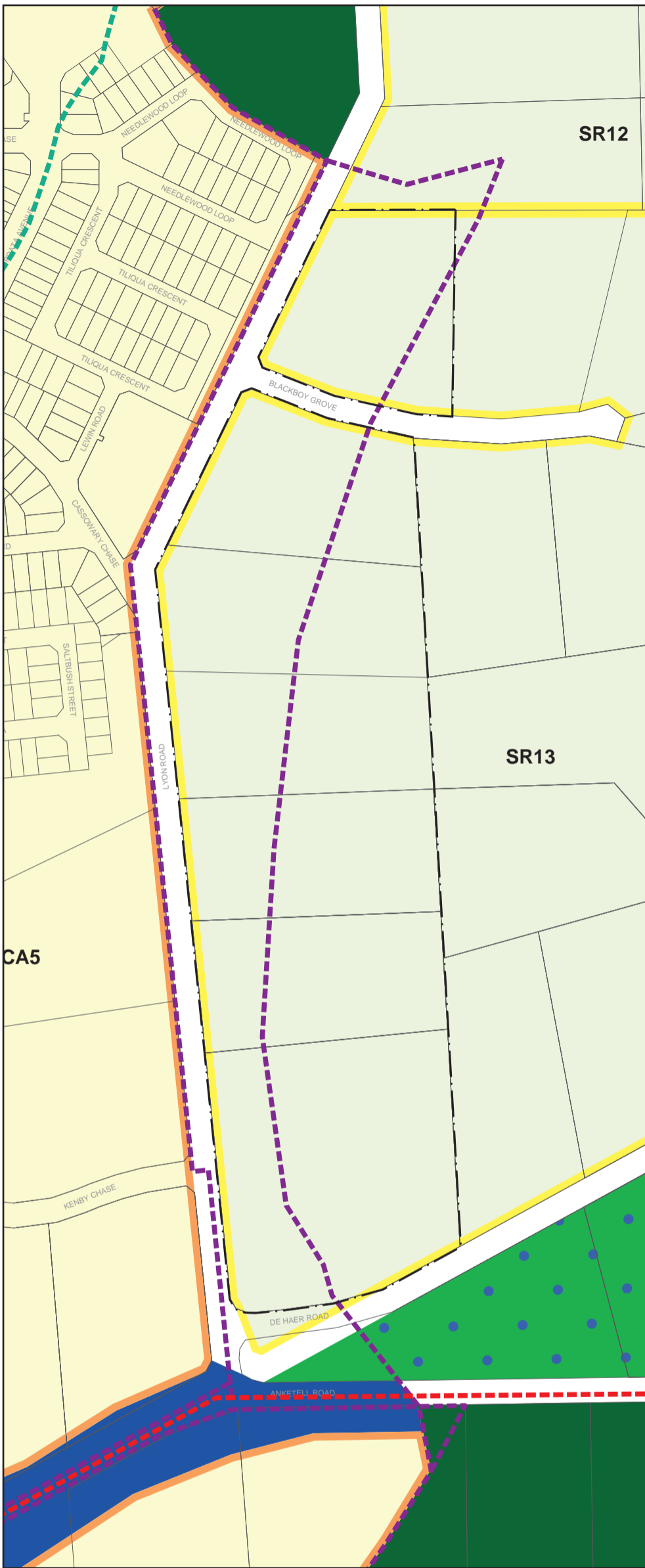
- Application Area
- MRS Rural - Water Protection

Subdivision Guide Plan

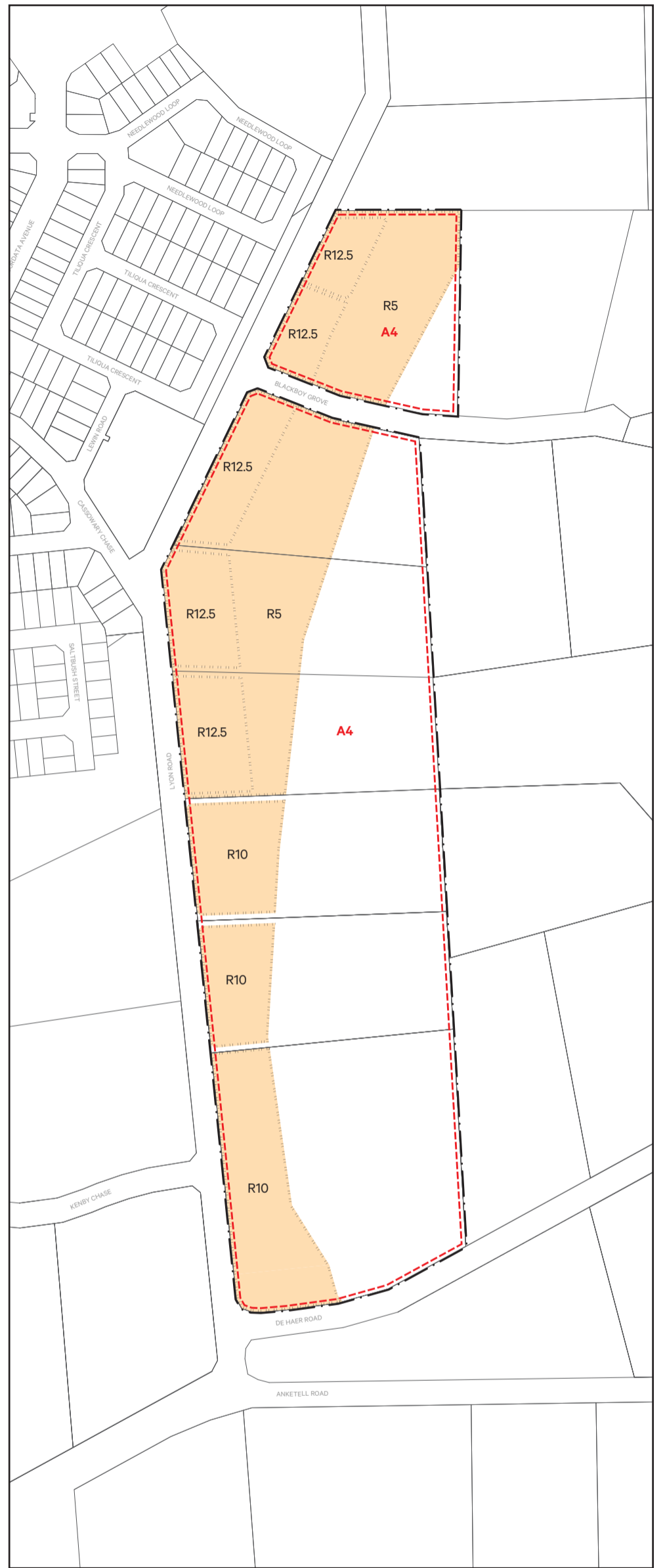
Lyon Road, Wandoo

Date: 20 Jul 2020 Scale: 1:3000@ A3 File: 19-360 SU-1 A Staff: JP GW Checked: GW

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
 PO Box 7375 Cloisters Square, Perth Western Australia 6850.
 T. +61 8 9289 8300 | E. hello@elementwa.com.au elementwa.com.au



Existing Zoning



Proposed Zoning

LEGEND		Other	
MRS Reserves		R20	R Codes
Other Regional Road		SR1	Special Rural Area
Parks and Recreation		DCA 1	Development Contributor
Water Catchments		1	Policy Areas
MRS Zones			Area of Landscape Protection
Development			No Zone
Residential			A4 Additional Use
Rural Water Resource			Amendment Area
Special Rural			

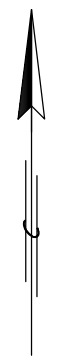
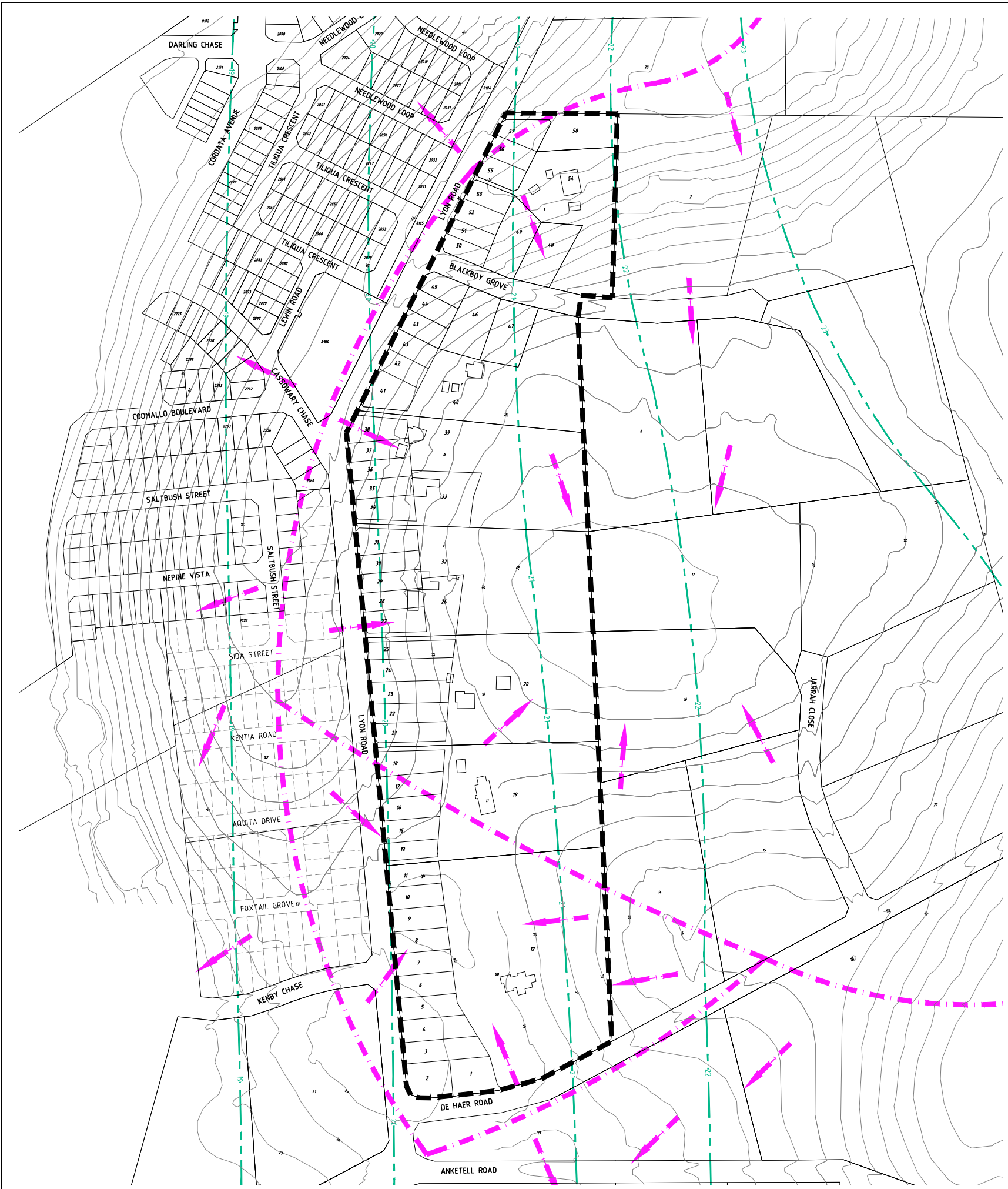
PLANNING AND DEVELOPMENT ACT 2005



TOWN PLANNING SCHEME NO. 2
SCHEME AMENDMENT NO. ____

APPENDIX B – DRAINAGE CATCHMENT PLANS

- **L03: Predevelopment Catchment Plan**
- **L04: Post Development Catchment Plan**

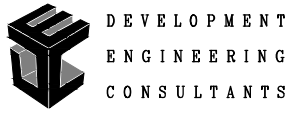


LEGEND	
	SITE AREA
	EXISTING SURFACE CONTOURS
	WATER CONTOURS
	IMPLIED NATURAL RIDGE
	FLOW ARROW



No.	DATE	BY	REVISION
D	19/08/20	PMS	AMENDED TO SUIT LATEST LAYOUT
C	12/11/19	BVS	LAYOUT AMENDED
B	16/5/17	JEG	UPDATED LAYOUT
A	16/3/17	JEG	INITIAL ISSUE

CLIENT: **TERRANOVIS PTY LTD**



**DEVELOPMENT
ENGINEERING
CONSULTANTS**

SUITE 3, 123A COLIN ST,
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 94.81 1900
Fax: (08) 94.81 1700

PROJECT: **LOTS 1, 7-11 & 88
LYON ROAD
WANDI**

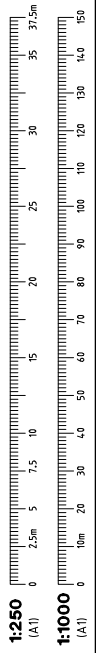
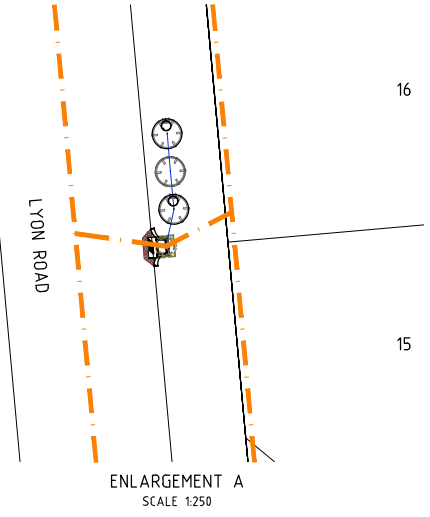
DRAWING: **CATCHMENT PLAN
PRE-DEVELOPMENT**

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DATE	DESIGNED	APPROVED	
16/3/17	JEG	SRA	
PROJECT NUMBER		DRAWING NUMBER	
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CAD DRAWING DO NOT MANUALLY ALTER

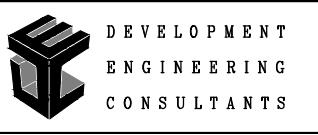


- LEGEND**
- DRAINAGE SUB-CATCHMENT BOUNDARY
 - EXISTING SURFACE CONTOURS
 - GROUNDWATER CONTOURS
 - SOAKWELL
 - SIDE-ENTRY PIT



No.	DATE	BY	REVISION
D	19/08/20	PMS	AMENDED TO SUIT LATEST LAYOUT
C	12/11/19	BVS	LAYOUT AMENDED
B	16/5/17	JEG	UPDATED LAYOUT
A	16/3/17	JEG	INITIAL ISSUE

CLIENT: **TERRANOVIS PTY LTD**



SUITE 3, 123A COLIN ST.
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

PROJECT: **LOTS 1, 7-11 & 88 LYON ROAD WANDI**

DRAWING: **CATCHMENT PLAN POST DEVELOPMENT**

SCALE	DRAWN	CHECK	REV No.
AS SHOWN	JEG	SRA	D
DATE	DESIGNED	APPROVED	
16/3/17	JEG	SRA	
PROJECT NUMBER		DRAWING NUMBER	
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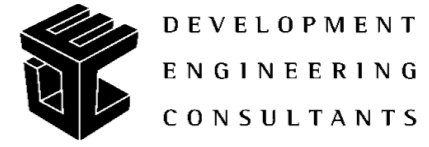
CAD DRAWING DO NOT MANUALLY ALTER

APPENDIX C – DRAINAGE CALCULATIONS

- **Soakwell and Drainage Pit Storage Calculations**
- **At-lot Detention Calculations for Standard Lots**

Development Engineering Consultants - Drainage Basin Spreadsheet

Project: **Lots 1, 7-11 & 88 Lyon Road, Wandi (Terranovis Pty Ltd)**
 Client: **Terranovis Pty Ltd**
 Location: **Soakwell Design**
 Designer: **SRA**



Location:		Lots 1, 7-11 & 88 Lyon Rd, Wandi		Lots 1, 7-11 & 88 Lyon Rd,	
Nearest grid cell:		Latitude	32.2125(S)	Longitude	115.8625(E)

Data to be input

Rainfall AEP (percentage)	1	ARI	v Descriptor v
63.2% AEP - 1hr impervious catchment (Ha)	0.17	100	Infrequent
Required bio-retention area (2%) (m ²)	6		
Required storage (63.2% - 1hr) (m ³)	26		
Available storage (m ³)	13		
Soakage outflow (L/s/m ²)	0.02		

Catchment details	Roads	Community centre/ commercial	Group housing/ retirement	Standard lots (unconnected)	School/POS	Drainage basin	Total
Gross area (Ha)	0.04	0	0	0	0.00	0.00	0.04
Runoff coefficient (C ₁₀)	0.70	0.01	0.25	0.001	0	1.00	
ARI multiplier	1.00	30.00	0.00	60.00	0.62	1.00	
Runoff coefficient (C _y)	0.70	0.30	0.00	0.06	0.00	1.00	
Impervious area (Ha)	0.03	0.00	0.00	0.00	0.00	0.00	0.03

0.70 Effective C

T _c (min)	T _c (hr)	I (mm/hr)	Q _{IN} (L/s)	V _{IN} (m ³)	Preliminary height (m)	Q _{OUT} (soakage) (L/s)	V _{OUT} (soakage) (m ³)	Net storage (after soakage) (m ³)	Time of water in basin (hr)	V _{OUT} required (m ³)	Q _{OUT} (L/s)
10	0.17	131.00	10	6	0.60	0.65	0.39	6	2.6	0	0.0
15	0.25	105.00	8	7	0.60	0.65	0.58	7	3.2	0	0.0
20	0.33	89.00	7	8	0.60	0.65	0.78	8	3.6	0	0.0
30	0.50	69.20	5	10	0.60	0.65	1.16	9	4.2	0	0.0
45	0.75	53.50	4	11	0.60	0.65	1.74	9	4.8	0	0.0
60	1.00	44.60	3	12	0.60	0.65	2.33	10	5.4	0	0.0
90	1.50	34.60	3	15	0.60	0.65	3.49	11	6.2	0	0.0
120	2.00	29.10	2	16	0.60	0.65	4.65	12	7.0	0	0.0
150	2.50	25.40	2	18	0.60	0.65	5.82	12	7.6	0	0.0
180	3.00	22.80	2	19	0.60	0.65	6.98	12	8.2	0	0.0
240	4.00	19.30	2	22	0.60	0.65	9.30	12	9.3	0	0.0
300	5.00	16.90	1	24	0.60	0.65	11.63	12	10.2	0	0.0
360	6.00	15.20	1	26	0.60	0.65	13.96	12	11.0	0	0.0
480	8.00	12.70	1	28	0.60	0.65	18.61	10	12.2	0	0.0
720	12.00	9.78	1	33	0.60	0.65	27.91	5	14.1	0	0.0
960	16.00	8.02	1	36	0.60	0.65	37.22	-1	15.4	0	0.0
1440	24.00	5.92	0	40	0.60	0.65	55.83	-16	17.1	0	0.0
2880	48.00	3.33	0	45	0.60	0.65	111.66	-67	19.2	0	0.0
4320	72.00	2.35	0	47	0.60	0.65	167.49	-120	20.4	0	0.0

Effective Run-off Per Hectare

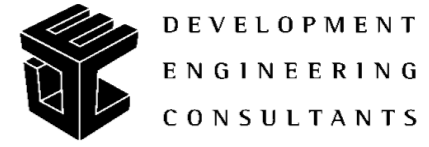
0.00 l/s/ha

Soakwell Storage Dimensions

Storage provided manholes and pipe	1.078
Number of Soakwells	2.00
Diameter of Soakwells	1.80
Depth of Each Soakwell	2.41 (2.44m deep pits, taking into account difference in GL heights)
Storage required Soakwells	12.25
Storage Provided	13.33

Development Engineering Consultants - Drainage Basin Spreadsheet

Project: **Lots 1, 7-11 & 88 Lyon Road, Wandi (Terranovis Pty Ltd)**
 Client: **Terranovis Pty Ltd**
 Location: **Soakwell Design**
 Designer: **SRA**



Location:		Lots 1, 7-11 & 88 Lyon Rd, Wandi		Lots 1, 7-11 & 88 Lyon Rd,	
Nearest grid cell:		Latitude	32.2125(S)	Longitude	115.8625(E)

Data to be input

Rainfall AEP (percentage)	1	ARI	v Descriptor v
63.2% AEP - 1hr impervious catchment (Ha)	0.17	100	Infrequent
Required bio-retention area (2%) (m ²)	8		
Required storage (63.2% - 1hr) (m ³)	26		
Available storage (m ³)	19		
Soakage outflow (L/s/m ²)	0.02		

Catchment details	Roads	Community centre/ commercial	Group housing/ retirement	Standard lots (unconnected)	School/POS	Drainage basin	Total
Gross area (Ha)	0.06	0	0	0	0.00	0.00	0.06
Runoff coefficient (C ₁₀)	0.70	0.01	0.25	0.001	0	1.00	
ARI multiplier	1.00	30.00	0.00	60.00	0.62	1.00	
Runoff coefficient (C _y)	0.70	0.30	0.00	0.06	0.00	1.00	
Impervious area (Ha)	0.04	0.00	0.00	0.00	0.00	0.00	0.04

0.70 Effective C

T _c (min)	T _c (hr)	I (mm/hr)	Q _{IN} (L/s)	V _{IN} (m ³)	Preliminary height (m)	Q _{OUT} (soakage) (L/s)	V _{OUT} (soakage) (m ³)	Net storage (after soakage) (m ³)	Time of water in basin (hr)	V _{OUT} required (m ³)	Q _{OUT} (L/s)
10	0.17	131.00	15	9	0.60	0.97	0.58	9	2.6	0	0.0
15	0.25	105.00	12	11	0.60	0.97	0.87	10	3.2	0	0.0
20	0.33	89.00	10	12	0.60	0.97	1.16	11	3.6	0	0.0
30	0.50	69.20	8	15	0.60	0.97	1.74	13	4.2	0	0.0
45	0.75	53.50	6	17	0.60	0.97	2.62	14	4.8	0	0.0
60	1.00	44.60	5	19	0.60	0.97	3.49	15	5.4	0	0.0
90	1.50	34.60	4	22	0.60	0.97	5.23	17	6.2	0	0.0
120	2.00	29.10	3	24	0.60	0.97	6.98	17	7.0	0	0.0
150	2.50	25.40	3	27	0.60	0.97	8.72	18	7.6	0	0.0
180	3.00	22.80	3	29	0.60	0.97	10.47	18	8.2	0	0.0
240	4.00	19.30	2	32	0.60	0.97	13.96	18	9.3	0	0.0
300	5.00	16.90	2	35	0.60	0.97	17.45	18	10.2	0	0.0
360	6.00	15.20	2	38	0.60	0.97	20.94	17	11.0	0	0.0
480	8.00	12.70	1	43	0.60	0.97	27.91	15	12.2	0	0.0
720	12.00	9.78	1	49	0.60	0.97	41.87	7	14.1	0	0.0
960	16.00	8.02	1	54	0.60	0.97	55.83	-2	15.4	0	0.0
1440	24.00	5.92	1	60	0.60	0.97	83.74	-24	17.1	0	0.0
2880	48.00	3.33	0	67	0.60	0.97	167.49	-100	19.2	0	0.0
4320	72.00	2.35	0	71	0.60	0.97	251.23	-180	20.4	0	0.0

Effective Run-off Per Hectare

0.00 l/s/ha

Soakwell Storage Dimensions

Storage provided manholes and pipe	1.078
Number of Soakwells	3.00
Diameter of Soakwells	1.80
Depth of Each Soakwell	2.41 (2.44m deep pits, taking into account difference in GL heights)
Storage required Soakwells	18.37
Storage Provided	19.45

Development Engineering Consultants - Drainage Basin Spreadsheet

Project: **Lots 1, 7-11 & 88 Lyon Road, Wandi (Terranovis Pty Ltd)**
 Client: **Terranovis Pty Ltd**
 Location: **Soakwell Design**
 Designer: **SRA**



		Lots 1, 7-11 & 88	
Location:		Lyon Rd,	
Nearest grid cell:	Latitude	32.2125(S)	Longitude 115.8625(E)

Data to be input

Rainfall AEP (percentage)	1	ARI	v Descriptor v
63.2% AEP - 1hr impervious catchment (Ha)	0.17	100	Infrequent
Required bio-retention area (2%) (m ²)	8		
Required storage (63.2% - 1hr) (m ³)	26		
Available storage (m ³)	19		
Soakage outflow (L/s/m ²)	0.02		

