



Central Coast Council

Central Coast Council
Planning Proposal
44W, 50W & 60 Parraweena Road
Gwandalan

RZ/2/2015;
October 2019



File No: RZ/2/2015;

Date: 17 October 2019

Central Coast Council

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Introduction & Locality Context	4
Part 1 Objectives or Intended Outcomes	4
Part 2 Explanation of Provisions	4
Part 3 Justification	6
Section A – Need for the Planning Proposal	6
Section B – Relationship to strategic planning framework	6
Section C – Environmental, Social and Economic Impact	14
Section D – State and Commonwealth Interests	14
Part 4 Mapping	16
Part 5 Community Consultation	16
Part 6 Project Timeline	16
Supporting Documentation	17
On-Line Reference Documents	18

Introduction & Locality Context

The site is located on the north-eastern corner of the intersection of Kanangra Drive and Summerland Road Gwandalan. All traffic entering Gwandalan and Summerland Point is distributed from this intersection. The site is approximately 1 km from the existing Gwandalan neighbourhood centre and approximately 2 km from the Summerland Point neighbourhood centre.

The site is currently vacant and contains some remnant native vegetation. The site slopes from west to east with the head of a drainage line apparent to the south-east. The site consists of mainly open woodland with scattered trees and a generally cleared understorey. The vegetation on the site is generally degraded due to previous industrial use and unauthorised recreational use.

The proposal predominately relates to Lot 20 DP 1089946 which is approximately 4.7 Ha in size. The proposal also includes Council owned land comprising part Lot 1 DP 1043151 currently zoned RE1 Public Recreation with an area of 4715 m².



Figure 1 Locality Plan

Part 1 Objectives or Intended Outcomes

To enable the development of vacant land at 50W & 60 Parraweena Road Gwandalan, for a mix of commercial and residential development.

Part 2 Explanation of Provisions

The subject site is currently zoned IN2 Light Industrial and RE1 Public Recreation, as shown in Figure 2 below:

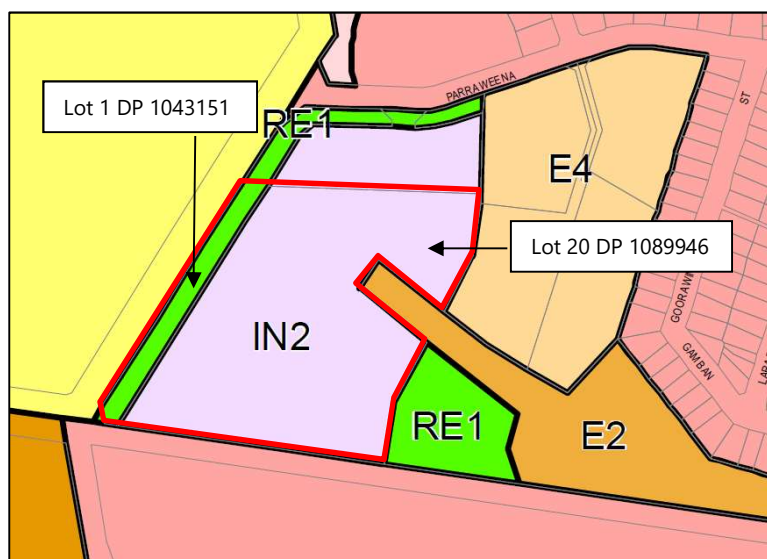


Figure 2– Current Zoning

The outcome will be facilitated by an amendment to Wyong Local Environmental Plan 2013 which involves the following:

- Rezoning part Lot 1 DP 1043151 from RE1 Public Recreation to B2 Local Centre
- Rezoning Lot 20 DP 1089946 from IN2 Light Industrial to R2 Low Density Residential, R1 General Residential and B2 Local Centre

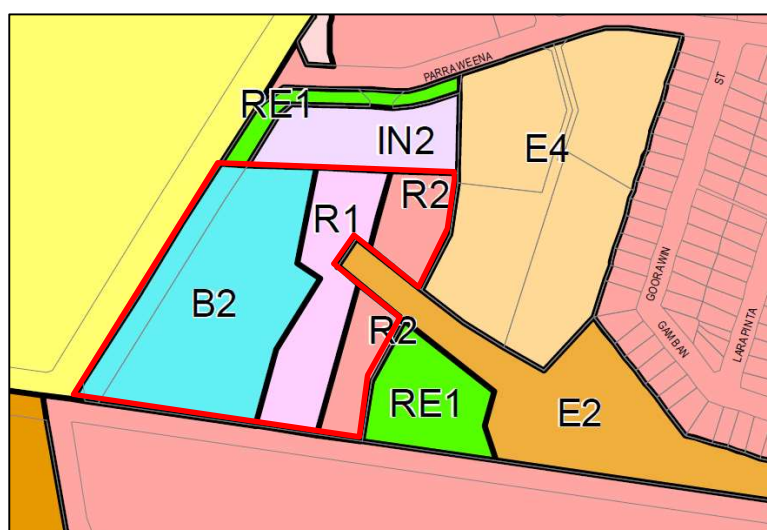


Figure 3 – Proposed Zoning

The outcome will be facilitated by an amendment to Wyong Local Environmental Plan (LEP) 2013. The following table identifies the proposed amendments:

Existing Provision				Proposed Amendment			
Land	Zoning	Map	8550_COM_LZN_017_020_20150216	Land	Zoning	Map	8550_COM_LZN_017_020_20150901
Lot Size Map 8550_COM_LSZ_017_020_20131219				Lot Size Map 8550_COM_LSZ_017_020_20150901			

Table 1 – Explanation of Map and Instrument Amendments

The reclassification of part Lot 1 DP 1043151 (Council owned land) is to be made by a local environmental plan at a later stage under a separate LEP amendment. The planning proposal may also amend the draft Central Coast Local Environmental Plan (however, this is subject to timing).

Part 3 Justification

Section A – Need for the Planning Proposal

1. **Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?**

The site is identified as a 'potential new centre' under the North Wyong Shire Structure Plan 2012 (NWSSP) (Appendix 01). The consideration of the NWSSP is further discussed under Section B below.

The Gwandalan Residential Development, Concept Plan MP10_0084 Director-General's Environmental Assessment Report (May 2012 p. 17) (Appendix 01) supported the rezoning of land to permit residential development directly to the south of the site. In considering this application the Department of Planning and Environment (DP&E) removed a proposed commercial centre on this adjoining site considering it "inconsistent with the draft North Wyong Shire Structure Plan" which identifies "the potential new centre, to the north of the subject site",

Wyong Shire Retail Centres Strategy (2013 Section 3.8 Demand Assessment p.8) (Appendix 01) states the following with regard to the Gwandalan/Summerland Point area:

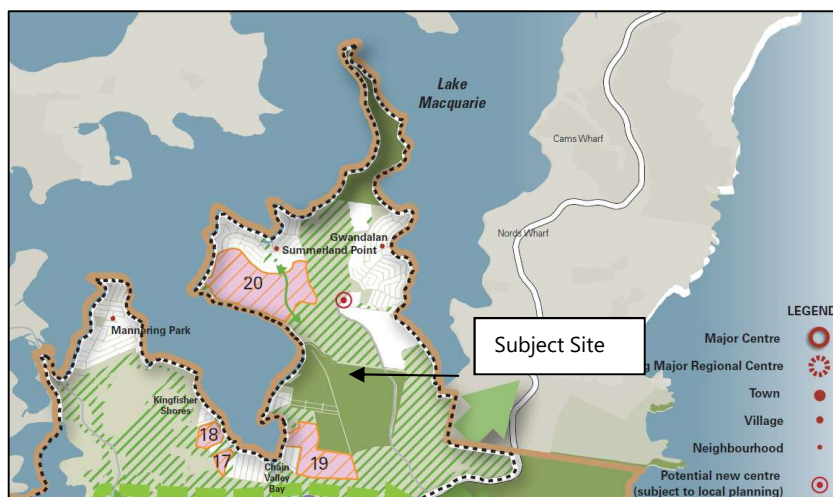
The *North Wyong Shire Structure Plan* includes the provision of a new centre at Gwandalan. It is likely that a neighbourhood centre to supplement the existing centres in Gwandalan and Summerland Point and the new centre at Lake Munmorah may be supportable in the future.

2. **Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?**

The majority of the subject site is currently zoned for industrial use. A change to the zoning and related controls is the appropriate way to permit development of the site for commercial and residential use.

Section B – Relationship to strategic planning framework

3. **Will the planning proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?**



North Wyong Shire Structure Plan

The site is identified as a 'potential new centre' under the North Wyong Shire Structure Plan 2012 (NWSSP) (see figure 2). The NWSSP identifies a new Centre at Gwandalan as providing employment opportunities and the potential for a variety of housing near this centre. The NWSSP also identifies significant potential residential land releases in the area in the long term.

Figure 3 - Extract from the North Wyong Shire Structure Plan

Central Coast Regional Plan

The Central Coast Regional Plan 2036 (CCRP) provides an overarching framework that guides the preparation of detailed land use plans, the determination of development proposals and informs infrastructure funding decisions. Table 1 below identifies the actions under the CCRP that are relevant to this proposal. The proposal is consistent with all the relevant actions identified under the CCRP.

Action	Consistency
3.1 Promote growth and renewal in centres by providing planning controls that create the right conditions for this to occur	The North Wyong Shire Structure Plan identifies the site as a potential new centre. The planning proposal facilitates the introduction of planning controls that support the growth of this identified centre.
5.1 Maintain an adequate supply of employment land that is appropriately service to respond to changing land use location and the floor space demand of industry	<p>The proposal will result in a reduction in available industrial land but will still provide for employment through the commercial zoning.</p> <p>The proposal responds to the identification of more suitable near-by employment land under the NWSSP.</p>
5.4 Protect employment land in suburbs across the region to provide local services and employment.	The proposal responds to the identification of more suitable near-by employment land under the NWSSP and provides for local employment through the commercial zoning.
7.1 Facilitate economic development that will lead to more local employment opportunities on the Central Coast	The proposal provides for local employment through proposed commercial development.
<p>10.1 Plan for the ongoing productive use of lands with regionally significant construction material resources in locations with established infrastructure and resource accessibility.</p> <p>10.2 Ensure that longer term extractive resources are not sterilised and minimise impacts on communities and the environment.</p> <p>10.3 Ensure development in the north of the region takes account of the extraction of coal, clay and gravel resources.</p>	<p>NSW Department of Industry – Resources and Energy raised no objection to the proposal but noted that, “the site is situated within the Swansea North Entrance Mine Subsidence District and any residential or commercial development within the site will need to comply with building guidelines stipulated by the Mine Subsidence Board”.</p> <p>The Mines Subsidence Board raised no objection to the rezoning proposal but advised that any future subdivision or development would need to seek the Board’s approval where required.</p>
<p>15.1 Create a well-planned, functional and compact settlement pattern around existing urban and employment areas, the Warnervale-Wadalba release area, the Northern and Southern Growth Corridors, existing rural villages and sites included in an endorsed local strategy.</p> <p>15.2 Ensure the settlement pattern responds to settlement planning principles and does not encroach on sensitive land uses</p>	The proposed centre is in a location identified in the North Wyong Shire Structure Plan.

15.3 Plan for communities to be better connected by an integrated transport system that prioritises safe walking, cycling and public transport.	The development of the centre will create a public transport destination and provide for increased housing densities near public transport links.
15.4 Investigate options to improve public transport services and better link centres, corridors and growth areas.	
16.1 Improve access to and through centres to support and encourage redevelopment	The proposal will improve access to the site through the formalisation of Summerland Road.
16.2 Enhance the network of centres by encouraging business and infrastructure investment in centres and planning for attractive mixed use places that respond to the character and role of the centre	A preliminary design has been provided for the proposal that demonstrates the possibility for the development of a small mixed-use precinct to be developed on the site.
16.3 Protect the function of centres and ensure local environmental plans include appropriate controls to limit retail activity outside planned centres.	The proposed centre is in a location identified in the North Wyong Shire Structure Plan.
17.1 Align land use and infrastructure planning to maximise the use and capacity of existing infrastructure, and the efficiency of new infrastructure.	Assessment indicates that the site can be serviced.
19.1 Release land for housing and employment in the North Wyong Shire Structure Plan area to align with the delivery of local and State infrastructure	The planning proposal encourages the release of land for housing and employment
19.3 Monitor land and housing delivery and accelerate housing supply to meet projected housing demand of 41,500 additional dwellings by 2036	The planning proposal will assist in the acceleration of housing supply to meet projected housing demand.
20.1 Improve housing choice by supporting housing delivery in and near the growth corridors and local centres.	The proposal provides for housing as part of a new centre and provides a new centre near a large land release area.
21.1 Provide greater housing choice by delivering diverse housing, lot types and sizes, including small-lot housing in infill and greenfield housing locations	The development concept encourages a diversity of lot sizes ranging from 250m ² to 450m ² .
21.4 Encourage housing diversity including studio, and one and two-bedroom dwellings, to match forecast changes in household sizes and provide greater housing choice	The proposal provides for a mix of R1 and R2 residential land which can provide for a variety of housing development types in response to market forces.

Table 2 – Relevant actions from the CCRP

4. Will the planning proposal give effect to a council's endorsed local strategic planning statement, or another endorsed local strategy or strategic plan?

Council will have its Local Strategic Planning Statement in place by 1 July 2020; this will supersede the Wyong Shire Settlement Strategy.

Wyong Settlement Strategy

The *Wyong Shire Settlement Strategy* (2013 p30) requires the undertaking of the following action





Identify an appropriate location for the development or expansion of a Town Centre within the NWSSP Area. Potential locations include the expansion of Summerland Point or Gwandalan Neighbourhood Centres.

The existing centres are physically constrained and unlikely to be appropriate for further expansion. The Wyong Shire Retail Centres Strategy states the following with regard to the Gwandalan/Summerland Point area:

The *North Wyong Shire Structure Plan* includes the provision of a new centre at Gwandalan. It is likely that a neighbourhood centre to supplement the existing centres in Gwandalan and Summerland Point and the new centre at Lake Munmorah may be supportable in the future.

'One Central Coast' Community Strategic Plan

One Central Coast Community Strategic Plan (CSP) identifies the ten year community vision for the Central Coast Region. The CSP themes are each supported by a range of objectives, with the relevant objectives identified in the table below. The proposal is considered to give effect to the objectives of the CSP in particular objectives B4, I4, C1, and C3.

Theme		Objectives	Comment
BELONGING		OUR COMMUNITY SPIRIT IS OUR STRENGTH	B4 Activate spaces and places to complement activity around town centres, foreshores, lakes and green spaces for families, community and visitors.
RESPONSIBLE		BALANCED AND SUSTAINABLE DEVELOPMENT	I2 Ensure all new developments are well planned with good access to public transport, green space and community facilities and support active transport I4 Provide a range of housing options to meet the diverse and changing needs of the community including adequate affordable housing.
SMART		A GROWING AND COMPETITIVE REGION	C3 Facilitate economic development to increase local employment opportunities and provide a range of jobs for all residents.
LIVEABLE		HEALTHY LIFESTYLES FOR A GROWING COMMUNITY	L4 Provide equitable, affordable, flexible and co-located community facilities based on community needs.

It is considered that the proposal gives effect to Council's endorsed local strategies and plans.

5. *Is the planning proposal consistent with applicable State Environmental Planning Policies?*

The proposal has been considered against the relevant State Environmental Planning Policies (SEPP) as detailed below.

State Environmental Planning Policy	Comment
SEPP No. 44 – Koala Habitat	
<p>Aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline:</p> <p>(a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and</p> <p>(b) by encouraging the identification of areas of core koala habitat, and</p> <p>(c) by encouraging the inclusion of areas of core koala habitat in environment protection zones</p>	<p>The site is sparsely vegetated and the majority of the site is degraded.</p> <p>The Ecological Assessment Report indicates that all field surveys conducted to date have not revealed any signs of Koalas or Koala activity and is not considered to be Core Koala Habitat.</p>
SEPP 55 – Remediation of Land	
<p>Aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment</p> <p>(a) by specifying when consent is required, and when it is not required, for a remediation work, and</p> <p>(b) by specifying certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out a remediation work in particular, and</p> <p>(c) by requiring that a remediation work meet certain standards and notification requirements.</p>	<p>The site has previously been used for industrial purposes and there are signs that the site has been used for illegal dumping in the past. A Preliminary Contamination Report was prepared and Council considers that the surficial contamination can be addressed at the subdivision stage.</p>
State Environmental Planning Policy (State and Regional Development) 2011.	The proposed development may trigger the SEPP where capital investment exceeds \$30 million.
Mining, Petroleum & Extractive Industries	

State Environmental Planning Policy	Comment
<p>Aims:</p> <p>(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and</p> <p>(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and</p> <p>(b1) to promote the development of significant mineral resources, and</p> <p>(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources, and</p> <p>(d) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development:</p> <p>(i) to recognise the importance of agricultural resources, and</p> <p>(ii) to ensure protection of strategic agricultural land and water resources, and</p> <p>(iii) to ensure a balanced use of land by potentially competing industries, and</p> <p>(iv) to provide for the sustainable growth of mining, petroleum and agricultural industries.</p>	<p>NSW Department of Industry – Resources and Energy raised no objection to the proposal but noted that, “the site is situated within the Swansea North Entrance Mine Subsidence District and any residential or commercial development within the site will need to comply with building guidelines stipulated by the Mine Subsidence Board”.</p> <p>The Mines Subsidence Board raised no objection to the rezoning proposal but advised that any future subdivision or development would need to seek the Board’s approval where required.</p>

Table 3: SEPP Assessment

6. ***Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 directions)?***

The proposal has been considered against the relevant Ministerial Section 9.1 Directions as summarised below. The full assessment of these Directions is contained within the Attachments of this proposal.

No.		Applicable	Consistent
1.1	Business & Industrial Zones	Y	N
1.2	Rural Zones	N	N/A
1.3	Mining, Petroleum Production and Extractive Industries	Y	Y
1.4	Oyster Aquaculture	N	N/A

No.		Applicable	Consistent
1.5	Rural Lands	N	N/A
2.1	Environmental Protection Zones	N	N
2.2	Coastal Management	N	N/A
2.3	Heritage Conservation	Y	TBD
2.4	Recreation Vehicle Areas	N	N/A
2.5	Application of E2 & E3 Zones and Environmental Overlays in the Far North Coast LEPS	N	N/A
3.1	Residential Zones	Y	Y
3.2	Caravan Parks and Manufactured Home Estates	Y	Y
3.3	Home Occupations	Y	Y
3.4	Integrating Land Use & Transport	Y	Y
3.5	Development Near Regulated Airports and Defence Airfields	N	N/A
3.6	Shooting Ranges	N	N/A
3.7	Reduction in non-hosted short term rental accommodation period	N	N/A
4.1	Acid Sulfate Soils	Y	TBD
4.2	Mine Subsidence and Unstable Land	Y	Y
4.3	Flood Prone Land	N	N/A
4.4	Planning for Bushfire Protection	Y	TBD
5.1	Implementation of Regional Strategies	N	N/A
5.2	Sydney Drinking Water Catchments	N	N/A
5.3	Farmland of State and Regional Significance on the NSW Far North Coast	N	N/A
5.4	Commercial and Retail Development along the Pacific Highway, North Coast	N	N/A

No.		Applicable	Consistent
5.9	North West Rail Link Corridor Strategy	N	N/A
5.10	Implementation of Regional Plans	Y	Y
5.11	Development of Aboriginal Land Council land	N	N/A
6.1	Approval and Referral Requirements	Y	Y
6.2	Reserving Land for Public Purposes	Y	Y
6.3	Site Specific Provisions	Y	Y
7.1	Implementation of A Plan for Growing Sydney	N	N/A
7.2	Implementation of Greater Macarthur Land Release Investigation	N	N/A
7.3	Parramatta Road Corridor Urban Transformation Strategy	N	N/A
7.4	Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	N	N/A
7.5	Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	N	N/A
7.6	Implementation of Wilton Priority Area Interim Land Use and Infrastructure Implementation Plan	N	N/A
7.7	Implementation of Glenfield to Macarthur Urban Renewal Corridor	N	N/A
7.8	Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	N	N/A
7.9	Implementation of Bayside West Precincts 2036 Plan	N	N/A
7.10	Implementation of Planning Principles for the Cooks Cove Precinct	N	N/A

Table 4: S117 Ministerial Direction Compliance

Section C – Environmental, Social and Economic Impact

7. *Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?*

Flora and Fauna

The site is vacant and contains remnant native vegetation. The vegetation on the site is generally quite degraded due to previous industrial uses and use of the site for unauthorised recreational use.

The rezoning proposal was lodged prior to 25 November 2018 and therefore, impacts to biodiversity values are assessed in accordance with the former planning provisions (i.e. section 5A of the EP&A Act), pursuant to the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*. An Ecological Assessment Report has been prepared and is provided in Attachment G.

The Biodiversity and Conservation Division (DPIE) are satisfied with the biodiversity assessment provided.

8. *Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?*

Other potential environmental effects have been addressed in the assessment of SEPPs and *Ministerial Section 1.9 Directions*.

9. *Has the planning proposal adequately addressed any social and economic impacts?*

Social Issues

The proposal has the potential to increase the range of goods and services available in an area that is somewhat isolated from major centres, provide for an increase in housing choice in the local area and provide local employment opportunities.

Economic Impacts

The proposal is consistent with Goal 1 of the Central Coast Regional Plan (CCRP) "A prosperous Central Coast with more jobs close to home", and the North Wyong Shire Structure Plan.

An economic report has been prepared which addresses the Wyong Shire Retail Centres Strategy and considers the market potential and surrounding competition, with the report noting that the floor space proposed in the concept plan is supportable. In addition, residential development of the Coal and Allied site directly to the south is expected to commence in 2019 which would support the new centre.

The Wyong Employment Lands Study and Industrial Lands Audit undertaken in 2013 identified the site as having a local service role for established and new residential communities with a combination of business and industrial zoning.

Section D – State and Commonwealth Interests

10. *Is there adequate public infrastructure for the planning proposal?*

Traffic

The concept proposal has been revised to reduce the number of exits onto Kanangra Drive, and the concept proposal is now supported by Council's traffic planner.

Services (Water, Sewer, Gas & Electricity)

All required services are currently available or can be suitably upgraded to accommodate any intensification of development of the subject land.

11. ***What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?***

In accordance with the Gateway Determination dated 30/09/2015 (see Supporting Documentation – *Assessment & Endorsement*) agency consultation was undertaken between 8/10/2015 and 30/10/2015.

The following table summarises the responses received and action taken to address any issues raised, whilst the responses in full are provided within the supporting documentation (Appendix 03 *Agency Responses*).

Agency	Date	Response	Action Required / Taken
Darkinjung Local Aboriginal Land Council	26/10/2015	Request an Aboriginal Heritage Site Survey.	An Aboriginal Cultural Heritage report has been prepared by the proponent and referred to the Department of Premier and Cabinet
Department of Primary Industries - Office of Water	24/11/2016	No response provided	Further referral to be undertaken during public exhibition
Environment Protection Authority		No objection	Further referral to be undertaken during public exhibition
Guringai Tribal Link		No objection	Further referral to be undertaken during public exhibition
Mine Subsidence Board	14/10/2015	No objection to the rezoning proposal but advised that any future subdivision or development would need to seek the Board's approval where required.	
NSW Rural Fire Service	27/11/2015	Request for a bushfire assessment	A Bushfire Assessment Report has been prepared by the proponent and referred to the NSW Rural Fire Service
NSW Trade and Investment - Minerals and Petroleum	28/10/2015	No objection to the proposal but noted that site development will need to comply with building guidelines stipulated by the Mine Subsidence Board	

Former Office of Environment & Heritage (now BCID)	19/10/2015	No objection	Further referral to be undertaken during public exhibition
Roads and Maritime Services	22/10/2015	No additional requirements as the site is not near a Classified (State) Road.	
Transport for NSW	28/10/2015	No objection provided issues outlined in correspondence are addressed in the Road Safety Audit and Traffic Impact Assessment and Transport Plan	Further referral to be undertaken during public exhibition

Table 4 – Proposed Agency Consultation List

Part 4 Mapping

Maps and diagrams are provided through the planning proposal as required by *A Guide to Preparing Planning Proposals (Department of Planning and Environment)*. Refer to Appendix 04 for the relevant current and proposed LEP Mapping.

Part 5 Community Consultation

In accordance with the Gateway Determination, the Planning Proposal and supporting documentation will be made available for a minimum of 28 days for community consultation.

The proposal will be made available at the following locations:

- Wyong Administration Building, 2 Hely Street, Wyong
- Council's website (On Exhibition page) www.centralcoast.nsw.gov.au.

Additionally, notification of the exhibition will be provided to adjoining landholders and other landowners considered to be potentially affected by the proposal.

Part 6 Project Timeline

Action	Period	Start Date	End Date
Anticipated commencement date (date of Gateway Determination)	TBD	4/9/2015	30/09/2015
Anticipated timeframe for the completion of required technical information	4 years	8/10/2015	17/07/2019
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination)	21 days	8/10/2015	20/08/19
Commencement and completion dates for public exhibition	28 days	03/02/20	02/03/20

Action	Period	Start Date	End Date
Dates for public hearing (if required)	N/A	N/A	N/A
Timeframe for consideration of submissions	14 days	03/03/20	17/03/20
Timeframe for consideration of a proposal post exhibition	30 days	17/03/20	14/04/20
Date of submission to the Department to finalise LEP	40 days	14/04/20	01/06/20
Anticipated date RPA will make the plan (if delegated)	7 days	03/06/20	10/06/20
Anticipated date RPA will forward to the Department for notification	1 day	11/06/20	12/06/20

Table 5: Key Project Timeframes

Supporting Documentation

No.	Document
01 Assessment and Endorsement	
A.	Council Report and Minutes –12 August 2015
B.	Section 9.1 Ministerial Directions Assessment
C.	<i>North Wyong Shire Structure Plan</i>
D.	<i>The Gwandalan Residential Development, Concept Plan MP10_0084 Director-General's Environmental Assessment Report</i>
E.	<i>Wyong Shire Retail Centres Strategy</i>
F.	Gateway Determination
02 Land Use Provisions	
A.	Land Use Tables
03 Agency Responses	
A.	Roads and Maritime Services
B.	Department of Planning, Industry and Environment – Biodiversity and Conservation Division
C.	Transport NSW
D.	Darkinjung Local Aboriginal Land Council
E.	NSW Rural Fire Services
F.	NSW Department of Industry (Resource and Energy)

No.	Document
G.	Mines Subsidence Board
04 Mapping	
A.	Site Identification Map
Existing Provisions	
B.	Land Zoning Map LZN_017
C.	Lot Size Map LSZ_017
Proposed Provisions	
D.	Land Zoning Map LZN_ 017
E.	Lot Size Map LSZ_ 017
05 Supporting Studies	
A.	Planning Proposal (Proponent)
B.	Concept Plans
C.	Preliminary Contaminated Site Investigation Report
D.	Aboriginal Cultural Heritage Assessment Report
E.	Retail and Economic Study – Market Potential Assessment Report
F.	Traffic and Parking Assessment Report
G.	Ecological Assessment Report
H.	Bushfire Threat Assessment Report

Table 6: Supporting Documentation to the Planning Proposal

On-Line Reference Documents

	Document	Hyperlink
A.	The Central Coast Regional Plan 2036 (CCRP)	http://www.planning.nsw.gov.au/Plans-for-your-area/Regional-Plans/Central-Coast/Central-Coast-regional-plan
B.	Central Coast Community Strategic Plan (CSP)	https://www.centralcoast.nsw.gov.au/council/news-and-publications/community-strategic-plan

01

Assessment & Endorsement

01 A

Council Report & Resolution

2.1 RZ/2/2015 - Planning Proposal - Commercial and Residential Development - Cnr Kanangra Drive and Summerland Road Gwandalan - RZ/2/2015

TRIM REFERENCE: RZ/2/2015 - D11979939

MANAGER: Tanya O'Brien, Manager

AUTHOR: Rodney Mergan; Senior Planner

SUMMARY

Council has received an application requesting an amendment to *Wyong Local Environmental Plan (LEP) 2013*, to rezone land at Gwandalan from IN2 Light Industrial, RE1 Public Recreation and E2 Environmental Conservation to a mixture of B2 Local Centre and part R3 Medium Density Residential. A preliminary assessment of the information submitted indicates that the proposed local centre and same residential use of the land has merit.

This report recommends that a planning proposal be prepared and forwarded to the Department of Planning and Environment (DP&E) for a gateway determination.

Applicant:	QMC Property Group Pty Ltd
Owners:	QMC Property Group Pty Ltd
Proposal No.:	RZ/2/2015
Description of Land:	44W, 50W & 60 Parraweena Road Gwandalan, Lot 20 DP 1089946, Part Lot 1 DP 1043151, Part Lot 3 DP 740701
Existing Zoning:	IN2 Light Industrial, RE1 Public Recreation, E2 Environmental Conservation
Zoning proposed by applicant:	B2 Local Centre and R3-Medium Density Residential
Existing Use:	Vacant
Employment Generation:	Approximately 100 combined construction and ongoing jobs
Estimated Value:	\$8.5 Million

RECOMMENDATION

- 1 That Council prepare a planning proposal to amend Wyong Local Environmental Plan 2013, pursuant to Section 55 of the Environmental Planning and Assessment (EP&A) Act 1979 to rezone the land to a combination of B2 Local Centre, R1 General Residential and R2 Low Density Residential.***
- 2 That Council forward the planning proposal to the Department of Planning and Environment accompanied by a request for a gateway determination, pursuant to Section 56 of the EP&A Act 1979.***
- 3 That Council request the General Manager to apply to accept plan making delegations for the rezoning.***

- 4 *The Council request the General Manager commence negotiations for the potential sale if required of part of Lot 1 DP1043151 and part of Lot 3 DP 740701 to the owner of Lot 20 DP 1089946, noting that any decision to sell that land will require a specific resolution of the Council.*
- 5 *That Council request the General Manager to negotiate and publically exhibit a draft Voluntary Planning Agreement to facilitate the sale of part of Lot 1 DP 1043151 and part of Lot 3 DP 740701 to the owner of Lot 20 DP 1089946 (if required).*
- 6 *That Council undertake community and government agency consultation in accordance with the requirements of the gateway determination. The consultation process is to include a public hearing for the reclassification of part Lot 3 DP 740701 from Community Land to Operational Land as required under the Local Government Act 1993.*
- 7 *That Council prepare appropriate Development Control Plan provisions and amend Section 94 Contributions Plans (if required) to support the development of the land subject to this Planning Proposal.*
- 8 *That Council consider a further report on results of the community consultation.*

BACKGROUND

The site is located on the north-eastern corner of the intersection of Kanangra Drive and Summerland Road Gwandalan. All traffic entering Gwandalan and Summerland Point is distributed from this intersection. The site is approximately 1 km from the existing Gwandalan neighbourhood centre and approximately 2 km from the Summerland Point neighbourhood centre.

The site is currently vacant of development and contains remnant native vegetation. The site slopes at approximately 10-15% from west to east with the head of a drainage line apparent to the south-east. The site consists of mainly open woodland with scattered trees and a generally cleared understorey. The vegetation on the site is generally degraded due to previous industrial use for manufactured home production and use of the site for recreational trail bike riding.



Figure 1 - Aerial photo featuring the subject site and surrounding development

The proposal predominately relates to Lot 20 DP 1089946 which is approximately 4.7 Ha in size and owned by the applicant. The zoning of this land for industrial use preceded the introduction of Wyong LEP 1991. In 1987 the subject site (edged in red above) was identified as part of a larger industrial subdivision. Industrial development was approved and constructed on the land to the north of the subject site (Labeled existing industrial land above).

In December 2005, Lot 20 DP 1089946 was approved for subdivision to create industrial lots under DA/583/2005. This subdivision has not been pursued. Part of the site was approved and occupied for the production of manufactured homes under DA/599/2005. This land use has since ceased with only a storage shed and hardstand area still visible on the site. The application asserts that over the past decade there has been little or no demand for further industrial development within the Gwandalan/Summerland Point catchment beyond that already constructed.

The planning proposal also affects two pieces of Council owned land being a 4715 m² section of Lot 1 DP 1043151 currently zoned RE1 – Public Recreation and a 2250m² section of Lot 3 DP 740701 currently zoned E2 Environmental Conservation, these parcels are discussed further below.

THE PROPOSAL

An application has been received which proposes the rezoning of the site from IN2 Light Industrial, RE1 Public Recreation, E2 Environmental Conservation to part B2 Local Centre and part R3 Medium Density Residential.

The proponent has provided a draft zoning plan (see figure 3) which proposes an approximate 60/40 split between commercial and residential development. The proposed centre could potentially accommodate a supermarket, retail shops, medical centre, child care centre and other community commercial uses. It is also proposed to allow residential development on the remaining area of the site.

To maximise the efficiency of the proposed future development area, the applicant has included two parcels of Council land being part of Lot 1 DP 1043151 currently zoned RE1 Public Recreation and part of Lot 3 DP 740701 currently zoned E2 Environmental Conservation (see figure 2). The inclusion of these lots provides for a more regular road and development pattern and provides opportunity for the development to front and gain access to Kanangra Drive. The applicant has also identified an interest in purchasing these two parcels of Council owned land, which is discussed further in the report.



Figure 2 – Extract from Wyong LEP 2013 land use zoning map. The site subject of the proposed rezoning is shown hatched. Two small sections of Council land of interest to the proponent for purchase are shown edged heavy black.



Figure 3 – The applicant's proposed zoning map

ASSESSMENT

Proposed new B2- Local Centre

The application proposes rezoning approximately 3.2ha of land adjacent to Kanangra Drive to the B2 Local Centre zone. The site is identified as a “potential new centre” under the *North Wyong Shire Structure Plan 2012* (NWSSP) (see figure 4). The NWSSP mentions the potential for “new village centres at Wadalba East, Lake Munmorah and Gwandalan”. The Lake Munmorah site and the recently expanded Wadalba centre are both zoned B2 Local Centre under Wyong LEP 2013 and it is considered appropriate to apply the same B2 zone to this proposed future centre.

The potential for a future neighbourhood centre in the Gwandalan/Summerland Point area is also mentioned in the *Wyong Shire Retail Centres Strategy 2013*.

The proposal therefore is consistent with the broader planning framework for centres in this locality.

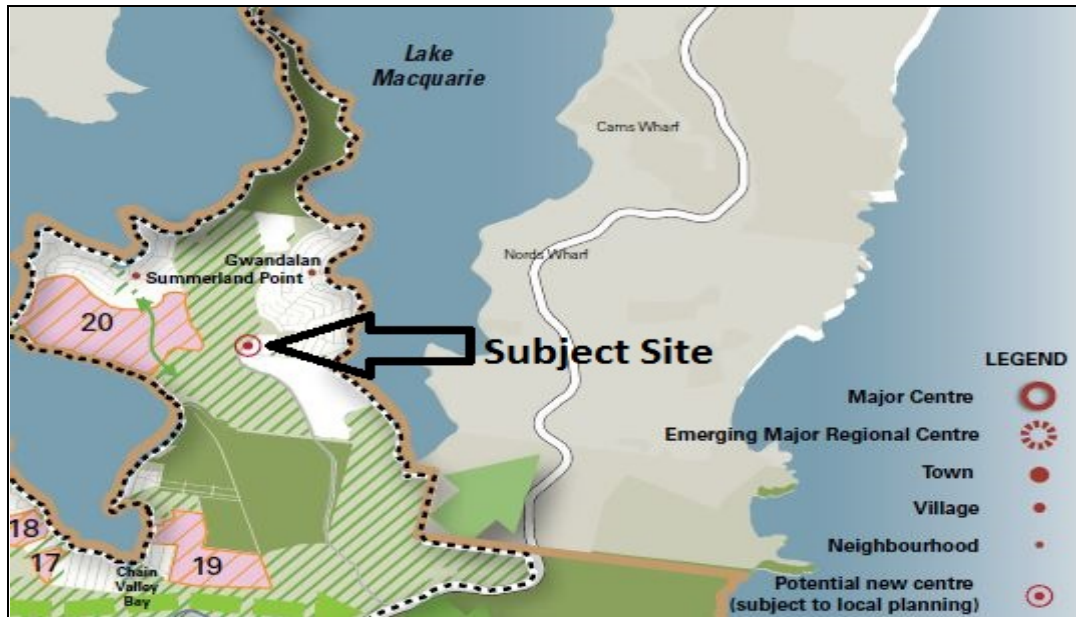


Figure 4 - Extract from the NWSSP – subject site shown as a potential new centre

Being located at the entry point of both Gwandalan and Summerland Point, the site is well located to serve the retail, social and convenience needs of both communities. The population of the area is set to grow with:

- the recently approved 405 lot residential subdivision directly to the south of the site,
- the recently commenced subdivision at the northern end of Kanangra Drive for approximately 200 residential lots,
- the potential development of land identified in the NWSSP as “long-term” residential land in the Summerland Point area. In accordance with the NWSSP (2012) long-term is defined as “land that will not be zoned before 15 years, the timing of which will be impacted by future coal extraction potential, future use of the power station sites and access to services and employment opportunities”. This could potentially be accelerated subject to demand, and
- increased activity in the northern part of the shire through the implementation of the NWSSP.

The *Retail Centres Review* and *Retail Centres Strategy* by Don Fox Planning, endorsed by Council in 2013, advocates a more flexible approach than previous retail strategies with respect to any increase in floor space within zoned centres in line with the principles of the NSW State Government’s *draft Centres Policy*.

With regard to new centres the *Retail Centres Strategy* includes a ‘toolbox’ for the purposes of preparing and assessing planning proposals which consider additional retail floor space based on the net community benefit test principles detailed in the *draft Centres Policy*.

Council's *Retail Centres Strategy (2013)* identifies a new neighbourhood centre in the Gwandalan area by 2031 though the development of a centre and the eventual capacity of the centre will be dependent on population growth and other factors of demand such as tourism and consumer behaviour. The Retail Centres Strategy does not specifically classify centres based on floor space but rather classifies centres on the following criteria:

- the size and the quantum of retail and commercial floor space within the centre;
- the mix of uses within the centre;
- the catchment or geographic area of influence;
- the role and function of the centre; and
- the centre's relationship to other centres.

A neighbourhood centre generally serves the needs of a local catchment, while a local centre provides a greater range of shops and services.

In accordance with the *Retail Centres Strategy*, as the proposal relates to the development of an out of centre retail centre, the proponent will be required to prepare a *Net Community Benefit Test* to support the planning proposal. The *Net Community Benefit Test* will be required to demonstrate:

- potential timing and staging of development,
- that alternatives within existing centres and in edge of centre locations are not suitable or available for the proposal,
- whether the proposal will impact on the availability of retail and commercial services in the area and
- any changes in population, market conditions and industry trends.

It is likely that the development of a centre will need to be staged through the provisions of appropriate development controls based on economic forecasts and population growth to be considered as part of the *Net Community Benefit Test*. It is proposed that site specific provisions be developed for inclusion in *DCP 2013* to direct appropriate staging of development and address other development issues such as site access and drainage similar to the process used to stage the development of the centre at Lake Munmorah.

The *Wyong Shire Community Strategic Plan (CSP)* identifies the Shire Strategic Vision, how the vision was created and how the Shire Strategic Vision integrates with *Council's Asset Management Strategy* and long-term Financial Strategy. The *CSP* priority objectives are each supported by a range of actions. The proposal is considered to be consistent with the objectives of the *CSP* in particular the objective that indicates that, "there will be a strong sustainable business sector and increased local employment".

Proposed residential component

The application proposes rezoning approximately 2.2ha of land to the R3 Medium Density Residential Zone. Based on the indicative draft concept plan (attachment 1), the residential portion could accommodate approximately 33 dwellings. The proponent has indicated that the portion of the site proposed for residential housing would “include a mix of villa and townhouse development”, to address potential mines subsidence concerns and maintain a similar scale to current development in the area.

Given consideration of the existing development and limited services for higher densities in the locality and the desired future character, the R2 Low Density and R1 General Residential zones are recommended as being more appropriate. The proposed residential zoning forms a natural expansion of existing and recently approved residential areas and will be well located near to the new centre. This form of housing would provide additional housing choice in the Gwandalan area and take advantage of the existing and future services. The residential use is also in accordance with the NWSSP (figure 4 - shown white meaning urban land) and the Wyong Settlement Strategy.

It is considered that the provisions of the R1 General Residential zone and R2 Low Density Residential zone are more appropriate for this locality than the R3 Medium Density zone suggested in the application.

It is noted, however, that the R1 and R2 zones generally accommodate development at the scale as proposed by the applicant. The R3 zone is generally only applied to areas which are directly adjacent to major centres and to promote larger scale residential development.

The R1 zone proposed for land that directly adjoins the proposed B2- Local Centre land, with the R2 zone proposed further from the centre.

It is considered that the R1 zone is appropriate for land that directly adjoins the proposed centre as the zoning provides for a greater range of land uses than the R2 zone including multi-dwelling housing and tourism related accommodation and other uses that can provide greater variety of services as well as being a transition between the B2 Local Centre and R2 Low Density Residential zones. One of the objectives of the R1 zone is to “promote walkable neighborhoods” and is therefore an appropriate zoning for land located so close to facilities and services to meet the day to day needs of residents.

The R2 zone provides for less intense development of the land though under the provisions of Wyong LEP 2013 still permit a variety of development opportunities such as dual occupancy development and small lot housing.

It is considered that the B2, R1 and R2 zones proposed across the site provides for a suitable transition for the centre to integrate with existing development in the locality including the adjoining E4 – Environmental Living zoned land to the east of the subject site.

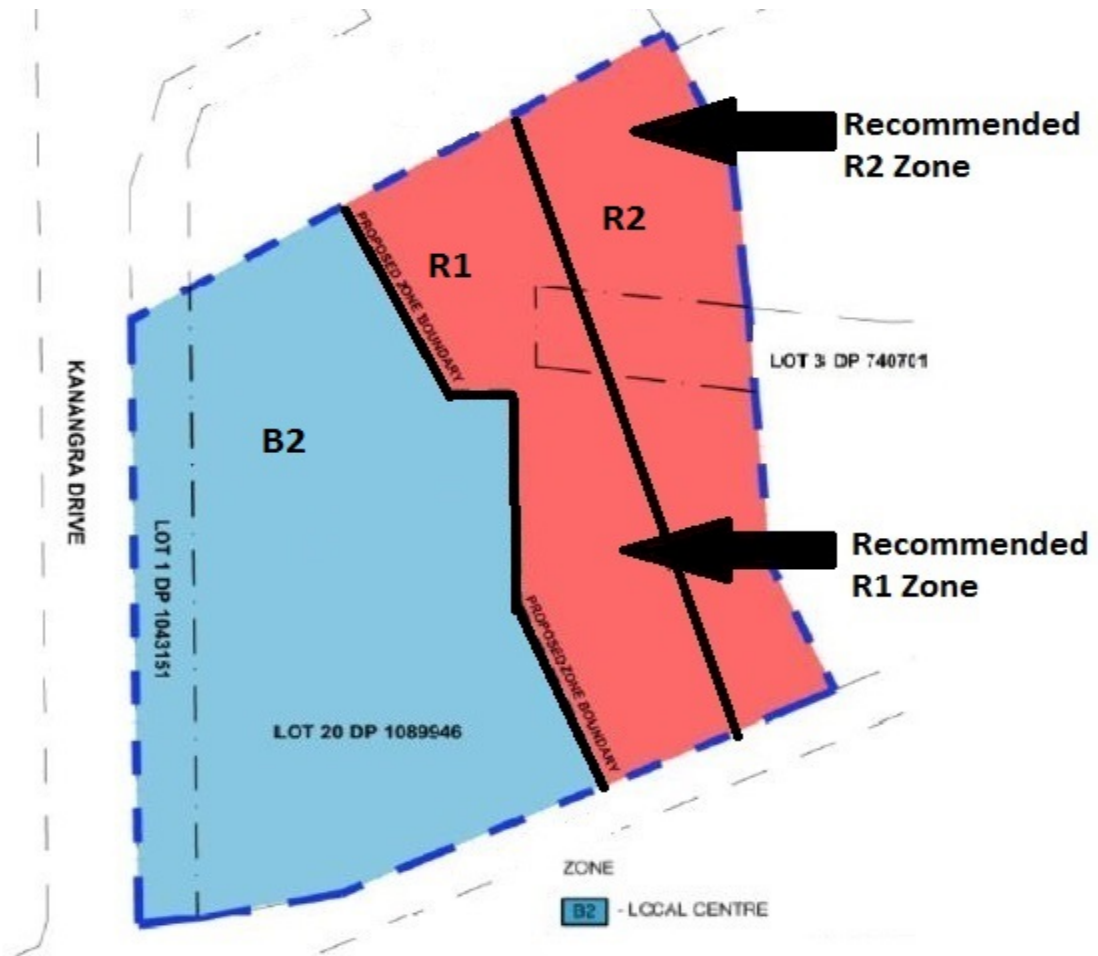


Figure 5– Recommended zoning – indicative only

Council owned land

The proposal seeks to include two parcels of Council owned land into the development area to create a more orderly development outcome with a more regular lot and street layout and providing opportunity for the development to access and front Kanangra Drive. The relevant asset owners of this land being Council's Roads & Drainage, Open Space & Recreation and Property and Economic Departments have been consulted and have indicated that the lands are surplus to current needs. It is noted that the land zoned E2 is categorised as Community Land and will need to be reclassified as well as rezoned through the rezoning process to facilitate any sale. While the incorporation of this Council land will provide an optimal development footprint, the proposal is not reliant on the additional land.

Lot 1 DP 1043151 is currently zoned RE1 Public Recreation and was originally put in place to provide a landscape buffer from the industrial land that will no longer be required for commercial development.

Lot 3 DP 740701 (the E2 land) contains the head of a drainage line and it is recommended that if the zoning is changed the drainage line and any significant vegetation be retained (see Figure 6). Initial investigations by Council's Ecologist have indicated that the current environmental mapping for this land is coarse and the E2 zoning established under Wyong LEP 2013 may not be appropriate.

The majority of the site is cleared or contains highly disturbed vegetation. An ecological report will be required for the review of Council and the Office of Environment and Heritage (OEH) to support the planning proposal. The study will need to map native vegetation and will involve targeted survey work over a 12 month period for relevant threatened species. Appropriate controls relating to this can be added to DCP 2013, the E2 zone be retained or another appropriate zoning be put in place if considered appropriate.

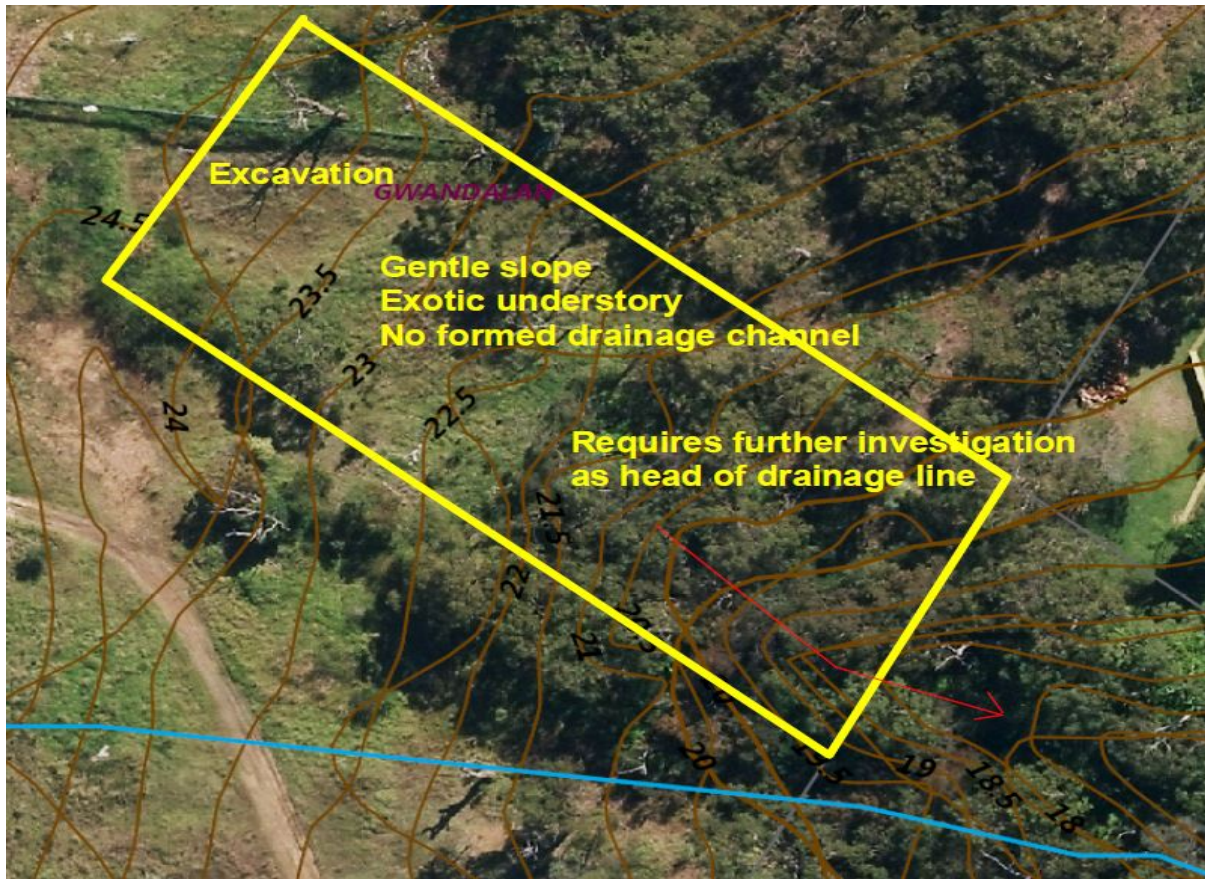


Figure 6 – Council E2 zoned land

Design Issues

A concept design has been provided with an indicative frame work for future development. There are a number of matters (attachment 1) that will need to be dealt with either during the assessment of the planning proposal and DCP or at development application stage:

- Access – the concept plan shows 7 access locations to the site. These will need to be consolidated and access addressed via a *Road Safety Audit and Traffic Impact Assessment & Transport Plan*.
- Acoustic Privacy - location of residential development in relation to existing industrial development and adjacent rural residential development.
- Odour - the Odour Constraint Mapping for Gwandalan Sewerage Treatment Plant impacts upon a small section of the western side of the site and may restrict some potential land uses. This can potentially be addressed through the rearrangement of the car parking area and commercial development and DCP restrictions.

- Drainage - the site naturally drains to a creek line to the east of the site. Water quality and quantity issues will need to be adequately addressed and detailed within the DCP.
- Bushfire – the entire site is potentially bushfire prone. Design will need to consider bushfire management and the comments of the NSW Rural Fire Services (RFS).

Planning Proposal Considerations

The *Guide to Preparing Planning Proposals* (Department of Planning and Infrastructure 2012) provides the guidelines for the information that is to be provided by Council to the DP&E when seeking a gateway determination. Section 2.3(a) of the guide provides a list of “questions to consider when demonstrating the justification”, which should be considered prior to Council’s endorsement of any proposal for gateway determination. This requires that the relevant State and local planning strategies, relevant State Environmental Planning Policies (*SEPP’s*) and *Ministerial Section 117 Directions* be considered.

Accordingly issues with regard to potential mines subsidence, bushfire and potential site contamination are amongst those that will need to be addressed in the planning proposal. The proposal is considered to be consistent with the relevant *SEPP’s* and *117 Directions* and consistent with the *North Wyong Shire Structure Plan*, *Council’s Strategic Plan* and *Retail Centres Strategy*.

Impact on the availability of industrial land

Ministerial Section 117 Direction 1.1 – Business and Industrial Zones requires that any reduction in industrial land must be justified.

The NWSSP identifies the subject site as the potential location for a new commercial centre and also identifies significant areas of industrial land to be released in the Lake Munmorah area.

There has been little or no interest in the development of the site for industrial purposes. Since the industrial subdivision was approved in 2005 the only industrial use approved for the site was mobile home manufacturing which has since vacated. Attempts have been made to promote the industrial subdivision but local demand has been absorbed by the existing industrial development to the north of the site. In addition the land owner has sought to develop the site for various purposes. A development application was lodged in June 2009 for a hotel, bottle shop, function room and manager’s residence and was withdrawn in February 2010. An alternate preliminary development meeting was held where a stand alone aged care facility was discussed but was not supported due to the inconsistency with the industrial zoning of the land.

The NWSSP also identifies approximately 94 Ha of employment land in Precinct 16 (approximately 7km away) which are better located with direct access to the Pacific Highway (see Figure 7). The industrial development of Precinct 16 is currently under consideration as part of a Master Plan being developed by Council’s Property and Economic Development Department for the Lake Munmorah area. The future rezoning of these areas can be expected to easily offset the loss of the 4.7 Ha of industrial land on this site.

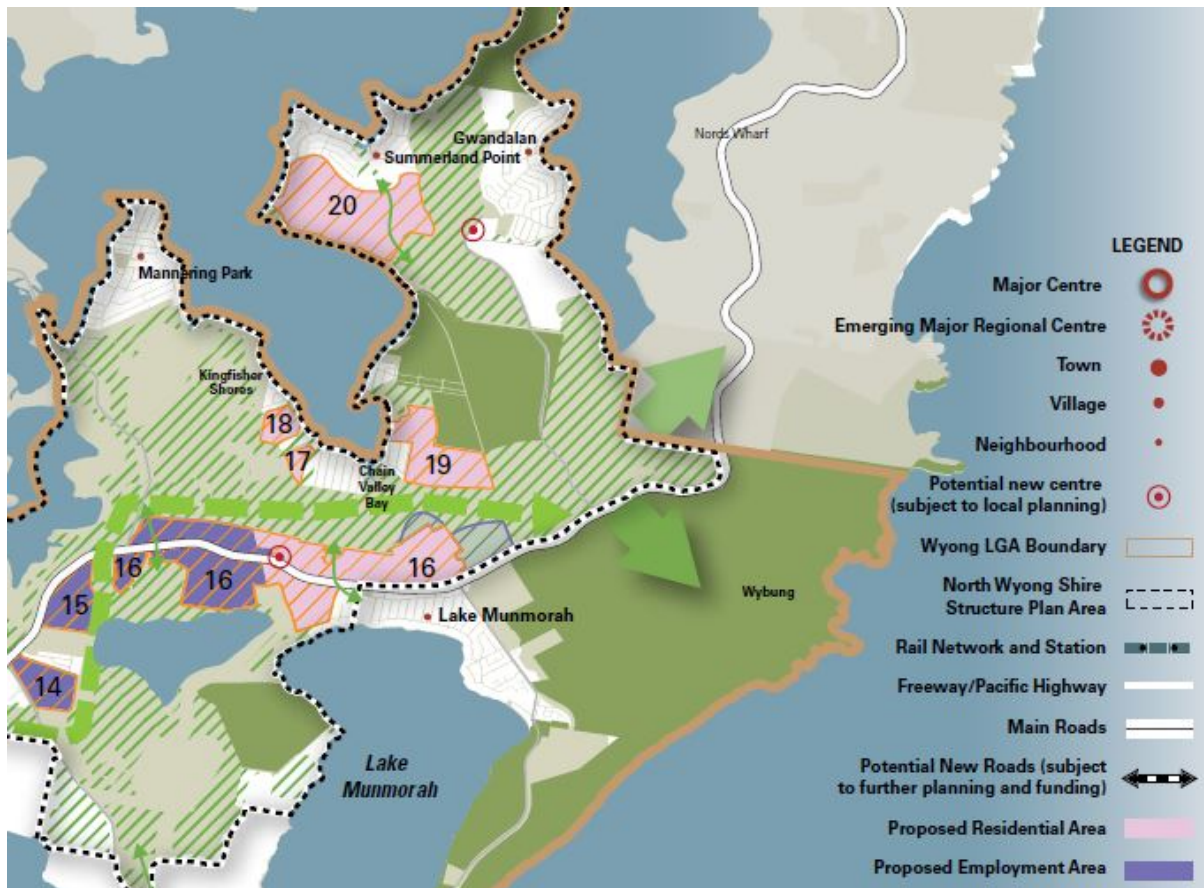


Figure 7 – NWSSP – location of nearby employment lands (precincts 14-16)

CONSULTATION

External Referrals

This report recommends seeking gateway determination from the Department of Planning and Environment. The gateway determination will provide the requirements for external consultation and public exhibition. It is likely that the gateway determination will require that authorities such as Roads and Maritime Services (RMS) and the Mines Subsidence Board (MSB), the Office of Environment and Heritage (OEH) and Rural Fire Service (RFS) be consulted either prior to or during the public exhibition process with appropriate studies to be prepared by the applicant for both the referral and public exhibition process. The results of the consultation process will be reported to Council.

Engineering Assessment

An internal engineering assessment has indicated that the redevelopment of the site is generally supported with services such as water, sewer and electricity is available and can be suitably upgraded as required. The proposal will provide for a similar level of demand for services as per the approved industrial subdivision.

The most significant issue will be the resolution of traffic and vehicular manoeuvring issues. It is likely that traffic issues can be resolved through consultation with the RMS and appropriate controls provided within the DCP.

GOVERNANCE AND POLICY IMPLICATIONS

The processing of the planning proposal is proposed to be undertaken in accordance with Council's adopted planning proposal procedure.

Rezoning of the land is undertaken by preparing an amendment to the Wyong Local Environmental Plan (WLEP) through progressing of a planning proposal under sections 55-59 of the *Environmental Planning & Assessment Act 1979*.

Section 55 requires Council to prepare a planning proposal that explains the intended effect of the amendment to the WLEP and sets out the justification for the amendment. Section 55 specifies matters to be included in the planning proposal.

Section 56 provides that Council submit the planning proposal to the Minister for a gateway determination who will advise whether or not the matter should proceed (with or without variation), and may specify further studies or modifications to the proposal, community and government agency consultation requirements and other matters.

Council may request delegation from the Minister for Planning for the determination of locally significant planning proposals. Given the relatively minor nature of this proposal it is recommended that in this instance delegation be sought.

The requirements for public exhibition would be set out under the gateway determination. In addition to the exhibition of a planning proposal, other associated material will require exhibition and Council endorsement including:

- a site specific DCP Chapter to guide the staging and design of the site development;
- a draft VPA to facilitate any potential sale of Council land; and explanatory note,
- a possible revision of the *Northern Districts Section 94 Contribution Plan* to address any unaccounted change in demand on services in the area.

It is noted that a further report will be prepared outlining the results of the State agency and public exhibition.

OPTIONS

While residential development of the eastern portion of the site is supported there is an opportunity to have this portion zoned either approximately half R1 General Industrial and half R2 Low Density Residential or to have the residential portion zoned entirely R2 Low Density.

It is recommended that the R1 and R2 zone option be pursued to provide an appropriate transition from the proposed local centre to the lower density residential.

CONCLUSION

The potential development of the vacant industrial land for future commercial and residential development is considered to have merit and is consistent with overarching regional policy. Preliminary assessment of the proposal indicates that the site has potential for further investigation of the R1 General Residential, R2 Low Density Residential and B2 Local Centre zones. It is likely that the commercial elements may need to be staged to ensure the ongoing viability of the centre and other existing centres. This is to be confirmed through a Net Community Benefit Test.

The two small sections of Council owned land are considered to be best utilised by inclusion within the rezoning as this maximises Council's options with regard to the land, they are therefore proposed to be rezoned and reclassified.

It is recommended that a planning proposal be prepared for the consideration of the DP&E requesting a gateway determination be issued. Further it is recommended that appropriate DCP, VPA and/or Section 94 Contribution Plan amendments are made and exhibited in conjunction with the planning proposal.

ATTACHMENTS

- 1 Concept Layout Plan D11980000

FOR ACTION

ORDINARY MEETING

12/08/2015

Subject: RZ/2/2015 - Planning Proposal - Commercial and Residential
Development - Cnr Kanangra Drive and Summerland Road Gwandalan -
RZ/2/2015

RESOLVED on the motion of Councillor EATON and seconded by Councillor TROY:

- 785/15 That Council prepare a planning proposal to amend Wyong Local Environmental Plan 2013, pursuant to Section 55 of the Environmental Planning and Assessment (EP&A) Act 1979 to rezone the land to a combination of B2 Local Centre, R1 General Residential and R2 Low Density Residential.
- 786/15 That Council forward the planning proposal to the Department of Planning and Environment accompanied by a request for a gateway determination, pursuant to Section 56 of the EP&A Act 1979.
- 787/15 That Council request the General Manager to apply to accept plan making delegations for the rezoning.
- 788/15 The Council request the General Manager commence negotiations for the potential sale if required of part of Lot 1 DP1043151 and part of Lot 3 DP 740701 to the owner of Lot 20 DP 1089946, noting that any decision to sell that land will require a specific resolution of the Council.
- 789/15 That Council request the General Manager to negotiate and publically exhibit a draft Voluntary Planning Agreement to facilitate the sale of part of Lot 1 DP 1043151 and part of Lot 3 DP 740701 to the owner of Lot 20 DP 1089946 (if required).
- 790/15 That Council undertake community and government agency consultation in accordance with the requirements of the gateway determination. The consultation process is to include a public hearing for the reclassification of part Lot 3 DP 740701 from Community Land to Operational Land as required under the Local Government Act 1993.
- 791/15 That Council prepare appropriate Development Control Plan provisions and amend Section 94 Contributions Plans (if required) to support the development of the land subject to this Planning Proposal.
- 792/15 That Council consider a further report on results of the community consultation.

FOR: CRS GB BEST, DE EATON, B G GRAHAM, LT TAYLOR, AT TROY AND LW WEBSTER
AGAINST: CRS KG GREENWALD AND LM MATTHEWS

01 B

Ministerial Section 9.1 Directions Assessment

Ministerial Section 9.1 Directions

Direction	Comment
Employment & Resources	
1.1 Business & Industrial Zones	
<p>Aims to:</p> <ul style="list-style-type: none"> encourage employment growth in suitable locations, protect employment land in business and industrial zones and support the viability of identified centres. <p>Applies when a planning proposal affects land within an existing or proposed business or industrial zone.</p>	<p>Applicable – inconsistent with justification</p> <p>The proposal encourages employment growth in suitable locations through the implementation of actions that are consistent with a relevant strategy the <i>North Wyong Shire Structure Plan 2012 (NWSSP)</i>.</p> <p>The <i>NWSSP</i> identifies the subject site as the potential location for a new commercial centre and also identifies significant areas of industrial land to be released in the Lake Munmorah area.</p> <p>Since the industrial subdivision of the site was approved by Council in 2005 the only industrial use approved for the site was mobile home manufacturing which has since vacated. Attempts have been made to promote the industrial subdivision but local demand has been absorbed by the existing industrial development to the north of the site.</p> <p>The <i>NWSSP</i> also identifies approximately 94 Ha of employment land in Precinct 16 (approximately 7km away) which are better located with direct access to the Pacific Highway. The future rezoning of these areas can be expected to easily offset the loss of the 4.7 Ha of industrial land on this site.</p> <p>The protection of the existing business and industrial zones are dealt with through the implementation of Council's Retail Centres Strategy.</p> <p>In issuing a Gateway Determination the (former) Department of Planning and Environment indicated that, "inconsistencies with S 117 Direction 1.1 Business and Industrial Zones is of minor significance".</p>
1.3 Mining, Petroleum Production and Extractive Industries	

Direction	Comment
<p>Aims to ensure that the future extraction of State or regionally significant reserves of coal, other minerals, petroleum and extractive materials are not compromised by inappropriate development.</p> <p>Applies when a planning proposal would have the effect of prohibiting the mining of coal or other minerals, production of petroleum, or winning or obtaining of extractive materials, or restricting the potential of development resources of coal, other mineral, petroleum or extractive materials which are of State or regional significance by permitting a land use that is likely to be incompatible with such development.</p>	<p>Applicable - Consistent</p> <p>NSW Department of Industry – Resources and Energy raised no objection to the proposal but noted that, “the site is situated within the Swansea North Entrance Mine Subsidence District and any residential or commercial development within the site will need to comply with building guidelines stipulated by the Mine Subsidence Board”.</p> <p>The Mines Subsidence Board raised no objection to the rezoning proposal but advised that any future subdivision or development would need to seek the Board’s approval where required.</p>
Environment & Heritage	
2.3 Heritage Conservation	
<p>Aims to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.</p> <p>Applies when the relevant planning authority prepares a planning proposal.</p>	<p>Applicable – TBD</p> <p>Several aboriginal heritage sites have previously been identified within a kilometre of the site. An Aboriginal Cultural Heritage Assessment has been prepared and referred to Darkinjung Local Aboriginal Land Council. The report will also be referred to the Department of Premier and Cabinet.</p>
2.4 Recreational Vehicle Areas	
<p>Aims to protect sensitive land or land with significant conservation values from adverse impacts from recreational vehicles.</p> <p>Applies when the relevant planning authority prepares a planning proposal.</p>	<p>Applicable - consistent</p> <p>The planning proposal does not enable land to be developed for the purpose of a recreation vehicle area.</p>
Housing, Infrastructure and Urban Development	
3.1 Residential Zones	
<p>Aims to encourage a variety and choice of housing types to provide for existing and future housing needs, to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and to minimise the impact of residential development on the environmental and resource lands.</p> <p>Applies when a planning proposal affects land within an existing or proposed residential zone, and any</p>	<p>Applicable - consistent</p> <p>The proposed residential zoning comprising R2 Low Density and R1 General Residential zones forms a natural expansion of existing and recently approved residential areas and will be well located near to the new centre. This form of housing would provide additional housing choice in the Gwandalan area and take advantage of the existing and future services.</p>

Direction	Comment
<p>other zone in which significant residential development is permitted or proposed to be permitted.</p>	<p>The residential use is also in accordance with the <i>NWSSP</i> and the <i>Wyong Settlement Strategy</i>.</p> <p>The R1 zone is proposed for land that directly adjoins the proposed B2- Local Centre land, with the R2 zone proposed further from the centre.</p> <p>It is considered that the R1 zone is appropriate for land that directly adjoins the proposed centre as the zoning provides for a greater range of land uses than the R2 zone including multi-dwelling housing, tourism related accommodation and other uses that can provide greater variety of services as well as being a transition between the B2 Local Centre and R2 Low Density Residential zones. One of the objectives of the R1 zone is to "promote walkable neighborhoods" and is therefore an appropriate zoning for land located so close to facilities and services to meet the day to day needs of residents.</p> <p>The R2 zone provides for less intense development of the land though under the provisions of Wyong LEP 2013 but still permit a variety of development opportunities beyond detached dwellings such as dual occupancy development and small lot housing.</p> <p>The site has previously been approved for industrial subdivision and it is considered that appropriate infrastructure is already available or can be upgraded without impacting the viability of the project.</p>
3.2 Caravan Parks and Manufactured Home Estates	
<p>Aims to provide for a variety of housing types and provide opportunities for caravan parks and manufactured home estates.</p> <p>Applies when the relevant planning authority prepares a planning proposal.</p>	<p>Applicable - consistent</p> <p>This Direction relates to the retention of zonings where caravan parks are permissible.</p> <p>Caravan parks are not permissible under the current land use zones that apply to the land under <i>Wyong LEP 2013</i>.</p>
3.3 Home Occupations	
<p>Aims to encourage the carrying out of low impact small business in dwelling houses.</p> <p>Applies when the relevant planning authority</p>	<p>Applicable - consistent</p> <p>To adopt the provisions of Wyong LEP 2013 and</p>

Direction	Comment
prepares a planning proposal.	SEPP Exempt and Complying Development
3.4 Integrating Land Use & Transport	
<p>Aims to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts to achieve: improving access to housing, jobs and services by walking, cycling and public transport; increasing choice of available transport and reducing transport on cars; reducing travel demand; supporting efficient and viable public transport services; and provide for efficient movement of freight.</p> <p>Applies when a planning proposal creates alters or moves a zone or provision relating to urban land, including land zoned for residential, business, industrial, village or tourist purposes.</p>	<p>Applicable - consistent</p> <p>The NWSSP identifies the subject site as the potential location for a new commercial centre and also identifies significant areas of industrial land to be released in the Lake Munmorah area.</p> <p>Being located at the entry point of both Gwandalan and Summerland Point, the site is well located to serve the retail, social and convenience needs of both communities. The population of the area is set to grow with:</p> <ul style="list-style-type: none"> the recently approved 405 lot residential subdivision directly to the south of the site, the recently commenced subdivision at the northern end of Kanangra Drive for approximately 200 residential lots, the potential development of land identified in the NWSSP as "long-term" residential land in the Summerland Point area. <p>The site is likely to become a hub for public transport with many residents within walking distance of the site.</p>
Hazard & Risk	
4.1 Acid Sulfate Soils	
<p>Aims to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.</p> <p>Applies when a planning proposal applies to land having a probability of containing acid sulfate soils on the Acid Sulfate Soils Planning Maps.</p>	<p>Applicable - inconsistent</p> <p>The eastern edge of the site is identified as category 5 under Council's Acid Sulfate Soils Map. Given the majority of the site is not mapped, and the likelihood of discovering Acid Sulfate Soils is potentially low, a preliminary Acid Sulfate Soils assessment could be undertaken at the subdivision design stage.</p>
4.2 Mine Subsidence & Unstable Land	
<p>Aims to prevent damage to life, property and the environmental on land identified as unstable or potentially subject to mine subsidence.</p> <p>Applies when a planning proposal permits development on land which is within a mine subsidence district, or identified as unstable in a</p>	<p>Applicable – Consistent</p> <p>NSW Department of Industry – Resources and Energy raised no objection to the proposal but noted that, "the site is situated within the Swansea North Entrance Mine Subsidence District and any residential or commercial development within the site will need</p>

Direction	Comment
study or assessment undertaken by or on behalf of the relevant planning authority or other public authority and provided to the relevant planning authority.	to comply with building guidelines stipulated by the Mine Subsidence Board". The Mines Subsidence Board raised no objection to the rezoning proposal but advised that any future subdivision or development would need to seek the Board's approval where required.
4.4 Planning for Bushfire Protection	
Aims to protect life, property and the environment from bushfire hazards, and encourage sound management of bushfire prone areas. Applies when a planning proposal affects or is in proximity to land mapped as bushfire prone land.	Applicable – inconsistent Council's Bushfire Prone Land mapping indicates that the entire site is bushfire prone. A Bushfire Assessment report was referred to the Rural Fire Service who considers that the existing circumstances are not consistent with the 9.1 Ministerial Direction. However, RFS are satisfied that the direction can be satisfactorily addressed with an appropriate subdivision design.
Regional Planning	
5.10 Implementation of Regional Plans	
Aims to give legal effect to the vision, land use strategy, goals, directions and actions contained in regional plans. Applies when the relevant planning authority prepares a planning proposal.	Applicable - Consistent <i>The Central Coast Regional Strategy (2008 p.11) (CCRS) identifies the NWSSP area "as the focus for new employment lands and new greenfield residential development and the key priority for release area planning".</i> This proposal is identified in the NWSSP. The proposal is considered to be consistent with the relevant Actions of the Strategy <i>The CCRS (2008 p.12) identifies two significant urban release areas providing potential demand for additional services.</i>
Local Plan Making	
6.1 Approval and Referral Requirements	
Aims to ensure that LEP provisions encourage the efficient and appropriate assessment of development. Applies when the relevant planning authority	Applicable - consistent The proposal does not propose to include provisions

Direction	Comment
prepares a planning proposal.	that require the concurrence, consultation or referral of development applications to a Minister or public authority following the completion of the planning proposal process.
6.2 Reserving Land for Public Purposes	
<p>Aims to facilitate the provision of public services and facilities by reserving land for public purposes, and facilitate the removal of reservations of land for public purposes where land is no longer required for acquisition.</p> <p>Applies when the relevant planning authority prepares a planning proposal.</p>	<p>Applicable - Consistent</p> <p>The proposal will result in the reduction of public land through the transfer and potential sale of public land to accommodate a retail and residential development.</p> <p>It is noted that the alteration of the existing zoning of land for public purposes requires the approval of the Department of Planning, Industry and Environment.</p> <p>In issuing a Gateway Determination the Department of Planning and Environment indicated that in relation to this Direction the Department " agreed that the reduction of land for public purposes on the basis that the land is surplus to Council's requirements and will assist in providing additional employment and housing".</p>
6.3 Site Specific Provisions	
<p>Aims to discourage unnecessarily restrictive site specific planning controls.</p> <p>Applies when the relevant planning authority prepares a planning proposal to allow particular development to be carried out.</p>	<p>Applicable - consistent</p> <p>No additional development standards beyond those under Wyong LEP 2013 are proposed. Any local provisions would be introduced by a site specific development control plan if required.</p>

01 C

North Wyong Shire Structure Plan



Planning &
Infrastructure



NORTH WYONG SHIRE STRUCTURE PLAN

October 2012

TABLE OF CONTENTS

1. Introduction.....3

1.1 Objectives of the Structure Plan.....3

1.2 Structure Plan process4

2. The Structure Plan area today and into the future5

2.1 The Structure Plan area5

2.2 Flooding5

2.3 Biodiversity5

2.4 Mineral resources6

2.4.1 Coal6

2.4.2 Clay and Gravel6

2.5 Housing and employment7

2.5.1 Housing.....7

2.5.2 Economy and employment.....7

2.6 Infrastructure and Services10

3. The Structure Plan development strategy12

3.1 The development precincts12

3.1.1 Employment13

3.1.2 Residential.....13

3.2 Development area staging18

3.3 Biodiversity planning for the Structure Plan area19

3.4 Strategic land subject to further investigation.....20

4. Implementation21

4.1 Coordination of land release21

4.2 Wyong Local Environmental Plan 2012.....21

4.3 Development Control Plan22

4.4 Ongoing land release via the precinct planning process22

APPENDIX 123

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1. Introduction

The 2008 Central Coast Regional Strategy identifies that the majority of the Central Coast's new greenfield residential development and all of the region's greenfield employment development to 2031 will locate in the northern part of Wyong LGA. This area will have the capacity for almost 17,000 new dwellings and between 12,150 and 17,100 new jobs to 2031.

The Regional Strategy also identified the need for a high level landuse strategy to guide ongoing development and planning for infrastructure and services for the North Wyong Shire area, which is identified on Maps 1-3. The Structure Plan identifies where and when development is planned to occur and ensures that sufficient land exists to meet regional housing and employment targets, as a minimum.

New Local Environmental Plans (LEPs) will be one of the key tools to implement this plan and these will need to be consistent with both the Regional Strategy and the Structure Plan.

The Regional Strategy also identifies that a Central Coast Regional Conservation Plan should be prepared. The intent of the Conservation Plan is to ensure that, where development occurs on the edge of the existing urban areas occurs, the area's rich natural resources and diversity of ecosystems are maintained. The Conservation Plan is currently being prepared by the Office of Environment and Heritage (OEH) which has also been closely involved in the preparation of the Structure Plan.

It is intended that the Structure Plan will be incorporated into the Regional Strategy when it is next reviewed, which is planned for 2013. This will ensure that the Regional Strategy continues to provide an integrated approach to the planning and delivery of land for residential and employment development.

1.1 Objectives of the Structure Plan

The Structure Plan project objectives were developed from the Regional Strategy and are to:

- Identify sufficient land for regional greenfield housing and employment targets to be met, as a minimum;
- Identify and protect important environmental assets, landscape values and natural resources;
- Provide greater certainty for the community, local government, industry groups and commerce on the location of future development and conservation areas; and
- Consider key infrastructure requirements to support new precincts and ensure that new urban land release contributes to infrastructure costs.