Catchment details	Roads	Community centre/ commercial	Group housing/ retirement	Standard lots (unconnected)	School/POS	Drainage basin	Total
Gross area (Ha)	0.06	0	0	0	0.00	0.00	0.06
Runoff coefficient (C ₁₀)	0.70	0.01	0.25	0.000	0	1.00	
ARI multiplier	1.00	30.00	0.00	0.00	0.62	1.00	
Runoff coefficient (C _y)	0.70	0.30	0.00	0.00	0.00	1.00	
Impervious area (Ha)	0.04	0.00	0.00	0.00	0.00	0.00	0.04

0.70 Effective C

T _c (min)	T _c (hr)	I (mm/hr)	Q _{IN} (L/s)	V _{IN} (m ³)	Preliminary height (m)	Q _{OUT} (soakage) (L/s)	V _{OUT} (soakage) (m ³)	Net storage (after soakage) (m ³)	Time of water in basin (hr)	V _{OUT} required (m ³)	Q _{OUT} (L/s)
10	0.17	131.00	15	9	0.60	0.97	0.58	9	2.6	0	0.0
15	0.25	105.00	12	11	0.60	0.97	0.87	10	3.2	0	0.0
20	0.33	89.00	10	12	0.60	0.97	1.16	11	3.6	0	0.0
30	0.50	69.20	8	15	0.60	0.97	1.74	13	4.2	0	0.0
45	0.75	53.50	6	17	0.60	0.97	2.62	14	4.8	0	0.0
60	1.00	44.60	5	19	0.60	0.97	3.49	15	5.4	0	0.0
90	1.50	34.60	4	22	0.60	0.97	5.23	17	6.2	0	0.0
120	2.00	29.10	3	24	0.60	0.97	6.98	17	7.0	0	0.0
150	2.50	25.40	3	27	0.60	0.97	8.72	18	7.6	0	0.0
180	3.00	22.80	3	29	0.60	0.97	10.47	18	8.2	0	0.0
240	4.00	19.30	2	32	0.60	0.97	13.96	18	9.3	0	0.0
300	5.00	16.90	2	35	0.60	0.97	17.45	18	10.2	0	0.0
360	6.00	15.20	2	38	0.60	0.97	20.94	17	11.0	0	0.0
480	8.00	12.70	1	43	0.60	0.97	27.91	15	12.2	0	0.0
720	12.00	9.78	1	49	0.60	0.97	41.87	7	14.1	0	0.0
960	16.00	8.02	1	54	0.60	0.97	55.83	-2	15.4	0	0.0
1440	24.00	5.92	1	60	0.60	0.97	83.74	-24	17.1	0	0.0
2880	48.00	3.33	0	67	0.60	0.97	167.49	-100	19.2	0	0.0
4320	72.00	2.35	0	71	0.60	0.97	251.23	-180	20.4	0	0.0

Effective Run-off Per Hectare

0.00 l/s/ha

Soakwell Storage Dimensions

Storage provided manholes and pipe	1.078	
Number of Soakwells	3.00	
Diameter of Soakwells	1.80	
Depth of Each Soakwell	2.41	(2.44m deep pits, taking into account difference in GL heights)
Storage required Soakwells	18.37	
Storage Provided	19.45	

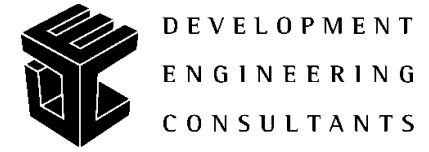
0.032

30.85

30.85

Development Engineering Consultants - Drainage Basin Spreadsheet

Client: **Lots 1, 7-11 & 88 Lyon Rd, Wand**
 Project: **Terranovis Pty Ltd**
 Location: **At-lot detention calculations to establish runoff coefficient - R5 Lots Setback Area**
 Designer: **JPF**



Location:	Lots 1, 7-11 & 88 Lyon Rd, Wand		
Nearest grid cell:	Latitude	32.2125(S)	Longitude 115.8625(E)

Data to be input

Rainfall AEP (percentage) **1** ARI **100** v Descriptor v **Infrequent**
 63.2% AEP impervious catchment (Ha) **0.003**
 Required storage (63.2% AEP - 1hr) (m³) **0.416**

Catchment details	Paved area	Unpaved area	Total
Lot area (m ²)			600.00
Proportion paved	5%	95%	100%
Area paved (Ha)	0.003	0.057	0.060
Runoff coefficient (C ₁₀)	0.90	0.00	
ARI multiplier	1.00	1.20	
Runoff coefficient (C _y)	0.90	0.00	
Impervious area (Ha)	0.003	0.000	0.003

AEP	ARI	Effective C	Multiplier
63.2	1	0	-
50	1.44	0	-
20	4.48	0	-
10	9.49	0	0.00
5	20	0	0.00
2	50	0.02	
1	100	0.06	

Effective C **0.05**

Volume and dimensions of available storage

Area above ground inundated to 0.04m deep (backyard and front yard) (m²) **500.00** **0.03** **15.00**
 Storage provided manholes/pipe (m³) **-**
 Number of soakwells **-**
 Diameter of soakwells (m) **1.20**
 Depth of each soakwell (m) **1.20**
 Storage required soakwells (m³) **-**
 Storage provided (m³) **15.00**
 Soakage rate (L/s/m²) **0.02**

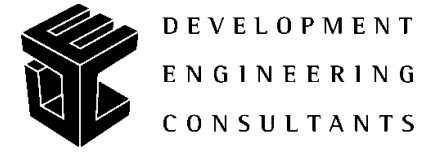
NOTE: All water is retained in soakwells up to and including 5% AEP (1 in 20yr ARI) without surcharge. For greater AEP storms water will surcharge soakwells and soak over an area of 40m² to a maximum depth of 40mm within the lot, and then enter the road drainage system.

Volume of storage required is 1m³ per 40.00 m² of total lot area
Volume of storage required is 1m³ per 2.00 m³ of paved lot area

T _c (min)	T _c (hr)	I (mm/hr)	Q _{IN} (L/s)	Q _{IN} From R25 Lots (L/s)	Total V _{IN} (m ³)	Q _{OUT} (soakage) (L/s)	V _{OUT} (soakage) (m ³)	Net storage (after soakage) (m ³)	V _{OUT} required (m ³)	Q _{OUT} (L/s)
10	0.17	131.00	1.0	0.2	0.71	10.02	6.01	-5.31	0.00	0.00
15	0.25	105.00	0.8	0.9	1.54	10.02	9.02	-7.48	0.00	0.00
20	0.33	89.00	0.7	1.1	2.07	10.02	12.03	-9.95	0.00	0.00
30	0.50	69.20	0.5	0.9	2.58	10.02	18.04	-15.46	0.00	0.00
45	0.75	53.50	0.4	0.6	2.77	10.02	27.06	-24.29	0.00	0.00
60	1.00	44.60	0.3	0.4	2.66	10.02	36.08	-33.42	0.00	0.00
90	1.50	34.60	0.3	0.1	1.94	10.02	54.12	-52.18	0.00	0.00
120	2.00	29.10	0.2	0.0	1.57	10.02	72.16	-70.59	0.00	0.00
150	2.50	25.40	0.2	0.0	1.71	10.02	90.20	-88.49	0.00	0.00
180	3.00	22.80	0.2	0.0	1.85	10.02	108.24	-106.40	0.00	0.00
240	4.00	19.30	0.1	0.0	2.08	10.02	144.33	-142.24	0.00	0.00
300	5.00	16.90	0.1	0.0	2.28	10.02	180.41	-178.13	0.00	0.00
360	6.00	15.20	0.1	0.0	2.46	10.02	216.49	-214.03	0.00	0.00
480	8.00	12.70	0.1	0.0	2.74	10.02	288.65	-285.91	0.00	0.00
720	12.00	9.78	0.1	0.0	3.17	10.02	432.98	-429.81	0.00	0.00
960	16.00	8.02	0.1	0.0	3.46	10.02	577.30	-573.84	0.00	0.00
1440	24.00	5.92	0.0	0.0	3.84	10.02	865.95	-862.12	0.00	0.00
2880	48.00	3.33	0.0	0.0	4.32	10.02	1731.91	-1727.59	0.00	0.00
4320	72.00	2.35	0.0	0.0	4.57	10.02	2597.86	-2593.29	0.00	0.00

Development Engineering Consultants - Drainage Basin Spreadsheet

Client: **Lots 1, 7-11 & 88 Lyon Rd, Wand**
 Project: **Terranovis Pty Ltd**
 Location: **At-lot detention calculations to establish runoff coefficient - R12.5**
 Designer: **JPF**



Location:	Lots 1, 7-11 & 88 Lyon Rd, Wand		
Nearest grid cell:	Latitude	32.2125(S)	Longitude 115.8625(E)

Data to be input

Rainfall AEP (percentage) **1** ARI **100** v Descriptor v **Infrequent**
 63.2% AEP impervious catchment (Ha) **0.036**
 Required storage (63.2% AEP - 1hr) (m³) **5.544**

Catchment details	Paved area	Unpaved area	Total
Lot area (m ²)			800.00
Proportion paved	50%	50%	100%
Area paved (Ha)	0.040	0.040	0.080
Runoff coefficient (C ₁₀)	0.90	0.00	
ARI multiplier	1.00	1.20	
Runoff coefficient (C _y)	0.90	0.00	
Impervious area (Ha)	0.036	0.000	0.036

AEP	ARI	Effective C	Multiplier
63.2	1	0	-
50	1.44	0	-
20	4.48	0	-
10	9.49	0	0.00
5	20	0	0.00
2	50	0.02	
1	100	0.06	

Effective C **0.45**

Volume and dimensions of available storage

Area above ground inundated to 0.04m deep (backyard and front yard) (m²) **100.00** **0.04** **4.00**
 Storage provided manholes/pipe (m³) **-**
 Number of soakwells **2.00**
 Diameter of soakwells (m) **1.20**
 Depth of each soakwell (m) **1.20**
 Storage required soakwells (m³) **2.71**
 Storage provided (m³) **6.71**
 Soakage rate (L/s/m²) **0.02**

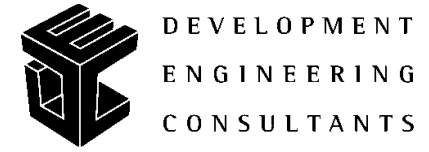
NOTE: All water is retained in soakwells up to and including 5% AEP (1 in 20yr ARI) without surcharge. For greater AEP storms water will surcharge soakwells and soak over an area of 40m² to a maximum depth of 40mm within the lot, and then enter the road drainage system.

Volume of storage required is 1m³ per 119.15 m² of total lot area
Volume of storage required is 1m³ per 59.57 m³ of paved lot area

T _c (min)	T _c (hr)	I (mm/hr)	Q _{IN} (L/s)	Total V _{IN} (m ³)	Q _{OUT} (soakage) (L/s)	V _{OUT} (soakage) (m ³)	Net storage (after soakage) (m ³)	V _{OUT} required (m ³)	Q _{OUT} (L/s)	Effective runoff C
10	0.17	131.00	13.1	7.86	2.20	1.32	6.54	0.00	0.00	0.00
15	0.25	105.00	10.5	9.45	2.20	1.98	7.47	0.75	0.84	0.04
20	0.33	89.00	8.9	10.68	2.20	2.64	8.04	1.32	1.10	0.06
30	0.50	69.20	6.9	12.46	2.20	3.97	8.49	1.78	0.99	0.06
45	0.75	53.50	5.4	14.45	2.20	5.95	8.50	1.78	0.66	0.06
60	1.00	44.60	4.5	16.06	2.20	7.93	8.12	1.41	0.39	0.04
90	1.50	34.60	3.5	18.68	2.20	11.90	6.78	0.07	0.01	0.00
120	2.00	29.10	2.9	20.95	2.20	15.87	5.09	0.00	0.00	0.00
150	2.50	25.40	2.5	22.86	2.20	19.83	3.03	0.00	0.00	0.00
180	3.00	22.80	2.3	24.62	2.20	23.80	0.83	0.00	0.00	0.00
240	4.00	19.30	1.9	27.79	2.20	31.73	-3.94	0.00	0.00	0.00
300	5.00	16.90	1.7	30.42	2.20	39.66	-9.24	0.00	0.00	0.00
360	6.00	15.20	1.5	32.83	2.20	47.60	-14.77	0.00	0.00	0.00
480	8.00	12.70	1.3	36.58	2.20	63.46	-26.89	0.00	0.00	0.00
720	12.00	9.78	1.0	42.25	2.20	95.19	-52.94	0.00	0.00	0.00
960	16.00	8.02	0.8	46.20	2.20	126.93	-80.73	0.00	0.00	0.00
1440	24.00	5.92	0.6	51.15	2.20	190.39	-139.24	0.00	0.00	0.00
2880	48.00	3.33	0.3	57.54	2.20	380.78	-323.24	0.00	0.00	0.00
4320	72.00	2.35	0.2	60.91	2.20	571.17	-510.25	0.00	0.00	0.00

Development Engineering Consultants - Drainage Basin Spreadsheet

Client: **Lots 1, 7-11 & 88 Lyon Rd, Wandri**
 Project: **Terranovis Pty Ltd**
 Location: **At-lot detention calculations to establish runoff coefficient - R25 Lots**
 Designer: **JPF**



Location:	Lots 1, 7-11 & 88 Lyon Rd, Wandri		
Nearest grid cell:	Latitude	32.2125(S)	Longitude 115.8625(E)

Data to be input

Rainfall AEP (percentage) **1** ARI **100** v Descriptor v **Infrequent**
 63.2% AEP impervious catchment (Ha) **0.027**
 Required storage (63.2% AEP - 1hr) (m³) **4.158**

Catchment details	Paved area	Unpaved area	Total
Lot area (m ²)			500.00
Proportion paved	60%	40%	100%
Area paved (Ha)	0.030	0.020	0.050
Runoff coefficient (C ₁₀)	0.90	0.00	
ARI multiplier	1.00	1.20	
Runoff coefficient (C _y)	0.90	0.00	
Impervious area (Ha)	0.027	0.000	0.027

AEP	ARI	Effective C	Multiplier
63.2	1	0	-
50	1.44	0	-
20	4.48	0	-
10	9.49	0	0.00
5	20	0	0.00
2	50	0.04	0.00
1	100	0.09	

Effective C **0.54**

Volume and dimensions of available storage

Area above ground inundated to 0.04m deep (backyard and front yard) (m²) **70.00** **0.03** **2.10**
 Storage provided manholes/pipe (m³) **-**
 Number of soakwells **2.00**
 Diameter of soakwells (m) **1.20**
 Depth of each soakwell (m) **1.20**
 Storage required soakwells (m³) **2.71**
 Storage provided (m³) **4.81**
 Soakage rate (L/s/m²) **0.02**

NOTE: All water is retained in soakwells up to and including 5% AEP (1 in 20yr ARI) without surcharge. For greater AEP storms water will surcharge soakwells and soak over an area of 40m² to a maximum depth of 40mm within the lot, and then enter the road drainage system.

Volume of storage required is 1m ³ per	103.86 m²	of total lot area
Volume of storage required is 1m ³ per	62.31 m³	of paved lot area

T _c (min)	T _c (hr)	I (mm/hr)	Q _{IN} (L/s)	Total V _{IN} (m ³)	Q _{OUT} (soakage) (L/s)	V _{OUT} (soakage) (m ³)	Net storage (after soakage) (m ³)	V _{OUT} required (m ³)	Q _{OUT} (L/s)	Effective runoff C
10	0.17	131.00	9.8	5.90	1.60	0.96	4.93	0.12	0.20	0.01
15	0.25	105.00	7.9	7.09	1.60	1.44	5.64	0.83	0.92	0.06
20	0.33	89.00	6.7	8.01	1.60	1.92	6.09	1.27	1.06	0.09
30	0.50	69.20	5.2	9.34	1.60	2.89	6.46	1.64	0.91	0.09
45	0.75	53.50	4.0	10.83	1.60	4.33	6.50	1.69	0.63	0.08
60	1.00	44.60	3.3	12.04	1.60	5.77	6.27	1.45	0.40	0.07
90	1.50	34.60	2.6	14.01	1.60	8.66	5.35	0.54	0.10	0.02
120	2.00	29.10	2.2	15.71	1.60	11.55	4.17	0.00	0.00	0.00
150	2.50	25.40	1.9	17.15	1.60	14.43	2.71	0.00	0.00	0.00
180	3.00	22.80	1.7	18.47	1.60	17.32	1.15	0.00	0.00	0.00
240	4.00	19.30	1.4	20.84	1.60	23.09	-2.25	0.00	0.00	0.00
300	5.00	16.90	1.3	22.82	1.60	28.86	-6.05	0.00	0.00	0.00
360	6.00	15.20	1.1	24.62	1.60	34.64	-10.01	0.00	0.00	0.00
480	8.00	12.70	1.0	27.43	1.60	46.18	-18.75	0.00	0.00	0.00
720	12.00	9.78	0.7	31.69	1.60	69.27	-37.59	0.00	0.00	0.00
960	16.00	8.02	0.6	34.65	1.60	92.37	-57.72	0.00	0.00	0.00
1440	24.00	5.92	0.4	38.36	1.60	138.55	-100.19	0.00	0.00	0.00
2880	48.00	3.33	0.2	43.16	1.60	277.10	-233.94	0.00	0.00	0.00
4320	72.00	2.35	0.2	45.68	1.60	415.65	-369.96	0.00	0.00	0.00

APPENDIX D – GROUNDWATER DATA

- **DoW Monitoring Bore Records for Bores JM42 and Anketell Site 1A**
- **Excerpt of 2004 Groundwater Atlas**

Department of Water

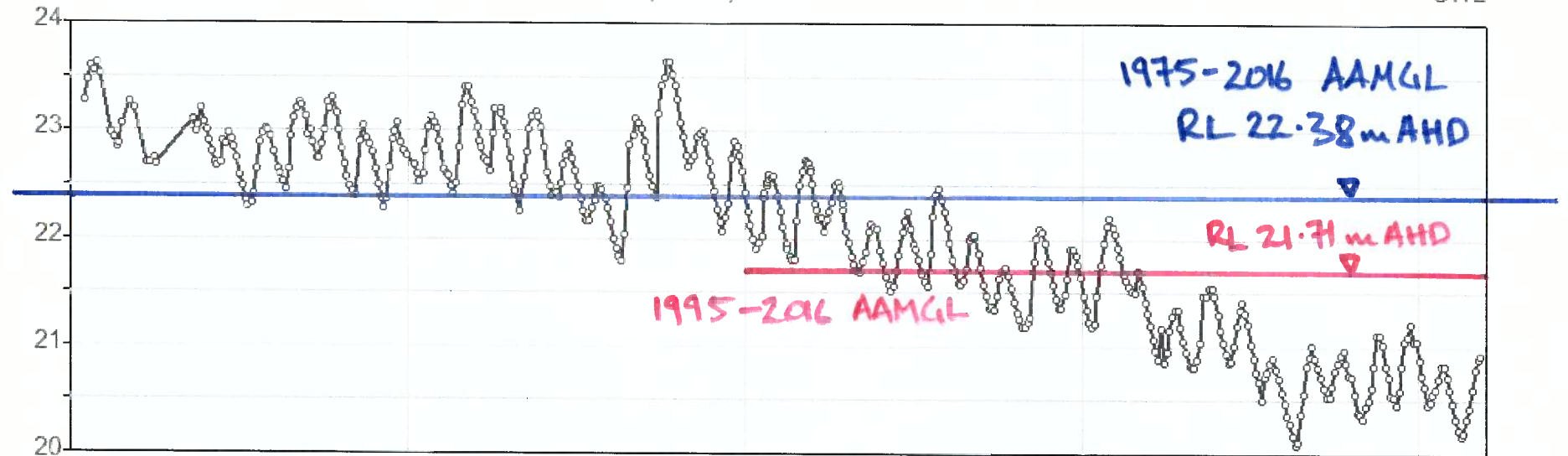
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Period 42 Year 01/01/1975 to 01/01/2017

1975-2016

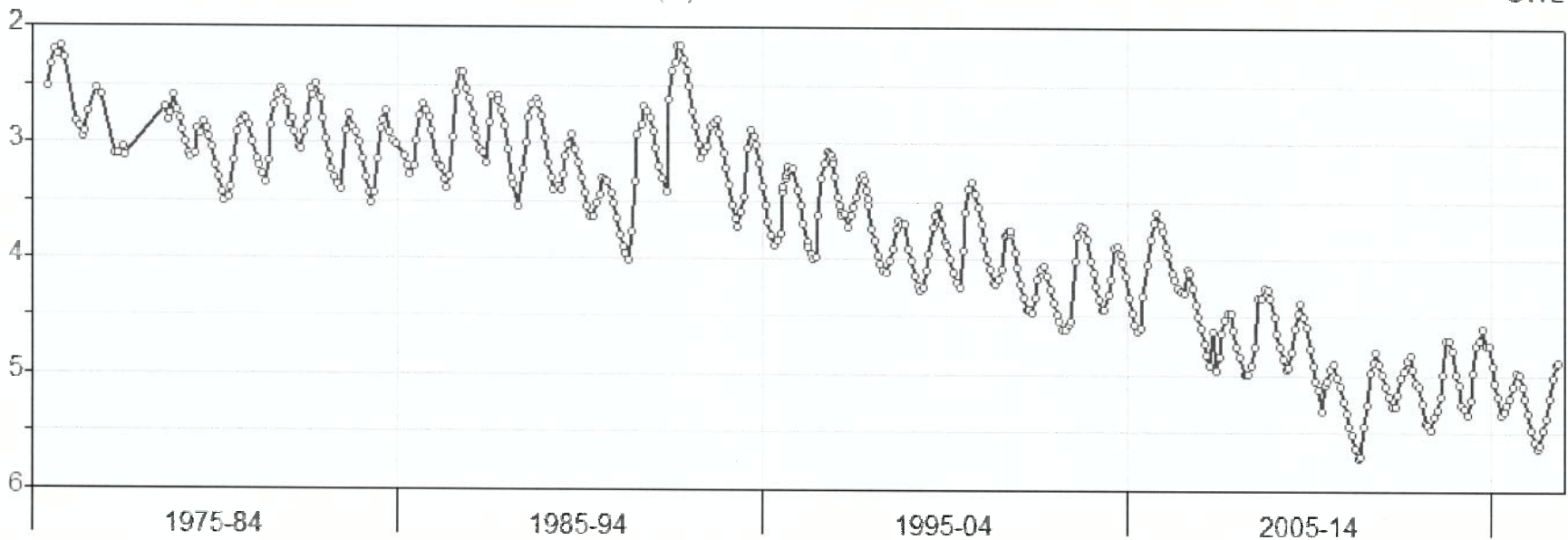
61410109 JM42 Level(mAHD) Discrete

GWL



61410109 JM42 Level(m)SWL Discrete

GWL



Department of Water

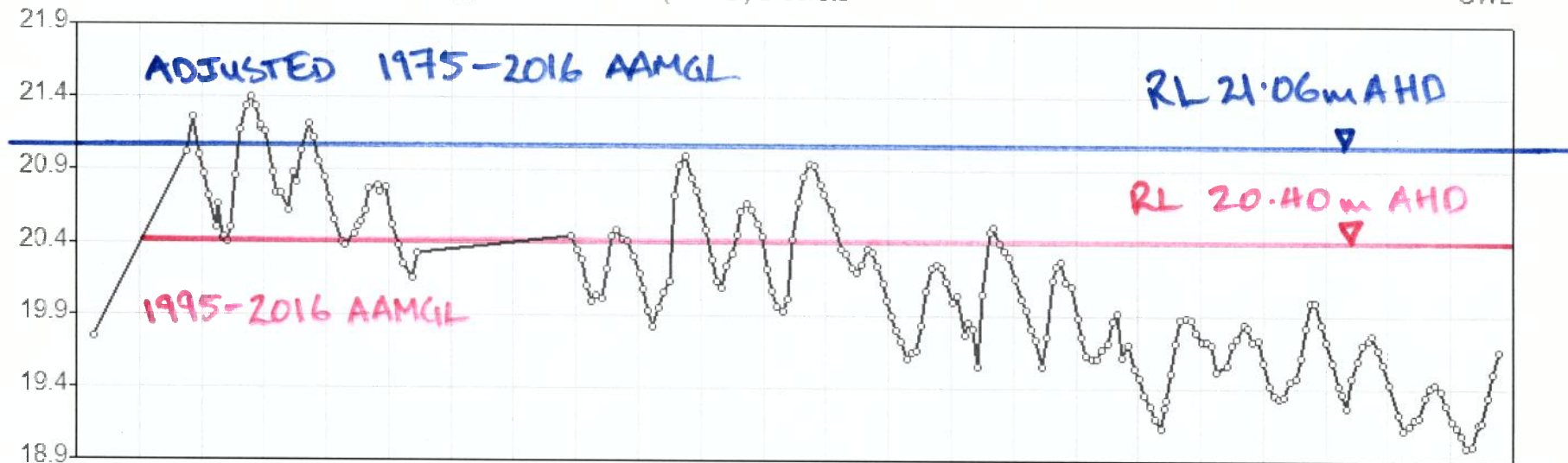
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1994-2016

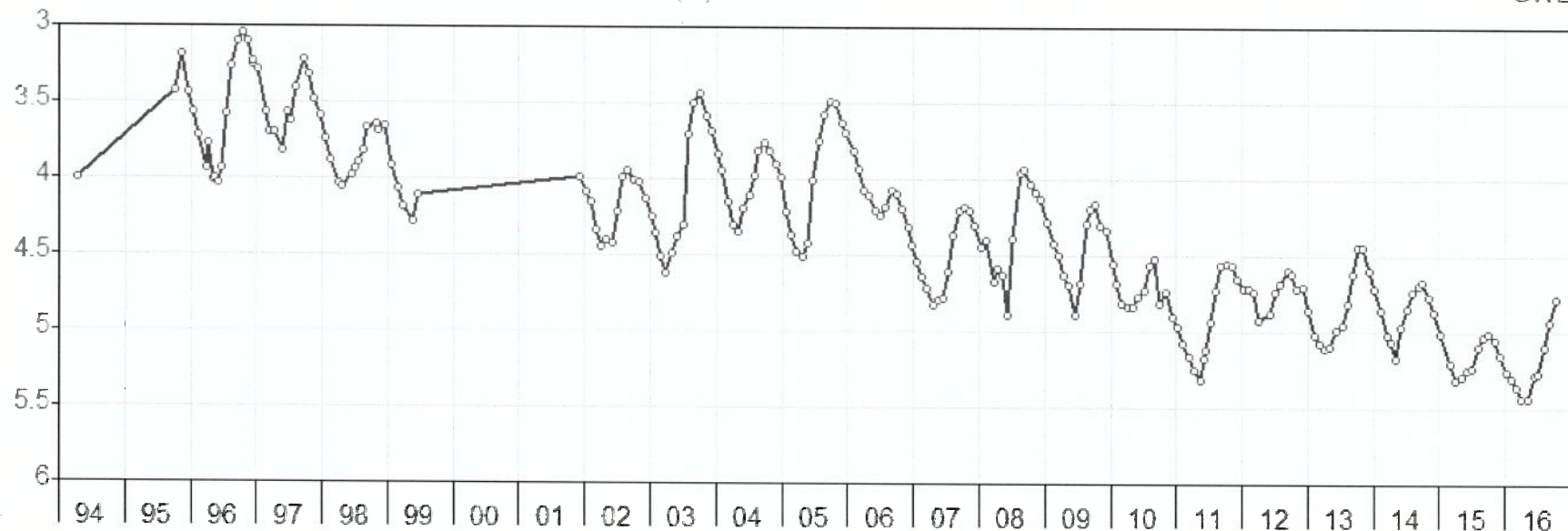
61410706 ANKETELL SITE 1A Level(mAHD) Discrete

GWL

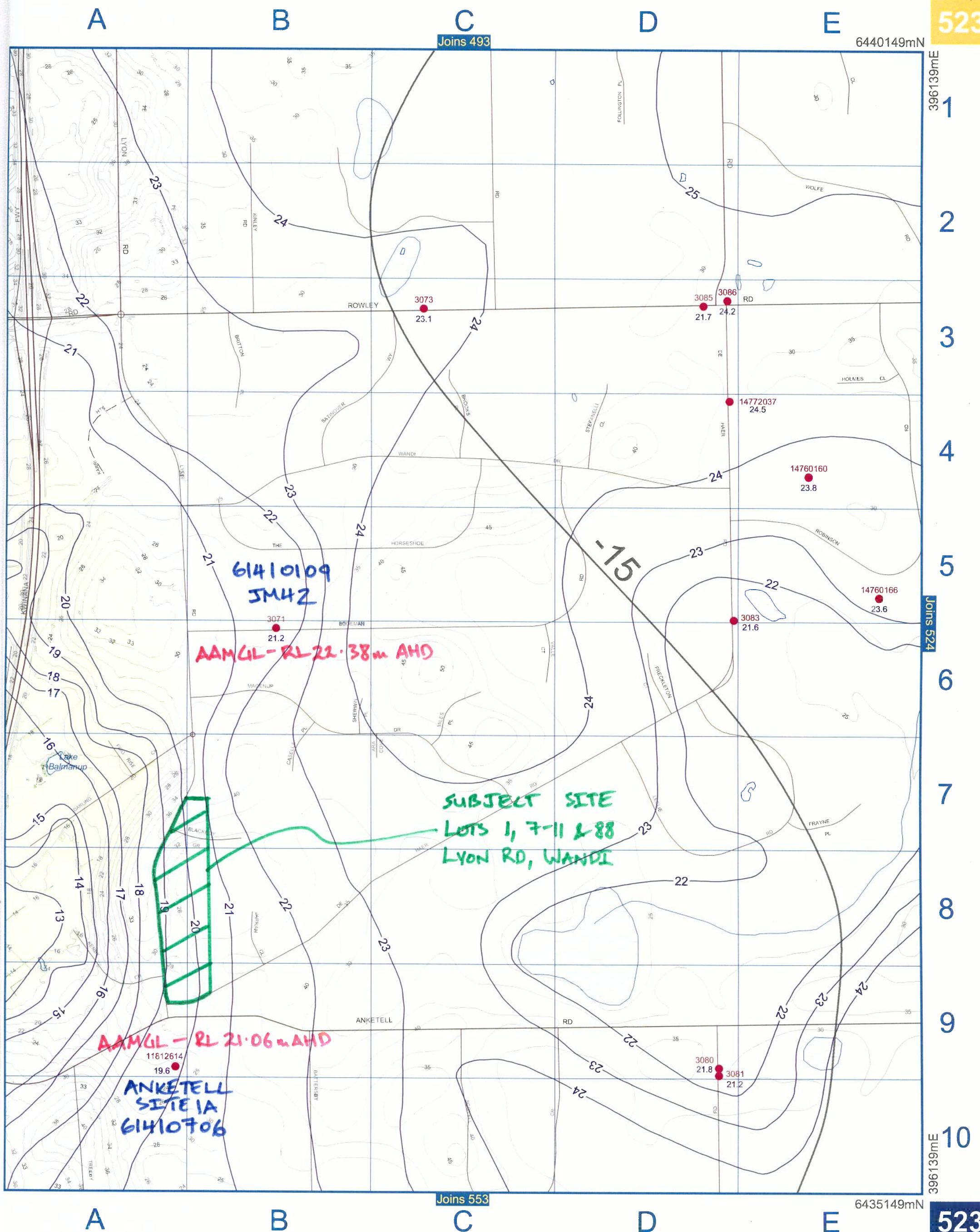


61410706 ANKETELL SITE 1A Level(m)SWL Discrete

GWL



Groundwater level contours are estimated based on recorded groundwater levels measured in May of 2003 (end of summer). Because of changes in groundwater and natural surface levels that can occur over time it should be clearly understood that the Department of Environment is not in a position to guarantee the accuracy of the data.



LEGEND	Natural surface contours in metres AHD	Groundwater development risk	4923 Bore hole / Site ID / 1.9 Water level (May 2003) in metres AHD	
	20 Water table contours (May 2003) in metres AHD			Iron staining risk
	-10 Contours on base of superficial formation in metres AHD			

Appendix 4

Bushfire Management Plan

Lots 7-11 & 88 Lyon Road, Wandi

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162



Smith Bushfire Consultants Pty Ltd

BUSHFIRE MANAGEMENT PLAN

**Lots 1, 7, 10, 11 & 88 Lyon Road & Lot 2 Blackboy Grove,
Wandi**

City of Kwinana



Prepared by Ralph Smith
SMITH BUSHFIRE CONSULTANTS PTY LTD
BPAD 27541
smith.consulting@bigpond.com
0458 292 280

Site visited 13 August 2020; Report completed 14 September 2020

NOTE

This Bushfire Management Plan has been developed by Smith Bushfire Consultants Pty Ltd for the exclusive use of the client, Terranovis and their agents.

The plan has been compiled using the standard methodologies required by Western Australian government departments and agencies. It is based on the following:

- *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)*, December 2015
- *Guidelines for Planning in Bushfire Prone Areas*, December 2017
- Australian Standard 3959 – Construction of buildings in bushfire-prone areas, November 2018

The techniques described in the above publications have been applied in the appropriate areas and circumstances for the subdivision of this document.

Where there was no public access the interpretation is based on photographic and satellite imagery, and a laser distance meter was used to measure distances and the effective slope has been determined through Near Maps.

It is recommended that this Bushfire Management Plan be revised every five years to ensure that it remains relevant and in-line with current requirements. This will optimise protection. It is proposed that the property owners undertake the review.

DISCLAIMER

This Bushfire Management Plan has been prepared in good faith. It is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, this plan is distributed on the terms and understanding that the author is not responsible for results of any actions taken based on information in this publication or for any error or omission from this publication.

Smith Bushfire Consultants Pty Ltd has exercised due and customary care in the preparation of this Bushfire Management Plan and has not, unless specifically stated, independently verified information provided by others.

Any recommendations, opinions or findings stated in this report are based on circumstances and facts as they existed at the time Smith Bushfire Consultants Pty Ltd performed the work. Any changes in such circumstances and facts upon which this document is based may adversely affect any recommendations, opinions or findings contained in this plan.

Document control

Report Version	Purpose	Author/reviewer and accreditation details	Date Submitted
1	Support the application for the subdivision	R Smith	4/11/2019
2	Modified to include additional lots	R Smith	26/8/2020
3	Modified to include new maps	R Smith	14/09/2020

© Smith Bushfire Consultants Pty Ltd September 2020

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address:

Site visit: Yes No

Date of site visit (if applicable): Day Month Year

Report author:

WA BPAD accreditation level (please circle):

Not accredited Level 1 BAL assessor Level 2 practitioner Level 3 practitioner

If accredited please provide the following.

BPAD accreditation number: Accreditation expiry: Month Year

Bushfire management plan version number:

Bushfire management plan date: Day Month Year

Client/business name:

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Is the proposal any of the following (see [SPP 3.7 for definitions](#))?

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

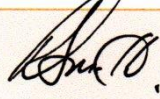
None of the above

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author



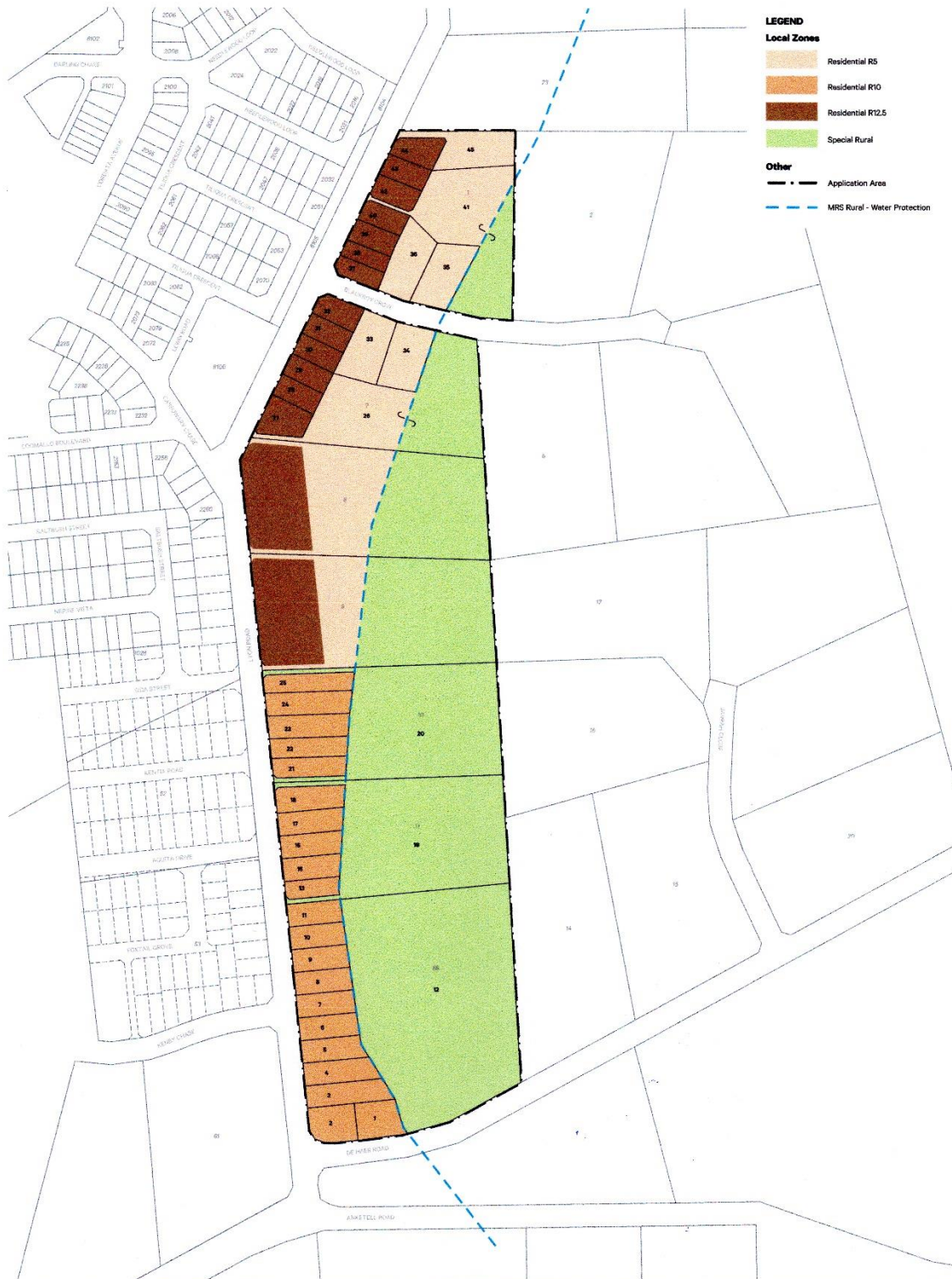
Date

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Section 1: Proposal Details

The proposal is to create 48 new lots of various sizes. The residential lots fronting Lyon Road (light brown and dark brown shading) will be cleared. The larger special residential type blocks (shaded yellow) will be parkland cleared with no undergrowth, only scattered trees. The lots will be protected from the remaining vegetation by a ten-metre cleared firebreak (shaded pink on Figure 2).



Subdivision Guide Plan

Lyon Road, Wandí

Date: 24 Jul 2020 Scale: 1:3000@ A3 File: 19-380 SU-2 A Staff: JP GW Checked: GW

element.

Level 16, 1st Flr, George Terrace, Perth Western Australia 6000
 172 New 10th October Square, Perth Western Australia 6000
 W. 4th & 5th Sts #1118 Public Administration Centre, Perth Western Australia 6000

Figure 1: Copy of proposed lot layout and MRS – Water Protection boundary.

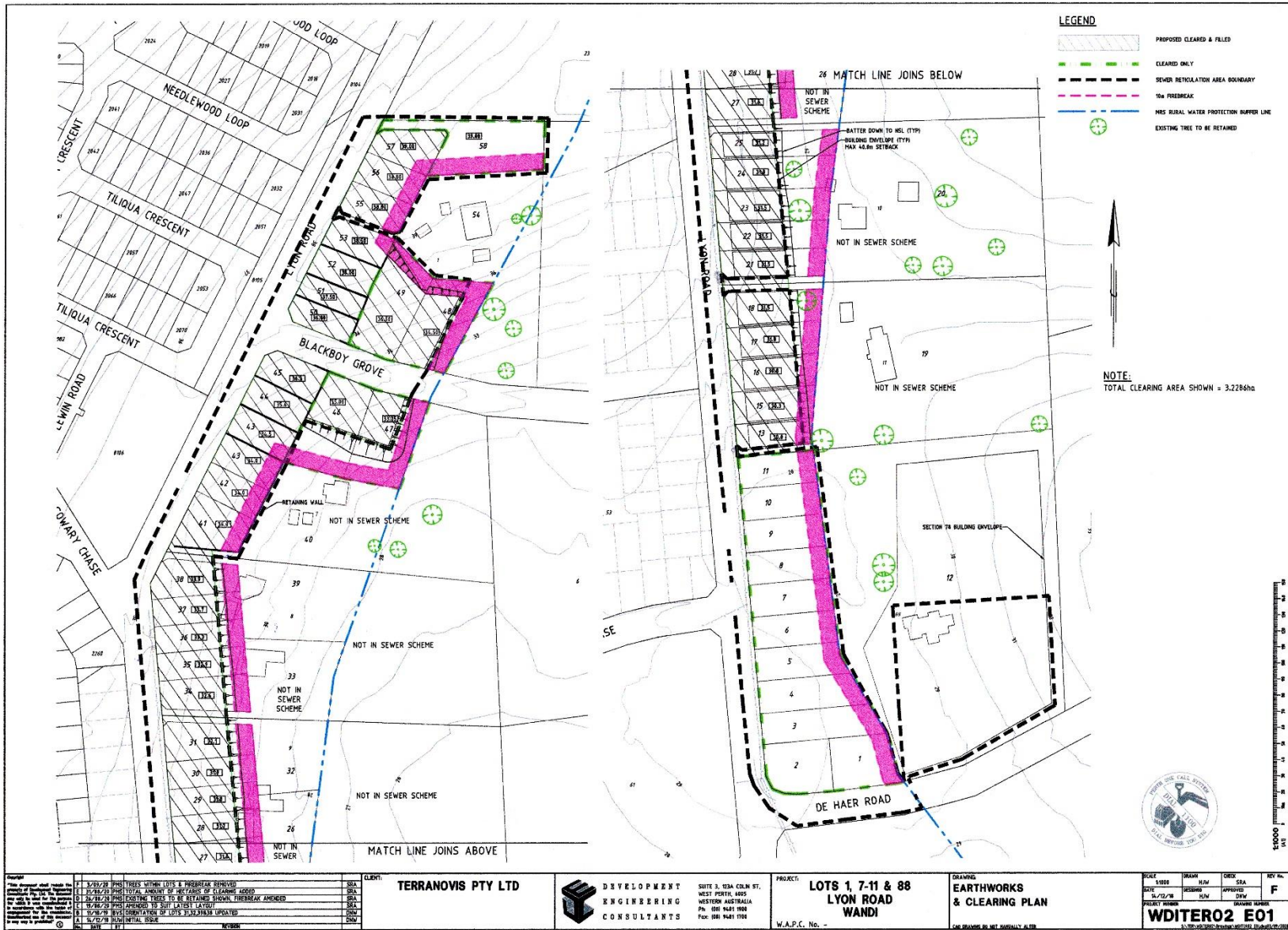


Figure 2: Copy of proposed lot layout, earthworks and clearing plan.

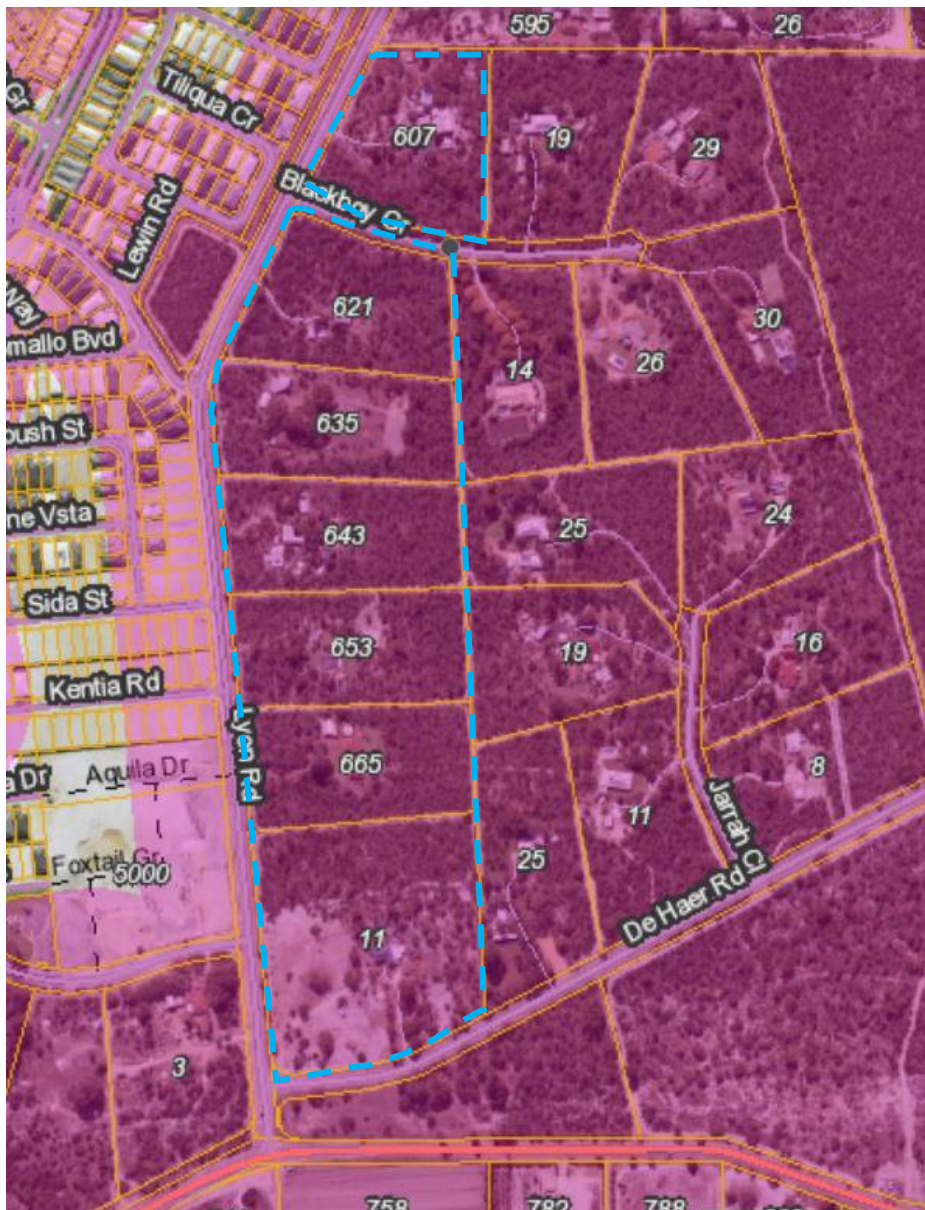


Figure 3: Map of Bushfire Prone Areas for subject site.

Section 2: Environmental Considerations

The subdivision site contains a mixture of significantly modified vegetation, and large areas of continuous native scrub vegetation. The development is restricted and does not impact on the MRS – Water Protection zone. Current dwellings east of the subdivision site will not be impacted.

Subsection 2.1: Native Vegetation – modification and clearing

The residential lots fronting Lyon Road will be cleared. The larger special residential type blocks will be parkland cleared with no undergrowth, only scattered trees. The lots will be protected from the remaining vegetation by a ten-metre cleared firebreak (shaded pink).

Subsection 2.2: Revegetation/Landscape Plans

It is proposed to only revegetate any portion of the site requiring revegetation with 'low threat vegetation' such as reticulated and managed gardens and lawn within the APZ (if required). Any revegetation that is undertaken on the site will not increase the BAL rating on the buildings.