Other aims and objectives for the Structure Plan are to:

- Focus initial development on areas that support the development of Warnervale Town Centre and the Wyong Employment Zone (WEZ);
- Provide a staging and sequencing plan to inform planning, and infrastructure investment;
- Ensure developable areas are serviced by a hierarchy of centres which can support a range of services and medium density residential development;
- Identify opportunities for new and expanded employment nodes which support existing employment area and/or which have good access to transport infrastructure;
- Concentrate new development in areas that allow for efficient infrastructure servicing;

- Ensure that future development takes account of current and potential future mining and quarrying issues;
- Ensure future development takes account of cultural heritage and values; and
- Ensure future development takes into account regional planning for the adjoining Lower Hunter Region.

Wyong Council's *Community Strategic Plan* (2011) identifies eight priority objectives which have also been considered in the development of the Structure Plan. These objectives are:

- Communities will be vibrant, caring and connected;
- There will be ease of travel;
- Communities will have a range of facilities and services;
- Areas of natural value will be enhanced and maintained;
- There will be a sense of community ownership of the natural environment;
- There will be a strong sustainable business sector;
- Information and communication technology will be world's best; and
- The community will be educated, innovative and creative.

1.2 Structure Plan process

The project has been led by the Department of Planning and Infrastructure, with the support and guidance of consultant Worley Parsons. Development of the Structure Plan has involved:

1. Gathering, collating and analysing information on the study area from Council, government agencies and other sources;
2. Conducting meetings with community and business groups, landowners and potential developers to determine the key characteristics of the study area and the key issues that the Structure Plan should address;
3. Preparing and testing several possible growth scenarios, based on the characteristics of the study area, in consultation with Government agencies, the consultants and Council;
4. Preparing and exhibiting a draft Structure Plan. The draft Structure Plan was exhibited for a period of six weeks in late 2010 and consultation included meetings with a wide range of stakeholders including Council, Government agencies, community groups, landowners, business groups and developers;
5. Reviewing submissions received on the draft plan and discussing possible changes to the draft plan with Government agencies and Council; and
6. Preparation and release of a final Structure Plan.

The community has had several opportunities to be involved in the Structure Plan process and further opportunities will be provided as the Structure Plan is implemented into the future. Future consultation opportunities will arise through the preparation of local planning strategies and planning proposals within the Structure Plan area. A range of more detailed investigations will be required to support future detailed local planning and future LEPs will be required to be consistent with the Structure Plan.

2. The Structure Plan area today and into the future

This section provides a brief description of the key characteristics which have guided the preparation of the Structure Plan. The key natural features that have guided the Structure Plan development strategy are flooding, biodiversity values and mineral resources, including coal, clay and gravel.

2.1 The Structure Plan area

The Structure Plan area covers approximately 11,500 hectares across the northern and north eastern areas of Wyong LGA. To the south the Structure Plan area extends to the Wyong River floodplain and southern boundary of the Porters Creek wetland. The western boundary extends west of the F3 Freeway, along Hue Hue Road and the eastern boundary adjoins the existing urban areas of Kanwal, Tuggerawong and Watanobbi in the south, Lake Haven, Charmhaven and San Remo, and Lake Munmorah in the north-east.

Existing residential areas within the study area are predominantly single dwellings while the most dominant employment development is industrial development. The study area also includes areas that have already been identified for future urban development, including Warnervale Town Centre, the WEZ, and parts of Hamlyn Terrace and Wadalba.

2.2 Flooding

Parts of the Structure Plan area are affected by flooding, including the Warnervale floodplain, foreshore areas of Lake Macquarie in the north and the Wyong River floodplain in the south. Council's flood mapping was updated in 2009 for key catchments in the Structure Plan area, including the Porters Creek catchment, and this has been used to identify which areas in the study area are not suitable for development.

A key principle applied to the Structure Plan has been to not intensify land use in areas that could be at risk from increased flooding. Detailed flooding investigations will need to be undertaken as part of local planning and will need to consider a range of additional factors including proposed landuse and the potential for mining-related subsidence.

2.3 Biodiversity

The Structure Plan area falls within coastal lowlands and associated floodplain communities. The historic landuse pattern within this area has resulted in a fragmented natural landscape. Future development within the identified development precincts will also require additional clearing.

To achieve a sustainable biodiversity outcome for the study area it is necessary to connect landscapes, which include smaller and larger patches, core protected areas, stepping stones as well as linear corridors. Developing a system of corridors and habitat networks is important in the context of past landscape fragmentation and a future need to allow species to adapt to climate change. The objectives of landscape connectivity are to¹:

1. Provide habitat for resident species and supplementary habitat for wide-ranging species;
2. Assist movement of dispersing or migratory species;
3. Maintain genetic interchange between populations; and
4. Support ecosystem processes.

¹ Scotts D (2003) Key Habitats and Corridors for Forest Fauna: a Landscape Framework for Conservation in North-East New South Wales. Occasional Paper 32. New South Wales National Parks and Wildlife Service, Sydney

Following on from the Structure Plan, further detailed environmental and landuse planning will be required to determine more precisely the amount of vegetation that may be lost by land development, and the areas that may need to be set aside as offsets, to compensate for that vegetation loss. These investigations will need to occur as part of the preparation of future planning proposals and could occur on several different levels e.g. LGA-wide, for the Structure Plan area or for a specific site, precinct or precincts. The identification of potential offset land could extend beyond the boundaries of the Structure Plan area, and possibly outside of Wyong LGA.

It is expected that the majority of the land within the proposed corridor and habitat networks (the 'green corridor') will remain in private ownership, with appropriate zoning and land use controls. The highest quality sites, that meet acquisition criteria, may be considered for acquisition or transferral into public ownership. A Regional Conservation Plan is also expected to identify which areas could be targeted for future conservation offsets and the range of planning and conservation tools which could be applied to these areas.

2.4 Mineral resources

Much of the Structure Plan area is underlain by coal resources. There are also significant clay and gravel deposits within the study area. Key resource developments are shown on Map 1 – Resource Development.

2.4.1 Coal

The impact of underground mining activities on surface development can be managed by applying building controls and staging surface development so that it occurs after coal has been extracted and surface subsidence is largely complete. The potential for future coal extraction and subsidence has been a key consideration in the development of the staging plan.

Large parts of the Structure Plan area are within Mine Subsidence Districts (MSDs) which are areas that could be subject to future land subsidence. Most substantial building works in MSDs requires approval from the Mine Subsidence Board (MSB) and must be designed according to the MSB's design requirements.

The MSB and the Office of Resources and Energy will need to be consulted as part of future planning proposal processes to determine the most appropriate surface controls which will apply to new development. As the existing surface controls allow 2-storey masonry construction across most MSDs in Wyong, they may only need to be reviewed where a development precinct:

- Has viable coal underneath it but it is not currently in a MSD (e.g. Precinct 4 falls in this category);
- No longer has a known economically viable coal resource underneath it; and
- Has areas which are suitable for development forms that are not permitted under the current surface controls (e.g. medium density residential development in and around centres).

2.4.2 Clay and Gravel

Both clay and gravel resource areas are identified by State planning policy and directions, to ensure their existence is considered in future local planning. Both resources could continue to be extracted over the long-term and provide important construction materials for the Central Coast and surrounding regions. The clay resource has State significance due to the quality of the clay, the existence of a roof tile manufacturing plant and its proximity to the Sydney

Metropolitan market and major transport infrastructure. The gravel resource has regional significance. Planning for these areas and the surrounding areas needs to ensure that:

- Mining and quarrying remains a permissible use, with development consent, in the resource areas;
- Appropriate landuse buffers are provided between these areas and future development; and
- These areas contribute to the longer-term formation of a green corridor, both during extraction (e.g. by maintaining existing vegetation links and/or restoration on areas not being quarried or mined) and on completion of resource extraction.

2.5 Housing and employment

The housing and employment capacity targets for the Structure Plan area are established under the Central Coast Regional Strategy.

2.5.1 Housing

The Regional Strategy identifies several key factors likely to influence the Central Coast housing market:

- Young families moving to the region and contributing to high birth rates;
- Influx of retirees who have an increasing life expectancy;
- Increasing life expectancy and birth rates in the current population; and
- Increasing number of single person households in traditional retirement areas.

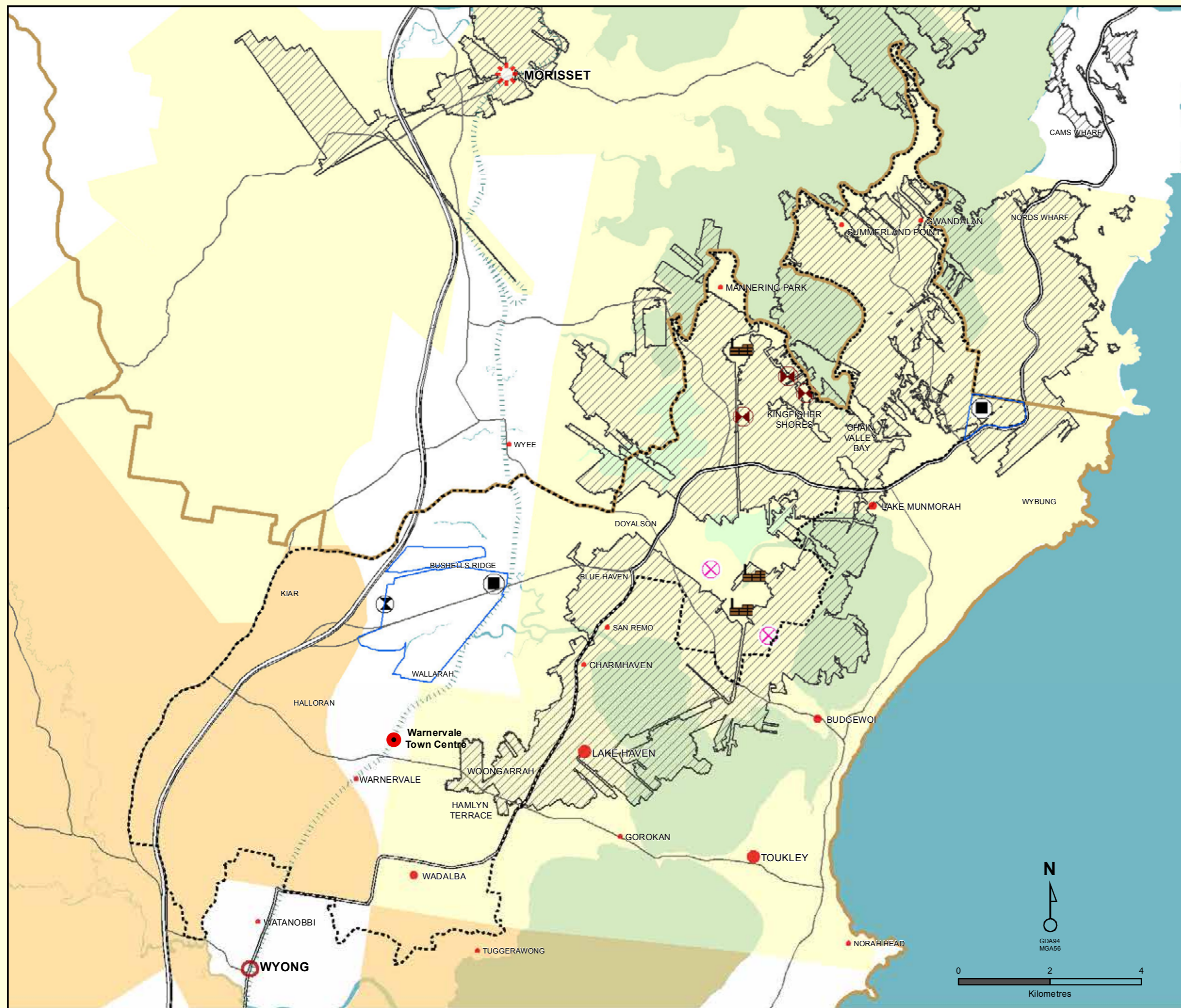
The adjusted Regional Strategy housing capacity target for the Structure Plan area was 17,400 new dwellings from 2006 to 2031 (e.g. 700 per year over that period). This figure includes sites now zoned for residential development but not yet developed, and the Warnervale Town Centre.

The Structure Plan adopts a minimum density target of 15 dwellings per hectare of developable land for new residential areas. It is expected that there will be a variety of dwelling types including detached dwellings at lower densities through to apartments, town houses and villas. Any potential shortfall in achieving the targeted residential densities due to localised development constraints (e.g. surface subsidence controls, biodiversity and flooding) is expected to be offset by medium density development opportunities in and immediately around centres, minor infill development in existing urban areas and development within areas identified for further investigation.

2.5.2 Economy and employment

Almost half the employed people who live in Wyong LGA work outside of the LGA. The Regional Strategy aims to increase local employment and establishes a minimum employment capacity target for the Structure Plan of 12,000 additional jobs by 2031. Included in this target are 1,200 jobs in and around Warnervale Town Centre and 6,000 in the WEZ. New jobs are expected to be located in:

1. Industrial lands with job densities that range between 10 and 20 jobs per hectare;
2. New centres and specialised employment nodes that form around major employment nodes such as Wyong Hospital, schools and the power stations; and
3. Home businesses, either distributed throughout the urban area or in purpose-built housing and employment estates.



Legend

- Major Centre
 - Emerging Major Regional Centre
 - Town
 - Village
 - Neighbourhood
 - Wyong LGA Boundary
 - North Wyong Shire Structure Plan Area
 - Railway Lines
 - Freeway
 - Highway
 - Main Road
 - Rivers
 - Power Stations
 - Quarry
 - Operating Mine
 - Decommissioned Mine
 - Proposed Mine
 - Extractive Resource Areas (Clay and Gravel)
- ### Coal Resource
- Colliery Holdings
 - Coal Exploration Licence
 - Known Historic Coal Mine Workings (Approximate)



North Wyong Shire Structure Plan

MAP 1 - RESOURCE DEVELOPMENT

Crown Copyright Feb 2006 NSW Government.
 This map is not guaranteed to be free from error or omission. Therefore the State of NSW and its employees disclaim liability for any act done or omission made on the information in the map and any consequences of such acts or omissions.
 Date: Mar 2012 Author: Sina Mavaddati - Planning Operations Coordination

It is anticipated that within the Structure Plan employment precincts, Wyong Council's more detailed strategic planning may identify opportunities for more intensive employment activities than traditional industrial development. For example, opportunities may arise for more traditional centre support activities to be located close to the proposed Lake Munmorah centre and a specialised, health-based employment node could be developed to complement Wyong Hospital.

Given the high number of workers who travel outside of the Region for work each day, the Structure Plan has identified additional employment land beyond that required to meet the minimum Regional Strategy targets. It is expected that due to its location, the nature of the land available, and market position, the Structure Plan area will continue to attract a range of employment activities including warehousing and storage activities, with lower job densities. The Structure Plan identifies employment land that is:

- Close to both existing and future residential areas and services; and
- Close to key transport nodes and transport corridors which would be suitable for large-scale employment development that services a broader market.

2.6 Infrastructure and Services

The provision of infrastructure is critical to the quality of people's lives, the efficient functioning of places and to the State's economic competitiveness. Without sound infrastructure planning, the delivery of roads, schools, hospitals and other key services by all levels of government risks being inefficient, delayed and/or more costly.

As the Structure Plan area accommodates the majority of the Central Coast region's future greenfield housing and employment growth over the next 20 years, a key challenge will be providing adequate infrastructure to meet the needs of people living and working in the North Wyong area.

The NSW Government has put in place new governance arrangements for the management of the State's infrastructure. This allows planning, prioritising, funding and delivery of infrastructure in a coordinated, efficient manner across government for all levels of infrastructure leading to better economic and social results across the State.

New governance arrangements for infrastructure planning in NSW

The New South Wales Government has established new structures and processes to better plan, prioritise, fund and deliver infrastructure across NSW. Infrastructure NSW has been established to improve the identification, prioritisation and delivery of critical infrastructure in the State.

Specific functions and activities to be undertaken by Infrastructure NSW include:

- preparation of a 20 year State Infrastructure Strategy
- preparation of 5 year infrastructure plans
- sector State Infrastructure Strategy statements (for example, water)
- coordination of major infrastructure projects (exceeding \$100 million)

To complement Infrastructure NSW, the Department of Planning and Infrastructure (DP&I) ensures that there are better linkages between land use planning, infrastructure delivery and development. DP&I will coordinate planning for the provision of infrastructure by identifying where infrastructure needs to be augmented to support growth and preparing Growth Infrastructure Plans. The aim of this process will be to ensure that, as far as possible, the necessary infrastructure is provided to enable the timely development of an area.

The North Wyong area already has substantial investment in infrastructure, including:

- The F3 Sydney to Newcastle Freeway, the Pacific Highway, and regional roads such as the Motorway Link, Sparks Road and Central Coast Highway/Elizabeth Bay Drive.
- The Sydney to Newcastle rail line provides a key link between the North Wyong area and Sydney and Newcastle for both freight and passenger movements and Gosford and Tuggerah-Wyong for passenger movements.

- Additionally, there is already a significant local road network and Wyong Council upgrades to the road network within the Warnervale and Wadalba release areas, including Warnervale Link Road, will ultimately connect Watanobbi with Sparks Road through to Warnervale Town Centre.
- The Structure Plan area is serviced by both Wyong Hospital and Gosford Hospital, the principal referral hospital for the region.
- Higher education opportunities include University of Newcastle – Central Coast's Ourimbah Campus and TAFE NSW campuses at Wyong and Ourimbah.

As parts of the Structure Plan area transition to urban areas, the residential and employment growth will result in the need for new infrastructure or upgrades to existing infrastructure such as:

- Transport (roads, rail and public transport, pedestrian and cycle ways)
- Water
- Sewerage
- Drainage
- Community buildings
- Open Space
- Health facilities
- Education buildings
- Energy infrastructure

This infrastructure can be provided in a number of ways as the planning and delivery of infrastructure is shared between many parties such as State Government agencies, Local Government, Commonwealth Government, as well as developers through development contributions and private sector investors.

As the area develops, infrastructure will be delivered by private developers and/or programmed into the State and local council capital works programs in stages with a view to keeping pace with the new urban development that is occurring. The State Government's new infrastructure governance processes outlined above will help ensure that the right State infrastructure is delivered in a timely way.

To facilitate the early stages of development in the area, major new infrastructure investments are already underway such as the:

- Recently opened \$120M Mardi - Mangrove Creek dam link which is a key step to implementing the Gosford - Wyong Council's 'WaterPlan 2050' and securing the region's future water supply needs;
- Funding the construction of the new intersection between Sparks Road and the new Warnervale Town Centre access road under the Government's \$181 million Housing Acceleration Fund;
- Construction of water and sewer infrastructure for the Warnervale Town Centre by Council and with the assistance of \$4.5 million in Federal funding, and
- Warnervale GP super clinic which is currently under construction.

The long term planning vision provided by the Structure Plan will assist all levels of government to identify, plan for and prioritise the future needs of the northern areas of the Wyong LGA. To ensure that planning for infrastructure, services and land use is integrated, the Government will continue to work co-operatively with Wyong Shire Council.

3. The Structure Plan development strategy

The Structure Plan future development areas, and the corridor and habitat networks (the ‘green corridor’) are identified on Map 2. The proposed precincts to accommodate residential and employment uses have an area of approximately 1,900 hectares.

The Structure Plan identifies more employment land than may be required to meet the Regional Strategy targets. Identifying additional potential development areas will:

- Allow additional land to be brought on line if there is a higher than expected demand;
- Provide a future land reserve if detailed local planning processes show that expected employment or residential capacity targets cannot be achieved, for example, due to environmental or extractive resource constraints; and
- Provide capacity for more local jobs and growth past 2031.

Development in the Structure Plan area will support development in the southern part of the Lake Macquarie LGA, including the Wyee Strategy area which is also planned for additional development.

There are some areas within the study area for which the Structure Plan does not make any additional recommendations. These areas include existing urban areas and other areas which are not suitable for future urban development or inclusion in the green corridor network. A decision on the future landuses in these areas will be considered in the context of Council’s proposed Settlement Strategy and new LEP (refer section 4.2).

The Structure Plan does not identify any areas within the study area, as being suitable for additional rural-residential development. Wyong Council may consider whether there are any other areas suitable for rural-residential development, outside of the Structure Plan area, as part of their Settlement Strategy and Comprehensive LEP process.

The Structure Plan is a high level strategy that has been prepared on the basis of sub-regional data. More detailed investigation may conclude that parts of the currently proposed development areas or proposed landuses are not appropriate. For example, detailed flooding or flora and fauna investigations, undertaken to support a future planning proposal that seeks to rezone some of the development precincts for urban development, may identify areas on the fringe of a development precinct which are not suitable for development but should more appropriately be included in the green corridor. Equally, the development precinct boundaries may need to be amended slightly if an area on the fringe is, by its features, not suitable for inclusion in the green corridor. Any future planning proposal within the Structure Plan area will need to demonstrate that it meets the overall objectives of the Structure Plan.

3.1 The development precincts

The initial focus for development in the Structure Plan area will be around the broader Warnervale/ Wadalba release area in the southern half of the study area. These areas will support continued development of these areas and the establishment of Warnervale Town Centre and the WEZ and can be more efficiently serviced by new or upgraded infrastructure than areas to the north. In the longer term, development is expected to occur around the Doyalson and Lake Munmorah corridor and areas on the southern shores of Lake Macquarie. The list of Precincts, their size and potential housing and employment yield is outlined in table 2 (Appendix 1).

The housing and employment capacity estimates are based on a broad assessment of the Net Developable Area (NDA) which could be achieved in each of the identified development

precincts. The actual development potential for each area will be determined as the land is more closely investigated and rezoned for urban development. Future reviews of the Regional Strategy and Structure Plan will assess whether the expected yields within the study area have been achieved and, if necessary, how any shortfall in development capacity could be made up, either in the Structure Plan area or elsewhere in the region.

3.1.1 Employment

The Structure Plan area has a total employment capacity of between 12,150 and 17,100 new jobs, including areas with an existing employment zoning at Warnervale Town Centre (1,200 jobs) and the WEZ (6,000 jobs).

Initiatives in the Structure Plan area which will improve local employment opportunities include:

- Expanding existing employment nodes at Charmhaven and Doyalson;
- Developing new employment areas in the WEZ, Doyalson North and Bushells Ridge;
- Developing new employment areas at Lake Munmorah to service new urban areas and provide landuse buffers around the power stations;
- Developing a specialised employment node in proximity to Wyong Hospital and exploring similar opportunities for other major infrastructure (e.g. schools and the power stations); and
- Developing new centres at Warnervale, Wadalba East, Lake Munmorah and Gwandalan.

Wyong Council will undertake more detailed investigation to determine the appropriate role of these centres and scale of development, the relationship between centres and the appropriate surrounding landuses to support these centres.

3.1.2 Residential

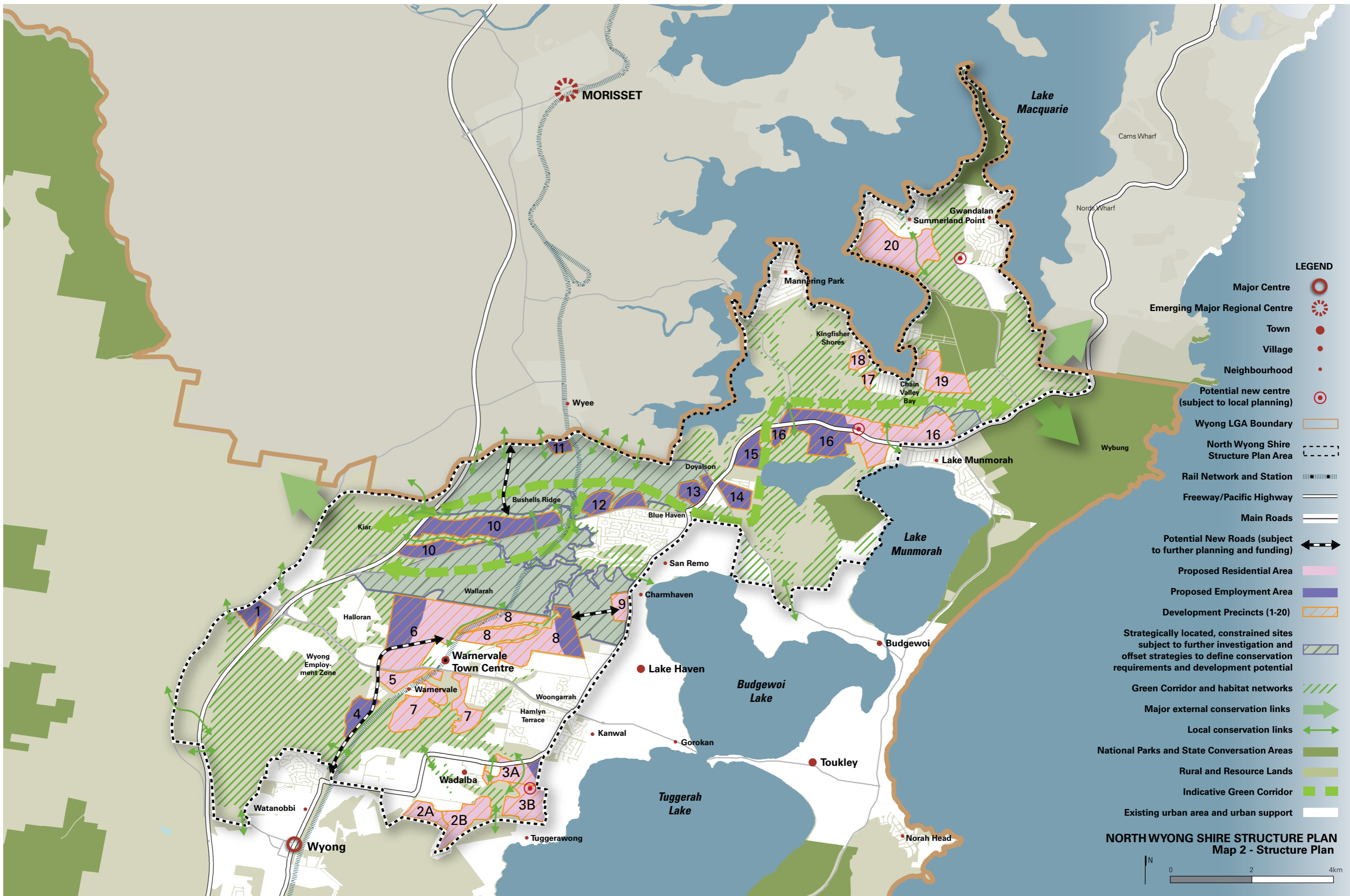
The future residential development areas and the potential dwelling yield are listed in Appendix 1. The Structure Plan area has capacity for almost 17,000 new dwellings to 2031. This development is expected to occur in the Warnervale Town Centre (1,650 dwellings), other areas already zoned for urban development but not yet developed and future release areas. These dwellings could accommodate an additional population of almost 37,400 persons over the long term, should all of these dwellings be developed and occupied.

The final residential development capacity estimate differs from the figures in the draft Structure Plan as a result of development occurring in the study area since the draft plan was prepared and the capacity targets for the Warnervale Town Centre being revised as part of the 2012 review of the planning provisions that apply to that site.

Residential development in the Structure Plan area is expected to occur within the walking catchments of planned and existing centres and public transport routes. In and immediately around centres, housing is expected to be in a variety of forms of medium density housing, depending on the centres hierarchy, for example:

- Warnervale Town Centre - within 800m distance of the centre;
- Proposed new village centres at Wadalba East, Lake Munmorah and Gwandalan – within 400m-600m of the centre; and
- Neighbourhood centres (e.g. the existing Warnervale village and development near Charmhaven shops, etc) – within 150m of the centre.

For areas which are further away from centres, a minimum density of 15 dwellings per gross hectare of development land should be achieved.



3.2 Development area staging

The staging of development within the Structure Plan area has been developed with input from Wyong Council and the Office of Resources and Energy. The staging plan is shown in Map 3 and Table 1. The staging plan has been determined by:

- The ability of State and local government to provide key infrastructure services in an orderly and cost-efficient manner, especially water and sewerage, which are a responsibility of Council;
- The potential timing of extraction of important mineral/ coal resources; and
- Whether development will support the establishment of the WEZ and Warnervale Town Centre.

Table 1 sets out the preferred Staging Plan for the Structure Plan. The actual timing of development will depend on a range of factors, including the economic conditions and the market, and the demand for additional housing and employment land. Close monitoring will be required to ensure that an adequate supply of land is maintained.

Table 1: Preferred staging and estimated development yield

Order of Development	Description	Location	Residential	Employment
			15 Dwellings/ hectare	10 -20 Jobs/ hectare
Short	Land already zoned and serviced which is expected to begin to develop in the coming years	Warnervale Town Centre, WEZ and parts of Wadalba, Woongarra, Hamlyn Terrace and Bushells Ridge	4,600	8,460 – 9,720
Medium	Land that is expected to be zoned in the next 15 years	Parts of the Warnervale, Wadalba, Charmhaven and Gwandalan areas	7,970	680 – 1,360
Long	Land that will not be zoned before 15 years, the timing of which will be impacted by future coal extraction potential, future use of the power station sites and access to services and employment opportunities	The final stages of the WEZ, Warnervale and Bushells Ridge areas. Also areas to the north at Doyalson, Lake Munmorah, Summerland Point and Chain Valley Bay	4,130	3,010 – 6,020
Total			16,700	12,150 - 17,100

Staging plans must maintain enough flexibility to allow additional land to be released, when required but to also ensure that there is not an over or under supply of land. The Government and Wyong Council may decide to accelerate the release of land if satisfactory arrangements

are in place to forward fund the appropriate infrastructure and other factors, such as the supply or demand for additional land, support an earlier release. The Structure Plan and the Staging Plan will be reviewed as part of future reviews of the Central Coast Regional Strategy.

Sites which are rezoned for urban development will be identified as short-term release precincts in future reviews of the Structure Plan. Examples of where this is likely to occur include the area around Warnervale Village station (Precincts, 4, 5 and 7) which are in the process of being rezoned.

The staging of development of any future urban land within the ‘strategically located’ sites is expected to be generally consistent with the staging identified for the adjoining land.

3.3 Biodiversity planning for the Structure Plan area

The Structure Plan process has identified the opportunity to provide a system of corridor and habitat networks in the Structure Plan area, known as the ‘green corridor’. The green corridor includes valuable vegetated areas that contain endangered ecological communities, threatened species and habitats, riparian environments and wetlands. The green corridor also includes areas that have been disturbed and degraded as a result of past landuse, however are also strategically located in terms of conservation connectivity and which can potentially be revegetated in the future.

Many of the properties within the proposed green corridor have physical attributes which would impact on their ability to be developed and are less well suited for development than the nominated development precincts. For example, much of the existing vegetation in this area is already protected under State and/or Federal legislation. Without the Structure Plan providing a strategic framework for decision making, decisions would be made on a site by site basis which is likely to lead to poor development and biodiversity outcomes.

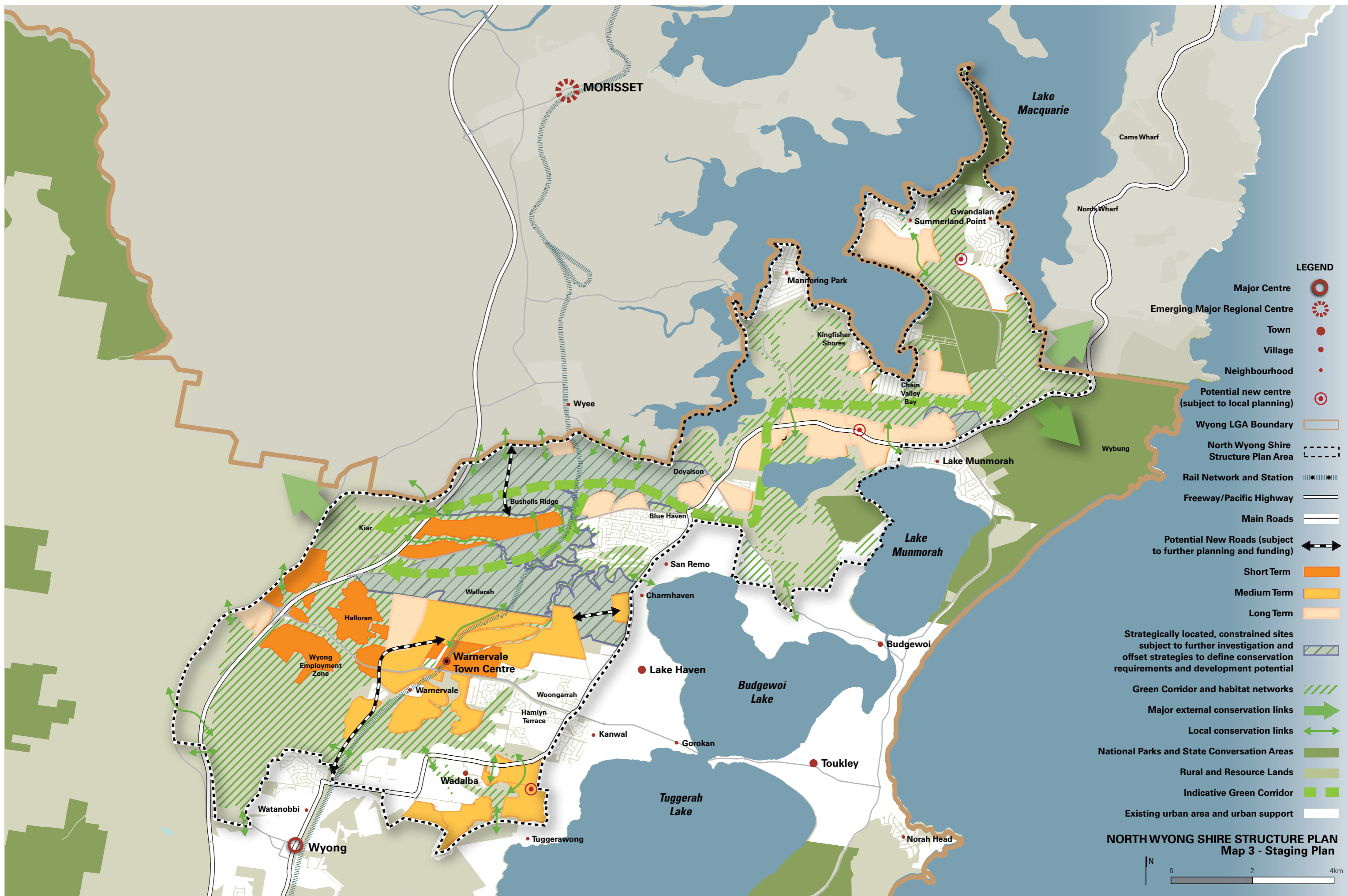
Although preferable, corridors are not necessarily continuous, but contribute to the retention and/or restoration of natural connectivity. Within and adjoining the corridor and habitat network areas, there are a range of areas where future improvements in biodiversity connectivity can provide a significant benefit to wildlife movement.

The green corridor aims to link the mountain areas in the west of the region to the ocean foreshore in the east. The corridor will also link through to the proposed Watagan-Stockton and Wallarah green corridors in the adjoining Lower Hunter region.

The Structure Plan Map (Map 2) illustrates the green corridor, the preferred east-west route for the corridor and several desirable corridor linkages within and adjoining the study area.

The green corridor will also reinforce the landscape and visual setting for urban development within Wyong LGA. This area can also provide opportunities for low impact, passive recreation activities including pedestrian and cycle paths which link to nearby urban development. The biodiversity and landscape planning objectives behind the establishment of the green corridor are:

- To improve the extent and condition of biodiversity in the region;
- To ensure connectivity for organisms at a landscape and regional scale;
- To provide landscape permeability to improve long-term ecological resilience;
- To facilitate adaptation to climate change through the protection and conservation of areas which enable fauna migration and dispersal, and the dispersal of plants;
- To maintain and enhance water flows, water quality, aquatic environments and groundwater dependent ecosystems;
- To protect and conserve Aboriginal cultural heritage;



- To improve the visual amenity of the region, and provide an attractive landscape setting for future development;
- To provide opportunities for public and private conservation;
- To provide for a range of land uses, where appropriate that do not adversely affect the overall function of the corridor, including dwellings, passive recreation and infrastructure; and
- To improve the health and well-being of the population.

3.4 Strategic land subject to further investigation

The Structure Plan identifies land in the north-west and north-east of the study area which is strategically located in relation to existing and proposed infrastructure (e.g. major roads, water and sewer) but will also contribute to the formation of the green corridor. Parts of Bushells Ridge and Wallarah also have significant clay resources underneath them. These areas warrant more detailed local investigation particularly in respect of ecology and stormwater management to more clearly determine their conservation and development potential (see Map 2). The scope of these assessments is outside the capacity of a Structure Plan, however it is important to identify that these areas are strategically located, and will be considered for further investigation.

It is acknowledged that some proposals for strategically located land may progress independently of other sites. The Structure Plan provides a framework and context for identifying and assessing future development opportunities in these areas, and for planning proposals to be prepared and progressed. The key planning issues that need to be addressed for these areas include:

- More detailed understanding of the environmental features of the land and opportunities to contribute to the proposed corridor and habitat networks;
- Resource extraction potential related to proposed coal mining and clay extraction (where these localised impacts occur);
- Opportunities to offset vegetation losses within future development areas;
- How the proposed development will relate to future development and the green corridor; and
- The need for additional residential or employment uses to meet future demand.

The key objective for these sites will be to achieve a balance between development and biodiversity conservation, within the broader context of the green corridor. Detailed ecological investigations will need to focus on:

- The location, nature and conservation value of the vegetated land including any threatened species listed under State and Federal legislation;
- The role of this land, or parts of the land, in complementing the green corridor;
- The location of local corridors, including riparian areas, and links to planned corridors outside the Structure Plan area; and
- The extent of potential biodiversity losses from development and the need for and extent of offsets.

4. Implementation

Implementation of the Structure Plan will occur over many years. Future planning proposals and local strategies will need to demonstrate consistency with the Structure Plan as a key landuse strategy of the Regional Strategy and under s.117 No. 5.1 – Implementation of Regional Strategies.

4.1 Coordination of land release

The NSW Government and Council will coordinate and monitor residential and employment land release through use of tools such as the Metropolitan Development Program and the Employment Lands Development Program. Decisions on the release of land will be coordinated to assist the efficient provision of infrastructure and the timely availability of land for development.

4.2 Wyong Local Environmental Plan 2012

Wyong Council is currently preparing a new Local Environmental Plan (LEP) which will replace Wyong LEP 1991. The new LEP will be based on a Standard Instrument which is being progressively implemented throughout NSW. The Standard Instrument introduces a suite of zones and planning provisions for use by local councils. Councils may modify and add to the LEP in some circumstances to reflect local conditions.

Many of the existing zones in Wyong LEP 1991 will readily translate into broadly equivalent zones in the Standard Instrument LEP. For example the residential zones in the Wyong LEP 1991 (e.g. 2(a) and 2(b)) are expected to become 'R' (residential) zones in the new LEP. Existing business zones (e.g. 3(a) and 3(b)) will become 'B' business zones in the new LEP. In some cases translation of zones in the Structure Plan area will be more complex and may be supported by additional mapping to reflect site characteristics.

Some particular situations of interest within the Structure Plan area are listed below. Most of these issues will need to be resolved by Council as part of the preparation of their new LEP:

- Power station holdings – should be zoned to reflect their dominant use but may be supported by overlays and/or an environmental zone that reflects the environmental values of undeveloped land. It is recommended that operational areas within the power station sites be given an SP Infrastructure zone to reflect their use as key pieces of infrastructure and that Council, the Office of Environment and Heritage and Delta Electricity work together to determine the best approach for the buffer areas;
- Scenic protection land developed as manufactured home estates – should be zoned to allow that use to continue on the site. Council will also need to determine whether manufactured home estates should continue to be permitted to occur in areas where they are currently permitted, but not yet developed. Council will need to consider the proximity to future development areas, infrastructure and services in making this decision;
- Investigation zone – as there is no equivalent for the existing 10(a) Investigation zone in the Standard Instrument, there may be other zones that are appropriate depending on the land's characteristics and its designation on the Structure Plan map (Map 2);
- Land identified on the Structure Plan for future development can also be progressively included on a Land Release Map in the new LEP and an associated local clause will apply. Among other things, this will allow future potential land use to be taken into consideration as part of the development assessment process, as currently occurs in

areas that are zoned 10(a). Further consideration will need to be given to the appropriate time when this should occur;

- Land identified on the Structure Plan for biodiversity corridors and linkages should be progressively zoned to reflect the intended environmental outcome for the land. Council will need to ensure that approved land uses can continue to operate and that land appropriate land use and development controls apply to these areas. Mapping overlays supported by local clauses to be used during development assessment can be used to reflect the specific environmental attributes of the land and to support a more detailed layer of development controls that could apply to the land; and
- Land identified as being strategically located, constrained and requiring further investigation is dependent on resolution of key planning issues as outlined in section 3.4. In the interim this land will need to be given a zone in the new Wyong LEP based on a combination of its current development potential, its environmental characteristics and its designation on the Structure Plan map (Map 2).

The Standard Instrument LEP allows different development standards, such as building heights, floor space ratios and minimum lot sizes, to be applied to different land within the same zone. This allows councils to fine tune the future development that may occur on land within a zone.

While the overarching aim of the Standard Instrument is to provide a standardised and modernised set of planning controls across the State, there is some capacity for Council LEPs to include specific local clauses.

4.3 Development Control Plan

Council will prepare an updated Development Control Plan (DCP) for release with the new LEP. The DCP could also include controls to support development in the Structure Plan area. It is likely that, in the first instance, the controls for the Structure Plan will be quite broad with more detail added as local planning takes place.

4.4 Ongoing land release via the precinct planning process

Once the Wyong comprehensive LEP is finalised there will be a need for ongoing release of the precincts identified in the Structure Plan. This will include detailed investigation of precincts to identify the location of infrastructure, roads and schools, parks, local biodiversity conservation areas and riparian corridors.

An example of this detailed assessment is the rezoning investigations that Council is undertaking for the area around the existing Warnervale train station (Structure Plan precincts 4, 5 and 7). This area is expected to be zoned for urban development in 2012/13.

Changing the zone and land use controls to enable a precinct to develop can be done through a Planning Proposal that amends Wyong LEP 2012. Alternative mechanisms include the potential for key sites covered by the Structure Plan area to be identified via a State Environmental Planning Policy (or equivalent), as has occurred for the Warnervale Town Centre and the WEZ.

Council's current land release process involves negotiating a cost-sharing arrangement with major landowners within land release precincts. The Structure Plan will be used by infrastructure and service providers, including Government agencies and Council in accordance with the adopted land release strategy. The Warnervale/Wadalba Human Services Planning Strategy is a good example of agency coordination improving the planning for and delivery of infrastructure and services in line with development. This model could be replicated for the planning of other infrastructure and services elsewhere in the Structure Plan area.

APPENDIX 1

Table 2: Proposed development precincts & estimated development yield of Structure Plan area*

Precinct No.	Area name	Land Use	Gross Area	Estimated Net Developable Area (ha)**	Dwellings	Jobs	
					15 /ha	10 /ha	20 /ha
1	Hue Hue Road	Employment	36	25	-	252	504
2A	Wadalba South	Residential	32	22	336	-	-
2B	Wadalba South	Residential	67	47	704	-	-
3A	Wadalba East	Residential	57	40	551	32	63
3B	Wadalba East	Residential	69	48	725	-	-
4	Warnervale South West	Employment	39	27	-	273	546
5	Warnervale South West	Residential	36	25	378	-	-
6	Warnervale North West	Residential & Employment	254	178	1,764	602	1,204
7	Warnervale South East	Residential	140	98	1,470	-	-
8	Warnervale North East	Residential & Employment	221	155	1,764	371	742
9	Charmhaven West	Residential	26	18	273	-	-
10	Bushells Ridge South	Employment	180	126	-	1,260	2,520
11	Bushells Ridge North East	Employment	16	11	-	112	224
12	Doyalson South West	Employment	52	36	-	364	728
13	Doyalson West	Employment	34	24	-	238	476
14	Doyalson East	Employment	34	24	-	238	476
15	Doyalson North East	Employment	37	26	-	259	518
16	Lake Munmorah	Residential & Employment	293	205	1,670	945	1,890
17	Chain Valley Bay West	Residential	8	6	84	-	-
18	Chain Valley Bay North West	Residential	16	11	168	-	-
19	Chain Valley Bay East	Residential	68	48	714	-	-
20	Summerland Point South	Residential	142	99	1,491	-	-
	Wyong Employment Zone***	Employment				6,000	6,000
	Warnervale Town Centre****	Residential, Retail and Commercial			1,650	1,200	1,200
	Other existing zoned areas*****	Residential			2,940		
ESTIMATED TOTAL DEVELOPMENT YIELD			1,857	1,299	16,682	12,146	17,091

* Some of the figures in this table have been rounded up or down in the body of the Structure Plan document

** Net Developable Area calculation is based on an estimate that 70% of each development precinct will be available for development following the detailed precinct planning and investigation process

*** The Wyong Employment Zone has been zoned for a total employment capacity of 6,000 jobs

**** The Warnervale Town Centre has been zoned for a range of landuses, including both residential and retail/commercial development

***** These areas include release areas that are zoned for residential development but are not yet developed (e.g. parts of Gwandalan, Wadalba and Hamlyn Terrace etc.).

Further information

Department of Planning & Infrastructure

Gosford Office

Level 3, 107 Mann Street (via Donnison Street), Gosford NSW 2250

Ph: 02 4348 5000

Fax: 02 4323 6573

Email: centralcoast@planning.nsw.gov.au

Web: www.planning.nsw.gov.au/central-coast-region

A translating and interpreting service is available. Please telephone 131 450, ask for an interpreter in your language and request to be connected to the Department of Planning & Infrastructure's Information Centre on ph: (02) 9228 6333. Local call cost from fixed phones. Calls from mobiles at applicable rates.

02

Land Use Provisions

02 A

Land Use Table

Land Use Tables

The Wyong Local Environmental Plan (LEP) 2013 is the principal Environmental Planning Instrument applying to the subject land.

The land is currently zoned part E2 Environmental Conservation, part IN2 Light Industrial and part RE1 Public Recreation. The zones proposed are B2 Local Centre, R2 Low Density Residential R1 General Residential. The land use tables, identifying the objectives, permissible and prohibited land uses for the existing and proposed zones are provided below:

Zone R1 General Residential

1 Objectives of zone

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To promote "walkable" neighbourhoods.
- To ensure that development is compatible with the scale and character of the local area and complements the existing streetscape.

2 Permitted without consent

Home occupations

3 Permitted with consent

Attached dwellings; Bed and breakfast accommodation; Boarding houses; Boat launching ramps; Boat sheds; Car parks; Caravan parks; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Educational establishments; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Home-based child care; Home businesses; Home industries; Home occupations (sex services); Hostels; Hotel or motel accommodation; Information and education facilities; Jetties; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Residential flat buildings; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Serviced apartments; Shop top housing; Signage; Tank-based aquaculture; Water recycling facilities; Water reticulation systems; Water storage facilities

4 Prohibited

Any development not specified in item 2 or 3

Zone R2 Low Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

- To maintain and enhance the residential amenity and character of the surrounding area.
- To provide a residential character commensurate with a low density residential environment.

2 Permitted without consent

Home occupations

3 Permitted with consent

Bed and breakfast accommodation; Boarding houses; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Car parks; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Health consulting rooms; Home-based child care; Home businesses; Home industries; Information and education facilities; Jetties; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Shop top housing; Tank-based aquaculture; Water recycling facilities; Water reticulation systems; Water storage facilities

4 Prohibited

Any development not specified in item 2 or 3

Zone IN2 Light Industrial

- To provide a wide range of light industrial, warehouse and related land uses.
- To encourage employment opportunities and to support the viability of centres.
- To minimise any adverse effect of industry on other land uses.
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.
- To support and protect industrial land for industrial uses.

1 Objectives of zone

2 Permitted without consent

Nil

3 Permitted with consent

Depots; Food and drink premises; Garden centres; Hardware and building supplies; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Neighbourhood shops; Oyster aquaculture; Places of public worship; Plant nurseries; Roads; Rural supplies; Tank-based aquaculture; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Eco-tourist facilities; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function

centres; Heavy industrial storage establishments; Home-based child care; Home businesses; Home occupations; Home occupations (sex services); Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Open cut mining; Passenger transport facilities; Pond-based aquaculture; Recreation facilities (major); Registered clubs; Residential accommodation; Rural industries; Tourist and visitor accommodation; Water recreation structures; Wharf or boating facilities

Zone RE1 Public Recreation

1 Objectives of zone

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To provide linked open space for ecosystem continuity, public access, local community recreation and waterway protection.
- To provide space for integrated stormwater treatment devices for flow and water quality management.
- To enable ancillary development that complements land zoned for recreational purposes.

2 Permitted without consent

Nil

3 Permitted with consent

Aquaculture; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Camping grounds; Caravan parks; Charter and tourism boating facilities; Centre-based child care facilities; Community facilities; Eco-tourist facilities; Emergency services facilities; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Food and drink premises; Function centres; Information and education facilities; Jetties; Kiosks; Marinas; Markets; Mooring pens; Moorings; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Respite day care centres; Roads; Sewerage systems; Waste or resource management facilities; Water recreation structures; Water supply systems

4 Prohibited

Any development not specified in item 2 or 3

Zone B2 Local Centre

1 Objectives of zone

- To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area.
- To encourage employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To permit residential accommodation while maintaining active retail, business and other non-residential uses at street level.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.

2 Permitted without consent

Nil

3 Permitted with consent

Boarding houses; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Information and education facilities; Medical centres; Oyster aquaculture; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Service stations; Sewage reticulation systems; Shop top housing; Tank-based aquaculture; Tourist and visitor accommodation; Water reticulation systems; Water storage facilities; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Boat building and repair facilities; Camping grounds; Caravan parks; Cemeteries; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Industrial retail outlets; Industrial training facilities; Industries; Marinas; Mortuaries; Open cut mining; Pond-based aquaculture; Recreation facilities (outdoor); Research stations; Residential accommodation; Resource recovery facilities; Rural industries; Sewerage systems; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste disposal facilities; Water supply systems; Wharf or boating facilities; Wholesale supplies

03

Agency Responses

03 A

Roads and Maritime Services



22 October 2015

CR2015/003372
SF2013/015403
KAP

General Manager
Wyong Council
PO Box 20
WYONG NSW 2259

Dear Rod Mergan,

PLANNING PROPOSAL FOR REZONING OF LAND, LOT: 20 DP: 1089946; LOT: 1 DP: 1043151;
LOT: 3 DP: 740701, 44W, 50W AND 60 PARRAWEENA ROAD, GWANDALAN

Reference is made to Council's email received 8 October 2015 (your reference: RZ/2/2015), regarding the subject Planning Proposal which was forwarded to Roads and Maritime Services for consideration.

Roads and Maritime understands that Council has received a Gateway Determination from the Department of Planning and Environment pursuant to Section 56(2)(d) of the *Environmental Planning and Assessment Act 1979* in respect of the subject Planning Proposal. The delegate of the Minister for Planning and Environment has directed Council to consult with Roads and Maritime in relation to the Planning Proposal.

It is further understood that the proposal seeks to amend the existing planning controls to enable the rezoning of land at 44W, 50W and 60 Parraweena Road, Gwandalan to permit a mix of commercial and residential development.

Roads and Maritime response

Roads and Maritime has reviewed the information provided and has noted that the proposed rezoning is generally consistent with zoning adjoining the subject sites and will not result in significant impacts to the classified (State) road network.

Continued consultation on this Planning Proposal would be appreciated to ensure that both Roads and Maritime and Council's interests are addressed.

Roads and Maritime Services

Should you require further information please contact Kylie-Anne Pont on 4924 0683 or by email at development.hunter@rms.nsw.gov.au.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'KMG', with a large, stylized loop at the end.

Kellee McGilvray
Manager Land Use Assessment
Hunter Region

03 B

**Department of Planning,
Industry and Environment –
Biodiversity and
Conservation Division**

Our ref: DOC19/643791-6

Your ref: CC140143

Rianan Rush
Senior Strategic Planner
Urban Planning and Development
Central Coast Council

Rianan.Rush@centralcoast.nsw.gov.au

Dear Ms Rush

Planning Proposal in respect of Lot 20 DP 1089946, Lot 1 DP 1043151, Lot 3 DP 740701 44W, 50W & 60 Parraweena Road, GWANDALAN

I refer to your request for advice from Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment (formerly Office of Environment and Heritage), dated 30 July 2019, regarding a planning proposal for a proposed mixed-use development over several lots at Parraweena Road, Gwandalan.

BCD has reviewed the *Planning Proposal for Gwandalan Town Centre (Amendments to Wyong LEP 2013) Kanangra Drive, Gwandalan* dated July 2019 prepared by Barker Ryan Stewart (BRS) and the *Ecological Assessment Report (Revision 1)* dated 22 May 2019 by Anderson Environment and Planning (AEP) in relation to biodiversity and flooding impacts.

BCD is satisfied with the biodiversity and flooding assessments provided and has no biodiversity or flooding comments.

Please note, BCD has not provided comments on Aboriginal cultural heritage at this time. This does not represent BCD support for the proposal, and Aboriginal cultural heritage matters may still need to be considered by the consent authority.

If you require any further information regarding this matter, please contact Peter Nichols, Senior Conservation Planner, on 4927 3103 or via email at rog.hcc@environment.nsw.gov.au

Yours sincerely



19 August 2019

STEVEN COX
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division

03 C

Transport NSW



**Transport
for NSW**

Chief Executive Officer
Wyong Shire Council
PO Box 20
WYONG NSW 2259

Attention: Mr Rod Mergen

Dear Sir/Madam,

Planning Proposal to rezone land on Parraweena Road, Gwandalan (RZ/2/2015)

Thankyou for your email of 8 October 2015 regarding the above proposal. Roads and Maritime Services will be providing a separate response to this referral.

Transport for NSW (TfNSW) has reviewed the proposal and note Council's intention for this new local centre to be a public transport hub for the surrounding villages and future residential areas. In that regard, the *Road Safety Audit and Traffic Impact Assessment & Transport Plan* being prepared for this proposal should address the following issues:

- Pedestrian and bicycle linkages and facilities between the local centre and surrounding areas, including safe crossing facilities
- Facilities for bicycle parking that are well located near the front of shops and offer good passive surveillance
- The provision of bus stops and shelters with legible pedestrian facilities (including safe road crossings) that connect with future businesses in the local centre
- Consultation with the local bus operator on improving services to serve the local centre and the surrounding areas.

Should you have any questions regarding this matter, please contact James Li on 02 8202 2179 or james.li@transport.nsw.gov.au. Formal referral notifications should be sent to development@transport.nsw.gov.au

Yours sincerely,



Mark Ozinga
**Principal Manager, Land Use Planning and Development
Freight, Strategy and Planning**

28/10/15

CD15/18617

03 D

Darkinjung Local Aboriginal Land Council



168 Pacific Highway Watanobbi NSW 2259

PO Box 401 Wyong NSW 2259

Phone (02) 4351 2930

Fax (02) 4351 2946

ABN 99 583 297 167

Email darkinjung@dlalc.org.au

Rod Mergan
Wyong Shire Council
PO Box 20
WYONG NSW 2259

26th October 2015

Dear Mr Mergan,

RE: Planning Proposal in respect of Lot 20 DP 1089946, Lot 1 DP 1043151, Lot 3 DP 740701 44W, 50W & 60 Parraweena Road, Gwandalan.

Thank You for the opportunity to formally respond to the Planning Proposal as listed above.

Darkinjung Local Aboriginal Land Council has reviewed the proposal and there are concerns relating to this proposal for the following reasons:

1. There does not seem to be any record of an Aboriginal Cultural Heritage Site Survey being conducted at any time for this property.
2. There are a number of registered Aboriginal Cultural Heritage sites within the vicinity of the property.
3. The area is considered to be very rich in Aboriginal Cultural Heritage.
4. There seems to be undisturbed and vegetated areas within the property area.

Recommendations:

1. An Aboriginal Cultural Heritage Site Survey must be carried out on Lot 20 DP 1089946, Lot 1 DP 1043151, Lot 3 DP 740701 44W, 50W & 60 Parraweena Road, Gwandalan before any approval for any type of development can be considered.

If you require any further information please do not hesitate to contact me on the numbers listed above.

Yours truly,

Sharon Hodgetts
Senior Project Officer, Culture and Heritage

03 E

NSW Rural Fire Services



NSW RURAL FIRE SERVICE



The General Manager
Central Coast Council
PO Box 20
WYONG NSW 2259

Your reference: RZ/2/2015
Our reference: L14/0001

15 August 2019

Attention: Rianan Rush

Dear Sir/Madam,

Planning Proposal at 44w, 50w and 60 Parraweena Road Gwandalan

Reference is made to Council's correspondence dated 26 July 2019 seeking comment in relation to the above planning proposal which seeks to rezone the land to Local Centre, General Residential and Low Density Residential.

The New South Wales Rural Fire Service (NSW RFS) has reviewed the proposal with regard to Section 4.4 of the directions issued in accordance with Section 9.1 of the *Environmental Planning and Assessment Act 1979*.

The objectives of the direction are:

- (a) *to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and*
- (b) *to encourage sound management of bush fire prone areas.*

The direction provides that a planning proposal must:

- (a) *have regard to Planning for Bushfire Protection 2006,*
- (b) *introduce controls that avoid placing inappropriate developments in hazardous areas, and*
- (c) *ensure that bushfire hazard reduction is not prohibited within the APZ.*

Based upon an assessment of the information provided, the NSW RFS is not satisfied that the proposal is consistent with the directions.

Existing circumstances

With regard to these requirements, the following comments are made in relation to the submitted concept site plan, based on the existing circumstances and requirements of *Planning for Bushfire Protection 2006*.

- The concept plan does not show in all cases the required Asset Protection Zones (APZs).

Postal address

NSW Rural Fire Service
Planning and Environment Services
Locked Bag 17
GRANVILLE NSW 2141

Street address

NSW Rural Fire Service
Planning and Environment Services (East)
4 Murray Rose Avenue
Sydney Olympic Park NSW 2127

T 1300 NSW RFS
F (02) 8741 5433
E records@rfs.nsw.gov.au
www.rfs.nsw.gov.au

In relation to the bushfire hazard that exists to the south of the site, a 25 metres (m) wide APZ is required between the hazard and any residential development. This APZ requirement is based on a calculation of slopes within the range of 0-5° on south/south-eastern and south eastern aspects (N.B. This assessment differs from that of the Bushfire Threat Assessment Report of AEP, which assessed the slope as upslope/flat, requiring a 20m APZ). On the assumption that this section of Summerland Road will be constructed, it would provide 20m of APZ, and therefore an additional 5m is required within the site.

In relation to the bushfire hazard to the east, a 25m wide APZ is required for the entirety of the eastern boundary. The concept site plans shows a perimeter road adjacent to most of the eastern boundary, but not in the north-eastern corner. The width is unable to be determined, but it is apparent part of the APZ would also be required to be within residential lots.

Additionally, for that part of the adjoining land zoned E2 that juts in to the subject site, a 10m APZ is required to the north and south, and a 25m APZ to the west. The road shown on the site concept plan provides this APZ to the south, and in part to the west, but no APZ is shown to the north. The respective APZs will be required.

The concept plan indicates a childcare centre. A childcare centre is a special fire protection purpose, and among other things, requires a larger APZ of 70m in relation to the bushfire hazard to the south. The location indicated in the site concept plan does not allow for this, and therefore is not acceptable in this location.

- The concept plan shows a dead-end road in the north-east of the site.

As set down in section 4.1.3(1) of *Planning for Bushfire Protection 2006* all roads are to be through roads. Dead end roads may be considered if unavoidable, but that is not the case here.

Potential future circumstances

The following comments are made in relation to possible future conditions in the vicinity of the site.

Removal and or management of bushfire hazards

The NSW RFS is aware that development has been proposed on the southern side of (the unmade portion of) Summerland Road. If development proceeds on this land it is assumed the bushfire hazard would be removed and therefore the APZ requirements as detailed above would no longer be applicable.

The Bushfire Threat Assessment Report of AEP has identified that land northeast of the subject site has a managed understorey with minimal fuel load. It has proposed the application of a section 88B instrument on those properties to ensure the continued management of their land to APZ standards. The NSW RFS would support this, thereby negating the APZ requirements where the site adjoins. It would also remove the objection to a dead-end road. However, the agreement in writing of the relevant property owners would be required before planning could proceed on this basis.

Planning for Bush Fire Protection 2019

Given the current status of the planning proposal, it is likely that future subdivision of the land would be subject to the revised version of *Planning for Bush Fire Protection* which is at an advanced draft stage and is anticipated to be in force later in 2019. Therefore, it is considered prudent to advise the APZ requirements that are expected to be in place.

Planning for Bush Fire Protection 2019, requires 29m APZs in relation to the hazards to the south and east (where they are still in place). In relation to the E2 land an 11m APZ is required to the north and south.

In relation to the child care centre, a 79m APZ is required (but only if the hazard to the south remains in place).

The NSW RFS does not object to the rezoning as such, subject to a requirement that the future subdivision of the land complies with *Planning for Bush Fire Protection 2006*, or *2019* if applicable. This includes, but is not limited to:

- Provision of APZs within the proposed lots in accordance with Table A2.4;
- Access to be provided in accordance with the design specifications set out in section 4.1.3; and,
- Services to be provided in accordance with section 4.1.3.

It is believed that the issues raised in this correspondence can be satisfactorily addressed with an appropriate subdivision design.

If you have any queries regarding this advice, please contact Peter Eccleston, Development Assessment and Planning Officer, on 1300 NSW RFS.

Yours sincerely,



Kalpana Varghese
Team Leader, Development Assessment and Planning
Planning and Environment Services (East)

03 F

**NSW Department of
Industry (Resource and
Energy)**



9th December 2015

Rod Mergan
Senior Planner
Wyong Shire Council
PO Box 20
Wyong NSW 2259

Emailed: Rod.Mergan@wyong.nsw.gov.au

Your Reference: RZ/2/2015
Our Reference (TRIM): OUT15/34766

Dear Mr Mergan

Re: Planning Proposal RZ/2/2015 - Various Lots - Parraweena Road Gwandalan

Thank you for the opportunity to provide advice on the above matter. This is a response from NSW Department of Industry – Geological Survey of New South Wales (GSNSW).

Specific Issues

The subject area is covered by Consolidated Coal Lease (CCL) 707 held by Lake Coal Pty Ltd. The site is located within the Newcastle Coalfield and overlies the Late Permian Newcastle Coal Measures. The Wallarah Seam has been mined beneath this area. A development proposal of the previous operator included underground mining of the Fassifern Seam beneath this area. Therefore the possibility of future secondary workings within the Fassifern Seam beneath this site cannot be discounted.

The site is situated within the Swansea North Entrance Mine Subsidence District and any residential or commercial development within the site will need to comply with building guidelines stipulated by the Mine Subsidence Board.

General Information

Petroleum Exploration Licence PEL 461 held by Dart Energy (Apollo) Pty Ltd, exists over a broad regional area that includes a small eastern portion of the subject area. Identification of this title is to make the consent authorities aware that there are other stakeholders with interests in the region. However, the Coal Seam Gas (CSG) industry has recently been affected by CSG residential exclusion zones that came into force in October 2013 with amendments to the Mining SEPP introduced in July 2014 so that the portion of the subject area covered by PEL461 is now covered by the CSG Residential Exclusion Zone.

Geoscience Information Services

The GSNSW has a range of online data available on line through the following website address:

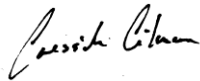
<http://www.resources.nsw.gov.au/geological/online-services>

This site hosts a range of data to enable research into exploration, land use and general geoscience topics. Additionally, the location of exploration and mining titles in NSW may be accessed by the general public using the following online utilities:

1. **MinView** allows on-line interactive display and query of exploration tenement information and geoscience data. It allows spatial selection, display and download of geological coverages, mineral deposits and mine locations, geophysical survey boundaries, drillhole locations, historical and current exploration title boundaries and other spatial datasets of New South Wales. This online service is available at:
<http://www.resources.nsw.gov.au/geological/online-services/minview>
2. **NSW Titles** enables the public to access and view frequently updated titles mapping information across NSW. This online service is available at:
<http://nswtitles.minerals.nsw.gov.au/nswtitles/>

Queries regarding the above information, and future requests for advice in relation to this matter, should be directed to the GSNSW Land Use team at landuse.minerals@industry.nsw.gov.au.

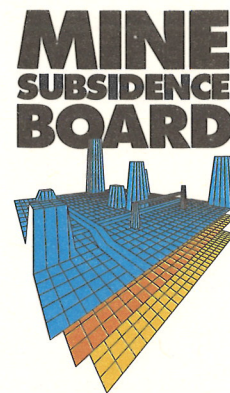
Yours sincerely



Cressida Gilmore
Team Leader - Land Use

03 G

Mines Subsidence Board



In reply please send to: Newcastle District Office
Our reference: FN05-00674W5
Your reference: RZ/2/2015
Contact: Paul Gray (02) 4908 4300

General Manager
WSC

14 October 2015

Dear Sir or Madam

REZONING APPLICATION NO TENQ15-13356W1
LOT 20 DP 1089946, LOT 1 DP 1043151, LOT 3 DP 740701
PARRAWEENA ROAD, GWANDALAN - RZ/2/2015

The Mine Subsidence Board has no objections to the proposed rezoning as described in your letter of 8 October 2015 and accompanying plan.

The applicant should be advised to seek the Board's approval for any proposed subdivision or the erection of improvements at the appropriate time.

Yours faithfully

Paul Gray
Acting District Manager

ABN: 87 445 348 918

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Free Call 1800 248 083

T 14 (Auto) Nov 2001

04

Mapping

04 A

Site Identification Map



The map displays a residential area with various lots and sections. A large area in the center is highlighted in red, indicating a specific site of interest. The lots are labeled with their respective lot numbers and section numbers, such as Lot 1, Lot 2, Lot 3, etc. The sections are labeled with their respective section numbers, such as Sec 24, Sec 25, etc. The map also shows the names of the streets, including PARRAWEENA, SUMMERLAND, KANANGRA, and LINMAR. The map is a technical drawing with precise lines and labels, typical of a cadastral map.