Section 3: Bushfire Assessment Results

Subsection 3.1: Assessment inputs

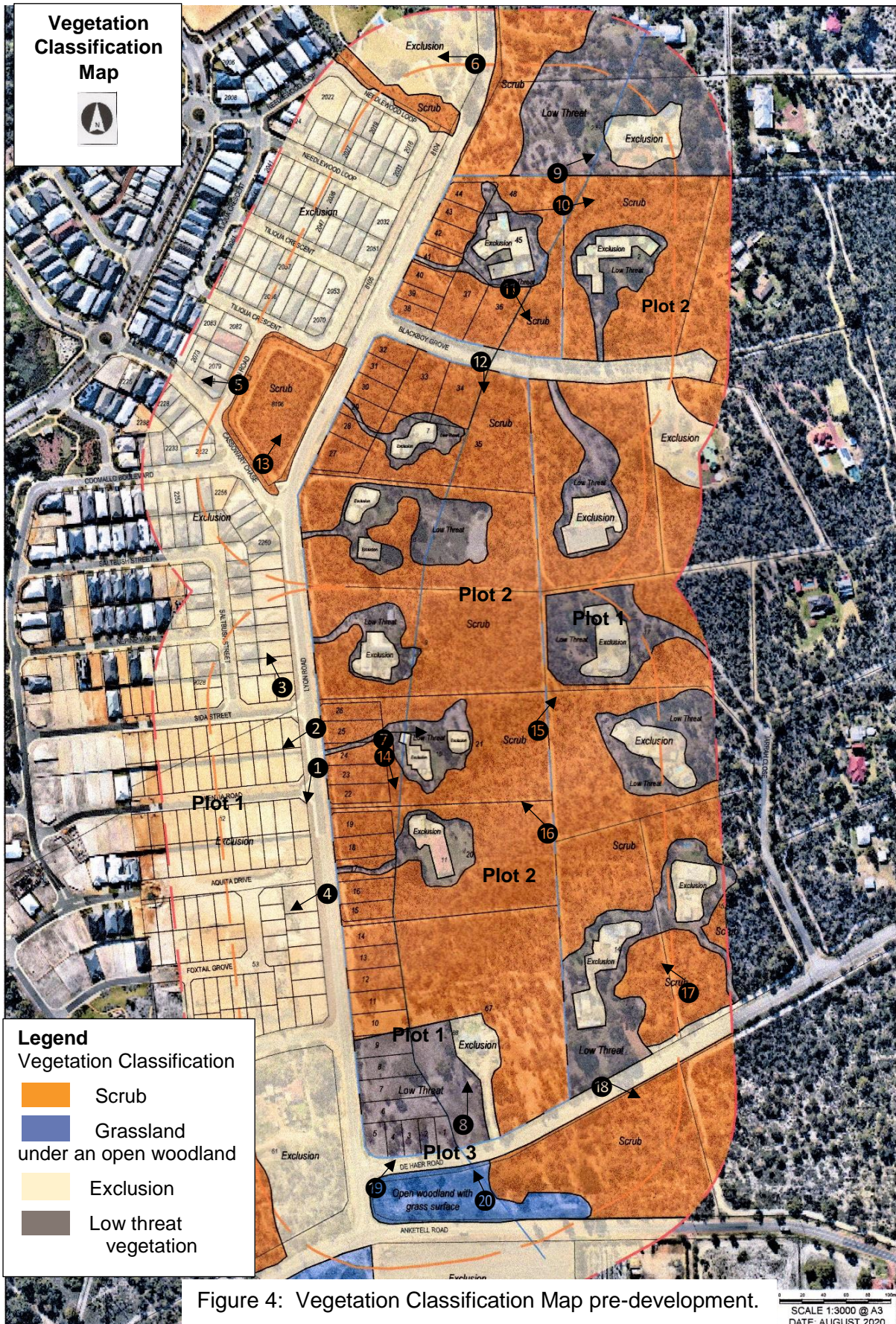




Figure 5: Vegetation Classification Map post-development.

SCALE 1:3000 @ A3
DATE: AUGUST 2020

Vegetation Classification

All vegetation within 150 metres of the proposed subdivision as indicated on the site assessment plan was classified in accordance with the Western Australian Government criteria and Clause 2.2.3 of AS 3959 was applied. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below. AS 3959 only requires consideration of 100 metres between vegetation and the building and 50 metres for grassland.

Plot 1

Exclusion – Low threat vegetation and non-vegetated areas, and includes modified to ‘low threat state’ vegetation required by the City’s firebreak and fuel load order.

Clause 2.2.3.2 (e) and (f)



Photo ID: Photo 1 Looking south at Lyon Road and the neighbouring cleared land and dwelling.



Photo ID: Photo 2 Looking west at the neighbouring cleared land and dwelling.



Photo ID: Photo 3 Looking at the cleared land and dwellings to the west of Lyon Road.



Photo ID: Photo 4 Looking at the cleared land to the west of Lyon Road opposite the subdivision.



13/08/2020 11:54:22 AM (+8.0 hrs) Dir=WNW Lat=-32.2017 Lon=115.86202 Alt=0m MSL WGS 1984
Photo ID: Photo 5 Looking at the houses, yard and infrastructure west of Lyon Road.



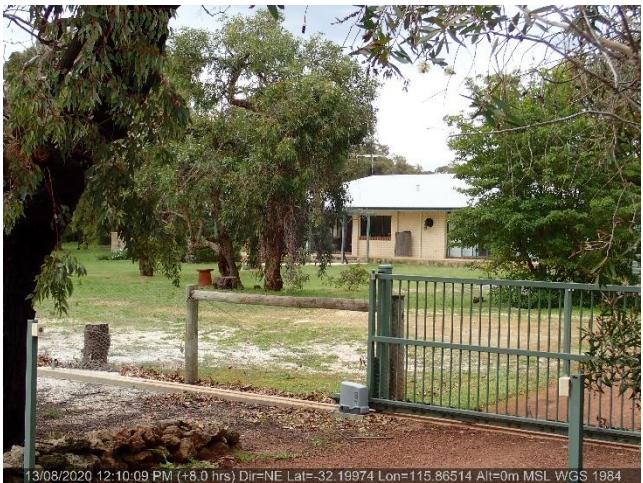
13/08/2020 12:15:26 PM (+8.0 hrs) Dir=WSW Lat=-32.19867 Lon=115.8644 Alt=0m MSL WGS 1984
Photo ID: Photo 6 Looking at infrastructure west of Lyon Road.



13/08/2020 11:36:41 AM (+8.0 hrs) Dir=E Lat=-32.20435 Lon=115.8634 Alt=0m MSL WGS 1984
Photo ID: Photo 7 Looking at the 'managed to low threat vegetation' APZ and dwelling east of Lyon Road.



13/08/2020 12:43:39 PM (+8.0 hrs) Dir=N Lat=-32.20768 Lon=115.86382 Alt=0m MSL WGS 1984
Photo ID: Photo 8 Looking at the 'managed to low threat vegetation' and dwelling.



13/08/2020 12:10:09 PM (+8.0 hrs) Dir=NE Lat=-32.19974 Lon=115.86514 Alt=0m MSL WGS 1984
Photo ID: Photo 9 Looking at the established dwelling and APZ north-east of the subdivision.

Plot 2

Class D – Scrub (AS 3959 classification D – 13)



Photo ID: Photo 10 Looking at the scrub to the east of the subdivision lots.



Photo ID: Photo 11 Looking at the scrub to the east of the subdivision lots.



Photo ID: Photo 12 Looking at the scrub vegetation south of Blackboy Grove.



Photo ID: Photo 13 Looking at the scrub which is west of Lyon Road.



Photo ID: Photo 14 Looking at the scrub vegetation on the subdivision lots.



Photo ID: Photo 15 Looking at the scrub vegetation east of the subdivision site.



Photo ID: Photo 16 Looking at the scrub vegetation east within the MRS – Water Protection Boundary.



Photo ID: Photo 17 Looking at the scrub vegetation.



Photo ID: Photo 18 Looking at the scrub vegetation which is south-east of the subdivision site.

Plot 3
Class G – Grassland (AS 3959 classification G – 21)



Photo ID: Photo 19 Looking at the grassland which is south of De Haar Road.



Photo ID: Photo 20 Looking at the grassland which is between Anketell Road and De Haar Road.

Notes to Accompany Vegetation Classification

1. Plot 1

Exclusion – Low threat vegetation and non-vegetated areas, and includes modified to 'low threat state' vegetation required by the City's firebreak and fuel load order.

Clause 2.2.3.2 (e) and (f)

This plot comprises the houses, sheds, gardens and infrastructure surrounding the proposed subdivision site. The site is within a well established suburb with all of the normal amenities such as roads, mains reticulated water, and other associated infrastructure, albeit on large lots to the east. West of Lyon Road the areas are basically cleared and developed ready for housing to be built, or with homes already constructed. The City of Kwinana firebreak and fuel load notice has specific land areas and assets required to be managed by the construction and maintenance of an APZ and other areas that are required to be managed in a 'low threat vegetation' state.

2. Plot 2

Class D – Scrub (AS 3959 classification D – 13)

This plot comprises the scrub that is east of Lyon Road and includes the subdivision lots. This scrub is a large contiguous area that is extensive to the east. This vegetation will be removed from the lots adjacent to Lyon Road and managed on the larger lots. There is an area of Regional Park to the south-east of the subdivision site.

3. Plot 3

Class G – Grassland under an open woodland (AS 3959 classification G – 06)

This plot comprises the small pocket of grassland under an open woodland south of the subdivision site and separated from the subdivision site by De Haar Road.

Slope



Figure 6: Five-metre contours for the site and surrounding areas.

Subsection 3.2: Assessment outputs

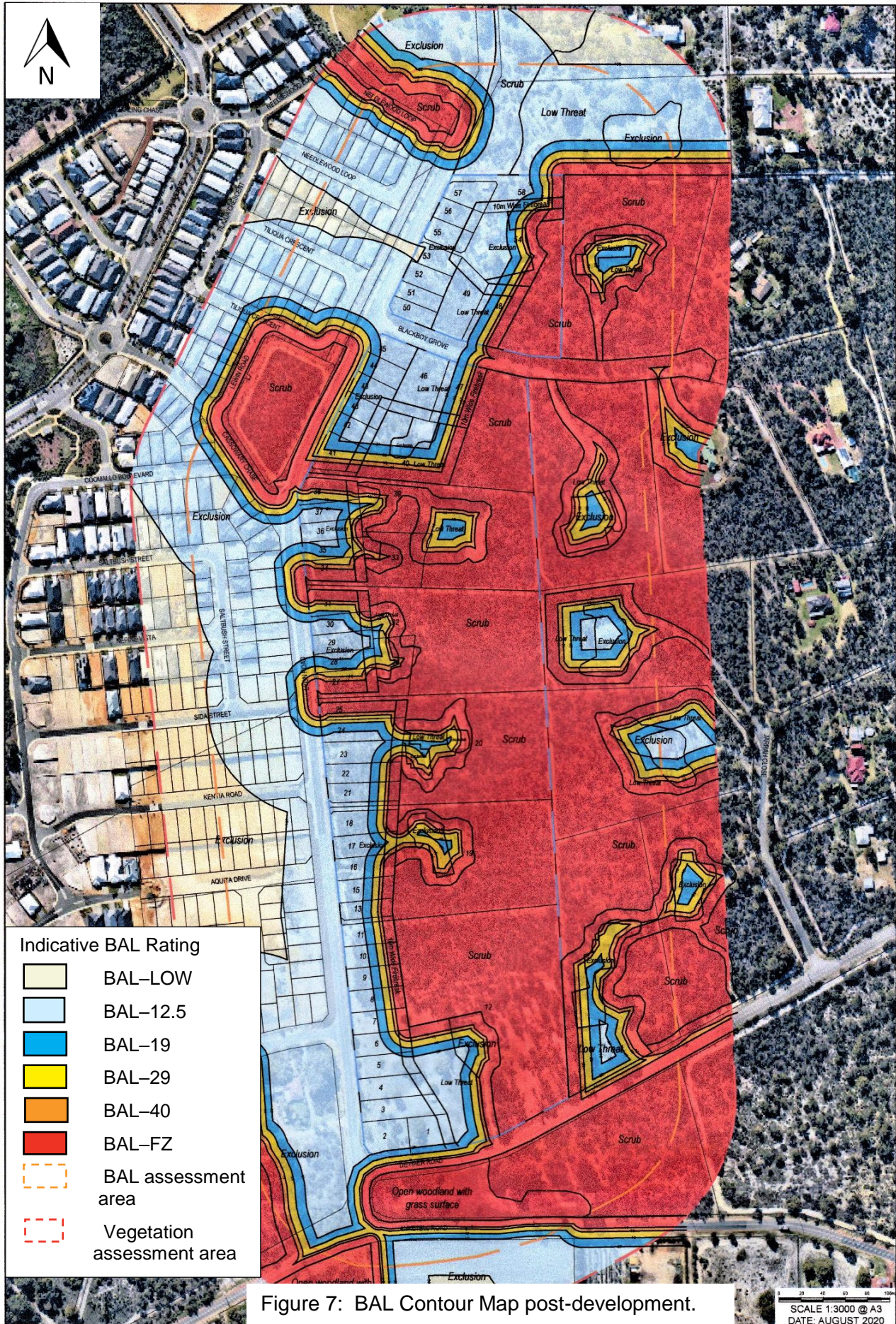


Figure 7: BAL Contour Map post-development.

Section 4: Identification of bushfire hazard issues

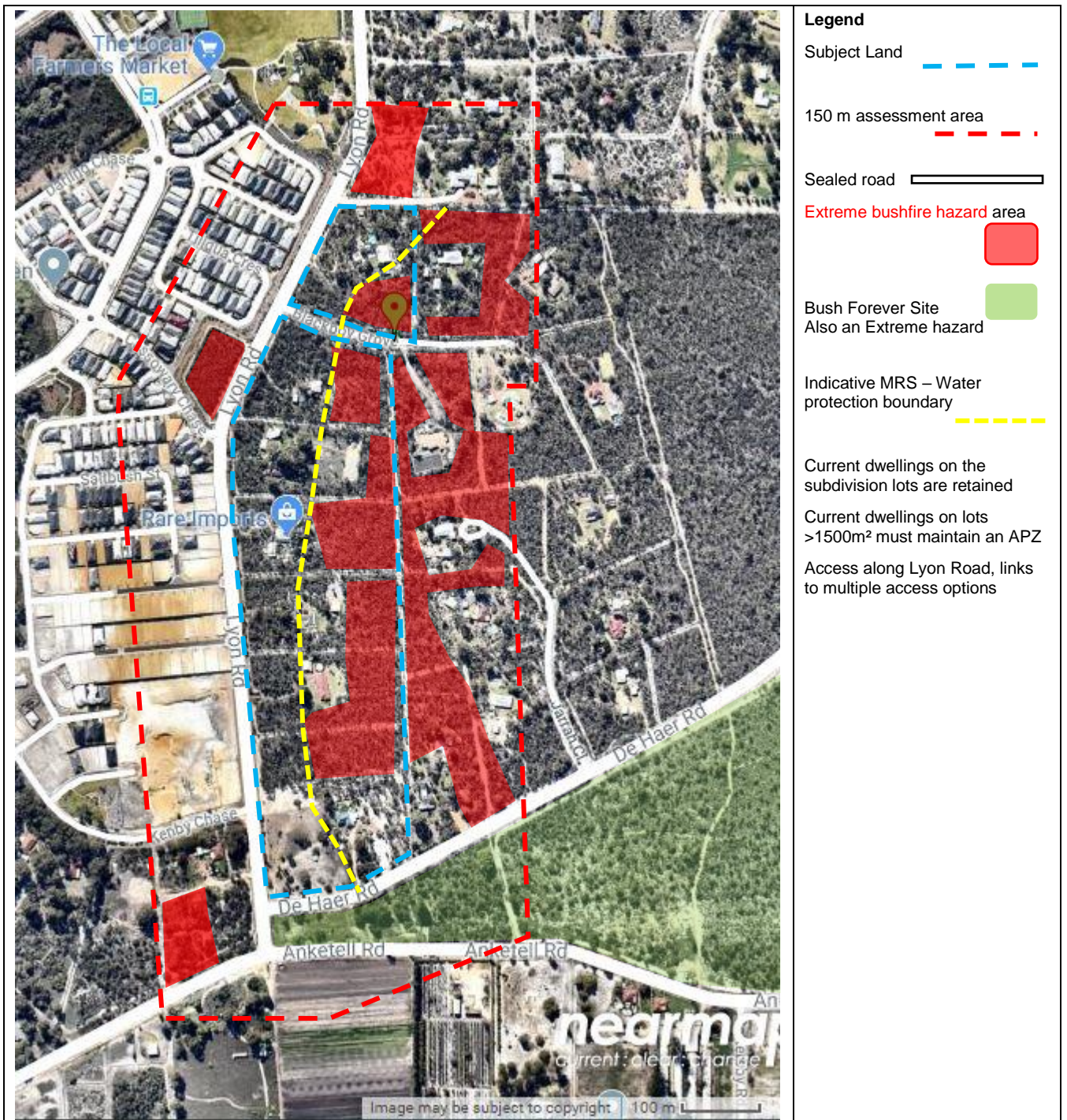


Figure 8: Issues Plan.

Section 5: Assessment against the bushfire protection criteria

Bushfire protection criteria	Method of Compliance	Proposed bushfire management strategies
	Acceptable solutions	
Element 1: Location	A1.1 Subdivision location	The proposed building envelopes will be developed in such a manner that on completion they will be at a maximum of BAL-29.
Element 2: Siting and design	A2.1 Asset Protection Zone (APZ)	
Element 3: Vehicular access	A3.1 Two access routes	Lyon Road provides multiple access options that facilitate movement to a range of alternative locations and directions of travel.
	A3.2 Public road	All public roads will be constructed to the appropriate standards as required in the Guidelines.
	A3.3 Cul-de-sac (including a dead-end-road)	Not applicable.
	A3.4 Battle-axe	Not applicable.
	A3.5 Private driveway longer than 50 m	It is not expected that any driveway will be longer than 50 m, but if there are any they will be constructed to the appropriate standard.
	A3.6 Emergency access way	Not applicable.
	A3.7 Fire service access routes (perimeter roads)	There will be firebreaks maintained as required in the City's firebreak and fuel load notice.
	A3.8 Firebreak width	Firebreak widths will be in accordance with the City's firebreak and fuel load notice.
Element 4: Water	A4.1 Reticulated areas	The site will be serviced with reticulated mains water in accordance with the State Government requirements.
	A4.2 Non-reticulated areas	Not applicable
	A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)	Not applicable

Section 5.2: Additional management strategies

Firebreaks will be maintained in accordance with the City's firebreak order. The vegetation within the APZ site will be managed so that it is compliant with the AS 3959 – 2018 definition of 'low threat vegetation' and the State's APZ criteria and the City's firebreak order. All new dwellings will be located on the site so that the BAL rating is a maximum of BAL-29 or less.

Section 6: Responsibilities for Implementation & Management of the Bushfire Measures

DEVELOPER/LANDOWNER – PRIOR TO SALE OR OCCUPANCY	
No.	Implementation Action
1	Install the access ways and associated signs to the standards stated in the Guidelines.
2	Establish the water reticulation system and associated infrastructure, including hydrants at the prescribed standard.
3	<p>A notification, pursuant to Section 165 of the <i>Planning and Development Act 2005</i> is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:</p> <p><i>"This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land".</i> (Western Australian Planning Commission)</p>

LANDOWNER/OCCUPIER – ONGOING MANAGEMENT	
No.	Management Action
1	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.
2	Ensure that any new Class 1, 2, 3 and associated Class 10a buildings that are built on the properties are designed and constructed in full compliance with the requirements of the City of Kwinana and as detailed in <i>Australian Standard 3959 – Construction of buildings in bushfire-prone areas</i> .
3	Maintain the buildings in good order and condition so that they comply with the appropriate construction standards.

Section 6.1: Spatial representation of the bushfire management strategies

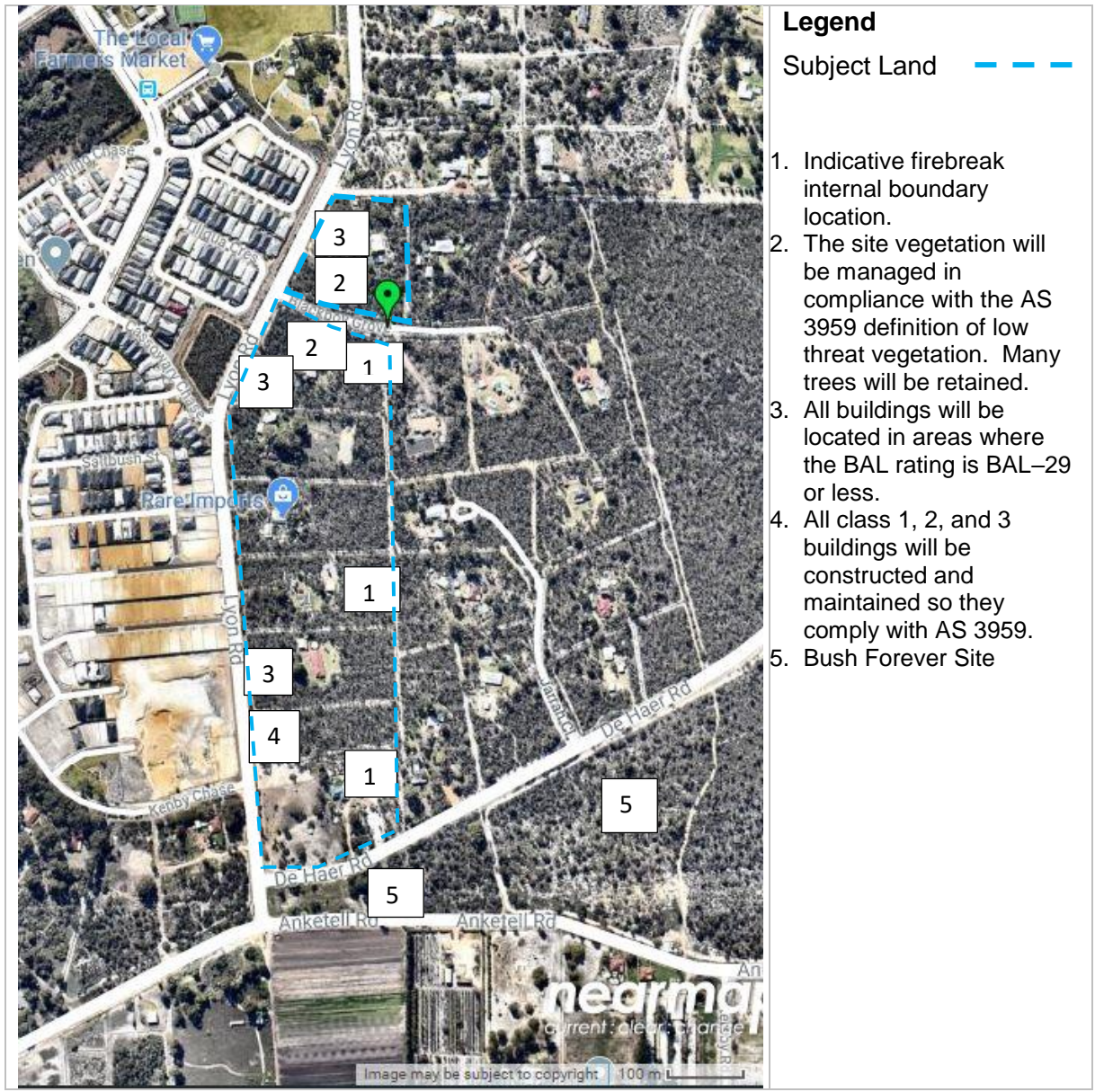


Figure 9: Spatial representation of the bushfire management strategies.

Appendix 1

The following are extracted from the Guidelines and provide guidance for the standards for constructing roads and driveways.

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	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

*Refer to E3.2 Public roads: Trafficable surface

ELEMENT 3: VEHICULAR ACCESS

PERFORMANCE PRINCIPLE

ACCEPTABLE SOLUTIONS

A3.5 Private driveway longer than 50 metres

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

- Requirements in Table 6, Column 3;
- Required where a house site is more than 50 metres from a public road;
- 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);
- 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
- Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes.
- All-weather surface (i.e. compacted gravel, limestone or sealed).

Appendix 2

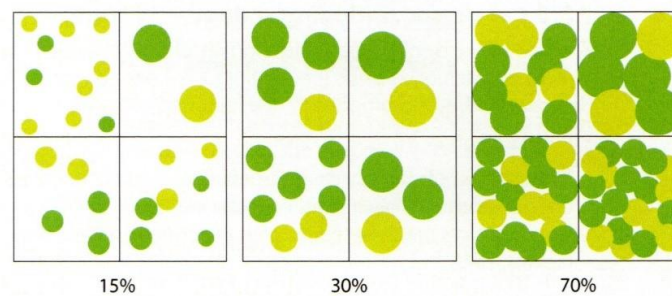
The following asset protection zone criteria are extracted from the Guidelines and provide guidance for constructing and maintaining the APZ.

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 16: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Appendix 3

The following asset protection zone criteria is extracted from the City of Kwinana firebreak and fuel load notice and provide guidance for constructing and maintaining the APZ.

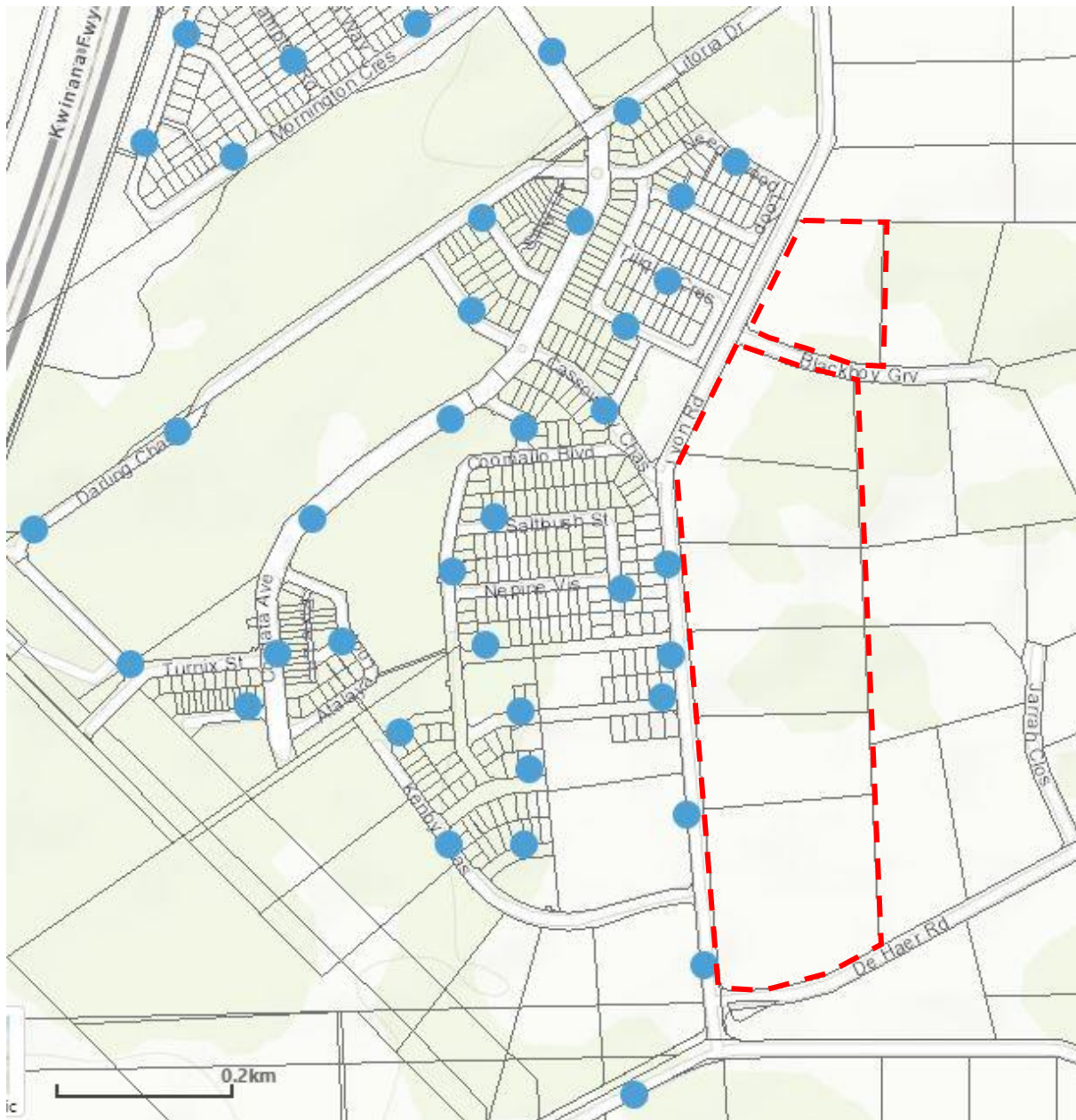
“Asset Protection Zone” means an area with a radius of 20 metres measured from the external perimeter of the building/s or as stated in your approved Bushfire Attack Level (BAL) assessment, within the boundaries of the lot on which the building/s is situated. Fuel loads in this zone shall be reduced and maintained to 2 tonnes per hectare or less.

<h4>Land area – 1,500m² to 3,500m²</h4> <p>The works outlined in this section must be maintained all year round and owners and/or occupiers are required to maintain an <i>asset protection zone</i> around all buildings, infrastructure and fixed assets on the property by:</p> <ul style="list-style-type: none">• Having all long grass, weeds, etc. slashed, mowed or trimmed down by other means to a height no greater than 50mm across the entire property; and• All trees, branches, limbs, etc. which are overhanging any buildings must be trimmed back to a vertical axis height of 4 metres.	<h4>Land area up to 1499m²</h4> <p>The works outlined in this section must be maintained all year round and owners and/ or occupiers are required to:</p> <ul style="list-style-type: none">• Have all long grass, weeds, etc. slashed, mowed or trimmed down by other means to a height no greater than 50mm across the entire property; and• All trees, branches, limbs, etc. which are overhanging any buildings must be trimmed back to a vertical axis height of 4 metres.
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<h4>Land area – 3,501m² or greater</h4> <p>The works outlined in this section must be completed before 1 December of each year and maintained throughout until 30 April the following year.</p> <p>Owners and/or occupiers of land that is 3,501m² or greater are required to construct a <i>firebreak</i>:</p> <ul style="list-style-type: none">• Inside and along all boundaries of land in a continuous form, or within 10 metres of boundaries adjacent to roads, rail and drain reserves and all public open space reserves;• Around all sides of any building on the land;	<ul style="list-style-type: none">• On all driveways and access ways to houses, sheds and buildings on the land;• On any land surrounding any place where, wood or timber piles, hay stacks, tyres, flammable liquids, chemicals and gas products are kept on the land, construct a <i>firebreak</i>;• Construct these <i>firebreaks</i> in a manner so that they are <i>trafficable</i>, contain no <i>dead ends</i> and are wide enough for a heavy-duty fire vehicle or a emergency services vehicle to be able to turn the corner without the vehicle being obstructed in anyway; and• Maintain an <i>asset protection zone</i> around all buildings, infrastructure and fixed assets on the property.
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Appendix 4

The map below shows the current location of the fire hydrants (blue dots) and subdivision site (red dash lines).



References

Australian Building Codes Board, (2019). *Building Code of Australia*. Australian Building Codes Board, Sydney

City of Kwinana, (2020). *Fire Break Notice 2020/21*. Retrieved 13 September 2020 from <https://www.kwinana.wa.gov.au/residents/bush-fire-and-emergency-management/fire-management-notice.aspx>

Near map from <http://maps.au.nearmap.com/>

Contour map from <https://maps.landgate.wa.gov.au/maps-landgate/registered/>

Department of Fire and Emergency Services (DFES), (2020). *Map of Bushfire Prone Areas*. Retrieved 13 September 2020 from <http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>

Standards Australia. (2018). *Australian Standard 3959 – Construction of buildings in bushfire-prone areas*. Standards Australia, Sydney, NSW.

Western Australian Planning Commission. (2015). *State Planning Policy 3.7 – Planning in Bushfire Prone Areas*. Western Australian Planning Commission, Perth, WA.

Western Australian Planning Commission. (2017). *Guidelines for Planning in Bushfire Prone Areas*. Western Australian Planning Commission, Perth, WA. December 2017.

Lots 7-11 & 88 Lyon Road, Wandii

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

Appendix 5

Servicing Report

Lots 7-11 & 88 Lyon Road, Wandii

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162



TERRANOVIS PTY LTD
LOTS 1, 7, 10, 11 & 88 LYON ROAD, WANDI
ENGINEERING SERVICES REPORT

1. General

The above land is to be developed into 37 fully serviced urban lots, five R5 lots fully serviced, two R5 lots with all services except sewer, and five balance title special rural lots as shown on the Element Subdivision Guide Plan. The balance title rural lots will retain existing vegetation outside of proposed building envelopes and the large (5) R5 residual lots within the buffer area will have clearing only for fill for sewer connection purposes, with batters instead of retaining walls. Existing residences on the balance title lots will be retained.

The development of the above lots occupies a narrow band of land between Lyon Road and the western edge of the Jandakot Public Water Supply Protection Zone. The proposed urban lots will have frontage to Lyon Road, Blackboy Grove and De Haer Road as shown on the subdivision guide plan produced by Element.

This report covers existing and proposed services plus proposals for earthworks, retaining walls, roadways, drainage, water supply, power supply, gas, telecommunications and sewerage as required for current urban development standards in line with the limitations outlined above.

Intervening lots 8 and 9 Lyon Road are not included in this proposal and will be subject to further study, albeit with services proposed for this development passing along the Lyon Road verge fronting them.

2. Executive Summary

The land the subject of this report is located on the eastern side of Lyon Road, Wandí, from Lot 1 north of Blackboy Grove, southwards to Lot 88 on the corner of De Haer Road, just north of Anketell Road in the City of Kwinana (CoK).

The only roadworks required for the development will be upgrade to Lyon Road, Blackboy Grove and De Haer Rd abutting the development as required, and battleaxe driveways to the balance title lots

The land is covered with mostly low to medium height Banksia scrub. The existing lots contain residences and sheds. These buildings will remain on residual title rural lots. No demolition is envisaged for subdivision.

The site grades down moderately from the western boundary along Lyon Road to a low area in the middle of the eastern boundary.

The land is underlain by free draining Bassendean Sands at a depth suitable for urbanisation. The site varies in height from around RL38mAHD at the northern corner of lot 1 on Lyon Road, falling to a general level of RL 28m along the eastern edge of the proposed development.

The historic groundwater level is shown as varying from RL23m HD along the eastern edge of the development, falling to RL 21m AHD along Lyon Road, according to the 1997 Groundwater Atlas of the Department of Water (DoW), which are the highest recorded levels.

The land can be connected to all services, by extension and upgrading from existing and proposed infrastructure from the west side of Lyon Road (Honeywood development). Sewer, water, power, gas and telephone services already exist in the urban development west of Lyon Road adjacent to the site.

A LWMS for the land has been approved, but it will be updated to the new development proposal and re-submitted.

Calculations for the LWMS show an AAMGL of approximately RL21.0m for the development site, with the AAMGL contour running north – south parallel to Lyon Road.

The minimum level of the proposed urban land is therefore some 7m above the AAMGL.

Some fill will be required along the eastern edge of the urban lots for the purpose of gaining the required cover for sewer. These lots will also require retaining walls or earthworks batters up to 2.5 metres in height to allow for the above sewer connection. Building envelopes will be placed on the urban lots to a depth of 40 metres to facilitate the sewer connection, minimize fill and retain vegetation where desired as shown on the attached plans.

The semi- rural and rural lots will be connected to all services except sewer.

3. Site

The development site, with an area of some 10 ha, according to the site plan, is located on the east side of Lyon Road between De Haer Road and some 130 metres north of Blackboy Grove. It is currently light bushland, with each lot containing a residence.

The Environmental Geology Map of the Geological Survey of Western Australia classifies the whole of the site as “S8” Bassendean Sand suitable for urbanisation. The current process is listed as “groundwater recharge”.

The post development water table is as detailed in the LWMS for the site, with a calculated AAMGL of RL 21.0 AHD.

The site is adjacent to Water Corporation sewer and water services on the west side of Lyon Road in new urban developments. A 200mm reticulation water main has been constructed along the western verge of Lyon Road from Cassowary Drive southwards to Anketell Road by other developers.

An extension of all public utility services required to be constructed for the development can readily be extended from the new developments on the western side of Lyon Road.

4. Development Proposal

It is proposed to develop the land as an urban residential subdivision of some 37 urban lots, seven R5 residential lots (including two balance title lots), plus 3 balance title special rural lots. The special rural lots are within the Water Resources Buffer zone immediately east of the proposed urban development.

Access to the development will be from the existing Lyon Road, except for the residual special rural lots of lots 1, 7 and 88, which will maintain existing or have new access of fBlackboy Grove and De Haer Road respectively, with all required servicing extended from existing new infrastructure immediately west of Lyon Road. The development will be provided with all normal services, with links to abutting developments (existing and proposed) for sewer (urban lots only), water, power, roads, gas and telephone services with all drainage to be retained on site, using best management practices.

The urban lot development will entail earthworks to provide level free residential lots at least 7 metres above the AAMGL as determined by the LWMS. Drainage will be managed by on-site disposal via soakwells for each lot storing at least the 1 year 1 hour storm.

5. Earthworks & Retaining Walls

The LWMS has determined that the site is at least some 7metres above the AAMGL, therefore not requiring fill for drainage purposes.

There is an earthworks embargo for this site during the months of November to March.

Earthworks on site will entail removal of topsoil, cut and fill, with the site being fully cleared to allow construction of level building blocks, including the provision of retaining walls to suit this purpose.

Stabilisation of the finished development will be done using stockpiled topsoil plus hydromulch.

6. Roads

All roadworks will be constructed to City of Kwinana standards and approval, including kerbing and piped drainage plus provision of footpaths as required (in Lyon Road).

The existing Lyon Road is a 7.4m wide newly sealed and kerbed road with centre line marking north of Cassowary Chase with side entry pit soakwell drainage along the western verge and flush kerbing and informal runoff on the eastern verge, and currently an 8m wide road rural road in fair condition south of Cassowary Chase, without any formal drainage.

Blackboy Grove is a nominal 5.5m wide sealed rural road in fair condition. De Haer Road is a nominal 7.5m wide sealed rural road with centre marking in good condition. No formal drainage exists along either road.

Lyon Road has recently been upgraded in part by the developer on the west side of the road, and it is expected that this upgrading will be continued south by both developers, using the same principles for widening and stormwater drainage via soakwells.

7. Drainage

The development site will be self-contained as far as stormwater drainage is concerned. The soil characteristics of the site will allow site soakage, based on the geology and the depth to the groundwater level. Site drainage will be by soakage into soakwells for each residential lot, as the depth to the AAMGL will be well in excess of the minimum of 1.5m for soakwells to operate efficiently. Lyon Road stormwater drainage runoff will discharge to roadside infiltration drainage pits as has been done further north with the recent upgrade.

The upgrade to Blackboy Grove will be similarly treated.

Battleaxe driveways will have centre drainage formation and gully pit soakwells.

8. Groundwater

The post development GWL at the site has been determined by the LWMS at RL21.0m AHD along a north south axis in the middle of the narrow site.

The finished lot levels for the site will be a minimum of some 7 metres above this level at RL 28m AHD.

9. Power

It appears that sufficient power supply exists in the area to supply the development. A 22kV high voltage and low voltage aerial power line is located along the eastern verge of Lyon Road. There is sufficient capacity in the Medina zone substation, which supplies this area, to fully service this development without the need for any upgrading of infrastructure.

The development may require a new 315kVA transformer to fully service all lots. It is expected that the overhead lines in Lyon Road, Blackboy Grove and De Haer Road may be relocated underground as part of the development servicing.

10. Water Supply

At present there is no reticulated water supply to the existing houses on the rural lots. The 200mm reticulation main located on the eastern verge of Lyon Road has been recently installed as a connecting main to Anketell Road. This line will provide sufficient water supply to this development.

Reticulation mains will be extended to the semi-rural and rural lots down battleaxe driveways and existing roads as required and approved by the Water Corporation.

11. Sewer

The site is not currently connected to sewer.

The site currently falls within the gravity sewer catchment connected to the Thomsons Lake Interim WWPS “M”. This WWPS is operational. The sewer system from this WWPS stretches southwards down to Anketell Road, and across to Lyon Road. Sewers adjacent to Lyon Road are generally not deep enough to extend across Lyon Road to this development, Water Corporation sewer planning indicates that the whole of the land being developed is planned to be connected into a sewer presently located in Kenby Chase some 150 metres west of Lyon Road at the southern end of the Honeywood development. The Honeywood development will also construct shallow sewers along the western verge of Lyon Road, into which some of this development lots may connect.

The Water Corporation has advised that the Kenby Chase sewer will be extended out to and along Lyon Road at the required depth to serve the whole of the land east of Lyon Road. This requires the sewer to be laid “hard down” at minimum grade so that it will be some 4.5m deep at and along Lyon Road. This extension will possibly be done by the Honeywood development as required by Water Corporation sewer construction policy, when it develops the southern end of its land, possibly in early 2020, or by this proponent.

This development will require a sewer to be constructed along the eastern verge of Lyon Road at a depth of some 3 metres to 3.5 metres to allow for lot sewer connections as set out above.

Any sewer installation along the east verge of Lyon Road will need to take into account the proximity of the existing OPTUS Fibre Optic cable which appears to be located along the 3.7m alignment. The sewer must be at least one metre away from the FO cable, so it will need to be constructed either along the trunk services alignment of 4.7m to 5m, or on the vacant water reticulation alignment of 2.1 metres.

12. Telephone & NBN

Telstra services exist in the area along Lyon Road, Blackboy Grove and De Haer Road. These are most likely to be able to be extended to service this proposed development. Some upgrading may be required.

If Telstra is to be the servicing authority, Telstra normally requires twelve months’ notice of development starting to ascertain any upgrading requirements.

The size of the proposed development falls within NBN’s guidelines, and NBN FTTP is likely to be installed by NBN.

In accordance with requirements, the developer is required to install NBN “pipe and pit” to allow for future installation of cables for the NBN. The design of the “pipe & pit” is the responsibility of the developer, and will be designed in conjunction with the underground power network, and installed during the construction phase of the development.

An OPTUS Fibre Optic cable exists along the east side of Lyon Road for the extent of the development.

13. Gas

Gas mains are available in this area. The development on the western side of Lyon road has reticulated gas mains, and it is expected that these will be extended into this development. At present there are no gas mains in Lyon Road.

It is expected that ATCO will construct the pipelines in trenches prepared by the developer as has been the normal practice.



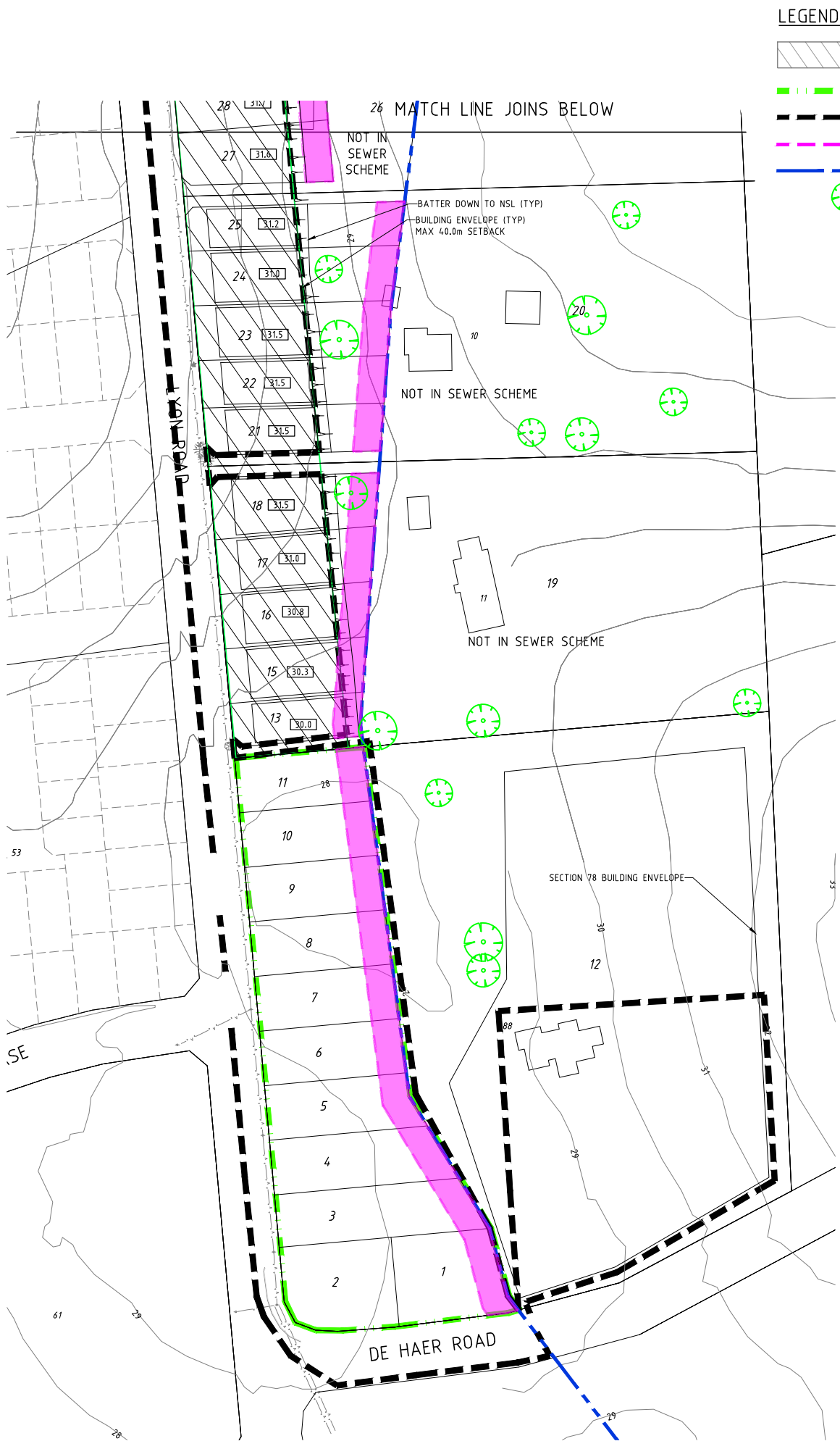
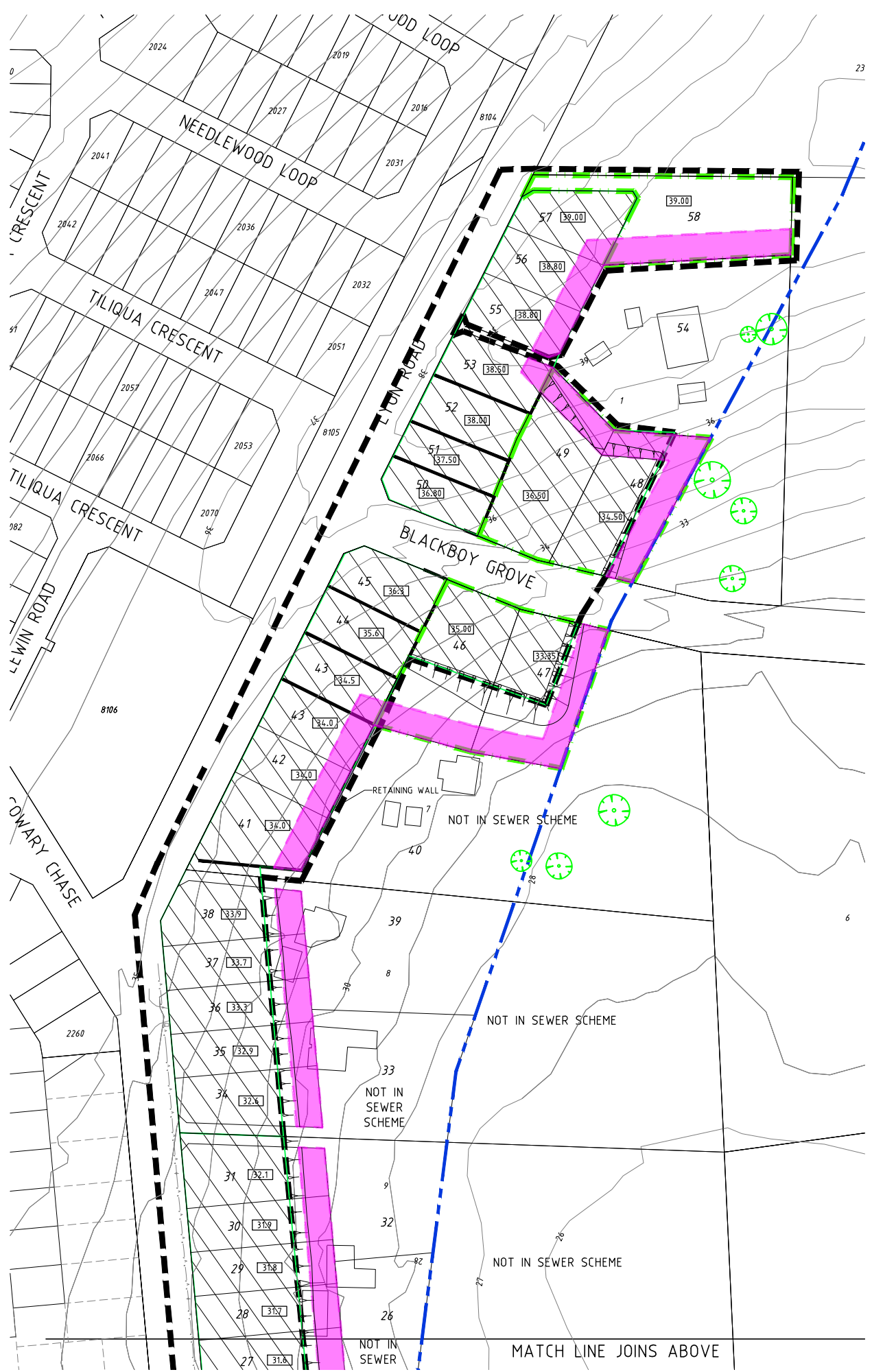
DEVELOPMENT ENGINEERING CONSULTANTS PTY LTD
THIS REPORT IS DATED 1ST OCTOBER 2019