04 B

Existing Land Zoning Map



Wyong
Shire
Council
CENTRAL COAST

Wyong Local Environmental Plan 2013

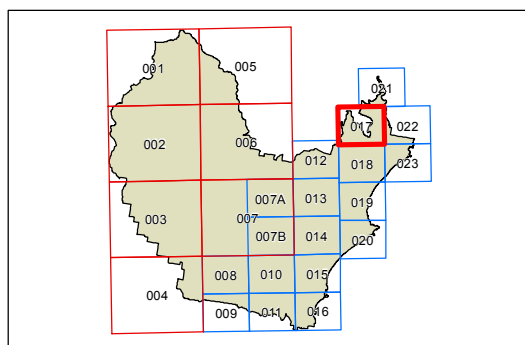
Land Zoning Map - Sheet LZN_017

Zone

- B1** Neighbourhood Centre
- B2** Local Centre
- B3** Commercial Core
- B4** Mixed Use
- B5** Business Development
- B6** Enterprise Corridor
- B7** Business Park
- E1** National Parks and Nature Reserves
- E2** Environmental Conservation
- E3** Environmental Management
- E4** Environmental Living
- IN1** General Industrial
- IN2** Light Industrial
- R1** General Residential
- R2** Low Density Residential
- R3** Medium Density Residential
- R5** Large Lot Residential
- RE1** Public Recreation
- RE2** Private Recreation
- RU1** Primary Production
- RU2** Rural Landscape
- RU3** Forestry
- RU5** Village
- RU6** Transition
- SP1** Special Activities
- SP2** Infrastructure
- SP3** Tourist
- W1** Natural Waterways
- W2** Recreational Waterways
- DM** Deferred matter

Cadastre

□ Cadastre 01/02/2015 © Land and Property information (LPI)

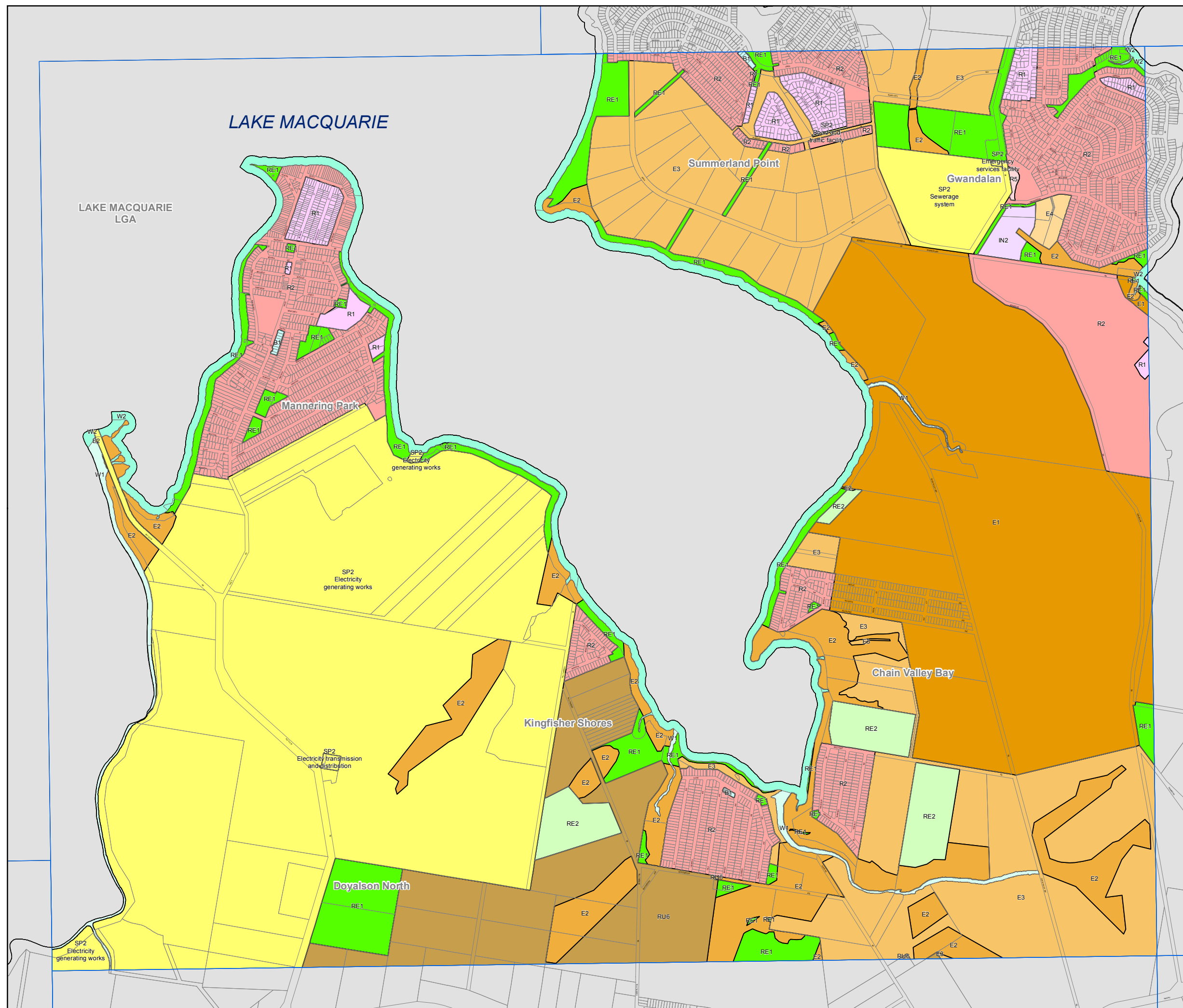


0 200 400 600 800
Metres

Projection: GDA 1994
MGA Zone 56

Scale: 1:20,000 @ A3

Map identification number:
8550_COM_LZN_017_020_20150901



04 C

Existing Lot Size Map



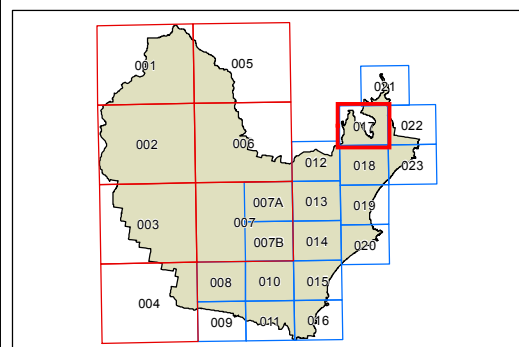
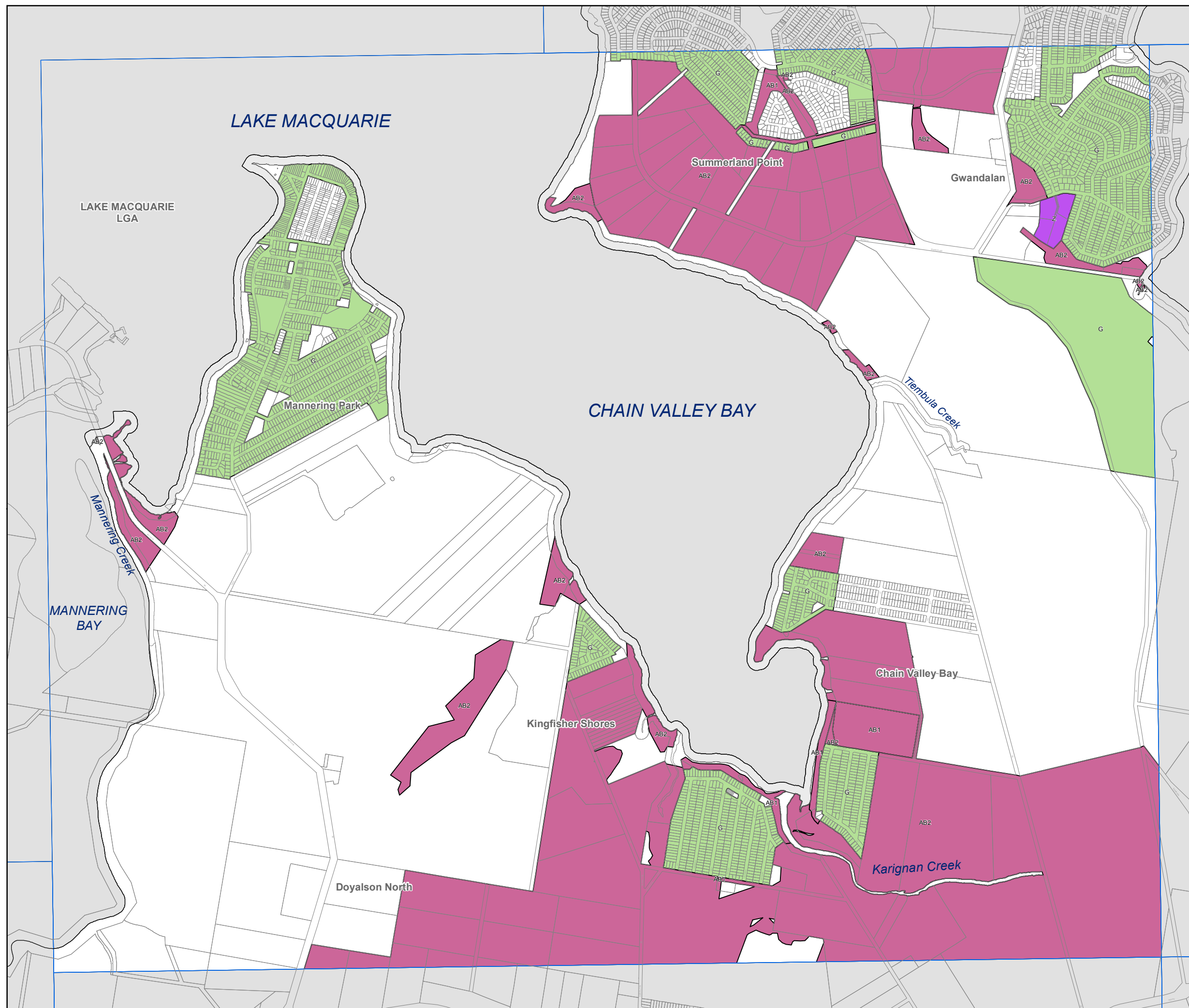
Lot Size Map - Sheet LSZ_017

Minimum Lot Size

G	450 m ²
V	2500 m ²
W	4000 m ²
Z	2 ha
AA	8 ha
AB1	20 ha
AB2	40 ha

Cadastre

Cadastre 01/03/2014 © Land and Property information (LPI)



Projection: GDA 1994
MGA Zone 56

0 200 400 600
Metres

Scale: 1:20,000 @ A3

04 D

Proposed Lot Size Map



**Wyong Local
Environmental
Plan 2013**

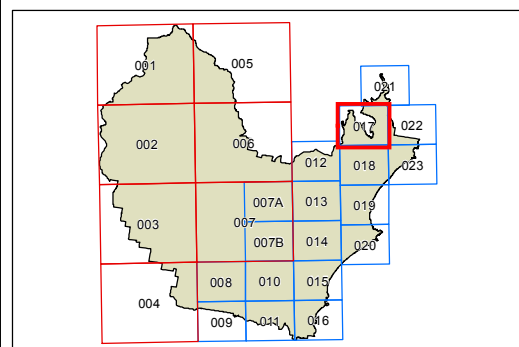
Lot Size Map - Sheet LSZ_017

Minimum Lot Size

G	450 m ²
V	2500 m ²
W	4000 m ²
Z	2 ha
AA	8 ha
AB1	20 ha
AB2	40 ha

Cadastre

Cadastre 01/03/2014 © Land and Property information (LPI)

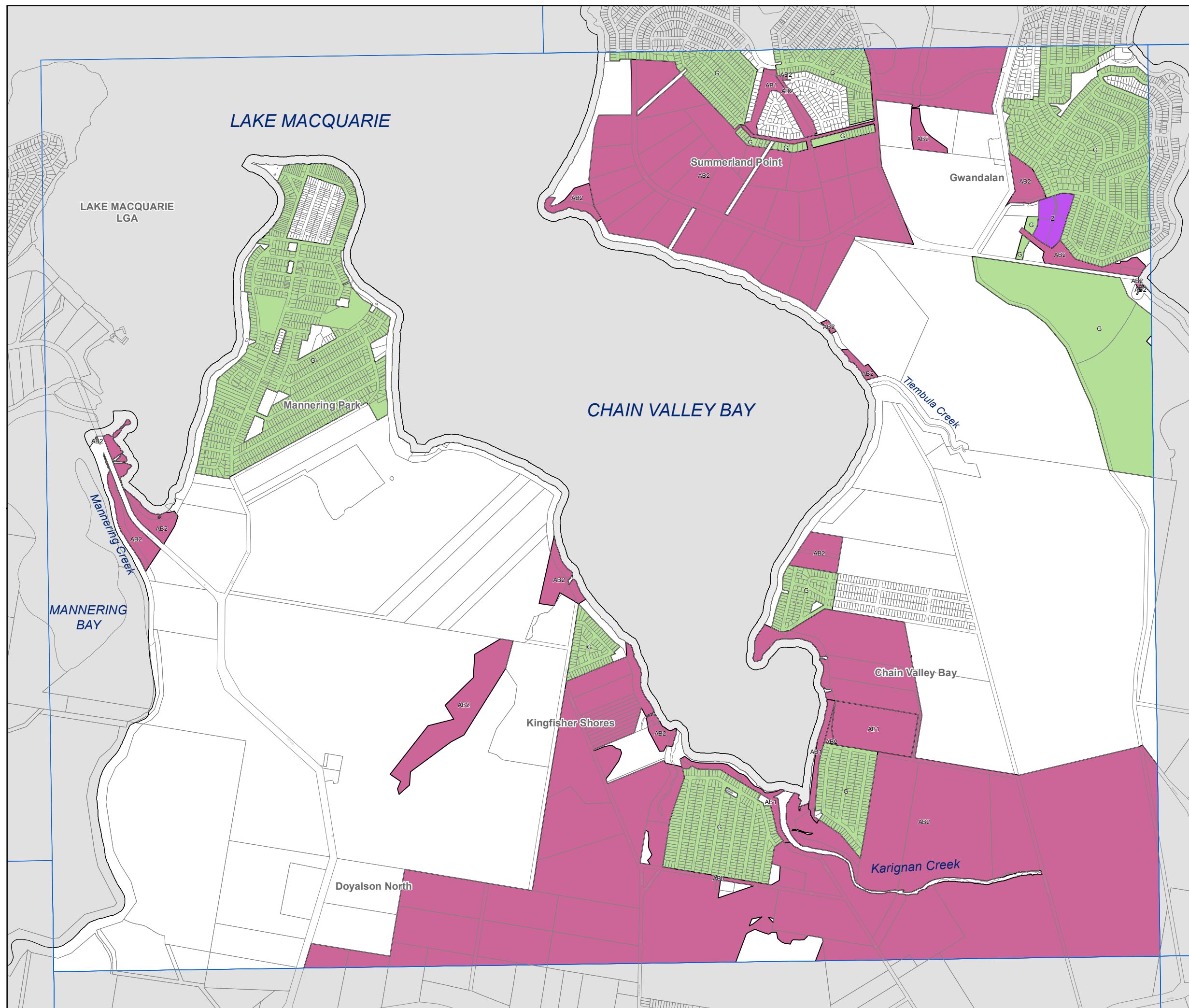


Projection: GDA 1994
MGA Zone 56

0 200 400 600
Metres

Scale: 1:20,000 @ A3

Map identification number:
8550_COM_LSZ_017_020_20150901



04 E

Proposed Land Zoning Map



Wyong
Shire
Council
CENTRAL COAST

Wyong Local Environmental Plan 2013

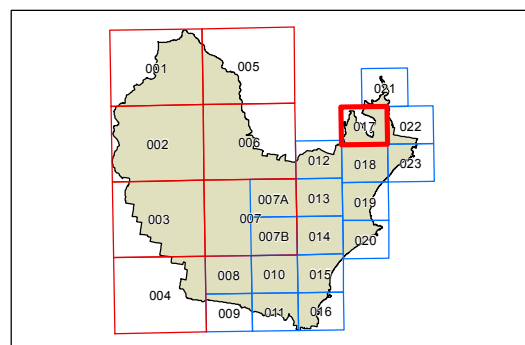
Land Zoning Map - Sheet LZN_017

Zone

- B1** Neighbourhood Centre
- B2** Local Centre
- B3** Commercial Core
- B4** Mixed Use
- B5** Business Development
- B6** Enterprise Corridor
- B7** Business Park
- E1** National Parks and Nature Reserves
- E2** Environmental Conservation
- E3** Environmental Management
- E4** Environmental Living
- IN1** General Industrial
- IN2** Light Industrial
- R1** General Residential
- R2** Low Density Residential
- R3** Medium Density Residential
- R5** Large Lot Residential
- RE1** Public Recreation
- RE2** Private Recreation
- RU1** Primary Production
- RU2** Rural Landscape
- RU3** Forestry
- RU5** Village
- RU6** Transition
- SP1** Special Activities
- SP2** Infrastructure
- SP3** Tourist
- W1** Natural Waterways
- W2** Recreational Waterways
- DM** Deferred matter

Cadastre

□ Cadastre 01/02/2015 © Land and Property information (LPI)

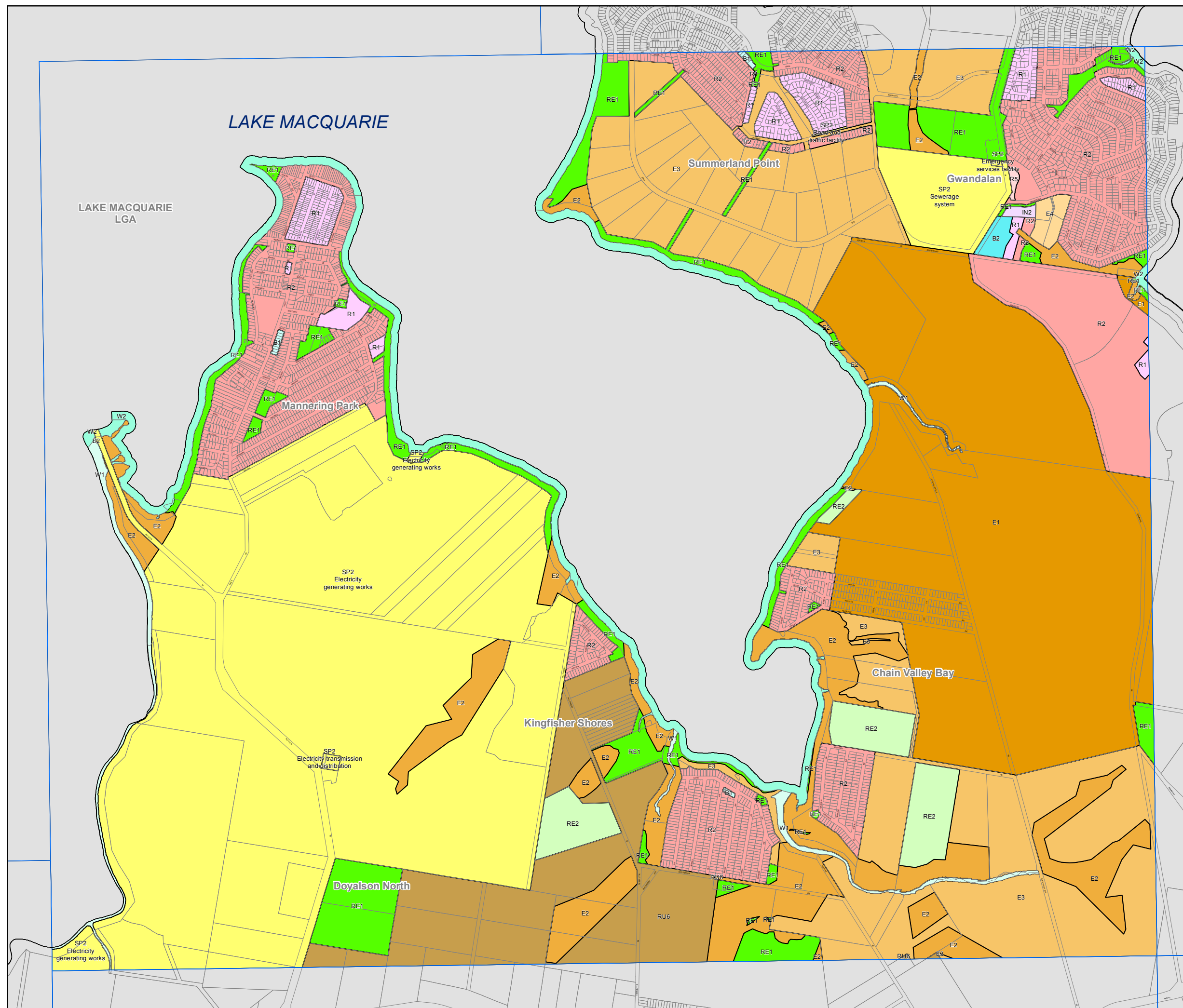


0 200 400 600 800
Metres

Projection: GDA 1994
MGA Zone 56

Scale: 1:20,000 @ A3

Map identification number:
8550_COM_LZN_017_020_20150901



05

Supporting Studies

05 A

**Planning Proposal
(Proponent)**



Planning Proposal

For

Gwandalan Town Centre
(Amendments to Wyong LEP 2013)
Kanangra Drive, Gwandalan

Prepared for
QMC Property Group Pty Ltd

July 2019

ENGINEERING
PLANNING
PROJECT MANAGEMENT
SURVEYING
CERTIFICATION

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Project No.	Project_Number1
Author	SH
Checked	IS
Approved	SH / LW

Rev No.	Status	Date	Comments
1 & 2	Previous PP		
3	Draft	12/07/2019	Amended PP
4	Updated Draft	16/07/2019	Client comments

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TABLE OF CONTENTS

Page numbers

1	Introduction	6
1.1	Purpose	6
1.2	Background.....	6
1.3	Proposed Development	7
2	Site Analysis	9
2.1	Site Description	9
2.2	Planning Provisions	15
2.2.1	Wyong Local Environmental Plan 2013	15
2.2.2	Draft Central Coast Local Environmental Plan	19
3	Part 1 – Objectives and Intended Outcomes	21
4	Part 2 – Explanation and Provisions	22
5	Part 3 - Justification	24
5.1	Section A – Need for the Planning Proposal.....	24
5.2	Section B – Relationship to the Strategic Planning Framework.....	25
5.3	Section C – Environmental, Social and Economic Impact	47
5.4	Section D – State and Commonwealth Interest	51
6	Part 4 – Mapping.....	54
6.1	Map 1 – Locality Map	54
6.2	Map 2 – Current Zoning Map extract under Wyong LEP 2013	55
6.3	Map 3 – Current Lot Size Map extract under Wyong LEP 2013.....	56
6.4	Map 4 – Proposed Land Zoning Map	57
6.5	Map 5 – Proposed Lots Size Map.....	58
7	Part 5 – Community Consultation	59
8	Part 6 – Project Timeline	60

Table of Contents (continued)

Page numbers

List of Figures

Figure 1: Extract of concept plan (Source: Christiansen Obrien Architects)	7
Figure 2: Map of site showing allotments (Source Sixmaps)	9
Figure 3: Aerial Photo of Site (Source: Sixmaps)	10
Figure 4: Aerial Photo of Locality (Source: Sixmaps)	11
Figure 5: Extract from Wyong LEP 2013 Zoning Map	15
Figure 6: Extract from LEP Minimum Lot Size Map	18
Figure 7: Extract from Wyong LEP 2013 ASS Map Extract	19
Figure 8: Extract from Draft CCLEP Zoning Map Extract	20
Figure 9: Extract of North Wyong Shire Structure Plan	31
Figure 10: Extract from SEPP (Coastal Management) Mapping Source: NSW Portal	40
Figure 11: Gwandalan area bus service map	52
Figure 12: Shared Pathways in Gwandalan and Northern part of Central Coast	52
Figure 13: Locality Map Source: Google maps	54
Figure 14: Current Land Zoning Map Extract Wyong LEP 2013	55
Figure 15: Current Minimum Lot Size Map Extract Wyong LEP 2013	56
Figure 16: Proposed Land Use Zoning Map	57
Figure 17: Proposed Minimum Lot Size Map	58

List of Photographs

Photograph 1: Site from Kanangra Drive	7
Photograph 2: Looking from site to neighbouring industrial units	12
Photograph 3: Showing scattered vegetation and cleared understorey	12
Photograph 4: Summerland Road reserve - looking towards intersection / roundabout	13
Photograph 5: Showing degradation of site and cleared areas	13
Photograph 6: View of Council reserve along Kanangra Drive and road looking north	14
Photograph 7: Roundabout at intersection with Kanangra Drive and Summerland Road	14

List of Tables

Table 1: Proposed Changes to Wyong LEP 2013	22
Table 2: Assessment of the Planning Proposal against the Central Coast Regional Strategy 2036	25
Table 3: Assessment of the Planning Proposal against the Central Coast Regional Plan – Implementation Plan 2018 - 2020	29
Table 4: Applicable objectives from the Community Strategic Plan 2012- 2028	32
Table 5: Outline of Key Planning Considerations in relation to Proposed Development	35
Table 6: Assessment of the Planning Proposal against relevant SEPPs	38
Table 7: Consistency with applicable Section 9.1 (2) Ministerial Directions	41
Table 8: Estimate of Project timeframe	60

Appendices

Appendix A – Concept Plans for Development of the Site
Appendix B – Justification for Commercial / Retail Development
Appendix C – Traffic and Parking Assessment Report
Appendix D – Bushfire Hazard Assessment Report
Appendix E – Ecological Assessment Report
Appendix F – Aboriginal Cultural Heritage Assessment

1 Introduction

1.1 Purpose

This Planning Proposal report has been prepared in relation to land along Kanangra Drive, Gwandalan, being Lot 20 DP 1089946, and part Lot 1 DP 1043151. Lot 1 is currently owned by Council and the Applicant is looking to acquire a portion of the allotments through the appropriate channels.

The Planning Proposal seeks amendment of Wyong Local Environmental Plan (LEP) 2013 to permit a change of zoning to enable the development of the site for commercial, retail and residential uses for the development of a town centre for Gwandalan.

This report has been prepared in accordance with Section 3.33 of the Environmental Planning and Assessment Act 1979 and the Department of Planning and Environment's Guidelines for Preparing Planning Proposals. It considers the planning implications of the draft LEP amendment as well as outlining the proposed development that is intended to be facilitated by the draft LEP amendment.

1.2 Background

The site has been zoned Industrial for a number of years, since at least 1991. In 2005 a 14 lot industrial subdivision of the site was approved by Council and was commenced, however there was virtually no interest for purchase of the allotments.

In 2005 the site was approved as a temporary use for the manufacture of mobile homes, although this use has ceased on the site, the compound and some ancillary buildings still exists.

The site of Lot 20 is approximately 4.688 ha, and with the portion of Lot 1 totals approximately 5.23 ha. It slopes at approximately 10-15% from west to east with a minor drainage path to the south east. The site consists of mainly open woodland with scattered trees and a generally cleared understorey. The site has been used over the years for trail bike riding and illegal dumping of rubbish together with weed invasion and erosion has made the site highly disturbed.

More recently through studies by the State Government and the former Wyong Council the site has been identified as having the potential for use as a town centre for the Gwandalan / Summerland Point area. This has become more important as a number of residential subdivisions are being developed and sold within close proximity to the area and the existing services are not adequate to cater for the increase in population.

Therefore this planning proposal has been prepared to consider the change of zoning of the site to permit commercial / retail development and associated low and medium density housing.

Photograph 1 below shows the site from Kanangra Drive and the level of disturbance.



Photograph 1: Site from Kanangra Drive

1.3 Proposed Development

The proposal for the site is for a mixture of uses including commercial, retail, community and residential. The conceptual plan for the site is included in Appendix A with an extract shown below as Figure 1.



Figure 1: Extract of concept plan (Source: Christiansen Obrien Architects)

To enable the development of the site for this proposal, the site will need to be rezoned under Council's Local Environmental Plan.

The proposal will include a retail and commercial centre on the Kanangra Drive frontage of the site which could include the following types of uses:

- Supermarket and ancillary retail shops;
- Community infrastructure potential such as a medical centre, childcare, recreational uses (multi purpose hall, swimming pool, gym or the like);
- Centre park including open space and small play area;
- Service station or other car repair facilities; and
- Associated car parking.

The east of the site is proposed to be zoned for residential housing, which could include a mix of residential accommodation including attached dwellings, town houses, villa homes and the like.

The height, due to the potential for mine subsidence conflicts will be two storeys, similar to the surrounding development in Gwandalan.

Access for the residential area will be provided off an extension to Summerland Road from the roundabout at the intersection with Kanangra Drive.

The proposal will link well with the nearby approved development to the south proposed by Coal and Allied and will service the existing and future residents of both Gwandalan and Summerland Point.

2 Site Analysis

2.1 Site Description

The site is located at Gwandalan within the local government area of Central Coast Council. It is located along Kanangra Drive on the corner of Summerland Drive (road reserve). Figure 2 shows the allotment configuration, Figure 4 the site in relation to the Gwandalan locality and Figure 3 shows the subject property with aerial photo in detail. The site comprises the following properties:

- Lot 20 DP 1089946; and
- Part Lot 1 DP 1043151;

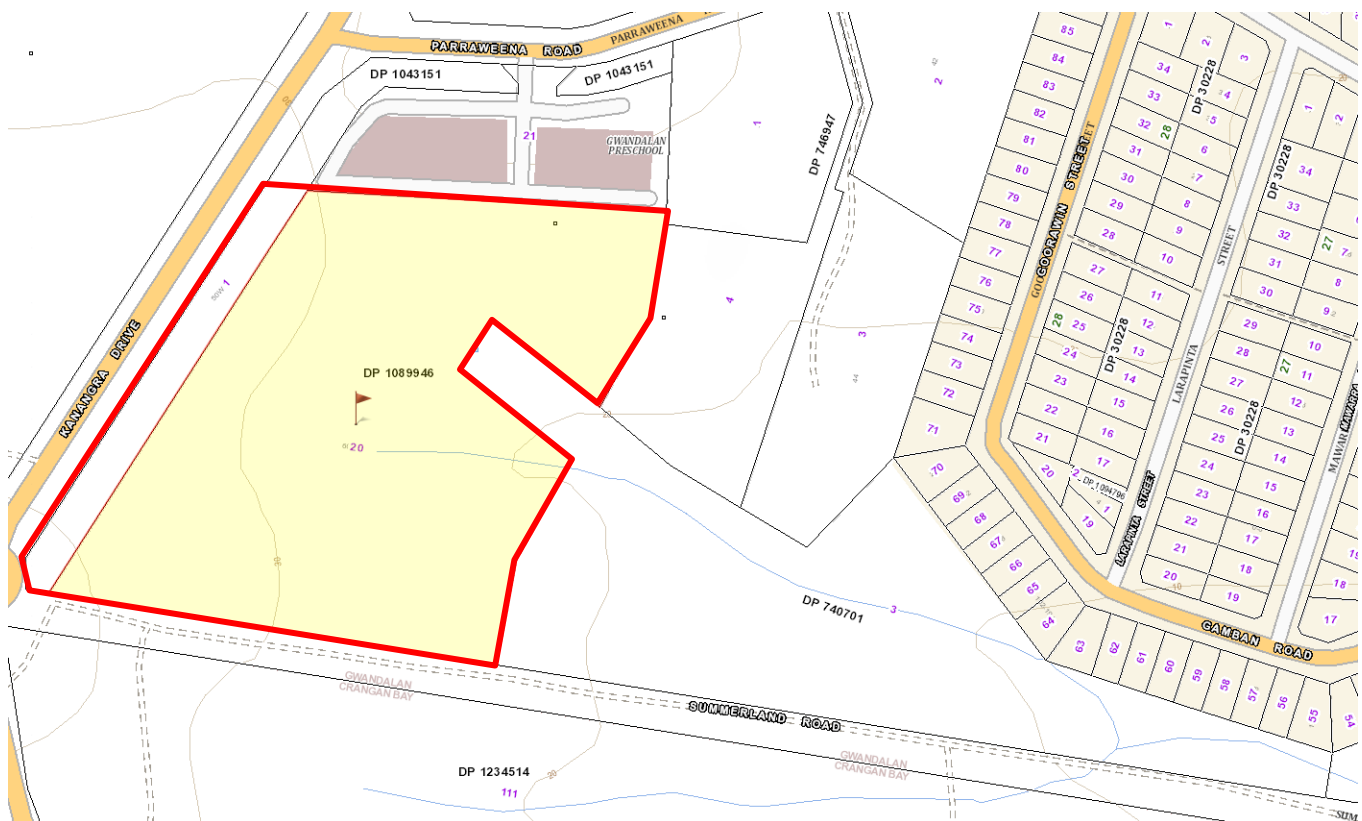


Figure 2: Map of site showing allotments (Source Sixmaps)

The total area of the subject site is approximately 5.23 hectares.



Figure 3: Aerial Photo of Site (Source: Sixmaps)



Figure 4: Aerial Photo of Locality (Source: Sixmaps)

The existing development on the site is limited to a compound area that was previously used for the manufacture of mobile homes. The sites currently have limited vehicular access from Kanangra Drive. The site is located on the outskirts of the current extent of the Gwandalan township and includes the following nearby development:

- Small scale industrial units to the north;
- Rural residential / Environmental Living to the north east which adjoins existing low density residential development;
- Council reserve to the south east;
- Approved Coal and Allied residential development to the south; and
- Council land including the local sewerage treatment plant to the west.

Photographs 2 to 7 below show the site in detail, including the surrounding development, roads and road reserves.



Photograph 2: Looking from site to neighbouring industrial units



Photograph 3: Showing scattered vegetation and cleared understorey



Photograph 4: Summerland Road reserve - looking towards intersection / roundabout



Photograph 5: Showing degradation of site and cleared areas



Photograph 6: View of Council reserve along Kanangra Drive and road looking north



Photograph 7: Roundabout at intersection with Kanangra Drive and Summerland Road

The site slopes at approximately 10-15% from west to east with a minor drainage path to the south east.

The site consists of mainly open woodland with scattered trees and a generally cleared understorey as can be seen in the photographs above.

The site is serviced by a local bus service between Gwandalan and Morisset, Lake Haven, Charlestown and Summerland Point. There are pedestrian and cyclist paths nearby that connect Summerland Point to Gwandalan.

2.2 Planning Provisions

2.2.1 Wyong Local Environmental Plan 2013

The site is zoned a mix of uses IN2 Light Industry and RE1 Public Recreation under Wyong LEP 2013 as shown in Figure 5 below:

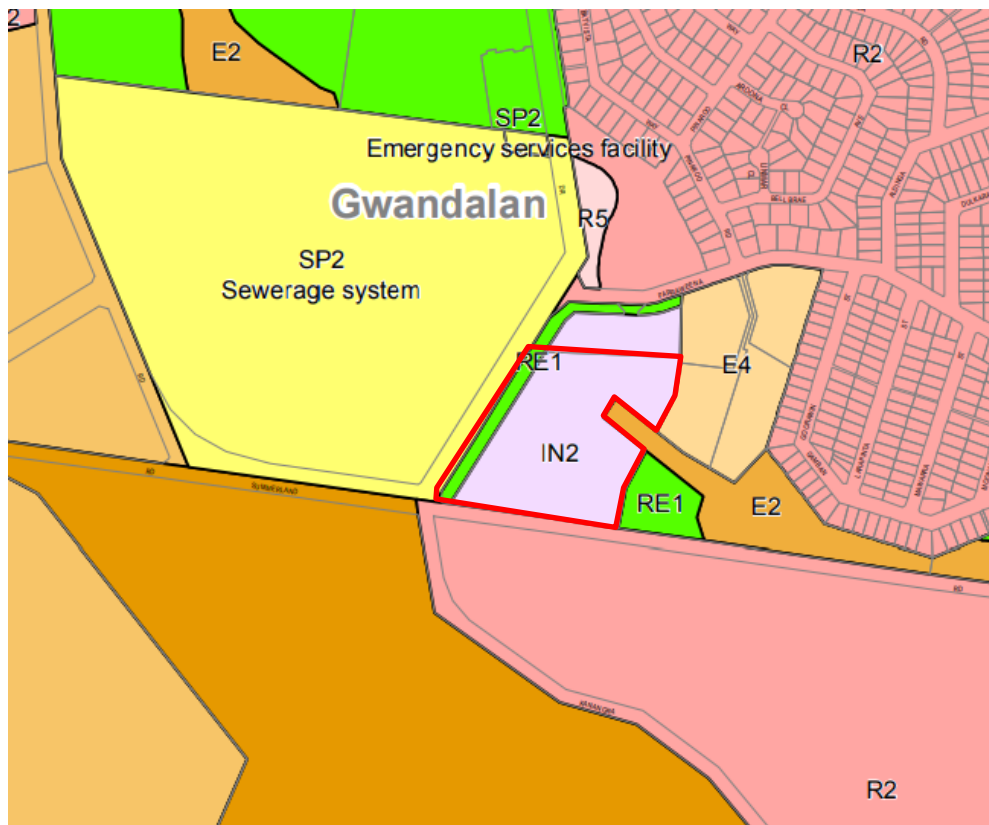


Figure 5: Extract from Wyong LEP 2013 Zoning Map

Extracts from the zoning tables for the IN2 and RE1 zones are shown below:

Zone IN2 Light Industrial

1 Objectives of zone

- To provide a wide range of light industrial, warehouse and related land uses.
- To encourage employment opportunities and to support the viability of centres.
- To minimise any adverse effect of industry on other land uses.
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.
- To support and protect industrial land for industrial uses.

2 Permitted without consent

Nil

3 Permitted with consent

Depots; Food and drink premises; Garden centres; Hardware and building supplies; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Neighbourhood shops; Oyster aquaculture; Places of public worship; Plant nurseries; Roads; Rural supplies; Tank-based aquaculture; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; **Commercial premises**; Correctional centres; Eco-tourist facilities; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function centres; Heavy industrial storage establishments; Home-based child care; Home businesses; Home occupations; Home occupations (sex services); Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Open cut mining; Passenger transport facilities; Pond-based aquaculture; Recreation facilities (major); Registered clubs; **Residential accommodation**; Rural industries; Tourist and visitor accommodation; Water recreation structures; Wharf or boating facilities

Zone RE1 Public Recreation**1 Objectives of zone**

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To provide linked open space for ecosystem continuity, public access, local community recreation and waterway protection.
- To provide space for integrated stormwater treatment devices for flow and water quality management.
- To enable ancillary development that complements land zoned for recreational purposes.

2 Permitted without consent

Nil

3 Permitted with consent

Aquaculture; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Camping grounds; Caravan parks; Charter and tourism boating facilities; Centre-based child care facilities; Community facilities; Eco-tourist facilities; Emergency services facilities; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Food and drink premises; Function centres; Information and education facilities; Jetties; Kiosks; Marinas; Markets; Mooring pens; Moorings; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Respite day care centres; Roads; Sewerage systems; Waste or resource management facilities; Water recreation structures; Water supply systems

4 Prohibited

Any development not specified in item 2 or 3

The following definitions are applicable to the proposed future use, which as you can see from the above extracts are currently prohibited in the IN2 and RE1 zones:

commercial premises means any of the following:

- (a) business premises,
- (b) office premises,
- (c) retail premises.

residential accommodation means a building or place used predominantly as a place of residence, and includes any of the following:

- (a) attached dwellings,
- (b) boarding houses,
- (c) dual occupancies,

- (d) dwelling houses,
 - (e) group homes,
 - (f) hostels,
 - (g) multi dwelling housing,
 - (h) residential flat buildings,
 - (i) rural workers' dwellings,
 - (j) secondary dwellings,
 - (k) semi-detached dwellings,
 - (l) seniors housing,
 - (m) shop top housing,
- but does not include tourist and visitor accommodation or caravan parks.*

Other definitions may be applicable, dependent on the final development proposed on the site.

The Wyong LEP 2013 also includes some other provisions that relate to the site, a summary of which is included below:

Lot Size

There are currently no minimum lot size provisions relating to the majority of the site.

It is proposed to apply a minimum lot size of 250m² and 450m² to the proposed R1 and R2 zones respectively.

No minimum lot size is proposed for the remaining B2 local centre zoned land, consistent with the other equivalent zones in the Wyong LEP 2013.

An extract from the LEP lot size map is shown below as Figure 6.

Note this remains consistent with online mapping provided in the Draft Central Coast LEP.

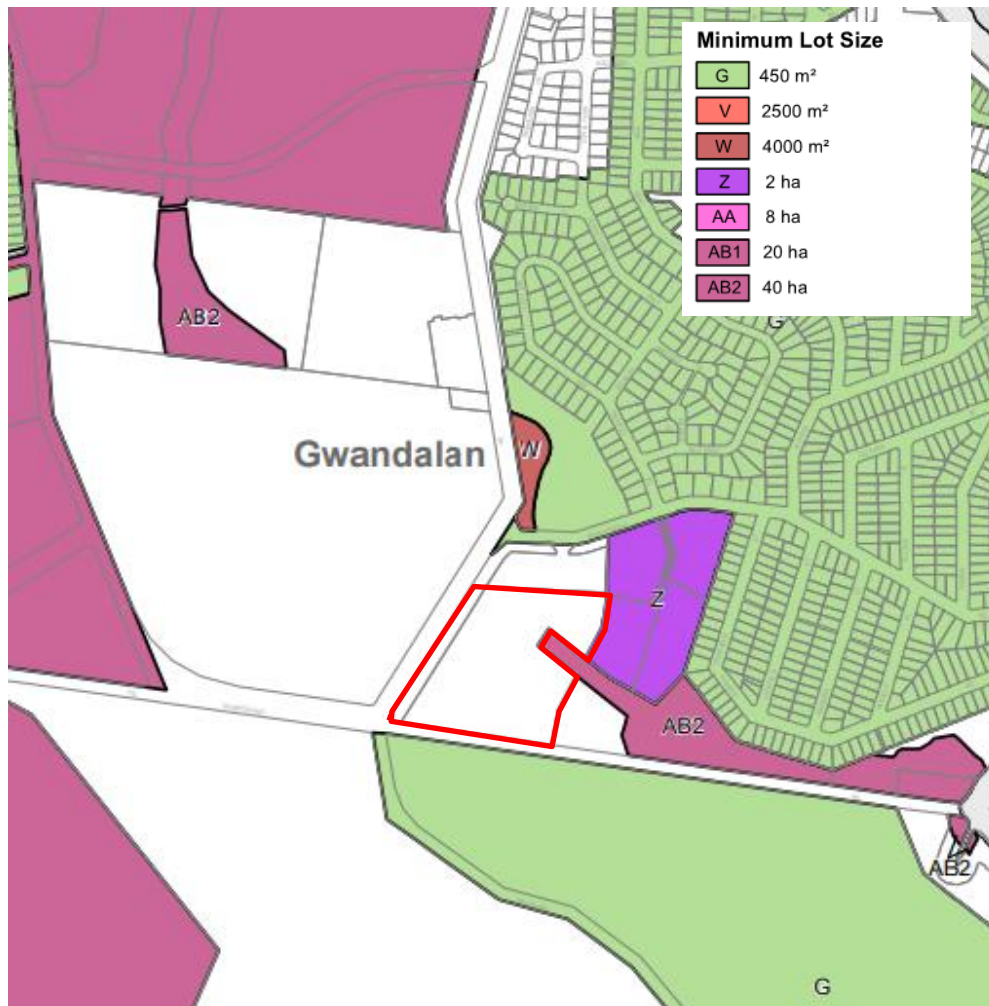


Figure 6: Extract from LEP Minimum Lot Size Map

Height of buildings

The site currently has no height of building standard and it is not proposed to change this provision in the proposed LEP amendment. A review of the Draft Central Coast LEP also indicates that no height of building standard will be applicable to the subject sites or other similar residential zoned lands.

Floor Space Ratio

The site currently has no floor space ratio (FSR) provision and it is not proposed to change this provision in the proposed LEP amendment. Further, no floor space mapping is provided within the Draft Central Coast LEP for the subject site.

Flood Planning

The site is not flood prone so the provisions relating to flood prone land and planning are not applicable.

Acid Sulfate soils

This clause aims to ensure that development does not disturb, expose or drain acid sulfate soils. Part of the site is located within areas of Class 5 Acid Sulfate Soils as shown in Figure 7 below.

Given that the majority of the site is categorised as Class 5, or not mapped, any potential site excavation is unlikely to uncover acid sulfate soils which will lower the watertable below 1 metre AHD. The provisions are not applicable.

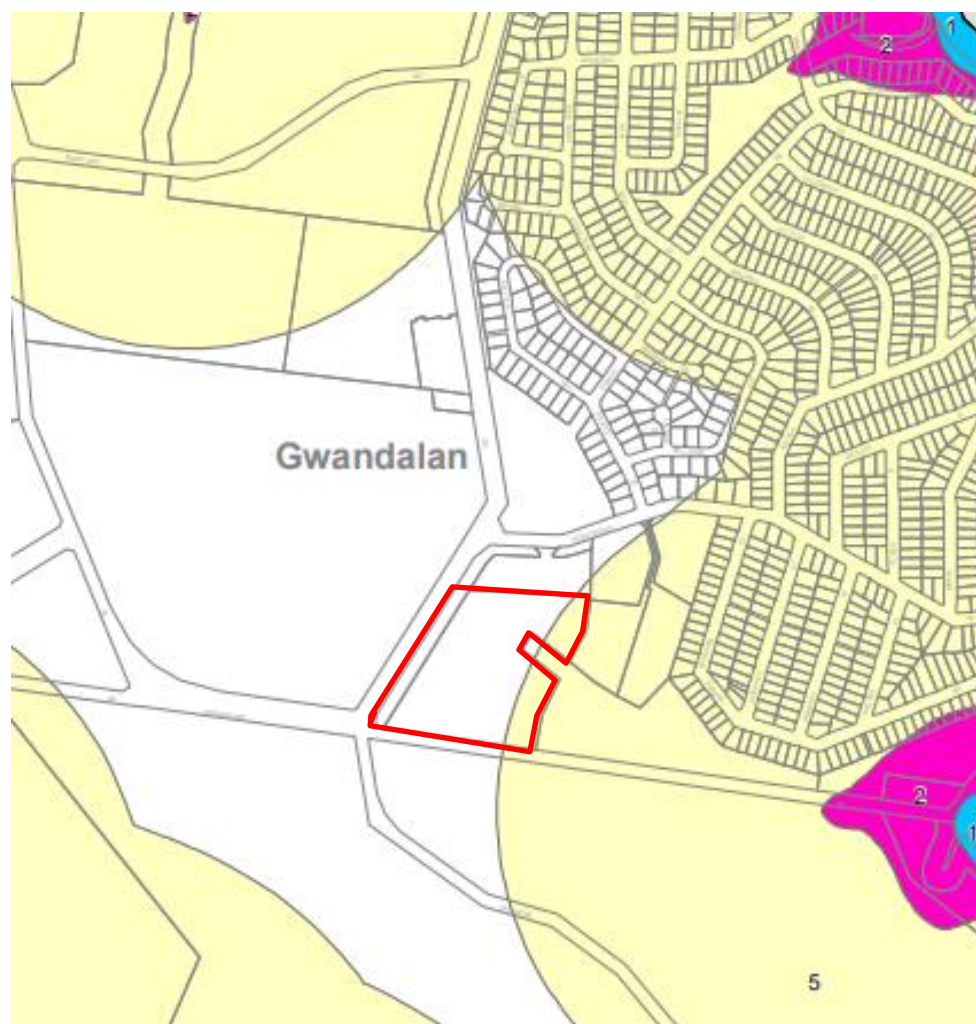


Figure 7: Extract from Wyong LEP 2013 ASS Map Extract

2.2.2 Draft Central Coast Local Environmental Plan

The Draft consolidated Central Coast LEP was placed on public exhibition between 6 December 2018 and 28 February 2019. Figure 8 shows the proposed zoning of the site under this draft LEP. There are no significant changes as a result of this draft LEP that will impact on the proposed rezoning of the site.

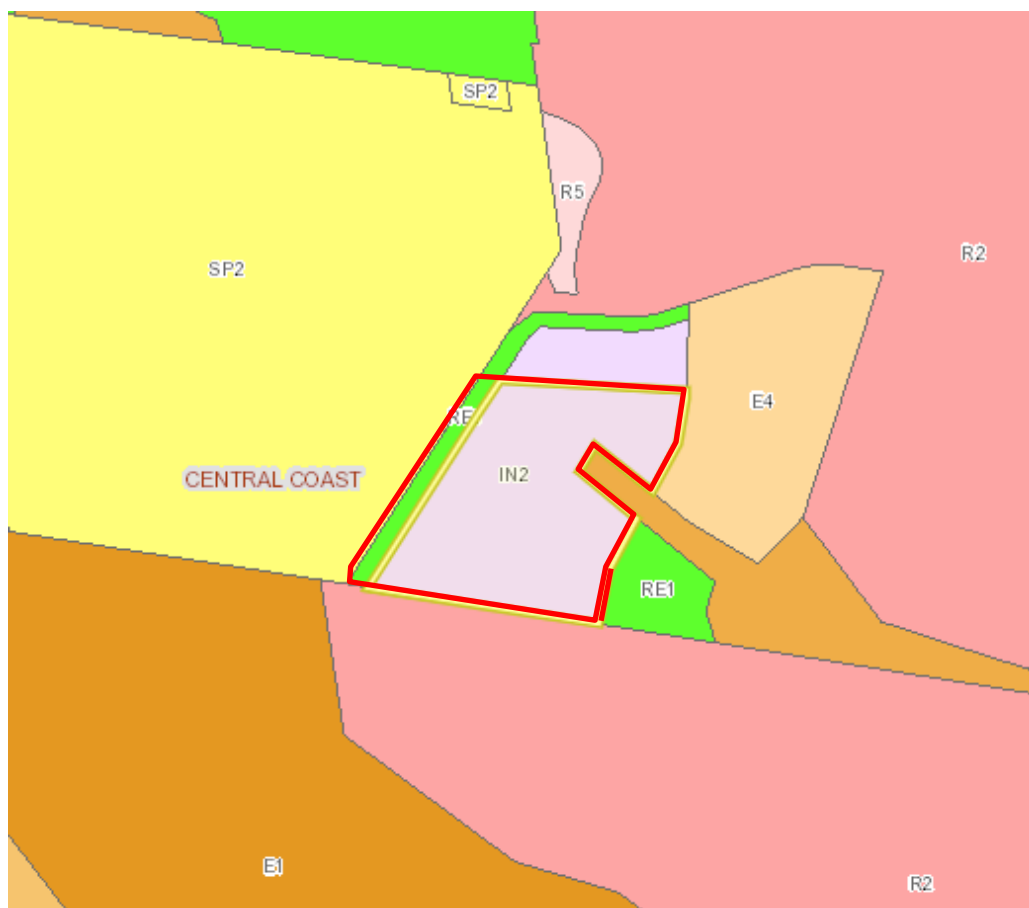


Figure 8: Extract from Draft CCLEP Zoning Map Extract

3 Part 1 – Objectives and Intended Outcomes

Section 3.33(2)(a) A statement of the objectives or intended outcomes of the proposed instrument.

The intended outcome of the Planning Proposal is to amend Wyong Local Environmental Plan 2013 to facilitate the development of a local commercial centre and associated residential development on Lot 20 DP 1089946, and part Lot 1 DP 1043151. Appendix A indicates the extent of the proposed application.

The current zoning (under Wyong LEP 2013) is IN2 Light Industrial and RE1 Public Recreation and does not permit the commercial and residential uses that are proposed and supported by local and regional studies.

The objectives of the Planning Proposal are:

- To facilitate a viable and commercially feasible development on the site;
- To facilitate a well-designed building form that is sustainable and takes advantage of the location, aspect and solar access;
- To encourage development that can act as a catalyst for other support services and the existing and proposed residents of the Gwandalan and Summerland Point areas;
- To provide residential opportunities in the village centre of Gwandalan which are close to services and community facilities;
- To provide local employment opportunities during and after construction; and
- To encourage the portion of land owned by Council to be sold to enable a more viable and sustainable development of the site.

It should be noted that Council will need to seek advice on the disposal of their land in relation to any interests, trusts or easements.

In addition to the changes to the LEP, changes to Wyong (or Central Coast) Development Control Plan (DCP) are also recommended in the form of a new chapter or site-specific provisions. Details of these provisions are included in Section 4 below.

4 Part 2 – Explanation and Provisions

Section 3.33(2)(b) An explanation of the provisions that are to be included in the proposed instrument.
Section 3.33(2)(d) If maps are to be adopted by the proposed instrument, such as maps for proposed land use zones, heritage areas, flood prone land map - a version of the maps containing sufficient detail to indicate the substantive effect of the proposed instrument.

The proposed commercial, retail and residential development is not permissible under Wyong LEP 2013. Therefore, amendments to the LEP are proposed, as outlined in Table 1 below.

Table 1: Proposed Changes to Wyong LEP 2013

AMENDMENT APPLIES TO	EXPLANATION OF PROVISION
Land Zoning Map – Sheet LZN_017 Currently the site is zoned part <ul style="list-style-type: none"> • IN2 Light Industrial; and • RE1 Public Recreation 	It is proposed to change the zoning of the site to part <ul style="list-style-type: none"> • B2 Local Centre; • R1 General Residential; and • R2 Low Density Residential. Refer to proposed Map amendment included in Section 6.
Lot Size Map – Sheet LSZ_017 Refer to extract included in Section 2.2 and Section 6.	The proposal adopts a minimum lot size of 250m ² and 450m ² respectively for the proposed R1 and R2 zones, consistent with complimentary zones within the LGA. Refer to proposed Map amendment included in Section 6.

The suggested site specific DCP should include provisions that relate to the following:

- Subdivision design – provisions that ensures the subdivision design is:
 - Sympathetic to site constraints,
 - Responds to the amenity of the area,
 - Considers adjoining land uses,
 - Complies with Council standards,
 - Responds to ownership patterns, and
 - Includes details of intersections, road hierarchy, design, lighting and landscaping.
- Servicing – provisions that ensure appropriate connection to services, particularly water and sewer.
- Biodiversity – provisions that ensure biodiversity is managed on site through the minimisation of impacts of construction and future development.
- Water Cycle Management – provisions that ensure water and drainage is appropriately managed on site through:
 - Managing risks from overland flow on the site, and
 - Ensure subdivision includes stormwater management and water sensitive urban design.
- Transport – provisions that ensure transport and traffic is managed through:
 - Reduce, where possible, negative impacts on the existing and future road networks,
 - Provide access to alternative transport options where possible,
 - Ensure safe internal road network,
 - Provide access for large vehicles for waste, removals etc.,
 - Includes safer by design principles, and
 - Promotes healthy by design principles for walking and cycling options.
- Open space and Landscaping:
 - Where possible, both active and passive in nature,
 - Integrated into the design of the commercial area,

- Able to promote social interaction, health and wellbeing.
- Potential Site contamination – provisions that ensure the development does not pose risks to future occupants and is suitable for residential development.
- Bush fire Management – provisions that ensure bush fire risk is managed by:
 - Minimising risks,
 - Ensuring development is accessible for emergency services, and
 - Ensuring bushfire protection does not compromise biodiversity.

The subject site is subject to Section 7.11 and 7.12 Contributions Plan and therefore no site-specific contributions plan is required.

5 Part 3 - Justification

Section 3.33(2)(c) The justification for those objectives, outcomes and provisions and the process for their implementation (including whether the proposed instrument will comply with relevant ministerial directions under section 9.1 of the Environmental Planning and Assessment Act 1979).

5.1 Section A – Need for the Planning Proposal

Is the Planning Proposal a result of any strategic study or report?

Yes, the Planning Proposal is the result of a strategic study / report. The site is identified in the North Wyong Shire Structure Plan released by the State Government in 2012 and the Wyong Shire Retail Centres Strategy dated October 2013 as a potential new centre.

The proposal includes a mix of commercial and retail uses as well as residential development with employment opportunities both during and after construction. The mixed use will create a walkable neighbourhood centre by providing a range of dwelling types in close proximity to a commercial and retail centre.

The site is also identified in Councils Development Control Plan (DCP) 2013 Chapter 5.2 Retail Centres as a proposed centre. Details on the Net Community Benefit Test required by the DCP is included in Appendix B.

Refer to discussion on these strategies and other relevant strategies in the sections below.

Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

In order to achieve a development on the subject site that would permit a mixed use development of commercial and residential uses the following options were considered:

Option 1 – Identify the areas of the site for commercial and residential uses and zone them accordingly. In this case the B2 Local Centre, R1 General Residential and R2 Low Density Residential zones were considered the most appropriate zones.

Or

Option 2 – Similar to Option 1, but identify different zones such as B4 Mixed Use for the commercial section and R1 General Residential for the residential section. The objectives of these zones and the permissible land uses would encourage development that moves away from the local centre surrounded by complimentary residential development, which as discussed in Section 5.2 below, is the strategic directive for this land. This option would stimulate opportunities for commercial/retail development and higher residential densities than are envisaged for this location.

Or

Option 3 – Zone the entire site B4 Mixed Use and insert the additional permitted use of residential accommodation within Schedule 1 of the LEP. This would provide flexibility to develop the site in a number of ways, however would not provide the same level of certainty that residential development would be encouraged where a clear preference towards commercial development would likely result with Options 1 or 2.

Option 1 is preferred as it permits the uses required on the site and best reflects the proposed uses, as a local centre and low – medium density residential development.

Further, the above options are only in relation to the portion of the site which is currently zoned Light Industrial. It is also proposed to include one small portion of Council owned land. This portion is currently classified as operational, which permits the disposal by Council. Council will need to resolve to dispose of this portion of land.

5.2 Section B – Relationship to the Strategic Planning Framework

Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including exhibited draft strategies)?

There are a number of relevant regional strategies that apply to the Central Coast LGA, some of which are yet to be updated to reflect the amalgamation of the former Wyong Shire local government area to the now Central Coast Council. Those that are relevant to the proposal are;

- Central Coast Regional Plan 2036;
- Central Coast Regional Plan – Implementation Plan 2018 – 2020;
- North Wyong Shire Structure Plan;
- Regional Economic Development and Employment Strategy
- Central Coast Community Strategic Plan 2018 - 2028
- Wyong Shire Retail Centres Strategy
- Wyong Shire Council Settlement Strategy
- Wyong Shire Economic Development Strategy

The proposal is consistent with these strategies in that it will be an employment generator during and following construction and will provide additional housing close to infrastructure and services. Each strategy and its implications related specifically to this proposal are outlined below.

Central Coast Regional Plan 2036

The Central Coast Regional Plan (CCRP) is the key strategic planning document for the Central Coast local government area. The Strategy aims to ensure that adequate land is available and appropriately located to accommodate the projected housing and employment needs for the Region's population over the next 20 years.

The NSW Government has set four goals for the region:

- A prosperous Central Coast with more jobs close to home
- Protect the natural environment and manage the use of agricultural and resource lands
- Well-connected communities and attractive lifestyles
- A variety of housing choice to suit needs and lifestyles

The following actions are relevant to the proposal:

Table 2: Assessment of the Planning Proposal against the Central Coast Regional Strategy 2036

Relevant Directions / Goals	Comment
Goal 1: A prosperous Central Coast with more jobs close to home	
Direction 2: Focus economic development in southern and northern growth corridors.	The subject site is not located within either of these growth centres, however is nominated as a future centre in other strategic documents. The proposed rezoning and ultimate development of the site will complement this direction and not be in competition with the focus identified in this direction.

Relevant Directions / Goals	Comment
<p>Direction 3: Support priority economic sectors <i>Focusing commercial and retail development in centres, growth corridors and identified clusters, and supporting it with public domain improvements, will encourage local employment growth.</i></p> <p>3.1 Promote growth and renewal in centres by providing planning controls that create the right conditions for this to occur.</p>	<p>The site is a nominated potential centre in the North Wyong Shire Structure Plan (NWSSP) and the proposed zoning will allow for the development of the site in a manner that promotes development of a centre with surrounding residential lands to support this centre. The ultimate development of the site will promote local employment in both the commercial and community land uses proposed.</p>
<p>Direction 4: Strengthen inter-regional and intra-regional connections for business <i>Improving connections between strategic centres and transport gateways will make it easier for people to use public transport to get to work, recreation and services.</i></p>	<p>The site is serviced by a local bus network and is located within the transport corridor of Summerland Road and Kanangra Drive.</p> <p>The proposed local centre will attract residents from those immediately located within the surrounding residential zoned land, promoting a more localised connection with the facilities and services offered at the local centre level.</p>
<p>Direction 7: Increase job containment in the region</p> <p>The Regional Economic Development and Employment Strategy (2009) for the Central Coast aimed to improve local employment in the region and was developed through collaboration with all levels of government and industry. It outlined strategies to:</p> <ul style="list-style-type: none"> secure new jobs and support existing jobs by facilitating growth associated with the region's growing population; <p>7.1 Facilitate economic development that will lead to more local employment opportunities on the Central Coast.</p>	<p>Local employment opportunities will arise through the construction of developments associated with this land (as indicated in Appendix B) as well as the on-going employment opportunities generated by the commercial and community land uses proposed.</p>
Goal 2 - Protect the natural environment and manage the use of agricultural and resource lands	
<p>Direction 8: Recognise the cultural landscape of the Central Coast</p>	<p>The proposed rezoning and land uses will not adversely impact on the environment or cultural landscape of the coast. The amended proposal allows for the specific retention of the E(2) zoned part of the site that was originally included in the proposal.</p> <p>The proposed rezoning and uses are consistent with the existing area and will not adversely impact on neighbouring land.</p>
<p>Direction 12: Protect and manage environmental values</p>	<p>The amended proposal particularly excludes the environmental lands zoned E(2) to allow for the preservation of these areas that are of value.</p> <p>The remaining land is currently zoned for industrial purposes and is in a degraded state following previous land uses.</p> <p>Notwithstanding this an Ecological Assessment Report has been prepared to assess the environmental value of this land (see Appendix E).</p>

Relevant Directions / Goals	Comment
	<p>This report concludes that with appropriate management plans and protection measures adopted during the development phase of the redevelopment of the site, along with protection of the adjoining E2 zoned land, this will minimise the further degradation of the environmental quality of this land.</p> <p>The site is located outside of the biodiversity corridors identified in this direction.</p>
Direction 13: Sustain water quality and security	<p>The site can be connected to appropriate water, drainage and sewerage services. No adverse impacts will be experienced from the additional uses on the site.</p>
Direction 14: Protect the coast and manage natural hazards and climate change	<p>The site is identified as bushfire prone land and will be developed in accordance with the guidelines provided in the <i>NSW Planning for Bushfire Protection 2006</i>.</p> <p>A Bushfire Hazard Assessment Report has been prepared (refer Appendix D) and provides recommendations in relation to future APZ for both the residential and commercial/community land uses, confirmation of vehicular access and services in accordance with PBP 2006.</p>
<p>Goal 3: Well connected communities and attractive lifestyles</p> <p>Encouraging more housing and different types of housing around centres can help to make them more robust and livelier places and capable of offering more services and jobs.</p> <p>Accelerating the supply of land for housing and jobs in established urban areas takes advantage of existing infrastructure and reduces the time it takes for residents to get to jobs and services. Over the next 20 years the community will need 41,500 new homes.</p> <p>Planning for new development and expanding the urban footprint will be consistent with settlement planning principles.</p>	
<p>Direction 15: Create a well planned, compact settlement pattern</p> <ul style="list-style-type: none"> 15.1 Create a well-planned, functional and compact settlement pattern around existing urban and employment areas, the Warnervale-Wadalba release area, the Northern and Southern Growth Corridors, existing rural villages and sites included in an endorsed local strategy. 15.2 Ensure the settlement pattern responds to settlement planning principles and does not encroach on sensitive land uses. 15.3 Plan for communities to be better connected by an integrated transport system that prioritises safe walking, cycling and public transport. 15.4 Investigate options to improve public transport services and better link centres, corridors and growth areas. 15.5 Link communities with centres, employment areas, the Northern and Southern 	<p>The proposed rezoning includes residential land use for low and medium density residential development. This will supplement the surrounding low density residential lands and is consistent with this direction by providing connected, compact and sustainable communities.</p>

Relevant Directions / Goals	Comment
Growth Corridors and greater open space and recreation opportunities.	
<p>Direction 16: Grow investment opportunities in the region's centres</p> <p>New commercial and retail business activity is expected to focus on the region's strategic centres at Gosford, Erina, Tuggerah, Wyong and to a lesser extent, other centres across the region.</p> <ul style="list-style-type: none"> 16.1 Improve access to and through centres to support and encourage redevelopment. 16.2 Enhance the network of centres by encouraging business and infrastructure investment in centres and planning for attractive mixed use places that respond to the character and role of the centre. 16.3 Protect the function of centres and ensure local environmental plans include appropriate controls to limit retail activity outside planned centres. 	<p>The Gwandalan site is identified as a future local centre and will not compete with the regional centres of Tuggerah and Wyong.</p> <p>This rezoning will allow for the introduction of new business opportunities as well as the inclusion of community services in this location, and at a local scale. This improves accessibility for locations like Gwandalan and Summerland Point and the emerging residential population in these areas.</p>
Direction 17: Align land use and infrastructure planning	The site is located adjoining established residential lands that can be easily accessed by pedestrians, cyclist, motor vehicles and public transport.
Direction 18: Create places that are inclusive, well-designed and offer attractive lifestyles.	The proposal will provide essential and community services to the local area. This will assist with providing healthy, active and full lifestyles to the local population and new residents.
Goal 4: A variety of housing choice to suit needs and lifestyles	
<p>Direction 19: Accelerate housing supply and improve housing choice</p> <ul style="list-style-type: none"> 19.1 Release land for housing and employment in the North Wyong Shire Structure Plan area to align with the delivery of local and State infrastructure. 19.2 Review development controls to accelerate housing supply. 19.3 Monitor land and housing delivery and accelerate housing supply to meet projected housing demand of 41,500 additional dwellings by 2036. 19.4 Monitor land and housing supply through an urban development program. 	<p>The proposed rezoning is entirely consistent with direction 19 in that R2 zoned land with a 450m² minimum lot size will significantly increase opportunities for additional dwellings within a designated urban area as per the NWSSP. This land release would characterise the effective utilisation of a significantly underutilised site via land supply that can achieve sustainable urban infill development.</p> <p>To meet the projected dwelling target of 41,500 additional homes by 2036, the Regional Plan argues that Council must review development controls to accelerate required housing supply. Given that the subject site is designated for future residential land uses surrounding the proposed centre, this planning proposal characterises a logical step in the planning process for this to occur.</p>
<p>Direction 20: Grow housing choice in and around local centres</p> <ul style="list-style-type: none"> 20.1 Improve housing choice by supporting housing delivery in and near the growth corridors and local centres. 	<p>The subject site is to provide day to day essential services, accessible both via pedestrian linkages as well as public/private transport.</p> <p>Housing proposed as part of this rezoning will have convenient access to this centre and therefore satisfies this direction.</p>

Relevant Directions / Goals	Comment
<p><i>Direction 21: Provide housing choice to meet community needs</i></p> <ul style="list-style-type: none"> 21.1 Provide greater housing choice by delivering diverse housing, lot types and sizes, including small-lot housing in infill and greenfield housing locations. 	<p>The Central Coast is experiencing a distinct ageing of its population. The Regional Plan encourages the implementation of changes to address the housing needs of specific population groups and from a planning perspective, this can be achieved via dwelling mix and housing choice. This proposal includes the provision of smaller lots to promote sustainable low and medium density development that appeals to a variety of persons. Opportunities for 250m² to 450m² lot sizes also promote affordability in contrast to larger Transition lots that remain underutilised within existing urban areas.</p>
<p><i>Direction 22: Deliver housing in new release areas that are best suited to building communities</i></p> <ul style="list-style-type: none"> 22.1 Coordinate infrastructure delivery to support the North Wyong Shire Structure Plan release areas. 	<p>The proposed rezoning will provide the opportunity for housing to be delivered in an established residential area as per the North Wyong Shire Structure Plan.</p>

Central Coast Regional Plan – Implementation Plan 2018 - 2020

The Central Coast Regional Plan, as discussed above, sets planning priorities for the Central Coast, with medium and longer-term actions. The Regional Plan is accompanied by a two-year Implementation Plan that sets out governance, tasks, responsibilities and timing for delivery of the Regional Plan. The Central Coast Implementation Plan 2018-2020 (Implementation Plan) is the second two-year implementation plan to ensure accountability to realise the vision of the Regional Plan. The priorities have been adjusted towards the next phase of planning for the region's growth and change to 2036.

The purpose of this Implementation Plan is to:

- Identify priorities for the next phase of implementing the Regional Plan.
- Ensure ongoing collaboration and agreement on the implementation of the Regional Plan
- Identify the role of NSW Government agencies and Central Coast Council involved in implementing the focus areas.
- Outline the Central Coast Delivery Coordination and Monitoring Committee's role in overseeing the delivery of the Regional Plan.
- Inform the review and update of the Regional Plan (review to commence this implementation period).

The Implementation Plan provides 7 focus areas to ensure delivery of the Regional Plan. Those that apply to the proposal are addressed in the following table:

Table 3: Assessment of the Planning Proposal against the Central Coast Regional Plan – Implementation Plan 2018 - 2020

Focus Area	Comment
Promote economic growth, jobs and development in strategic centres and growth corridors.	
Deliver the Northern Growth Corridor Strategy	<p>The subject site is not located within the growth corridor, however is nominated as a future centre in the North Wyong Structure Plan. The proposed rezoning and ultimate development of the site will complement this focus area and not be in competition with the growth corridor.</p>

Focus Area	Comment
Progress the Bus Headstart and the Rapid Bus Package for the Central Coast to implement the NSW Future Transport Strategy.	The site is well supported with access to public transport and will align with the objective to cluster intensified development around centres to support demand for public transport access. The proposed residential zoning is also in support of this focus area in that it will provide pedestrian access to the local centre, as well as pedestrian links to the existing public transport access points.
Improve knowledge of housing and employment land supply and demand to support better decision making.	
Continue the Housing Monitoring Program	While not entirely applicable, the planning proposal does support this intention by the supply of additional lands for housing adjacent to an established residential community.
Support the integration of implementation priorities in Council's work program	
Rezoning and developing land consistent with the planned staging and sequencing of development in the region.	The proposed rezoning of the site is consistent with strategic direction of the Council for this area.
Coordinate Strategic Conservation Planning for the region	
Continue implementation of the Strategic Conservation Planning Program	The proposal identifies the E2 Environmental Conservation zoned land for particular exclusion from the proposed rezoning and thus supports the focus of this policy.

North Wyong Shire Structure Plan (2012)

The North Wyong Shire Structure Plan (NWSSP) identifies where and when development is planned to occur and ensures that sufficient land exists to meet regional housing and employment targets. The NWSSP was developed in response to a CCRS outcome to provide for a high level land use strategy to guide ongoing development and planning for infrastructure and services for the North Wyong Shire area. The NWSSP was also developed with consideration of Wyong Community Strategic Plan (2011).

The primary objectives relevant to the proposed development include:

- Identify sufficient land for regional greenfield housing and employment targets to be met, as a minimum;
- Provide greater certainty for the community, local government, industry groups and commerce on the location of future development and conservation areas;
- Consider key infrastructure requirements to support new precincts and ensure that new urban land release contributes to infrastructure costs;
- Ensure developable areas are serviced by a hierarchy of centres which can support a range of services and low – medium density residential development;
- Identify opportunities for new and expanded employment nodes which support existing employment area and/or which have good access to transport infrastructure; and
- Concentrate new development in areas that allow for efficient infrastructure servicing.

The site is identified in the NWSSP as a potential new centre and has been earmarked for development in the medium term or within 15 years. An extract of the Structure Plan map is included in Figure 9 below which shows the potential centre location and existing and proposed residential development within close proximity to the site.

Housing targets and density will be appropriate to the centre hierarchy and development should generally be contained within 400m-600m of the centre. The Plan recognises that the site will facilitate a

village retail centre, which will assist in meeting overall employment targets. This new centre will provide employment opportunities within close proximity to the existing and proposed residential areas in Gwandalan and Summerland Point areas.

This proposal will assist in achieving the objectives and actions of the NWSSP by:

- Providing the new centre as identified in the NWSSP to service the needs of the growing population, including retail and community infrastructure;
- Provision of new housing options within the Gwandalan area which will provide a diversity of housing choice within close proximity to services; and
- Provide employment opportunities before and after construction.

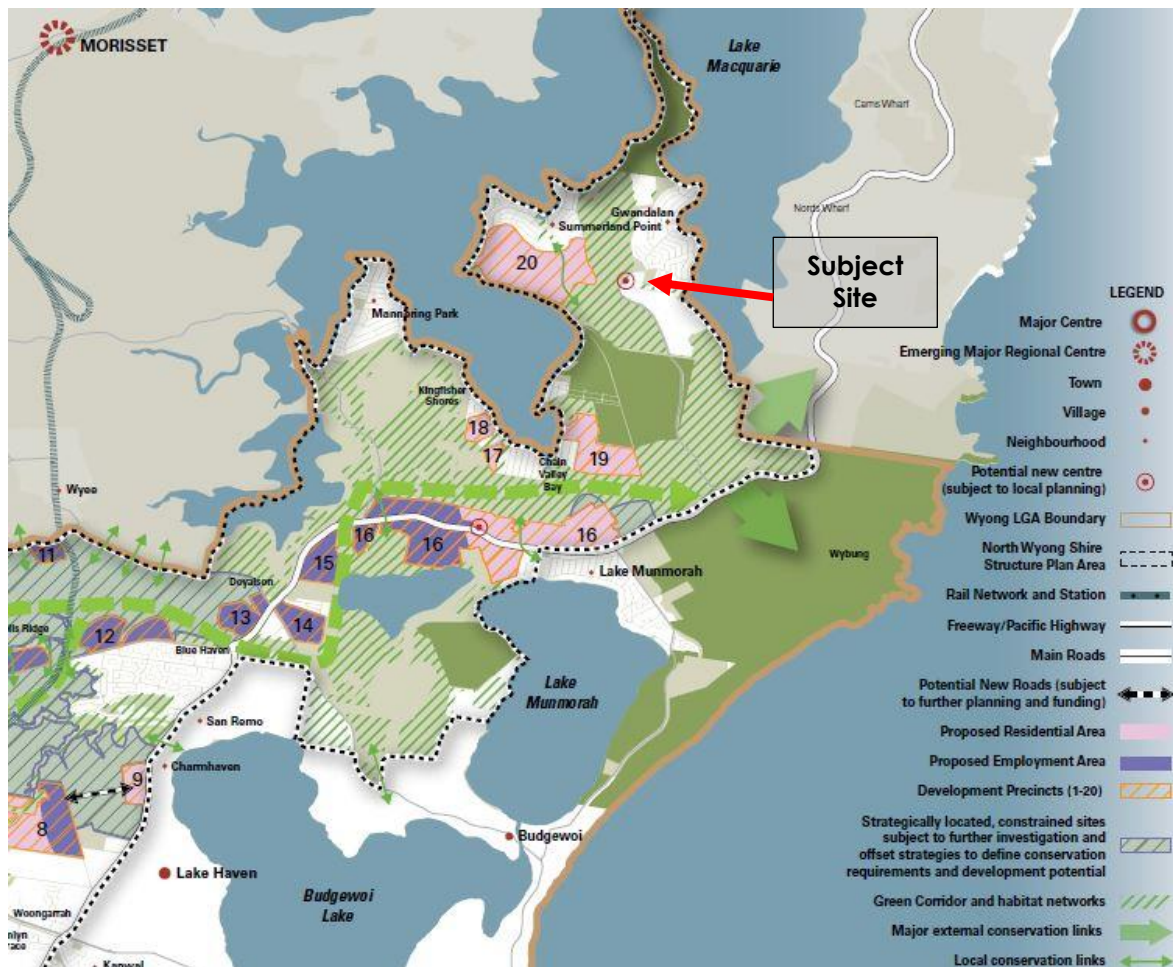


Figure 9: Extract of North Wyong Shire Structure Plan

The Central Coast of NSW: A Sustainable, Smart and Connected Region - Regional Economic Development & Employment Strategy

The Regional Economic Development and Employment Strategy (REDES) is the long-term strategy for sustainable economic development and jobs growth for the NSW Central Coast region. It was developed as part of the regional strategy detailed above.

Relevant key objectives of the strategy for this proposal are:

- To deliver more than 45,000 new jobs by 2031, increasing the region's level of employment self-containment and providing jobs for a growing population;
- To ensure the delivery of key infrastructure necessary to support ongoing employment growth; and

- To encourage employment growth in key employment nodes, including strategic centres, employment lands and smaller centres.

Following from these objectives the proposal will help with the strengthening the regional economy through securing new jobs employment opportunities both during and after construction in a variety of sectors.

Central Coast Community Strategic Plan 2018 - 2028

The Central Coast Community Strategic Plan now acknowledges the former Wyong and Gosford government areas as one region. The Plan provides a clear path of action for the communities' future and is characterised by five themes: *Belonging; Smart, Green, Responsible and Liveable*.

The CCCSP identifies a number of important projected population and housing statistics. Most relevant to this planning proposal for rezoning to R1 and R2 is the need for an additional 41,500 dwellings on the Central Coast by 2036 to accommodate population growth levels.

Table 4 below outlines the relevant objectives based on consultation with the community and the details of how this proposal for rezoning can assist in achieving them.

Table 4: Applicable objectives from the Community Strategic Plan 2012- 2028

Relevant Objectives	Comment
<i>B4 Activate spaces and places to complement activity around town centres, foreshores, lakes and green spaces for families, community and visitors</i>	The proposal has been designed to achieve a sustainable local centre and low-medium density housing opportunities. The proposed rezoning will facilitate the retention of the environmental zoned land for community purposes by the specific exclusion of this land. The proposed centre will also include passive recreation space in the proposed park which will provide an important recreation and open space area which will improve the liveability and sustainability of the site.
<i>F1 Protect our rich environmental heritage by conserving beaches, waterways, bushland, wildlife corridors, and inland areas and the diversity of local native species.</i>	The Ecological Assessment Report (Appendix E) identifies that the proposal will avoid or <i>minimise impacts on native vegetation, threatened or regionally significant flora and fauna, populations and ecological communities, including retention of the land zoned E2 Environmental Conservation</i> (now excluded in the amended planning proposal). Where these impacts cannot be avoided or mitigated, offsets may be used to compensate for any remaining impacts in order to achieve an ' <i>improve or maintain</i> ' outcome for the proposal. The Ecological Assessment Report identifies potential offsets for the development, where necessary.
<i>F2 Promote greening and ensure the wellbeing of communities through the protection of local bushland, urban trees, tree canopies and expansion of the Coastal Open Space System (COSS)</i>	Given that the subject sites have experienced degradation through previous land uses the proposal for rezoning and future development of the site effectively utilises the site characteristics without compromising the natural and environmental heritage.
<i>H2 Improve pedestrian movement safety, speed and vehicle congestion around schools, town centres, neighbourhoods and community facilities.</i>	This rezoning proposal supports the development of a local centre adjacent to an established residential area and includes daily essential services that will be accessible by pedestrian linkages to the residential zoned areas.

Relevant Objectives	Comment
<i>12 Ensure all new developments are well planned with good access to public transport, green space and community facilities and support active transport</i>	The concept plan has been designed with regard to public transport, green space and community facilities. The site is well located to existing public transport links with a bus stop sited immediately adjacent to the site on the Pacific Highway. This service provides links north to Gwandalan, south to Toukley and Wyong and to Wyee Train Station. The inclusion of a centre park will promote community and resident based interaction via inclusive design elements.
<i>13 Ensure land use planning and development is sustainable and environmentally sound and considers the importance of local habitat, green corridors, energy efficiency and stormwater management</i>	The proposed rezoning will facilitate important opportunities for sustainable development. The Ecological Assessment Report attached in Appendix E provides a preliminary review of existing flora and fauna characteristics. Where impacts to the items cannot be avoided or mitigated, offsets may be used to compensate for any remaining impacts in order to achieve an 'improve or maintain' outcome for the proposal. The Ecological Assessment Report identifies potential offsets for the development, where necessary.
<i>14 Provide a range of housing options to meet the diverse and changing needs of the community including adequate affordable housing</i>	The proposed rezoning will provide opportunities for additional low-medium density housing to meet the needs of the Central Coast community. The 450m ² minimum lot size associated with the R1 and R2 zone can best provide for a housing mix that can address the diverse nature of the regional population.
<i>L4 Provide equitable, affordable, flexible and co-located community facilities based on community needs.</i>	The proposal includes the provision of community services such as a potential child care centre, and indoor recreation centre/swimming pool. This will provide a more accessible option for the Gwandalan and Summerland Point communities.

This proposal will help to address a number of these objectives by providing:

- Housing choice and diversity;
- Employment opportunities;
- Implementation of regional strategies;
- Providing social and community infrastructure for the local community to access; and
- Location of accessible future housing opportunities within walking distance of services

Is the Planning Proposal consistent with the local Council's community strategic plan or other local strategic plan?

Council has a number of strategic planning documents that are relevant to the proposal including the Wyong Shire Retail Centres Strategy, Wyong Shire Council Settlement Strategy and the Wyong Shire Economic Development Strategy. The proposal is generally consistent with these documents and the justification is outlined below.

Wyong Shire Retail Centres Strategy

The purpose of the Wyong Shire Retail Centres Strategy (Retail Strategy) is to consider opportunities for the redevelopment and renewal of existing centres in Wyong and establish broad planning requirements for the planning and development of new centres. To achieve this the Strategy outlined a number of objectives which prioritised the need to ensure a viable network of centres so that the community would have equitable access.

Other more secondary objectives of the Retail Strategy included:

- To establish a hierarchy for the Wyong centres.
- To consider the scale and mix of uses within a centre and opportunities to promote activity through uses such as higher-density housing, offices and employment-generating land uses in centres.
- To identify where demand for additional retail floorspace may be required in response to population growth.
- To provide a basis for an integrated approach to centre planning throughout Wyong.

The Strategy considered the policy context, industry trends, population projections, existing retail networks and hierarchy, and demand assessment to prepare a strategy for retailing in the former Wyong Shire as well as some additional actions.

The site at Gwandalan has been included in the North Wyong Shire Structure Plan as a future centre and was therefore considered as a potential site in the Retail Strategy. The rezoning and development of the site into a new local centre is supported by the Retail Strategy and will assist in meeting the retail needs of local residents, and in the immediately proposed residential areas. The Strategy states that the new centre at Gwandalan will supplement the existing centres at Gwandalan and Summerland Point.

An important aspect of the Retail Strategy is the recognition of the centres hierarchy. The development of a strong hierarchy ensures that the needs of local residents are met while maintaining the objectives and functions for each of the different levels of centres within the retail hierarchy. Further, the hierarchy framework outlines the role and function of centres within that network and how best to encourage investment while maintaining the viability of existing centres in Wyong would be more appropriate.

The Retail Strategy suggests that the proposed new centre should be a neighbourhood centre, while the North Wyong Shire Structure Plan suggests that the new Gwandalan centre should be a village centre. The proposed development, the subject of this planning proposal, is more in line with the characteristics of a village centre rather than a neighbourhood centre given the Retail Strategy criteria for centre types. The retail centre will include a supermarket, specialty retail stores and cafes, as well as supporting services such as a child care centre, medical centre or community centre. The centre will be supported by adjoining low – medium density housing which will provide opportunities for working from home close to facilities.

The Strategy did however suggest that the Gwandalan centre would not be supportable until at least 2031. To justify the rezoning of the site now, some additional information to support the rezoning for retail and commercial development, as well as a net community benefit test (referred to in Section 13 of the Retail Strategy) is included in Appendix B.

Wyong Shire Council Settlement Strategy

The Wyong Shire Settlement Strategy establishes a framework for land use and development activities that are consistent with State, regional and local planning objectives for the former Wyong LGA (now Central Coast).

The Settlement Strategy was prepared to cater for anticipated growth until 2031, in line with the CCRS and the NWSSP, referred to above. It provides a comprehensive set of objectives and actions relating to land use planning within the Shire. These were mainly used to prepare the Wyong LEP and DCP 2013, but also provide guidance for future growth and planning proposals.

Table 5 below outlines the key planning considerations referred to in the Strategy that are specifically important to the proposed development and a comment as to how the proposed development will work towards addressing and implementing them.

Table 5: Outline of Key Planning Considerations in relation to Proposed Development

KEY PLANNING CONSIDERATION	COMMENT RELATING TO PROPOSED DEVELOPMENT
<p><i>Improved Community Facilities and Services</i> Co-locate community facilities with complementary facilities, such as sport and recreation facilities, schools and retail centres to create a "community hub".</p>	<p>The proposal will include community infrastructure and services within an existing and expanding community, within walking distance of most residents.</p> <p>The subject site is located where community facilities are indicated as a potential location in Figure 4 of the Settlement Strategy. The proposal is therefore consistent with this consideration.</p>
<p><i>Open Space and Recreation</i> Provide a hierarchy of play opportunities within open space areas from district playgrounds and all access playgrounds to landscaped areas for imaginative play. Maintain and provide for a variety of open space and recreation facilities to service existing and new development. New Greenfield and Infill development areas to include appropriate open space facilities within the urban interface area in bushfire prone areas. Build connectivity into residential precincts via footpaths, cycleways and shared pathways. Create public places and spaces that are conducive to community connectedness to enable residents to meet and use the facilities and services in the area. Ensure open space and recreation facilities are safe, inviting, attractive and reflective of community identity, through landscape design, public art, street furniture etc.</p>	<p>The amended proposal will now include the retention of land zoned E2 and within ownership of Council to operate accordingly. Currently the land zoned RE1 is a narrow strip of land adjacent to the road. The proposal includes the potential for both active and passive open space areas, including a proposed small central park and the possibility of a multi purpose building.</p> <p>These spaces are integrated into the commercial and community facilities to promote convenient access and availability. These are also ideally located to the surrounding residential areas, thus providing good connectivity.</p> <p>The proposed park will allow passive surveillance of this space, as well as providing an opportunity for establishing community identity through the future design and public art.</p>
<p><i>Health</i> Consider the Healthy Planning Checklist prepared by the Premier's Council for Active Living as part of master planning process for new and expanding communities, to encourage and facilitate active living.</p>	<p>The proposed development will encourage walking and cycling due to its location. It is also well placed to include new residential development. It will also reduce the dependence on cars as it will allow locals to walk and cycle to local services.</p> <p>The proposal also indicates additional community facilities in this location that promote a healthy lifestyle.</p>
<p><i>Commercial and Retail Centres</i> Protect and reinforce the existing hierarchy of commercial and retail centres. Manage commercial and retail development so that new development does not cause adverse economic or social impacts on the existing hierarchy of commercial and retail centres. Ensure that the viability of the commercial and retail hierarchy is maintained and enhanced through appropriate built form requirements,</p>	<p>The proposed development is located within the existing retail hierarchy and is not proposing a new centre not previously identified in the North Wyong Shire Structure Plan for a new centre.</p> <p>The viability of the centre and its need has been considered and is identified in the information provided in Appendix B.</p> <p>Further as the population of Gwandalan and Summerland Point is quite removed from other centres, the current and future population would welcome a new centre that will cater to their</p>

KEY PLANNING CONSIDERATION	COMMENT RELATING TO PROPOSED DEVELOPMENT
<p><i>encouraging higher density, compact form and mixed uses.</i></p> <p><i>Ensure that dispersed populations have access to sustainable local centres that provide for the needs of the community.</i></p> <p><i>Facilitate increased use of transport alternatives to the private motor vehicle by encouraging improved public transport and walking/cycling pathways connecting to commercial and retail centres.</i></p>	<p>needs, not only for retail and commercial services but for social infrastructure.</p> <p>The central location of the new centre will encourage people to walk and cycle to the centre rather than use their car which is currently the main mode of transport to centres located outside Gwandalan and Summerland Point.</p>
<p><i>Economic Development</i></p> <p><i>Increase the provision of locally based jobs and increase the proximity of employment opportunities to existing and future development areas.</i></p> <p><i>Facilitate and support the growth of small and home-based business.</i></p>	<p>The proposal will provide for local jobs both during and after construction.</p> <p>The proposed low-medium density development will support home-based businesses within close proximity to the new services.</p>
<p><i>Residential Centres</i></p> <p><i>Higher density developments should be located around the commercial core of nominated Town, Village and Neighbourhood Centres, whilst having regard to the desired urban character of each settlement. This will need to be supported by local planning strategies and/or masterplans.</i></p> <p><i>The majority of new housing within Wyong LGA will be located within or immediately adjacent to existing Town, Village and Neighbourhood Centres.</i></p> <p><i>Facilitate the creation of social hubs in new Urban Release Areas that satisfy the needs of the community, including community cultural, education, health and recreation facilities.</i></p> <p><i>Provide for appropriate housing choice in new Urban Release Areas. This may be assisted by incorporating the findings of the Affordable Housing study.</i></p>	<p>The proposed residential area is located very close to the new centre and is proposed to be both low and medium density in nature.</p> <p>It will provide housing choice for residents and will encourage the creation of a social hub, together with the local services, which are proposed to include health and recreation facilities.</p>
<p><i>Affordable housing</i></p> <p><i>Support the delivery of a mix of housing types to assist housing diversity and affordability to better accommodate the housing needs of the community.</i></p> <p><i>Aged housing</i></p> <p><i>Provide for a mix of housing types, including housing that will accommodate an ageing population and smaller household sizes.</i></p> <p><i>Ensure aged housing is well designed and located in relation to community facilities and services and public transport.</i></p>	<p>The mix of housing types proposed will assist with the provision of affordable housing and housing for the aged. The housing will be well located for services and facilities and will allow people to age in place rather than being forced to relocate when they downsize.</p>

Further to the above planning guidelines, the strategy addresses issues such as bushfire, ecology, drainage and stormwater management, protection of scenic quality, land contamination, and access and infrastructure. These issues are more site specific and have been discussed in more detail below in Section 5.3.

In summary the proposed development meets the objectives and actions of the Settlement Strategy as:

- The proposed development is consistent with the NWSSP, which identifies the site as being a potential town centre;
- The site is close to a number of urban release areas and new developments within the Gwandalan and Summerland Point localities that are identified in the Settlement Strategy;
- The proposed site is within close proximity to an existing bus network, has existing connections to utilities and is within close proximity to the existing community and recreational facilities in the Gwandalan and Summerland Point areas;
- The proposed development includes a number of community and commercial facilities including shopping, child care, medical centre and park;
- The proposed design provides a liveable and walkable community as dwellings are proposed close to the retail centre, while the CPTED principles will be used in the detailed design to reduce opportunities for crime and create a sense of ownership; and
- The planned development, shown in Figure 1, provides for a range of dwelling types to meet the needs of the wider community.

The Settlement Strategy does however refer to the protection of employment lands. The site is currently zoned industrial with an existing approval for 14 lots and associated roads and access and has the potential to provide for employment uses. Since the approval was issued in 2005, the interest in industrial in this location has not been forthcoming and the subdivision was not finished. Further the existing units located along Parraweena Road are not being used entirely for industrial purposes (alternate land uses include a child care centre, veterinary clinic and other uses more fitting of a commercial definition) and these uses, while permissible, are not achieving the primary objective of the zone for industrial and warehouse development. The prevalence of these land uses does indicate a demand for non-industrial floor space within this area, including community facilities. Therefore, following from this and the identification of the site within the NWSSP as a centre, this planning proposal has been prepared.

Wyong Shire Economic Development Strategy

The Wyong Shire Economic Development Strategy was prepared in 2014 to provide a positive framework that guides and encourages diverse and sustainable economic development in the former Wyong Shire.

The strategy identified a number of actions and activities to be undertaken each year with an aim to improving the economic performance of the Shire and to encourage new business, industry and employment.

Although this strategy is larger in scale and more holistic than this planning proposal, it does provide a base for new development and growth of both businesses and population into the future. The centre at Gwandalan will provide an employment option during and after construction and will also provide the much needed social and community infrastructure to support a diversity of residential and business growth.

Is the Planning Proposal consistent with applicable State Environmental Planning Policies (SEPPs)?

Table 6 below details the implications and relevance of SEPPs applicable to the proposal.

Table 6: Assessment of the Planning Proposal against relevant SEPPs

SEPP	Relevance / Implications
State Environmental Planning Policy No 33 – Hazardous and Offensive Development	This SEPP relates to potentially hazardous or offensive industry and may be applicable when a development application is submitted for the service station. It is not applicable in relation to the rezoning.
State Environmental Planning Policy No 44—Koala Habitat Protection	As the site is relatively degraded and used regularly by off-road motorbikes, it is unlikely that the site is being used by Koalas as habitat. An Ecological Assessment Report (Appendix E) has undertaken an assessment in accordance with SEPP 44. No evidence of the presence of Koalas could be found on the site and it is not deemed to qualify as 'Core Koala Habitat'. Therefore no further assessment is required.
State Environmental Planning Policy No 55 - Remediation of Land	The proposal is located on a site that was proposed to be developed for industrial purposes. This SEPP is applicable; however the current development only occupies a small portion of the site and was only used for mobile home manufacturing. A detailed report was undertaken as part of the original gateway determination and Council has indicated that no further investigation was required.
State Environmental Planning Policy No 64 - Advertising and Signage	This SEPP relates to signage and will be applicable when a development application is submitted. It is not applicable in relation to the rezoning.
State Environmental Planning Policy No 65 - Design Quality of Residential Flat Development	Clause 28 of this SEPP 'Preparation of Instruments' requires a person who prepares an environmental planning instrument <i>that makes provision with respect to residential flat development should include provisions in the instrument or plan to ensure the achievement of design quality in accordance with the design quality principles and have regard to the publication Residential Flat Design Code.</i> It is unlikely future development will include residential flat buildings or any development over three storeys, however where this is proposed the future development of the site can be assessed in accordance with this SEPP at DA stage.
Sydney Environmental Planning Policy (Coastal Management) 2018	The land to be developed for this proposal is located outside the Coastal Zone for this SEPP. There is no requirement to consider the provisions of Clause 13 of the SEPP further. It is considered that the proposal will be able to satisfy the requirements of SEPP (Coastal Management). Note the requirements of this clause would be addressed at the DA stage. Refer to Figure 10 following this table for an extract of SEPP (Coastal Management) mapping.
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	This SEPP relates to buildings and is not applicable in relation to this rezoning. Future residential development will be required to comply with relevant BASIX provisions and will be certified appropriately at development application stage.

SEPP	Relevance / Implications
State Environmental Planning Policy (Infrastructure) 2007	The proposed development may trigger the SEPP Infrastructure 2007 at the development application stage in accordance with Clause 104 Traffic Generating Development due to the nature or size of the commercial / retail area. This would be addressed further at DA stage. Refer to the Preliminary Traffic Impact Assessment attached in Appendix C for further traffic discussion.
State Environmental Planning Policy (Affordable Rental Housing) 2009	This SEPP applies to the state of NSW. In accordance with Clause 4, the site is considered to be within the Sydney Region. The site is within close proximity to a bus stop with regular stops, however the buses generally do not run to 21.00 on weekdays. Therefore, the site is not identified as being an accessible area, which is generally a requirement for affordable housing development under the SEPP. It does not however stop the development of affordable housing types as considered by Council.
State Environmental Planning Policy (State and Regional Development) 2011.	This SEPP applies to the state of NSW. The proposed development may trigger the SEPP where capital investment exceeds \$30 million.
State Environmental Planning Policy Educational Establishments and Child Care Facilities) 2017	This SEPP applies to the state of NSW and development involving educational establishments and early education and care facilities. This SEPP will be applicable when a development application is submitted for the child care centre. It is not applicable in relation to the rezoning.
State Environmental Planning Policy (Aboriginal Land) 2019	The subject site is located outside land nominated by this SEPP and is therefore not applicable.



Figure 10: Extract from SEPP (Coastal Management) Mapping Source: NSW Portal

Is the Planning Proposal consistent with applicable Ministerial Directions (S.9.1 Directions)?

An assessment of the Planning Proposal and its consistency against the applicable Ministerial Directions is provided at Table 7 below.

Table 7: Consistency with applicable Section 9.1(2) Ministerial Directions

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
1.1 Business and Industrial Zones	(a) Encourage employment growth in suitable locations, (b) Protect employment land in business and industrial zones, and (c) Support the viability of identified strategic centres.	<p>Justifiably inconsistent. The proposal includes the replacement of the industrial zone at Gwandalan with a business and residential zoning.</p> <p>The industrial land has been zoned for this purpose since at least 1991 and although approval was given for subdivision, the take up and sale of land has been non-existent. However, the developer has received interest for retail and commercial uses.</p> <p>The site is identified in local and regional strategies for a local centre and the loss of industrial / employment land is relatively minor considering the replacement with substantial business zoning.</p> <p>Therefore, the proposal is justifiably inconsistent with this direction. The proposal will provide a mix of residential and commercial uses, directly adjacent to a number of large sites zoned for residential development and will provide much needed social infrastructure on this part of the Central Coast.</p>
1.2 Rural Zones	Protect the agricultural production value of rural land.	Not Applicable. Site is not located within an area zoned for rural purposes.
1.3 Mining, Petroleum Production and Extractive Industries	Ensure that the future extraction of State or regionally significant reserves of coal, other minerals, petroleum and extractive materials are not compromised by inappropriate development.	The site is currently zoned for industrial purposes and the change in zoning will not further limit or restrict the potential for mining or other extractive industries.
1.4 Oyster Aquaculture	Ensure priority oyster aquaculture areas are adequately considered and protected from any adverse impacts on water quality.	Not applicable. This proposed rezoning will not have an impact on priority oyster aquaculture areas.
1.5 Rural Lands	Protect agricultural production value of land and facilitate orderly and economic development of rural lands for rural and related purposes.	Not applicable. The site is not located within a rural.

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
2.1 Environment Protection Zones	Protect and conserve environmentally sensitive areas.	The amended planning proposal now excludes a component of E2 zoned land that was formerly part of the rezoning, therefore no further consideration against this direction is required.
2.2 Coastal Protection	Implement the principles in the NSW Coastal Policy.	Consistent. The proposal is located outside the Coastal Zone.
2.3 Heritage Conservation	Conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.	Consistent. The planning proposal does not impact on any known heritage items or conservation areas. An Aboriginal Cultural Heritage Assessment report has been prepared and identified items for assessment (see Appendix F). This report recommends the submission of an AHIP and this will need to be done prior to the commencement of any works on site. The ACHA does not identify any matter that would impede the rezoning of the land as proposed.
2.4 Recreation Vehicle Areas	Protect sensitive land or land with significant conservation values from adverse impacts from recreation vehicles.	Not applicable. No recreation vehicle areas are proposed.
2.5 Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEP's	Ensure that a balanced and consistent approach is taken when applying environmental protection zones and overlays to land on the NSW Far North Coast.	Not applicable.
3.1 Residential Zones	(a) Encourage a variety and choice of housing types to provide for existing and future housing needs, (b) Make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and (c) Minimise the impact of residential development on the environment and resource lands.	Consistent. The proposed development will provide a range of housing types to meet the market. The proposed R1 and R2 zones will provide a range of housing options. The proposed B2 zone will provide services to dwellings within the site, existing residents of the Gwandalan and Summerland villages and future residents in the adjacent growth areas to the south and west. Infrastructure is currently available for the site including power, water, sewer, communications and public transport.
3.2 Caravan Parks and Manufactured Home Estates	(a) Provide for a variety of housing types, and (b) Provide opportunities for caravan parks and manufactured home estates.	Not applicable. No changes are proposed.

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
3.3 Home Occupations	Encourage the carrying out of low-impact small businesses in dwelling houses.	Consistent. No changes to these provisions are proposed. Home occupation will be permitted without consent in the R1 and R2 zones consistent with existing provisions.
3.4 Integrating Land Use and Transport	<p>Ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:</p> <p>(a) improving access to housing, jobs and services by walking, cycling and public transport, and</p> <p>(b) increasing the choice of available transport and reducing dependence on cars, and</p> <p>(c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and</p> <p>(d) supporting the efficient and viable operation of public transport services, and</p> <p>(e) providing for the efficient movement of freight.</p>	<p>Consistent. The proposed development will provide housing, employment and services within close proximity to existing and proposed residential areas. Residents within the development will be within walking distance of the shops and be located adjacent to two local bus stops.</p> <p>The proposal is consistent with local and regional strategies, in that it is providing a local centre in a designated location, with associated housing that will provide increased choice close to services and facilities.</p>
3.5 Development Near Licensed Aerodromes	<p>(a) Ensure the effective and safe operation of aerodromes, and</p> <p>(b) Ensure that their operation is not compromised by development that constitutes an obstruction, hazard or potential hazard to aircraft flying in the vicinity, and</p> <p>(c) Ensure development for residential purposes or human occupation, if situated on land within the Australian Noise Exposure Forecast (ANEF) contours of between 20 and 25, incorporates appropriate mitigation measures so that the development is not adversely affected by aircraft noise.</p>	Not applicable. There are no licensed aerodromes within the vicinity of the proposal.
3.6 Shooting Ranges	(a) Maintain appropriate levels of public safety and amenity when rezoning land adjacent to an existing shooting range,	Not applicable. No shooting ranges are within the vicinity of the proposal.

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
	(b) Reduce land use conflict arising between existing shooting ranges and rezoning of adjacent land, (c) Identify issues that must be addressed when giving consideration to rezoning land adjacent to an existing shooting range.	
4.1 Acid Sulfate Soils	Avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.	Consistent. Acid sulfate soils have been considered in accordance with these provisions and those within the Wyong LEP 2013. An assessment will be prepared at development application stage if required but as only a small portion of the site is impacted, it is unlikely that it will be necessary.
4.2 Mine Subsidence and Unstable Land	Prevent damage to life, property and the environment on land identified as unstable or potentially subject to mine subsidence.	Consistent. The Mine Subsidence Board (MSB) will be consulted during the planning proposal process. However, all buildings will be a maximum of two storeys in height and constructed according to MSB requirements so it is unlikely that there will be any objection to the proposal.
4.3 Flood Prone Land	(a) Ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and (b) Ensure that the provisions of an LEP on flood prone land is commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land.	Not applicable. Site not subject to flooding.
4.4 Planning for Bushfire Protection	(a) Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and (b) Encourage sound management of bush fire prone areas.	Consistent. The site is identified as Vegetation Category 1 and Vegetation Buffer. Therefore, the site is classified as bushfire prone land and a study (see Appendix D) is provided in accordance with relevant provisions including Planning for Bushfire Protection 2006.
5.1 Implementation of Regional Strategies	Give legal effect to the vision, land use strategy, policies, outcomes and actions contained in regional strategies.	Consistent. Refer to section above that considers the Central Coast Regional Strategy, the North Wyong Structure Plan and other relevant regional documents.

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
5.2 Sydney Drinking Water Catchment	Protect water quality in the Sydney drinking water catchment.	Not applicable. Does not apply to Central Coast LGA.
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	Ensure protection of farmland for future generations and reduction of conflicts in agricultural areas.	Not applicable. Does not apply to Central Coast LGA.
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	Managing commercial and retail development along the Pacific Highway on the North Coast.	Not applicable. Does not apply to Central Coast LGA.
5.8 Second Sydney Airport: Badgerys Creek	Avoid incompatible development in the vicinity of any future Sydney Airport at Badgerys Creek.	Not applicable. Does not apply to Central Coast LGA.
5.9 North West Rail Link Corridor Strategy	Promote, manage growth and consistent development in accordance with strategy within North West Rail Link corridor.	Not applicable. Does not apply to Central Coast LGA.
5.10 Implementation of Regional Plans	To give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.	There are no Regional Plans that apply to the former Wyong portions of the Central Coast LGA.
5.11 Development of Aboriginal Land Council land	Consideration of development delivery plans prepared under State Environmental Planning Policy (Aboriginal Land) 2019.	Not applicable, does not apply to the subject site.
6.1 Approval and Referral Requirements	Ensure that LEP provisions encourage the efficient and appropriate assessment of development.	Consistent. No new approvals or referrals are proposed.
6.2 Reserving Land for Public Purposes	(a) Facilitate the provision of public services and facilities by reserving land for public purposes, and (b) Facilitate the removal of reservations of land for public purposes where the land is no longer required for acquisition.	Consistent. Lot 1 is classified as operational and in Business Paper 12 August 2015 of item 2.1, on page 33, this report indicated that consultation had been undertaken to various interested sections of Council and that it was determined that the land identified as Lot 1 was surplus to Councils current needs. This parcel is relatively small and while the proposal incorporates this surplus land to provide an optimal outcome, this proposal is not reliant upon the use of the additional land.
6.3 Site Specific Provisions	Discourage unnecessarily restrictive site specific planning controls.	Consistent. This proposal is to change the zoning applying to the specific site. The proposed changes will be consistent with the standard instrument zoning and not create any unnecessarily restrictive provisions.

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
7.1 Implementation of the Metropolitan Plan for Sydney 2036	Give effect to the vision, transport and land use strategy, policies, outcomes and actions contained in the Metropolitan Plan for Sydney.	Not applicable. Does not apply to Central Coast LGA.
7.2 Implementation of Greater Macarthur Land Release Investigation	Ensure development within the Greater Macarthur Land Release Investigation Area is consistent with the Greater Macarthur Land Release Preliminary Strategy and Action Plan	Not applicable. Does not apply to Central Coast LGA.
7.3 Parramatta Road Corridor Urban Transformation Strategy	Facilitate development in the Parramatta Road Corridor	Not applicable. Does not apply to Central Coast LGA
7.4 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	Ensure development within the North West Priority Growth Area is consistent with the North West Priority Growth Area Land Use and Infrastructure Strategy (the Strategy).	Not applicable. Does not apply to Central Coast LGA.
7.5 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Ensure development within the Greater Parramatta Priority Growth Area is consistent with the Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan dated July 2017 (the interim Plan).	Not applicable. Does not apply to Central Coast LGA.
7.6 Implementation of Wilton Priority Area Interim Land Use and Infrastructure Implementation Plan	Ensure development within the Wilton Priority Growth Area is consistent with the Wilton Interim Land Use and Infrastructure Implementation Plan and Background Analysis.	Not applicable. Does not apply to Central Coast LGA.
7.7 Implementation of Glenfield to Macarthur Urban Renewal Corridor	Ensure development within the precincts between Glenfield and Macarthur is consistent with the plans for these precincts.	Not applicable. Does not apply to Central Coast LGA.
7.8 Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	Ensure development within the Western Sydney Aerotropolis is consistent with the Stage 1 Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan dated August 2018 (the Stage 1 Land Use and Implementation Plan).	Not applicable. Does not apply to Central Coast LGA.
7.9 Implementation of Bayside West Precincts 2036 Plan	Ensure development within the Bayside West Precincts (Arncliffe, Banksia and Cooks Cove) is consistent with the Bayside West Precincts 2036 Plan (the Plan).	Not applicable. Does not apply to Central Coast LGA.

MINISTERIAL DIRECTION	OBJECTIVE/S	CONSISTENCY / COMMENT
7.10 Implementation of Planning Principles for the Cooks Cove Precinct	Ensure development within the Cooks Cove Precinct is consistent with the Cooks Cove Planning Principles	Not applicable. Does not apply to Central Coast LGA.

5.3 Section C – Environmental, Social and Economic Impact

Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

A flora and fauna assessment was prepared for the development application for subdivision in 2005. It identified the site included threatened species and had the potential for other species to occur on the site. The site however is now heavily degraded and past clearing, illegal dumping and unauthorised vehicle and pedestrian access may have reduced the site's ecological potential.

A subsequent Ecological Assessment has been prepared by Anderson Environment & Planning dated 22 May 2019 and included at Appendix E. The Ecological Assessment provides the following summary of the environmental attributes of the site and potential impacts as a consequence of the proposal.

The subject site is approx. 5.5ha and approx. 3.7ha of remnant vegetation could be cleared as part of a residential and commercial subdivision following the rezoning process.

Approximately 3.7ha of a single vegetation community was identified on site. This vegetation community was commensurate with E-31 – Narrabeen Doyalson Coastal Woodland as described by the Natural Vegetation of the Wyong LGA – Vegetation Community Profiles (Bell 2002). The vegetation community is also commensurate with the Plant Community Type (PCT) Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast (PCT 1636). The PCT exists in a moderately to highly disturbed state as a result of past clearing, trail bike activity vegetation maintenance and other activities, however it is still in a 'Medium - Good' condition as defined under BAM. The above vegetation type is not commensurate with any listed Endangered Ecological Community (EEC).

Threatened flora species recorded within the study area included Angophora inopina (Charmhaven Apple) and Tetratheca juncea (Black-eyed Susan). The proposal will remove around 15 individual A. inopina and eight clumps of T. juncea. Both species are commonly found in the immediate locality in intact Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast and associated communities.

Fauna species recorded were typical of those expected in this locality in a disturbed and managed vegetation remnant. Threatened fauna species recorded within the site were limited to microbat species including Little Bent-winged Bat (Miniopterus australis), Largefooted Myotis (Myotis macropus) and White-bellied Sea-eagle (Haliaeetus leucogaster). Threatened species recorded within the Coal & Allied lands to the south of the site within commensurate habitat included Little Lorikeet (Glossopsitta pusilla), Varied Sittella (Daphoenositta chrysoptera), Squirrel Glider (Petaurus norfolcensis), Grey-headed Flying-fox (Pteropus poliocephalus), Eastern False Pipistrelle (Falsistrellus tasmaniensis), Little Bentwinged Bat (Miniopterus australis), and Greater Broad-nosed Bat (Scoteanax rueppellii), all of which could potentially utilise the subject site to some degree.

Assessment under SEPP 44 – 'Koala Habitat Protection' revealed that areas of 'Potential Koala Habitat' exist on site. All field surveys conducted to date have not revealed any signs of Koalas or Koala activity. As such, the site would not constitute "Core Koala Habitat" as defined within the policy, and no further provisions of the policy would apply to the site.

Consideration of the EPBC Act revealed that impacts on Matters of National Environmental Significance, namely on *Tetratheca juncea* and *Angophora inopina* will occur, and as such an EPBC referral is required to be considered.

An assessment of the impact of the proposed development upon local and regional ecological corridors was undertaken. It was determined that although an overall reduction in width and quality of the corridor will occur, viable connections will remain between Point Wollstonecraft and the wider landscape.

Where impacts on known and potentially occurring threatened species and ecological communities cannot be avoided or mitigated and where the determining authorities consider it necessary, offsets may be used to compensate for any remaining impacts in order to achieve an improve or maintain outcome for the proposal. Potential offsets for the development have been quantified with reference to the Biodiversity Assessment Method (2017).

Under the new legislation any impacts upon a species / community listed as a 'Serious and Irreversible Impacts (SAIL) candidate species' must be assessed for significance and, if deemed to be a SAIL, the decision maker is 'required to refuse to grant development consent'. No candidate SAIL vegetation communities are considered likely to be found within the site.

The proposed removal of vegetation within the subject site would subsequently require approx. 89 Ecosystem Credits and 181 Species Credits, namely:

- Scribbly Gum - Red Bloodwood - *Angophora inopina* heathy woodland on lowlands of the Central Coast (PCT 1636): 89 credits;
- *Tetratheca juncea* (Black-eyed Susan): 15 credits;
- *Angophora inopina* (Charmhaven Apple): 34 credits;
- Southern Myotis (*Myotis macropus*): 8 credits, and
- Squirrel Glider (*Petaurus norfolcensis*): 119 credits.

A further comment is also provided in relation to the potential presence of two threatened orchid species (*Genoplesium insigne* and *Corunastylis* sp. Charmhaven) within part Lot 1 DP 1043151 and Lot 20 DP 1089946.

Genoplesium insigne (Wyang Midge Orchid 1) was the subject of a targeted search (along with *Tetratheca juncea*) on the 15 September 2016. This search occurred within the known flowering period of this orchid as set out by Wyong Shire Council's Flora Survey Guidelines for cryptic, threatened plants. Further the date of the survey sits between recorded sightings of *Genoplesium insigne*, as recorded in the Bionet Atlas, with records on 16 August 2016 and further records on 4-9 October 2016. It is therefore considered that the survey undertaken occurred during a period where flowering was likely and is therefore adequate and appropriate. No *Genoplesium insigne* were recorded during survey works on the site.

Corunastylis sp. Charmhaven (Wyang Midge Orchid 2) was not surveyed for as there are no nearby records proximate to the subject site with the closest approx. 10.5km to the Southwest. Further to the above, *Corunastylis* sp. Charmhaven is not listed as a threatened species known to occur within plant community type (PCT) 1636 - Scribbly Gum - Red Bloodwood - *Angophora inopina* heathy woodland on lowlands of the Central Coast; as listed within the BioNet Vegetation Classification.

The Ecological Assessment Report provided recommendations for the future redevelopment of the site in accordance with the planning proposal. These recommendations included particular protection and priority for retention of the *Angophora inopina* species. Clearing and works undertaken on site are to be completed with the supervision of an Ecologist and ensure the protection of the adjoining E2 zoned lands. Management practices during clearing works are to be employed to ensure the protection and safe movement of fauna species from the site. Future redevelopment of the site should include

appropriate landscaping to encourage native fauna and be native species commensurate with the vegetation community found on site.

Are there other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?

There is potential for some minor environmental effects relating to the following issues:

- Hydrological and drainage will need to be considered and how the proposed development will impact on local drainage systems and the hydrology of the area, however as the site has access to Council's sewerage and stormwater system the impacts will be minimal, especially on water quality;
- Contamination will need to be considered. Although the site has already been disturbed, the proposal will include excavation which may disturb old fill;
- The proposed development may result in a visual impact during construction, however as the adjacent site is proposed to be developed for residential dwellings the future development will be consistent with the surrounding area;
- Consideration of potential for noise or odour impacts from adjoining industrial and nearby effluent treatment facilities;
- A Bushfire Threat Assessment in accordance with Planning for Bushfire Protection has been prepared in support of the proposal (see Appendix D). The subject site is classified as Vegetation Buffer and Category 1 bushfire prone land. The following conclusions are provided in this regard.

Investigations undertaken for this Bushfire Threat Assessment have revealed that the subject site will be affected by offsite bushland hazard to the north, east, south and west.

It should be noted that there is significant development approved to the south of the subject site, it is likely that that area will be developed prior to a Development Application being lodged. As such, we have presented a potential future scenario where hazard vegetation to the south of the subject site has been excluded.

Forested land adjoining the site to the northeast may be removed as a hazard provided an 88B Easement arrangement under the 'Conveyancing Act 1919' can be established.

Suitable access and egress to the site will be provided via Kanangra Drive and Summerland Drive, new internal roads of the subdivision will need to be compliant with Section 4.6 of the PBP (2006). It is also noted that any future development application will likely occur under PBP 2018 which is currently under pre-release and is expected to be enacted later this year.

It is expected that the development will be serviced by a reticulated water supply system extended from existing and proposed industrial areas and street hydrant access is to be delivered in accordance with AS2419.1 – 2005.

Any future development on the site will require a project specific Bushfire Threat Assessment which will address the specific requirements of individual development being residential, commercial/retail or potentially Special Fire Protection Purposes.

It is considered that the subject site is suitable for the proposed zones and that development specific to each of the proposed zones is able to occur with regards to bushfire considerations, principally APZs and relevant construction standards, comply with the relevant requirements of Planning for Bushfire Protection and AS-3959. When applied, these measures should provide adequate protection to life and property within the proposed development in the event of a bushfire occurring in the immediate locality.

- Sediment and waste management controls will be appropriately applied by the applicant and Council in preparation and consideration of future development applications for the site;

- Geotechnical studies will need to be carried out to provide guidance for excavation and construction;
- Traffic and car parking will need to be considered for the development (including pedestrians and bicycles) as there will be an increase resulting from the residential and commercial uses on the site. A Traffic and Parking Report (Appendix C) has been prepared for this planning proposal and includes an assessment of the existing traffic and intersection operations and carparking. The report provides the following conclusions:

Parking

- *The proposed mixed use development overall complies with Council's car parking requirements for the commercial land use.*
- *Each residential house will need to comply with Council's car parking requirements.*

Traffic

- *The proposed development is a high net trip generator for the weekday AM and PM peak hours.*
- *However, the additional trips from the proposed development can be accommodated at the nearby intersection without noticeably affecting intersection performance, delays or queues.*
- *There are no traffic engineering reasons why a planning permit for the proposed mixed-use in the corner of Kanangra Drive and Summerland Road in Gwandalan should be refused.*

It is not anticipated that these issues will be detrimental to the proposal and are able to be managed appropriately, mainly at development application stage.

How has the Planning Proposal adequately addressed any social and economic effects?

A number of social and economic issues have been considered. They include:

- European heritage - no known heritage items have been identified near the site and it is not anticipated that there will be any heritage concerns;

Aboriginal heritage - An Aboriginal Cultural Heritage Assessment (ACHA) is submitted with this proposal (see Appendix F). Consultation was undertaken with all Aboriginal parties who registered an interest in the project and the results of this consultation have been included in the ACHA. Further, a draft ACHA report was provided to these parties as part of the consultation process prior to finalisation, no comments were submitted by interested parties. The report recommends the preparation of an Aboriginal Heritage Impact Permit (AHIP) application and the following statement of significant is provided in the ACHA,

Investigation into the Aboriginal heritage value of the Project Area has indicated that the land and surrounding region has cultural value for the local Aboriginal community as part of a broader landscape of occupation. Archaeological material was identified in disturbed contexts across the site, including isolated artefacts and shell fragments as well as low density shell scatters. Additionally, the Project Area has low to moderate potential to contain PADs in areas where A horizon soils remain intact. Due to these PADs it is not possible to assess scientific values or Aboriginal Heritage significance without further investigation. The Project Area does not demonstrate significance under the historical or aesthetic criteria.

The recommendations of this report, including the application for an AHIP and further subsurface investigations, these can be implemented prior to the commencement of any works following the rezoning of the land.

- Social impacts – due to the many social and community benefits of the proposal including potential employment, retail and commercial facilities, social infrastructure, housing (potentially

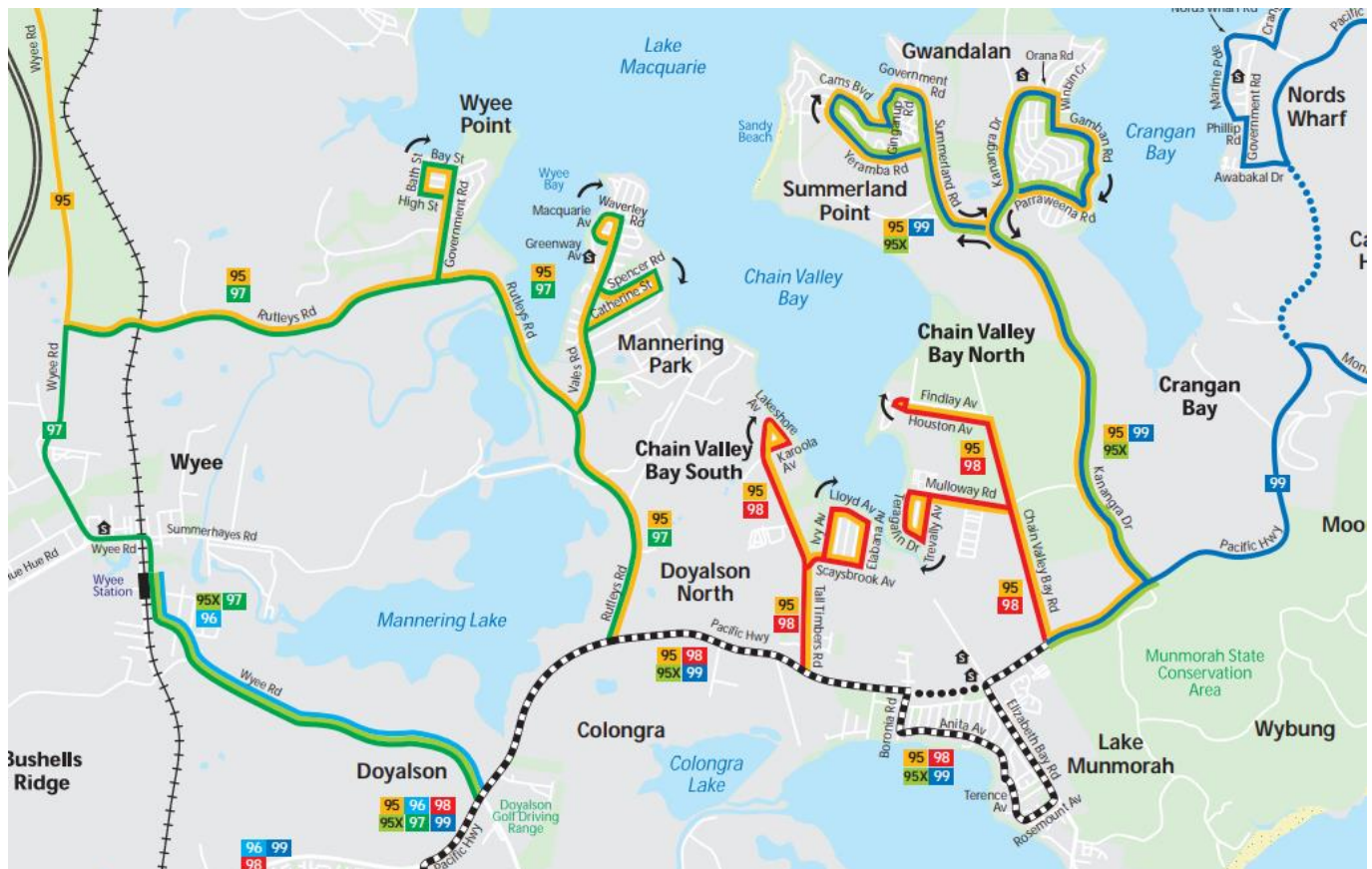
more affordable) and additional open space and meeting places, it is not considered that a social impact assessment would be required; and

- Economic and employment - it is anticipated that the proposal will have a positive benefit on the local community in terms of financial and employment gains, an economic study would confirm the benefits to the local business community if required.

5.4 Section D – State and Commonwealth Interest

Is there adequate public infrastructure for the Planning Proposal?

The site is well located and can be serviced by water, sewer, electricity, communications and gas utilities. In respect to public transport, the site is serviced by buses. Bus services operate to Morisset, Lake Haven, Charlestown, Summerland Point and Gwandalan. Figure 11 below is an extract from the Bus service map for Gwandalan run by a local bus company.



78 Wyong - Tuggerah - Lake Haven via Warnervale Station & Wadalba

79 Wyong - Tuggerah - Lake Haven via Watanobbi & Louisiana Rd

80 Wyong - Tuggerah - Lake Haven via Wyong Hospital & Walker Av

81 Wyong - Tuggerah - Lake Haven via Pollock Av & Johns Rd

82 Wyong - Tuggerah - Lake Haven via Wyongah & Tacoma

90 Lake Haven - Toukley - Noraville - Budgewoi - Buff Point - San Remo (anti-clockwise loop)

91 Lake Haven, Toukley, Noraville & Norah Head

92 Lake Haven - San Remo - Buff Point - Budgewoi - Noraville - Toukley (clockwise loop)

93 Wyong - Tuggerah - Noraville via Toukley

94 Wyong - Tuggerah - Budgewoi via San Remo

95 Lake Haven - Gwandalan - Lake Munmorah - Morisset

95X Lake Haven - Gwandalan - Lake Munmorah - Wyee

96 Wyee - Blue Haven - San Remo - Budgewoi

97 Lake Haven - Wyee - Mannering Park

98 Lake Haven - Blue Haven - Chain Valley Bay

99 Lake Haven - Blue Haven - Gwandalan - Swansea - Charlestown

Legend

Shopping Centres Schools
 Hospitals

●●●● Occasional trips
— Common route
— Bus routes operated by other operators

Figure 11: Gwandalan area bus service map

The site is approximately 17 minute drive to Wyee Station and 23 minutes to Morisset Station, with regional access to Sydney, Gosford and Newcastle. Figure 12 below shows an extract from the Shared Pathways map existing and proposed, in the Gwandalan area and the northern part of Central Coast local government area. The network shows connections between centres, however could be expanded to provide better connections along existing roads.

A traffic and parking assessment will be prepared to show how the traffic generated from the proposal will interact with the existing traffic in the locality. It is not anticipated that there would be an adverse impact on the level of service of the existing road network or traffic or pedestrian safety in the locality. Pedestrian and cycleway connections should be considered as part of the traffic assessment for the site.



Figure 12: Shared Pathways in Gwandalan and Northern part of Central Coast

What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

No consultation has been undertaken as yet with government authorities. Consultation with State and Commonwealth public authorities can be undertaken prior to the community consultation and has been identified as part of the Gateway determination. Consultation with the following authorities has been recommended:

- Office of Environment and Heritage,
- NSW Trade & Investment – Resources and Energy,
- Mine Subsidence Board,
- Transport for NSW – Roads and Maritime Services,
- Transport for NSW,
- Darkinjung Local Aboriginal Land Council,
- Guringai Tribal Link,
- Environment Protection Authority, and
- NSW Rural Fire Service.

6 Part 4 – Mapping

6.1 Map 1 – Locality Map

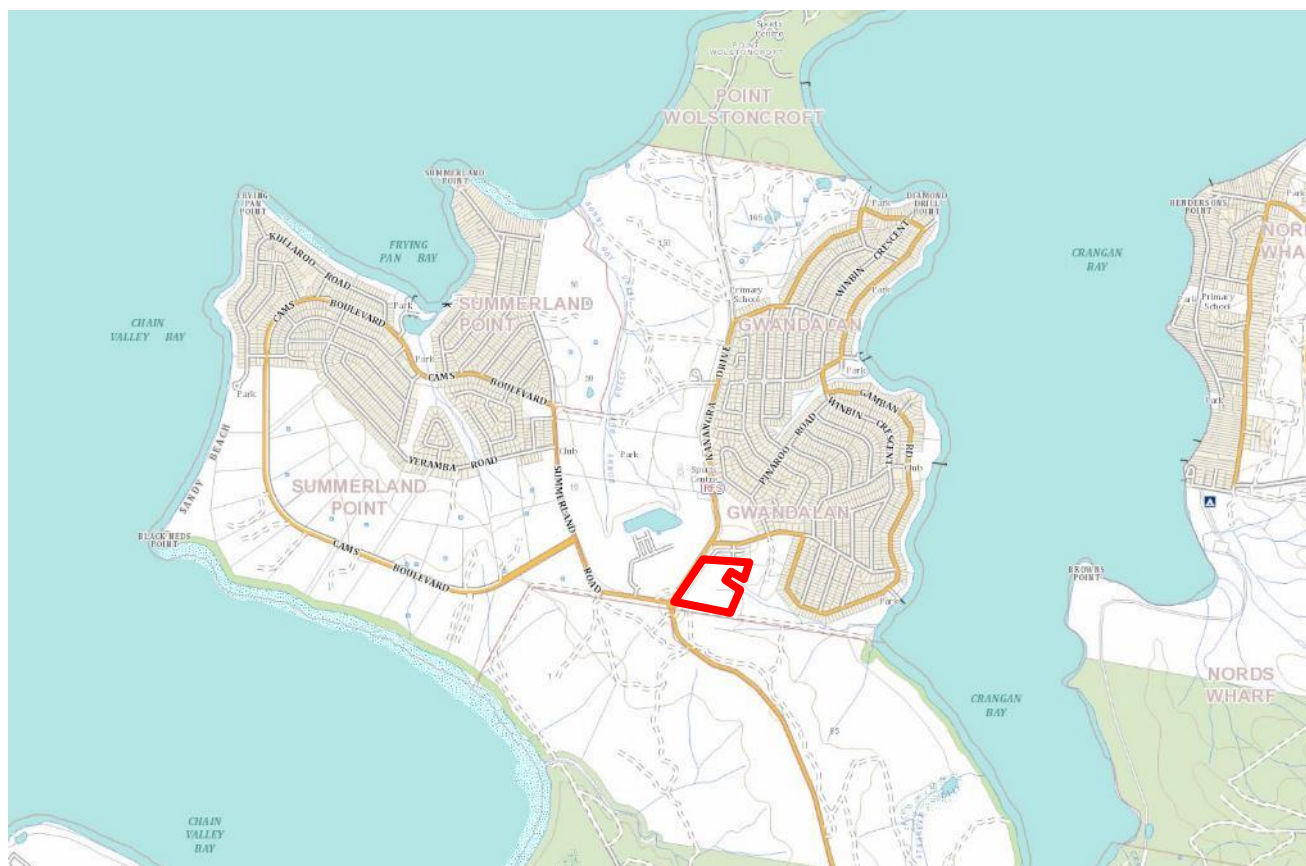
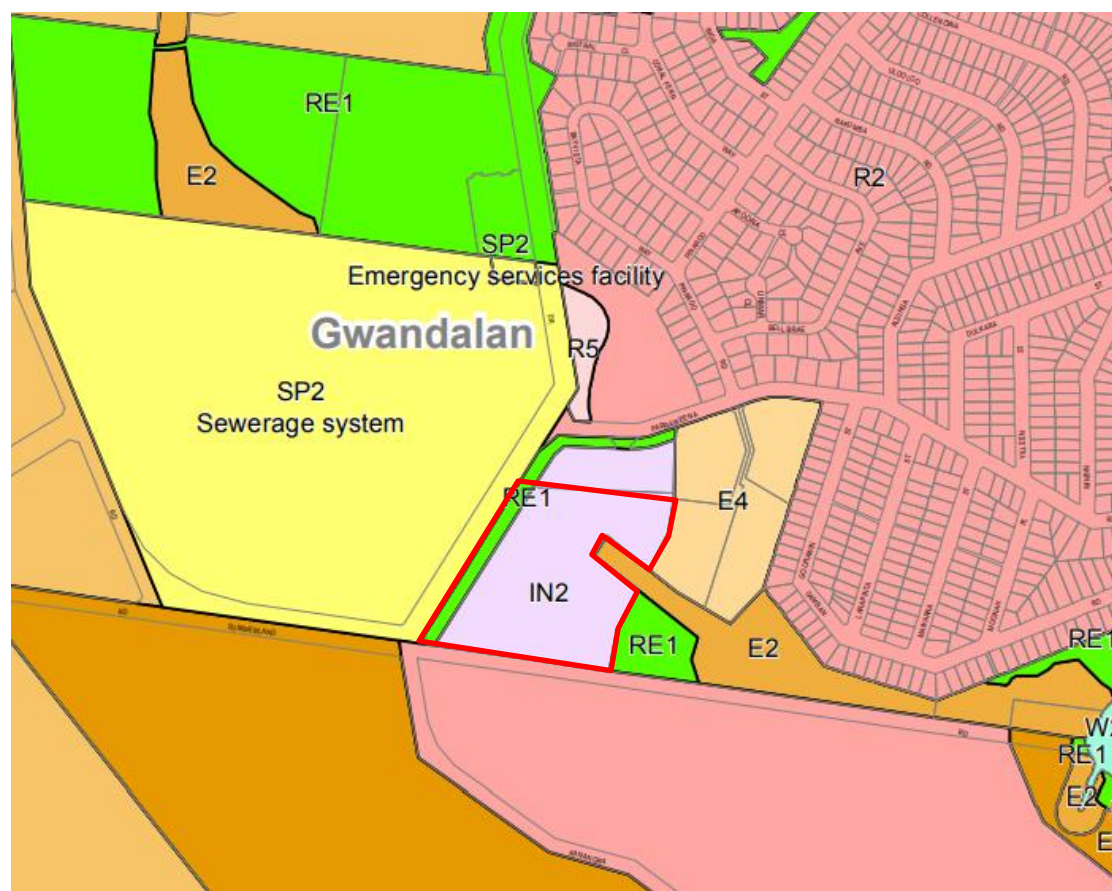


Figure 13: Locality Map Source: Google maps

6.2 Map 2 – Current Zoning Map extract under Wyong LEP 2013

Figure 14 below is an extract from the Wyong LEP 2013 identifying the current zoning of the subject site, being IN2 and RE1.



Land Zoning Map - Sheet LZN_017

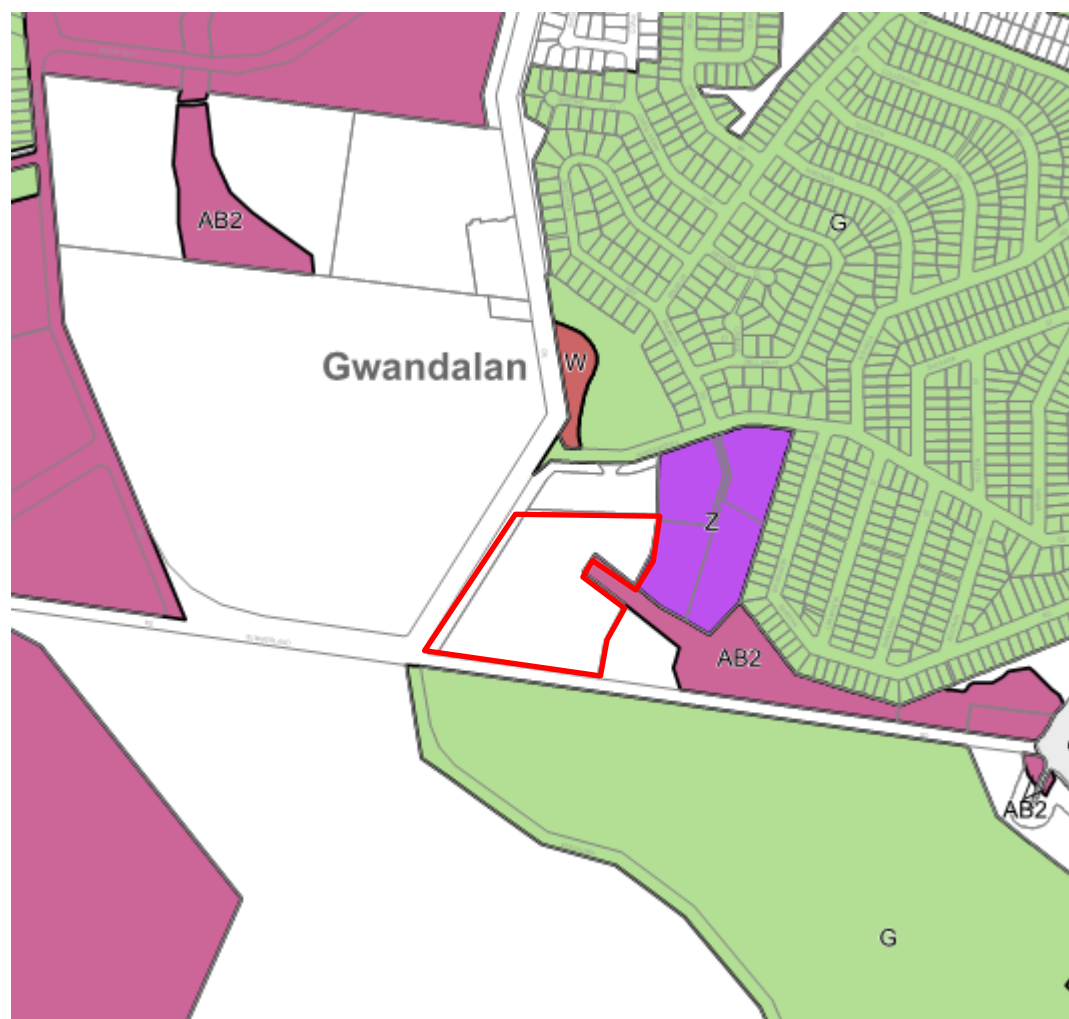
Zone

B1 Neighbourhood Centre	R3 Medium Density Residential
B2 Local Centre	R5 Large Lot Residential
B3 Commercial Core	RE1 Public Recreation
B4 Mixed Use	RE2 Private Recreation
B5 Business Development	RU1 Primary Production
B6 Enterprise Corridor	RU2 Rural Landscape
B7 Business Park	RU3 Forestry
E1 National Parks and Nature Reserves	RU5 Village
E2 Environmental Conservation	RU6 Transition
E3 Environmental Management	SP1 Special Activities
E4 Environmental Living	SP2 Infrastructure
IN1 General Industrial	SP3 Tourist
IN2 Light Industrial	W1 Natural Waterways
R1 General Residential	W2 Recreational Waterways
R2 Low Density Residential	

Figure 14: Current Land Zoning Map Extract Wyong LEP 2013

6.3 Map 3 – Current Lot Size Map extract under Wyong LEP 2013

Figure 15 below is an extract from the current minimum lot size map showing no minimum lot size applying to the subject lands.



Lot Size Map - Sheet LSZ_017

Minimum Lot Size

G	450 m ²
V	2500 m ²
W	4000 m ²
Z	2 ha
AA	8 ha
AB1	20 ha
AB2	40 ha

Figure 15: Current Minimum Lot Size Map Extract Wyong LEP 2013

6.4 Map 4 – Proposed Land Zoning Map

Figure 16 below is an extract from the proposed land zoning map incorporating site rezoning from IN2 and RE1 to R1 General Residential, R2 Low Density Residential, and B2 Local Centre.

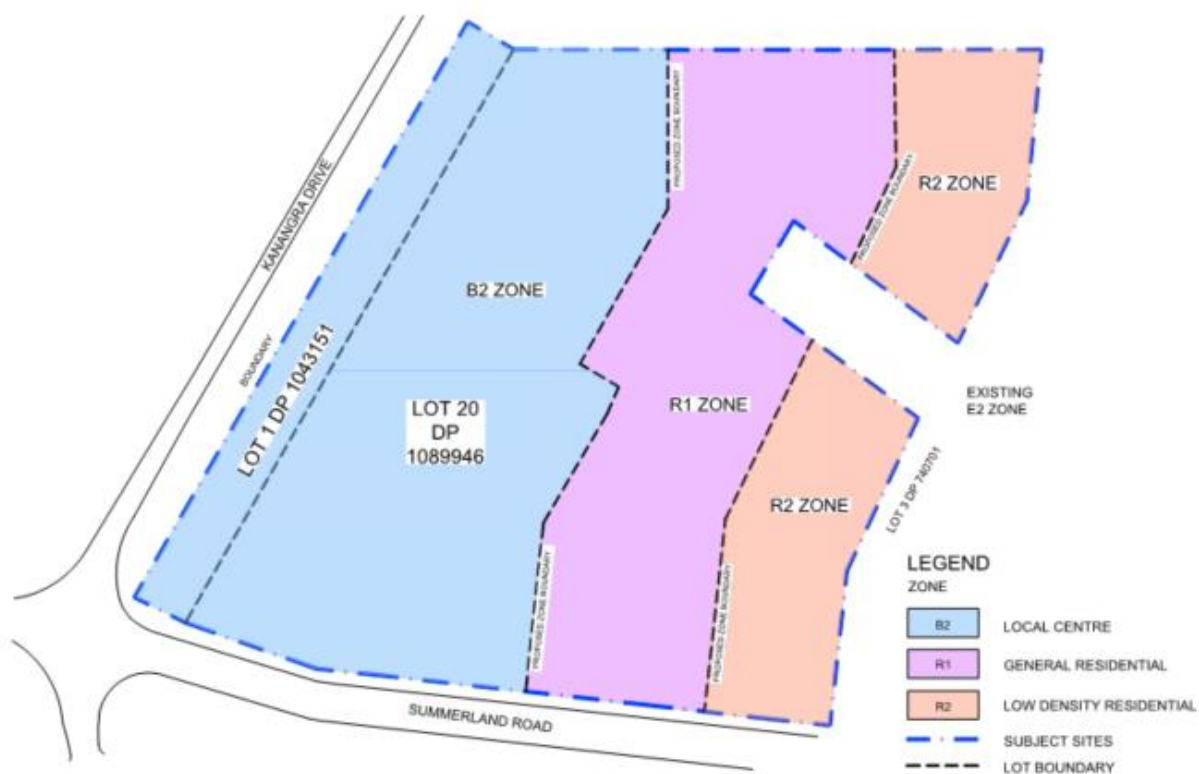


Figure 16: Proposed Land Use Zoning Map

6.5 Map 5 – Proposed Lots Size Map

Figure 17 below is an extract from the proposed minimum lot size map showing minimum lot sizes from 250m² and 450m² within the subject lands.

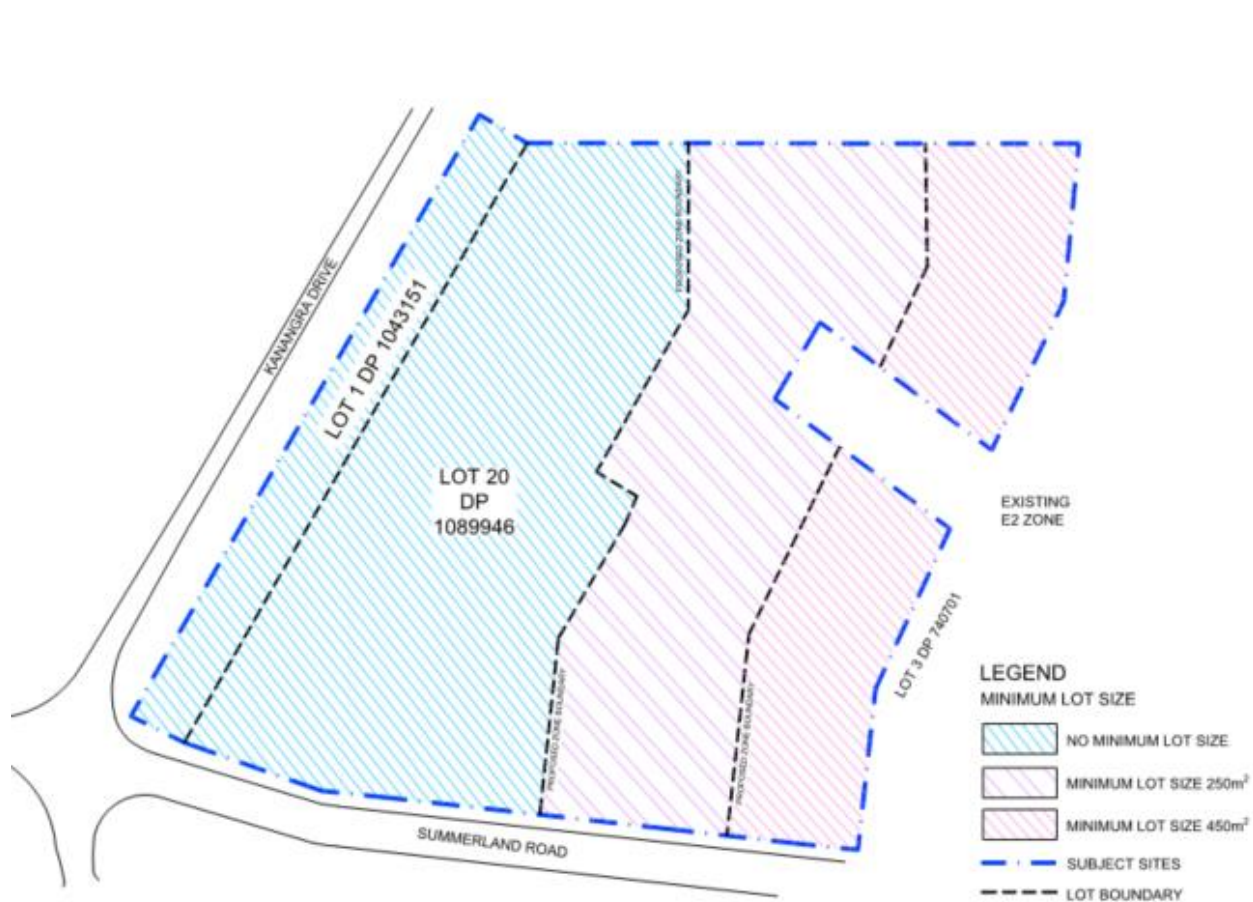


Figure 17: Proposed Minimum Lot Size Map

7 Part 5 – Community Consultation

Prior to considering the preparation of a planning proposal for commercial and residential development on the site, the land owners undertook a phone survey of local residents. Approximately 380 residents were contacted and over 80 per cent of the residents were supportive of a local centre on this site.

It is recommended that Council exhibit the proposal for a period of 28 days and should include:

- Notification in a local newspaper by Central Coast Council;
- Notification on the website of Central Coast Council; and
- Notification in writing to the adjoining and other affected land owners.

The exhibition will need to include:

- The planning proposal and accompanying studies and reports;
- The Gateway determination; and
- Any information or technical reports relied upon for the preparation of the planning proposal.

8 Part 6 – Project Timeline

Table 8 below is required to be completed by Council to estimate the timing for the completion of the planning proposal. The timeframe is based on the complexity of the proposal, additional information and agency and community consultation.

Table 8: Estimate of Project timeframe

ACTION	TIMEFRAME
Commencement date (date of Gateway determination)	20 September 2015
Anticipated timeframe for completion of required technical information	July 2019
Timeframe for government agency consultation (pre exhibition)	
Public exhibition (commencement and completion dates)	
Date of Public hearing (if required)	
Consideration of submissions	
Timeframe for government agency consultation (post exhibition if required)	
Post exhibition planning proposal consideration / preparation	
Submission to Department to finalise LEP	
Date RPA will make Plan (if delegated)	
Date RPA will forward to the Department for notification (if not delegated)	

Appendix A – Concept Plans for Development of the Site

Provided under separate cover

Appendix B – Justification for Commercial / Retail Development

Justification for Commercial / Retail Development of the Site

Site Context

Gwandalan is a suburb in the northern part of Central Coast local government area on the shores of Lake Macquarie. There is a singular entry point to the suburb along Kanangra Drive, which is accessed from the Pacific Highway which links Sydney (from the M1) to Newcastle via the coast. The township is surrounded by Lake Macquarie to the north, east and west and future residential and conservation lands to the south.

Gwandalan currently has limited infrastructure which includes, a community hall, preschools, primary school, bowling club, small convenience shops, sporting oval, tennis courts, foreshore reserves and bushfire brigade. The closest high school is at Lake Munmorah. A regular bus services the towns of Gwandalan and nearby Summerland Point, but this is limited.

The proposed site is located on the north east corner of the intersection of Kanangra Drive and Summerland Road. It is within close proximity to the existing and proposed residential areas of Gwandalan and within walking and cycling distance of Summerland Point residential areas (current and proposed).

The nearest retail centre is Lake Munmorah and Budgewoi which have anchor supermarkets and a number of specialty stores. Tuggerah is the closest regional shopping centre within the Central Coast or Charlestown which is located within the City of Lake Macquarie.

Trade Area - definition

Primary – The primary trade area will encompass Gwandalan and Summerland Point as well as Crangan Bay and Point Wolstoncroft. There is also the potential for parts of Chain Valley Bay to access the site as it is closer in walking and cycling distance than Lake Munmorah centre.

Secondary – The secondary trade area would cross over with the Lake Munmorah Centre and would include parts of Lake Munmorah, Chain Valley Bay, Catherine Hill Bay and Moonee.

Trade Area – Population

The area around Gwandalan and the northern parts of the former Wyong Shire have grown steadily in recent years and as the majority of future growth is expected in these areas so the population is expected to grow.

The population for the Northern Lakes Social Planning District is currently estimated at 15,539 and is expected to reach 20,162 by 2031 (Wyong Shire Community Profile), with the majority of the growth expected to be in the areas close to Gwandalan and Summerland Point as identified in the North Wyong Shire Structure Plan prepared by the NSW Department of Planning and Environment in 2012. Other statistics show that this population of over 20,000 people will be reached earlier, possibly by 2021, particularly if you bring in the areas of southern Lake Macquarie at Catherine Hill Bay and Nords Wharf where over 1200 residential lots are currently being developed.

Demand

Although the recent development of the shopping centre at Lake Munmorah has taken away from the immediate demand, the future demand will only steadily increase for a centre within close proximity to the major growth areas of Gwandalan and Summerland Point. If the rezoning of land is left until 2031, as suggested in the Wyong Shire Retail Strategy, then the provision of the local centre on this site will be delayed and many of the residents will be left underserved and without easy access to facilities.

The lack of a centre will make people use their cars, rather than walking or cycling and will create traffic and congestion problems as well as being environmentally unsustainable. The provision of a centre at Gwandalan, will not only provide local retail and commercial services but also provide the opportunity for social infrastructure such as a medical centre, community and/or recreation facilities and a community square / open space for meeting and community events.

Net Community Benefit Test

The Wyong Shire Retail Strategy requires new rezonings for retail or commercial development to undertake the Net Community Benefit Test, this is mainly in relation to new centres or facilities outside of those areas identified in a strategy, however to provide additional justification for this proposal, the assessment has been undertaken.

- ***Whether the proposal is consistent/compatible with agreed State and regional strategic directions.***

The North Wyong Shire Structure Plan includes the site as a location for a future village centre and this has been continued onto inclusion in the Wyong Shire Retail Strategy and development control plan section.

- ***Whether the proposal is likely to create a precedent.***

The site is identified in a strategy and is already zoned for industrial purposes. It is unlikely that there is any similar location within the former Wyong Shire, where this site or proposal could be used as a precedent to permit another rezoning.

- ***What the cumulative effects of the proposal might be.***

The proposal will provide needed community infrastructure in a location where growth is identified and is currently underway. The proposal also includes medium density residential development which is not currently available in the Gwandalan area, close to services. The cumulative impacts can only be positive for the community generally and the future residents.

- ***Whether it is likely to facilitate employment opportunities.***

The proposal will facilitate employment before and after construction. The development of a supermarket, associated shops and community facilities will provide a number of local employment opportunities. Construction jobs for both the commercial and residential sections will also be provided.

- ***Whether it will impact on the supply of residentially zoned land.***

The proposal provides some additional residential land for medium density development which is unique in this locality. The centre will support the existing zoned and proposed residential areas and will not create any additional need.

- ***Whether there is sufficient infrastructure in place or planned for to service the development.***

The site is already serviced by infrastructure as the site is already zoned Industrial and apart from the necessary road upgrading, other services will be adequate.

- ***Whether it is sustainable.***

The proposal provides for more sustainable development of both this site and new development in the locality. It will remove the need for residents to drive long distances for services and day to day needs that they currently need to do. The proposal will be designed to be sustainable in terms of flow on impacts of drainage, pollution etc.

- **Whether it is in the public interest.**

The provision of local services and facilities to a rapidly growing community that are lacking will most definitely serve the public interest. The site has very limited potential as a light industrial area for the local community. The proposal will increase employment opportunities and provide retail and community services within walking and cycling distance of most residents.

- **Whether the proposal will impact on the availability of retail and commercial services in the area. If there is an impact, the extent of that impact and whether the proposed development will 'make good' any change of circumstance arising as a result of that impact. Specifically, the assessment of impact will need to consider any impacts on 'anchor' tenants/facilities within the affected centre(s) and the potential 'knock on' effect of any loss of trade for those major facilities which might affect their ability to continue to trade or function effectively. Anchor tenants or facilities could include supermarkets or grocery stores, government and non government services, community facilities and any major floorspace user.**

Initially there may be some impact felt by the Lake Munmorah centre, however this will be offset quickly as the area grows and develops, particularly due to the recent/imminent approval of a large, approximately 600 lot subdivision, on land owned by the Darkinjung. Due to the distance and the diverse areas that the centres are serving, they will be able to operate independently and without loss of service or function.

- **Whether the proposal (if a single entity commercial development) has the capacity to develop into a centre in the future and if so, what the impacts of that might be.**

Not applicable. A centre is proposed as per the requirements of the North Wyong Shire Structure Plan provisions.

Appendix C – Traffic and Parking Assessment Report

Provided under separate cover

Appendix D – Bushfire Hazard Assessment Report

Provided under separate cover

Appendix E – Ecological Assessment Report

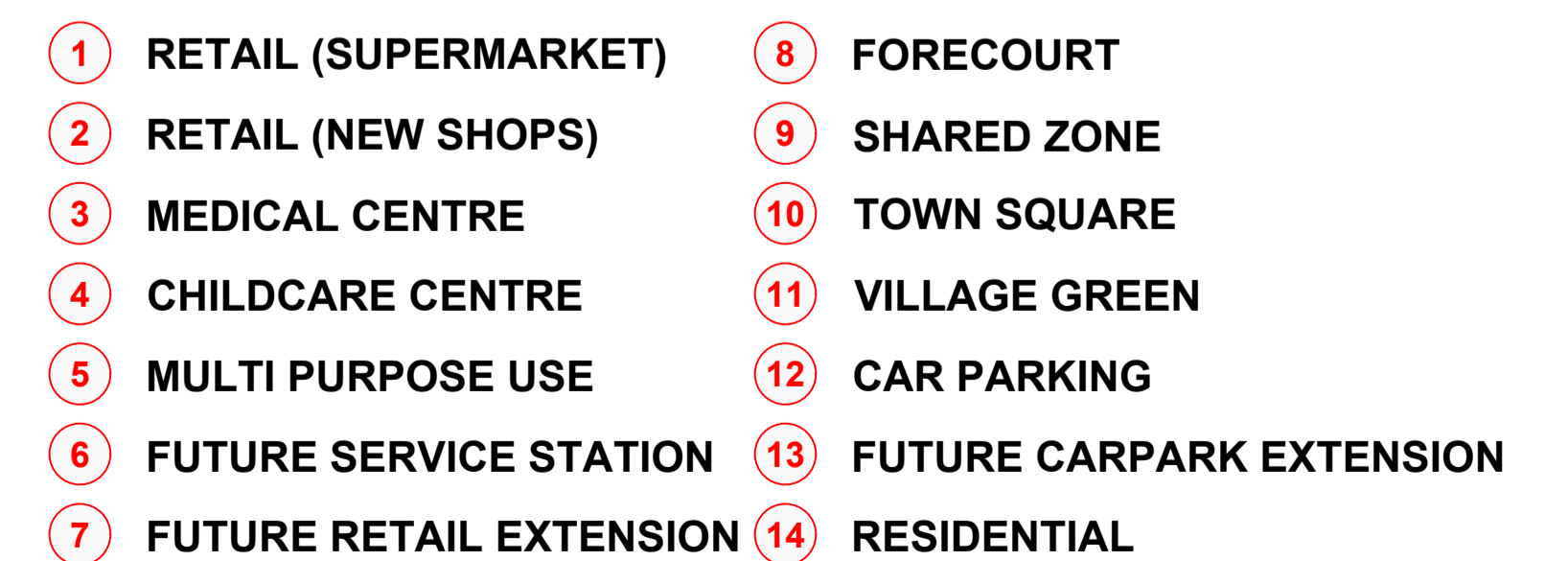
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Appendix F – Aboriginal Cultural Heritage Assessment

Provided under separate cover

05 B

Concept Plans



SCALE	1:500 @A1	REV	DRG
DATE	16.05.19	P1	CP-01
DRN	BN,NC		

05 C

Preliminary Contaminated Site Investigation Report

06 December 2016
Ref: 61204

QMC Propert Group Pty Ltd
PO Box 6082
LONG JETTY NSW 2261

Attention: Mr Dean Carter

Dear Sir,

Preliminary Contaminated Site Investigation

**Re: Lot 20 DP 1089946, Part Lot 1 DP 1043151 & Part
Lot 3 DP 3740701 No. 60, 50W, 44W Parraweena
Road, Gwandalan**

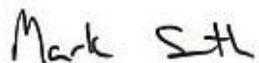
This report presents and interprets the findings of the Limited Geotechnical Investigation undertaken at Lot 20 DP 1089946, Part Lot 1 DP 1043151 & Part Lot 3 DP 3740701 No. 60, 50W, 44W Parraweena Road, Gwandalan.

The purpose of this investigation was to assess the existing site conditions in order to provide geotechnical recommendations to aid in the design and documentation of the proposed development. Geotechnical recommendations are made in accordance with current Australian, NSW and local government standards.

If you have any further enquiries please do not hesitate to contact the undersigned.

Yours faithfully,

Forum Consulting Engineers

A handwritten signature in black ink that reads "Mark Smith".

Mark Smith

Geotechnical/Environmental Engineer
B.E. (Environmental)

Contents

1.	Introduction	3
2.	Site Description	3
3.	Geological Setting	4
4.	Review of Historical Aerial Photographs	5
5.	Review of NSW Environmental Protection Authority Contaminated Land Database.....	5
6.	Groundwater Bore Search	6
7.	Fieldwork and Subsurface Conditions.....	6
8.	Conceptual Site Model	10
8.1	Sources of Contamination	10
8.2	Human and Ecological Receptors and Exposure Pathways.....	11
9.	Conclusions and Recommendations	13
10.	Limitations	14

Attachments

1. Drawing 61204-SIT/1
2. Photographs 1 – 12
3. Johnson Partners Topographical Survey
4. Preliminary Site Sketch
5. Historical Aerial Photographs
6. General Notes



1. Introduction

At your request Forum Consulting Engineers (Forum) have carried out a Preliminary Contaminated Site Investigation at Lot 20 DP 1089946, Part Lot 1 DP 1043151 & Part Lot 3 DP 3740701 No. 60, 50W, 44W Parraweena Road, Gwandalan and its surrounding areas.

The purpose of this Preliminary Contaminated Site Investigation was to identify the location, sources and/or distribution of historical or existing contamination at the site.

This investigation was undertaken at the request of Mr Dean Carter of QMC Property Group Pty Ltd. The investigation is to be submitted to Wyong Council as part of the required documents for the proposed re-zoning of the land.

This report should be read in conjunction with the attached "General Notes".

2. Site Description

The subject site was located on the eastern side of Kanangara Drive, Gwandalan. The subject site is approximately rectangular shaped with an estimated area of 5.3Ha. The site was bordered by Kanangara Drive to the west, by sclerophyllous bushland to the south and east, by residential dwellings to the northeast and by a commercial/industrial complex to the north.

At the time of the investigation the site was generally undeveloped and comprised of sparse sclerophyllous bushland with the exception of the central-northern portion of the site which appeared to have been historically used as a site office/workshop for commercial building purposes.

Topographically, the site was situated on the top and mid slopes of a very low rising hill which generally sloped down from the west/southwest to the east/northeast at an average slope of approximately 2 - 5°.

The closest sensitive human receptor to the site was considered to be the residential developments to the northeast. The closest sensitive environmental receptor was considered to Lake Macquarie approximately 780m to the east and 950m to the southwest of the site.

It is proposed that the subject site is to be re-zoned for residential and commercial purposes. The current and proposed zoning for the site can be seen in Table 1 below.



Table 1 – Current and Proposed Zoning

Lot and DP	Current Zoning	Proposed Zoning
Lot 20 DP 1089946	IN2	R1, R2 and B2
Part Lot 1 DP 1043151	RE1	B2
Part Lot 3 DP 3740701	E2	R1 and R2

R1 – General Residential
R2 – Low Density Residential
B2 – Local Centre
RE1 – Public recreation
E2 – Environmental Conservation
IN2 – Light Industrial

The existing site layout can be seen in Drawing 61204-SIT/1 and Photographs 1 – 12. The site boundaries and proposed zoning can be seen in the attached Johnson Partners topographical survey and the provided preliminary site sketch.

3. Geological Setting

Reference to the 1:100 000 Gosford-Lake Macquarie Special Geology Map published by NSW Trade and Investment – Recourse and Energy 2009 indicates that the site lies within the Munmorah Conglomerate Formation of the Clifton Subgroup of the Narrabeen Group. The Munmorah Conglomerate Formation overlies the Wallarah Seam. The Munmorah Conglomerate Formation consists of conglomerate, sandstone and thin, lenticular coal bands. Some tuffaceous claystones are also associated with the lenticular coal bands. The Munmorah Conglomerate has been regarded as the basal unit of the Narrabeen Group but no sharp break in sedimentation can be recognised in the Vales Point area between the underlying coal measures and this formation. The transitional members are the Wallarah Tuff Member, the Karignan Conglomerate Member and the Vales Point Seam.