Appendix 6

Earthworks and Clearing Plan

Lots 7-11 & 88 Lyon Road, Wandii

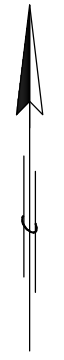
City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162



LEGEND

	PROPOSED CLEARED & FILLED
	CLEARED ONLY
	SEWER RETICULATION AREA BOUNDARY
	10m FIREBREAK
	MRS RURAL WATER PROTECTION BUFFER LINE
	EXISTING TREE TO BE RETAINED

NOTE:
TOTAL CLEARING AREA SHOWN = 3.2286ha



No.	DATE	BY	REVISION
F	3/09/20	PMS	TREES WITHIN LOTS & FIREBREAK REMOVED
E	31/08/20	PMS	TOTAL AMOUNT OF HECTARES OF CLEARING ADDED
D	26/08/20	PMS	EXISTING TREES TO BE RETAINED SHOWN, FIREBREAK AMENDED
C	19/08/20	PMS	AMENDED TO SUIT LATEST LAYOUT
B	11/10/19	BVS	ORIENTATION OF LOTS 31,32,39&38 UPDATED
A	14/12/18	HJW	INITIAL ISSUE

CLIENT:	TERRANOVIS PTY LTD
SRA	
SRA	
SRA	
DNW	
DNW	

DEVELOPMENT ENGINEERING CONSULTANTS

SUITE 3, 123A COLIN ST,
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

PROJECT: **LOTS 1, 7-11 & 88 LYON ROAD WANDI**
W.A.P.C. No. -

DRAWING:	EARTHWORKS & CLEARING PLAN
SCALE:	1:1000
DATE:	14/12/18
DESIGNED:	HJW
APPROVED:	DNW
CHECK:	SRA
REV No.:	F

PROJECT NUMBER:	WDITER02 E01
DRAWING NUMBER:	WDITER02 E01

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CAD DRAWING DO NOT MANUALLY ALTER

Lots 7-11 & 88 Lyon Road, Wandii

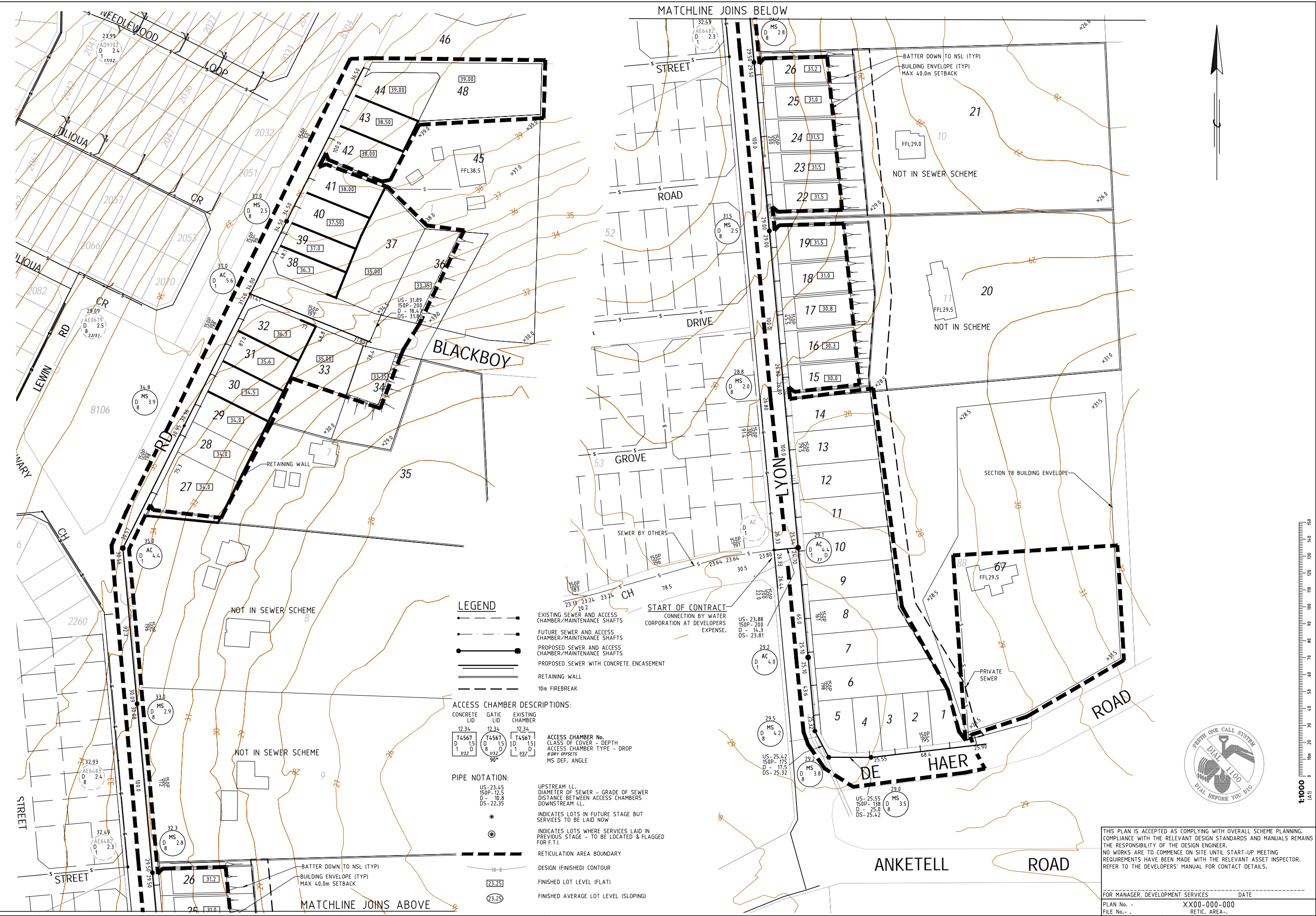
City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162

Appendix 7

Sewer Reticulation Plan

Lots 7-11 & 88 Lyon Road, Wandi

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162



LEGEND

- EXISTING SEWER AND ACCESS CHAMBER/MAINTENANCE SHAFTS
- FUTURE SEWER AND ACCESS CHAMBER/MAINTENANCE SHAFTS
- PROPOSED SEWER AND ACCESS CHAMBER/MAINTENANCE SHAFTS
- PROPOSED SEWER WITH CONCRETE ENCASUREMENT
- RETAINING WALL
- 10m FIREBREAK

ACCESS CHAMBER DESCRIPTIONS:

CONCRETE LID	GATIC LID	EXISTING CHAMBER

ACCESS CHAMBER No.
CLASS OF COVER - DEPTH
ACCESS CHAMBER TYPE - DROP
ENTRY ANGLES
MS DEF. ANGLE

PIPE NOTATION:

US-23.45	150P-12.5	D-10.8	DS-22.35
----------	-----------	--------	----------

UPSTREAM I.L.
DIAMETER OF SEWER - GRADE OF SEWER
DISTANCE BETWEEN ACCESS CHAMBERS
DOWNSTREAM I.L.

* INDICATES LOTS IN FUTURE STAGE BUT SERVICES TO BE LAID NOW
 ⊛ INDICATES LOTS WHERE SERVICES LAID IN PREVIOUS STAGE - TO BE LOCATED & FLAGGED FOR F.T.I.

- RETICULATION AREA BOUNDARY
- DESIGN (FINISHED) CONTOUR
- FINISHED LOT LEVEL (FLAT)
- FINISHED AVERAGE LOT LEVEL (SLOPING)

THIS PLAN IS ACCEPTED AS COMPLYING WITH OVERALL SCHEME PLANNING. COMPLIANCE WITH THE RELEVANT DESIGN STANDARDS AND MANUALS REMAINS THE RESPONSIBILITY OF THE DESIGN ENGINEER. NO WORKS ARE TO COMMENCE ON SITE UNTIL START-UP MEETING REQUIREMENTS HAVE BEEN MADE WITH THE RELEVANT ASSET INSPECTOR. REFER TO THE DEVELOPERS' MANUAL FOR CONTACT DETAILS.

FOR MANAGER, DEVELOPMENT SERVICES	DATE
PLAN No. - XX00-000-000	
FILE No. -	RETIC. AREA -

No.	DATE	BY	REVISION
B	11/10/19	BVS	SEWER AND SEWER RETICULATION AMENDED
A	13/12/18	HJW	INITIAL ISSUE

CLIENT:
TERRANOVIS PTY LTD

DEVELOPMENT ENGINEERING CONSULTANTS
 SUITE 3, 123A COLIN ST.
 WEST PERTH, 6005
 WESTERN AUSTRALIA
 Ph: (08) 9481 1900
 Fax: (08) 9481 1700

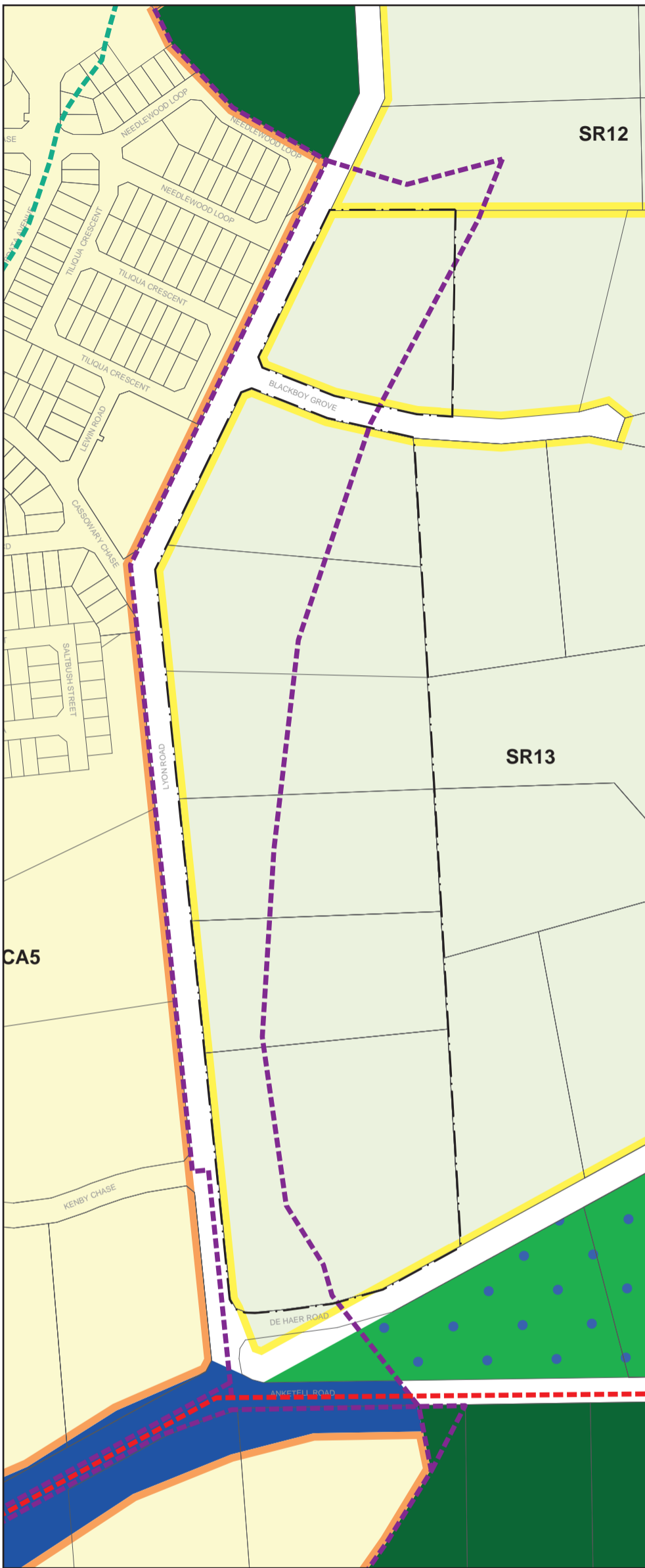
PROJECT:
LOTS 1, 7-11 & 88 LYON ROAD WANDI
 W.A.P.C. No. -

DRAWING:
SEWER RETICULATION LAYOUT PLAN
 CAD DRAWING DO NOT MANUALLY ALTER

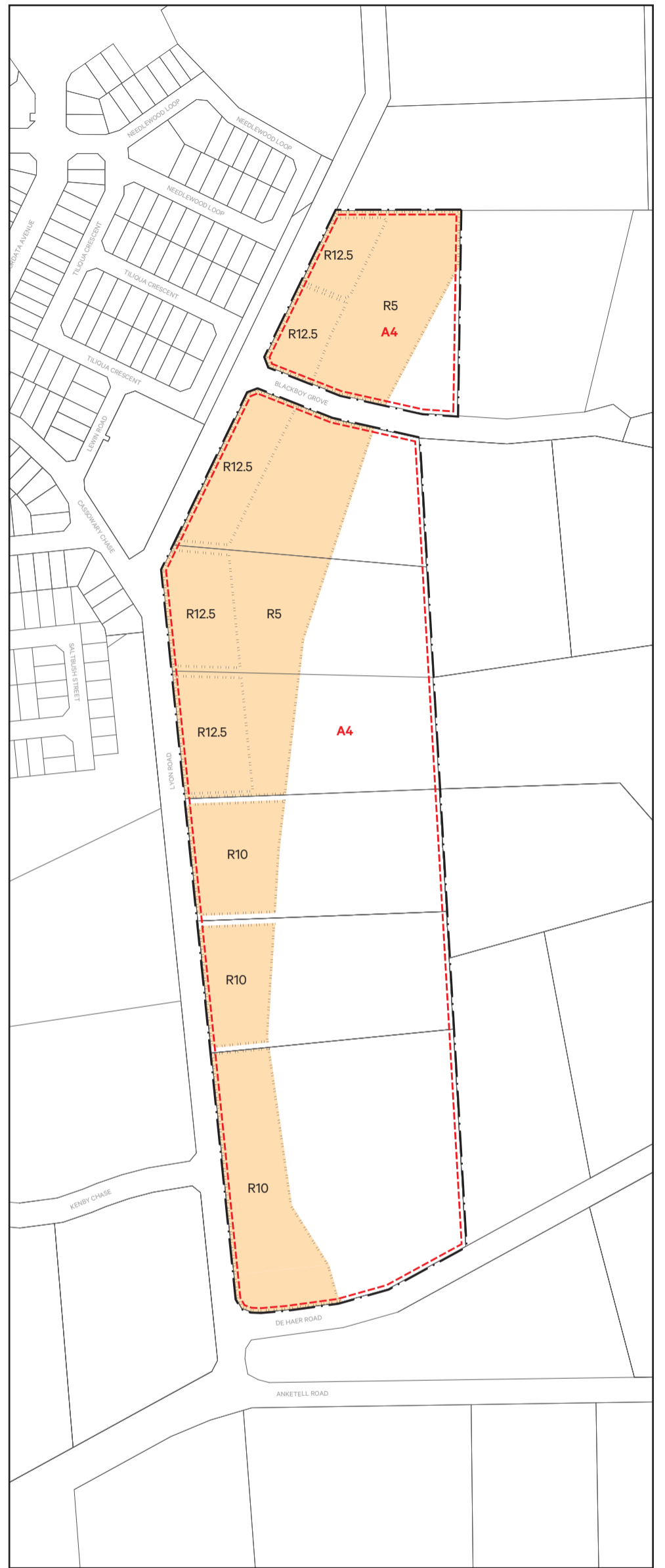
SCALE	DRAWN	CHECK	REV No.
1:2000	HJW	SRA	B
DATE	DESIGNED	APPROVED	
13/12/18	HJW	DNW	
PROJECT NUMBER		DRAWING NUMBER	
WDITER02 S01		WDITER02 S01	

Lots 7-11 & 88 Lyon Road, Wandri

City of Kwinana | Town Planning Scheme No. 2 – Local Scheme Amendment No.162



Existing Zoning



Proposed Zoning

LEGEND		Other	
MRS Reserves		R20 R Codes	
	Other Regional Road		SR1 Special Rural Area
	Parks and Recreation		DCA 1 Development Contributor
	Water Catchments		1 Policy Areas
MRS Zones			Area of Landscape Protection
	Development		No Zone
	Residential		A4 Additional Use
	Rural Water Resource		Amendment Area
	Special Rural		

PLANNING AND DEVELOPMENT ACT 2005



TOWN PLANNING SCHEME NO. 2
SCHEME AMENDMENT NO. ____

Planning and Development Act 2005
RESOLUTION TO AMEND LOCAL PLANNING SCHEME

City of Kwinana
District Town Planning Scheme No. 2
Amendment No. 162

Resolved that the Local Government pursuant to section 75 of the *Planning and Development Act 2005*, amend the above Local Planning Scheme by:

1. Rezoning a portion of Lots 1, 7 - 11 & 88 Lyon Road, Wandi from 'Special Rural' (SR13) to 'Residential' with densities R5, R10 and R12.5.
2. Insert into Schedule VII Additional Uses the following:

No.	Land Particulars	Base Zone	Permitted Uses	Development Standards/Conditions
4	Lots 1, 7 - 11 & 88 Lyon Road, Wandi	Residential Special Rural No. 13	For Residential zone as per Residential zone For Special Rural No.13 as per Schedule II for SP13 zone	<ol style="list-style-type: none"> 1. Existing development prior to gazettal of this amendment may continue to operate. 2. Any subdivision and/or development of land from the date of gazettal of this amendment shall be undertaken in a manner so as to prevent any new dwelling from being located or developed within the Rural Water Protection zone. 3. Replacement of the existing dwelling is discretionary subject to development approval being granted by the local authority. 4. For lots zoned Residential with a density code of R5, measures to be taken at subdivision and/or development approval stage to ensure any trees worthy of retention are adequately retained and incorporated into development. 5. No clearing of vegetation within the Rural Water Protection zone is permitted, except for the purpose of bushfire management, or with the approval of the local authority.

3. Amendment in the Scheme Map accordingly.

COUNCIL ADOPTION

This Complex Amendment was adopted by resolution of the Council of the City of Kwinana at the _____ Meeting of the Council held on the _____ day of _____, 20_____.

.....
MAYOR/SHIRE PRESIDENT

.....
CHIEF EXECUTIVE OFFICER

COUNCIL RESOLUTION TO ADVERTISE

By resolution of the Council of the City of Kwinana at the _____ Meeting of the Council held on the _____ day of _____, 20_____, proceed to advertise this Amendment.

.....
MAYOR/SHIRE PRESIDENT

.....
CHIEF EXECUTIVE OFFICER

COUNCIL RECOMMENDATION

This Amendment is recommended [for support/not to be supported] by resolution of the Council of the City of Kwinana at the _____ Meeting of the Council held on the _____ day of _____, 20_____ and the Common Seal of the City of Kwinana was hereunto affixed by the authority of a resolution of the Council in the presence of:

.....
MAYOR/SHIRE PRESIDENT

.....
CHIEF EXECUTIVE OFFICER

WAPC ENDORSEMENT (r.63)

.....
DELEGATED UNDER S.16 OF
THE P & D ACT 2005

DATE

APPROVAL GRANTED

.....
MINISTER FOR PLANNING

DATE

element.

the art and science of place

Level 18, 191 St Georges Tce, Perth WA 6000

T. (08) 9289 8300 – E. hello@elementwa.com.au

elementwa.com.au

DETAILED AREA PLAN (DAP) 2 - LOTS 155 - 160 LYON ROAD, WANDI



LOCAL LOCATION
SCALE 1: 8000

Unless otherwise defined below, all development shall be in accordance with the Town of Kwinana Town Planning Scheme No. 2, the Residential Design Codes, and the Wandri (north) Local Structure Plan.

Unless varied below, the R10 provisions of the Residential Design Codes apply to all Lots subject to this Detailed Area Plan.

Setbacks

- » Front - 10 metres
- » Rear - in accordance with the R20 provisions of the Residential Design Codes
- » Side - 1.5 metres

Building Envelopes

- » All buildings are to be contained within the building envelopes defined on the Detailed Area Plan, unless otherwise approved by Council.
- » A 1.5 metre building exclusion zone shall be applied from the 10 metre front setback line to ensure dwellings are adequately separated from the adjoining Revegetation/Landscape Protection Buffer. No development is to occur within this area with the exception of low intensity landscaping and/or pavement areas.

Landscaping

- » A 10 metre wide Revegetation/Landscape Protection Buffer is to be provided along Lyon Road, in accordance with the WAPC Subdivision Approval (I40239) Condition 35.
- » Rehabilitation of the Revegetation/Landscape Protection Buffer is to be in accordance with the approved Revegetation Plan, available from the Town of Kwinana.
- » The use of native waterwise planting should be maximised and should seamlessly link into verge plantings.
- » Where possible, informal paving materials (eg. gravel or crushed limestone) should be used instead of turf.
- » The use of turf/lawn within the Revegetation/Landscape Protection Buffer and 1.5 metre building exclusion zone is not permitted.
- » No indigenous trees, shrubs, or other substantial vegetation may be removed from the revegetation / landscape buffer area without the prior written approval of Council.

Solar Orientation

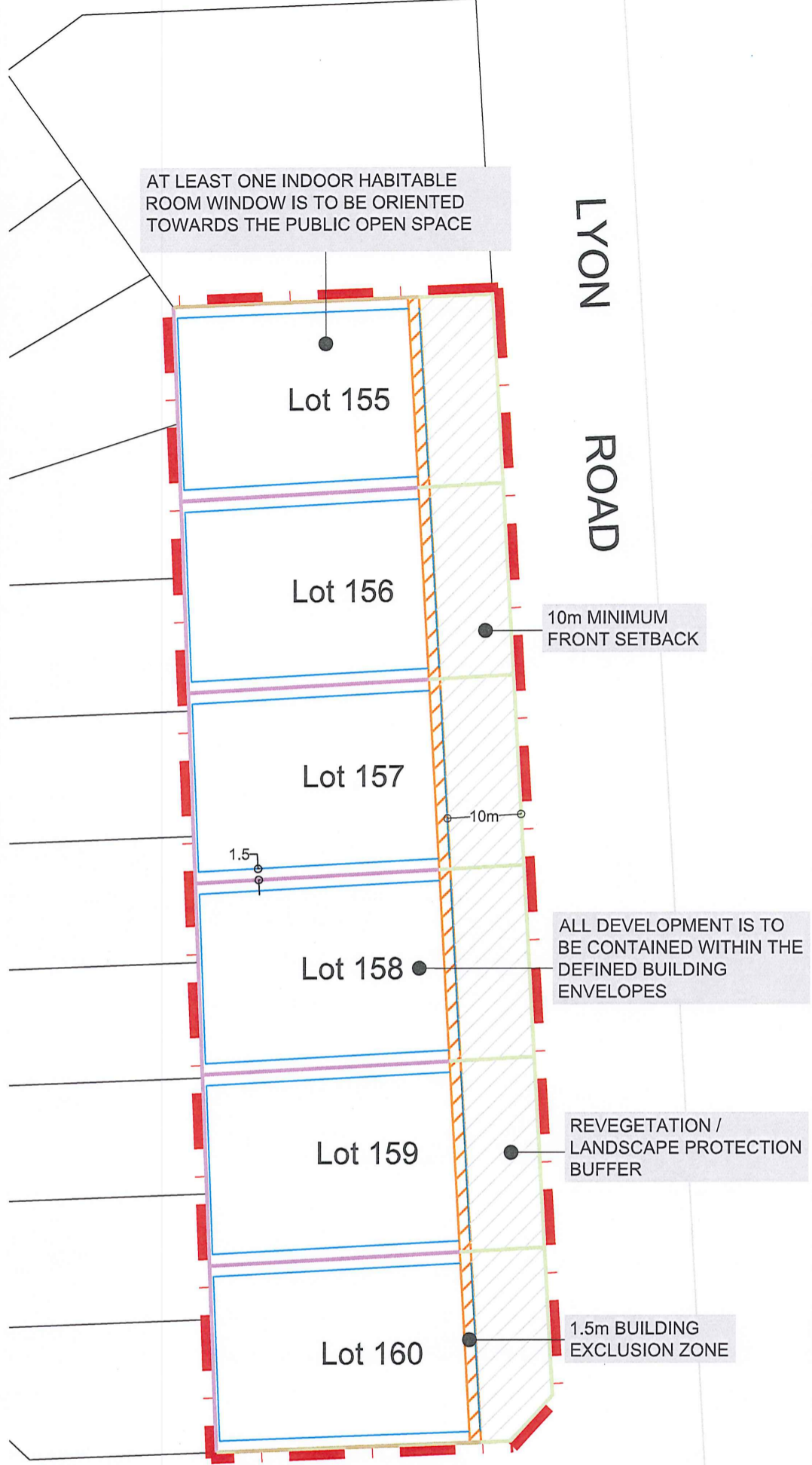
- » Dwelling design and orientation is to maximise opportunities for solar access and responsiveness to climatic conditions.
- » Outdoor living areas shall be positioned with a northern aspect to maximise opportunities for solar access.