The site falls within the Doyalson Landscape as identified on the “Soil landscapes of the Lake Macquarie-Gosford 1:100 000 Sheet” published by the Department of Land and Water Conservation. The Doyalson Landscape is an erosional landscape characterised by gently undulating rises on Munmorah Conglomerate north of Tuggerah Lake on the Central Coast Lowlands. Soils consist of moderately deep (50-150cm) Yellow Earths, Yellow Podzolic Soils and Soloths on sandstones and conglomerates, moderately deep (50-150cm) Yellow Podzolic Soils, Soloths and some Red Podzolic Soils on fine-grained siltstones and claystones, moderately deep to deep (100->150cm) Yellow leached Earths, Grey Earths, Soloths and Gleyed Podzolic Soils along drainage lines. The open-forest of the Doyalson Landscape has been extensively cleared although some small areas of disturbed bushland remain. The Doyalson Landscape consist generally of undulating rises with local reliefs to 30m and slope gradients <10%. Broad crests, ridges and long gently inclined slopes are major landform elements along with broad drainage lines.



4. Review of Historical Aerial Photographs

Forum reviewed the historical aerial photographs for the years 2005, 2010 and 2016. Table 2 shows the observations of a review of the historical aerial photographs and the historical aerial photographs are shown attached to this report.

Table 2 – Review of Historical Aerial Photographs

Year	Description of site
2005 (Colour)	<p>The site has not been delineated. The site appears to generally consist of sparse sclerophyllous bushland with several motorbike/mountain bike tracks. The central northern portion of the site appears to be used for commercial/industrial purposes with a small number of buildings, paved bitumen areas and various materials present onsite.</p> <p>The surrounding area comprises of sclerophyllous bushland to the south, west and east, residential dwellings to the northeast and by a commercial/industrial complex to the north. A wastewater treatment plant is located approximately 150m to the northwest of the site.</p>
2010 (Colour)	<p>There has been minimal change to the site and surrounding area when compared to the 2005 aerial photograph.</p>
2016 (Colour)	<p>There appears to be minimal change to the site and surrounding area when compared to the 2010 aerial photograph with the exception of the northern portion of the site which is no longer used for commercial/industrial purposes and appears to be un-occupied.</p>

5. Review of NSW Environmental Protection Authority Contaminated Land Database

Forum undertook a search of the NSW Environmental Protection Authority (EPA) public lands register (<http://www.epa.nsw.gov.au/publicregister/>) and did not find any record of Environment Protection licences, applications, notices, audits or pollution studies and reduction programs applicable to the site.

Forum undertook a search of sites notified to the NSW EPA as potentially requiring regulation (<http://www.epa.nsw.gov.au/clm/publiclist.htm>) and confirmed that the site has not been notified to the NSW EPA as potentially requiring regulation. Two sites (the Metro Petroleum Service Station and old Gwandalan Landfill) within the Gwandalan precinct have been notified or are/have been regulated by the NSW EPA. These two sites are greater than 1Km from the site and, as such, not considered to influence contaminant concentrations at the site.



6. Groundwater Bore Search

A groundwater bore search was undertaken using the NSW Office of Water (NOW) online groundwater data system (<http://allwaterdata.water.nsw.gov.au/water.stm>). The groundwater bore search indicated there are no groundwater bores within 1Km of the site. Forum considers that information provided by groundwater bore logs outside of a 1Km radius would not supply relevant data for the site.

7. Fieldwork and Subsurface Conditions

The fieldwork undertaken on the 4 October 2016, consisted of a visual assessment of the site and surrounding area to identify any potentially contaminating activities or substances at the site.

The site was generally described to comprise of scattered sclerophyllous bushland with motorbike/mountain bike trails, an ephemeral gully and scattered fill stockpiles containing soil, paint cans/drums, vegetation and building/household refuse. The observations of the site inspection are summarised in Table 3 below.



Table 3 – Summary of Site Observations

Note No.	Description of Observation	Coordinates	Potential for Contaminating substances or materials
1	An ephemeral gully was located to the east of the site. The head of the drainage line was located within the eastern/southeastern portion of the site.	N/a	N/a
2	Several motorbike/mountain bike dirt trails were observed across the site. Several fill soil stockpiles sourced from the cuttings for the construction of these trails were observed across the site.	N/a	N/a
3	Scattered concrete and stormwater pipes were observed in the central eastern portion of the site.	-33.14758, 151.58074	N/a
4	Randomly scattered vegetation stockpiles and illegal dumping comprising of various materials such as building/household refuse was observed across the site.	N/a	N/a
5	A dilapidated shed/office was observed in the northern portion of the site. The remnants within the building indicated the office/shed was used as a site office for a construction company.	-33.14661, 151.58132	N/a
6	Illegally dumped paint/varnish cans and drums (approximately 5L to 10L) were observed in the southeastern portion of the site. Some of the cans/drums contained paint or varnish and there were minor surface spills in this area.	-33.14817, 151.58109	Paints and varnish may contain various contaminants such as, but not limited to, hydrocarbons, metals and/or pesticides/herbicides.
7	In western/southwestern portion of the site illegal dumping of various materials was observed. The materials comprised of surfboards, washing machines, buckets, building refuse, tiles, metals, plastic etc. Bulk asbestos material (approximately <20m ³) was observed within this fill stockpile (Photographs 5 and 6).	-33.14853, 151.57905	Asbestos material identified in this area. Forum considers that the asbestos material is in reasonable condition. As such, it is considered the asbestos is likely confined to the bulk material and unlikely to contain asbestos fines or be within the underlying soils.
8	A localised area of bulk asbestos material was observed in the northeastern portion of the site.	-33.14725, 151.58058	
9	Fill soil stockpile generally comprising of red/orange/brown Gravelly Clayey SAND (approximately 50m ³) was observed in the southern portion of the site. It is unknown whether the material was sourced from onsite excavations or from illegal dumping.	-33.14827, 151.57953	Uncontrolled fill material from unknown sources may contain various contaminants including, but not limited to, hydrocarbons, metals and/or pesticides/herbicides.



10	Fill soil stockpile generally comprising of grey SAND (approximately 20m ³ – 30m ³) was observed in the eastern/southeast portion of the site, adjacent to the ephemeral gully. It is unknown whether the material was sourced from onsite excavations or from illegal dumping.	-33.14782, 151.58138	
11	Fill material was observed to have been placed in the northern/central northern portion of the site. The quantity, distribution and depth of fill could not be accurately determined, however, the perimeter of the southern boundary of the fill material was noted. A cut in the fill material was observed along the southern perimeter which was approximately 1m to 1.5m in height. The source of the fill material was unknown.	Perimeter: -33.14709, 151.58078 -33.14710, 151.58100 -33.14718, 151.58078 -33.14723, 151.58093 -33.14736, 151.58087	
12	The northern/central northern portion of the site was enclosed by construction fencing. The northern half of this area was covered by bitumen and assumed to be underlain by fill material. The southern half of this area was covered by grass and assumed to be underlain by fill and/or natural material. This area was observed to have several scattered switch boards.	N/a	
13	Fill soil stockpile generally comprising of red/orange/brown Gravelly Clayey SAND (approximately 120-160m ³) was observed in the western portion of the site. It is unknown whether the material was sourced from onsite excavations or from illegal dumping.	-33.14752, 151.57914	
14	A dilapidated caravan was observed at the site. Adjacent to the caravan were paint buckets and a 44 gallon drum. Some paint buckets were full and the 44 gallon drum was full with unknown contents. No spills were observed. A bulk asbestos material was observed in this area.	-33.14660, 151.58016	Asbestos material was identified in this area. Forum considers that the asbestos material is in reasonable condition. As such, it is considered the asbestos is likely confined to the bulk material and unlikely to contain asbestos fines or be within the underlying soils. Paints and varnish may contain various contaminants such as hydrocarbons and metals.



15	An above ground fuel tank was observed in the neighbouring property to the north of the site. The fuel tank was not bunded and it is assumed to contain or had contained petroleum or diesel compounds. No spills were observed in the immediate area surrounding the fuel tank.	-33.14640, 151.58091	Spills from fuel tanks may contaminate the immediate surface and subsurface soils surrounding the fuel tank. Forum considers that it is unlikely that significant contamination has occurred at the site due to the fuel tank, considering that no spills were observed in the immediate area of the fuel tank.
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While the sub-surface profile was not determined it was expected that the natural subsurface soil profile at the site would comprise of shallow residual soils overlying weathered conglomerate/pebbly sandstone. Areas of uncontrolled fill placed at the site were considered to be limited to scattered stockpiles and a large area in the central-northern portion of the site.

Neither groundwater nor surface water were encountered during the investigation.

The location of the above observations has been generally outlined in Drawing 61204-SIT/1 attached to this report.

8. Conceptual Site Model

National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 1999, amended April 2013 identifies a conceptual site model (CSM) as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors.

The development of a CSM is an essential part of all site assessments. NEPM (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air);
- Human and ecological receptors;
- Potential and complete exposure pathways, and;
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

Each of these elements is discussed in the following sections.

8.1 Sources of Contamination

Based on the visual assessment of the site, a series of potential sources of contamination were identified and include:

- Fill material:
 - Fill material was identified in stockpiles across the site and placed in the northern portion of the site. Potential contaminants of concern can be varied in fill material, however, as a minimum Forum considers that fill material may have elevated concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX), total recoverable hydrocarbons (TRH),



- poly-aromatic hydrocarbons (PAH), metals (arsenic (Ar), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn)), organochlorine pesticides, organophosphorous pesticides and/or polychlorinated biphenyls.
- Onsite risks are considered possible and likely limited to direct contact and ingestion.
 - Offsite risks are possible depending upon the distribution and extent of fill.
 - Potential contamination of surface soils due to paint/varnish spills:
 - Surface soils have the potential to be contaminated due to surface spills of paint cans/drums in the southeastern portion of the site. Potential contaminants of concern include BTEX, TRH, PAH, metals (Ar, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCP, OPP and PCB.
 - Onsite risks are considered possible and likely limited to direct contact, ingestion and/or inhalation of vapours.
 - Offsite risks are considered limited/non-existent considering the size of the spills and proximity to neighbouring properties.
 - Potential asbestos contamination:
 - Asbestos bearing materials were observed in various locations across the site.
 - Onsite risks are considered possible and likely limited to inhalation of asbestos fibres if the bulk asbestos material is damaged during site works.
 - Offsite risks are considered limited/negligible due to the quantity of asbestos material observed at the site. However, poor handling and disposal practices may result in offsite risks.

8.2 Human and Ecological Receptors and Exposure Pathways

Table 4 summarises potential contaminant sources, contaminants of concern, human and ecological receptors and associated exposure pathways for the site.



Table 4 – Summary of Potential Human Exposures

Contamination Source	Potential Contaminants of Concern	Release Mechanism	Pathway	Receptor	Exposure Mechanism
Uncontrolled Fil/Fill Stockpiles	BTEX, TRH, PAH, metals (Ar, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCP, OPP and PCB	Proposed works, potential excavation of contaminated soil, potential site use as residential/commercial premises	Soil absorption/adsorption, uptake of contaminants by flora	Residents, workers, site trespassers, flora and fauna	Ingestion / dermal contact/ inhalation of vapours or dust particles / secondary contamination
Identified Asbestos Bearing Material	Asbestos	Poor disposal/management practices	Dust	Residents, workers, site trespassers, flora and fauna	Inhalation
Paint Spills on Surficial Soils	BTEX, TRH, PAH, metals (Ar, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCP, OPP and PCB	Proposed works, potential excavation of contaminated soil, potential site use as residential/commercial premises	Soil absorption/adsorption, uptake of contaminants by flora	Residents, workers, site trespassers, flora and fauna	Ingestion / dermal contact/ inhalation of vapours or dust particles / secondary contamination



9. Conclusions and Recommendations

Forum undertook a Preliminary Contaminated Site Investigation at Lot 20 DP 1089946, Part Lot 1 DP 1043151 & Part Lot 3 DP 3740701 No. 60, 50W, 44W Parraweena Road, Gwandalan and its surrounding areas.

The purpose of this investigation was to identify the location, sources and/or distribution of historical or existing contamination at the site.

The scope of works comprised of a desktop assessment including a review of geological maps, historical aerial photographs, the NSW EPA database, the NSW Office of Water database and a visual assessment of the site and surrounding areas.

The assessment identified that the site has several scattered stockpiles of fill soil material, scattered stockpiles of illegally dumped household and commercial refuse, scattered areas of asbestos material and a large area of un-controlled fill placed for levelling purposes.

Forum considers that potential contamination arises from:

- Fill material in stockpiles or placed in the northern portion of the site which may contain hydrocarbon, metal and/or pesticide/herbicide contamination;
- Stockpiles containing paint cans/drums that had observed surficial spills which may contain hydrocarbon, metal and/or pesticide/herbicide contamination;
- Scattered areas of asbestos material.

Forum considers that further investigations and/or appropriate remediation of the identified potential sources of contamination should be undertaken. These investigations may include, but are not limited to, the following:

- Sampling and analysis of fill material in the northern portion of the site to determine the vertical and lateral extent of fill material and any potential contamination;
- The removal and disposal of surficial soils impacted by paint spills;
- The removal and disposal of fill stockpiles;
- The removal and disposal of asbestos material.

Any soil proposed to be disposed of offsite must be laboratory analysed and classified as general, restricted or hazardous solid waste in accordance with NSW DECCW (2014) Waste Classification Guidelines by an appropriate contaminated land practitioner prior to removal from site.



Any asbestos proposed to be disposed of offsite must be handled by an approved contractor and undertaken in accordance with relevant guidelines.

If stockpiled fill material is proposed to remain or be re-used onsite, it must be laboratory analysed and meet the requirements of the NEPM, Council Guidelines and relevant legislation/guidelines.

10. Limitations

Forum have performed investigation and consulting services for this project in general accordance with current professional and industry standards. The findings contained within this report are the result of site observations, discussions with personnel with knowledge of the site, physical records and the field investigation. The extent of testing was limited to discrete test locations and variations that cannot be inferred or predicted may occur in ground conditions between test locations. To the best of our knowledge, information presented in this report represents a reasonable interpretation of the general condition of the site. Under no circumstances, however, do these findings represent the actual state of the site at all points.

The interpretations presented within this report are limited in nature and Forum, or any other reputable consultant, cannot provide unqualified warranties, nor does Forum assume liability for site conditions not accessible during the time of the investigation.

Forum Consulting Engineers should be contacted immediately should subsurface conditions be found to differ from those described in this report.

Yours faithfully,

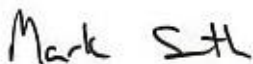
Forum Consulting Engineers



Byron Garner

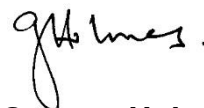
Civil/Geotechnical Engineer
B.E. (Civil)

Reviewed



Mark Smith

Geotechnical/Environmental Engineer
B.E. (Environmental)



Graeme Holmes

CPeng Civil Engineer
Director



Attachments



LEGEND:
⑪ - NUMBER & APPROXIMATE DIRECTION AND LOCATION OF PHOTO

REVISIONS				
Rev.	By	Date	Description	Des'd
A	JG	02.12.16	ORIGINAL ISSUE	MS

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A.B.N. 48 157 853 677

Client **CARTER**

Project **PRELIMINARY CONTAMINATION INVESTIGATION
No. 44W, 50W AND 60 PARRAWEENA ROAD, GWANDALAN
GWANDALAN**

Approved by _____ B.E. MIE (Aust) CPEng

Drawing No. **61204 - SIT/01 OF 01**

Revision **A**

Sheet **A3**



Photograph 1



Photograph 2





Photograph 3



Photograph 4





Photograph 5 – Asbestos fragment identified in stockpile in south/southwestern portion of site.



Photograph 6 – Example of stockpiles of household/commercial refuse found across site.





Photograph 7 – Paint/varnish cans found in eastern portion of site.



Photograph 8





Photograph 9 – Asbestos fragments identified in northeastern portion of site.



Photograph 10 – Caravan, paints, refuse and asbestos identified in northern portion of site.





Photograph 11 – Fuel tank found on neighbouring property to the north of the site.



Photograph 12 – Dilapidated site office observed in the northeastern portion of the site.

SIGNATURES AND SEALS ONLY

SURVEYING REGULATION 2001: CLAUSE 32(2)

SCHEDULE OF EASEMENT BOUNDARIES



MARK	M.G.A. CO-ORDINATES		ZONE	CLASS	ORDER
	EASTING	NORTHING			
P.M. 53214	367 612.927	6 331 716.313	56	B	2
P.M. 77570	367 879.911	6 331 705.988	56	B	2
P.M. 77571	367 607.525	6 331 650.405	56	A	1
P.M. 77574	367 031.925	6 331 436.666	56	B	2

SOURCE: M.G.A. CO-ORDINATES ADOPTED FROM LAND INFORMATION CENTRE ON 13th OCTOBER 2005
COMBINED SEA LEVEL & SCALE FACTOR = 0.99981

No.	BEARING	DIST	No.	BEARING	DIST
1	49° 06'	16.055	8	76° 29' 05"	16.325
2	1° 53'	5	9	86° 49' 05"	3.64
3	36° 53'	14.14	10	76° 29' 05"	14.305
4	86° 49' 05"	10.665	11	181° 15' 05"	15.945
5	224° 12' 25"	14.795	12	245° 00' 30"	5.05
6	181° 53'	5	13	177° 29' 30"	16.22
7	86° 49' 05"	16.325	14	181° 15' 05"	6.9

Registered
C.A.
Title System: TORRENS
Purpose: SUBDIVISION
Ref. Map:
Last Plan: D.P. 740701

SCHEDULE OF REFERENCE MARKS FOUND			
No.	BEARING	DISTANCE	ORIGIN
R.M.A	163° 17' 25"	0.975	G.I.P. D.P. 740701
R.M.B	163° 58' 25"	0.46	G.I.P. R32524
R.M.C	171° 39' 25"	0.46	G.I.P. R32524
R.M.D	179° 21' 25"	0.46	G.I.P. R32524
R.M.E	NOT FOUND		G.I.P. R32524
R.M.F	211° 52' 55"	0.705	G.I.P. R32524
R.M.G	121° 52' 55"	0.45	G.I.P. R32524
R.M.H	GONE		G.I.P. R23203
R.M.I	8° 12' 25"	0.5	G.I.P. D.P. 740701
R.M.J	347° 06' 25"	5.79	G.I.P. (DIST'D) D.P. 740701
R.M.K	347° 01'	5.87	BY ME
R.M.L	NOT FOUND		G.I.P. D.P. (04/35)
R.M.M	GONE		D.H. & W. D.P. 26382
R.M.N	8° 06'	0.5	G.I.P. D.P. 74866

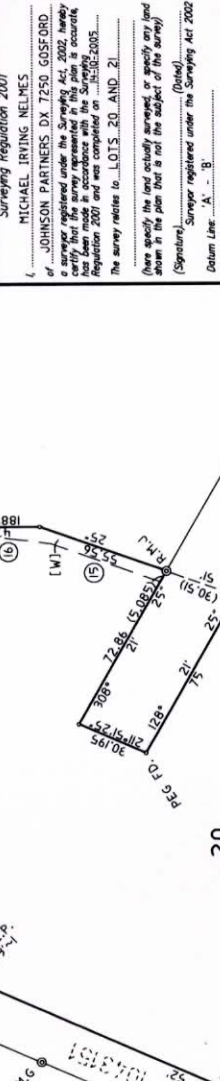
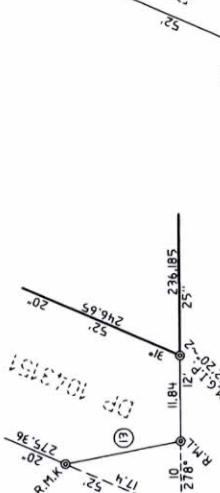
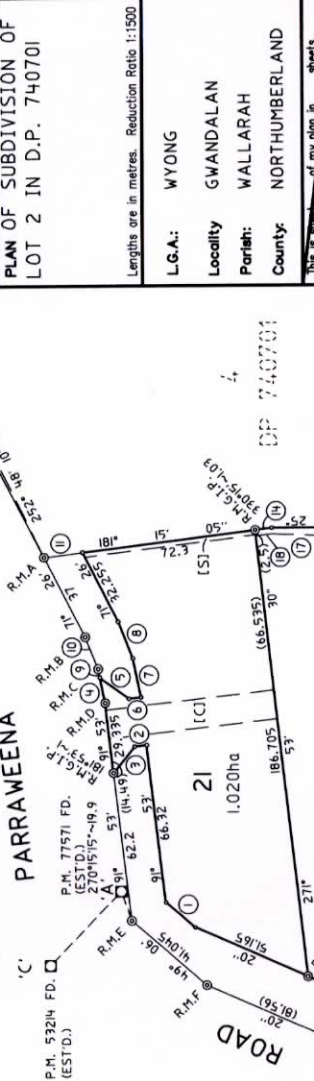


DIAGRAM
SCALE 1:500

DIAGRAM
SCALE 1:500

'A' - 'B'			
'A' - 'B'	BEARING	DISTANCE	
M.G.A.	78° 28' 14"	277.995	
GND.	78° 28' 14"	278.048	
SVY.	78° 28' 14"	278.048	

'A' - 'C'			
'A' - 'C'	BEARING	DISTANCE	
M.G.A.	4° 41' 08"	66.129	
GND.	4° 41' 08"	66.142	
SVY.	4° 41' 08"	66.142	

'A' - 'B'			
'A' - 'B'	BEARING	DISTANCE	
M.G.A.	78° 28' 14"	277.995	
GND.	78° 28' 14"	278.048	
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M.G.A.	4° 41' 08"	66.129	
GND.	4° 41' 08"	66.142	
SVY.	4° 41' 08"	66.142	

Crown Lands Office Approval
PLAN APPROVED
Land District
Paper No.
Field Book
pages

Subdivision Certificate
I certify that the provisions of s108(1) of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed
* (Insert "Subdivision" or "New Road")
* Authorised Person/General Manager/Authorised Officer
Consent Authority
Date of endorsement
Accreditation No.
Subdivision Certificate No.
File No.
When this plan is to be lodged electronically in the Land Title Office, it should include a signature in an electronic or digital format approved by the Registrar-General.
* Delete whichever is inapplicable

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* Delete whichever is inapplicable

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, to create public easements, to create public restrictions on the use of land or positive covenants.
PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919 AS AMENDED, IT IS INTENDED TO CREATE:
1. EASEMENT TO DRAIN WATER 5 WIDE & VAR. [W]
2. RIGHT OF CARRIAGEWAY 12 WIDE [C]
3. EASEMENT FOR SERVICES 2 WIDE [S]

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2. RIGHT OF CARRIAGEWAY 12 WIDE [C]
3. EASEMENT FOR SERVICES 2 WIDE [S]

KANANGRA DRIVE

LOT 1 DP 1043151

B2

LOT 20 DP 1089546

PROPOSED ZONE BOUNDARY

PROPOSED ZONE BOUNDARY

Recommended
R2 Zone

LOT 3 DP 740701

Recommended
R1 Zone

ZONE

B2 - LOCAL CENTRE



2005



2005



2010



2010



2016



2016

Geotechnical General Notes

As part of your geotechnical report, you should have an understanding of how your report's findings and recommendations affect you. These notes have been prepared by Forum Consulting Engineers to assist you to interpret and understand your report.

Introduction

These notes have been provided in order to explain your geotechnical report in relation to current design standards, field procedures, laboratory testing methods and design and construction recommendations. Not all elements are necessarily relevant to all reports.

Your Geotechnical Report

Your geotechnical report is based on information gained from limited subsurface investigation, sampling and laboratory testing, an understanding of local geology and personnel experience.

Your report is based on a unique set of criteria tailored to the requirements of your project. Project criteria typically include the general nature of the structure involved, its size and configuration, the location of the structure on the site and its orientation, physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program.

For this reason, your report must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Without approval from Forum Consulting Engineers, your report should not be used if there are any changes to the project. If they are not consulted, Forum Consulting Engineers will not accept responsibility for problems that occur due to project/site modifications.

Borehole/Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes/testpits there are several potential problems, namely:

- In low permeability soils, groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an inaccurate indication of the true water table;
- Water table levels will vary from time to time with seasons or weather events. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable groundwater observations may be made by installing standpipes which may be read over variable extended timeframes.

Site Anomalies

In the event that conditions encountered during construction appear to vary from those from those detailed within your report, Forum Consulting Engineers should be notified immediately. Most problems are much more readily resolved when anomalies are addressed when identified, rather than at some later stage.

Change In Conditions

Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, future or modified construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and thus, the continuing adequacy of a geotechnical report. Forum should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary. In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Forum requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed during construction, than at some later stage, well after the event.

Geotechnical General Notes

To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Project Design

To help avoid misinterpretations, Forum Consulting Engineers should be consulted during the design stage of any site development.

As per Section 1.4.2 of AS2870, constructions methods and materials used within developments should be designed to ensure that a minimum design life of 50 years is achieved.

Site Inspection

Forum Consulting Engineers will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Geotechnical Investigation and Classification

Investigation Methods

The following is a brief summary of investigation methods that may have been used by Forum Consulting Engineers as part of your report.

Test Pits

Testpits are excavated with a backhoe or a tracked excavator and allows a close examination of in-situ soils.

Boreholes

Continuous spiral flight boreholes are undertaken using 75–115mm diameter augers which are withdrawn at intervals to allow sampling or in-situ testing. Continuous spiral flight boreholes may be undertaken using either mechanical or hand methods.

Large diameter boreholes are undertaken using 300 mm or larger diameter rotating plate or short spiral auger.

Non-core rotary boreholes are undertaken using a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of determining density or strength and also of obtaining an undisturbed sample. The test procedure is described in Section 6.3.1 of AS1289.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. The tube to be driven in three successive 150 mm increments and the 'N' value is recorded. The results of the tests can be related empirically to the engineering properties of the soil.

Cone Penetrometer Testing and Interpretation

The cone penetrometer tests (CPT) method provides a continuous profile of engineering properties. Cone penetrometer tests (CPT) are used as a means of determining soil bearing pressure, soil shear modulus, depth to groundwater, pore water pressure, Poisson's ratio and an inferred soil profile. The test procedure is described in Section 6.4.1 of AS1289.

The test is carried out using a 35 mm diameter rod with a cone-tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the friction resistance on a separate 130 mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are connected by electrical wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

The information provided on the plotted results comprises:

- Cone resistance (the actual end bearing force divided by the cross sectional area of the cone, expressed in MPa).
- Sleeve friction (the frictional force on the sleeve divided by the surface area, expressed in kPa).
- Friction ratio (the ratio of sleeve friction to cone resistance, expressed as a percentage).

Hand Penetrometer

Hand penetrometers are completed by driving a rod into the ground falling weight hammer and measuring the blows for successive 100 mm increments of penetration. Normally, there is a depth limitation of 1.2 m but this may be extended in certain conditions by the use of extension rods. The test procedure is undertaken in accordance with ASTM D6951 / D6951M. Two similar tests are available.

Perth Sand Penetrometer — in accordance with Section 6.3.3 of AS1289, a 16 mm diameter flathead rod is driven with a 9 kg hammer, dropping 600 mm. This test is suitable for use in granular soils and filling.

Dynamic Cone Penetrometer — in accordance with Section 6.3.2 of AS1289, a 16 mm rod with a 20 mm diameter cone end is driven with a 9 kg hammer dropping 510 mm. The test was developed initially for pavement subgrade investigations.

Laboratory Testing

Laboratory testing is carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes" and other specific requirements for each test procedure.

Soils and Rock

Description and Classification Methods

The description and classification of soils and rocks used within your report are based on descriptions and classifications detailed in Australian Standard AS 1726. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present.

Geotechnical Investigation and Classification

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Grading Terms

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows.

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	S	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below.

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 - 5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

Alluvium - river deposits

Lacustrine - lake deposits

- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium – transported downslope by gravity assisted by water.
- Often includes angular rock fragments and boulders.

05 D

Aboriginal Cultural Heritage Assessment Report

05 E

**Retail and Economic Study –
Market Potential
Assessment Report**

Gwandalan, Central Coast Market Potential Assessment

Prepared for QMC Property Group

September 2016



TABLE OF CONTENTS

INTRODUCTION i

KEY FINDINGS..... 1

FIGURES, MAPS AND TABLES 16

INTRODUCTION

This report presents an independent review of the market potential for a convenience based centre at Gwandalan on the Central Coast of New South Wales.

The key findings are presented in an executive summary format, outlining the following key information:

- The regional and local context of the centre.
- An assessment of the main trade area population and retail spending projections. A review of the socio-economic profile of the main trade area population is also provided.
- A summary of the existing and future competitive retail environment.
- An analysis of the market potential for retail and non-retail facilities at the centre, including the optimal size, mix and composition of supportable floorspace within the development. Projected sales (for the retail component of the centre) and gross rents are also provided.

KEY FINDINGS

The key considerations regarding the market potential for retail and non-retail facilities at Gwandalan include:

Regional and Local Context

- i. The suburb of Gwandalan is located approximately 45 km south of Newcastle and 130 km north of Sydney (refer Map 1).
- ii. Gwandalan is located within the Wyong Shire municipality, which accommodates a population in excess of 160,000 and provides almost 50,000 jobs. The largest industries of employment are retail trade (13.6%), health care and social assistance (13.3%) and construction (7.2%).
- iii. Gwandalan is the northern most town within the Wyong Shire, located on a peninsula that extends northward into Lake Macquarie.
- iv. The township has a single entry route via Kanangra Drive, which can be accessed from the Pacific Highway via a traffic lighted intersection. The Pacific Highway is the major north-south coastal route, linking Sydney to Brisbane.
- v. Gwandalan is situated between the Lake Macquarie and Lake Munmorah State Conservation Areas, and forms part of an east – west conservation corridor that links with the Wallarah Peninsula Corridor.
- vi. Coal & Allied is one of the major coal producers within the region, with annual coal production of around 30 million tonnes. Coal & Allied has seven separate land holdings in the Lower Hunter/Central Coast region totalling approximately 4,078 hectares, which are proposed for redevelopment, including residential uses. Three of the land holdings located in close proximity to the proposed Gwandalan site are:
 - **Gwandalan Estate:** encompassing 62.28 hectares, which has development approval for a 623 residential lot sub-division.

- **Catherine Hill Bay (Middle Camp) Estate:** comprising 42.77 hectares, with concept plan approval for 222 residential lots.
 - **Nords Wharf Estate:** Provided across 10.18 hectares, with concept plan approval from 90 residential lots.
- vii. The site of the proposed Gwandalan neighbourhood centre is located on the north-eastern corner of the intersection of Kanangra Drive and Summerland Road. The proposed retail facilities will be located close to the Coal & Allied Gwandalan residential estate (as outlined above).
- viii. Map 2 outlines the key facilities provided within the local area, including:
- The existing industrial village (comprising eight tenants, including a True Value Hardware, a vet clinic, child care centre and takeaway outlet) provided on the south-eastern corner of the intersection of Parraweena Road and Kanangra Drive, immediately north of the site.
 - A FoodWorks store of 350 sq.m is provided along Cams Boulevard in Summerland Point, at the northern end of the peninsula.
 - Gwandalan Primary School is located at the northern extent of the township, along Kanangra Drive.
 - Gwandalan Cobras Football Club, located on the south-western corner of the intersection of Kanangra Drive and Heritage Walk.
 - Point Wolstoncroft Sport and Recreation Centre, located at the northern extent of the peninsula, which provides a range of services, facilities and accommodation options for school camps, functions and corporate training.
 - Lake Macquarie State Conservation Area is located directly south of the township.

Trade Area Analysis

- i. Map 3 illustrates Gwandalan main trade area which includes one primary sector and one secondary sector.
- ii. The main trade area generally extends up to 4 km around the site, bounded to the south by the Pacific Highway and to the north, east and west by Lake Macquarie, reflecting the location of the site on a peninsula.
- iii. Table 1 outlines the current and projected population levels for the Gwandalan main trade area. As shown, the main trade area is currently estimated at 7,538 persons, including 4,683 persons within the primary sector.
- iv. Based on new dwelling approvals data sourced from the ABS over the period from 2006/7 to 2015/16, an average of 45 new dwellings have been approved annually throughout the main trade area over this period, with a gradual increase in approvals over the period (refer Table 2).
- i. The main trade area is projected to increase to 10,888 persons by 2031, including 7,158 persons in the primary sector, reflecting an average annual growth rate of 2.5%.
- ii. Future population growth will be driven by a number of key residential estates and release areas (refer Map 3):
 - Lakeside Gwandalan is a private residential estate located approximately 2 km north of the Gwandalan site (primary sector). The development is expected to yield around 187 lots (around 470 persons) upon completion across seven stages. Based on discussions with the developer (Rose Group), the development is assumed to reach completion by 2020, with some 25 lots constructed to date.
 - Gwandalan Estate will be located on the Coal & Allied site, directly south of the Gwandalan subject site. The land encompasses approximately 62.28 hectares, and has development approval for a 623 residential lot sub-division. First

residents are assumed by 2019, with development projected to continue for some 10 years thereafter.

- Two proposed development precincts outlined within the *North Wyong Structure Plan 2012* are located with the main trade area, namely Precinct 19 - Chain Valley Bay East (secondary sector) and Precinct 20 - Summerland Point South (primary sector). These precincts have an estimated dwelling yield of approximately 50 and 100 lots, respectively (based on 15 dwellings/hectare). The preferred staging of development precincts indicates that this land is unlikely to be zoned within 15 years (2027), and for the purposes of this assessment is not assumed to proceed before this time.
 - The Darkinjung Local Aboriginal Land Council (DLALC) holds a portfolio of approximately 3,500 hectares, including Site 1 - Lake Munmorah (secondary sector), illustrated in Map 3. The land has received gateway approval for rezoning to enable future low density residential development, with an estimated potential yield of 620 lots. For the purposes of this assessment, first homes are not assumed at the site until post 2027.
- iii. Table 3 summarises the socio-economic profile of the Gwandalan main trade area population by sector, as compared with the non-metropolitan New South Wales benchmark. Overall, the main trade area is characterised by an older Australian born population, who earn income levels which are below both the non-metropolitan New South Wales and Australian benchmarks.
- iv. Table 4 outlines the key changes between the 2006 and 2011 Census periods. Key points to note include:
- Average per capita and per household incomes grew broadly in line with the non-metropolitan NSW benchmark.
 - The average age of main trade area residents increased by more than the benchmark.

- The average household size fell, as compared with a relatively stable benchmark. This reflects the popularity of the area with retirees.
- v. Table 5 summarises the retail expenditure capacity of the Gwandalan main trade area population, based on information sourced from MDS Market Data Systems. Total retail expenditure within the main trade area is currently estimated at \$106.4 million and is projected to increase at an average annual rate of 5.9% to \$250.3 million by 2031. All figures presented in this report are in inflated dollars and include GST.

Competition

Existing Competition

- i. Table 6 provides a summary of the key competitive facilities to Gwandalan, which are also illustrated on Map 4.
- ii. Retail facilities within the region form a typical retail hierarchy as follows:
 - Westfield Tuggerah of some 83,331 sq.m is the closest regional shopping centre, located 33.2 km south-west of the Gwandalan site. The centre is anchored by a David Jones department store, Target and Big W discount department stores, as well as Woolworth, Coles and Aldi supermarkets.
 - Lake Haven Shopping Centre (43,100 sq.m, anchored by Kmart, Coles, Woolworths and Aldi) is the closest sub-regional shopping centre to the site, located some 18 km to the south-west.
 - Both Westfield Tuggerah and Lake Haven Shopping Centre are of limited competitive relevance to the proposed facilities at Gwandalan, given their distance from the site.
 - The closest full-line supermarket offer is the recently developed Woolworths supermarket (3,800 sq.m) anchoring Lake Munmorah Shopping Centre, located approximately 6.7 km south-west of the Gwandalan site.

- The closest Aldi supermarket to the site is the recently opened store at Blue Haven, some 14.7 km to the south-west.
- FoodWorks (400 sq.m) at Summerland Point (primary sector) represents the only convenience offer within the main trade area, located some 2.2 km north-west of the site.

Proposed Competitive Developments

- i. Table 7 details the proposed retail developments within the region. Key points to note are as follows:
 - There are currently no proposed retail developments within the main trade area.
 - It is understood that plans for a Woolworths supermarket at Colongra (along Scenic Drive), 10 km to the south of the site, have been abandoned.
 - An approved supermarket of some 900 sq.m at Wyee Point has been delayed, with the subject site currently for sale with approval. The site is not ideal for retail uses, given that it is located along Government Road, 0.5 km off Ruttleys Road, which is the main arterial route through the locality.
 - All other proposed developments in the region are of limited competitive relevance, based on their distance from the Gwandalan site.

Retail Market Potential

Supermarket Potential

- i. Typically, a full-line supermarket (i.e. 3,200 sq.m or larger) requires a catchment population of 8,000 – 10,000 in order to be supportable, indicating that a full -line store could not be supported within the main trade area until around 2026. Coles would be the most likely brand to locate at the site, given that Woolworths recently opened at Lake Munmorah.

- ii. It is unlikely that a supermarket based development at the site would capture a significant proportion of spend from residents beyond the main trade area, given that it is located on a peninsula, with a highly convenient Woolworths based centre located at Lake Munmorah on the Pacific Highway, 6.7 km to the south-west.
- iii. Market shares achieved from the secondary sector would also be relatively low, given that these residents have convenient access to Lake Munmorah Shopping Centre via Chain Valley Bay Road. Access for residents of the secondary sector to the Gwandalan site is currently provided via Link Road, which is somewhat inconvenient being essentially a dirt road.
- iv. Aldi currently do not have a strong representation in the area, with the closest store located at Blue Haven, 14.7 km to the south-west. Aldi typically require a catchment population of 15,000 – 20,000 in order to be sustainable, indicating that a store is unlikely to be supportable at the site in the short to medium term.
- v. With a main trade area population of around 8,000 by 2018/19, a smaller format supermarket of 1,500 – 2,000 sq.m, potentially operated by IGA would be supportable at the site, with the potential to expand to a full-line offer in the medium to long term.
- vi. Taking into account the above, the potential for supermarket facilities at the site is assessed under following scenarios:
 - **Scenario 1:** A full-line (3,500 sq.m) Coles supermarket.
 - **Scenario 2:** An Aldi supermarket of 1,350 sq.m.
 - **Scenario 3:** An IGA supermarket of 1,750 sq.m.
- vii. Table 8 outlines projected supermarket sales under each of the three scenarios over the period 2019-31, assuming that no other supermarkets are developed within the main trade area during the forecast period. Key points to note as are follows:
 - **Scenario 1:** As shown, projected supermarket sales for a full-line Coles supermarket are \$21.9 million (approximately \$6,250 per sq.m) in 2018/19,

increasing to \$48.7 million in 2030/31, reflecting an average annual growth rate of 6.9%. Assuming an occupancy cost ratio of 4.0%, projected gross rents for a Coles supermarket in 2018/19 are \$0.9 million (\$250 per sq.m).

- **Scenario 2:** Assuming an Aldi supermarket is developed, projected sales are \$12.0 million (approximately \$8,900 per sq.m) in 2018/19, increasing to \$26.8 million in 2030/31, reflecting an average annual growth rate of 6.9%. Assuming an occupancy cost ratio of 4.0%, projected gross rents for an Aldi supermarket in 2018/19 are \$0.5 million (\$360 per sq.m).
- **Scenario 3:** Projected sales for an IGA supermarket of 1,750 sq.m are \$13.4 million in 2018/19 (approximately \$7,650 per sq.m) in 2018/19, increasing to \$29.9 million in 2030/31, reflecting an average annual growth rate of 6.9%. Assuming an occupancy cost ratio of 4.0%, projected gross rents for an IGA supermarket in 2018/19 are \$0.5 million (\$300 per sq.m).

viii. Table 9 outlines the amount of supportable supermarket floorspace at the site, assuming a trading level of around \$8,000 per sq.m in 2018/19. As shown, a supermarket of around 1,700 sq.m is supportable in 2019. By 2031, approximately 2,600 sq.m of supermarket floorspace could be supported.

ix. Based on the above analysis, our recommendation is to target an IGA supermarket of 1,500 – 2,000 sq.m to locate at the site, with the potential to expand to a full-line offer in the longer term.

Mini-Major Potential

- i. A mini-major tenant is a retail specialty tenant 400 sq.m or greater in size.
- ii. Mini-major tenants which typically locate in neighbourhood centres are primarily convenience based, including fresh produce, liquor, pharmacy and discount variety operators. The trading performance of mini-major tenants varies significantly, depending on the type of tenant secured (e.g. a pharmacy or liquor operator would trade at a higher level than a discount variety operator).

- i. The benchmark provision of mini-major floorspace for single supermarket based centres is 510 sq.m (Urbis Averages 2014/15), with average sales levels of \$2.3 million (\$4,437 per sq.m). These benchmarks, however, are based on a sample which includes a large number of major full-line supermarkets (the benchmark provision of supermarket floorspace in single supermarket based centres is 3,498 sq.m.).
- ii. While securing a quality, national brand mini-major tenant would be ideal in terms of generating additional foot traffic and sales to the centre, it is difficult for smaller format supermarket anchored centres to attract such tenants, based on their size. For the purposes of this analysis a mini-major tenant is not assumed.

Retail Specialty Potential

- i. A supermarket is the major generator for customer visitation to any shopping centre, with the specialty stores feeding off customer flows generated by the supermarket.
- ii. Typically, the ratio of supermarket sales to specialty sales at small convenience centres is around 70 : 30. In the newer convenience centres, which typically have a greater emphasis on food catering, this ratio can be up to 60 : 40. In the case of Gwandalan, we have assumed a ratio of 65 : 35 supermarket sales to specialty sales. This would indicate that retail specialty sales of \$7 - \$8 million is achievable in 2018/19.
- iii. Table 10 outlines the likely level of specialty sales and consequent amount of floorspace that is supportable over the period from 2019 – 2031, assuming a small format supermarket of 1,750 sq.m anchors the centre. Key points to note are follows:
 - Given the development timeframe of Gwandalan, assumed over a 10-year period, the provision of retail specialty could be staged in line with population growth.
 - Overall, some 1,000 – 1,500 sq.m of retail specialty floorspace is supportable in 2018/19 (assuming an average trading level of \$6,000 per sq.m).

- This provision could potentially be expanded to 1,500 – 2,000 sq.m by around 2031, once the residential component of the Gwandalan development is complete.
- iv. The key tenants in any convenience centre could include:
- **Food Retailing:** bakery (potentially as part of a larger café) and liquor store (potentially relocated from either the Ganban Road strip in Gwandalan or Cams Boulevard in Summerland Point). Other fresh food tenants could be difficult to secure in an internalised location
 - **Food Catering:** including a café and takeaway stores.
 - **General Retail:** a pharmacy, particularly if a medical centre is provided.
 - **Retail Services:** a hairdresser or beauty salon.
 - **Non-Retail:** a real estate agent, banks, post office (potentially relocated from the Ganban Road strip) or other medical uses such as a dentist, podiatrist, chiropractor, pathology etc. which could complement a medical centre at the site.
- v. Other non-retail uses could also be supportable at the site, including potentially a medical centre, child care centre, gym facility etc. A high level review of the potential for these facilities is outlined in the next sub-section.

Potential Non-Retail Uses

Medical Centres

- i. Map 5 shows the location of existing medical centres within the region, indicating the following:
- There are currently no large format medical centres (i.e. ten or more doctors) provided within the main trade area.
 - Currently, only two doctors operate within the main trade area; both operate at Lakeside Surgery along Orana Road in Gwandalan.

- ii. Typically, one doctor is provided for every 1,000 residents in Australia, indicating the potential for additional medical facilities within the main trade area, based on a population level of almost 8,000 persons in 2019. This indicates demand for eight doctors (some six additional doctors than I currently provided).
- iii. Typically, successful medical centres and facilities are situated within high profile locations, either along main roads or within close proximity to a retail and/or commercial centre. In that way, these facilities receive maximum exposure to passing traffic, but more importantly, are easily recognisable and accessible for the surrounding population.
- iv. On this basis, the development of a medical centre of up to six doctors is potentially feasible at the site. IPN, Healthscope and Primary Health Care are major medical centre operators within Australia that could be targeted.
- v. Medical centres can range in size from 250 sq.m – 1,000 sq.m, (depending on the number of doctors and services offered) and typically pay gross rents in the order of \$350 - \$750 per sq.m.

Childcare Centres

- i. Given that the proportion of households comprising couples with dependent children within the primary sector at 40.8% is comparable with the non-metropolitan New South Wales benchmark (40.7%), there could be sufficient demand for a childcare facility at Gwandalan.
- ii. Map 6 outlines the provision of childcare facilities throughout the main trade area. week.
- iii. Research undertaken by Location IQ indicates that around 32% of children aged between 0 – 5 years are typically in long day care facilities. There are approximately 447 children aged 0 – 5 within the main trade area, which indicates demand for some 143 childcare places, assuming each child attends long day care five days a week. According to the Australian Bureau of Statistics (ABS), however, the average number

of days which children attend long day care is 2.5 days per week, indicating demand for around 70 child care places.

- iv. Currently, 94 long day care (including family day care) places are provided within the main trade area (with some vacancies), across four locations, indicating that the main trade area is well supplied with child care facilities currently. There could, however, be potential to relocate an existing facility to the site.
- v. Childcare centres can vary in size with a range from 250 sq.m up to in-excess of 1,000 sq.m, (not including play areas and car parking) and pay gross rents in the order of \$350 - \$500 per sq.m. Legislation (*Education and Care Services Regulation 2013 (QLD)*/*Children's Services Regulation 2004 (NSW)*) generally details that childcare centres must provide the following amount of floorspace per child:
 - 3.25 sq.m of unencumbered indoor play space per child.
 - 7 sq.m of useable outdoor floorspace.
 - 10.25 sq.m of total floorspace.
- vi. Such facilities are likely to significantly increase visitation to the centre, with parents picking up their daily or weekly shopping items when collecting their children from childcare.

Gyms/Swim Schools

- i. There are many different sizes and forms of gyms provided throughout Australia as follows:
 - The well-known brands and health clubs such as Fitness First and Virgin Active typically operate large sized gyms of around 1,000 sq.m and serve a catchment of approximately 50,000 – 70,000 persons, and typically only operate in metropolitan locations.
 - Local gyms which are typically around 200 sq.m in size serve a catchment of around 10,000 persons.
- ii. The provision of gyms and swim schools throughout the region are shown on Maps 7 and 8. Key points to note include:
 - While there are sports facilities provided in the main trade area; at Summerland Sporties Club (in Summerland Point) and at the community centre provided along Kanangra Drive (in Gwandalan), no gym or swim school facilities are currently provided.
 - Virgin Active and Fitness First do not operate within the region.
 - The closest gym facility to the site is Active Fitness, provided at Doylo's RSL Club, 14 km to the south-west.
 - The closest smaller format national brand gyms operating within the region are:
 - Jetts at San Remo, 17 km to the south-west.
 - Curves at Charmhaven, 20 km to the south-west.
 - Anytime Fitness at Lake Haven, 21 km to the south-west.
 - Plus Fitness is proposed at Toukley, 21 km to the south.
 - The closest swim school facility is North Lakes Swim School, located at Budgewoi, some 14 km to the south of the site.

- iii. Contours and Fit N Fast are not currently represented in the region and could potentially be targeted to locate at the Gwandalan site.
- iv. Typically, gyms pay rents in the order of \$350 - \$400 per sq.m, depending on their size and location.

Total Centre Floorspace Provision

- i. As outlined above, Table 11 details the overall level of suggested floorspace including retail and non-retail uses at the site.
- ii. In total, around 4,000 – 5,000 sq.m of floorspace is supportable and is forecast to achieve gross rents in the order of \$2.0 million (\$486 per sq.m) in 2018/19.
- iii. The retail specialty component of the centre is assumed to achieve an occupancy cost ratio of 12.5%, reflecting a gross rental rate of \$721 per sq.m in 2018/19.

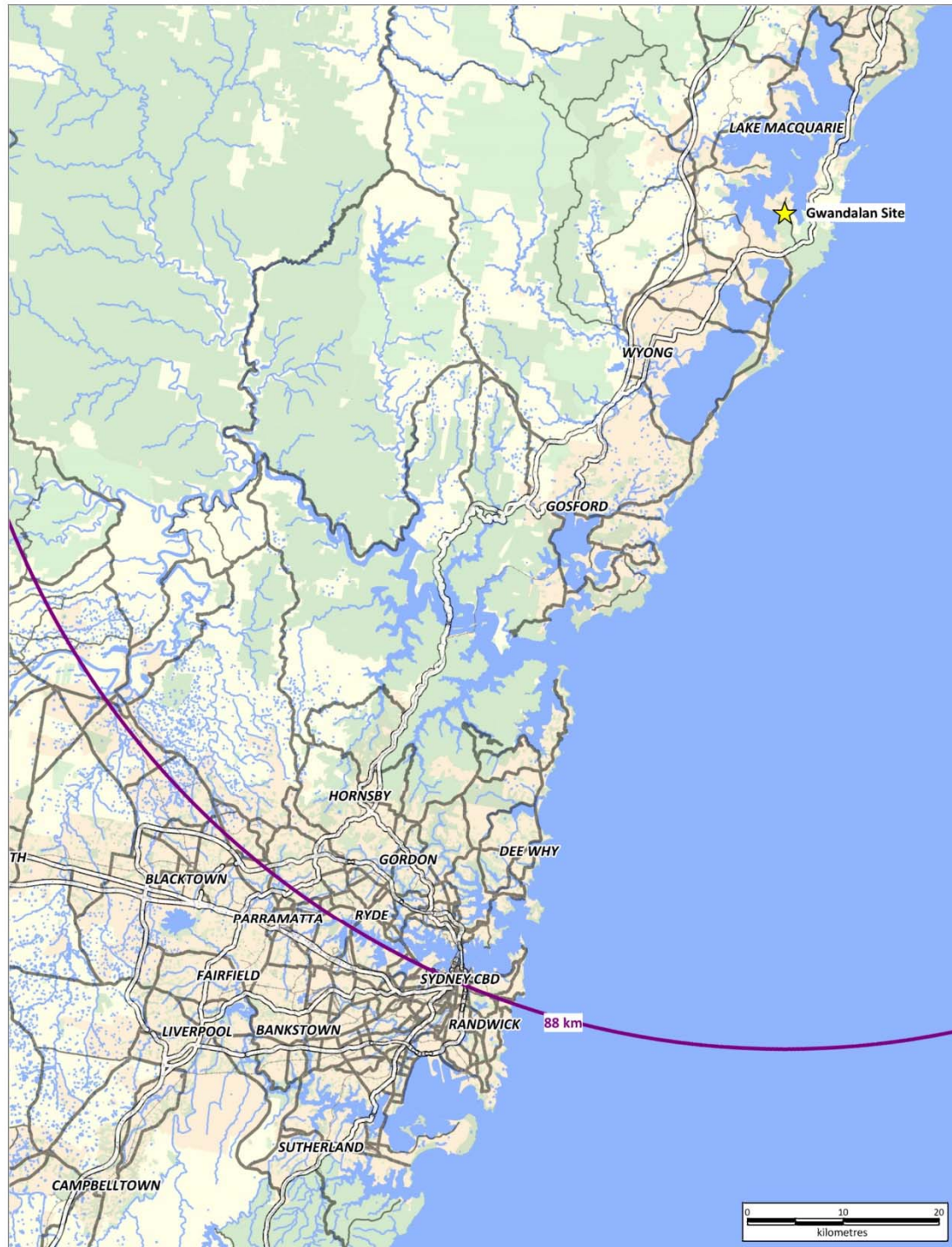
Critical Success Factors

- i. The critical success factors in relation to the proposed neighbourhood centre at Gwandalan would include:
 - **Accessibility and visibility** – the site of the proposed neighbourhood centre has excellent accessibility and visibility, being located on Kanagra Drive. All residents of the primary sector would pass the site when entering/exiting the peninsula.
 - **Car parking** – car parking should be provided at grade at a rate of around 4 – 5 spaces per 100 sq.m of floorspace. This car parking should be accessible from two entry points.
 - **Centre design** – the most successful convenience centres are provided in an L-shape arrangement over a single level, with each store facing the car park. In this way, each store has an opportunity to trade over an extended period of the day including at night time.

- **Anchor tenants** – the likely key anchor tenant at the neighbourhood centre would be an IGA supermarket, together with a medical centre, childcare centre, gym/swim school and petrol station. Ascertaining interest from these tenants would be important to securing a successful specialty offer and providing a high level of amenity to future residents of Gwandalan.

FIGURES, MAPS AND TABLES

MAP 1 – GWANDALAN REGIONAL CONTEXT



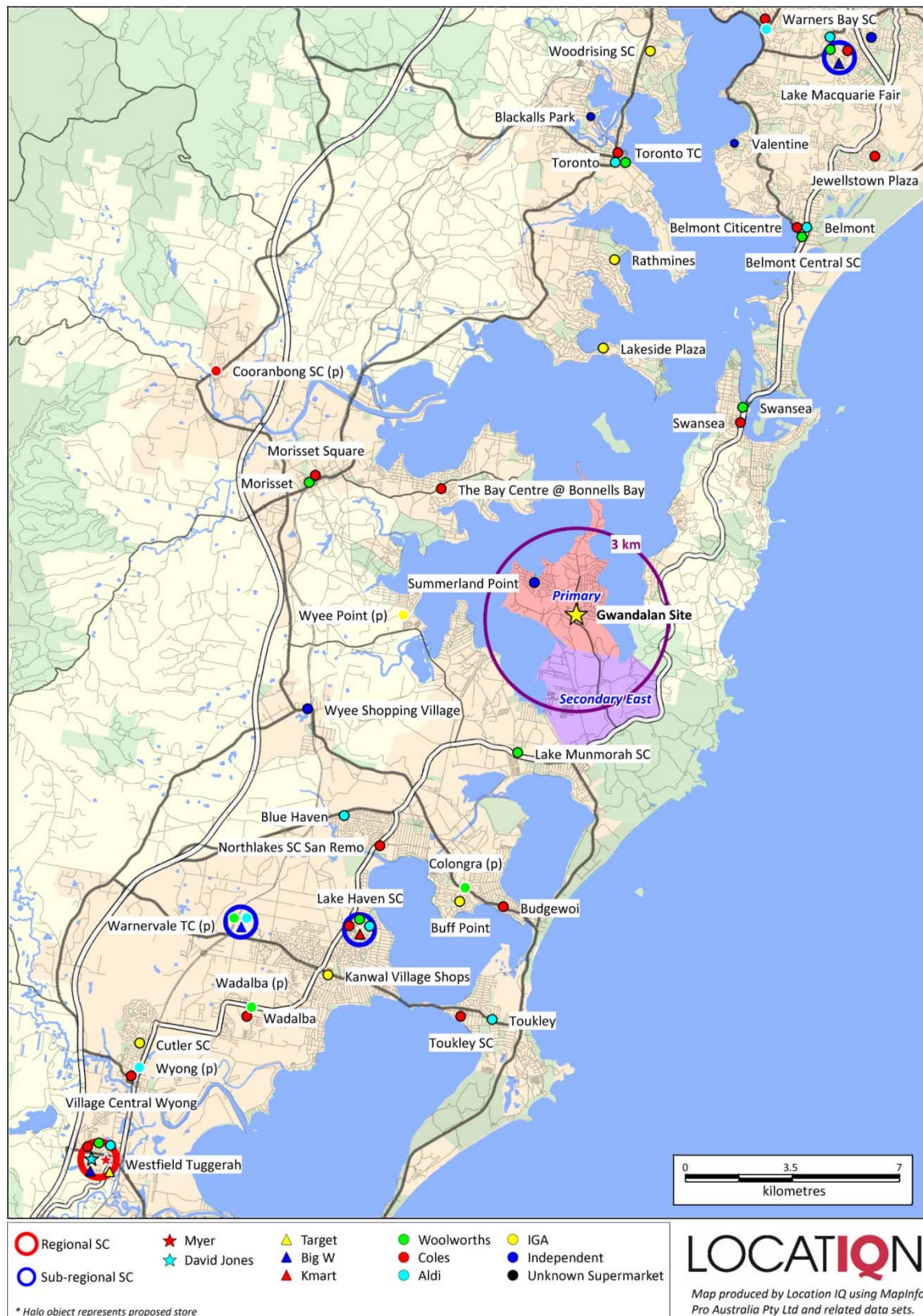
LOCATIONIQ

Map produced by Location IQ using MapInfo Pro Australia Pty Ltd and related data sets.

MAP 2 – GWANDALAN LOCAL CONTEXT



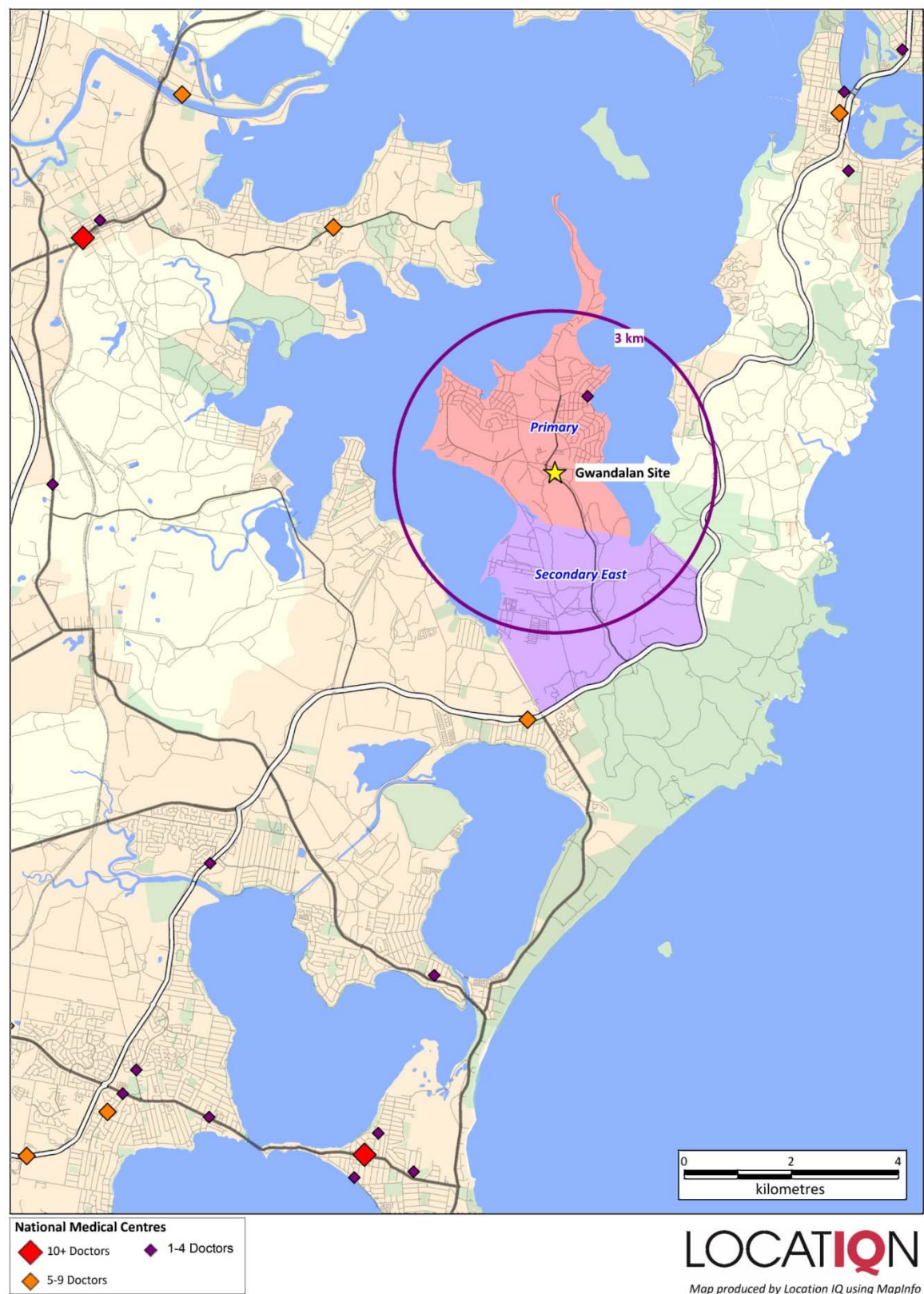
MAP 3 – GWANDALAN MAIN TRADE AREA AND COMPETITION



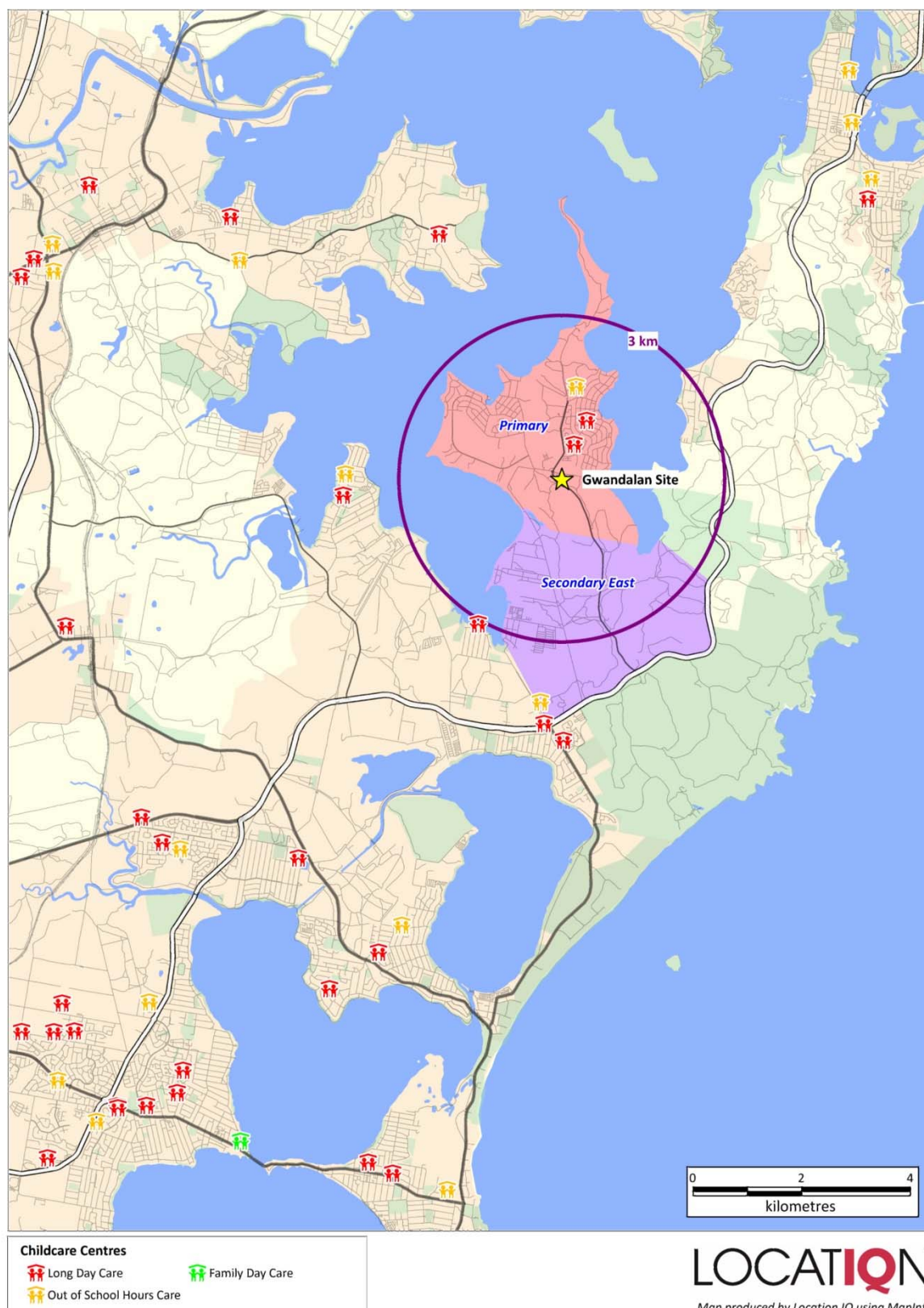
MAP 4 – GWANDALAN RESIDENTIAL DEVELOPMENT AREAS AND ESTATES



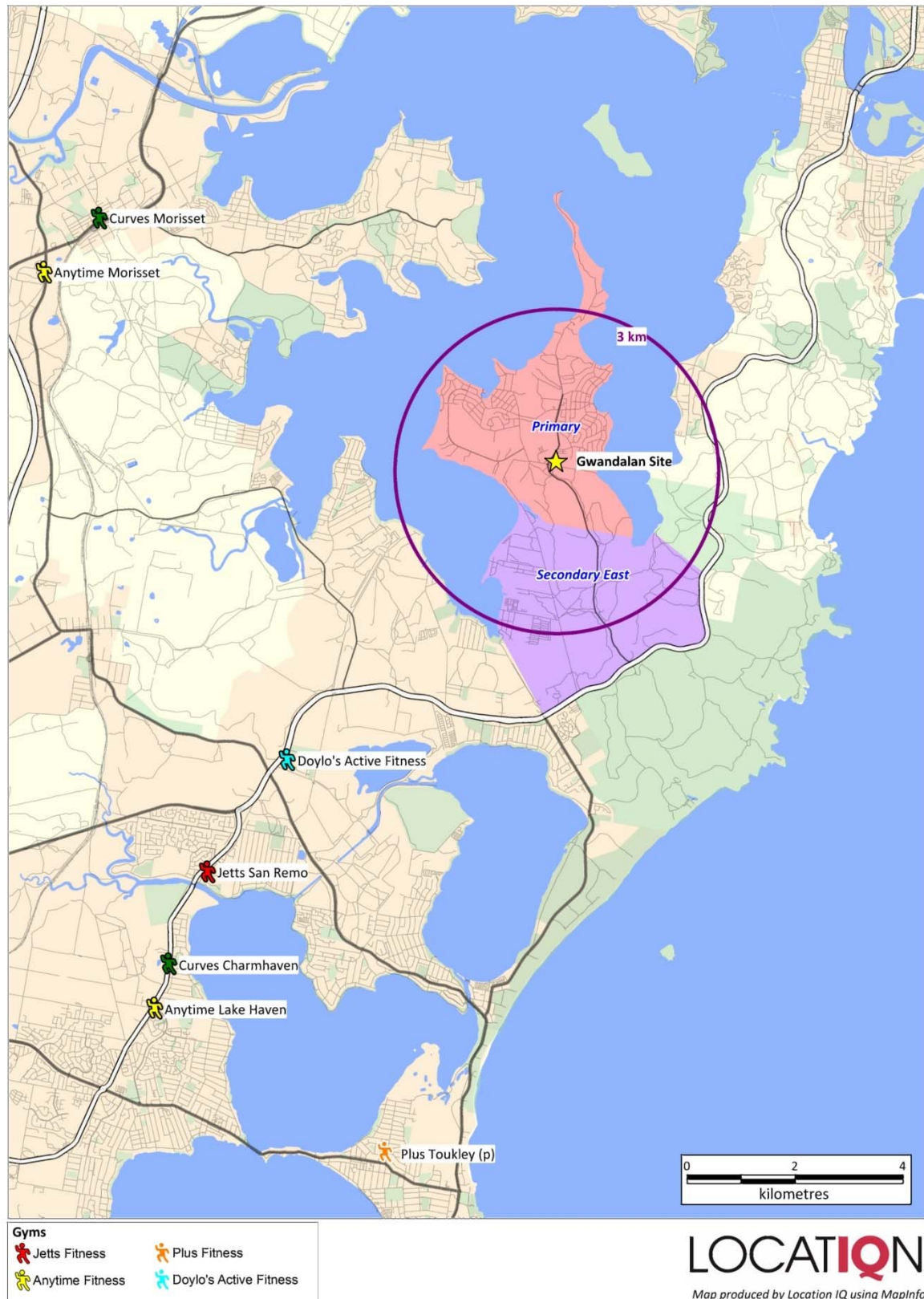
MAP 5 - EXISTING MEDICAL FACILITIES



MAP 6 – EXISTING CHILDCARE FACILITIES



MAP 7 – EXISTING GYM FACILITIES



MAP 8 – EXISTING SWIM SCHOOL FACILITIES

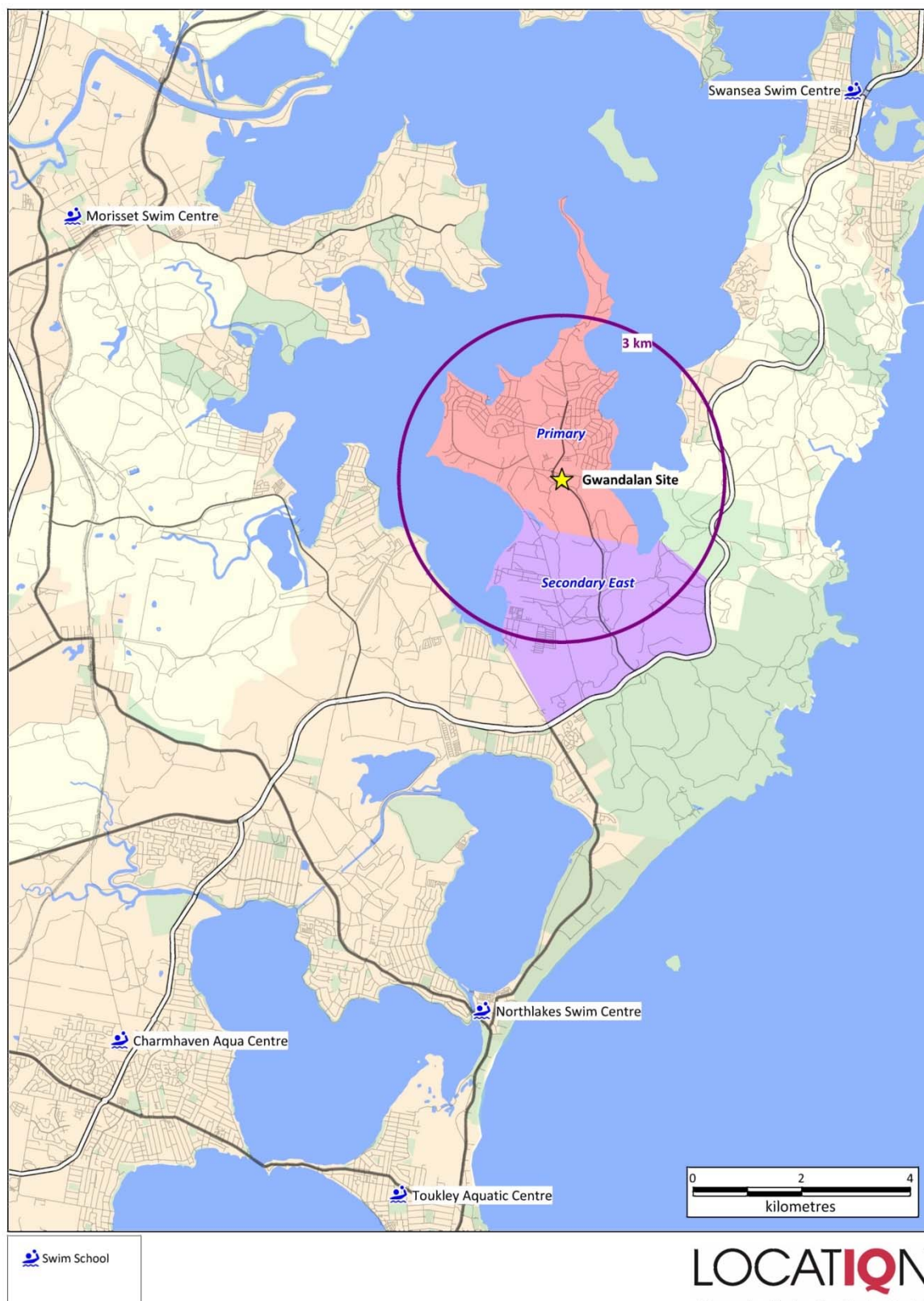


TABLE 1 – GWANDALAN MAIN TRADE AREA FORECAST POPULATION, 2006-31

Trade Area Sector	Estimated Resident Population		Forecast Population				
	2006	2011	2016	2019	2021	2026	2031
Primary Sector	4,241	4,433	4,683	5,058	5,408	6,408	7,158
Secondary Sector	<u>2,570</u>	<u>2,730</u>	<u>2,855</u>	<u>2,930</u>	<u>2,980</u>	<u>3,230</u>	<u>3,730</u>
Main Trade Area	6,811	7,163	7,538	7,988	8,388	9,638	10,888
Average Annual Change (No.)							
	2006-2011	2011-2016	2016-2019	2019-2021	2021-2026	2026-2031	
Primary Sector		38	50	125	175	200	150
Secondary Sector		<u>32</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>50</u>	<u>100</u>
Main Trade Area		70	75	150	200	250	250
Average Annual Change (%)							
	2006-2011	2011-2016	2016-2019	2019-2021	2021-2026	2026-2031	
Primary Sector		0.9%	1.1%	2.6%	3.4%	3.5%	2.2%
Secondary Sector		<u>1.2%</u>	<u>0.9%</u>	<u>0.9%</u>	<u>0.8%</u>	<u>1.6%</u>	<u>2.9%</u>
Main Trade Area		1.0%	1.0%	2.0%	2.5%	2.8%	2.5%
<i>Non Metro NSW</i>		1.0%	0.7%	0.7%	0.6%	0.5%	0.4%
<i>Australian Average</i>		1.8%	1.7%	1.7%	1.6%	1.5%	1.4%
<i>All figures as at June</i> <i>All figures are based on 2011 SA1 boundary definition with the exception of 2006 which is based on 2006 CCD boundary definition. 2006 and 2011 ERP is calculated using 2011 enumeration factor.</i> <i>Sources : ABS; SAfi by .id</i>							

TABLE 2 – NEW DWELLING APPROVALS, 2006/07 – 2015/16

Sector	Primary Sector	Secondary Sector	Main TA
<u>New Houses</u>			
2006/07	15	12	27
2007/08	13	21	34
2008/09	13	21	34
2009/10	22	13	35
2010/11	12	34	46
2011/12	11	30	41
2012/13	16	33	49
2013/14	9	44	53
2014/15	16	58	74
2015/16	<u>20</u>	<u>29</u>	<u>49</u>
Total New Houses	147	295	442
Average	15	30	44
<u>Other Dwellings</u>			
2006/07	0	0	0
2007/08	0	0	0
2008/09	0	0	0
2009/10	0	0	0
2010/11	0	0	0
2011/12	0	0	0
2012/13	0	0	0
2013/14	0	0	0
2014/15	2	2	4
2015/16	<u>4</u>	<u>0</u>	<u>4</u>
Total Other Dwellings	6	2	8
Average	1	0	1
<u>Total Dwellings</u>			
2006/07	15	12	27
2007/08	13	21	34
2008/09	13	21	34
2009/10	22	13	35
2010/11	12	34	46
2011/12	11	30	41
2012/13	16	33	49
2013/14	9	44	53
2014/15	18	60	78
2015/16	<u>24</u>	<u>29</u>	<u>53</u>
Total Dwellings	153	297	450
Average	15	30	45
Source: ABS			

TABLE 3 – GWANDALAN MAIN TRADE AREA SOCIO-ECONOMIC PROFILE

Characteristics	Primary Sector	Secondary Sector	Main TA	Non Metro NSW Average	Aust Average
Income Levels					
Average Per Capita Income	\$26,923	\$29,138	\$27,654	\$29,579	\$34,201
Per Capita Income Variation	-9.0%	-1.5%	-6.5%	n.a.	n.a.
Average Household Income	\$67,421	\$62,922	\$65,781	\$72,680	\$87,928
Household Income Variation	-7.2%	-13.4%	-9.5%	n.a.	n.a.
Average Household Size	2.5	2.2	2.4	2.5	2.6
Age Distribution (% of Pop'n)					
Aged 0-14	20.5%	14.6%	18.6%	19.4%	19.3%
Aged 15-19	6.2%	4.9%	5.8%	6.6%	6.5%
Aged 20-29	8.0%	7.2%	7.8%	10.9%	13.8%
Aged 30-39	11.0%	8.4%	10.2%	11.3%	13.8%
Aged 40-49	13.3%	10.0%	12.2%	13.4%	14.2%
Aged 50-59	13.2%	13.2%	13.2%	13.9%	12.8%
Aged 60+	27.7%	41.7%	32.3%	24.4%	19.6%
Average Age	41.0	48.0	43.3	40.1	37.9
Housing Status (% of H'holds)					
Owner/Purchaser	77.5%	83.6%	79.5%	71.3%	69.3%
Renter	22.5%	16.4%	20.5%	28.7%	30.7%
Birthplace (% of Pop'n)					
Australian Born	88.9%	84.0%	87.2%	88.5%	73.9%
Overseas Born	11.1%	16.0%	12.8%	11.5%	26.1%
• Asia	0.6%	0.7%	0.7%	1.6%	7.6%
• Europe	7.0%	11.5%	8.5%	6.1%	9.4%
• Other	3.5%	3.8%	3.6%	3.8%	9.1%
Family Type (% of Pop'n)					
Couple with dep't children	40.8%	31.5%	37.7%	40.7%	45.3%
Couple with non-dep't child.	6.7%	5.8%	6.4%	7.0%	7.7%
Couple without children	27.2%	36.9%	30.4%	25.7%	23.0%
Single with dep't child.	11.9%	7.3%	10.4%	10.6%	9.2%
Single with non-dep't child.	2.7%	2.8%	2.7%	3.5%	3.5%
Other family	0.8%	1.1%	0.9%	0.9%	1.1%
Lone person	9.9%	14.6%	11.5%	11.7%	10.2%
Sources : ABS Census of Population and Housing 2011					

TABLE 4 – GWANDALAN SOCIO-ECONOMIC PROFILE COMPARISON, 2006 – 2011

Characteristics	Gwandalan MTA			Non Metro NSW Benchmark		
	2006	2011	Change (%)	2006	2011	Change (%)
Income Levels						
Average Per Capita Income	\$21,511	\$27,654	28.6%	\$23,056	\$29,579	28.3%
Average Household Income	\$52,941	\$65,781	24.3%	\$57,128	\$72,680	27.2%
Age						
Average Age	41.2	43.3	5.0%	39.1	40.1	2.6%
Birthplace (% of Pop'n)						
Australian Born	87.3%	87.2%	-0.1%	89.2%	88.5%	-0.7%
Overseas Born	12.7%	12.8%	0.1%	10.8%	11.5%	0.7%
Household Size & Structure						
Average Household Size	2.5	2.4	-3.4%	2.5	2.5	-0.8%
Couple with dep't children	39.2%	37.7%	-1.5%	42.3%	40.7%	-1.6%
Housing Status (% of H'holds)						
Owner/Purchaser	78.8%	79.5%	0.7%	72.2%	71.3%	-0.9%
Renter	21.2%	20.5%	-0.7%	27.8%	28.7%	0.9%
Sources : ABS Census of Population and Housing 2006 & 2011				LOCATION		

TABLE 5 – GWANDALAN MAIN TRADE AREA FORECAST RETAIL EXPENDITURE, 2016 – 31

Y/E June	Primary Sector	Secondary Sector	Main TA
2016	64.3	42.1	106.4
2017	66.9	43.4	110.3
2018	71.0	45.2	116.2
2019	75.4	47.2	122.5
2020	80.3	49.2	129.5
2021	85.9	51.3	137.2
2022	91.9	53.7	145.6
2023	98.3	56.5	154.8
2024	105.3	59.4	164.6
2025	112.7	62.4	175.1
2026	120.6	65.6	186.2
2027	128.4	69.4	197.8
2028	135.8	73.9	209.8
2029	143.7	78.7	222.5
2030	152.1	83.9	236.0
2031	160.9	89.3	250.3
Expenditure Growth			
2016-2019	11.0	5.1	16.1
2019-2021	10.5	4.1	14.7
2021-2026	34.7	14.3	49.0
2026-2031	40.3	23.7	64.0
2016-2031	96.6	47.2	143.9
Average Annual Growth Rate			
2016-2019	5.4%	3.9%	4.8%
2019-2021	6.8%	4.3%	5.8%
2021-2026	7.0%	5.0%	6.3%
2026-2031	5.9%	6.4%	6.1%
2016-2031	6.3%	5.1%	5.9%
<i>*Inflated dollars & Including GST</i> <i>Source : Marketinfo</i>			LOCATION

TABLE 6 – GWANDALAN EXISTING COMPETITION

Centre	Shopfront GLA (sq.m)	Anchor Tenants	Dist. From Gwandalan (km)
Regional Shopping Centres			
Westfield Tuggerah	83,300	David Jones (13,198), Target (7,100), Big W (7,060), Woolworths (4,605), Coles (3,570), Aldi (1,357)	33.2
Sub-regional Shopping Centres			
Lake Haven SC	43,100	Kmart (7,985), Coles (4,244), Woolworths (4,234) Aldi (1,350)	18.5
<u>Mount Hutton</u>	<u>18,900</u>		<u>31.4</u>
• Lake Macquarie Fair	16,900	Big W (6,584), Woolworths (4,003), Coles (3,087)	
• Other	2,000	Aldi (1,350)	
Supermarket Based Shopping Centres			
<u>Lake Munmorah</u>	<u>5,000</u>		<u>6.7</u>
• Other	5,000	Woolworths (3,800)	
<u>Budgewoi</u>	<u>4,000</u>		<u>14.1</u>
• Other	4,000	Coles (2,700)	
Northlakes SC	4,000	Coles (3,500)	14.6
<u>Blue Haven</u>	<u>996</u>		<u>14.7</u>
• Other	996	Aldi (996)	
<u>Swansea</u>	<u>9,000</u>		<u>19.0</u>
• Other	9,000	Woolworths (3,378), Coles (3,324)	
<u>Toukley</u>	<u>7,500</u>		<u>19.3</u>
• Toukley SC	5,500	Coles (2,708)	
• Other	2,000	Aldi (1,580)	
Source: Australian Shopping Centre Council Database			LOCATION

TABLE 7 – GWANDALAN FUTURE COMPETITION

Name	Additional Retail GLA (sq.m)	Components	Status	Assumed Opening Date
Beyond MTA				
Wyee Point IGA	1,401	IGA (900 sq.m)	For Sale with Approval	n.a.
Colongra Woolworths	3,500	Woolworths (3,500 sq.m)	Abandoned	n.a.
Warnervale Town Centre	33,112	Woolworths, Aldi, large format retail, commercial, cinema and entertainment precinct	Approved - Deferred	n.a.
Lakeside SC	15,603	Supermarket, mini-majors, spec. shops, commercial, residential (478 dwellings)	For Sale with Approval	n.a.
Cooranbong Shopping Centre	3,699	Coles (2,611 sq.m), spec. shops	Mooted	n.a.
Woolworths Wadalba	3,791	Woolworths (3,591 sq.m), spec. shops (200 sq.m)	Approved - Deferred	2018
Aldi Wyong	1,533	Aldi (1,533 sq.m)	Construction	2017
<u>Westfield Tuggerah</u>				
• Stage One	12,638	Myer (12,000 sq.m), mini-major reduction (-1,124 sq.m) & spec. shops (1,762 sq.m)	Approved	2018/19
• Stage Two	n.a.	Gmax cinema (2,450 seats) at rear of existing cinema	Approved	n.a.