Dwelling Orientation

- » Dwellings are to suitably address all street frontages and areas of public open space through the use of high quality architectural design features.
- » Lot 155 shall be designed to incorporate the outdoor living area and at least one window to a habitable room being oriented towards the the adjoining public open space to ensure the passive surveillance of this area is achieved.

Other

- » Maximum crossover width is to be 6 metres and located to minimise impacts on the revegetation / landscape buffer area.
- » Outbuildings are to be screened from view from the Primary Street and areas of public open space where they are not constructed of similar materials to the dwelling.
- » Outbuildings shall be constructed of materials and colours which are visually sympathetic to the main dwelling.
- » Fencing abutting Public Open Space shall be visually permeable above 1.2 metres.
- » All fencing within the front setback area shall be of a rural style and of an open nature in accordance with the rural fencing specifications of the Town of Kwinana Fencing Local Law.



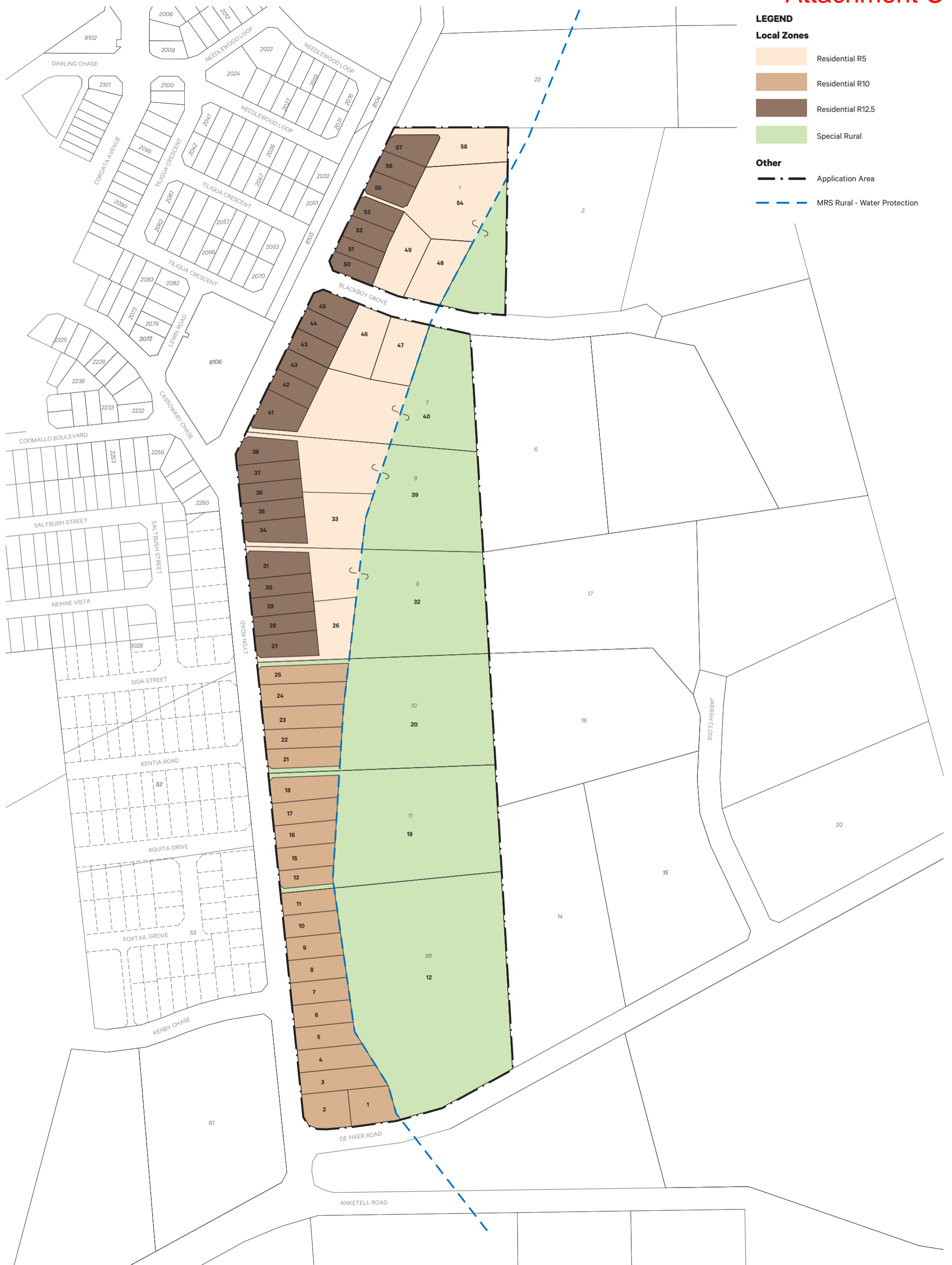
LEGEND

- SUBJECT SITE
- BUILDING ENVELOPE
- REVEGETATION / LANDSCAPE PROTECTION BUFFER
- 1.5 METRE BUILDING EXCLUSION ZONE
- RURAL STYLE FENCE
- ESTATE FENCE (COLOURBOND)
- ESTATE WALL / FENCE

This Detailed Area Plan has been approved by Council under the provisions of the Town of Kwinana Town Planning Scheme No. 2 and the Wandri (north) Local Structure Plan.

Principal Planner:

Date: 8/11/10



LEGEND

Local Zones

- Residential R5
- Residential R10
- Residential R12.5
- Special Rural

Other

- Application Area
- MRS Rural - Water Protection

Subdivision Guide Plan

Lyon Road, Wandoo

Date: 15 Jul 2020 Scale: 1:3000@ A3 File: 19-360 SU-1 A Staff: JP GW Checked: GW



element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
 PO Box 7375 Cloisters Square, Perth Western Australia 6850.
 T. +61 8 9289 8300 | E. hello@elementwa.com.au elementwa.com.au

17.4 City of Kwinana submission on draft Medium Density Code

DECLARATION OF INTEREST:

There were no declarations of interest declared.

SUMMARY:

State Planning Policy 7.3 Residential Design Codes (R-Codes) provides planning and design provisions for residential development across Western Australia. At present, there are two volumes of the R-Codes; one for apartments and one for Single Houses and Grouped Dwellings.

It has been recognised through the State Government's Action Plan for Planning Reform, that greater importance needs to be placed on well-designed residential development. Medium density is the dominant form of housing in the metropolitan region, and the current R-Codes are not delivering high quality, sustainable outcomes. As part of this reform program the draft new Medium Density Code has been released which provides provisions for Single Houses and Grouped Dwellings above R30 and Multiple Dwellings from R30 to R60.

This report seeks Council endorsement of a submission prepared by City officers (Attachment A). Overall, the proposed Medium Density Code is a positive step in improving the quality of dwellings for residents and the community they are being added to. The submission details the suggested areas of improvement and/or further investigation for the draft Codes before they are finalised.

OFFICER RECOMMENDATION:

That Council endorse the submission responding to the draft Medium Density Code as detailed in Attachment A.

DISCUSSION:

Current provisions

There are currently two volumes of the Residential Design Codes – one for Multiple Dwellings and the other for Grouped Dwellings and Single houses. It has been recognised through the State Governments Action Plan for Planning Reform, that there needs to be greater effort put into ensuring developments employ good design practices.

To achieve the government's infill housing targets, many suburbs are being re-zoned to R30 and above. This has resulted in significant development in established suburbs, with predominantly poor results as more dwellings are fit onto constrained sites. Additionally, in fringe areas like the City of Kwinana, newer suburbs may contain significant areas at R30 and above, placing them in the medium density bracket. In both infill or green field developments, there has been a significant loss of tree canopy and increase in the urban heat island effect as built form replaces significant trees, bushland and open gardens in suburbs. Medium density is currently characterised by roof's, concrete driveways and courtyards covered in patios.

17.4 CITY OF KWINANA SUBMISSION ON DRAFT MEDIUM DENSITY CODE

A study commissioned by the Department of Planning Lands and Heritage (DPLH), looked at the cost of a typical infill development on the community (see Figure 1 below). The cost of stormwater runoff, loss of private open space, loss of trees, active heating and cooling and social isolation, among other items, was estimated to be \$1460 per year, per dwelling to the community.



Figure 1 – Typical infill medium density development

Proposed codes

The Western Australian Planning Commission now proposes to break down the R-Codes further as follows:

- Volume 1
 - Low density code (Single houses and Grouped dwellings R2-R25 and Multiple dwellings R10-R45) – *no change as part of this consultation*
 - Medium density code (Single houses and Grouped dwellings R30 and above and Multiple dwellings R30-R60)
- Volume 2
 - Apartments (R80 and above) – *no change as part of this consultation*

The focus of this current consultation, is the Medium density code. Rather than being an amendment of the existing R-Codes, it is a new policy. It does draw on some existing provisions, but is predominantly a set of new and improved provisions that are seeking to increase the quality of built form. New elements previously not covered in the R-Codes for this density of development include, but are not limited to:

- Trees, deep soil area and landscaping
- Indoor amenity of primary living spaces
- Solar access and natural ventilation
- Waste management
- Universal design
- Housing on lots less than 100m²

For other provisions, changes or simplifications have been made to elements. These include:

- Three separate categories for site area calculations for each density code;
- Outbuildings (garden sheds) being permitted to have no setback to lot boundaries;
- Ancillary dwellings permitted to be on lots of any size, rather than being limited to 450m² and above;

17.4 CITY OF KWINANA SUBMISSION ON DRAFT MEDIUM DENSITY CODE

- Simplification of lot boundary setback calculations;
- Expansion of ways to achieve visual privacy on neighbouring lots;
- Maximum parking requirements, in addition to minimum's and
- Height limits on street fencing.

Officer comments

Overall, the intention to increase the baseline for medium density development is supported. There are too many examples of poor development and little the planning framework currently does to improve it for medium density.

The draft document does however require further refinement. Many of the clauses should result in a positive change, but there are some which may have unintended consequences. The following points cover the most significant changes, but it is noted that there are further comments elaborated in the City's proposed submission (Attachment A).

- The introduction of new categories for lot areas is a good idea in theory, as requires consideration of site characteristics to determine the number of dwellings permitted on a development site. For example, if a lot is on a corner and near a train station it may be able to accommodate more dwellings than a comparable sized lot not on a corner or near a train station. This could help increase diversity of dwelling types and sizes in our suburbs which is the key intention of the new Codes.

However, it will also result in a variety of lot and dwelling sizes within areas of the same zoning. The result being a significant change to suburbs without community consultation. In R30 zones for example, a Single house will have a deemed to comply average site area of 300m², 260m² or 220m² depending on which site category they are in. When local governments want to change the R-Code of a suburb, consultation is required with all affected landowners and occupiers and justification put to the WAPC through an amendment to a local planning scheme. This is not the case with these Codes.

The unpredictable nature of density could also impact on development contribution plans, making it more difficult to forecast dwelling yields and anticipate demand on infrastructure. This element needs to be reconsidered and investigated further, as there are likely to be unintended consequences for the community.

For Kwinana, this may impact sites within our existing commercially zones centres, such as the Kwinana City Centre, Medina and Bertram as well as sites within 800m of a train station (Wellard and Kwinana) and 250m of a high frequency bus route (portion of Gilmore Avenue in Medina/Orelia). The provisions, as written, could mean greater housing diversity and density in these locations than typically expected which whilst meeting the strategic intent of our draft Local Planning Strategy, would be occurring in the absence of precinct planning for each Activity Centre.

- The new Codes should deliver improved outcomes, but it should be recognised that it will be more work across all industries to implement the policy. Ongoing training and support should be provided by DPLH to ensure that there is consistent application of the policy across local government and industry. Given the increase in criteria within the Codes for all forms of development within these densities, timeframes for determination of applications are likely to increase.

17.4 CITY OF KWINANA SUBMISSION ON DRAFT MEDIUM DENSITY CODE

- The transitional provisions for local governments to update their local planning policies are clear and understood. However, the auditing and updating of policies will only go smoothly if staffed appropriately at the state government end. Additionally, with the number of policies for some local governments, the resources required will be significant so there will need to be some flexibility with timeframes. The City of Kwinana fortunately does not have a large number of residential policies in comparison with other local governments, however it will take a substantial amount of officer time to audit the policies and make recommendations to the Council for submission to the WAPC. Combined with a more complex new assessment required by the Codes, the resourcing of planning projects such as the development of a new Local Planning Scheme may be detrimentally impacted.
- Additional dwelling types have been included, which is a positive move to provide housing choice in medium density areas.
- The addition of deep soil areas, trees and usable outdoor space is strongly supported. These inclusions, if delivered well, are expected to have positive impacts on the amenity of dwellings for residents and reduce the negative impacts of new homes on the environment.
- The simplification of lot boundary setback provisions is welcomed, as is the introduction of nil setbacks for small garden sheds and patios. This will assist in reducing the number of development applications required for minor buildings.

CONCLUSION

Overall the development of a Medium Density Code is a positive move. It introduces a focus on quality, sustainable residential development, seeks to provide greater housing choice and improve streetscape and neighbourhood character. Newer structure planned areas such as Wellard Village (Figure 2 below) are generally characterised by smaller lots with limited to no green space. The Medium Density Code will introduce the requirement for onsite trees, deep soil planting areas for garden or lawn, consideration of practical items such as bin storage and natural ventilation and sunlight access to internal rooms. Overall, on individual development sites it should improve the quality of housing being delivered.



Figure 2 – Wellard Village R80 Single Houses

17.4 CITY OF KWINANA SUBMISSION ON DRAFT MEDIUM DENSITY CODE

There are some provisions which may need some refining to avoid unintended consequences as detailed in the submission. Requirements for proactive consideration of built form prior to subdivision design and even structure plan finalisation in our development zones such as Casuarina, Wellard, Anketell and Mandogalup will go a significant way to ensuring higher quality dwellings are built in these locations

LEGAL/POLICY IMPLICATIONS:

This report relates to a draft new volume of State Planning Policy 7.3 Residential Design Codes.

FINANCIAL/BUDGET IMPLICATIONS:

There are no direct financial implications arising from the preparation of the submission however should the Medium Density Code be adopted, additional officer time and training will need to be considered to ensure that statutory timeframes for decision making are adhered to.

ASSET MANAGEMENT IMPLICATIONS:

Nil

ENVIRONMENTAL/PUBLIC HEALTH IMPLICATIONS:

The proposal has the potential to help improve the following determinants of health -

- Built Environment – Sanitation; Environmental Quality; Neighbourhood Amenity;

STRATEGIC/SOCIAL IMPLICATIONS:

This proposal will support the achievement of the following outcome and objective detailed in the Strategic Community Plan and Corporate Business Plan.

Plan	Outcome	Objective
Strategic Community Plan	A well planned city	4.4 Create diverse places and spaces where people can enjoy a variety of lifestyles with high levels of amenity

COMMUNITY ENGAGEMENT:

This report relates to the City of Kwinana's response to a publically advertised document from the state government. The draft Codes are available for the public to also review and comment on.

There are no changes proposed to public advertising requirements.

17.4 CITY OF KWINANA SUBMISSION ON DRAFT MEDIUM DENSITY CODE**RISK IMPLICATIONS:**

The risk implications in relation to this proposal are as follows:

Risk Event	Failure to provide a response to DPLH may result in unwanted or unworkable deemed-to-comply provisions once adopted
Risk Theme	Failure to fulfil statutory regulations or compliance requirements
Risk Effect/Impact	Property
Risk Assessment Context	Operational
Consequence	Moderate
Likelihood	Possible
Rating (before treatment)	Moderate
Risk Treatment in place	Reduce - mitigate risk
Response to risk treatment required/in place	Prepare detailed submission for lodgement on behalf of the City.
Rating (after treatment)	Low

COUNCIL DECISION

399

MOVED CR S LEE**SECONDED CR M ROWSE**

That Council endorse the submission responding to the draft Medium Density Code as detailed in Attachment A.

**CARRIED
7/0**

Design WA
Department of Planning Lands and Heritage
140 William Street
PERTH WA 6000

Dear Sir/Madam

SUBMISSION: DRAFT MEDIUM DENSITY CODE

The introduction of the Medium Density Code is long overdue and the intent behind the document overall is supported. The Residential Design Codes currently encourage basic built form that has a focus on maximising dwellings on site, with little regard to existing site conditions. Medium density developments often significantly reduce the amount of canopy cover in our suburbs and are contributing to the urban heat island. The current exercise of planning reform that is attempting to improve living conditions for future residents and increase diversity in our suburbs is encouraging.

Notwithstanding the general position of support, there are elements of the draft Code that require refinement or reconsideration. Please see the following comments from the City of Kwinana in response to the draft Medium Density Code.

General comments

Method of assessment

- While a deemed to comply pathway is still retained, the criteria are more design based and complex. Single house exemptions will be more difficult to check, placing greater pressure on planning and building surveying teams, and increasing the detail required on plans at building permit stage.

- Tools and regular training should be provided for planners, designers and building surveyors to ensure consistent implementation of the new Medium Density Codes (MD Codes). The guidelines are useful, but not overly detailed.
- A testing report for designing buildings has been undertaken, but has an assessment test been undertaken by different planners from all sectors of the industry? This is recommended to see how consistently the provisions are applied.
- There may end up being more development applications (DA's) due to the more complex, and entirely new, provisions. It is anticipated that existing house designs from project home builders will not comply. Overall, this is not a negative as the document requires designers to consider site more carefully.
- The introduction of more diagrams, and placing them with the related provision, is supported. Diagrams are useful and helpful for when explaining what the provision means and reduces inconsistency between officers.
- Further emphasis is needed in the document to ensure that the onus is on the applicant to provide detail on the plans to demonstrate compliance. This will assist local governments in requesting information or denying lodgement without the required detail.
- There are references to Australian Standards and books that aid assessment that are not publically accessible. These documents, or relevant provisions need to be made available by the Western Australian Planning Commission (WAPC).
- Greater guidance and provisions are required to detail how additions and alterations are to be dealt with.

Local planning framework

- While it is supported that variations to the local planning framework should be reviewed and vetted for consistency by the WAPC, there should be some acknowledgement in the document, that recommendations by local governments should be given due regard in the final decision. Local planning policies go through consultation and Council consideration, meaning that the local community affected by the change has provided their input. This step is important and in keeping with the Medium Density Code intent that the framework should be highlighting local streetscape values and place based design considerations.
- The transitional arrangements proposed for local planning policies will only work if the Department of Planning Lands and Heritage resources the review of the

hundreds of LPP's and audits that are submitted by local government at the same time.

- The timeframes proposed for review and amendment to policies are short. Flexibility should be provided by the WAPC as lead in times for Council reports are usually around a month. Additionally, reviews of policies may also require advertising to the community.
- The ability for adopted structure plans and Local Development Plans (LDP) will continue to have effect until their expiry date is supported as the resources required to audit all structure plans and LDP's would be substantial.

Draft codes

1.0 - Land

- Site area
 - The new site categories for each R-Code is a good idea in theory as it looks to increase density in appropriate locations like in areas with dual street or laneway access.
 - The introduction of the three categories within each R-Code, means that there may be significant density increases without a zoning change in the local planning scheme. It is acknowledged there will be built form controls to reduce building bulk, however there are offsite impacts of density increases that should be considered such as the increase in traffic associated with the increase in households, further demands on public parking and community facilities.
 - The potential diversity of lot sizes under the same R-Code will mean it is difficult for residents to anticipate what their suburb may look like. When a local government undertakes this exercise, community consultation is required.
 - Site category 3, the category of greatest change, relies on being within a certain distance of high frequency bus or a train route. Train routes are far less likely to change, however bus routes and timetables change frequently. This can mean, that density is increased in an area that may lose a high frequency bus route to another road. It is suggested that site category 3 only apply to areas within 800m of a train station and perhaps main roads (i.e. primary distributors) that are less likely to be reclassified.

- The additional categories encourage amalgamation to achieve a minimum lot size. While a greater lot size makes sense as it provides more flexibility for home designers, in infill areas it is often difficult to get individual landowners to work together meaning we end up with the undesirable medium density outcomes that occur now.
- The testing report provided by DPLH concludes that many of the site categories and different housing typologies rely on underlying high land values to deliver the potential positive outcomes. Without this land value, only minor changes will occur in infill areas as the incentives are not worth it for developers to create bigger sites and change. This will cause issues further down the line as the opportunity for amalgamation of sites gets eroded by property owners proceeding with basic battle axe subdivisions for a quick win.
- Site area categories 2 and 3 should require a precinct plan or be in areas identified by local government through their local planning scheme, which is created after detailed studies and consultation.
- In site category 3, the inclusion of increased energy efficiency, universal design and higher than normal minimum ceiling heights is supported. The requirements should go further to ensure an overall community benefit given the potential impact of additional dwellings.
- Development Contribution Area's (DCA's) based on lot yield are calculated based on the R-Code applied at the time of the Structure Plan being adopted. The structure plan will include a dwelling yield calculation. The risk that this introduces is that, even if further analysis is undertaken as part of the lot yield for the structure plan, it cannot capture which site category will be used as that level of detail just isn't included. This will likely be dealt with, through local governments charging for the highest possible option. Administrative costs of DCA's will increase due to the amount of variance between estimates and actuals.
- The removal of a separate battle axe site area calculation is positive. This helps to ensure that the importance is placed on the effective lot area where a house is to be built rather than the driveway area.
- The requirement for a LDP (for site category 3), will only be of use if it is submitted with the subdivision application. This will help demonstrate that high quality built form can be delivered on the reduced lot sizes. When a

subdivision has been conditionally approved, there is less scope to negotiate subdivision design and compromised outcomes are generally proposed in LDP's.

- Including Activity Centres in the definition of Location A may need some further consideration. While on principle Activity Centres are a good location to increase density, smaller neighbourhood centres are not always well serviced by public transport and the incentive of increased residential development may come at the expense of land meant to be prioritised for commercial land uses. A precinct structure plan could be the solution for new centres or complete redevelopment of existing centres, however protection of established centres from a slow conversion to entirely residential needs to be considered.
- Dwelling types and diversity
 - No minimum site area for ancillary dwellings is supported. This will open up more site options and locations to help with diversifying housing options.
 - No longer having plot ratio for apartments yield is supported as it will result in less complications with calculating site area and allow for easy combination of dwelling type on the same parent lot.
 - Small dwellings provide more flexibility than the previous single bedroom dwelling by allowing more flexibility in layout and different living preferences. Transitional provisions should be provided for previously approved single bedroom dwellings, noting that most will have a restrictive covenant or notification on the title.
 - The lack of diversity in dwelling sizes is one of the biggest issues in medium density areas. For larger developments, for example over 10 dwellings, a mix in dwelling sizes should be required.
- There are limited provisions for subdivision design. As most green field development areas start with subdivision and not built form, this should be considered further. Additionally, there is a clear intent for applicants to consider built form outcomes before subdivision, but only in limited cases is this required (i.e. small dwellings). Otherwise, there are no provisions that mandate the consideration of built form during lot design. As mentioned above, concept plans or LDP's should be submitted

with subdivisions to ensure that higher quality built form outcomes can be achieved. Taking it a step earlier, concept plans for lot layouts, particularly in Location A areas should be submitted with Local Structure Plan's to demonstrate that high quality outcomes can be achieved.

2.0 The Garden

- Deep soil areas and trees
 - The introduction of a clear focus on deep soil areas, trees and usable outdoor space is supported.
 - The retention of significant, existing trees is welcomed. Having incentives proposed rather than mandated requirements is supported, however the difficulty will always be the ongoing retention of the tree and informing future residents that the tree must stay. Additionally, if keeping a tree is part of the proposed development, provisions should be included to require protection of the tree during construction as well as evidence that the tree will survive in its new environment (i.e. sufficient access for water, sunlight).
 - Design principles for deep soil areas are comprehensive.
 - The shift away from dedicated outdoor living areas, which are usually covered and paved, to a minimum amount of deep soil area is supported. This will have a positive impact on the amenity of the resident and locality, as well as broader environmental impacts.
 - The deemed to comply criteria for deep soil areas allows for minor intrusions of impervious surfaces (i.e. paving) into the compliant area. There seems to be a conflict with the definition of deep soil area however, as this states that impervious surfaces are not included.
 - The guidelines supporting the MD Code state – “where development approval is required, a landscaping plan should be included”. Shouldn't this also apply with building applications or deemed to comply checks if there are provisions they are supposed to be demonstrating compliance with?