LOCATION

TABLE 8 – GWANDALAN FORECAST SUPERMARKET SALES, 2019 – 31

Y/E	Full-line Coles (3,500 sq.m) (\$M)	Aldi (1,350 sq.m) (\$M)	IGA (1,750 sq.m) (\$M)
June			
2019	21.9	12.0	13.4
2020	23.3	12.8	14.3
2021	25.0	13.7	15.3
2022	26.8	14.7	16.4
2023	28.7	15.8	17.6
2024	30.8	16.9	18.9
2025	33.1	18.1	20.3
2026	35.5	19.5	21.7
2027	37.9	20.8	23.2
2028	40.4	22.2	24.7
2029	43.0	23.6	26.3
2030	45.8	25.1	28.0
2031	48.7	26.8	29.9
Average Annual Growth (2019-31)	6.9%	6.9%	6.9%
<i>*Inflated dollars & Including GST</i>			

LOCATION

TABLE 9 – SUPERMARKET SALES AND FLOORSPEACE, 2019 - 2031

Y/E June	Supermarket Sales*		Supportable Floorspace
	(\$M)	(\$/sq.m)	(sq.m)
2019	13.4	8,000	1,673
2020	14.3	8,240	1,734
2021	15.3	8,487	1,803
2022	16.4	8,742	1,876
2023	17.6	9,004	1,954
2024	18.9	9,274	2,036
2025	20.3	9,552	2,121
2026	21.7	9,839	2,209
2027	23.2	10,134	2,293
2028	24.7	10,438	2,370
2029	26.3	10,751	2,450
2030	28.0	11,074	2,533
2031	29.9	11,406	2,618
Average Annual Growth			
2019-2021	6.9%	3.0%	
2021-2026	7.3%	3.0%	
2026-2031	6.6%	3.0%	
2019-2031	6.9%	3.0%	
Source : Marketinfo			LOCATION

TABLE 10 – SPECIALTY SALES AND FLOORSACE

Y/E June	Supermarket Sales* (\$M)	Specialty Sales* (@ 35% of smkt Sales) (\$M)	Supportable Specialty Floorspace (Sq.m)
2019	13.4	7.2	6,000
2020	14.3	7.7	6,180
2021	15.3	8.2	6,365
2022	16.4	8.8	6,556
2023	17.6	9.5	6,753
2024	18.9	10.2	6,956
2025	20.3	10.9	7,164
2026	21.7	11.7	7,379
2027	23.2	12.5	7,601
2028	24.7	13.3	7,829
2029	26.3	14.2	8,063
2030	28.0	15.1	8,305
2031	29.9	16.1	8,555
Average Annual Growth			
2019-2021	6.9%	6.9%	
2021-2026	7.3%	7.3%	
2026-2031	6.6%	6.6%	
2019-2031	6.9%	6.9%	
Source : Marketinfo			

TABLE 11 – GWANDALAN RECOMMENDED CENTRE POTENTIAL, 2018/19

Tenant/ Category	GLA (sq.m)	Forecast Sales* (\$'000) (\$/sq.m)		Gross Rents** (\$'000) (\$/sq.m)		Occ. Cost (%)
<u>Majors</u>						
IGA	1,750	13,386	7,649	535	306	4.0%
Mini-majors	0	0	0	0	0	n.a.
Retail Specialty	<u>1,250</u>	<u>7,208</u>	<u>5,766</u>	<u>901</u>	<u>721</u>	<u>12.5%</u>
Total Retail	3,000	20,594	6,865	1,436	479	7.0%
<u>Non-retail</u>						
Medical	500			225	450	
Gym/Swim School	400			160	400	
Petrol Station	<u>200</u>			<u>170</u>	<u>850</u>	
Total Non-retail	1,100			555	505	
Total Centre	4,100			1,991	486	
<i>*Inflated dollars & Including GST</i>						
<i>** Including GST</i>						
LOCATIONION						

Location IQ
02 8248 0100
Level 6, 56 Pitt Street
Sydney NSW 2000
www.locationiq.com.au



05 F

Traffic and Parking Assessment Report

TRAFFIC AND PARKING IMPACT ASSESSMENT OF A MIXED-USE DEVELOPMENT

***Corner of Kanangra Drive and Summerland Road
in Gwandalan***

Prepared for: QMC Property Group Pty Ltd

A1615676N (Version 1a)

July 2019

1. INTRODUCTION

Motion Traffic Engineering was commissioned by QMC Property Group Pty Ltd to undertake a traffic and parking impact assessment of a proposed mixed-use development at the corner of Kanangra Drive with Summerland Road in Gwandalan. The development site has frontage to Summerland Road and Kanangra Drive. Currently the site is an empty lot.

The proposed development will have vehicle access and egress via three two proposed roads and two driveways on Summerland Road and one proposed driveway on Kanangra Drive.

This traffic report focuses on the proposed development and changes in car usage and car park utilisation and additional trips from the proposed development.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED LOCATION

2.1 Location and Land Use

The proposed mixed-use rezoning application is located approximately 1.2km south west from the local town centre and post office. The development site has frontage to Summerland Road and Kanangra Drive. Currently the site is a large plot of land.

The development site is located in a low-density residential area with the nearby land uses comprised primarily of some dwelling houses and commercial premises.

Figures 1 and 2 show the location of the development site from the aerial and street map perspective respectively.

Figure 3a show a photograph of the development site from the Kanangra Drive where it intersects Parraweena Road.

Figure 3b show the concept site plan of the proposed development.



Figure 1: Location of the Subject Site on Aerial



Figure 2: Street Map of the Location of the Development Site



Figure 3a: Photo of site from Kanangra Drive



Figure 3b: Concept Site Plan

2.2 Road Network

This section discusses the road network adjacent to the site.

Parraweena Road is a collector road with one lane each way with a road shoulder for general traffic. On street parking is not permitted on both sides of the road. The sign posted speed limit is 50km/hr.

Kanangra Drive is a collector road with one lane each way with a road shoulder. On street parking is not permitted on both sides of the road. The sign posted speed limit is 60km/hr.

Orana Road is a local road with one lane each way with unrestricted on street parking permitted on both sides. The sign posted speed limit is 50km/hr.

Summerland Road is a collector road with two lanes each way with a road shoulder. On street parking is not permitted on both sides of the road. The sign posted speed limit is 60km/hr.

2.3 Intersection Description

As part of this traffic impact assessment three intersections near the proposed development are assessed as follows:

- The roundabout intersection of Kanangra Drive with Summerland Road
- The stop intersection of Kanangra Drive and Parraweena Road
- The priority intersection of Kanangra Drive and Orana Road
- The priority intersection of Parraweena Road with Pinaroo Road

External traffic to and from the proposed development will most likely need to travel through one of the above intersections.

The roundabout intersection of Kanangra Drive with Summerland Road is a three-leg intersection with all turn movements permitted with one circulating lane. Pedestrian crossings are provided on all approaches. Figure 4 shows a layout of this intersection using SIDRA - an industry standard intersection assessment software. The numbers on the island represent the diameter in metres.

The stop control intersection of Kanangra Drive and Parraweena Road is a three-leg intersection with all turn movements permitted. Drivers on Parraweena Road need to stop and give way to traffic on Kanangra Drive. Pedestrian crossings are not provided on all approaches. Figure 5 shows a layout of this intersection using SIDRA.

The priority intersection of Kanangra Drive and Orana Road is a three-leg intersection with all turn movements permitted. Drivers from Kanangra Road north need to give way to traffic on Orana Road and Kanangra Road south. Figure 6 shows a layout of this intersection using SIDRA.

The priority intersection of Parraweena Road and Pinaroo Road is a four-leg intersection with all turn movements permitted. Drivers from Pinaroo Road need to give way to traffic on Parraweena Road. Figure 7 shows a layout of this intersection using SIDRA.

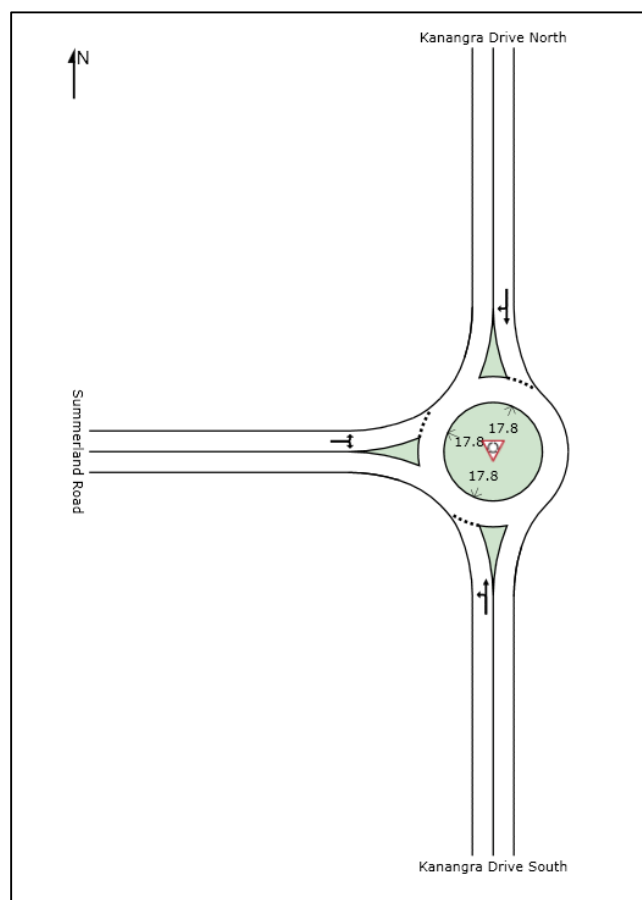


Figure 4: Roundabout intersection of Kanangra Drive with Summerland Road (SIDRA)

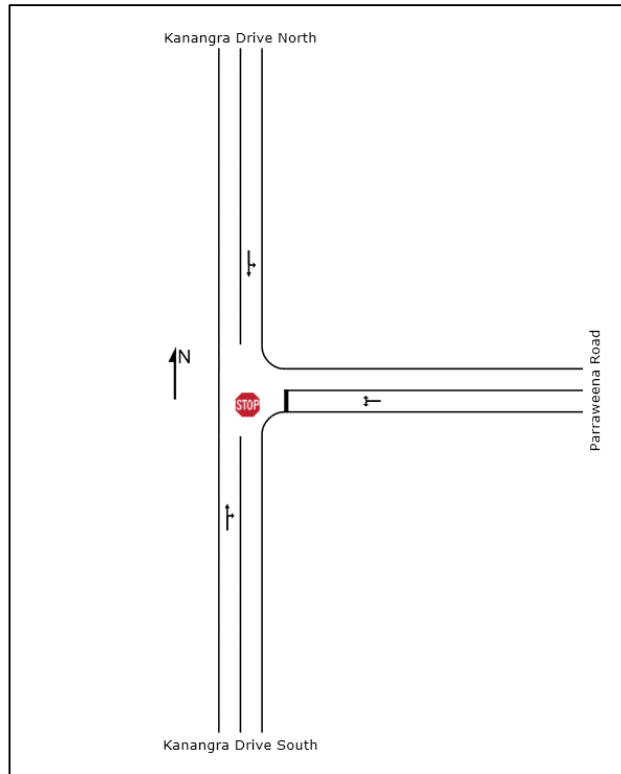


Figure 5: Priority intersection of Kanangra Drive and Parraweena Road. (SIDRA)

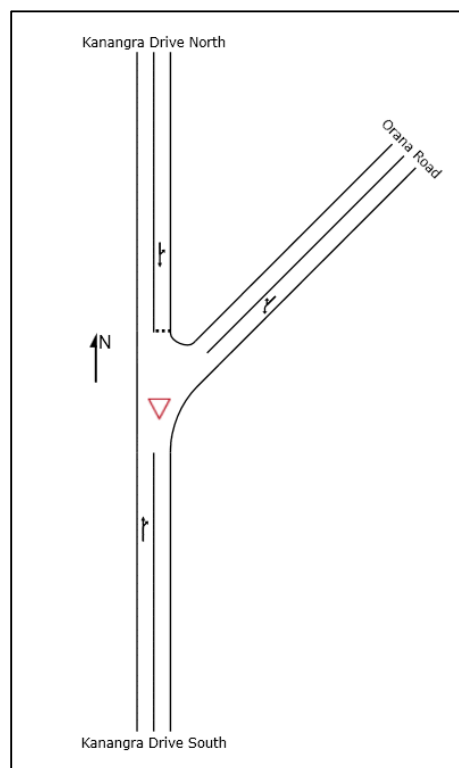


Figure 6: Priority intersection of Kanangra Drive and Orana Road (SIDRA)

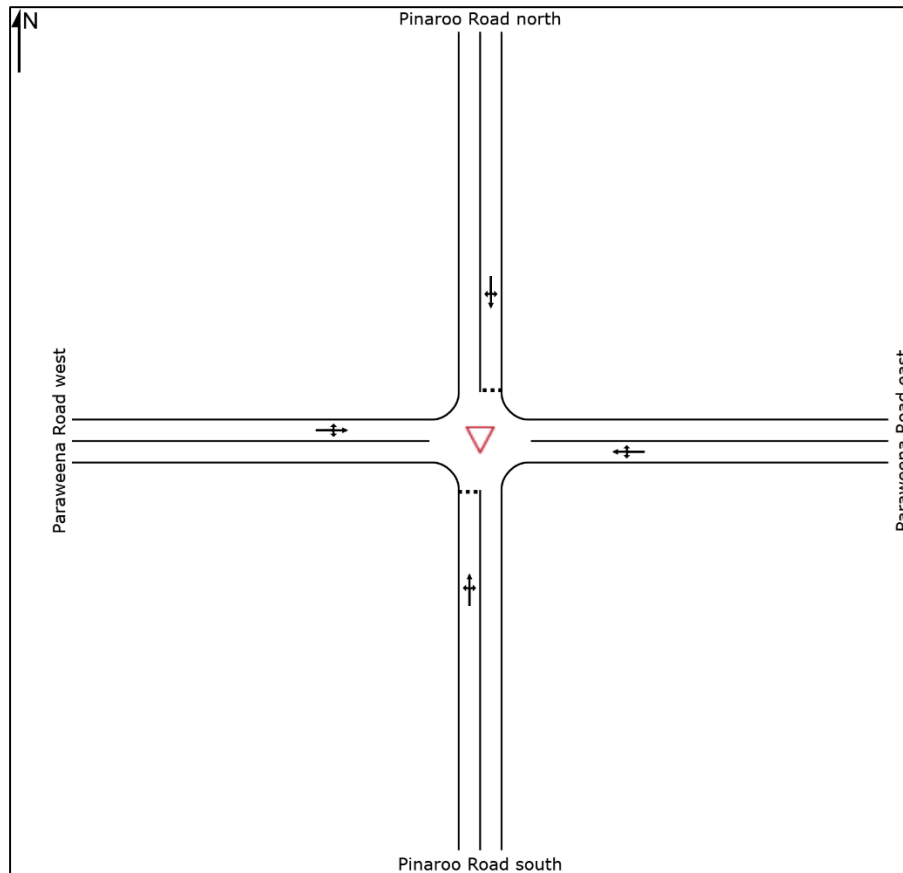


Figure 7: Priority intersection of Parraweena Road with Pinaroo Road (SIDRA)

2.4 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the two intersections for the weekday AM and PM peak period. The peak hours were 7:45am to 8:45am for the weekday AM peak hour. The PM peak hour was 4:45pm to 5:45pm.

The following figures present the traffic volumes in vehicles for the weekday peak hours.

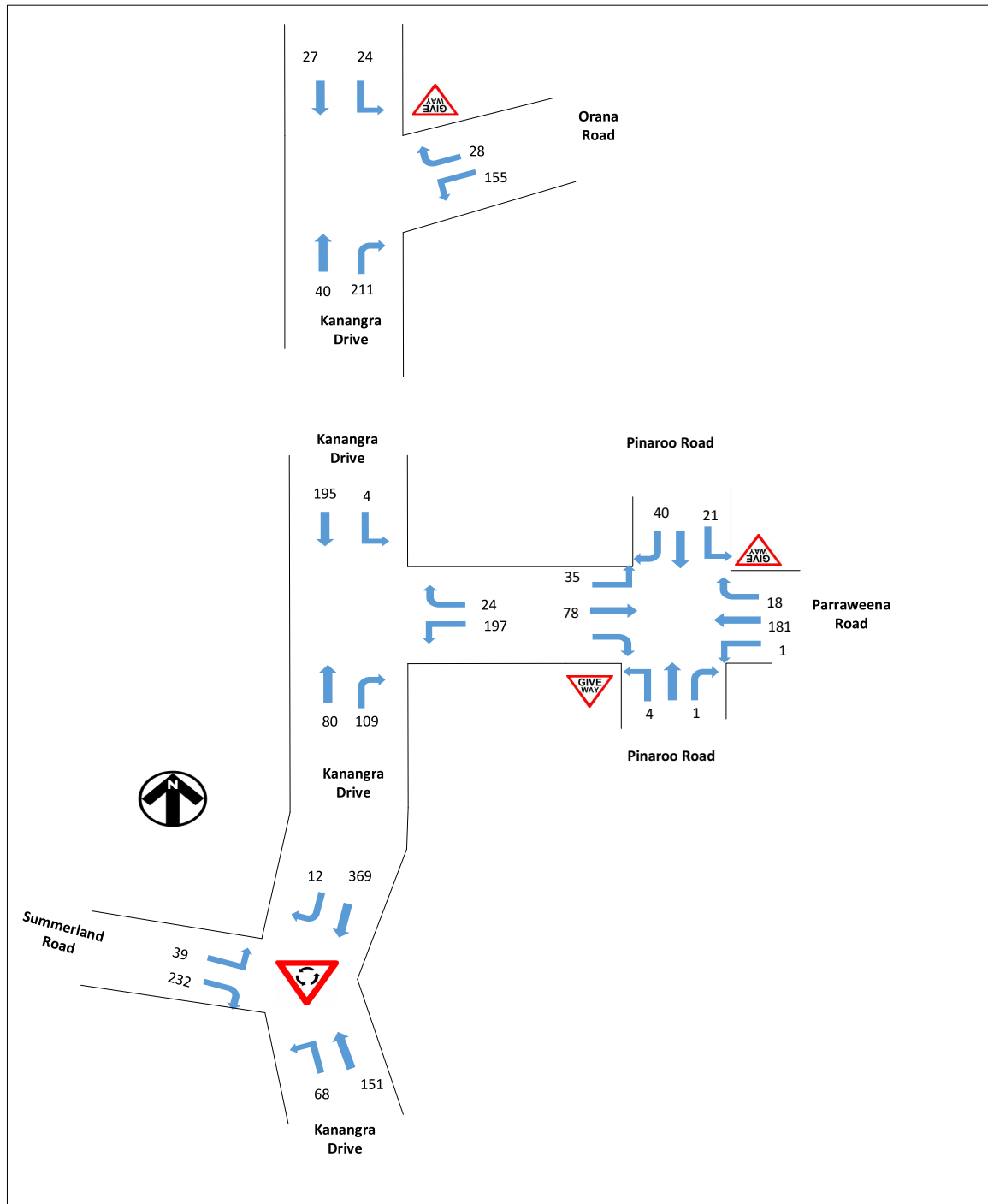


Figure 8: Existing Weekday Traffic Volumes AM Peak Hour

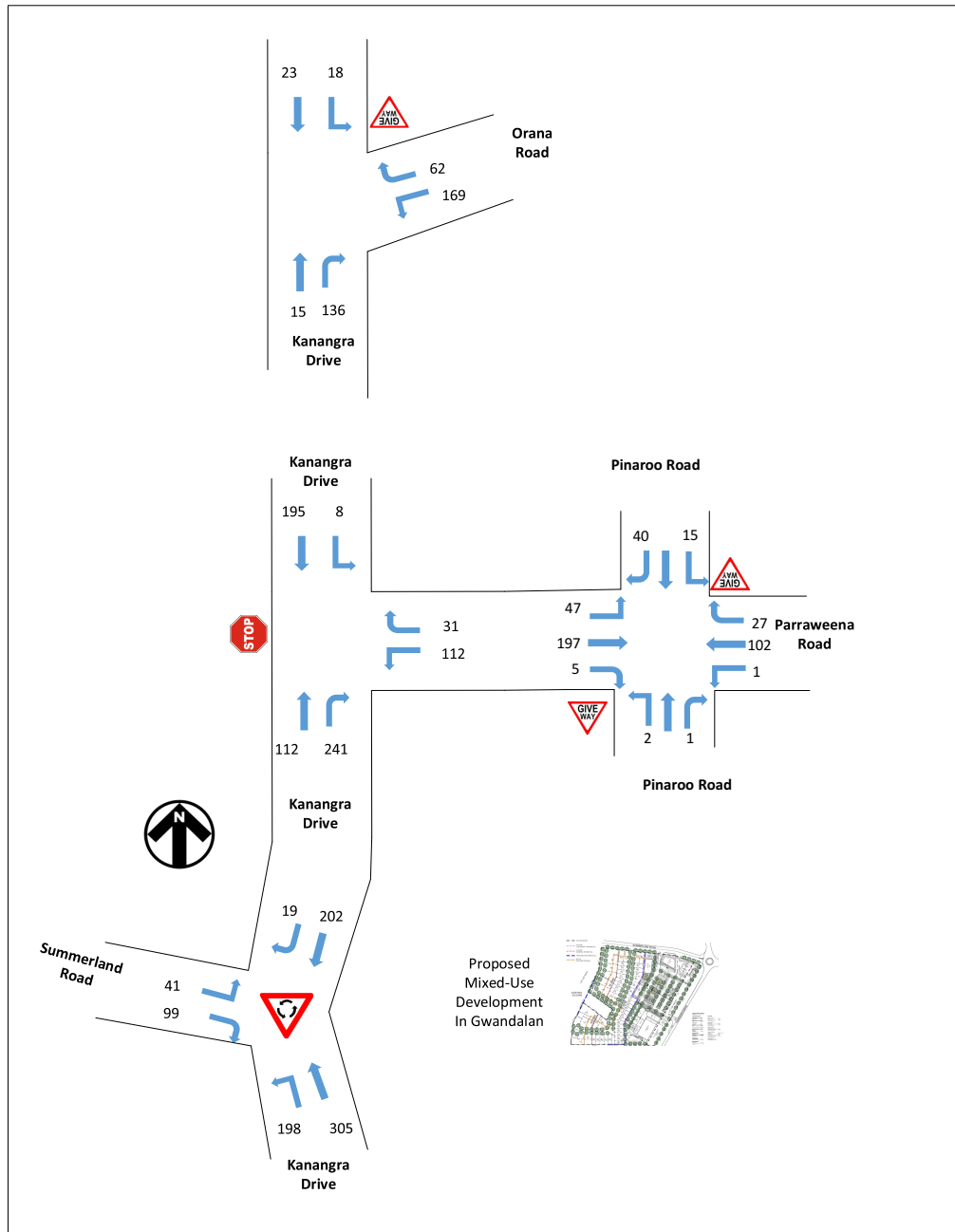


Figure 9: Existing Weekday Traffic Volumes PM Peak Hour

2.5 Intersection Assessment

An intersection assessment has been undertaken for the surveyed intersection.

The existing intersection operating performance was assessed using the SIDRA software package (version 6) to determine the Degree of Saturation (DS), Average

Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

Roundabout of Kanangra Drive with Summerland Road

- The overall intersection has a LoS A for both peak hours
- There is spare capacity at this intersection to accommodate additional vehicle traffic for peak hours.

Stop Control Intersection Kanangra Drive with Parraweena Road

- All turn movements have an acceptable LoS A for both peak hours
- There is spare capacity at this intersection to accommodate additional vehicle traffic for peak hours.

Priority Intersection of Kanangra Drive with Orana Road

- All turn movements have an acceptable LoS A for both peak hours
- There is spare capacity at this intersection to accommodate additional vehicle traffic for AM peak hours.

Priority Intersection of Parraweena Road and Pinaroo Road

- All turn movements have an acceptable LoS A for both peak hours
- There is spare capacity at this intersection to accommodate additional vehicle traffic for AM peak hours.

The full SIDRA results are presented in Appendix A.

2.6 Public Parking Opportunities

Public street parking is available on all local roads to the north and west of the site including, Pinaroo Road and Goorawin Street

2.7 Public Transport

The development site is within walking distance to the bus stop on Parraweena Road which is serviced by the 95, 98 and 99 routes, see Figure 10. These routes go from Lake Haven to Charlestown.

Overall the site has good access to public transport taking into the site is in a regional area.

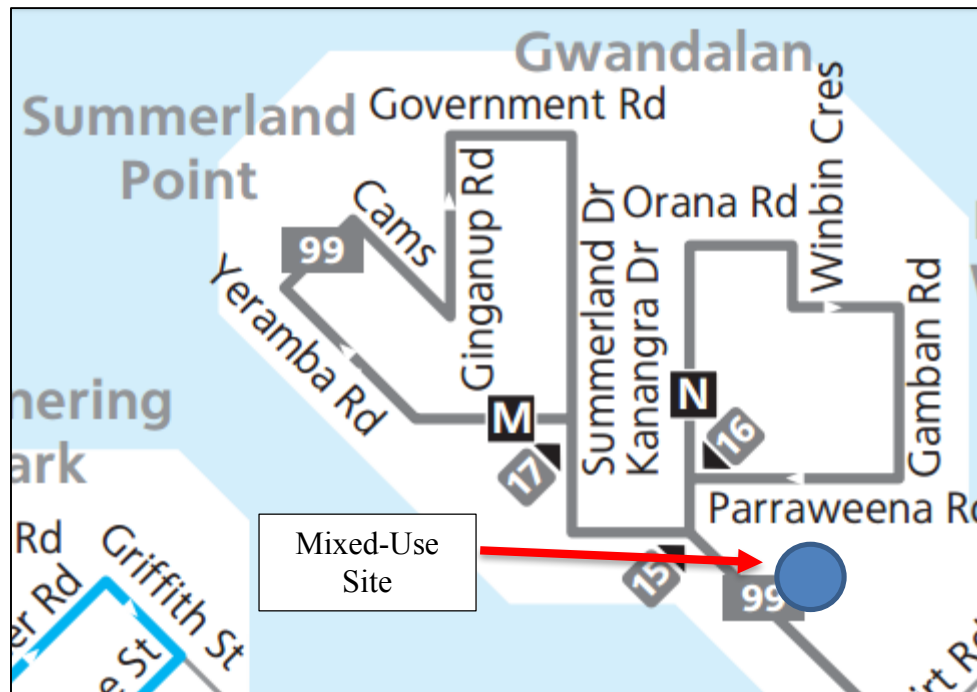


Figure 10: Local Public Transport Services

2.8 Conclusions on the Existing Conditions

Vehicle access and egress to the proposed development site is via three new proposed roads.

The proposed development is located in an area where there are conveniently located on street public parking opportunities available.

The nearby intersections overall perform well with sufficient spare capacity to accommodate additional traffic.

The site has good access to public transport.

3. PROPOSED DEVELOPMENT

The details of the land use for the proposed development are as follows:

Residential Development

- 41 x (250m² lots) three-bedroom houses
- 8 x (500m² lots) four-bedroom houses

Retail/Commercial Component

- Specialty Shops: 900 m² gross floor area (GFA)
- Supermarket: 2500 m² GFA (including a future expansion of 1000 m²)
- Liquor: 190 m² GFA
- Petrol Station (shop): 200 m² GFA
- Multi-Purpose: 450 m² GFA
- Medical Centre: 400 m² GFA
- Childcare Centre: 1125 m² GFA with a capacity for 75 children
- Mini Major: 250 m² GFA

Car parking is provided on the ground level with vehicle access and egress via three two proposed roads and two driveways on Summerland Road and one proposed driveway on Kanangra Drive Details as follows:

- 192 x car spaces for retail and shops
- Thirteen car spaces for the service station
- Twenty-five car spaces for the multipurpose centre
- Twenty car spaces for the medical centre
- Eighteen car spaces for the childcare centre
- ***A total of 268 car spaces for retail and commercial***

A full scaled plan of the proposed development is provided as part of the Development Application.

1.2 Road Network

The proposed development includes the addition of two new local roads intersecting with Summerland Road. The newly proposed roads will service the residential houses.

4. PARKING CONSIDERATIONS

4.1 Wyong Council Development Control Plan

The land uses for the proposed development are presented in the “*Wyong Development Control Plan WDCP 2013*”, with details as follows as it applies to the proposed development:

Residential Development

- one car space per dwelling with one to three bedrooms
- two spaces per dwelling with four or more bedrooms
- one visitor car space per five dwellings

Retail Development

- one car space per 20 m² GFA for Medical Centre
- one car space per 20m² GFA for supermarket
 - 1 service space per 400 m² up to 2000m² plus 1 space per 1300 m² thereafter
- one car space per 20 m² GFA for liquor shop
- one car space per 20 m² GFA of the convenience store in a service station
- one car space per 20 m² GFA for the multi-purpose centre
- one car space per 20 m² GFA for mini major
- four spaces per consulting room and 1 space per employee for medical centre (allow 1/20m² GFA)
- one car space per four children for the childcare centre

Table 3 summarises the car parking requirements and provisions for the residential component. Each of the houses will need to comply with Council’s car parking requirements and will be subject to individual Council approval.

Table 4 summarises the car parking requirements and provisions for the retail component. The retail car parking requirement is 265 car spaces versus 268 provided. The retail component complies with Council’s car parking requirements.

Use	Gross Floor Area m ²	Car Parking Rate per m ²	Car Spaces Required	Car Spaces Provided
Speciality Shops	900	0.05	45	192
Supermarket	2500		125	
Liquor	190		9.5	
Mini Major	250		12.5	
Petrol Station - Shop	200	0.05	10	13
Multipurpose	450	0.05	23	25
Medical Centre	400	0.05	21	20
Use	Number of Children	Car Parking Rate per Children	Car Spaces Required	Car Spaces Provided
Childcare Centre	75	0.25	18.8	18
Total			265	268

Table 4: Retail Car Parking Requirements and Provisions

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

5.1 Traffic Generation

The RTA Guide to Traffic Generating Developments publishes trip generation rates, as it applies to the proposed development:

Residential Dwellings

- 0.85 trips per dwelling for the AM and PM peak hours

Retail and Commercial Component

- 12.3 trips per 100 m² GFA for specialty shops for the PM peak hour
- 12.3 trips per 100 m² GFA for supermarket for the PM peak hour
- 12.3 trips per 100 m² GFA for liquor store for the PM peak hour
- 0.04 GFA area of site + 0.3GFA for service station for the PM peak hour
- 12.3 trips per 100 m² GFA for multi-purpose or tavern for the PM peak hour
- 12.3 trips per 100 m² GFA for medical centre for the AM and PM peak hours
- 0.8 and 0.7 trips per child for childcare centre for the AM and PM peak hours respectively
- 12.3 trips per 100 m² GFA for mini major for the PM peak hour

In addition to the above, the following assumption is made for the weekday AM peak hour:

- Trip generation rate for the AM peak hour is 10 percent of the PM rate for the retail shops and multi-purpose centre

Table 5a and 5b summarise the trip generation for the proposed development for the AM and PM peak hours respectively

AM Peak Hour			
Use	GFA m ²	Traffic Generation Per m ² GFA	Number of Trips
Speciality Shops	900	0.0123	12
Supermarket	2500	0.0123	31
Liquor	190	0.0123	3
Mini Major	250	0.0123	4
Petrol Station - Shop	200	0.04 Area Site + 0.3* GLFA Shop	7
Multipurpose	450	0.0123	6
Medical Centre	400	0.123	50
Use	Number of Children	Traffic Generation per child (Long Day Care)	Number of Trips
Childcare Centre	75	0.8	60
Total			173
Use	Number of Dwellings	Trip Generation Per Dwelling	Number of Trips
Residential	49	0.85	42
Total			42

Table 5a: Summary of Trip Generation for the AM peak hour

PM Peak Hour			
Use	GFA m ²	Trip Generation Per m ² GFA	Number of Trips
Speciality Shops	900	0.123	111
Supermarket	2500	0.123	308
Liquor	190	0.123	24
Mini Major	250	0.123	31
Petrol Station - Shop	200	0.04 Area Site + 0.3* GFA Shop	72
Multipurpose	450	0.123	56
Medical Centre	400	0.123	50
Use	Number of Children	Traffic Generation per child (Long Day Care)	Number of Trips
Childcare Centre	75	0.7	53
Total			705
Use	Number of Dwellings	Trip Generation Per Dwelling	Number of Trips
Residential	49	0.85	42
Total			42

Table 5b: Summary of Trip Generation for the PM peak hour

Table 6(a) and 6(b) summarise the trip distribution for the proposed development for the AM and PM peak hours respectively

AM Peak Hour			
Use	Origin	Destination	Total
Speciality Shops	6	6	12
Supermarket	15	16	31
Liquor	0	0	3
Mini Major	2	2	4
Petrol Station - Shop	3	4	7
Multipurpose	0	0	6
Medical Centre	5	45	50
Childcare Centre	30	30	60
Residential	34	8	42
Total	Origin	Destination	Total
AM Peak Hour	95	111	206

Table 6(a): Net Trip Distribution Weekday AM Peak Hour

PM Peak Hour			
Use	Origin	Destination	Total
Residential	4	38	42
Speciality Shops	56	55	111
Supermarket	154	154	308
Liquor	12	12	24
Mini Major	15	16	31
Petrol Station - Shop	36	36	72
Multipurpose	28	28	56
Medical Centre	25	25	50
Childcare Centre	27	26	53
PM Peak Hour	Origin	Destination	Total
Total	357	390	747

Table 6(b): Net Trip Distribution Weekday PM Peak Hour

5.2 Forecast Traffic Volumes

The following figures present the existing and with development traffic volumes for the AM and PM peak hours distributed onto the intersections with the development traffic.

The additional development traffic is in red for origin trips and blue for destination trips.

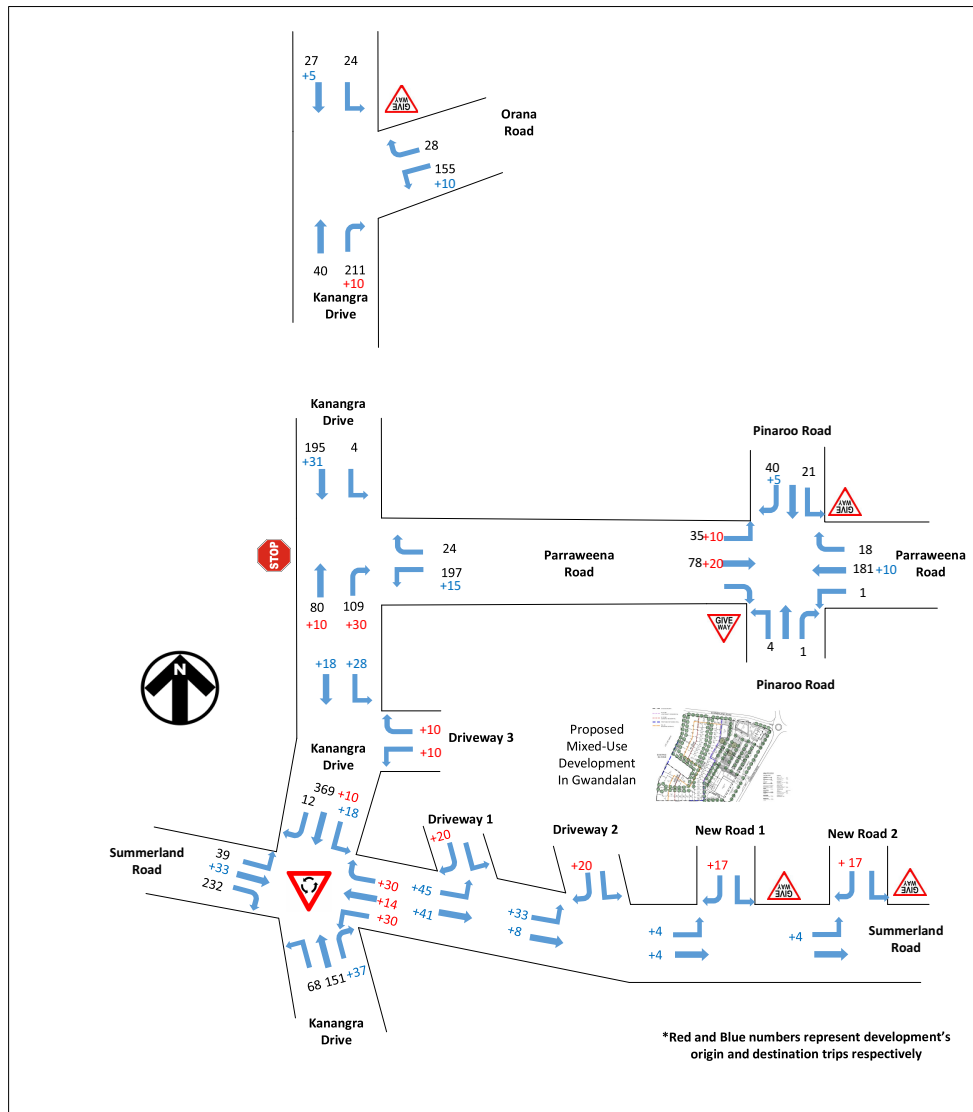


Figure 11: Existing Weekday AM Peak Hour Traffic Volumes with Development Traffic

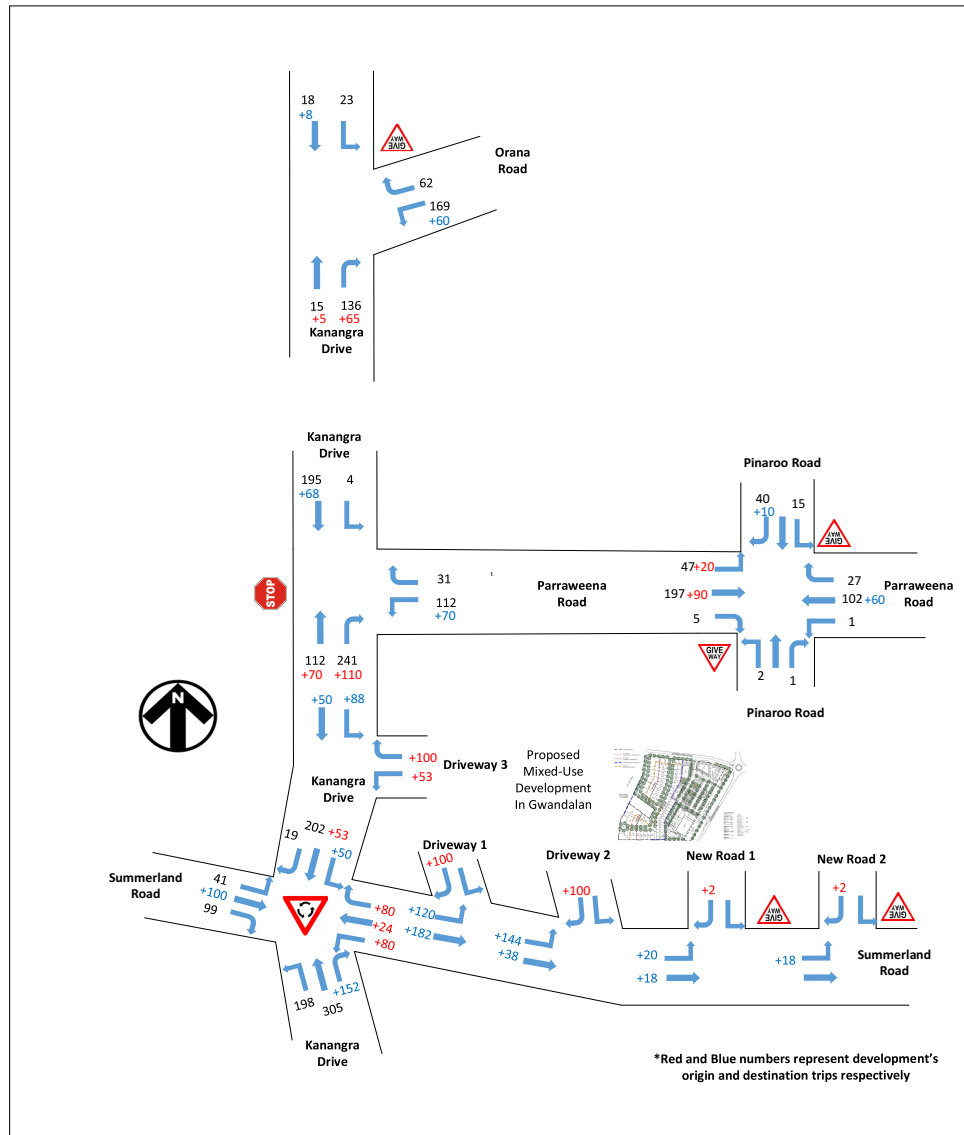


Figure 12: Existing Weekday PM Peak Hour Traffic Volumes with Development Traffic

5.3 Intersection Assessment

This section assesses the following intersections for the existing traffic with the school traffic. The results of the intersection assessment are as follows:

Kanangra Drive with Summerland Road

- The intersection has an overall LoS A for both peak hours
- The additional trips do not change the LoS for the overall intersection or for any turn movement

Kanangra Drive with Parraweena Road

- All turn movements have a LoS A for both peak hours
- The additional trips do not change the LoS for the overall intersection or for any turn movement

Kanangra Drive with Orana Road

- All turn movements have a LoS A for both peak hours
- The additional trips do not change the LoS for the overall intersection or for any turn movement

Parraweena Road with Pinaroo Road

- All turn movements have a LoS A for both peak hours
- The additional trips do not change the LoS for the overall intersection or for any turn movement

The full SIDRA results are presented in Appendix B for the existing conditions with the school traffic. The full SIDRA results are presented in Appendix A for the existing conditions.

6. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

Parking

- The proposed mixed use development overall complies with Council's car parking requirements for the commercial landuse
- Each residential house will need to comply with Council's car parking requirements

Traffic

- The proposed development is a high net trip generator for the weekday AM and PM peak hours.
- However, the additional trips from the proposed development can be accommodated at the nearby intersection without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning permit for the proposed mixed-use in the corner of Kanangra Drive and Summerland Road in Gwandalan should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kanangra Drive South											
1	L2	72	0.0	0.147	4.0	LOS A	0.9	6.2	0.09	0.43	54.9
2	T1	159	0.0	0.147	4.2	LOS A	0.9	6.2	0.09	0.43	56.2
Approach		231	0.0	0.147	4.2	LOS A	0.9	6.2	0.09	0.43	55.8
North: Kanangra Drive North											
8	T1	388	0.0	0.359	5.7	LOS A	2.4	16.5	0.51	0.57	54.0
9	R2	13	0.0	0.359	10.1	LOS A	2.4	16.5	0.51	0.57	53.9
Approach		401	0.0	0.359	5.9	LOS A	2.4	16.5	0.51	0.57	54.0
West: Summerland Road											
10	L2	41	0.0	0.233	4.8	LOS A	1.3	9.1	0.35	0.63	51.4
12	R2	244	0.0	0.233	9.4	LOS A	1.3	9.1	0.35	0.63	52.4
Approach		285	0.0	0.233	8.8	LOS A	1.3	9.1	0.35	0.63	52.3
All Vehicles		917	0.0	0.359	6.4	LOS A	2.4	16.5	0.36	0.55	53.9

Table A1: Intersection Performance of Kanangra Drive and Summerland Road Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kanangra Drive South											
2	T1	84	0.0	0.120	0.6	LOS A	0.6	4.1	0.31	0.34	55.9
3	R2	115	0.0	0.120	6.2	LOS A	0.6	4.1	0.31	0.34	54.2
Approach		199	0.0	0.120	3.8	NA	0.6	4.1	0.31	0.34	54.9
East: Parraweena Road											
4	L2	207	0.0	0.209	9.0	LOS A	0.9	6.3	0.35	0.89	51.5
6	R2	25	0.0	0.209	10.2	LOS A	0.9	6.3	0.35	0.89	51.2
Approach		233	0.0	0.209	9.1	LOS A	0.9	6.3	0.35	0.89	51.4
North: Kanangra Drive North											
7	L2	4	0.0	0.104	5.5	LOS A	0.0	0.0	0.00	0.01	58.2
8	T1	205	0.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
Approach		209	0.0	0.104	0.1	NA	0.0	0.0	0.00	0.01	59.8
All Vehicles		641	0.0	0.209	4.5	NA	0.9	6.3	0.22	0.43	55.0

Table A2: Intersection Performance of Kanangra Drive and Parraweena Road AM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kanangra Drive South											
2	T1	42	0.0	0.148	0.1	LOS A	0.8	5.3	0.11	0.43	56.1
3a	R1	222	0.0	0.148	4.6	LOS A	0.8	5.3	0.11	0.43	54.6
Approach		264	0.0	0.148	3.9	NA	0.8	5.3	0.11	0.43	54.8
Northeast: Orana Road											
24a	L1	163	0.0	0.105	5.3	LOS A	0.2	1.3	0.04	0.58	53.1
26b	R3	29	0.0	0.105	6.2	LOS A	0.2	1.3	0.04	0.58	52.9
Approach		193	0.0	0.105	5.5	NA	0.2	1.3	0.04	0.58	53.0
North: Kanangra Drive North											
7b	L3	25	0.0	0.052	7.2	LOS A	0.2	1.3	0.36	0.61	53.2
8	T1	28	0.0	0.052	6.1	LOS A	0.2	1.3	0.36	0.61	53.0
Approach		54	0.0	0.052	6.6	LOS A	0.2	1.3	0.36	0.61	53.1
All Vehicles		511	0.0	0.148	4.8	NA	0.8	5.3	0.11	0.51	54.0

Table A3: Intersection Performance of Kanangra Drive with Orana Road Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pinaroo Road south											
1	L2	4	0.0	0.005	5.1	LOS A	0.0	0.1	0.29	0.51	46.1
2	T1	1	0.0	0.005	4.5	LOS A	0.0	0.1	0.29	0.51	46.2
3	R2	1	0.0	0.005	6.1	LOS A	0.0	0.1	0.29	0.51	45.7
Approach		6	0.0	0.005	5.2	LOS A	0.0	0.1	0.29	0.51	46.0
East: Paraweena Road east											
4	L2	1	0.0	0.110	4.9	LOS A	0.1	0.9	0.05	0.05	49.1
5	T1	191	0.0	0.110	0.0	LOS A	0.1	0.9	0.05	0.05	49.6
6	R2	19	0.0	0.110	4.9	LOS A	0.1	0.9	0.05	0.05	48.6
Approach		211	0.0	0.110	0.5	NA	0.1	0.9	0.05	0.05	49.5
North: Pinaroo Road north											
7	L2	22	0.0	0.068	4.8	LOS A	0.2	1.7	0.24	0.56	45.9
8	T1	1	0.0	0.068	4.5	LOS A	0.2	1.7	0.24	0.56	46.0
9	R2	42	0.0	0.068	6.2	LOS A	0.2	1.7	0.24	0.56	45.5
Approach		65	0.0	0.068	5.7	LOS A	0.2	1.7	0.24	0.56	45.7
West: Paraweena Road west											
10	L2	37	0.0	0.063	4.6	LOS A	0.0	0.1	0.01	0.17	48.5
11	T1	82	0.0	0.063	0.0	LOS A	0.0	0.1	0.01	0.17	49.0
12	R2	1	0.0	0.063	5.2	LOS A	0.0	0.1	0.01	0.17	48.1
Approach		120	0.0	0.063	1.5	NA	0.0	0.1	0.01	0.17	48.9
All Vehicles		402	0.0	0.110	1.7	NA	0.2	1.7	0.07	0.18	48.6

Table A4: Intersection Performance of Paraweena Road with Pinaroo Road Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kanangra Drive South											
1	L2	208	0.0	0.333	4.1	LOS A	2.3	16.0	0.13	0.43	54.8
2	T1	321	0.0	0.333	4.3	LOS A	2.3	16.0	0.13	0.43	56.0
Approach		529	0.0	0.333	4.2	LOS A	2.3	16.0	0.13	0.43	55.5
North: Kanangra Drive North											
8	T1	213	0.0	0.182	4.7	LOS A	1.1	7.5	0.30	0.46	54.9
9	R2	20	0.0	0.182	9.1	LOS A	1.1	7.5	0.30	0.46	54.7
Approach		233	0.0	0.182	5.1	LOS A	1.1	7.5	0.30	0.46	54.9
West: Summerland Road											
10	L2	43	0.0	0.140	5.6	LOS A	0.7	5.1	0.47	0.66	51.6
12	R2	104	0.0	0.140	10.2	LOS A	0.7	5.1	0.47	0.66	52.6
Approach		147	0.0	0.140	8.9	LOS A	0.7	5.1	0.47	0.66	52.3
All Vehicles		909	0.0	0.333	5.2	LOS A	2.3	16.0	0.22	0.48	54.8

Table A5: Intersection Performance of Kanangra Drive and Summerland Road Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kanangra Drive South											
2	T1	118	0.0	0.212	0.7	LOS A	1.1	8.0	0.35	0.40	55.4
3	R2	225	0.0	0.212	6.3	LOS A	1.1	8.0	0.35	0.40	53.7
Approach		343	0.0	0.212	4.4	NA	1.1	8.0	0.35	0.40	54.3
East: Parraweena Road											
4	L2	118	0.0	0.151	8.9	LOS A	0.6	4.2	0.35	0.90	51.2
6	R2	33	0.0	0.151	11.3	LOS A	0.6	4.2	0.35	0.90	51.0
Approach		151	0.0	0.151	9.4	LOS A	0.6	4.2	0.35	0.90	51.2
North: Kanangra Drive North											
7	L2	8	0.0	0.106	5.6	LOS A	0.0	0.0	0.00	0.02	58.1
8	T1	205	0.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
Approach		214	0.0	0.106	0.2	NA	0.0	0.0	0.00	0.02	59.7
All Vehicles		707	0.0	0.212	4.2	NA	1.1	8.0	0.24	0.39	55.1

Table A6: Intersection Performance of Kanangra Drive and Parraweena Road PM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kanangra Drive South											
2	T1	16	0.0	0.092	0.2	LOS A	0.4	3.1	0.16	0.46	55.7
3a	R1	143	0.0	0.092	4.7	LOS A	0.4	3.1	0.16	0.46	54.2
Approach		159	0.0	0.092	4.3	NA	0.4	3.1	0.16	0.46	54.4
Northeast: Orana Road											
24a	L1	178	0.0	0.134	5.3	LOS A	0.4	2.7	0.04	0.59	53.0
26b	R3	65	0.0	0.134	6.1	LOS A	0.4	2.7	0.04	0.59	52.9
Approach		243	0.0	0.134	5.5	NA	0.4	2.7	0.04	0.59	53.0
North: Kanangra Drive North											
7b	L3	19	0.0	0.040	6.9	LOS A	0.1	1.0	0.29	0.58	53.4
8	T1	24	0.0	0.040	5.8	LOS A	0.1	1.0	0.29	0.58	53.2
Approach		43	0.0	0.040	6.3	LOS A	0.1	1.0	0.29	0.58	53.3
All Vehicles		445	0.0	0.134	5.2	NA	0.4	3.1	0.11	0.54	53.5

Table A7: Intersection Performance of Kanangra Drive with Orana Road Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pinaroo Road south											
1	L2	2	0.0	0.004	4.8	LOS A	0.0	0.1	0.23	0.50	46.2
2	T1	1	0.0	0.004	4.8	LOS A	0.0	0.1	0.23	0.50	46.3
3	R2	1	0.0	0.004	6.4	LOS A	0.0	0.1	0.23	0.50	45.8
Approach		4	0.0	0.004	5.2	LOS A	0.0	0.1	0.23	0.50	46.1
East: Paraweena Road east											
4	L2	1	0.0	0.076	5.4	LOS A	0.2	1.4	0.17	0.12	48.4
5	T1	107	0.0	0.076	0.3	LOS A	0.2	1.4	0.17	0.12	48.9
6	R2	28	0.0	0.076	5.4	LOS A	0.2	1.4	0.17	0.12	47.9
Approach		137	0.0	0.076	1.4	NA	0.2	1.4	0.17	0.12	48.7
North: Pinaroo Road north											
7	L2	16	0.0	0.068	5.2	LOS A	0.2	1.6	0.37	0.61	45.6
8	T1	1	0.0	0.068	4.8	LOS A	0.2	1.6	0.37	0.61	45.7
9	R2	42	0.0	0.068	6.6	LOS A	0.2	1.6	0.37	0.61	45.2
Approach		59	0.0	0.068	6.2	LOS A	0.2	1.6	0.37	0.61	45.4
West: Paraweena Road west											
10	L2	49	0.0	0.136	4.6	LOS A	0.0	0.3	0.01	0.11	48.8
11	T1	207	0.0	0.136	0.0	LOS A	0.0	0.3	0.01	0.11	49.3
12	R2	5	0.0	0.136	4.9	LOS A	0.0	0.3	0.01	0.11	48.4
Approach		262	0.0	0.136	1.0	NA	0.0	0.3	0.01	0.11	49.2
All Vehicles		462	0.0	0.136	1.8	NA	0.2	1.6	0.11	0.18	48.5

Table A8: Intersection Performance of Paraweena Road with Pinaroo Road Weekday PM Peak Hour Existing Conditions

APPENDIX B

SIDRA Intersection Results for Existing Traffic Conditions and Proposed Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kanangra Drive South												
1	L2	72	0.0	0.208	4.5	LOS A	1.3	9.0	0.31	0.49	0.31	53.6
2	T1	159	0.0	0.208	4.7	LOS A	1.3	9.0	0.31	0.49	0.31	54.9
3	R2	39	0.0	0.208	9.1	LOS A	1.3	9.0	0.31	0.49	0.31	48.3
Approach		269	0.0	0.208	5.3	LOS A	1.3	9.0	0.31	0.49	0.31	53.9
East: Summerland Road												
4	L2	42	0.0	0.156	5.9	LOS A	0.9	6.6	0.70	0.75	0.70	47.8
5	T1	32	0.0	0.156	6.4	LOS A	0.9	6.6	0.70	0.75	0.70	49.5
6	R2	49	0.0	0.156	10.3	LOS A	0.9	6.6	0.70	0.75	0.70	49.3
Approach		123	0.0	0.156	7.8	LOS A	0.9	6.6	0.70	0.75	0.70	48.8
North: Kanangra Drive North												
7	L2	63	0.0	0.461	6.2	LOS A	3.3	23.3	0.63	0.65	0.63	30.5
8	T1	399	0.0	0.461	6.4	LOS A	3.3	23.3	0.63	0.65	0.63	53.7
9	R2	19	0.0	0.461	10.9	LOS A	3.3	23.3	0.63	0.65	0.63	53.5
Approach		481	0.0	0.461	6.6	LOS A	3.3	23.3	0.63	0.65	0.63	50.7
West: Summerland Road												
10	L2	41	0.0	0.286	5.4	LOS A	1.7	12.0	0.47	0.66	0.47	51.4
11	T1	35	0.0	0.286	5.6	LOS A	1.7	12.0	0.47	0.66	0.47	31.0
12	R2	244	0.0	0.286	10.1	LOS A	1.7	12.0	0.47	0.66	0.47	52.4
Approach		320	0.0	0.286	9.0	LOS A	1.7	12.0	0.47	0.66	0.47	50.1
All Vehicles		1194	0.0	0.461	7.1	LOS A	3.3	23.3	0.52	0.63	0.52	51.1

Table B1: Intersection Performance of Kanangra Drive and Summerland Road Weekday AM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kanangra Drive South												
2	T1	95	0.0	0.150	0.8	LOS A	0.8	5.3	0.35	0.37	0.35	55.7
3	R2	146	0.0	0.150	6.4	LOS A	0.8	5.3	0.35	0.37	0.35	50.2
Approach		241	0.0	0.150	4.2	NA	0.8	5.3	0.35	0.37	0.35	52.2
East: Parraweena Road												
4	L2	223	0.0	0.232	8.6	LOS A	1.0	7.1	0.39	0.89	0.39	47.6
6	R2	25	0.0	0.232	10.3	LOS A	1.0	7.1	0.39	0.89	0.39	47.4
Approach		248	0.0	0.232	8.8	LOS A	1.0	7.1	0.39	0.89	0.39	47.6
North: Kanangra Drive North												
7	L2	4	0.0	0.120	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.3
8	T1	238	0.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		242	0.0	0.120	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
All Vehicles		732	0.0	0.232	4.4	NA	1.0	7.1	0.25	0.43	0.25	52.7

Table B2: Intersection Performance of Kanangra Drive and Parraweena Road AM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kanangra Drive South												
2	T1	47	0.0	0.157	0.1	LOS A	0.8	5.7	0.11	0.32	0.11	47.9
3a	R1	233	0.0	0.157	2.6	LOS A	0.8	5.7	0.11	0.32	0.11	46.9
Approach		280	0.0	0.157	2.2	NA	0.8	5.7	0.11	0.32	0.11	47.1
NorthEast: Orana Road												
24a	L1	174	0.0	0.110	3.4	LOS A	0.2	1.3	0.04	0.47	0.04	44.4
26b	R3	29	0.0	0.110	4.3	LOS A	0.2	1.3	0.04	0.47	0.04	44.3
Approach		203	0.0	0.110	3.6	NA	0.2	1.3	0.04	0.47	0.04	44.4
North: Kanangra Drive North												
7b	L3	25	0.0	0.059	7.2	LOS A	0.2	1.5	0.37	0.62	0.37	44.8
8	T1	34	0.0	0.059	6.3	LOS A	0.2	1.5	0.37	0.62	0.37	52.9
Approach		59	0.0	0.059	6.7	LOS A	0.2	1.5	0.37	0.62	0.37	49.1
All Vehicles		542	0.0	0.157	3.2	NA	0.8	5.7	0.11	0.41	0.11	46.2

Table B3: Intersection Performance of Kanangra Drive with Orana Road Weekday AM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Pinaroo Road south												
1	L2	4	0.0	0.006	5.1	LOS A	0.0	0.1	0.30	0.51	0.30	46.1
2	T1	1	0.0	0.006	4.7	LOS A	0.0	0.1	0.30	0.51	0.30	46.1
3	R2	1	0.0	0.006	6.3	LOS A	0.0	0.1	0.30	0.51	0.30	45.6
Approach		6	0.0	0.006	5.2	LOS A	0.0	0.1	0.30	0.51	0.30	46.0
East: Paraweena Road east												
4	L2	1	0.0	0.116	5.0	LOS A	0.1	1.0	0.06	0.05	0.06	49.1
5	T1	201	0.0	0.116	0.1	LOS A	0.1	1.0	0.06	0.05	0.06	49.6
6	R2	19	0.0	0.116	5.1	LOS A	0.1	1.0	0.06	0.05	0.06	48.6
Approach		221	0.0	0.116	0.5	NA	0.1	1.0	0.06	0.05	0.06	49.5
North: Pinaroo Road north												
7	L2	22	0.0	0.077	4.9	LOS A	0.3	1.9	0.28	0.58	0.28	45.8
8	T1	1	0.0	0.077	4.7	LOS A	0.3	1.9	0.28	0.58	0.28	45.9
9	R2	47	0.0	0.077	6.5	LOS A	0.3	1.9	0.28	0.58	0.28	45.4
Approach		71	0.0	0.077	6.0	LOS A	0.3	1.9	0.28	0.58	0.28	45.5
West: Paraweena Road west												
10	L2	47	0.0	0.079	4.6	LOS A	0.0	0.1	0.01	0.17	0.01	48.5
11	T1	103	0.0	0.079	0.0	LOS A	0.0	0.1	0.01	0.17	0.01	49.0
12	R2	1	0.0	0.079	5.2	LOS A	0.0	0.1	0.01	0.17	0.01	48.1
Approach		152	0.0	0.079	1.5	NA	0.0	0.1	0.01	0.17	0.01	48.8
All Vehicles		449	0.0	0.116	1.8	NA	0.3	1.9	0.08	0.18	0.08	48.5

Table B4: Intersection Performance of Paraweena Road with Pinaroo Road Weekday AM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kanangra Drive South												
1	L2	208	0.0	0.546	5.2	LOS A	4.7	32.6	0.53	0.58	0.53	52.6
2	T1	321	0.0	0.546	5.4	LOS A	4.7	32.6	0.53	0.58	0.53	53.8
3	R2	160	0.0	0.546	9.8	LOS A	4.7	32.6	0.53	0.58	0.53	46.9
Approach		689	0.0	0.546	6.4	LOS A	4.7	32.6	0.53	0.58	0.53	52.3
East: Summerland Road												
4	L2	84	0.0	0.201	4.3	LOS A	1.2	8.4	0.59	0.69	0.59	49.4
5	T1	25	0.0	0.201	4.8	LOS A	1.2	8.4	0.59	0.69	0.59	51.3
6	R2	84	0.0	0.201	8.7	LOS A	1.2	8.4	0.59	0.69	0.59	51.1
Approach		194	0.0	0.201	6.3	LOS A	1.2	8.4	0.59	0.69	0.59	50.4
North: Kanangra Drive North												
7	L2	20	0.0	0.345	6.3	LOS A	2.2	15.6	0.61	0.67	0.61	30.4
8	T1	268	0.0	0.345	6.5	LOS A	2.2	15.6	0.61	0.67	0.61	53.4
9	R2	53	0.0	0.345	10.9	LOS A	2.2	15.6	0.61	0.67	0.61	53.3
Approach		341	0.0	0.345	7.2	LOS A	2.2	15.6	0.61	0.67	0.61	52.1
West: Summerland Road												
10	L2	43	0.0	0.300	7.5	LOS A	1.9	13.6	0.71	0.78	0.71	51.1
11	T1	105	0.0	0.300	7.7	LOS A	1.9	13.6	0.71	0.78	0.71	30.7
12	R2	104	0.0	0.300	12.2	LOS A	1.9	13.6	0.71	0.78	0.71	52.2
Approach		253	0.0	0.300	9.5	LOS A	1.9	13.6	0.71	0.78	0.71	43.4
All Vehicles		1477	0.0	0.546	7.1	LOS A	4.7	32.6	0.59	0.65	0.59	50.4

Table B5: Intersection Performance of Kanangra Drive and Summerland Road Weekday PM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kanangra Drive South												
2	T1	192	0.0	0.365	1.3	LOS A	2.3	15.8	0.46	0.43	0.46	55.0
3	R2	369	0.0	0.365	6.9	LOS A	2.3	15.8	0.46	0.43	0.46	49.7
Approach		561	0.0	0.365	4.9	NA	2.3	15.8	0.46	0.43	0.46	51.4
East: Parraweena Road												
4	L2	192	0.0	0.254	8.8	LOS A	1.0	7.3	0.44	0.91	0.44	47.1
6	R2	33	0.0	0.254	15.1	LOS B	1.0	7.3	0.44	0.91	0.44	46.8
Approach		224	0.0	0.254	9.7	LOS A	1.0	7.3	0.44	0.91	0.44	47.0
North: Kanangra Drive North												
7	L2	8	0.0	0.141	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
8	T1	277	0.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		285	0.0	0.141	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.8
All Vehicles		1071	0.0	0.365	4.7	NA	2.3	15.8	0.34	0.42	0.34	52.3

Table B6: Intersection Performance of Kanangra Drive and Parraweena Road PM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kanangra Drive South												
2	T1	21	0.0	0.135	0.2	LOS A	0.7	4.7	0.17	0.47	0.17	55.6
3a	R1	212	0.0	0.135	4.8	LOS A	0.7	4.7	0.17	0.47	0.17	54.2
Approach		233	0.0	0.135	4.3	NA	0.7	4.7	0.17	0.47	0.17	54.3
NorthEast: Orana Road												
24a	L1	241	0.0	0.168	5.3	LOS A	0.4	2.8	0.04	0.58	0.04	53.0
26b	R3	65	0.0	0.168	6.1	LOS A	0.4	2.8	0.04	0.58	0.04	52.9
Approach		306	0.0	0.168	5.5	NA	0.4	2.8	0.04	0.58	0.04	53.0
North: Kanangra Drive North												
7b	L3	24	0.0	0.053	7.1	LOS A	0.2	1.4	0.36	0.62	0.36	52.9
8	T1	27	0.0	0.053	6.7	LOS A	0.2	1.4	0.36	0.62	0.36	52.7
Approach		52	0.0	0.053	6.9	LOS A	0.2	1.4	0.36	0.62	0.36	52.8
All Vehicles		591	0.0	0.168	5.2	NA	0.7	4.7	0.12	0.54	0.12	53.5

Table B7: Intersection Performance of Kanangra Drive with Orana Road Weekday PM Peak Hour Existing Conditions with Mixed Use Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Pinaroo Road south												
1	L2	2	0.0	0.005	5.0	LOS A	0.0	0.1	0.32	0.52	0.32	45.9
2	T1	1	0.0	0.005	5.9	LOS A	0.0	0.1	0.32	0.52	0.32	45.9
3	R2	1	0.0	0.005	7.5	LOS A	0.0	0.1	0.32	0.52	0.32	45.4
Approach		4	0.0	0.005	5.9	LOS A	0.0	0.1	0.32	0.52	0.32	45.8
East: Paraweena Road east												
4	L2	1	0.0	0.111	6.0	LOS A	0.3	1.8	0.16	0.09	0.16	48.6
5	T1	171	0.0	0.111	0.3	LOS A	0.3	1.8	0.16	0.09	0.16	49.1
6	R2	28	0.0	0.111	6.0	LOS A	0.3	1.8	0.16	0.09	0.16	48.2
Approach		200	0.0	0.111	1.2	NA	0.3	1.8	0.16	0.09	0.16	49.0
North: Pinaroo Road north												
7	L2	16	0.0	0.100	5.6	LOS A	0.3	2.4	0.47	0.70	0.47	44.9
8	T1	1	0.0	0.100	6.0	LOS A	0.3	2.4	0.47	0.70	0.47	45.0
9	R2	53	0.0	0.100	8.1	LOS A	0.3	2.4	0.47	0.70	0.47	44.5
Approach		69	0.0	0.100	7.5	LOS A	0.3	2.4	0.47	0.70	0.47	44.6
West: Paraweena Road west												
10	L2	71	0.0	0.196	4.6	LOS A	0.1	0.4	0.01	0.11	0.01	48.9
11	T1	302	0.0	0.196	0.0	LOS A	0.1	0.4	0.01	0.11	0.01	49.3
12	R2	5	0.0	0.196	5.2	LOS A	0.1	0.4	0.01	0.11	0.01	48.4
Approach		378	0.0	0.196	0.9	NA	0.1	0.4	0.01	0.11	0.01	49.2
All Vehicles		652	0.0	0.196	1.7	NA	0.3	2.4	0.11	0.17	0.11	48.6

Table B8: Intersection Performance of Paraweena Road with Pinaroo Road Weekday PM Peak Hour Existing Conditions with Mixed Use Traffic

05 G

Ecological Assessment Report



ECOLOGICAL ASSESSMENT REPORT

FOR

REZONING PROCESS

OF

VARIOUS LOTS
KANANGRA DRIVE,
GWANDALAN

Prepared for: QMC PROPERTY GROUP PTY LTD

Revision 1 – 22 May 2019



EXECUTIVE SUMMARY

Anderson Environment & Planning (AEP) was commissioned by QMC Property Group (the client) to undertake this revised Ecological Assessment Report over land off Kanangra Drive, Gwandalan (the site). The purpose of the Ecological Assessment Report is to accompany the Planning Proposal as part of the Gateway Process for the proposed rezoning of the site. It is proposed that the site will be zoned B2 – Local Centre, R1 – General Residential and R2 – Low Density Residential. The subject site is approx. 5.5ha and approx. 3.7ha of remnant vegetation could be cleared as part of a residential and commercial subdivision following the rezoning process.

Approximately 3.7ha of a single vegetation community was identified on site. This vegetation community was commensurate with E-31 – Narrabeen Doyalson Coastal Woodland as described by the *Natural Vegetation of the Wyong LGA – Vegetation Community Profiles* (Bell 2002). The vegetation community is also commensurate with the Plant Community Type (PCT) Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast (PCT 1636). The PCT exists in a moderately to highly disturbed state as a result of past clearing, trail bike activity vegetation maintenance and other activities, however it is still in a 'Medium - Good' condition as defined under BAM. The above vegetation type is not commensurate with any list Endangered Ecological Community (EEC).

Threatened flora species recorded within the study area included *Angophora inopina* (Charmhaven Apple) and *Tetralthea juncea* (Black-eyed Susan). The proposal will remove around 15 individual *A. inopina* and eight clumps of *T. juncea*. Both species are commonly found in the immediate locality in intact Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast and associated communities.

Fauna species recorded were typical of those expected in this locality in a disturbed and managed vegetation remnant. Threatened fauna species recorded within the site were limited to microbat species including Little Bent-winged Bat (*Miniopterus australis*), Large-footed Myotis (*Myotis macropus*) and White-bellied Sea-eagle (*Haliaeetus leucogaster*). Threatened species recorded within the Coal & Allied lands to the south of the site within commensurate habitat included Little Lorikeet (*Glossopsitta pusilla*), Varied Sittella (*Daphoenositta chrysoptera*), Squirrel Glider (*Petaurus norfolcensis*), Grey-headed Flying-fox (*Pteropus poliocephalus*), Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), Little Bent-winged Bat (*Miniopterus australis*), and Greater Broad-nosed Bat (*Scoteanax rueppellii*), all of which could potentially utilise the subject site to some degree.

Assessment under SEPP 44 – 'Koala Habitat Protection' revealed that areas of 'Potential Koala Habitat' exist on site. All field surveys conducted to date have not revealed any signs of Koalas or Koala activity. As such, the site would not constitute "Core Koala Habitat" as defined within the policy, and no further provisions of the policy would apply to the site.



Consideration of the EPBC Act revealed that impacts on Matters of National Environmental Significance, namely on *Tetratheca juncea* and *Angophora inopina* will occur, and as such an EPBC referral is required to be considered.

An assessment of the impact of the proposed development upon local and regional ecological corridors was undertaken. It was determined that although an overall reduction in width and quality of the corridor will occur, viable connections will remain between Point Wollstonecraft and the wider landscape.

Where impacts on known and potentially occurring threatened species and ecological communities cannot be avoided or mitigated and where the determining authorities consider it necessary, offsets may be used to compensate for any remaining impacts in order to achieve an *improve or maintain* outcome for the proposal. Potential offsets for the development have been quantified with reference to the Biodiversity Assessment Method (2017).

Under the new legislation any impacts upon a species / community listed as a 'Serious and Irreversible Impacts (SAIL) candidate species' must be assessed for significance and, if deemed to be a SAIL, the decision maker is 'required to refuse to grant development consent'. No candidate SAIL vegetation communities found are considered likely to be found within the site.

The proposed removal of vegetation within the subject site would subsequently require approx. 89 Ecosystem Credits and 181 Species Credits, namely:

- Scribbly Gum - Red Bloodwood - *Angophora inopina* heathy woodland on lowlands of the Central Coast (PCT 1636): 89 credits;
- *Tetratheca juncea* (Black-eyed Susan): 15 credits;
- *Angophora inopina* (Charmhaven Apple): 34 credits;
- Southern Myotis (*Myotis macropus*): 8 credits, and
- Squirrel Glider (*Petaurus norfolcensis*): 119 credits.



Contents

1.0	Introduction	1
2.0	Site Particulars.....	2
3.0	Proposed Development.....	4
5.0	Scope and Purpose.....	8
6.0	Study Certification and Licencing.....	9
7.0	Methods.....	10
7.1	Literature Review.....	10
7.2	Field Survey	11
8.0	Results.....	18
8.1	Database Searches.....	18
8.2	Vegetation Communities.....	25
8.3	Flora.....	27
8.4	Tetratheca juncea	27
8.5	Angophora inopina	27
8.6	Habitat Assessment	27
8.7	Fauna.....	28
9.0	Key Species Considerations	30
10.0	7 Part Test Assessment	33
11.0	SEPP 44 Assessment.....	41
12.0	EPBC Act Assessment.....	42
13.0	EPBC Act referral guidelines for the vulnerable Black-eyed Susan	44
14.0	Vegetation Corridor Considerations	51
16.0	Avoid and Minimise.....	54
17.0	Serious and Irreversible Impacts.....	55
18.0	Potential Offsets & Credit Generation.....	57



19.0	Recommendations	59
20.0	References	61

Tables

Table 1 – Field Survey Periods	15
Table 2 – Flora Field Survey Effort vs. WSC F&F Guidelines	15
Table 3 – Fauna Field Survey Effort vs. WSC F&F Guidelines	16
Table 4 – Threatened Species Appraisal	18
Table 5 – Subject Species	24
Table 6 – Key Species Analysis	30
Table 7 – BAM Credits for the Site	57

Figures

Figure 1 – Site Location	3
Figure 2 – Proposed Concept Plan	5
Figure 3 – Biodiversity Values Map	7
Figure 4 – Survey Effort	17
Figure 5 – Vegetation Map and Threatened Species Records	26



Appendices

Appendix A – Flora Species List

Appendix B – Expected Fauna Species List

Appendix C – Biobanking Field sheets

Appendix D – Hollow Bearing Tree and Glider Feed Tree Data

Appendix E – Site Photographs

Appendix F – Author CVs



1.0 Introduction

The purpose of the Ecological Assessment Report is to accompany the Planning Proposal as part of the Gateway Process for the proposed rezoning of the site. The site is currently zoned RE1 – Public Recreation and IN2 – Light Industrial. It is proposed that the site will be zoned B2 – Local Centre, R1 – General Residential and R2 – Low Density Residential. Future development on the site is likely to include residential and commercial subdivision.

At the request of QMC Property Group (*the client*), Anderson Environment & Planning (AEP) have undertaken required investigations to inform the production of a 7 part test assessment report addressing the proposed development.

This report is specifically intended to indicate the likelihood of the proposed rezoning and any subsequent development having a significant effect on threatened species, populations or ecological communities. In this regard, the report aims to recognise the relevant requirements of the *Environmental Planning and Assessment Act 1979* (EPA Act), the *Biodiversity Conservation Act 2016* (BC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Consideration of other relevant policies such as State Environmental Planning Policy No. 44 (SEPP 44) – ‘Koala Habitat Protection’ is also included.

During progression of this rezoning proposal, changes in the legislation occurred as part of the 2016 Biodiversity Reforms, resulting in a repeal of the *Threatened Species Conservation Act 1995* (TSC Act) and introduction of the *Biodiversity Conservation Act 2016* (BC Act). These changes came into effect after field investigations and report preparation had commenced. As such this report has been prepared to address biodiversity assessment and offset requirements with reference to the BC Act and Biodiversity Assessment Method (BAM).

There has been an attempt within the proposal to avoid and minimise impacts on native vegetation, threatened or regionally significant flora and fauna, populations and ecological communities, this has included removing land zoned E2 Environmental Conservation from the planning proposal. Where impacts cannot be avoided or mitigated and where the determining authorities consider it necessary, offsets may be used to compensate for any remaining impacts in order to achieve an *improve or maintain* outcome for the proposal. Potential offsets for the development have been quantified using the Biodiversity Assessment Method (BAM).





2.0 Site Particulars

- **Address** – 60 and part 50W, part 44W Parraweena Road, Gwandalan.
- **LGA** – Central Coast.
- **Title Details** – Part Lot 1 DP 1043151, Part Lot 3 DP 740701 and Lot 20 DP 1089946.
- **Site** – the site encompasses approx. 5.5 hectares (ha).
- **Proposed Development Area** – approx. 5.5ha
- **Zoning** – As per Wyong Shire Council LEP 2013, the site is zoned RE1 – Public Recreation and IN2 – Light Industrial.
- **Current Land Use** – The site includes disused hardstand areas as well as disturbed remnant habitat with a managed understorey and numerous trail bike tracks traversing the site. There is a small dam located in the central north-west of the site and some parts of the site are devoid of remnant vegetation and comprise rank grassland.
- **Surrounding Land Use** – The site is bounded by Kanangra Drive to the west, remnant vegetation to the east (south of the creek) and south, large lot subdivision to east (north of creek) and light industrial to the north.

Figure 1 depicts the extent of the site overlain on an aerial photograph of the locality.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Lot Boundary
-  Cadastre



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



Title: Figure 1 - Site Location

Date: April 2019

Location: Gwandalan, NSW

Client: QMC Property Group

Our Ref: 1467



3.0 Proposed Development

This report has been specifically prepared to accompany the Planning Proposal as part of the Gateway Process for the proposed rezoning of the site. The site is currently zoned RE1 – Public Recreation and IN2 – Light Industrial. It is proposed that the site will be zoned B2 – Local Centre, R1 – General Residential and R2 – Low Density Residential.

Future development of the site following the rezoning of the site may include:

- A mix of retail, commercial and community service use type buildings;
- Town square / park area; and
- Residential subdivision.

Figure 2 depicts a concept plan of the proposed development within the study area. The concept plan should be considered indicative only.





4.0 Approvals Pathway

4.1 NSW Biodiversity Conservation Act 2016

Recent changes to biodiversity legislation within NSW have fundamentally changed the approvals pathway for vegetation clearing. Development seeking to remove native vegetation above a certain threshold (which in this instance would be 0.25ha; a threshold that would be exceeded) and therefore triggers entry into the Biodiversity Offsets Scheme (BOS).

This assessment has been undertaken with reference to the BAM, utilising information gathered under the previous approval pathway and assessment process (TSC Act), and BioBanking methodology. This information has been used to inform decisions to avoid and minimise impacts, and identify the biodiversity values that may require offsets for future development. Following the rezoning process, a BDAR will be required to accompany a DA.

A BDAR requires formalised assessment of biodiversity values present within the site (including vegetation plots, surveys for potentially occurring threatened species, etc.), along with details of efforts made by the proponent to avoid and / or minimise high biodiversity values and subsequently minimise impacts upon identified biodiversity (particularly threatened entities).

Residual impacts are quantified after the avoid / minimise process is applied and, subject to conditions placed upon the proposal by Council (see **s16 Avoid and Minimise**), offsets in the form of biodiversity credits that require retirement or purchase are calculated based upon the vegetation type being removed and the threatened species that are likely to be impacted by the proposal.

Given the extent of native vegetation to be cleared on site, development on the site will trigger entry into the Biodiversity Offsets Scheme. An extract of the Biodiversity Values Map is shown in **Figure 3** below. The site is not mapped on the biodiversity values map.

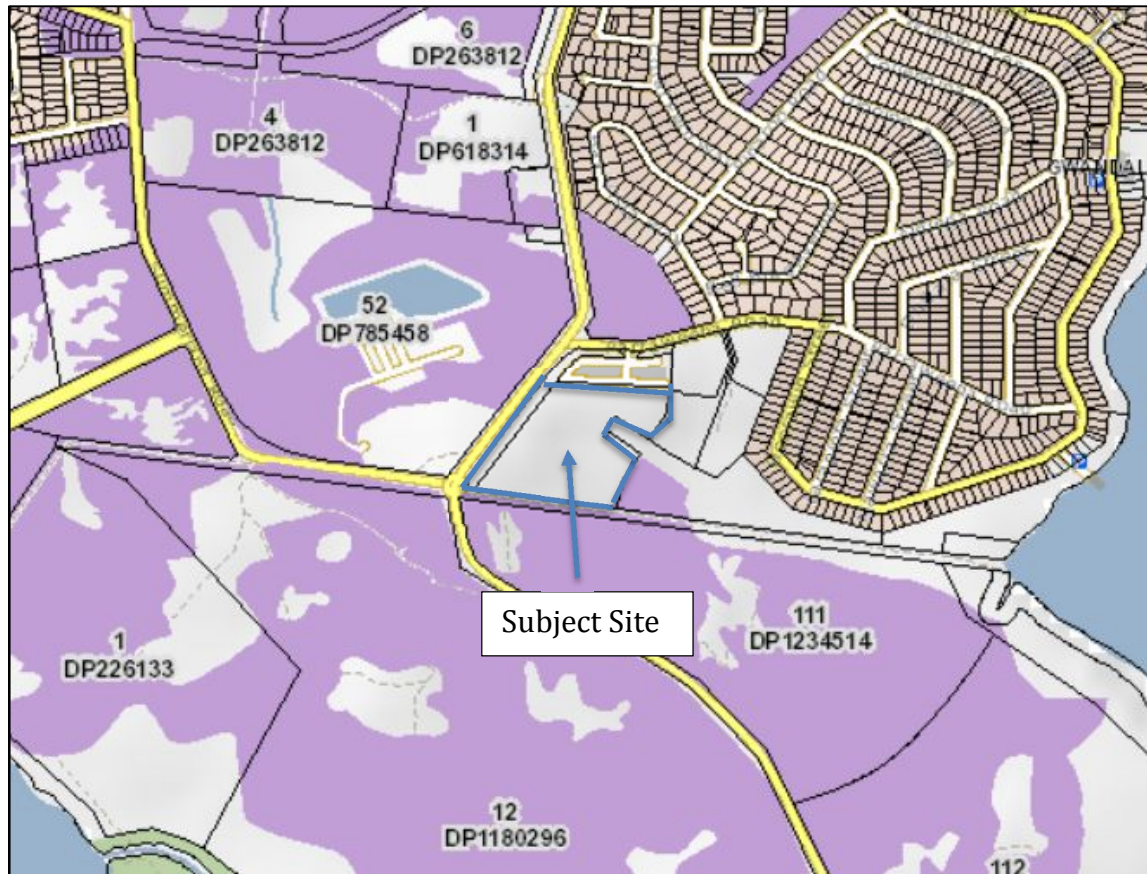


Figure 3 – Biodiversity Values Map



5.0 Scope and Purpose

Investigations were carried out on site and via literature / database searches to gather information required to adequately address Section 5A of the *Environmental Planning & Assessment Act 1979* (known as the “7 part test”), and to satisfy the requirements of Wyong Shire Council’s Flora & Fauna Survey Guidelines (Version 2.2, April 2014).

Also afforded consideration were the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act), and relevant State Environmental Planning Policies (SEPPs), namely SEPP 14 – ‘Coastal Wetlands’ and SEPP 44 – ‘Koala Habitat Protection’.

This has been achieved via background research and literature review, database searches, consultation, targeted ecological fieldwork and mapping, detailed habitat assessment, and ultimately impact assessment consideration against the type and form of development proposed.

Impact assessment was undertaken with due reference to the “Threatened Species Assessment Guidelines” (DECC, 2009).

Potential offsets for the development have been quantified using the Biodiversity Assessment Method (BAM).

Specifically, the scope of this study is to:

- Identify vascular plant species occurring within the site, including any threatened species listed under the BC Act or EPBC Act;
- Identify and map the extent of vegetation communities within the site, including any Endangered Ecological Communities (EEC’s) listed under the BC Act or EPBC Act;
- Identify any fauna species, including threatened and migratory species, and populations or their habitats, which occur within the site and are known to occur in the wider locality;
- Assess the potential of the proposed development to have a significant impact on any threatened species, populations or ecological communities (or their habitats) identified from the site;
- Describe measures to be implemented to avoid, minimise, manage or monitor potential impacts of the proposal; and
- Quantify potential impacts and required offsets for the development.

In addition to the survey work conducted within the site boundary and its immediate surrounds, consideration has been afforded to the wider locality, via database searches within 10km of the site and via appreciation of habitat areas that may be linked ecologically to the site.



6.0 Study Certification and Licencing

This report was written by Ian Benson BEng & GradDipSc (Ecology) (BAAS: 18147), Joel Stibbard BSc (BAAS:17003) and Craig Anderson BAppSc (EAM) (BAAS: 17002) of Anderson Environment & Planning.

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL101313;
- Animal Research Authority (Trim File No: 14/600(2)) issued by NSW Agriculture; and
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 14/600(2)) issued by NSW Agriculture.

Certification:

As the principal author, I, Ian Benson, make the following certification:

- The results presented in the report are, in the opinion of the principal author and certifier, a true and accurate account of the species recorded, or considered likely to occur within the Survey Area;
- Commonwealth, state and local government policies and guidelines formed the basis of project surveying methodology, unless specified departures from industry standard guidelines are justified for scientific and/or animal ethics reasons; and
- All research workers have complied with relevant laws and codes relating to the conduct of flora and fauna research, including the Animal Research Act 1995, National Parks and Wildlife Act 1974 and the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes.

Principal Author and Certifier:

Ian Benson

Senior Ecologist

Biodiversity Accredited Assessor Scheme: 18147

Anderson Environment & Planning

May 2019



7.0 Methods

The field surveys for the subject area have been prepared and performed with due recognition of the Wyong Shire Council Flora & Fauna Survey Guidelines (Version 2.2, April 2014).

The size of the site, the type of native vegetation and habitats remaining, the status of existing and proposed surrounding land use, and the level and type of habitat linkages to other proximate bushland areas all were considered in formulating the methodology employed and described below.

The assessment approach was tailored to undertake sufficient works to ensure that legislative requirements were met relating to threatened species and native species in general for the proposed specific development.

To ensure a robust impact assessment approach, where any potential doubt remained over species impact, presence within the study area was assumed to ensure an overly conservative approach was employed.

7.1 Literature Review

Main information sources reviewed included:

- Aerial Photograph Interpretation (API) of the site and surrounding locality;
- Wyong Shire Council Flora & Fauna Survey Guidelines (Version 2.2, April 2014);
- The 2010 Ecological Assessment Report produced by RPS for the former Coal & Allied lands immediately to the south of the proposed development;
- OEH Threatened Species, Populations and Ecological Communities website (<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/>);
- Collective knowledge gained from previous ecological survey and assessment in the Lake Macquarie/Wyong area over the past 20 years.

In addition, database searches were carried out, namely:

- Review of flora and fauna records held by the NSW Office of Environment & Heritage (OEH) Atlas of NSW Wildlife within a 10km radius of the site (November 2016 & May 2019); and
- Review of flora and fauna records held by the Commonwealth Department of Energy and Environment (DoEE) Protected Matters Search within a 5km radius of the site (November 2016 & May 2019).



7.2 Field Survey

7.2.1 Vegetation Communities

Vegetation was surveyed utilising a variety of methods, as outlined below.

- Review of the Wyong Shire Vegetation mapping prepared by East Coast Flora Survey (2002);
- Aerial Photo interpretation (API) to identify any notable variations within the site;
- Consultation of 1:25,000 topographic map series for the area;
- Study area inspection to ground truth the unit(s) identified by API;
- Identification of the vegetation map unit occurred via identification of required dominant species in community structural layers; and
- Detailed floristic input from formal plots and transects to the Biobanking methodology conducted within the study area (see below).

The final derived vegetation map was based on dominant species present in the over-storey, shrub and ground layers. Vegetation community names were as per East Coast Flora Survey (2002). The dominant species composition, structural and physical attributes were all considered when assigning the best fit community type.

Consideration was given to the potential for the derived vegetation communities to constitute Endangered Ecological Communities (EEC's) as listed under the BC Act and/or EPBC Act. The floristic composition, geomorphological characteristics and geographical extent were important considerations in this process.

7.2.2 Flora

A general flora survey was undertaken to produce a flora species list for the study area, to search specifically for threatened flora species known from the wider area, and to gather data necessary to both derive vegetation community type(s) and to meet relevant survey guidelines. Such works included:

- Identification of all vascular plant species encountered during fieldwork. Study area coverage was both systematic to ensure all key points of the study area were checked, and therein the Random Meander Technique (Cropper, 1993) was utilised to maximise species encountered. A full list of all flora species recorded during fieldwork is included as **Appendix A**.
- Targeted searches in areas of potentially suitable habitat were undertaken for any threatened flora species previously recorded in the locality. Parallel transects were



conducted within potential habitat for cryptic species including threatened orchids. Such species were identified via database searches and other sources.

- Biobanking Plot based surveys – two (2) plots were placed with reference to the variations observed in the initial mapping process to ensure that as much community variation as possible was sampled. The Biobanking plots included the following methodologies:
 - Within each 0.04ha plot (20 x 20m) all flora species were recorded along with Stratum, Growth Form, Cover and Abundance;
 - Each 20m by 50m quadrat recorded number of hollow bearing trees and total length of fallen timber; and
 - Each 50 m transect recorded the native percentage foliage cover for Canopy, Mid-storey, Ground cover – grasses, Ground cover – shrubs and Ground cover – other as well as exotic plant cover.

Plot based survey results are included in **Appendix C**. The location of all flora survey efforts is provided within **Figure.4**

7.2.3 Habitat

An assessment of the relative habitat values present within the study area was carried out. This assessment focused primarily on the identification of specific habitat types and resources within the study area favoured by known threatened species from the region. The assessment also considered the potential value of the study area (and surrounding areas) for all major guilds of native flora and fauna.

The assessment was based on the specific habitat requirements of each threatened fauna species in regards to home range, feeding, roosting, breeding, movement patterns and corridor requirements. Consideration was given to contributing factors including topography, soil, light and hydrology for threatened flora and assemblages.

In particular, focus was put on documenting the presence of key habitat features such as tree hollows. Hollows are an important resource utilised by a variety of forest fauna, and are particularly relevant for several of the likely key threatened species in this locality. Vertebrate and invertebrate species use hollows as diurnal or nocturnal shelter sites, for rearing young, feeding, thermoregulation, and to facilitate ranging behaviour and dispersal.

Tree hollows were recorded and mapped within the study area utilising the methodology of tree hollow identification set by OEH in the BioBanking field plot methodology (Feb 2009), namely:

“A hollow is only recorded if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm across; (c) the hollow appears to have depth (i.e. you cannot see



solid wood beyond the entrance); and (d) the hollow is at least 1 m above the ground (this omits hollows in cut stumps or at the base of trees)”.

The location of hollow-bearing trees observed within the study area are shown in **Figure 5**.

Trees displaying glider feed scars were also recorded during the fieldwork and are shown in **Figure 5**.

7.2.4 Fauna

Fauna survey has been carried out utilising techniques as outlined below. All Fauna Survey technique locations are shown in **Figure 4**. Fauna survey work was undertaken with reference to relevant guidelines and to add additional information to the generated Expected Fauna Species List (**Appendix B**).

7.2.4.1 Small Terrestrial Mammal Trapping

Small mammals were targeted on the study area via the use of Elliott Type ‘A’ traps. Twenty-five traps were deployed in a trap line encircling the study site, sampling all habitat types present. The traps were baited with a mixture of rolled oats and honey with a smear of peanut butter. The traps were checked early each morning, and where necessary, reset and rebaited. The traps were left out for four nights, giving a total of 100 small terrestrial trap nights.

7.2.4.2 Medium Terrestrial Mammal Trapping

Medium sized terrestrial mammals were targeted by the use of Elliot Type ‘B’ traps (7). The traps were placed in suitable positions and baited with a mixture of rolled oats and honey and dry dog food. The traps were checked early each morning, and where necessary, reset and rebaited. The traps were left out for four nights, giving a total of 28 medium terrestrial trap nights.

7.2.4.3 Arboreal Mammal Trapping

Arboreal mammals were targeted on the study area via the use of Elliott Type ‘B’ traps (12). The traps were placed on bracket mounted wooden supports attached to suitable trees throughout the study area. Trees targeted were, where possible, those that had hollows, were flowering and/or had scratches on the bole. The traps were baited with a mixture of rolled oats and honey, with a smear of peanut butter. Traps were also sprayed with a water and vanilla essence mix to help mask the smell of humans. The traps were checked early each morning, and where necessary, reset and rebaited. The traps were left out for four nights, giving a total of 48 arboreal trap nights.



7.2.4.4 Bat Call Recording

Bat echolocation calls were taped using one Anabat Detector at two locations within the study area. Call recording was undertaken by stationary units during night time period per night over two nights. Transformed calls were analysed by Dr. Anna McConville using commercially available software.

7.2.4.5 Avifauna Surveys

The presence of avifauna within the study area was carried out via targeted diurnal and nocturnal surveys as well as incidental observations during all other phases of fieldwork.

For diurnal surveys, emphasis was placed on peak activity periods, i.e. early morning and late afternoon, to maximise chances of species encountered. Birds were identified by direct observation or by recognition of calls or distinctive features such as nests, feathers etc.

For nocturnal surveys, spotlighting attempted to identify any roosting birds, and similar methods were employed as per diurnal surveys. Additionally, pre-recorded calls of *Ninox strenua* (Powerful Owl), *N. connivens* (Barking Owl), *Tyto novaehollandiae* (Masked Owl) and *T. tenebricosa* (Sooty Owl) were broadcast through an amplification system designed to project the sound for at least 1km under still night conditions. The calls were repeated in the four compass directions for five minutes from suitable positions, with a listening period of five minutes after broadcast, followed by short periods of spotlighting for owls that may have flown in following the calls.

Other techniques utilised to target owls included quiet listening at dusk and into first dark for calling birds, and also by utilising the 'squeak technique' (rubbing glass on Styrofoam) to mimic injured prey species.

7.2.4.6 Herpetofauna Surveys

Specific herpetofauna (frog and reptile) searches were carried out in each of the habitat units present. Both diurnal and nocturnal searches were made in areas of appropriate habitat. Such habitat included areas of thicker vegetation, in ground litter, near and under fallen timber, around piles of refuse, and wet / damp areas such as drainage lines, dams and areas of poor infiltration capacity and / or periodic inundation.

Physical frog searches were augmented by call recognition. Any calls unable to be clarified in the field were recorded for later comparison with commercially available recordings. Opportunistic encounters during all other phases of fieldwork were also noted.



7.2.4.7 Spotlighting

Spotlighting was undertaken for by two people over two hours within the study area over one night via the use of a 100-Watt hand-held spotlight. Given the relatively small size of the study area, a comprehensive survey was achieved, with all areas covered on foot.

7.2.4.8 Incidental Observations & Secondary Indications

Incidental records of any fauna species observed during fieldwork were noted. This included opportunistic sightings of secondary indications (scratches, scats, diggings, tracks etc.) of any resident or migratory species. Searches were also conducted for whitewash, regurgitation pellets and prey remains from Owls, chewed (*Allo*) *Casuarina* cones from Black-Cockatoos, chewed fruit remains from frugivorous birds etc.

Given the amount of field survey time spent on this relatively small study area, survey intensity coverage was high, which led to several additions to site records via incidental observations.

7.2.5 Survey Dates, Times & Activity

Table 1 – Field Survey Periods

Date	Time	Field Activity	No. of Persons on Site
28/7/16	2:30 pm – 4:00 pm	Site familiarisation and seasonal <i>Diuris praecox</i> survey	2
15/8/16	11:00 am – 4:00 pm	Deploy of fauna survey equipment, fauna survey, Anabat deploy, hollow bearing tree survey and incidentals.	3
16/8/16	5:15 am – 6:15 am	Fauna survey equipment check, flora survey, fauna survey, incidentals	1
17/8/16	5:15 am – 6:15 am	Fauna survey equipment check, flora survey, fauna survey, incidentals	1
18/8/16	5:15 am – 6:15 am	Fauna survey equipment check, flora survey, fauna survey, incidentals	1
19/8/16	5:15 am – 7:30 am	Fauna survey equipment check, flora survey, fauna survey, incidentals	2
15/9/16	10:00 am – 1:00 pm	Seasonal survey for <i>Tetratheca juncea</i> & <i>Genoplesium insigne</i>	1
9/11/16	3:00 pm – 9:15 pm	Flora survey plots and transects, seasonal <i>Cryptostylis hunteriana</i> survey, nocturnal survey	2
18/2/19	?	Umwelt performed parallel transects over the subject site on behalf of Department of Planning as part of Strategic Biocertification surveys. Surveys targeted <i>Corunastylis</i> sp. Charmhaven	?







By combining the above survey effort involving numerous site visits, and assumed presence for more mobile species recorded previously within the locality, all possible use of the site by notable species is considered, and hence accommodated within impact assessments.

Tables 2 and 3 below outline the works undertaken against the specific requirements of the WSC F&F Survey Guidelines.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Lot Boundary
-  Anabat Location
-  Elliot Trap Line
-  September 2016 Flora Transect



0 100
metres

Scale: 1:1,800

Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 4 - Survey Effort

Date: Dec 2016

Location: Kanangra Drive, Gwandalan, NSW

Client: QMC Property Group

Our Ref: 1467



Table 2 – Flora Field Survey Effort vs. WSC F&F Guidelines

Flora			
Area of Land with Remnant Vegetation	Activity	Minimum Survey Effort	Effort Undertaken and Comments
<50 ha (Site ~5.5ha with ~3.7ha remnant vegetation)	Flora Survey. Simple Floristic Structure	1-2 walking transects + 1 quadrat / community + 1 replicate quadrat per community ≥5 ha.	Narrabeen Doyalson Coastal Woodland (3.7ha) – 1 transect & 2 Biobanking plots (quadrat).
	<i>Tetratheca juncea</i> targeted flora survey	<p>All plant clumps within 500 m of the development site require assessment and mapping. Survey during peak flowering period from mid-September to mid-October. If detected, surveys to:</p> <ul style="list-style-type: none"> Identify number of individuals affected Quantify extent of population and proportion impacted Identify the patch size of the native vegetation that the plant clumps occur within Thoroughly search within 500 m of the population to address stepping stone conservation Identify the spatial relationship and connectivity of plant clumps within 500m of the development site Identify whether the population is a large population or of conservation significance Determine if the population sets viable seed Identify whether the plant clumps occur at the edge of suitable habitat 	<p>Field survey undertaken within the development footprint. Desktop survey within 10km of the development. Targeted field survey conducted on 15/09/2016, 8 x <i>T. juncea</i> clumps were counted and locations recorded. The population is considered a small as clump density is lower than 20 clumps/ hectare. The population is not considered of conservation significance.</p>
	Ground Orchids targeted survey - <i>Diuris praecox</i> - <i>Cryptostylis hunteriana</i>	Targeted surveys during flowering season	<p>Targeted field surveys were undertaken during the appropriate flowering season for each orchid, in accordance with the WSC F&F Guidelines. The following effort was undertaken:</p> <ul style="list-style-type: none"> 28/7/16 survey for <i>Diuris praecox</i> 15/9/16 survey for <i>Genoplesium insigne</i>



Flora			
Area of Land with Remnant Vegetation	Activity	Minimum Survey Effort	Effort Undertaken and Comments
	<ul style="list-style-type: none"> - <i>Genoplesium insigne</i> - <i>Corunastylis</i> sp. Charmhaven 		<ul style="list-style-type: none"> - 9/11/16 survey for <i>Cryptostylis hunteriana</i> - 18/2/18 survey for <i>Corunastylis</i> sp. Charmhaven (Umwelt)
+ targeted surveys for relevant threatened plants, including <i>Tetratheca juncea</i> . <i>Angophora inopina</i>			

Table 3 – Fauna Field Survey Effort vs. WSC F&F Guidelines

Fauna Group	Survey Technique	Survey Period	Survey Effort Vegetation Type	Effort Undertaken and Comments
Birds				
Diurnal Birds	Formal Census (FC) + incidental observations (IO)	Summer & Winter	1 ha plot for 20 mins	1 formal census plot + >35 hrs. of diurnal site fieldwork. Visuals, call ID, nests, feeding remains etc.
Nocturnal Birds	Formal census (FC) + incidental observations (IO)	Summer & Winter	One point census / km ²	1 point census surveys + >4 hrs of nocturnal site fieldwork. Included quiet listening, squeak technique, call playback, spotlighting, roost / nest searches, pellet searches etc.
Mammals				
Small terrestrial	Small mammal traps	Avoid winter cold	100 trap nights over 4 consecutive nights per veg comm.	100 trap nights on site over four nights. Plus, incidental observations.
Medium terrestrial	Cage / B Elliott traps	Any time of year	12 trap nights over 4 consecutive nights per veg comm.	28 trap nights on site over four nights. Plus, incidental observations.
Arboreal mammals	B Elliott Traps	Any time of year	10 traps for 3 consecutive nights	48 trap nights over 4 consecutive nights. Plus, incidental observations.
	Stagwatching	Any time of year	Observing hollow for 30 mins prior to sunset until 60 mins after sunset	Two hollow-bearing trees stagwatched for 45 mins pre and post sunset



Fauna Group	Survey Technique	Survey Period	Survey Effort Vegetation Type	Effort Undertaken and Comments
Microchiropteran bats	Faecal pellet counts	Any time of year	Minimum of 1 plot per 1,000m ²	Koala habitat observed, but study area small (<3 ha of vegetation) and no recent Koala records nearby. Therefore, no formal faecal pellet counts undertaken. Incidental observations.
	Spotlighting	All year	Walking rate of 1km/hr.	>2 hrs spotlighting undertaken over one night. All on foot.
	Echolocation call	October to May	2 separate nights continuous recording from dusk per site (minimum 4 hours)	2 separate nights continuous recording
	Harp Traps	October to May	2 harp traps per night per vegetated community	Nil
Reptiles				
Diurnal Searches	Habitat Searches	September to April	1 ha search for 30 mins on 2 separate days per veg comm.	>35 hrs of diurnal site fieldwork. Visuals, habitat searches, incidental observations.
Nocturnal Searches	Spotlight Searches	September to April	2 x 30 min searches @ walking rate of 1km/hr. on 2 separate nights	>4 hrs spotlighting undertaken over one night. All on foot.
Specific Habitats	Diurnal and Nocturnal Searches	September to April	1 ha diurnal search for 30 mins on 2 separate days + 30 min spotlight search on 2 nights	Forest Habitats – sampled opportunistically. Rubbish piles / old built structures, rock areas all targeted during diurnal and nocturnal surveys.
Amphibians				
Diurnal Searches	Opportunistic Searches	September to March	Occur if and when frogs are heard calling through the day until identified	Undertaken as part of reptile diurnal searches. >35 hrs of diurnal site fieldwork. Visuals, call recognition, habitat searches, incidental observations.
Nocturnal Searches	Spotlight Searches	September to March	2 x 30 minutes on 2 separate nights	>4 hrs spotlighting undertaken over one night. All on foot.
	Playback of recorded calls	September to March	Once on each of two separate nights	Call playback between dam and creek. Incidental observations.
	Specific habitat searches	September to March	2hrs / 200m of water body edge	1 hr targeted search, limited habitat present. Incidental observations.



The above tables show that most areas of required survey have been met or exceeded, and given the relatively small size and disturbed nature of the study area, comprehensive coverage has been achieved during survey effort. Where any doubt in regards to presence was noted for key species, presence is assumed for impact assessment purposes. This effort and approach is considered suitably adequate for ecological assessment of the study area and surrounding site.



8.0 Results

8.1 Database Searches

Searches were undertaken of databases within a 10km radius of the site as per OEH (BC Act listings) & DoEE (EPBC Act listings) (**Table 4**). Note that any records considered erroneous, historic only, or obviously of no relevance to the site in regards to habitat (e.g. seabirds, marine species etc.) have been omitted.

The potential for the listed threatened species to occur within the site is considered below.

Detailed ecological profile descriptions of species can be found at:

<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/>



Table 4 – Threatened Species Appraisal

Scientific Name	Common Name	BC Act	EPBC Act	Chance of Occurrence
Plants				
<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Angophora inopina</i>	Charmhaven Apple	V	V	Recorded within the study area. SUBJECT SPECIES
<i>Corunastylis sp. Charmhaven</i>	Wyong Midge Orchid 2	CE	CE	At the time of initial site investigations, no records for the species existed within a 10km radius of the site, and the species was not associated with the vegetation community found onsite; Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast. Therefore, the species was considered highly unlikely to occur and a targeted search was considered unnecessary and was not undertaken for the site. Council has since provided additional information regarding a new population of this species recently found within 10km of the site, and within the same or similar PCT vegetation. A targeted survey for the species was undertaken by Umwelt on 18 February 2018, coinciding with the flowering of the OEH reference population. Species remained undetected within the site.
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V		No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Cryptostylis hunteriana</i>	Leafless Tongue-Orchid	V	V	No sign of this species during fieldwork, including targeted surveys during the flowering period. No previous records on site. Nearby Atlas record.
<i>Diuris praecox</i>	Rough Doubletail	V	V	No sign of this species despite targeted search during known flowering period.
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	V	No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Eucalyptus parramattensis subsp. decadens</i>	Earp's Gum	V	V	No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Eucalyptus parramattensis ssp. parramattensis (popn in Wyong and Lake Mac LGA)</i>	Parramatta Red Gum	E2		No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Genoplesium insigne</i>	Variable Midge Orchid 1	E	CE	No sign of this species during targeted searches. A targeted search was undertaken on 15 September 2016 during the known flowering period for this species. Certainty of flowering period can be confirmed as the search date sits within two confirmed sightings recorded in the Bionet Atlas, one in August and one in October.
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.



Scientific Name	Common Name	BC Act	EPBC Act	Chance of Occurrence
<i>Pelargonium sp. Striatellum</i>	Omeo Stork's-bill	E	E	Not known to the CMA. No sign of this species during seasonal surveys.
<i>Rutidosia heterogama</i>	Heath Wrinklewort	V	V	No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Syzygium paniculatum</i>	Magenta Lily Pily	E	V	No sign of this species despite targeted searches, unlikely to remain undetected within the small and disturbed site.
<i>Tetraloche juncea</i>	Black-eyed Susan	V	V	Eight clumps recorded on site during current surveys. SUBJECT SPECIES
<i>Thesium australe</i>	Austral Toadflax	V	V	No sign of this species despite targeted search during known flowering period.
Birds				
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	E	No sign of species during fieldwork. No preferred winter feed tree species were noted on site. Highly mobile species which could possibly utilise the study area during flowering of feed tree species as part of a larger foraging range. Contact with the LMBC confirm that the site is not considered important habitat for the Regent Honeyeater SUBJECT SPECIES
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V		No sign of species during fieldwork. The study area may offer some habitat opportunity for this species when in the area. Potential foraging and nesting habitat would be removed as part of the development. SUBJECT SPECIES
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	No sign of species during fieldwork. No suitable habitat present on site.
<i>Burhinus grallarius</i>	Bush Stone-curlew	E		No sign of species during fieldwork. Unlikely to occur due to type and size of habitats present.
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo	V		No sign of species during fieldwork. Limited Atlas records in the area. A mobile species, so could possibly occur, and favoured food resources were identified in low densities within the study area. Suitably sized nesting hollows are present. SUBJECT SPECIES
<i>Chthonicola sagittata</i>	Speckled Warbler	V		No sign of species during fieldwork. The forested parts of the study area and suitable grassy surrounds would provide suitable habitat for this species. Records east of the freeway with the exception of one are historical. Potential habitat would be removed as part of the development. SUBJECT SPECIES
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	V		No sign of species during fieldwork. The disturbed nature of the site is not preferred habitat for the species. Atlas records absent for the locality.



Scientific Name	Common Name	BC Act	EPBC Act	Chance of Occurrence
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V		No sign of species during fieldwork. The study area may offer some habitat opportunity for this species. Potential habitat would be removed as part of the development. SUBJECT SPECIES
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	No sign of species during fieldwork. Unlikely to occur due to type of habitats present and proximity to existing records.
<i>Epthianura albifrons</i>	White-fronted Chat	V		No sign of species during fieldwork. Unlikely to occur due to type of habitats present.
<i>Glossopsitta pusilla</i>	Little Lorikeet	V		No sign of species during fieldwork. The study area may offer some habitat opportunity for this species when in the area. Potential foraging and nesting habitat would be removed as part of the development. SUBJECT SPECIES
<i>Grantiella picta</i>	Painted Honeyeater	V	V	No sign of species during fieldwork. Unlikely to occur due to type of habitats present and proximity to existing records.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V		Species recorded flying over site. No foraging habitat present on site. Site provides marginal potential breeding habitat based on height of trees and proximity to development. SUBJECT SPECIES
<i>Ixobrychus flavicollis</i>	Black Bittern	V		No sign of species during fieldwork. Unlikely to occur due to type of habitats present.
<i>Lathamus discolor</i>	Swift Parrot	E	E	No sign of species during fieldwork. No preferred winter feed tree species were noted on site. Highly mobile species which could possibly utilise the study area during flowering of feed tree species as part of a larger foraging range. Contact with the LMBC confirm that the site is not considered important habitat for Swift Parrot. SUBJECT SPECIES
<i>Ninox connivens</i>	Barking Owl	V		No sign of species during fieldwork. A mobile species, so could possibly occur and records known from the wider locality. Potential nesting habitat is marginal, but study area could potentially be utilised as hunting habitat as part of a larger home range. SUBJECT SPECIES.
<i>Ninox strenua</i>	Powerful Owl	V		No sign of species during fieldwork, however the species was recently recorded on nearby sites. A mobile species, so could possibly occur and records known from the wider locality. Potential nesting habitat is marginal, but study area could potentially be utilised as hunting habitat as part of a larger home range. SUBJECT SPECIES.
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V		No sign of species during fieldwork. Habitat is marginal at best and preferred feed trees absent from the site. Highly mobile species and site would only be used incidentally.



Scientific Name	Common Name	BC Act	EPBC Act	Chance of Occurrence
<i>Tyto novaehollandiae</i>	Masked Owl	V		No sign of species during fieldwork. A mobile species, so could possibly occur and records known from the wider locality. Potential nesting habitat is marginal, but study area could potentially be utilised as hunting habitat as part of a larger home range. SUBJECT SPECIES.
Mammals				
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	No sign of species during fieldwork. Vegetated parts of the study area and cleared flyways would offer suitable foraging habitat opportunities for this mobile species, however no roosting habitat in the form of caves were observed. Potential foraging habitat would be removed as part of the development SUBJECT SPECIES
<i>Dasyurus maculatus maculatus</i>	Tiger Quoll (SE Mainland popn)	V	E	Atlas data suggests records in the wider area, however no sign of the species during various ecological surveys. Disturb nature of site is not preferred habitat for the species.
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V		No sign of species during fieldwork. The forested parts of the study area would provide suitable habitat for this species, including potential roosting habitat. Potential foraging and roosting habitat would be removed as part of the development SUBJECT SPECIES
<i>Miniopterus australis</i>	Little Bentwing-bat	V		Species recorded on site. The forested parts of the study area and surrounds would provide suitable habitat for this species, including potential roosting habitat. No breeding habitat i.e. caves were observed. Potential foraging and roosting habitat would be removed as part of the development. SUBJECT SPECIES
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V		No sign of species during fieldwork. Vegetated parts of the study area and cleared flyways would offer suitable foraging habitat opportunities for this mobile species, however no roosting habitat in the form of caves were observed. Potential foraging habitat would be removed as part of the development SUBJECT SPECIES
<i>Mormopterus norfolkensis</i>	Eastern Freetail Bat	V		Species recorded on site. The forested parts of the study area would provide suitable habitat for this species, including potential roosting habitat. Potential foraging and roosting habitat would be removed as part of the development SUBJECT SPECIES
<i>Myotis macropus</i>	Southern Myotis	V		Species recorded during fieldwork. No preferred foraging habitats occur within the study area. Very limited roosting/breeding habitat present on site. SUBJECT SPECIES



Scientific Name	Common Name	BC Act	EPBC Act	Chance of Occurrence
<i>Petaurus norfolcensis</i>	Squirrel Glider	V		Recorded in Coal & Allied site to the south and glider feed scars present. Potential foraging and roosting habitat would be removed as part of the development. SUBJECT SPECIES
<i>Petauroides volans</i>	Greater Glider	E	V	Habitat is generally considered unsuitable and no records from the area.
<i>Phascolarctos cinereus</i>	Koala	V	V	A single record for Koala occurs at the southern end of the former Coal & Allied site within Mangrove Gully. No evidence of Koalas was observed during fauna surveys. Favoured Koala Feed Trees were present. SUBJECT SPECIES
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	Habitat is generally considered unsuitable and no records from the area.
<i>Pseudomys novaehollandiae</i>	New Holland Mouse		V	No sign of species during fieldwork. The study area may offer some habitat opportunity for this species. Marginal habitat would be removed as part of the proposed development. SUBJECT SPECIES
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Recorded on the former Coal & Allied lands to the south of the site. A mobile species, so could occur when suitable fruiting / flowering resources available within the study area and in the locality. Study area offers a minute component of a much larger foraging range. SUBJECT SPECIES
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V		Not recorded during surveys, however vegetated parts of the study area and surrounds would offer suitable habitat opportunities for this mobile species. Potential habitat would be removed as part of the development. SUBJECT SPECIES
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V		Not recorded during surveys, however vegetated parts of the study area and surrounds would offer suitable habitat opportunities for this mobile species. Potential foraging and roosting habitat would be removed as part of the development. SUBJECT SPECIES
<i>Vespadelus troungtoni</i>	Eastern Cave Bat	V		No sign of species during fieldwork. The forested parts of the study area and surrounds would provide suitable foraging habitat for this species, however no roosting habitat in the form of caves were observed. Foraging habitat will be removed. No caves are present for roosting. SUBJECT SPECIES



Scientific Name	Common Name	BC Act	EPBC Act	Chance of Occurrence
Herpetofauna				
<i>Crinia tinnula</i>	Wallum Froglet	V		Species recorded on former Coal & Allied Lands to the south of the site. Habitat on site is marginal. SUBJECT SPECIES
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	No sign of species during fieldwork. Unlikely to occur due to type of habitats present. Absence of records suggest no resident frogs occupy the wider locality.
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	No sign of species during fieldwork. Unlikely to occur due to type of habitats present. Absence of records suggest no resident frogs occupy the wider locality.
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	V	No sign of species during fieldwork. Unlikely to occur due to type of habitats present. Absence of records suggest no resident frogs occupy the wider locality.

Table Key - Status (BC Act & EPBC Act):

CE: Critically Endangered

E: Endangered

E2: Endangered Population

V: Vulnerable



From the above, the following species are considered as the key subject species / indicator species for this site due to either being recorded on site, potentially likely to forage and roost on the site, or the site potentially forms an important part of a local home range for resident species and some potential habitat will be removed.

Table 5 – Subject Species

Scientific Name	Common Name	BC Act	EPBC Act
Plants			
<i>Angophora inopina</i>	Charmhaven Apple	V	V
<i>Corunastylis sp. Charmhaven</i>	Wyong Midge Orchid 2	CE	CE
<i>Tetradlea juncea</i>	Black-eyed Susan	V	V
Birds			
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	E
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	
<i>Chthonicola sagittata</i>	Speckled Warbler	V	
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	
<i>Lathamus discolor</i>	Swift Parrot	E	E
<i>Ninox connivens</i>	Barking Owl	V	
<i>Ninox strenua</i>	Powerful Owl	V	
<i>Tyto novaehollandiae</i>	Masked Owl	V	
Mammals			
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V
<i>Dasyurus maculatus maculatus</i>	Tiger Quoll (SE Mainland popn)	V	E
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	
<i>Miniopterus australis</i>	Little Bentwing-bat	V	
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V	
<i>Mormopterus norfolkensis</i>	Eastern Freetail Bat	V	
<i>Myotis macropus</i>	Southern Myotis	V	
<i>Petaurus norfolkensis</i>	Squirrel Glider	V	
<i>Phascogale cinerea</i>	Koala	V	V
<i>Pseudomys novaehollandiae</i>	New Holland Mouse		V
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	
<i>Vespertilio acuminatus</i>	Eastern Cave Bat	V	



Scientific Name	Common Name	BC Act	EPBC Act
Herpetofauna			
<i>Crinia tinnula</i>	Wallum Froglet	V	

Table Key - Status (BC Act & EPBC Act):

CE: Critically Endangered

E: Endangered

E2: Endangered Population

V: Vulnerable

8.2 Vegetation Communities

Fieldwork has revealed the presence of Narrabeen Doyalson Coastal Woodland (MU 31) as per *Natural Vegetation of the Wyong LGA – Vegetation Community Profiles* (Bell 2002). This vegetation type is not commensurate with any listed EEC.

The Narrabeen Doyalson Coastal Woodland canopy typically comprises *Eucalyptus haemastoma* (Broad-leaved Scribbly Gum) and *Corymbia gummifera* (Red Bloodwood), which are generally the dominant species. A smaller number of *Angophora costata* (Smooth-barked Apple), *E. capitellata* (Brown Stringybark) and *A. inopina* (Charmhaven Apple) occur.

The shrub layer is generally absent from the site due to ongoing vegetation management and is generally limited to regenerating *Banksia oblongifolia* (Fern-leaved Banksia), *Grevillea* species and *Epacris pulchella* (Wallum Heath).



The ground cover was predominantly native species including *Themeda australis* (Kangaroo Grass), *Entolasia stricta* (Wiry Panic), *Xanthorrhoea lateralis*, *Imperata cylindrica* (Blady Grass) and *Austrostipa pubescens*.

The remainder of the study area comprises rank grasslands, lands previously cleared and/or highly disturbed, including the cleared pad areas and numerous trailbike tracks. Vegetation communities for the wider site are shown in **Figure 5**.

Narrabeen Doyalson Coastal Woodland (MU 31) was found to be commensurate with PCT 1636 Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Narrabeen Doyalson Coastal Woodland
-  Site Boundary
-  Location *Angophora inopina*
-  Hollow-bearing Trees
-  Glider Feed Trees
-  Aboreal Termite Nest
-  *Tetratheca juncea* Location



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 5 - Vegetation Map and Threatened Species Records

Location: Kanangra Drive, Gwandalan, NSW

Client: QMC Property Group

Date: May 2019

Our Ref: 1467



8.3 Flora

Flora surveys have resulted in the identification of over 62 species within the study area. Approximately 16% of these species are exotics, principally invasive weed species associated with areas of previous disturbance.

A full list of flora species identified by surveys conducted within the study area is included in **Appendix A**.

8.4 *Tetratheca juncea*

Targeted seasonal surveys confirmed the presence of flora species *Tetratheca juncea* (Black-eyed Susan) within the *study area* on 15 September 2016. This species is listed as Vulnerable under both the BC Act and EPBC Act. 8 individual clumps were identified within Narrabeen Doyalson Coastal Woodland community at density of 0.7 clumps/hectare. This population is not considered to be an important population.

Potential impacts of the proposal on the local population are addressed in **Section 8, 9 and 13**. A full record of species occurrence within the site is depicted within **Figures 5** below.

8.5 *Angophora inopina*

Surveys conducted by AEP resulted in the identification of around six individuals of the threatened tree species *Angophora inopina* within the study area. Further to this Umwelt conducted a more recent targeted survey (18th February 2018) and recorded a total of 15 specimens. This species is listed as Vulnerable under both the BC Act and EPBC Act. The locations of the threatened plants are shown in **Figure 5**.

8.6 Habitat Assessment

The site offers some habitat features for native fauna as outlined below.

- **Trees** – the large trees within the site provide potential seasonal foraging resources for nectivorous, insectivorous and to a lesser extent, frugivorous species.
- **Hollows** – A total of 56 hollow-bearing trees (with a total of 105 hollows) were mapped in the study area. The location of each hollow-bearing tree is shown in **Figure 4** and further details are provided in **Appendix D**. A wide range of hollow sizes were observed and would represent a viable potential habitat resource for most guilds of native fauna that utilise tree hollows including birds, microbats, possums and gliders, and potentially herpetofauna. There were a number of large tree hollows considered marginal for forest owls to occupy.
- **Glider Feed Trees** – A total of 12 *Corymbia gummifera* were noted as having extensive glider feed scars which may be from Squirrel Gliders or Sugar Gliders. The location of



each Glider Feed Tree is shown in **Figure 5** and further details are provided in **Appendix D**

- **Shrubs** – the shrub layer is generally absent from the site and limited to regrowth/regeneration due to on-going site vegetation management. If vegetation management was to cease on the site the shrub layer would provide foraging resources for nectivorous species including honeyeaters and gliders during flowering periods, as well as potential foraging and shelter opportunities for various other fauna species.
- **Patch size / connectivity** – The subject site exists within an approx. 1.5km corridor between Summerland Point and Gwandalan, this corridor links the Point Wollstonecraft peninsula to areas of similar habitat to the south and wider locality. Given its size, width and habitat features found therein it is likely that it exists as an inhabited corridor populated by variety of different species. Being a peninsula, this corridor is the only connection to the wider landscape allowing migration and gene flow between remnants.
- **Cleared areas** – the cleared area which comprises significant amounts of dumped refuse potentially provides habitat for small mammals and herpetofauna, and flyways for microbats.

In summary, the areas of native vegetation within the study area and surrounding site would provide suitable habitat opportunities and resources for a range of species suited to the habitat type. The hollow-bearing trees within the study area are of particular habitat value to resident hollow-dependent bird species, microbats and arboreal mammal and herpetofauna species.

8.7 Fauna

Fauna surveys to date have identified 89 species within the subject site and the former Coal & Allied site to the south of the subject site, consisting of three amphibian, six reptiles, 21 mammals and 59 bird species.

Three threatened fauna species have been recorded on the subject site. An additional seven threatened species have been recorded on the former Coal & Allied lands and where habitat is commensurate with the study site such species have been assumed to potentially be affected by the proposed development.

The threatened species recorded within the study area were:

- White-bellied sea-eagle (*Haliaeetus leucogaster*);
- Little Bentwing-bat (*Miniopterus australis*) (recorded using ultrasonic recording); and
- Southern Myotis (*Myotis macropus*) (recorded using ultrasonic recording).

Additional threatened species recorded on the site to the south included:



- Little Lorikeet (*Glossopsitta pusilla*);
- Varied Sittella (*Daphoenositta chrysoptera*);
- Wallum Froglet (*Crinia tinnula*);
- Squirrel Glider (*Petaurus norfolcensis*);
- Grey-headed Flying-fox (*Pteropus poliocephalus*);
- Eastern Falsistrelle (*Falsistrellus tasmaniensis*); and
- Greater Broad-nosed Bat (*Scoteanax rueppellii*).

The study area includes potential foraging habitat for local populations of most of these species as well as potential roosting and breeding habitat in the form of hollow trees.

Other notable species, including some more mobile (flying) threatened species, are also considered to possibly utilise the site on an intermittent basis as part of a larger home range. Such species are considered further in following Sections.

An Expected Fauna Species List has been generated for the site and is included as **Appendix B**, and all fauna species recorded during fieldwork are noted therein.



9.0 Key Species Considerations

Following all of the works outlined in previous Sections, the species identified for further considered have been categorised into guilds for further consideration. By considering these species and their lifecycle needs, many other species are also inadvertently considered as well in identifying key features. The analysis below considers key lifecycle features for each guild of species in more detail, and assists in informing the subsequent 7 part test assessment.

Table 6 – Key Species Analysis

Guild / Species	Key Habitat Feature	Comment
Plants <i>Incl.</i> <i>Angophora inopina</i> <i>Tetratheca juncea</i>	Suitable woodland / open forest habitat	<p>The proposal will remove around 15 individuals of <i>A. inopina</i> and eight clumps of <i>T. juncea</i>. Both species are commonly found in the immediate locality in intact Coastal Plains Scribbly Gum Woodland and associated communities.</p> <p>The site had subjected to vegetation management (slashing / clearing) prior to the <i>T. juncea</i> survey, and more clumps of the species may have remained undetectable during the targeted survey.</p>
<i>Corunastylis sp.</i> Charmhaven	It occurs within low woodland to heathland with a shrubby understorey and ground layer. Dominants include Black She-oak (<i>Allocasuarina littoralis</i>), Prickly Tea-tree (<i>Leptospermum juniperinum</i>), Prickly-leaved Paperbark (<i>Melaleuca nodosa</i>), Narrow-leaved Bottlebrush (<i>Callistemon linearis</i>) and Zig-zag Bog-rush (<i>Schoenus brevifolius</i>).	<p>Council has since provided additional information regarding a new population of this species recently found within 10km of the site, and within the same or similar PCT vegetation. The proposed development will result is the removal of approx. 5.1ha of suitable habitat for the species.</p> <p>A targeted survey for the species was undertaken by Umwelt on 18 February 2018, coinciding with the flowering of the OEH reference population. Species was undetected within the site.</p>
Nectivorous Birds <i>Incl.</i> <i>Regent Honeyeater</i> <i>Little Lorikeet</i> <i>Swift Parrot</i>	Foraging Resources	<p>The study area supports a variety of flowering trees and shrubs that would offer some seasonally suitable resources, however tree species encountered on site typically flower in summer when Swift Parrots and Regent Honeyeaters are likely to be absent from the region.</p> <p>The Little Lorikeet is less 'seasonal' in movement, and will access suitable foraging resources when available.</p>
	Roosting and Nesting	<p>All species could potentially utilise the study area for nocturnal roosting when in the locality.</p> <p>Potential nesting would likely be limited to Little Lorikeet, which could utilise suitable small hollows occurring within the study area in this regard.</p> <p>Swift Parrots only breed in Tasmania, and Regent Honeyeaters have not been recorded nesting in immediate coastal habitats, so such activity is considered unlikely.</p>
	Connectivity	<p>Given the high mobility of these species, the site is considered viably connected to other potential habitat areas within a wider landscape matrix.</p>



Guild / Species	Key Habitat Feature	Comment
Glossy Black-Cockatoo	Foraging Resources	Areas of the site supporting Black She-Oak would offer suitable periodic foraging resources for Glossy Black-Cockatoo.
	Roosting & Nesting	Suitable areas of roosting and nesting habitat are available in the form of forest areas (roosting) and large hollow trees (nesting).
	Connectivity	Given the high mobility of this species, the site is considered viably connected to other potential habitat areas within a wider landscape matrix.
Woodland Birds <i>Incl.</i> Dusky Woodswallow Speckled Warbler Varied Sittella	Foraging Resources	Suitable foraging resources are present for all woodland bird species in forested areas, and immediate surrounds for some species more tolerant of open spaces.
	Roosting & Nesting	Suitable roosting and nesting habitat is present for all species.
	Connectivity & Patch Size	The site supports native vegetation that is fragmented into smaller areas by previous clearing. Woodland birds tend to prefer larger patch areas, such as those occurring to the south. The site is unlikely to be preferentially utilised over such areas by any local populations.
White-bellied Sea-Eagle	Foraging Resources	No likely foraging habitat present on site.
	Roosting & Nesting	Site provides marginal potential breeding habitat based on height of trees and proximity to development.
	Connectivity	Given the high mobility of these species, the site is considered viably connected to other potential habitat areas within a wider landscape matrix.
Forest Owls <i>Incl.</i> Barking Owl Powerful Owl Masked Owl	Large hollows	Large hollows are present on the site, however based on the disturbed and fragmented nature of the site and the style of hollows present, the site would be considered marginal nesting habitat.
	Diurnal Roosts	Forest Owls may either roost in large tree hollows, or within a suitable tree, often associated with thick vegetation / creek lines. Parts of the site near the creek would offer marginal habitat in this regard.
	Prey Species	Prey species were not recorded during the recent survey; however, records are known from the wider area and suitable habitat is present for prey species.
	Home range	Forest Owls have a large home range, foraging principally within 2km of their nest site to meet their hunting requirements. If utilised, the site would be a small component of a larger home range within the wider locality.
Tiger Quoll (SE Mainland popn)	Foraging	Given the disturbed and fragmented nature of the site, the site would not be considered preferred foraging habitat.
	Shelter and Nesting	There are some hollows bearing trees that would be suitable den sites, however, again given the disturbed and fragmented nature of the site as well as the managed understory the site would provide at best, marginal shelter and nesting habitat for Quolls.
	Home range and Connectivity	Quolls have a large home range up to about 500ha to meet their hunting requirements. If utilised, the study area would be a very small component of a larger home range within the wider locality. Links to offsite habitat areas are available in several directions.
New Holland Mouse	Foraging	Given the disturbed and fragmented nature of the site, the site would not be considered preferred foraging habitat.
	Shelter and Nesting	Hollow logs, timber debris and dense vegetation preferred. As the site is subject to ongoing vegetation management, these features are generally absent from the site.



Guild / Species	Key Habitat Feature	Comment
	Home range and Connectivity	Tend to occupy small home ranges, so wider site could offer a complete home range however, given the lack of suitable habitat, it is unlikely that the site would form a home range for this species. Links to offsite habitat areas are available in several directions.
Koala	Foraging	Given the density of a preferred feed tree on site (<i>Eucalyptus haemastoma</i>) the site would be considered to provide suitable foraging habitat.
	Home range and Connectivity	Given a typical home range of 5ha to 25ha, the site may provide part or all of home range for one individual. Links to offsite habitat areas are available in several directions.
Squirrel Glider	Foraging	The species requires access to suitable areas for seasonal foraging movements, and feeds on nectar, pollen, plant exudates (e.g. wattle and eucalypt sap), invertebrates, and honeydew (sugary exudate from insects), and rarely small vertebrates such as nestling birds. A good supply of nectar in winter seems important, however tree species encountered on site typically flower in summer. The site contains a variety of flowering trees and shrubs. Site contains a large number of bloodwoods with numerous feeding scars indicating seasonal use of the site by glider species.
	Shelter and Nesting	Suitably sized hollows occur within the study area to offer potential nest sites.
	Home range and Connectivity	Given the presence of habitat areas on site with connections to offsite areas of habitat, it is considered that suitable home range and connectivity exists to maintain viable populations. Squirrel Gliders have been confirmed to be present on the former Coal & Allied site to the south.
Microbats Incl. Large-eared Pied Bat Eastern False Pipistrelle Little Bentwing-bat Eastern Bentwing-bat Eastern Freetail Bat Southern Myotis Yellow-bellied Sheathtail-bat Greater Broad-nosed Bat Eastern Cave Bat	Roosting & Maternity Habitat	<p>The presence of numerous hollow bearing trees means that suitable micro-bat roosting habitat is available for species that utilise such features.</p> <p>Southern Myotis, which was recorded on site, typically roosts within 200m of feeding habitat, based on this habitat constraint, 0.25ha of the site is within 200m of the ponds associated with the nearby Waste Water Treatment Plant.</p> <p>No caves or other similar structures were identified for species requiring such features for roosting / maternity habitat.</p>
	Foraging	<p>Whilst the various microbat species have differing micro-habitat preferences for foraging habitat, they all seek insects in and around forested areas, and may also at times forage around proximate developed areas.</p> <p>Southern Myotis typically forages over waterbodies or in forested vegetation within 20m of waterbodies. This habitat feature is absent from the site.</p>
Grey-headed Flying-fox	Roost Camp Areas	No roost camp is present within the study area. It is considered that the wider site, as with many other forested patches, would have some limited potential to be utilised as a roost camp, particularly near the creek.
	Foraging Areas	The study area offers suitable seasonal foraging potential. Given the species high mobility (up to 50km from camp for foraging at night), seasonal visits would be expected.
Wallum Froglet	Habitat	Wallum Froglet are restricted to freshwater swamps in lowland coastal areas and are found in associated vegetation communities such as heath, sedgeland and woodland on nutrient-poor sandy soils. Acidic swamps and lakes in these areas provide essential breeding habitat for wallum-dependent frog species. While the species was recorded on the site to the south of the subject site, the habitat features required by this species are absent.



10.0 7 Part Test Assessment

Section 5A of the *Environmental Planning & Assessment Act 1979* (EP&A Act) lists seven factors that must be taken into account in determining the significance of potential impacts of proposed activities on threatened species, populations, ecological communities and/or their habitats as listed within Biodiversity Conservation Act 2016 (BC Act).

The 7 part test is used to determine whether there is likely to be a significant impact, and thus whether a Species Impact Statement (SIS) is required to accompany a development application.

For the purposes of the 7 part test assessment, the **subject site** is the area directly affected by proposed development / vegetation clearing. The **study area** includes both the subject site and adjacent habitat areas including the E2 lands to the east and former Coal & Allied lands to the south that may be subject to indirect impacts from the vegetation clearing and development.

(a) *in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction*

The proposed development involves the removal of approx. 3.7ha of native vegetation, which solely comprised Narrabeen Doyalson Coastal Woodland. The remainder of the site comprised rank grasslands, lands previously cleared and/or highly disturbed, including the cleared pad areas and numerous trailbike tracks.

Plants:

The development as proposed will result in the removal of around 15 individual *Angophora inopina* (exact counting difficult due to coppicing nature) and eight clumps of *Tetratheca juncea*. Both species are commonly found in the immediate locality in intact Coastal Plains Scribbly Gum Woodland and associated communities.

Numerous records exist for these species within the locality of the site, and the populations found on site are not considered to be of any notable significance to a local population of these species given they do not occur at the geographical limit of the species' range, nor are they likely to be a key source of dispersal or genetic integrity for the species.

The RPS report (2010) for the then Coal & Allied lands immediately to the south of the subject site identified 3,109 individuals of *A. inopina* of which 2,411 will be retained within the offset lands for the development. Likewise, 10,089 individuals of *T. juncea* were located of which 6,591 will be retained within the offset lands. The above numbers show, that while the development of the subject site will contribute to incremental loss of the threatened



species, the subject site does not represent an important component of the local population for either species and removal is unlikely to place these local population at risk of extinction.

There is a recommendation for specimens of *A. inopina* to be retained within the proposed development and for the species to be used within the landscaping for the proposed development if possible, though such is encouraged but not mandatory to avoid a significant impact. It is recommended that seed collection occur from the mature *A. inopina* within the site for propagation and reuse within the landscaping of the site.

The removal of any *T. juncea* or *A. inopina* from the development site will incur a BAM credit liability to be quantified in the Biodiversity Development Assessment Report that will accompany any future DA for the development.

For *Corunastylis sp.* Charmhaven, although it has recently been determined that the site may provide suitable habitat for the species, targeted searches during the known flowering period failed to record any individuals within the subject site. Given this result, it is considered unlikely that the species is present or that the development will pose a significant impact the species.

Nectivorous Birds:

Little Lorikeets have been recorded within the former Coal & Allied site and it is assumed that they could periodically utilise the site for foraging and potentially breeding. Given the absence of any specific evidence of continued use of, or residence within the site, it is not considered that the Little Lorikeet, Regent Honeyeater or Swift Parrot will be significantly impacted by the proposal. Given that Little Lorikeets nest in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed to be cleared, and that a supervising ecologist is on hand during clearing to rescue any potentially affected native fauna. Contact with the LMBC confirms that the site is not mapped as important habitat for Regent Honeyeater or Swift Parrot.

Cockatoos:

Given the absence of any specific evidence of continued use of, or residence within the site, the minimal amount of foraging habitat and the relative abundance of suitable habitat within the wider locality, it is not considered likely that the Glossy Black-Cockatoo will be significantly impacted upon by the proposal. Given that these species nest in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed to be cleared, and that a supervising ecologist is on hand during clearing to rescue any potentially affected native fauna.

Woodland Birds:

Varied Sittellas have been recorded within the former Coal & Allied site and it is assumed that they could periodically utilise the site for foraging and potentially breeding. No records exist for Dusky Woodswallow or Speckled Warbler. Given the absence of any specific



evidence of continued use of, or residence within the site, and the relative abundance of suitable habitat within the wider locality including preferred larger intact habitat areas, it is not considered likely that the listed woodland birds will be significantly impacted upon by the proposal. However, as the Dusky Woodswallow nests in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed to be cleared, and that a supervising ecologist is on hand during all clearing works to rescue any potentially affected native fauna. In addition, the retention of hollow-bearing trees within the development site is highly encouraged. Supplementary nest boxes are to be installed in appropriate densities within the retained vegetation on site prior to clearing works, as dictated within a future RMP, to provide additional roosting locations for any displaced fauna.

Raptors:

The White-bellied Sea Eagle was only observed flying over the site. There is no likely foraging habitat present on the site. Nesting potential on the site is considered low given the height of trees, disturbed nature of the site and proximity to development. Given the absence of any specific evidence of use of, or residence within the site, and the relative abundance of habitat within the wider locality for this highly mobile species, it is not considered likely that the White-bellied Sea Eagle will be significantly impacted upon by the proposal.

Forest Owls:

Given the absence of any specific evidence of use of, or residence within the site, and the relative abundance of habitat within the wider locality for these highly mobile species, it is not considered likely that the Masked Owl, Powerful Owl or Barking will be significantly impacted upon by the proposal. Given that these species nest in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed to be cleared, and that a supervising ecologist is on hand during clearing to rescue any potentially affected native fauna.

Quolls:

Given the absence of any specific evidence of use of, or residence within the site, and the relative abundance of habitat within the wider locality for this mobile species, it is not considered likely that the Spotted-tailed Quoll will be significantly impacted upon by the proposal. Given that these species den in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed to be cleared, and that a supervising ecologist is on hand during clearing to rescue any potentially affected native fauna.

Rodents:

Given the disturbed understorey on the site and the absence of any specific evidence of use of, or residence within the site, and the relative abundance of habitat within the wider



locality, it is not considered likely that the Eastern Chestnut Mouse will be significantly impacted upon by the proposal.

Koala:

Given the absence of any specific evidence of use of, or residence within the site, and the relative abundance of habitat within the wider locality for this species, it is not considered likely that the Koala will be significantly impacted upon by the proposal. Further considerations to impact on Koala are in Section 10 with assessment against SEPP44.

Gliders:

Given the abundance of glider feed scars on *Corymbia gummifera* (Red Bloodwood) it is clear that the site is used intermittently by Glider species (either Sugar Gliders or Squirrel Gliders). Given the Squirrel Gliders were recorded on the former Coal & Allied site to the south it is assumed that Squirrel Gliders utilise the site to some degree. While connectivity through the subject site will be removed by the proposed development, no vegetation will become isolated as connectivity around the subject site will remain post development.

Given that Squirrel Glider nest in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed to be cleared, and that a supervising ecologist is on hand during all clearing works to rescue any potentially affected native fauna. In addition, the retention of hollow-bearing trees within the development site is highly encouraged.

While Squirrel Glider has not been recorded during the current assessment, there are numerous records from the locality and as such the vegetated parts of the site is considered habitat for the species. The removal of any Squirrel Glider habitat from the development site will incur a BAM credit liability to be quantified in the Biodiversity Development Assessment Report that will accompany any future DA for the development.

Microbats:

For the cave dwelling species, namely Large-eared Pied Bat, Eastern Bentwing-bat and Little-Bentwing-bat, the site is foraging habitat only. Foraging habitat will remain on site post development. These species will not be significantly impacted by the proposed development.

For the hollow dwelling species, there is potential for individuals to be impacted upon by clearing of hollow trees. However, given the abundance of hollow bearing trees in the locality, it is considered very unlikely that any local population of these species is solely dependent on the resources on site in the areas proposed to be cleared. As such, it is considered unlikely that the development as proposed will significantly impact any local population of these species.

Given that these species nests in tree hollows, it is considered an important safeguard measure that pre-clearance surveys of hollow trees are carried out within areas proposed



to be cleared, and that a supervising ecologist is on hand during clearing to rescue any potentially affected native fauna.

The removal of any hollow bearing trees within 200m of an open water body will incur a BAM credit liability for Southern Myotis to be quantified in the Biodiversity Development Assessment Report that will accompany any future DA for the development.

Grey-headed Flying-fox:

Given the absence of any specific evidence of continued use of, or residence within the site, and the relative abundance of habitat within the wider locality for this highly mobile species, and the continued availability of potential resources post development, it is not considered likely that the Grey-headed Flying-fox will be significantly impacted upon by the proposal.

Frogs:

Given the absence of any specific evidence of continued use of, or residence within the site, and the absence of specific “wallum” habitat within the site for this species, it is not considered likely that the Wallum Froglet will be significantly impacted upon by the proposal.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were recorded, or likely to be present.

(c) in the case of an endangered ecological community, whether the action proposed:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

No Endangered Ecological Communities were identified on site.



(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The proposed development involves the removal of approx. 3.7ha of native vegetation, being Narrabeen Doyalson Coastal Woodland habitat. Negligible amounts of native vegetation will remain within the proposed development area.

This vegetation is not EEC vegetation.

This vegetation offers suitable habitat resources for many native species, including some of the threatened fauna species as discussed above.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The development as proposed will contribute to habitat loss and a reduction of corridor quality and width as a result of native vegetation clearing. Despite vegetation clearing occurring on site, no vegetation patches outside of the subject site will become isolated due to the proposed development, nor will viable connectivity for key species such as the Squirrel Glider be lost within the surrounding landscape.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

While the site contains a high density of hollow bearing trees with a wide variety of hollow types suitable for a variety of species, the density of hollows is typical for the vegetation types in the locality.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

No critical habitat is present.



(f) *whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan*

The development as proposed will contribute to habitat clearing and fragmentation, and may increase exposure to human hazards (e.g. vehicle strike for Masked Owl). These processes are nominated threats within the *Recovery Plan for Large Forest Owls* (DEC 2006).

No relevant Threat Abatement Plans have been developed that would apply to the site or proposed development.

(g) *whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process*

The development has potential to contribute to the following KTP's:

- *Anthropogenic Climate Change*

The development as proposed will contribute in a small way to the processes causing Anthropogenic Climate Change via the removal of forest vegetation which acts as a carbon sink. It is not considered the contribution to this KTP in this instance is of a notable magnitude.

- *Clearing of native vegetation*

The development as proposed will involve the removal of approx. 3.7ha of native vegetation. This loss is a direct contribution to this KTP, and contributes to incremental habitat loss in the locality.

- *Infection of frogs by amphibian chytrid causing the disease chytridiomycosis*

There is potential for development of the site to inadvertently introduce chytrid into the site. Given the recorded presence of Wallum Froglet on the adjacent site (albeit in a separate catchment to the location of the site), it is recommended that appropriate hygiene controls are put in place for all construction related activity to limit such potential.

- *Infection of native plants by *Phytophthora cinnamomi**

There is potential for development of the site to inadvertently introduce *Phytophthora cinnamomi* into the site, which may lead to infection and degradation of retained and adjacent vegetation areas. As such, it is recommended that appropriate controls are put in place for all construction related activity to limit such potential.



- *Loss of hollow bearing trees*

Existing hollow-bearing trees would be lost as a result of the proposed development. To reduce impacts, retention of hollow-bearing trees within the development site wherever possible is highly encouraged.

- *Removal of dead wood and dead trees*

The development as proposed will remove areas that contain dead wood and dead trees. Consideration should be given to relocating larger and/or more significant habitat features such as hollow logs and potential future den sites into retained areas.

- *Invasion and spread of aggressive weed species (several listed).*

Parts of the site already support numerous weed species. These areas will be developed removing such weeds from the site.



11.0 SEPP 44 Assessment

Schedule 2 of State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44) lists tree species which are considered indicators of potential Koala habitat as they are known to be utilised as feed trees by Koalas. The presence of any of these tree species on a site proposed for development triggers the requirement for an assessment of the study site for ‘Potential Koala Habitat’ (PKH).

PKH is defined in the SEPP as:

“areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.”

Vegetation survey has identified the presence of one Schedule 2 listed tree species, namely *Eucalyptus haemastoma* (Broad-leaved Scribbly Gum).

E. haemastoma is the dominant or co-dominant canopy species across the majority of the areas on site comprising native vegetation. The majority of these areas are proposed to be developed.

As such, it was necessary to consider the potential presence of ‘Core Koala Habitat’ (CKH).

CKH is defined in the SEPP as:

“an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population”.

Ecological field surveys across the site have not revealed any signs of Koalas or indications of their presence.