- Primary garden area
 - More flexibility is needed in the provisions for the primary garden area to enable applicants to consider offsite impacts. Specifically, as exemptions from development approval are available for single houses, most applicants will

apply the deemed to comply requirement without further consideration. The requirement to place the primary garden area in the northern part of the site does not consider off site impacts like the existence of a commercial building, visual privacy impacts, shadow etc.

- The requirement to adhere to a northern orientation even if in the street setback is also unlikely to be followed through. Development plans will be prepared that show the primary garden area, but it will not get used or excessive fencing will be applied for to screen it from public view.

- **Balconies**

- The intent of visual privacy screening only being permitted for 75% of balcony is supported as there is currently nothing restricting a balcony being entirely screened. However for a studio with minimum balcony dimension of 2m, the occupant may only end up with 500mm not screened which is unlikely to have a significant positive effect on the occupant's access to sunlight and ventilation.
- The unscreened portion of a balcony will still need balustrading. Clarity is needed in the provisions about how this balcony can be treated and whether it can be any material other than clear glass.
- Having separate provisions for balconies is supported, noting that the deemed to comply criteria requires the designer to respond to the size of the dwelling and expected number of occupants.
- The note under relevant table for balcony sizes (4.6a) advises that it excludes service areas. There is a high likelihood of things like air conditioner condensers being added on at later stages. It may be better to require a slightly larger area of balcony that demonstrates an area for "services" to accommodate these, without necessarily requiring detailed plans. Provisions for treating and/or screening these items should also be included to protect amenity.
- The design principles prevent multiple dwellings from not having a balcony. Does this mean that the conversion of commercial and/or heritage buildings where that may not be possible will need to be refused? Another design principle should be included to ensure applicants can provide justification like access to a high quality communal area or public open space.

3.0 The building

- Bicycle parking
 - Why do we need bicycle parking spaces for single houses when there are significant storage areas, garages and outdoor space for this? Seems to be an unnecessary requirement.
 - Why do multiple dwellings only require 0.5 bicycle space per dwelling? Apartments generally have a smaller floor area and storage space, meaning there is less capacity to store a bicycle if there is insufficient bicycle racks. Particularly in Location A, we should be encouraging people to cycle around the centre and/or neighbourhood.

- Car parking
 - It is unclear why there are different parking requirements for carports and garages, specifically why there are no maximum's for carports when there are for garages.
 - The introduction of maximum parking is supported in Location A, however in Location B which is usually with minimal public transport, this may mean greater pressure on public parking areas.
 - The lack of minimum (and inclusion of maximum) parking needs to be investigated further. Not all Location A's are the same. Being close to a train station doesn't necessarily mean connectivity to the rest of their community, and car travel is often required. One suggestion would be to retain the requirement for minimum, as well as a maximum.
 - The lack of a requirement for electric vehicle charging is a missed opportunity.
 - The deemed to comply criteria allow for unlimited car bays in carports. Residents often want security for their vehicles to protect from a perceived or actual threat. There should be provisions for gates on carports to ensure the impact on streetscapes is minimised.
 - Why not allow tandem bays - get width of one from street but 2 spaces inside the garage.

- Waste management
 - There is no discernable difference between the deemed to comply and design principle criteria.

- Visual privacy
 - Highlight windows should be removed from deemed to comply as a solution to avoid overlooking. They often end up being the only solution in low cost developments and are a poor outcome when implemented in bulk.

- Internal amenity
 - The additional considerations like minimum room dimensions, solar access and ventilation are supported.
 - The requirement to have minimum window sizes for habitable rooms is another positive, so will not end up with tokenistic openings that meet deemed to comply but in reality provide little benefit.
 - Habitable rooms need to have operable windows, however there are many circumstances where this may conflict with noise provisions that require protection from nearby noise sources like rail, road or ports.
 - The focus and emphasis on appropriate storage spaces is supported. If storage is designed well, residents are more likely to accept a smaller living space (i.e. don't need the spare room for "stuff").

- Outbuildings
 - Permitting sheds on boundaries is supported. It will assist in exempting small garden sheds from needing development approval and ensure more efficient use of space in backyards.

- Universal and livable design
 - The introduction of universal design requirements is a positive move. However, grouped and multiple dwellings generally need development approval by nature of their use (not exempt like single houses), and there is therefore limited incentive to meet deemed to comply if there is an easier option. Many applicants may choose to apply the design principle instead which is not as onerous.
 - There is no definition of adaptable dwelling (referenced in design principle).
 - Developers may lodge smaller DA's or split sites to avoid having to apply livable housing design guidelines.

- Ancillary dwellings
 - It is questioned why Ancillary dwellings are still not permitted for grouped dwellings.
 - The introduction of dual key arrangements for multiple dwellings is supported.
 - A clarifying note needs to be included to confirm that the excluded deemed to comply criteria only apply to the Ancillary Dwelling and not the Single House .For example, while an Ancillary dwelling does not have to provide its own deep soil area,a development for a Single House still needs to demonstrate how it meets the criteria.

- Small dwellings
 - The introduction of a new housing form is a positive step for housing diversity and assists young and old people stay in areas that may not have had suitable alternatives in the past.
 - The minimum floor area of 70m² does not accommodate tiny houses, noting that the floor area restriction is also in the definition which cannot be varied. Tiny houses, especially those on trailers are unlikely to fit with any of the criteria in this code and should be considered further.

- Micro lots (100sqm)
 - Balconies can come right out to street front under deemed to comply criteria. There should be a restriction on side screening as this could impact on streetscapes which are otherwise required to be setback a couple of metres.
 - The restriction on fence height, which is less than other dwellings, could look odd in the streetscape as there are only two micro lots in a row required.

4.0 Neighbourliness

- Lot boundary setbacks
 - Significant improvements to the lot boundary setback provisions are supported.
 - The introduction of nil setbacks permitted for Patios or similar is supported.

- Site cover
 - The change in language from open space to site cover is supported. However there is no limit on unenclosed patios (currently 10% of site area) which should be reconsidered. It could end up with patios covering a large portion of backyard or carport covering all of front yard.
 - Given there are other provisions, such as setbacks and deep soil areas, is there any need to have site cover requirements at all?

- Building height
 - The inclusion of more clarifying diagrams is welcomed.
 - The removal of the reference to views of significance from the building height design principle is a positive move for consistency in assessment. Most design principles can be objectively reviewed by a planner- what view is significant is not so easily quantified, as what is significant to one isn't necessarily to another.
 - The introduction of skillion and other roof types to building height is supported. Applicants are currently disadvantaged for unique or more site responsive design as the deemed to comply criteria of the current codes are not inclusive.

- Street fencing
 - Introduction of maximum height for street fences and change to visually permeable requirements are supported.
 - The introduction of consideration for fences on corner sites is also supported.

- Solar access for adjoining sites
 - Further guidance is needed on how to assess the protection of solar collectors now that this is a design principle. The intent is supported.

- Visual privacy
 - Overall the new provisions are a positive approach, particularly as they have considered both green fill and infill situations. Substantial more effort will be required from applicants which is not a bad thing.
 - The design principles however, seem to focus on the existence of a dwelling next door. Does this mean that if the site is vacant, that protection of visual privacy will not be necessary?

Should you have any questions regarding this submission, please do not hesitate to contact Chloe Johnston, Coordinator Statutory Planning on 9439 0427.

Yours sincerely,

Paul Neilson

Manager Planning and Development

18 Reports – Civic Leadership

18.1 Proposed Disposition by way of sale of 1 and 3 Moombaki Avenue, Bertram also known as Lots 1 and 2 on Deposited Plan 73505P, City of Kwinana

DECLARATION OF INTEREST:

There were no declarations of interest declared.

SUMMARY:

The City acquired 1 and 3 Moombaki Avenue, Bertram (**the Lots**) for the purposes of a drainage realignment. At the completion of these works, City Officers recommended that we hold onto the properties until market conditions had improved. With the residential market now in recovery, City Officers see an opportunity to divest the properties.

It is proposed to engage a local real estate agent to sell the properties. The City has engaged a valuer to establish the valuation of the properties and will advertise the proposed sales in accordance with s.3.58(3)(a) of the *Local Government Act 1995 (the Act)*.

The proceeds of the sale are recommended to be put into a reserve and then reapplied with other proceeds of sales into purchasing strategic investment properties that will reduce our long term dependence on rate income.

OFFICER RECOMMENDATION:

That Council:

1. Approve the sale of Lot 1 and Lot 2 Moombaki Avenue, Bertram;
2. Authorise the CEO to consent to acceptable offers (being within 95% of the valuation price) and advertise proposed disposals of land as required by s.3.58(3);
3. Subject to no objections, authorise the CEO to execute the sale agreement;
4. Pursuant to s.6.1(1) of the *Local Government Act 1995*, establish the Strategic Property Reserve; and
5. Require the proceeds of the sale be placed in the Strategic Property Reserve.

DISCUSSION:

The land was transferred to the City at no cost to facilitate drainage upgrades in Bertram. At the conclusion of the process, the City retained the Lots, with the intention to sell them once market conditions had improved.

As vacant land, the property only offers a return to the City through capital growth that can only be realised at the time of sale. As an investment property, the City should instead be looking to invest in property that has capital growth as well as regular income through a lease.

18.1 PROPOSED DISPOSITION BY WAY OF SALE OF 1 AND 3 MOOMBAKI AVENUE, BERTRAM ALSO KNOWN AS LOTS 1 AND 2 ON DEPOSITED PLAN 73505P, CITY OF KWINANA

A valuation on the lots determined the market value to be as follows:

- As to Lot 1: \$265,000
- As to Lot 2: \$252,000

The City will look to appoint a real estate agent, to be determined based on sales costs, and take the property to market. The sale will be subject to the disposal being advertised in a local paper, as per the requirements of the Act.

The proceeds are recommended to be held in reserve for the express purpose of re-investing the money in further property. Reserve accounts allow the City to hold money that may not be used in the current financial year. As the City has no appropriate reserve, the resolution includes a clause to establish the Strategic Property Reserve, for the purposes of holding these funds.

LEGAL/POLICY IMPLICATIONS:

Section 3.58(3) of the *Local Government Act 1995 (the Act)* is applicable to the proposed disposition of the Lots and section 6.1(1) of the Act allows for Council to establish Reserves.

FINANCIAL/BUDGET IMPLICATIONS:

The City will receive an estimated \$517,000, less the sales fees, through the sale of the Lots.

ASSET MANAGEMENT IMPLICATIONS:

There are no asset management implications identified as a result of this report.

ENVIRONMENTAL IMPLICATIONS:

There are no environmental implications identified as a result of this report.

COMMUNITY ENGAGEMENT:

The City will publish a Notice in a local newspaper requesting public submissions either for or against the sale of the Lots.

PUBLIC HEALTH IMPLICATIONS

There are no implications on any determinants of health as a result of this report.

18.1 PROPOSED DISPOSITION BY WAY OF SALE OF 1 AND 3 MOOMBAKI AVENUE, BERTRAM ALSO KNOWN AS LOTS 1 AND 2 ON DEPOSITED PLAN 73505P, CITY OF KWINANA

RISK IMPLICATIONS:

The risk implications in relation to this proposal are as follows:

Risk Event	That Council does not authorise the proposed disposition by way of sale of 1 and 3 Moombaki Avenue, Bertram also known as Lots 1 and 2 on Deposited Plan 73505P, City of Kwinana.
Risk Theme	Ineffective management of facilities/venues/events
Risk Effect/Impact	Financial/Reputational
Risk Assessment Context	Operational
Consequence	Minor
Likelihood	Unlikely
Rating (before treatment)	Low
Risk Treatment in place	Avoid
Response to risk treatment required/in place	Authorise the CEO to consent to acceptable offers (being within 95% of the valuation price) and advertise proposed disposals of land as required by s.3.58(3);
Rating (after treatment)	Low

COUNCIL DECISION

400

MOVED CR P FEASEY

SECONDED CR W COOPER

That Council:

1. **Approve the sale of Lot 1 and Lot 2 Moombaki Avenue, Bertram;**
2. **Authorise the CEO to consent to acceptable offers (being within 95% of the valuation price) and advertise proposed disposals of land as required by s.3.58(3);**
3. **Subject to no objections, authorise the CEO to execute the sale agreement;**
4. **Pursuant to s.6.1(1) of the *Local Government Act 1995*, establish the Strategic Property Reserve; and**
5. **Require the proceeds of the sale be placed in the Strategic Property Reserve.**

CARRIED

7/0

19 Notices of motions of which previous notice has been given

Nil

20 Notices of motions for consideration at the following meeting if given during the meeting

Nil

21 Late and urgent Business

COUNCIL DECISION

401

MOVED CR D WOOD

SECONDED CR S LEE

That Council deal with the item of urgent business as presented in the Addendum to the Agenda.

CARRIED
7/0

21.1 Donation to the Lord Mayor's Distress Relief Fund - Tropical Cyclone Seroja Appeal 2021

DECLARATION OF INTEREST:

There were no declarations of interest declared.

SUMMARY:

The Lord Mayor's Distress Relief Fund (LMDRF) was established in 1961, in conjunction with the State Government to provide financial assistance to individuals for the alleviation and relief of distress, suffering and personal hardships, brought about by any disaster or emergency within Western Australia declared by the Western Australian Government or for which the LMDRF Board considers assistance is warranted.

Tropical Cyclone Seroja crossed the coast of Western Australia just south of Kalbarri on Sunday 11 April 2021 leaving a trail of damage and destruction and power outages throughout the Mid West region. Residents of Kalbarri saw seventy per cent of their town damaged/destroyed, experiencing wind gusts of up to 170km/h. Many smaller towns throughout the Mid West, including Northampton have also been severely damaged, with electricity supplies disrupted for days, leaving 20,000 residents without power.

An appeal for victims of the cyclone has been launched and City Officers recommend a donation to the LMDRF be made towards the disaster relief effort underway.

As a result of the donation a budget variation is required to the City's current 2020/2021 Budget to transfer the required funds from the Community Services and Emergency Relief Reserve.

OFFICER RECOMMENDATION:

That Council:

1. Approves a donation of \$5,000 to the Tropical Cyclone Seroja Appeal 2021 through the Lord Mayor's Distress Relief Fund (LMDRF) to assist the residents affected by the damage and destruction caused by Tropical Cyclone Seroja.

21.1 DONATION TO THE LORD MAYOR'S DISTRESS RELIEF FUND - TROPICAL CYCLONE SEROJA APPEAL 2021

2. Approves the required budget variations to the Current Budget for 2020/2021 as follows:

ITEM #	DESCRIPTION	CURRENT BUDGET	INCREASE/ DECREASE	REVISED BUDGET
1	Operating Expense – Other Welfare – Sundry Donations	(5,000)	(5,000)	(10,000)
	Reserve Transfer - Community Services & Emergency Relief Reserve	94,452	5,000	89,452

A variation to the budget is required to transfer the required funds from the Community Services and Emergency Relief Reserve to make this donation.

NOTE: AN ABSOLUTE MAJORITY OF COUNCIL IS REQUIRED

DISCUSSION:

The appeal has been set up through the LMDRF, this fund provides relief for personal hardship and distress arising from natural disasters occurring within Western Australia and has been activated on this occasion to coordinate donations to support those affected by the damage and destruction caused by the cyclone.

This extreme weather event has caused massive devastation with residents being evacuated, it has left thousands of homes and businesses without power, and many homes and businesses damaged or destroyed.

It is recommended that the City donates \$5,000 towards the Tropical Cyclone Seroja Appeal 2021 through the Lord Mayor's Distress Relief Fund.

LEGAL/POLICY IMPLICATIONS:

City of Kwinana Community Funding Policy

- 5.2.3 *Emergency Relief Reserve Fund*
Council by resolution may consider making a donation to disaster relief appeals upon being given approval by the Ministerial body at the time. Such donations are to be drawn from the Emergency Relief Reserve Fund.

The Local Government Act 1995

Part 6 Division 4 s 6.8 (1) requires the local government not to incur expenditure from its municipal fund for an additional purpose except where the expenditure-

- (b) is authorised in advance by resolution**

"additional purpose" means a purpose for which no expenditure estimate is included in the local government's annual budget.

**requires an absolute majority of Council.*

21.1 DONATION TO THE LORD MAYOR'S DISTRESS RELIEF FUND - TROPICAL CYCLONE SEROJA APPEAL 2021**FINANCIAL/BUDGET IMPLICATIONS:**

The Council donation of \$5,000 to the Tropical Cyclone Seroja Appeal 2021 through the Lord Mayor's Distress Relief Fund (LMDRF) is proposed to be funded from the Community Services and Emergency Relief Reserve. A Budget Variation is required to transfer the required funds from Community Services and Emergency Relief Reserve to make this donation.

ASSET MANAGEMENT IMPLICATIONS:

No asset management implications have been identified as a result of this report or recommendation.

ENVIRONMENTAL IMPLICATIONS:

No environmental implications have been identified as a result of this report or recommendation.

STRATEGIC/SOCIAL IMPLICATIONS:

There are no strategic/social implications as a result of this proposal.

COMMUNITY ENGAGEMENT:

There are no community engagement implications as a result of this report.

PUBLIC HEALTH IMPLICATIONS:

The recommendation has the potential to assist with the recovery effort of those affected individuals and communities in the cyclone affected areas.

RISK IMPLICATIONS:

The risk implications in relation to this proposal are as follows:

Risk Event	The City is not seen as assisting with the disaster relief effort.
Risk Theme	Inadequate engagement practices
Risk Effect/Impact	Reputation
Risk Assessment Context	Operational
Consequence	Minor

21.1 DONATION TO THE LORD MAYOR'S DISTRESS RELIEF FUND - TROPICAL CYCLONE SEROJA APPEAL 2021

Likelihood	Unlikely
Rating (before treatment)	Low
Risk Treatment in place	Avoid - remove cause of risk
Response to risk treatment required/in place	Donate to the Lord Mayor's Distress Relief Fund.
Rating (after treatment)	Low

Risk Event	The City does not manage its finances adequately and allows budget expenditure to exceed allocation and the City then finds itself unable to fund its services that have been approved through the budget process
Risk Theme	Failure to fulfil statutory regulations or compliance Providing inaccurate advice/information
Risk Effect/Impact	Financial Reputation Compliance
Risk Assessment Context	Operational
Consequence	Major
Likelihood	Rare
Rating (before treatment)	Low
Risk Treatment in place	Reduce (mitigate risk)
Response to risk treatment required/in place	Submit budget variation requests to Council as they arise, identifying financial implications and ensuring there is nil effect on the budget adopted
Rating (after treatment)	Low

COUNCIL DECISION

402

MOVED CR D WOOD**SECONDED CR P FEASEY****That Council:**

- Approves a donation of \$5,000 to the Tropical Cyclone Seroja Appeal 2021 through the Lord Mayor's Distress Relief Fund (LMDRF) to assist the residents affected by the damage and destruction caused by Tropical Cyclone Seroja.**
- Approves the required budget variations to the Current Budget for 2020/2021 as follows:**

ITEM #	DESCRIPTION	CURRENT BUDGET	INCREASE/ DECREASE	REVISED BUDGET
1	Operating Expense – Other Welfare – Sundry Donations	(5,000)	(5,000)	(10,000)

21.1 DONATION TO THE LORD MAYOR'S DISTRESS RELIEF FUND - TROPICAL CYCLONE SEROJA APPEAL 2021

Reserve Transfer - Community Services & Emergency Relief Reserve	94,452	5,000	89,452
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A variation to the budget is required to transfer the required funds from the Community Services and Emergency Relief Reserve to make this donation.

CARRIED BY AN ABSOLUTE MAJORITY OF COUNCIL

7/0

22 Reports of Elected Members

22.1 Councillor Wendy Cooper

Councillor Wendy Cooper reported that it had been interesting to share time with many representatives of community groups at the Social Strategy Focus Group gathering. Councillor Cooper stated that she personally learned more about some of the community assistance schemes that are available to the City's residents and the important needs of such groups.

Councillor Cooper advised that she had attended the City of Kwinana Emergency Services Civic Event, which is always a pleasant way to acknowledge the valuable contribution made by this group in keeping us safe.

Councillor Cooper mentioned that several communities were providing celebrations for Neighbourhood Day and she had the pleasure of attending functions at Casuarina, Medina, Sloan's Cottage and Wandi, which is always a delightful way to share time with residents.

Councillor Cooper reported that she had attended a City of Kwinana Citizenship Ceremony and stated that it had a wider variety of nationalities represented than usual.

Councillor Cooper advised that she had attended the City of Kwinana Mayor's Easter Staff Functions, Councillor Cooper explained that they are always an opportunity to thank, in person, many of the staff that have completed tasks for the City throughout the year, especially the depot team who seem hidden away most of the time and often have the less pleasant tasks to undertake.

Councillor Cooper mentioned that commercial entities were able to apply for funding to support their business and it was the task of the Commercial Support Grant Panel to select appropriate applications for such funding.

Councillor Cooper reported that on the first anniversary of his appointment, the Executive Appraisal Committee met to begin the annual process of evaluation of the Chief Executive Officer (CEO).

22.2 Councillor Sandra Lee

Councillor Sandra Lee reported that she had attended the Signing of the Memorandum of Understanding (MOU) with the City of Kwinana and the Lions Club for Rhodes Park. Councillor Lee explained that it is hoped that tables and chairs, along with sensory equipment will be installed at Rhodes Park for the benefit of our community.

Councillor Lee advised that she had attended the Neighbourhood Day Events, A Thank you for the Casuarina Bushfires, the Wandi Progress Association and the Medina Residents, held at the Ridley Green area.

Councillor Lee mentioned that she had attended the City of Kwinana Citizenship Ceremony held at Medina Hall, where 39 people became Australian Citizens from 17 different countries. Councillor Lee stated that Kwinana is truly a multi-cultural community.

Councillor Lee reported that she had attended the City of Kwinana Mayor's Easter Morning Tea.

22 REPORTS OF ELECTED MEMBERS

Councillor Lee advised that she had attended the City of Kwinana Emergency Services Civic Event.

22.3 Councillor Dennis Wood

Councillor Dennis Wood reported that he had attended the Signing of the MOU with the City of Kwinana and the Lions Club for Rhodes Park. Councillor Wood mentioned it had been a good time and great to see recognition of the Lions Club.

23 Answers to questions which were taken on notice

Nil

24 Mayoral Announcements

Mayor Carol Adams reported that she had attended the Gilmore College School Board Meeting.

The Mayor advised that she had attended the City of Kwinana Emergency Services Civic Event, where the City acknowledged the valuable contribution provided to our community by our emergency service volunteers.

The Mayor mentioned that she had participated in the signing of the Memorandum of Understanding between the City of Kwinana and Lions Club of Kwinana – for the improvements and maintenance of Rhodes Park, Calista.

The Mayor reported that she had attended the WA Defence Review Corporate Luncheon – Discussion held on Future of the Western Trade Coast.

The Mayor advised that she had attended the Neighbourhood Day Events at Casuarina, Wandi Progress Association, Medina Residents Group and Sloan's Cottage.

The Mayor mentioned that she had attended the Boola Mara Many Hands Advisory Group Meeting.

The Mayor reported that she had attended the City of Kwinana Audit and Risk Committee Briefing Session.

The Mayor advised that she had attended the Keys Board Meeting.

The Mayor mentioned that she had attended the City of Kwinana Citizenship Ceremony where the City welcomed 39 new Australians.

The Mayor reported that she had attended a meeting with representatives of the Southern Districts BMX Club.

The Mayor advised that she had attended the Special Council Meeting where council resolved to support the City's draft Integrated Planning Documents – Major Strategic Community Plan Review.

24 MAYORAL ANNOUNCEMENTS

The Mayor mentioned that as patron of the Kwinana Swimming Club, she had been invited to the team jumper presentation for three swimmers who have qualified for the National Championship to be held in Queensland.

The Mayor reported that she had attended the State Council Post State Election Forum.

The Mayor advised that she had attended the 40th Anniversary of the Chevrolet Club of WA Inc. hosted by Ridley's GM Museum in Bertram.

The Mayor mentioned that she had attended the quarterly meeting with Mandurah District Police Superintendent, John Leembrugen. The Mayor announced that the new Officer in Charge of the Kwinana Police Station is Senior Sergeant Andrea Smith, whom is warmly welcomed to the City.

The Mayor advised that she had attended the City of Kwinana Mayor's Easter Staff Functions and that it was great to be able to thank all of the City staff for their contributions and the important first quarter for the City.

25 Confidential items

Nil

26 Close of meeting

The Mayor declared the meeting closed at 5:50pm.