Atlas Data reveals 13 records from within 10km. Seven records pertain to the introduced and now expatriated population from Pulbah Island. The most recent and nearby records relate to a series of 2003 records from the South Wallarah Peninsula area at a distance of greater than 2.7km from the site.

Based on the absence of evidence on site from recent ecological surveys and the paucity of historical records, it is clear that the site would not constitute CKH as defined by the SEPP.

As such, no further provision of the policy would apply to the site.



12.0 EPBC Act Assessment

A search was conducted in November 2016 of Matters of National Environmental Significance (MNES) as relevant to the Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act). The following MNES are considered in this assessment.

World Heritage Properties:

The site is not a World Heritage area, and is not in close proximity to any such area.

National Heritage Places:

The site is not a National Heritage place, and it is not in close proximity to and such places.

Wetlands of International Significance (declared Ramsar wetlands):

The site is not proximate to any wetlands of international significance.

Great Barrier Reef Marine Park:

The site is not part of, or within close proximity to, the Great Barrier Reef Marine Park.

Commonwealth Marine Areas:

The site is not part of, or within close proximity to, any Commonwealth Marine Area.

Threatened Ecological Communities:

The Protected Matters Search revealed that the Endangered ecological community “*Posidonia australis* seagrass meadows of the Manning-Hawkesbury ecoregion” was found to be likely to occur within the search area (10km radius from the site). However, this ecological community does not occur on site, and none of the other vegetation communities present would qualify as TEC’s.

Threatened Species:

Threatened species listed within the EPBC Act that have been recorded on site during fieldwork, from previous database records, or from local anecdotal information include:

- *Angophora inopina* Charmhaven Apple
- *Tetratheca juncea* Black-eyed Susan

The development as proposed will result in the removal of around six individual *A. inopina* and eight clumps of *T. juncea*. Numerous records exist for the species within the locality of the site, and the population found on site is not considered to be of any notable significance to a local population of the species given it does not occur at the geographical limit of the



species' range, nor is it likely to be a key source of dispersal or genetic integrity for the species.

The RPS report (2010) for the former Coal & Allied lands immediately to the south of the subject site identified 3,109 individuals of *A. inopina* of which 2,411 will be retained within the offset lands for the development. Likewise, 10,089 individuals of *T. juncea* were located of which 6,591 will be retained within the offset lands. The above shows that while the development of the subject site will contribute to incremental loss of the threatened species, the subject site does not represent an important population for either species and removal is unlikely to place the local populations at risk of extinction.

Tetratheca juncea is considered in **Section 13**.

Based on this, it is not considered likely that this species will be significantly impacted by the proposal. The development will contribute to the incremental loss of this species in the locality.

Other EPBC listed species such as *Anthochaera phrygia* (Regent Honeyeater) and *Lathamus discolor* (Swift Parrot) were also assessed as having some potential to visit the site, but the resources therein are either proposed to be retained and enhanced (riparian areas) or are not considered preferred foraging resources in a broader context. Such areas have not been mapped as "High Value" habitat for these species in the Lower Hunter (Roderick et al, 2013). As such it is not considered that the development of this land as proposed is likely to significantly impact these species.

Any other EPBC listed entities that are recorded as part of the BDAR surveys may require further assessment.

Migratory Species:

A number of EPBC listed migratory species have some potential to visit the site on an irregular basis. However, it is not considered that the development of this land as proposed is likely to significantly affect the availability of potential habitat for such mobile species, or disrupt migratory patterns.

EPBC Act Assessment Conclusion:

Consideration of the EPBC Act revealed that impacts on Matters of National Environmental Significance will occur, principally being the removal of specimens of *Angophora inopina* and *Tetratheca juncea*. Given the abundance of these species in the locality the loss of the individuals on site, while contributing to incremental loss, it is unlikely to lead to a significant impact.

However, the proponent should consider the need to engage with Department of Environment to ensure the proposed approach is suitable.



13.0 EPBC Act referral guidelines for the vulnerable Black-eyed Susan

The guidelines set out seven points to consider when assessing the impacts of a development on *Tetratheca juncea*.

1. Could the impacts of the action occur within the modelled distribution of Black-eyed Susan?

The site is located within the area mapped as the Central Coast metapopulation. This means impacts of this project will occur within the modelled distribution of *Tetratheca juncea*.

2. Could the impacts of the action affect habitat for the Black-eyed Susan?

T. juncea is known to occur in Coastal Plains Scribbly Gum Woodland.

T. juncea on the subject site have been identified in Narrabeen Doyalson Coastal Woodland, which is commensurate with Coastal Plains Scribbly Gum Woodland.

This means impacts of this project will affect habitat for *T. juncea*.

3. Has surveying for Black-eyed Susan occurred using recommended methods?

A survey was conducted by a trained ecologist within the peak flowering period (1 September to 31 October), the date being 15th September 2016.

As the area to be developed is less than 30ha and the shrub layer and understorey are largely absent from the site, a meander survey was conducted over the entirety of the subject site and was considered adequate. These surveys were recorded on GPS trackers. Identified plant clumps were counted and recorded on the GPS tracker. These records, are presented in **Figure 5**.

Over the 5.5ha study area, 8 clumps of *T. juncea* were identified.

The EPBC referral guidelines recommend:

“Preliminary investigations should compare the number of flowers to the number of buds. A minimum of 75 per cent of buds should be in flower before conducting surveys at a proposed affected area.”

Given that *T. juncea* is difficult to identify when only budding and not flowering, and given that other survey guidelines for this species including ‘Lake Macquarie *Tetratheca juncea* Planning and Management Guidelines’ do not request a flowering to budding ratio, this recommendation is considered impractical for the site. The targeted survey within the known peak flowering period is considered sufficient to observe the species during its peak flowering period.



4. Could the action impact on an important population of Black-eyed Susan?

The observed *T. juncea* were considered against the following criteria for important populations:

- **Has greater than 1000 plant clumps**

Less than 1000 plant clumps were observed. Consideration of Atlas records identifies approximately 690 records within 10km of the site.

- **An area of habitat has an average estimate plant clump density of 20 clumps/hectare or greater**

Density of *T. juncea* in the study area is 0.7 clumps/hectare.

- **Occurs in rare habitat**

T. juncea has been observed in Narrabeen Doyalson Coastal Woodland, which is not considered rare habitat.

- **Occurs in an area of “important habitat” and has greater than 500 plant clumps**

Observed *T. juncea* is not located in an area mapped as ‘important habitat’ in Map 4a of the guidelines. 8 plant clumps were observed in the development area.

- **Occurs at or near the distributional limits of Black-eyed Susan**

Observed *T. juncea* are well within the distributional limits of the species.

- **Occurs in close proximity to a protected area where Black-eyed Susan is known to occur. Close proximity includes within 500m if connected by a suitable habitat corridor such as native vegetation**

The closest protected area where *T. juncea* is known to occur is within the Lake Macquarie State Conservation Area (Chain Valley Bay), which is located 1km south of the development site.

Over 10,000 *T. juncea* plants were located within lands directly south of the subject site. Although these lands are proposed to be developed approx. 6,500 individuals will be retained within conservation lands to the south and west, with another likely approx. 200 to be retained within landscape areas of the development. This population is connected to the site by suitable habitat with the closest individual being approx. 200m from the subject site.

5. Could the action impact on the species as a whole?

The action could impact on the species as a whole if it is likely to:



- **Adversely affect habitat critical to the survival of the species**

T. juncea occurs relatively commonly in the Gwandalan area, and the small number of individuals to be affected by the proposed development would not constitute a significant proportion of the local population.

- **Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

Approx. 5.5ha of suboptimal habitat is to be removed as part of the proposed development. With the large number of records within the locality and surrounding lands, impacts to local populations will be minimal and are unlikely to result in *T. juncea* to decline within the locality.

- **Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**

There is potential for the accidental introduction of invasive flora species during construction works. However, there are simple and effective mitigation and avoidance measures that can be implemented to reduce the likelihood of introduction of invasive flora species (see **6 below**).

- **Introduce disease that may cause the species to decline**

There is potential for the accidental introduction of *Phytophthora cinnamomi* during construction works. However, there have been no reports of *Phytophthora* impacting *T. juncea* and there are simple and effective mitigation and avoidance measures that can be implemented to reduce the likelihood of introduction of disease (see **6 below**).

- **Interfere substantially with the recovery of the species**

The removal of 8 plants and 5.5ha of suboptimal habitat for the species is considered unlikely to interfere substantially with the recovery of the species.

6. Is the project's impact mitigation best practice so that it may reduce the significance of its impacts?

Impact mitigation measures to be undertaken as part of this project are italicised.



Threat	Impact	Mitigation
<p>Habitat loss and fragmentation –</p> <p>Connectivity is particularly important for maintaining gene flow given Black-eyed Susan is pollinator limited and has limited dispersal ability</p>	<ul style="list-style-type: none"> • Reduced population size • Loss of genetic variation • Reduced opportunities for outcross pollination 	<ul style="list-style-type: none"> • Retain habitat patches known or likely to contain black-eyed Susan and manage for the species. • Manage key threatening processes applicable to the site. • Design the proposed development such that: <ul style="list-style-type: none"> • The development footprint avoids habitat disturbance • Asset protection zones include roads, easements and services (N/A) • Asset protection zones are constructed outside of buffer and/or corridor widths (N/A) • Easements and services are integrated and co-located into a single corridor, and • No services are built on conservation land. • Provide suitable buffer zones and corridors for pollinator movement and potential habitat: <ul style="list-style-type: none"> • Buffer zones around habitat sites should be greater than 30m. • Vegetation corridors connecting otherwise disconnected habitat sites should be greater than 20m wide and consist of native vegetation such as native grassland. (N/A)



Threat	Impact	Mitigation
		<ul style="list-style-type: none"> Restrict access by fencing populations to minimise risk of accidental damage or destruction of plants: Fence habitat on at least three sides to limit use as a thoroughfare. Erect interpretive/educational signage to highlight conservation significance.
Inappropriate fire regimes e.g. high frequency of slow cool fires, and high intensity fires	<ul style="list-style-type: none"> Elimination of plant clumps Reduction in flowering plant numbers and diversity 	<ul style="list-style-type: none"> Develop and implement an appropriate fire management regime. N/A No more than one quick, low intensity fire event in an eight-year period. N/A Avoid slow cool or high intensity fire events. N/A
Introduction of weeds and disease e.g. species may be adversely affected the plant pathogen <i>Phytophthora cinnamomi</i>	<ul style="list-style-type: none"> Competition for resources Smothering of plant clumps Loss of plant clumps 	<ul style="list-style-type: none"> <i>Avoid landscaping that would introduce weeds, Phytophthora cinnamomi or non-indigenous plants.</i> Assess the site for the presence of <i>Phytophthora cinnamomi</i> and if present, undertake measures to prevent its spread and reduce its impact. <i>Implement strict hygiene control procedures (on maintenance and construction vehicles, machinery, personnel and revegetation projects) to ensure weeds and Phytophthora cinnamomi are not spread or introduced.</i> <i>Avoid broad-scale chemical and pesticide use and avoid drift of herbicide onto native vegetation. For example use carefully applied targeted spot-spraying or 'wiping'.</i> Use sealed roads and footpaths outside the site boundary to limit the spread of weeds and help control fire.



Threat	Impact	Mitigation
<p>Changes in soil and hydrology e.g. changes in urban or agricultural run-off and rubbish dumping</p>	<ul style="list-style-type: none"> Altered hydrological regimes, nutrient load and soil permeability Soil loss, disturbance and compaction Pollution 	<ul style="list-style-type: none"> <i>Control hydrological regimes including stormwater management.</i> <i>Hydrological control mechanisms should be constructed within the development area to control altered water flow.</i> Developments should be designed down-slope of a subpopulation within a minimum 30m buffer zone applied. If not possible, then: <ul style="list-style-type: none"> Larger buffer areas should be implemented and urban drainage directed away from the subpopulation. Sediment basins should be constructed upslope of subpopulations if potential runoff from fertilising activities may occur. Avoid soil disturbance near plants. <i>Prevent stock grazing through the habitat.</i> <i>Control feral animals and invasive species on the project site.</i>
<p>Reduction in flowering plant numbers and diversity –</p> <p>Black-eyed Susan flowers produce no nectar and so rely on the presence of surrounding nectar producing flowers to attract pollinators</p>	<ul style="list-style-type: none"> Decline in pollinator numbers affecting recruitment Altered canopy resulting in invasion by weed species Competition for resources 	<ul style="list-style-type: none"> See mitigation for habitat loss and fragmentation. Improve degraded areas of habitat on the project site (revegetated areas should be established prior to the removal of occupied habitat).



7. Could the action require a referral to the federal environment minister for significant impacts on the Black-eyed Susan?

The project would not require a referral. *T. juncea* has been observed in the study site at a density of 0.7 clumps/hectare, is not present in rare habitat and is not considered an important population. As such, significant impacts to the local population are considered highly unlikely.

There may however be potential for indirect impacts to occur, as suggested by the guidelines. In particular, the potential for the plant pathogen *Phytophthora cinnamomi* to be introduced to the site and surrounding areas during development works. However, given that effective procedures exist to limit the spread of *Phytophthora* and that these can be easily implemented on the development site, the likelihood of infection is very low.



14.0 Vegetation Corridor Considerations

Further to the 7-part test in **Section 9**, the potential for the proposed development to have significant impact upon the viability of local and regional ecological corridors needs to be assessed.

Ecological corridors are crucial to providing connectivity for wildlife across the landscape. These characteristics make the landscape habitable for communities of plants and animals, allowing their movement, adaptation and evolution. Retention of ecological connectivity is vital to conservation. Retaining functioning corridors may reduce extinction rates, increase recolonisation after local extinction, and permit gene flow between reserves. They also allow an interchange of wildlife between different habitat types, allow wildlife to migrate, and let species change environments in response to environmental change (Thomas 1991). Barriers to these connections, such as fragmentation threaten long-term ecological function (DSEWPC 2012).

The subject site exists within an approx. 1.5km corridor between Summerland Point and Gwandalan, this corridor links the Point Wollstonecraft peninsula to areas of similar habitat to the south and wider locality. Given its size, width and habitat features found therein it is likely that it exists as an inhabited corridor populated by variety of different species. Being a peninsula, this corridor is the only connection to the wider landscape allowing migration and gene flow between remnants. Maintaining this corridor is therefore vital to biodiversity within the Point Wollstonecraft peninsula.

Smith (2002) discusses the impact of remnant size and connectivity on squirrel glider populations within the Wyong Shire. "Surveys of Squirrel Gliders in remnants on the Wyong coastal plain have shown that glider density and probability of occurrence in remnants increases significantly with increasing remnant size. Glider density and occurrence in remnants is also related to the presence and size of corridor links with adjoining remnants and the width of any gaps in corridors and links" (Smith, 2002).

To allow for the continued persistence of species within the peninsula and to maintain its habitat suitability, the corridor must continue to allow species unimpeded movement through it. The proposed development would remove an area of 5.5ha, 250m in width from the central eastern section of the discussed corridor. An approx. 1km wide corridor would remain west of the subject site and an approx. 180m wide area to the east. Although the development sits within this important ecological corridor and would result in an overall reduction in its size and quality, it is determined that the corridor will continue to provide viable connection between remnants in the north and south and that connection between patches will not be lost.

14.1 Squirrel Glider – Vegetation Corridor Considerations

The potential for the proposed development to have significant impact upon the local Squirrel Glider population was assessed against the LMCC *Draft Squirrel Glider Planning and*



Management Guidelines (2015) (in the absence of CCC guidelines). By considering the Squirrel Glider and their lifecycle needs, many other species are also inadvertently considered. The assessment is provided in **Table 5** below.

Table 5 – Squirrel Glider – Vegetation Corridor Assessment

Assessment Criteria	Proposed Development
An area of Squirrel Glider habitat of more than 4ha will be cleared.	Up to 3.7ha of habitat will be removed or modified as part of the proposed development.
and/or	
More than 1ha of habitat will be cleared and the habitat patch size will be reduced to less than 4ha.	Up to 3.7ha of habitat will be removed or modified, the patch size is an area of over 500ha extending north up into Point Wollstonecraft south to Lake Munmorah and east to the Pacific Highway.
and/or	
There is greater than 5% loss of habitat patches with an area of more than 10ha.	The removal or modification of 3.7ha of vegetation within the immediate habitat represents a loss of <1% of over 500ha of habitat within the patch.
and/or	
Habitat connectivity to a habitat patch will be lost, or narrowed to a width that is not suitable for maintaining in the long term.	The subject site sits on the central eastern edge of a approx. 1.5km wide corridor connecting vegetation south of the subject site up to Point Wolstonecraft.in the north. This corridor is in the centre of a patch of “metahabitat” of approx. 500ha. The width of this corridor will be reduced by approx. 250m. leaving large areas of vegetation continuing to connect habitat to the north and south of the site both to the east and west.

As can be seen in **Table 5**, significant impact on Squirrel Glider is unlikely to occur based on the assessment criteria within the Guidelines.



15.0 Control Measures for all Works

Prior to construction of any stage commencing in any area, the following controls must be implemented, regularly inspected and maintained for the entirety of future construction stages.

- Best-practice erosion and sediment controls as detailed in the *Blue Book*;
- Disease and pathogen controls;
- Tree Protection Zones (TPZ) for retained trees within the site.



16.0 Avoid and Minimise

Section 8 of the BAM provides a list of measures that need to be taken into consideration during project planning and design, to minimise impacts upon native vegetation, habitat and other prescribed biodiversity values. One of the overarching principles of the Biodiversity Offsets Scheme is to avoid and minimise impacts to biodiversity within the development.

As the BDAR consent authority, Council is also bound to consider the practical application of “Avoid / Minimise / Offset”, with provision of Offsets being seen as a last resort. As to how Councils will apply the concept of “Avoid / Minimise” is likely to vary considerably from LGA to LGA, but there is potential for such to be utilised to restrict full site development. It is likely that “avoid and minimise” considerations will involve the retention of a few mature trees where they fit within the proposed development layout, endemic species commensurate with the vegetation community found onsite will be used for landscape planning in and around the development including the collection, propagation of *Angophora inopina* seed from within the site. It is to be noted that if no trees are to be retained, it is not foreseen that Council would restrict development where offsets are provided.

Within the project planning phase the site is strategically placed within the suburbs of Gwandalan and Summerland Point and is the logical location for a development of this type which is predominantly providing services for the local community. A review of aerial photography indicates that for a development of this scale, the site subject to the planning proposal is the most appropriate within the locality of Gwandalan/Summerland Point. A review of the aerial photography indicates that the site is in a moderately disturbed condition when compared with other similar sized allotments with the locality which generally show intact native vegetation.

Across the subject site, the vegetation condition within the area of remnant vegetation is relatively uniform, i.e. there is no area of the site with a notionally higher Vegetation Integrity Score than any other part of the site. As discussed above the site is moderately disturbed, leading to the conclusion that there is no logical part of the site that should be avoided.

The locations of the threatened plant species within the site are relatively spread out and located within degraded parts of the site, again there is no logical area to retain the small number of threatened plant specimens recorded within the site. Likewise both *A. inopina* and *T. juncea* are abundant within the locality as discussed within the 7 Part Test. Both species are listed as vulnerable under both State and Federal Legislation. *A. inopina* has a Biodiversity Risk Weighting of 1.0 and *T. juncea* has a Biodiversity Risk Weighting of 2.0.

There has been an attempt within the proposal to avoid and minimise impacts on native vegetation, threatened or regionally significant flora and fauna, populations and ecological communities, this has included removing land zoned E2 Environmental Conservation from the planning proposal. It is also recommended that the proponent financially contribute to revegetation works with the E2 zoned handle that projects into the site.



17.0 Serious and Irreversible Impacts

The concept of Serious and Irreversible Impacts (SAIIs) has been devised under the new legislation. Candidate SAIIs are determined by decision makers (i.e. Council) for each particular threatened species / community based upon four (4) principles listed within the *Guidance and criteria to assist a decision maker to determine a serious and irreversible impact* (OEH 2017) and include:

- recent rapid rate of decline in numbers;
- small population size;
- very restricted distribution; or
- a threatened entity being typically unresponsive to conservation actions.

Any impacts upon a species / community listed as a 'SAII candidate species' must be assessed for significance and, if deemed to be a SAI, the decision maker i.e. the Minister for the Environment is 'required to refuse to grant development consent' for any Biodiversity Certification under Part 8 of the BC Act. This assessment is undertaken in light of any avoid and minimise measures that have been developed.

No candidate SAI vegetation communities found are considered likely to be found within the site.

Reference to *Guidance to assist a decision-maker to determine a serious and irreversible impact* (OEH 2017) as well as the preliminary *BAM Candidate Species Report* generated by the BAM Calculator for the site indicates that following SAI Candidate Species have some potential to occur on the site:

- *Astrotricha crassifolia* (Thick-leaf Star-hair);
- *Corunastylis* sp. Charmhaven;
- *Genoplesium insigne* (Variable midge orchid);
- Large-eared Pied Bat (*Chalinolobus dwyeri*);
- Broad-headed Snake (*Hoplocephalus bungaroides*);
- Swift Parrot (*Lathamus discolor*);
- Little Bentwing-bat (*Miniopterus australis*);
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Brush-tailed Rock-wallaby (*Petrogale penicillata*).

It should be noted that *Corunastylis* sp. Charmhaven was not listed as known or predicted to occur within the PCT 1636 identified on site, and the nearest records located in excess of 10km from the site, therefore no targeted survey was undertaken (as detailed in Letter to QMC Property Group dated 25/03/2019). However, Council has provided additional



information regarding a new population of this species recently found within 10km of the site, and within the same or similar PCT vegetation.

Targeted searches during known flowering periods for both *Genoplesium insigne* (Variable midge orchid) and *Corunastylis* sp. Charmhaven have now been conducted and neither species was recorded onsite.

Additional impact assessment provisions are required under the BDAR process for candidate SAI communities and species as outlined under Section 10.2 of the BAM Methodology.



18.0 Potential Offsets & Credit Generation

There has been an attempt within the proposal to minimise impacts on native vegetation, threatened or regionally significant flora and fauna, populations and ecological communities. Where impacts cannot be avoided or mitigated and where the determining authorities consider it necessary, offsets may be used to compensate for any remaining impacts in order to achieve an improve or maintain outcome for the proposal. Potential offsets for the development have been quantified using the Biodiversity Assessment Method (BAM). A summary of potential credit liabilities for development on the site is presented in **Table 7** below.

Table 7 – Biobanking Credits for the Site

Vegetation Zone / Species Credit Species	Area Impacted	Credits Required	Current BCT Cost
Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast (PCT 1636)	3.7	89	\$710,000
Southern Myotis— <i>Myotis macropus</i>	0.25	8	\$7,119
<i>Angophora inopina</i> – Charmhaven Apple	1.43	34	\$4,250
<i>Tetradlea juncea</i> – Black-eyed Susan	0.46	15	\$3,155
Squirrel Glider - <i>Petaurus norfolcensis</i>	3.7	119	\$64,500
Total			~\$790k

It should be noted that the previous iteration of this report was undertaken utilising the BioBanking scheme, prior to the introduction of the BC Act and BAM. The Squirrel Glider is now listed as a Credit species (not previously listed under the BioBanking scheme), and has now been added to the offset and credit requirement, due to records in close proximity to the site and glider feed scars present. Potential foraging and roosting habitat would likely be removed as part of the development.

The requirement to ‘retire’ the estimated credits can be either achieved in a variety of ways including:

- Establishing offsite Stewardship Site(s) that generate required credit types and numbers;
- Purchasing suitable on-market credits and retiring them;
- Paying into the Biodiversity Conservation Trust Fund; and/or
- Combination/s of the above.

The credit burden for the development to pay into the BCT to satisfy the credit liability is shown in **Table 7** above.



Additional credits may be required to be retired based on the results of additional assessment associated with a BDAR. Reasons may include: vegetation communities being closer to benchmark than currently estimated, occurrence of native ground cover species in disturbed and grazed areas, and records of threatened flora or fauna encountered during required fieldwork.



19.0 Recommendations

The following general recommendations are made for consideration to minimise localised impacts on biodiversity in general as a result of the development of the site:

- Tree retention is highly encouraged wherever feasible within the scope of the development, noting the limitations posed by residential construction and development. Emphasis should be placed upon the retention of *Angophora inopina* and hollow-bearing trees. Such trees should be identified by finer design planning prior to construction and be clearly marked on site to ensure retention;
- An appropriately detailed Construction Environment Management Plan (CEMP) would be generated that includes measures to protect retained trees and habitat areas from direct or indirect construction related impacts. Erosion and sediment controls would be detailed in the CEMP to limit offsite movement of contaminants into adjacent E2 lands and riparian areas.
- Required clearing of any vegetation on site should be undertaken in the presence of a suitably experienced Ecologist to ensure any displaced native fauna can be taken into care and dealt with appropriately;
- Pre-clearance surveys should be undertaken to identify and clearly mark all hollow-bearing trees, and observe any occupied hollows prior to felling. Appropriate measures should be devised prior to vegetation removal works to minimise impacts on resident fauna during the felling process;
- Trees should remain in situ for a minimum of 48 hours to allow any fauna to disperse to retained vegetation nearby;
- Clearing of vegetation should be conducted from a west/ north-westerly to east/ south easterly direction to allow displaced fauna to disperse into retained bushland to the east and south of the subject site;
- Appropriate landscaping within the developed areas should be encouraged to provide resources for native fauna, particularly birds via suitable flowering trees and shrubs. This should include native species commensurate with the vegetation community found onsite;
- Collection and propagation of *Angophora inopina* seeds from the site should be undertaken and utilised within landscaping around and within the proposed development;
- Incoming residents should be appropriately educated on the value of the retained conservation areas, and should be made aware of the negative impacts of green waste dumping, uncontrolled run-off, incremental incursion etc.;



- It is also recommended that the proponent financially contribute to revegetation works with the E2 zoned handle that projects into the site.



20.0 References

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Appendix A – Flora Species List



FLORA SPECIES LIST

The following list includes all species of vascular plants observed on site during fieldwork. It should be noted that such a list cannot be considered comprehensive, but rather indicative of the flora present on the site. It can take many years of flora surveys to record all of the plant species occurring within any area, especially plant species that are only apparent in some seasons such as Orchids.

A number of species cannot always be accurately identified during a brief survey, generally due to a lack of suitable flowering and/or fruiting material. Any such species are identified as accurately as possible, and are indicated in the list as thus:

- specimens that could only be identified to genus level are indicated by the generic name followed by the abbreviation “sp.”, indicating an unidentified species of that genus;
- specimens for which identification of the genus was uncertain are indicated by a question mark (“?”) placed in front of the generic, which is followed by the abbreviation “sp.” and;
- specimens that could be accurately identified to genus level, but could be identified to species level with only a degree of certainty are indicated by a (“?”) placed in front of the epithet.

Authorities for the scientific names are not provided in the list. These follow the references outlined below.

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Names of families and higher taxa follow a modified Cronquist System (1981).

Introduced species are indicated by an asterisk “*”.

Threatened species listed under the *Threatened Species Conservation Act 1995* (BC Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are indicated in **bold font** and marked as:

(V) = Vulnerable Species listed under the BC Act

(E) = Endangered Species listed under the BC Act

(EV) = Vulnerable Species listed under the EPBC Act 1999

(EE) = Endangered Species listed under the EPBC Act 1999



Family Name	Scientific Name	Common Name	Plot 1	Plot 2	General
<i>Acanthaceae</i>	<i>Pseuderanthemum variable</i>	<i>Pastel Flower</i>		•	
<i>Anthericaceae</i>	<i>Tricoryne elatior</i>	<i>Yellow Rush Lily</i>	•	•	
<i>Apiaceae</i>	<i>Hydrocotyle bonariensis*</i>	<i>Kurnell Curse / Pennywort</i>	•		
	<i>Platysace linearifolia</i>	<i>Narrow-leafed Platysace</i>		•	
	<i>Actinotus minor</i>	<i>Lesser Flannel Flower</i>	•		
<i>Asteraceae</i>	<i>Bidens pilosa*</i>	<i>Cobbler's Pegs</i>	•		
	<i>Ozothamnus ferrugineus</i>	<i>Tree Everlasting</i>		•	
<i>Casuarinaceae</i>	<i>Allocasuarina littoralis</i>	<i>Black She-oak</i>	•		
<i>Cyperaceae</i>	<i>Lepidosperma laterale</i>	<i>Variable Sword-sedge</i>	•	•	
<i>Droseraceae</i>	<i>Drosera peltata</i>	<i>Sundew</i>		•	
<i>Epacridaceae</i>	<i>Epacris pulchella</i>	<i>Wallum Heath</i>	•		
<i>Euphorbiaceae</i>	<i>Glochidion ferdinandi</i>	<i>Cheese Tree</i>	•		
<i>Fabaceae (Faboideae)</i>	<i>Dillwynia spp.</i>		•		
	<i>Pultenaea spp.</i>		•		
<i>Fabaceae (Mimosoideae)</i>	<i>Acacia longifolia</i>		•	•	
<i>Fabaceae/Cesalpinioideae</i>	<i>Senna pendula var. glabrata*</i>	-		•	
<i>Fabaceae/faboideae</i>	<i>Glycine tabacina</i>	<i>Twining Glycine</i>	•	•	
	<i>Daviesia ulicifolia</i>	<i>Gorse Bitter Pea</i>	•		
	<i>Gompholobium latifolium</i>	<i>Broad-leaf Wedge-pea</i>	•		
<i>Goodeniaceae</i>	<i>Goodenia bellidifolia subsp. bellidifolia</i>		•		
<i>Haemodoraceae</i>	<i>Haemodorum planifolium</i>	<i>Bloodroot</i>	•	•	
<i>Haloragaceae</i>	<i>Gonocarpus spp.</i>	<i>Raspwort</i>	•		
<i>Iridaceae</i>	<i>Patersonia sericea</i>	<i>Wild Iris</i>	•		
	<i>Sisyrinchium spp.*</i>			•	



Family Name	Scientific Name	Common Name	Plot 1	Plot 2	General
<i>Lindsaeaceae</i>	<i>Lindsaea linearis</i>	Screw Fern		•	
<i>Lobeliaceae</i>	<i>Pratia purpurascens</i>	Whiteroot		•	
<i>Lomandraceae</i>	<i>Lomandra filiformis</i>	Wattle Matt-rush	•	•	
	<i>Lomandra obliqua</i>	Twisted Mat-rush	•	•	
	<i>Lomandra glauca</i>	Pale Mat-rush	•		
	<i>Lomandra longifolia</i>	Spiky-headed Mat-rush		•	
<i>Myrsinaceae</i>	<i>Anagallis spp.*</i>		•		
<i>Myrtaceae</i>	<i>Corymbia gummifera</i>	Red Bloodwood	•	•	•
	<i>Eucalyptus haemastoma</i>	Broad-leaved Scribbly Gum	•	•	•
	<i>Angophora costata</i>	Smooth-barked Apple	•		•
	<i>Angophora inopina</i>	Charmhaven Apple			•
	<i>Eucalyptus capitellata</i>	Brown Stringybark		•	
	<i>Leptospermum spp.</i>	Tea-tree		•	
<i>Orchidaceae</i>	<i>Cryptostylis subulata</i>	Large Tongue Orchid	•	•	•
	<i>Cymbidium suave</i>	Snake Orchid			•
<i>Phormiaceae</i>	<i>Dianella caerulea</i>	Blue Flax-lily	•	•	
<i>Pittosporaceae</i>	<i>Billardiera scandens</i>	Hairy Appleberry	•		
<i>Plantaginaceae</i>	<i>Plantago major*</i>	Large Plantain	•		
<i>Poaceae</i>	<i>Imperata cylindrica</i>	Blady Grass	•	•	•
	<i>Austrostipa pubescens</i>	Tall Speargrass	•	•	•
	<i>Entolasia stricta</i>	Wiry Panic	•	•	
	<i>Eragrostis sp.</i>	Lovegrass	•	•	
	<i>Stenotaphrum secundatum*</i>	Buffalo Grass	•	•	
	<i>Themeda australis</i>	Kangaroo Grass	•	•	•
	<i>Andropogon virginicus*</i>	Whisky Grass	•		•
	<i>Cortaderia selloana *</i>	Pampas Grass			•
<i>Poaceae cont.</i>	<i>Cynodon dactylon</i>	Common Couch	•		•



Family Name	Scientific Name	Common Name	Plot 1	Plot 2	General
<i>Proteaceae</i>	<i>Banksia oblongifolia</i>	<i>Fern-leaf Banksia</i>	•	•	
	<i>Grevillea spp.</i>		•		
	<i>Grevillea spp. 2</i>		•		
	<i>Persoonia levis</i>	<i>Broad-leaved Geebung</i>	•		
<i>Schizaeaceae</i>	<i>Schizaea dichotoma</i>	<i>Branched Comb-fern</i>		•	
<i>Stylidiaceae</i>	<i>Stylidium spp.</i>			•	
<i>Thymelaeaceae</i>	<i>Pimelea latifolia</i>		•		
	<i>Pimelea sp.</i>	<i>Rice Flower</i>		•	
<i>Tremandraceae</i>	<i>Tetratheca juncea</i>	<i>Black-eyed Susan</i>			•
<i>Verbenaceae</i>	<i>Verbena bonariensis*</i>	<i>Purpletop</i>			•
<i>Xanthorrhoeaceae</i>	<i>Xanthorrhoea spp.</i>		•	•	•



Appendix B – Expected Fauna Species List



EXPECTED FAUNA SPECIES LIST

The following list includes fauna species that could be reasonably expected to occur on the study site at some point, given site attributes and location.

- species observed or indicated by scats, tracks etc. on, over or near the site during the various field investigations undertaken by AEP (2016).

CA - species observed or recorded by RPS (2010) on the former Coal & Allied lands to the south of the development site

* - Introduced species

? - Unconfirmed record, anecdotal records etc.

A - NSW Atlas of Wildlife record of threatened species for the site.

Threatened species listed under the *Biodiversity Conservation Act 2016* (BC Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are indicated in **bold font**.



BIRDS

Family Phasianidae - True Quails

Brown Quail

Coturnix ypsilophora

Family Anatidae - Ducks, Swans and Geese

Wood Duck

Chenonetta jubata

Family Accipitridae - Osprey, Hawks, Eagles and Harriers

Brown Goshawk

Accipiter fasciatus

CA Collared Sparrowhawk

Accipiter cirrhocephalus

Grey Goshawk

Accipiter novaehollandiae

Wedge-tailed Eagle

Aquila audax

Crested Hawk

Aviceda subcristata

Black-shouldered Kite

Elanus notatus

#, CA **White-bellied Sea-Eagle**

Haliaeetus leucogaster

Whistling Kite

Haliastur sphenurus

Little Eagle

Hieraaetus morphnoides

Black Kite

Milvus migrans

Eastern Osprey

Pandion cristatus

Family Falconidae - Falcons

Brown Falcon

Falco berigora

Nankeen Kestrel

Falco cenchroides

Australian Hobby

Falco longipennis

Peregrine Falcon

Falco peregrines

Family Charadriidae - Plovers, Dotterels and Lapwings

Masked Lapwing

Vanellus miles

Family Columbidae - Pigeons, Doves

*Feral Pigeon

Columba livia

Bar-shouldered Dove

Geopelia humeralis

Peaceful Dove

Geopelia striata

Wonga Pigeon

Leucosarcia melanoleuca

Crested Pigeon

Ocyphaps lophotes

Common Bronzewing

Phaps chalcoptera



*Spotted Dove

Streptopelia chinensis

Family Cacatuidae - Cockatoos and Corellas

Sulphur-crested Cockatoo
Galah
Little Corella
Long-billed Corella
#, CA Yellow-tailed Black-Cockatoo
Glossy Black-Cockatoo

Cacatua galerita
Cacatua roseicapilla
Cacatua sanguinea
Cacatua tenuirostris
Calyptorhynchus funereus
Calyptorhynchus lathami

Family Psittacidae - Parrots, Rosellas and Lorikeets

King Parrot
CA Little Lorikeet
Musk Lorikeet
Crimson Rosella
#, CA Eastern Rosella
Red-rumped Parrot
#, CA Scaly-breasted Lorikeet
#, CA Rainbow Lorikeet

Alisterus scapularis
Glossopsitta pusilla
Glossopsitta concinna
Platycercus elegans
Platycercus eximius
Psephotus haematonotus
Trichoglossus chlorolepidotus
Trichoglossus haematodus

Family Cuculidae - Cuckoos

Horsfield's Bronze-Cuckoo
Shining Bronze-Cuckoo
CA Fan-tailed Cuckoo
Brush Cuckoo
Common Koel
Channel-billed Cuckoo

Chrysococcyx basalis
Chrysococcyx lucidus
Cuculus pyrrhophanus
Cuculus variolosus
Eudynamis scolopacea
Scythrops novaehollandiae

Family Tytonidae - Barn Owls

Barn Owl
Masked Owl

Tyto alba
Tyto novaehollandiae

Family Strigidae - Hawk-Owls

Barking Owl
Southern Boobook
Powerful Owl

Ninox connivens
Ninox novaeseelandiae
Ninox strenua



Family Podargidae - Frogmouths

CA Tawny Frogmouth

Podargus strigoides

Family Aegothelidae - Owlet Nightjars

CA Australian Owlet Nightjar

Aegotheles cristatus

Family Apodidae - Swifts

Fork-tailed Swift

Apus pacificus

White-throated Needletail

Hirundapus caudacutus

Family Halcyonidae - Tree Kingfishers

Laughing Kookaburra

Dacelo novaeguineae

CA Sacred Kingfisher

Todiramphus sancta

Family Coraciidae - Rollers

Dollarbird

Eurystomus orientalis

Family Climacteridae - Treecreepers

CA White-throated Treecreeper

Cormobates leucophaea

Family Maluridae - Fairy-Wrens and Emu-Wrens

CA Variegated Fairy-Wren

Malurus assimilis

Superb Fairy-Wren

Malurus cyaneus

CA Southern Emu-Wren

Stipiturus malachurus

Family Pardalotidae - Pardalotes, Gerygones, Scrubwrens, Heathwrens and Thornbills

Yellow-rumped Thornbill

Acanthiza chrysorrhoa

#, CA Striated Thornbill

Acanthiza lineata

CA Yellow Thornbill

Acanthiza nana

#, CA Brown Thornbill

Acanthiza pusilla

CA Buff-rumped Thornbill

Acanthiza reguloides

CA Brown Gerygone

Gerygone mouki

White-throated Gerygone

Gerygone olivacea

#, CA Spotted Pardalote

Pardalotus punctatus

CA Striated Pardalote

Pardalotus striatus

CA White-browed Scrubwren

Sericornis frontalis

Family Meliphagidae - Honeyeaters



#, CA	Red Wattlebird	<i>Anthrochaera carunculata</i>
#, CA	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>
	Little Wattlebird	<i>Anthrochaera chrysoptera</i>
#, CA	Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>
	Brown Honeyeater	<i>Lichmera indistincta</i>
	Noisy Miner	<i>Manorina melanocephala</i>
	Bell Miner	<i>Manorina melanophrys</i>
CA	Lewin's Honeyeater	<i>Meliphaga lewinii</i>
CA	Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>
CA	White-naped Honeyeater	<i>Melithreptus lunatus</i>
CA	Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>
CA	Noisy Friarbird	<i>Philemon corniculatus</i>
	New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>
CA	White-cheeked Honeyeater	<i>Phylidonyris nigra</i>
	Striped Honeyeater	<i>Plectorhyncha lanceolata</i>
Family Petroicidae - Robins and Jacky Winter		
CA	Eastern Yellow Robin	<i>Eopsaltria australis</i>
CA	Rose Robin	<i>Petroica rosea</i>
Family Cinclosomatidae - Whipbird and Quail-thrushes		
	Spotted Quail-thrush	<i>Cinclosoma punctatum</i>
	Eastern Whipbird	<i>Psophodes olivaceus</i>
Family Neosittidae - Sittellas		
CA	Varied Sittella	<i>Daphoenositta chrysoptera</i>
Family Pachycephalidae - Whistlers, Shrike-tit and Shrike-thrushes		
#, CA	Grey Shrike-thrush	<i>Colluricincla harmonica</i>
	Crested Shrike-tit	<i>Falcunculus frontatus</i>
#, CA	Golden Whistler	<i>Pachycephala pectoralis</i>
CA	Rufous Whistler	<i>Pachycephala rufiventris</i>
Family Dicruridae - Monarchs, Flycatchers, Fantails, Drongo and Magpie-Lark		
	Spangled Drongo	<i>Dicrurus megarhynchus</i>
#	Magpie-lark	<i>Grallina cyanoleuca</i>
	Black-faced Monarch	<i>Monarcha melanopsis</i>



	Leaden Flycatcher	<i>Myiagra rubecula</i>
#, CA	Grey Fantail	<i>Rhipidura fuliginosa</i>
	Willie Wagtail	<i>Rhipidura leucophrys</i>
Family Campephagidae - Cuckoo-shrikes and Trillers		
#, CA	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>
	Cicadabird	<i>Coracina tenuirostris</i>
Family Oriolidae - Orioles and Figbird		
CA	Olive-backed Oriole	<i>Oriolus sagittatus</i>
	Figbird	<i>Sphecotheres viridis</i>
Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs		
	White-breasted Woodswallow	<i>Artamus leucorhynchus</i>
CA	Pied Butcherbird	<i>Cracticus nigrogularis</i>
#, CA	Grey Butcherbird	<i>Cracticus torquatus</i>
#, CA	Australian Magpie	<i>Cracticus tibicen</i>
#, CA	Pied Currawong	<i>Strepera graculina</i>
Family Corvidae - Crows, Raven		
#, CA	Australian Raven	<i>Corvus coronoides</i>
Family Ptilinorhynchidae - Bowerbirds		
	Satin Bowerbird	<i>Ptilinorhynchus violaceus</i>
Family Motacillidae - Pipits and Wagtails		
	Australian Pipit	<i>Anthus novaseelandiae</i>
Family Passeridae - Sparrows, Grassfinches, Mannikins		
CA	Red-browed Firetail	<i>Aegintha temporalis</i>
	*House Sparrow	<i>Passer domesticus</i>
Family Dicaeidae - Flowerpeckers		
CA	Mistletoebird	<i>Dicaeum hirundinaceum</i>
Family Hirundinidae - Swallows and Martins		
	Fairy Martin	<i>Cecropis ariel</i>
	Tree Martin	<i>Cecropis nigricans</i>

ANDERSON

ENVIRONMENT & PLANNING



ENVIRONMENT | STRATEGY | SOLUTIONS | MANAGEMENT

#, CA Welcome Swallow

Hirundo neoxena

Family Pycnonotidae - Bulbuls

*Red-whiskered Bulbul

Pycnonotus jocosus

Family Zosteropidae - White-eyes

#, CA Silvereye

Zosterops lateralis

Family Sturnidae - Starlings and Mynas

*Common Myna

Acridotheres tristis

*Common Starling

Sturnus vulgaris



AMPHIBIANS

Family Myobatrachidae - 'Southern' Frogs

CA Common Eastern Froglet

CA Wallum Froglet

Eastern Banjo Frog

Ornate Burrowing Frog

Striped Marsh Frog

Spotted Grass Frog

Brown Toadlet

Red-backed Toadlet

CA Dusky Toadlet

Smooth Toadlet

Crinia signifera

Crinia tinnula

Limnodynastes dumerilii

Limnodynastes ornatus

Limnodynastes peronii

Limnodynastes tasmaniensis

Pseudophryne bibronii

Pseudophryne coriacea

Uperolia fusca

Uperoleia laevigata

Family Hylidae - Tree Frogs

Green Tree Frog

Red-eyed Green Tree Frog

Bleating Tree Frog

Dwarf Tree Frog

Freycinet's Frog

Dainty Tree Frog

Jervis Bay Tree Frog

Broad-palmed Frog

Lesueur's Frog

Rocket Frog

Peron's Tree Frog

Green Leaf Tree Frog

Tyler's Tree Frog

Verreaux's Tree Frog

Litoria caerulea

Litoria chloris

Litoria dentata

Litoria fallax

Litoria freycineti

Litoria gracilentia

Litoria jervisensis

Litoria latopalmata

Litoria lesueuri

Litoria nasuta

Litoria peronii

Litoria phyllochroa

Litoria tyleri

Litoria verreauxii



REPTILES

Family Chelidae - Tortoises

Eastern Snake-necked Tortoise

Chelodina longicollis

Family Gekkonidae - Geckoes

Wood Gecko

Diplodactylus vittatus

Lesueur's Velvet Gecko

Oedura lesueurii

Southern Leaf-tailed Gecko

Phyllurus platurus

Thick-tailed Gecko

Underwoodisaurus milii

Family Pygopodidae - Legless Lizards

Burton's Snake-lizard

Lialis burtonis

Common Scaly-foot

Pygopus lepidopus

Family Agamidae - Dragons

CA Jacky Lizard

Amphibolurus muricatus

Eastern Water Dragon

Physignathus lesueurii

Eastern Bearded Dragon

Pogona barbata

Family Varanidae - Monitors

Lace Monitor

Varanus varius

Family Scinidae - Skinks

Southern Rainbow Skink

Carlia tetradactyla

Tussock Rainbow Skink

Carlia vivax

Wall Lizard

Cryptoblepharus virgatus

Striped Skink

Ctenotus robustus

Copper-tailed Skink

Ctenotus taeniolatus

CA Oak Skink

Cyclodomorphus casuarinae

Land Mullet

Egernia major

Egernia modesta

Black Rock Skink

Egernia saxatilis

Tree Skink

Egernia striolata

White's Skink

Egernia whitii

Eastern Water Skink

Eulamprus quoyii

Eulamprus tenuis



	Pink-tongued Lizard	<i>Hemisphaeriodon gerrardii</i>
#, CA	Grass Skink	<i>Lampropholis delicata</i>
	Garden Skink	<i>Lampropholis guichenoti</i>
		<i>Lygisaurus foliorum</i>
	Red-throated Skink	<i>Pseudomoia platynota</i>
CA	Three-toed Skink	<i>Saiphos equalis</i>
	Weasel Skink	<i>Saproscincus mustelina</i>
	Eastern Blue-tongued Lizard	<i>Tiliqua scincoides</i>
Family Typhlopidae - Blind Snakes		
		<i>Ramphotyphlops nigrescens</i>
		<i>Ramphotyphlops proximus</i>
		<i>Ramphotyphlops wiedii</i>
Family Boidae - Pythons		
	Carpet (Diamond) Python	<i>Morelia spilota</i>
Family Colubridae		
	Brown Tree Snake	<i>Boiga irregularis</i>
	Green Tree Snake	<i>Dendrolaphis punctulata</i>
Family Elapidae - Venomous Snakes		
	Golden Crowned Snake	<i>Cacophis squamulosus</i>
CA	Yellow-faced Whip Snake	<i>Demansia psammophis</i>
	Red-naped Snake	<i>Furina diadema</i>
CA	Black-bellied Swamp Snake	<i>Hemiaspis signata</i>
	Spotted Black Snake	<i>Pseudechis guttatus</i>
CA	Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>
	Eastern Brown Snake	<i>Pseudonaja textilis</i>
	Eastern Small-eyed Snake	<i>Rhinoplocephalus nigrescens</i>



MAMMALS

Family Tachyglossidae

Echidna

Tachyglossus aculeatus

Family Dasyuridae - Dasyurids

Yellow-footed Antechinus

Antechinus flavipes

Dusky Antechinus

Antechinus swainsonii

CA Brown Antechinus

Antechinus stuartii

Family Peramelidae - Bandicoots

Northern Brown Bandicoot

Isoodon macrourus

Long-nosed Bandicoot

Perameles nasuta

Family Petauridae - Gliders

CA Sugar Glider

Petaurus breviceps

CA **Squirrel Glider**

Petaurus norfolcensis

Family Pseudocheiridae - Ringtail Possums and Greater Glider

CA Common Ringtail Possum

Pseudocheirus peregrinus

Family Acrobatidae - Feathertail Glider

Feathertail Glider

Acrobates pygamaeus

Family Phalangeridae - Brushtail Possums

CA Common Brushtail Possum

Trichosurus vulpecula

Family Macropodidae - Kangaroos, Wallabies

Red-necked Wallaby

Macropus rufogriseus

#, CA Swamp Wallaby

Wallabia bicolor

Family Pteropodidae - Fruit Bats

CA **Grey-headed Flying-fox**

Pteropus poliocephalus

Family Rhinolophidae - Horseshoe-bats

Eastern Horseshoe-bat

Rhinolopus megaphyllus



Family Emballonuridae - Sheath-tail Bats

Yellow-bellied Sheath-tail-bat

Saccolaimus flaviventris

Family Molossidae - Freetail Bats

East-coast Freetail-bat

Eastern Freetail-bat

Mormopterus norfolkensis

Mormopterus sp.

CA **White-striped Freetail-bat**

Nyctinomus australis

Family Vespertilionidae - Plain-nosed Bats

#, CA **Gould's Wattled bat**

Chalinolobus gouldi

CA **Chocolate Wattled Bat**

Chalinolobus morio

CA **Eastern Falsistrelle**

Falsistrellus tasmaniensis

#, CA **Little Bentwing-bat**

Miniopterus australis

Eastern Bentwing-bat

Miniopterus schreibersii

Southern Myotis

Myotis macropus

Lesser Long-eared Bat

Nyctophilus geoffroyi

Gould's Long-eared Bat

Nyctophilus gouldii

Little Broad-nosed Bat

Nycticeius greyii

CA **Greater Broad-nosed Bat**

Scoteanax rueppellii

CA **Eastern Broad-nosed Bat**

Scotorepens orion

Large Forest Bat

Vespadelus darlingtoni

CA **Eastern Forest Bat**

Vespadelus pumilus

Southern Forest Bat

Vespadelus regulus

CA **Little Forest Bat**

Vespadelus vulturnus

Family Muridae - Rodents

*House Mouse

Mus musculus

Southern Bush Rat

Rattus fuscipes

CA **Swamp Rat**

Rattus lutreolus

*Brown Rat

Rattus norvegicus

CA ***Black Rat**

Rattus rattus

Family Canidae

CA ***Fox**

Vulpes vulpes

*Dog

Canis familiaris



Family Felidae

*Cat

Felis catus

Family Leporidae

*European Hare

Lepus capensis

*Rabbit

Oryctolagus cuniculus

Family Suidae

*Feral Pig

Sus scrofa

Family Bovidae

*Goat

Capra hircus



Appendix C – Biobanking Field sheets

Site value: Transect plot data sheet

(Start a new sheet for each vegetation zone)

BioBanking
Biodiversity Banking and Offsets Scheme

CMA area Hunter/lenah Rivers CMA subregion Wgong Recorder IB/ON Date 9/6/16

Proposal ID 1467 Proposal name Woodchuck Rezoning Zone ID

Vegetation formation

Vegetation class

Vegetation type

Condition (low or mod/good) Mod/Good Zone descriptor (optional) Geographic/habitat features Credit Calculator) ☐

Coordinates (GPS datum GDA94:)

Transect / plot number	1	2	3	4	5	6	7	8	9	10
Easting										
Northing										
Zone AMG										

Transect 10 points along 50-m transect (see transect tally table for % foliage cover variables)

Native over-storey cover (%)	15.5	8								
Native mid-storey cover (%)	0	0								
Native ground cover (grasses) (%)	12	34								
Native ground cover (shrubs) (%)	8	2								
Native ground cover (other) (%)	4	24								
Exotic plant cover	38	16								

Larger sampling area

Native plant species richness ¹	36	35								
Number of trees with hollows ²	2	3								
Over-storey regeneration ³	1	1								
Total length of fallen logs (m) ²	2	1								

Comments/additional conservation values (riparian areas, special features, geology, etc.):

¹ 20 x 20 m plot ² 20 x 50 m plot ³ whole zone

Site value: Transect tally table

BioBanking
Biodiversity Banking and Offsets Scheme

CMA area Amber / Central / Blue CMA subregion Wyang Recorder B/DN Date 9/4/11

Proposal ID 1467 Proposal name Zone ID

Vegetation formation

Vegetation class

Vegetation type

Condition (low or mod/good) M/G Zone descriptor (optional) Geographic/habitat features Credit Calculator)

Transect number <u>1</u>	Number of hits (tally)	%
Native over-storey cover (%)	<u>15, 20, 10, 25, 20, 25, 20, 15, 0, 5</u>	<u>15.5</u>
Native mid-storey cover (%)	<u>-</u>	<u>0</u>
Native ground cover (grasses) (%)	<u> 1</u>	<u>12</u>
Native ground cover (shrubs) (%)	<u> </u>	<u>8</u>
Native ground cover (other) (%)	<u> </u>	<u>4</u>
Exotic plant cover (%)	<u> </u>	<u>38</u>

Transect number <u>2</u>	Number of hits (tally)	%
Native over-storey cover (%)	<u>20, 15, 15, 10, 5, 0, 0, 10, 0, 5, 0</u>	<u>8</u>
Native mid-storey cover (%)	<u>-</u>	<u>0</u>
Native ground cover (grasses) (%)	<u> </u>	<u>34</u>
Native ground cover (shrubs) (%)	<u> </u>	<u>2</u>
Native ground cover (other) (%)	<u> </u>	<u>24</u>
Exotic plant cover (%)	<u> </u>	<u>16</u>

Transect number <u></u>	Number of hits (tally)	%
Native over-storey cover (%)		
Native mid-storey cover (%)		
Native ground cover (grasses) (%)		
Native ground cover (shrub) (%)		
Native ground cover (other) (%)		
Exotic plant cover (%)		

Transect number <u></u>	Number of hits (tally)	%
Native over-storey cover (%)		
Native mid-storey cover (%)		
Native ground cover grasses (%)		
Native ground cover shrubs (%)		
Native ground cover other (%)		
Exotic plant cover (%)		

BIOBANKING FLORISTIC PLOT DATA SHEET

(to accompany OEH Transect Plot Data Sheet)

Date: 9/11/16

Job Ref: 1467

Recorder: BS/ON

Vegetation Type: _____

Condition: M/L Transect/Plot Number: 1 Easting/Northing: _____

Species	Stratum (& layer)	Growth Form (t/s/g/h)	Cover (%) (<1%, 1-5%, 5%, 10% etc)	Abundance Rating (# individuals) (1, 2, 3 ... 10, 20, 50, 100, 500, 1000, 1000+)
<i>Xanthoschoea</i> sp.	C	S	2%	50
<i>Lomandra obliqua</i>	L	h	<1%	100
<i>Stenotaphrum secundatum</i> ^{sp}	L	g	5%	1000+
<i>Lomandra filiformis</i>	L	h	<1%	200
<i>Plantago major</i> ^{sp}	L	h	<1%	100
<i>Eriolasia stricta</i>	L	g	1-2%	1000
<i>Gonocarpus</i> sp.	L	h	<1%	20.
<i>Billardiera scandens</i>	L	h	<1%	50
<i>Banksia oblongifolia</i>	L	S	<1%	10
<i>Haemodorum planifolium</i>	L	h	<1%	10
<i>Glochidion ferdinandi</i>	L	t	<1%	5
<i>Davisia ulicifolia</i>	L	S	<1%	5
<i>Gompholobium latifolium</i>	L	S/h	<1%	10
<i>Dianella caespitosa</i> <i>angustata</i> <i>longifolia</i>	L	S/h	<1%	100
<i>Lomandra glauca</i>	L	S/h	<1%	50
<i>Anagallis</i> sp. ^{sp}	L	h	<1%	100
<i>Lepidosperma laterale</i>	L	g	<1%	50

Species	Stratum (& layer)	Growth Form (t/s/g/h)	Cover (%) (<1%, 1-5%, 5%, 10% etc)	Abundance Rating (# individuals) (1, 2, 3 ... 10, 20, 50, 100, 500, 1000, 1000+)
<i>Glycine tabacina</i>	h	h	<1%	100
<i>Pterisanthera sericea</i>	h	h	<1%	100
<i>Cryptostylus subulatus</i>	h	h	<1%	10
<i>Themeda australis</i>	h	g	10-15%	1000+
<i>Bidens pilosa</i> *	h	h	<1%	10
<i>Imperata cylindrica</i>	h	g	5%	1000+
<i>Acacia longifolia</i>	h	h/s	<1%	10
<i>Grevillea</i> sp.	h	h/s	<1%	5
<i>Achras minor</i>	h	h	<1%	100
<i>Pterisanthera lewis</i>	h	s	<1%	10
<i>Euphorbia pulchella</i>	h	s/h	<1%	20
<i>Goodenia bellidifolia</i> sp. bellidifolia	h	h	<1%	10
<i>Andropogon victricus</i> *	h	g	2%	500
<i>Allocasuarina lanceolata littoralis</i>	M	s/h	<1%	3
<i>Austrostipa pubescens</i>	h	g	5-10%	1000
<i>Cynodon dactylon</i>	h	g	2%	1000+
<i>Dillwynia</i> sp.	h	h	<1%	50
* <i>Grevillea</i> sp. 2	h	h	<1%	10
<i>Eragrostis</i> sp.	h	g	<1%	100
<i>Coscinum gummitera</i>	h/c	+	25	6
<i>Eucalyptus haemastoma</i>	c	+	10	2
<i>Argemone costata</i>	c	+	5	1
<i>Andropogon</i> sp. <i>Tricoma elata</i>	h	h	<1%	10
<i>Pinelawn latifolia</i>	h	h/s	<1%	10

BIOBANKING FLORISTIC PLOT DATA SHEET

(to accompany OEH Transect Plot Data Sheet)

Date: 9/11/16

Job Ref: 1467

Recorder: JB/ON

Vegetation Type: _____

Condition: M/L Transect/Plot Number: 2 Easting/Northing: _____

Species	Stratum (& layer)	Growth Form (t/s/g/h)	Cover (%) (<1%, 1-5%, 5%, 10% etc)	Abundance Rating (# individuals) (1, 2, 3 ... 10, 20, 50, 100, 500, 1000, 1000+)
<i>Eutolasia stricta</i>	L	g	5	1000+
<i>Dianella caerulea</i> var <i>caerulea</i>	L	L	<1%	100
<i>Hydrocotyle bonariensis</i> #	L	h	<1%	100
<i>Xanthoxenon</i> sp.	L	s	<1%	50
<i>Themeda australis</i>	L	g	10	1000+
<i>Lomandra longifolia</i>	L	L	<1%	5
<i>Lomandra oligaria</i>	L	h	<1%	100
<i>Lomandra filiformis</i>	L	h	<1%	20
<i>Stenotaphrum secundatum</i>	L	g	2%	1000+
<i>Pultenaea</i> sp.	L	s/h	<1%	1
<i>Corymbia gummitera</i>	L	t	2%	1
<i>Eucalyptus capitellata</i>	L	t	20%	5
<i>Eucalyptus haemastoma</i>	L	t	5%	1
<i>Ozothamnus dendroideus</i>	L	s/h	<1%	5
<i>Schizaea dichotoma</i>	L	h	<1%	10
<i>Leptospermum</i> sp.	L	h	<1%	200
<i>Lepidospermum lutescens</i>	L	h/g	<1%	500

Species	Stratum (& layer)	Growth Form (l/s/g/h)	Cover (%) (<1%, 1-5%, 5%, 10% etc)	Abundance Rating (# individuals) (1, 2, 3 ... 10, 20, 50, 100, 500, 1000, 1000+)
<i>Glycine tabacina</i>	h	h	<1%.	50
<i>Impatiens cylindrica</i>	h	g	<1%.	50
<i>Eragrostis</i> sp.	h	g	<1%.	500
<i>Lindsaea linearis</i>	h	h	<1%.	500
<i>Banksia oblongifolia</i>	h	h/s	<1%.	50
<i>Haemodorum planifolium</i>	h	h	<1%.	10
<i>Cryptostylis sulcata</i>	h	h	<1%.	5
<i>Senna pendula</i> *	h	h	<1%.	20
<i>Drosera peltata</i>	h	h	<1%.	5
<i>Tricoryne elata</i>	h	h	<1%.	5
<i>Austrostipyn pubescens</i> .	h	g	<1%.	50
<i>Pipturus asperescens</i>	h	h	<1%.	50
<i>Glycine clandestina</i>	g/h	h	<1%.	5
<i>Pseudanthemum unia Side</i>	h	h	<1%.	10
<i>Platysace linearifolia</i>	h	h/s	<1%.	5
<i>Acacia longifolia</i>	h	h/s	<1%.	5
<i>Epacris pulchella</i>	h	h	<1%.	20
<i>Sisyrinchium rosulatum</i>	h	h/g	<1%.	2
<i>Stylidium</i> sp.	h	h	<1%.	1
<i>Pimelea</i> sp.	h	h	<1%.	10



Appendix D – Hollow Bearing Tree and Glider Feed Tree Data



Hollow Bearing Trees

No.	Species	DBH (mm)	Hollows	Total	Other
1	<i>Eucalyptus haemastoma</i>	800 - 1000	2 x M	2	
2	<i>E. haemastoma</i>	800 - 1000	1 x M, 1 x L	2	
3	<i>E. haemastoma</i>	1000+	2 x S	2	
4	<i>E. haemastoma</i>	800 - 1000	1 x S	1	Microbat potential
5	<i>Corymbia gummifera</i>	800 - 1000	1 x M	1	Worn edges and feed scars. Potential glider hollow
6	<i>E. haemastoma</i>	1000+	4 x L	4	
7	<i>E. haemastoma</i>	800 - 1000	1 x L	1	Upright trunk, multiple scratches
8	<i>E. haemastoma</i>	1000+	1 x S	1	Very large hollowed out trunk, small hollow in branch
9	<i>C. gummifera</i>	400 - 600	2 x M	2	
10	<i>C. gummifera</i>	1000+	2 x M, 2x L	4	Feed scars present. High potential for utilisation
11	<i>E. haemastoma</i>	1000+	1 x S, 1 x M	2	Numerous scratches, some deep
12	<i>C. gummifera</i>	1000+	4 x S, 1 x M	5	Feed scars present
13	<i>E. haemastoma</i>	800 - 1000	1 x S	1	Some scratches
14	<i>E. haemastoma</i>	1000+	1 x M	1	
15	<i>E. haemastoma</i>	1000+	1 x M	1	
16	<i>E. haemastoma</i>	600 - 800	1 x S	1	
17	<i>C. gummifera</i>	1000+	1 x M	1	Hollow in main trunk, worn edges, utilisation potential
18	<i>Angophora inopina</i>	600 - 800		-	Peeling bark, microbat potential
19	Stag	1000+	2 x M	2	
20	<i>C. gummifera</i>	800 - 1000	1 x L	1	Hollow in main trunk, feed scars present
21	<i>C. gummifera</i>	1000+	2 x S, 1 x M, 2 x L	5	Old feed scars present, arboreal termite nest
22	Stag	1000+		-	Multiple fissures present and loose bark. Microbat potential
23	<i>E. haemastoma</i>	1000+	1 x M	1	May not be hollow. Termite infested
24	<i>A. costata</i>	1000+	2 x L	2	Some scratches present
25	<i>E. haemastoma</i>	800 - 1000	1 x M	1	Cavity in arboreal termite mound
26	<i>E. haemastoma</i>	1000+	1 x L	1	Hollow in main trunk
27	<i>C. gummifera</i>	1000+	2 x M, 2 x L	4	
28	<i>E. haemastoma</i>	800 - 1000	1 x L	1	Hollow in trunk
29	<i>E. haemastoma</i>	600-800	2 x S, 1 x M	3	
30	<i>E. haemastoma</i>	1000+	1 x S	1	
31	<i>A. costata</i>	1000+	1 x L	1	



No.	Species	DBH (mm)	Hollows	Total	Other
32	<i>C. gummifera</i>	1000+	3 x S	3	Microbat potential
33	<i>C. gummifera</i>	400-600	2 x S, 1 x M	3	
34	<i>A. costata</i>	1000+	1 x M	1	
35	<i>E. haemastoma</i>	1000+	2 x S, 1 x M	3	Numerous scratches
36	<i>E. haemastoma</i>	1000+	1 x M, 1 x L	1	Potential for more in cut off limbs (hollows have been harvested)
37	<i>E. haemastoma</i>	800 - 1000	3 x M	3	
38	<i>E. haemastoma</i>	600 - 800	1 x L	1	Microbat potential only
39	<i>C. gummifera</i>	800 - 1000	1 x L	1	Hollow in main trunk
40	<i>C. gummifera</i>	1000+	1 x M	1	Feed scars also present
41	<i>E. haemastoma</i>	800 - 1000	4 x S	4	
42	<i>E. haemastoma</i>	400 - 600	1 x S	1	
43	<i>C. gummifera</i>	400 - 600	1 x L	1	
44	<i>C. gummifera</i>	400 - 600	1 x M	1	
45	<i>E. haemastoma</i>	800 - 1000	1 x S, 4 x M, 1 x L	6	Some hollows have been previously harvested
46	<i>E. haemastoma</i>	200 - 400	1 x S	1	
47	<i>E. haemastoma</i>	600 - 800	1 x M	1	
48	<i>E. haemastoma</i>	1000+	1 x S, 1 x M, 1 x L	3	
49	<i>A. costata</i>	400 - 600	1 x L	1	
50	<i>E. haemastoma</i>	400 - 600	1 x S	1	
51	<i>E. haemastoma</i>	400 - 600	1 x S, 1 x L	2	
52	<i>E. haemastoma</i>	200 - 400	2 x S	2	
53	<i>C. gummifera</i>	800 - 1000	2 x S	2	Large arboreal termite nest with Kookaburra observed leaving cavity
54	<i>E. haemastoma</i>	600 - 800	1 x S	1	
55	<i>E. haemastoma</i>	800 - 1000	2 x S, 1 x M	3	
56	<i>E. haemastoma</i>	600 - 800	2 x L	2	Nest in hollow (Australian Wood Duck?)
57	<i>C. gummifera</i>	200 - 400	1 x M	1	Cavity in arboreal termite nest
Total Number of Hollows				105	

Table Key

S – Small (<10cm)

M – (10-20cm)

L – (>20cm)



Glider Feed Trees

No.	Species	DBH (mm)	Other
1	<i>Corymbia gummifera</i>	800 - 1000	Significant scaring
2	<i>C. gummifera</i>	400 - 600	Scars on multiple branches
3	<i>C. gummifera</i>	200 - 400	Multiple scars (older)
4	<i>C. gummifera</i>	200 - 400	Multiple scars – many of which are very low
5	<i>C. gummifera</i>	200 - 400	Numerous scars, some fresh
6	<i>C. gummifera</i>	200 - 400	Older scars present
7	<i>C. gummifera</i>	400 - 600	Numerous old scars
8	<i>C. gummifera</i>	400 - 600	Generally old scars
9	<i>C. gummifera</i>	200 - 400	Generally old scars
10	<i>C. gummifera</i>	200 - 400	Generally old scars
11	<i>C. gummifera</i>	200 - 400	Generally old scars
12	<i>C. gummifera</i>	200 - 400	Generally old scars

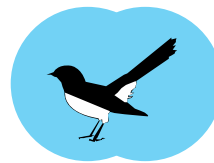


Appendix E – Site Photographs



Plot 1 (above) –Plot 2 (below)





Above – extensive glider scars on *Corymbia gummifera*



Appendix F – Author CVs



CRAIG ANDERSON

Curriculum Vitae

An environmental professional with approximately 20 years' experience providing high level ecological services, advice, strategic direction and management for sectors such as land development, infrastructure, conservation, government, legal, mining & quarrying.

Personal Details

Full Name:	Craig John Anderson
Date of Birth:	5 November 1971
Postal Address:	PO Box 210, ADAMSTOWN NSW 2289
Email:	craig@andersonep.com.au
Phone Mobile:	0418 681 581

Qualifications

- Bachelor of Applied Science (Environmental Assessment & Management) University of Newcastle, New South Wales (1994).
- Currently completing a Graduate Diploma in Archaeological Heritage through University of New England (one subject to complete).

Licencing

- NSW Scientific Investigation Licence SL101313
- NSW Animal Research Authority
- Accredited Biobanking Assessor No. 0150

Further Education & Training (select summary)

- Biobank and Biocertification Assessors Training Course
- Animal Ethics Training (University of Newcastle / NSW DPI)
- RFS / PIA NSW Consulting Planners Bushfire Training
- Bush Regeneration Training
- NSW Driver's Licence: Car (Class "C"). Experienced 4WD operator.
- Occupational Health & Safety Training, including legal compliance requirements of Officers (Standard 11 & S1, S2, S3) / Green Card.
- + various other vocational environmental and computer-based training sessions.

Fields of Special Competence



- Production and peer review of detailed environmental impact assessment documentation. Author and / or Manager of hundreds of ecological / environmental / bushfire / historical heritage / archaeological heritage / strategic & statutory planning documents over approximately 20 years of environmental work
- Detailed ecological field survey, covering all aspects of terrestrial and aquatic flora and fauna
- Expert witness legal representation
- Ecological Management Planning, ranging from individual species to full ecosystem management
- Project Management and delivery of complex projects, including projects worth more than \$100M
- Project Management (including areas outside environmental sphere)
- Environmental Due Diligence processes for both asset procurement and divestment
- Management and co-ordination of teams producing EIA documentation
- Identification of strategic approval pathways and key project risk evaluation and management
- Extensive experience in conflict resolution, impact mediation and outcome negotiation on large scale and contentious projects
- Detailed knowledge of land and infrastructure development processes
- Detailed knowledge of coal mining development and operational processes

Professional Affiliations / Memberships (past / present)

- Hunter Bird Observers Club (HBOC). Current member of Records Appraisal Committee, previous elected Committee Member.
- Society for Growing Australian Plants (SGAP).
- Hunter Coal Environment Group (HCEG).
- NSW Minerals Council (NSWMC), including Executive Committee Meetings representation.
- Queensland Resources Council (QRC).
- Bird Observers Club of Australia (BOCA).
- Ecological Consultants Association of NSW (ECA). Involved in the initial formulation of the Association. Served two terms as an elected Councillor.
- Urban Development Institute of Australia (UDIA).
- Planning Institute of Australia (PIA).
- Australasian Bat Society (ABS).
- Frog and Tadpole Study Group (FATS).
- Society of Frogs and Reptiles (SOFAR).
- Society for Growing Australian Plants (SGAP).
- Hunter Heritage Network (HHN).

Employment History

2013-present **Director / Principal Consultant**
Anderson Environment & Planning, Newcastle

Providing consulting services to land, property, mining industry, legal, government. Covering ecological, project management, environmental, planning services, advices, strategy and representation.

2012-present **Director**
Habitat Indoor / Outdoor Living, Furniture, Homewares & Design, Newcastle



Well known retailer servicing high end of market for indoor and outdoor furniture and homewares, interior and landscape design, curtain and blind services, specimen plant supply etc.

2010-2012 **General Manager Sustainable Development**
Cockatoo Coal Ltd, Coal Mining Company,
Newcastle / Sydney / Brisbane

Employed by emerging coal company to establish regional offices & build staff workforce and business systems to deliver projected growth. Oversaw and managed all aspects of the Sustainable Development portfolio (encompassing Environmental Compliance & Approvals, External Affairs, Health & Safety, and GIS) and the 20+ staff therein, maintained relationships with key business partners including high profile Korean and Japanese companies, actively managed and oversaw all aspects of SD for all company projects, assisted the Board and top tier management when required in relation to assessing and delivering business opportunities, and managing risk. Included overseeing the progression of up to six EIS'S and related processes for new and/or expanded mining projects, some with capital values exceeding \$1 Billion.

2009 – 2010 **Independent Environmental Expert**
Donaldson Conservation Trust

Appointed by Donaldson Coal as the Independent Environmental Expert to oversee the planning and implementation of environmental programs governed by the Trust. The Donaldson Conservation Trust was established to address a Condition of Consent for the Abel Coal Mine in the Lower Hunter Valley.

2010 **Principal - Environment**
RPS, Development Consultants, Newcastle

Providing high level ecological services to key mining, government and land development clients.

2006 – 2009 **Manager Environment Group**
RPS HSO, Development Consultants, Newcastle
(Company sold to UK listed Company RPS in Nov 2006)

Managing the growth and development of the Environment Group. Providing project management, planning and environmental services to key mining, land development and government clients. Interface and business development activities with the wider global RPS Group.

2001 – 2006 **Manager Environment Group / Director**
Harper Somers O'Sullivan, Development Consultants, Newcastle.
(Company Director & shareholder as of July 2003)

Established & grew the Environment Group of the business, and co-managed and grew the operation from 20 staff to a business of 50+ staff. Managed environmental portfolio on many significant projects for a wide variety of clients in Australia and New Zealand. Ran the successful due diligence process and sale of the business to UK listed Company RPS.



2000 – 2001 **Senior Ecologist & NSW Projects Manager**
Wildthing Environmental Consultants, Salt Ash.

Managed all staff and key projects for the business in association with owners. Actively contributed to significant growth in size and turnover of the business. Services covered a wide variety of ecological, environmental, planning and heritage related commissions.

1996 – 1999 **Ecologist**
Wildthing Environmental Consultants, Salt Ash.

Undertook and managed numerous ecological and other environmental related projects throughout Australia. Played a key role in the growth in standing, size, turnover and client roster of the Company.

1995 – 1996 **Ecologist / Environmental Officer**
Pulver Cooper & Blackley, Engineers & Surveyors, Newcastle.

Undertook a variety of environmental, surveying and mapping related works for land development and construction projects.

1995 **Environmental Officer / Cadastral Survey Assistant**
Kel Nagle Cooper & Associates, Golf Course Design & Construction Newcastle.



JOEL STIBBARD

Curriculum Vitae

Joel is an environmental professional with a diverse background of research and monitoring experience in both terrestrial and aquatic environments. He has focussed over the past 6 years in providing terrestrial ecological consultancy services to a range of clients in the public and private sector, and is highly proficient in flora and fauna survey methodologies, environmental reporting and GIS systems.

Personal Details

Full Name:	Joel Ryan Stibbard
Date of Birth:	20 October 1981
Postal Address:	PO Box 210, ADAMSTOWN NSW 2289
Email:	joel@andersonep.com.au
Phone Mobile:	0417 282 685

Qualifications

- Bachelor of Science (Ecology and Zoology) University of Queensland (2004).
- Currently completing a Masters in Environmental Management through University of Queensland (two subjects to complete).

Licencing

- NSW Scientific Investigation Licence SL101313
- NSW Animal Research Authority

Further Education & Training (select summary)

- NSW Driver's Licence: Car and Motorcycle (Class "C" and "R"). Experienced 4WD operator.
- Occupational Health & Safety Training
- Mapinfo Professional Training
- PADI Divemaster (now expired) and current Rescue Diver
- PADI recognised Coral Reef Monitoring Training
- + various other vocational environmental and computer based training sessions.



Fields of Special Competence

- Production of detailed environmental impact assessment documentation. Author of multiple ecological / environmental documents over 6+ years of consultancy work
- High proficiency in the interpretation, manipulation and presentation (mapping) of spatial data through the utilisation of Geographic Information Systems (GIS)
- Detailed ecological field survey, covering all aspects of terrestrial and aquatic flora and fauna
- Ecological Management Planning

Professional Affiliations / Memberships (past / present)

- Hunter Bird Observers Club (HBOC).
- Birdlife Australia
- Ecological Consultants Association of NSW (ECA)

Relevant Employment History

2018-Present **Ecologist Biodiversity Conservation Trust**

2015-2018 **Ecology / GIS Manager**
Anderson Environment & Planning, Newcastle

Currently employed by Anderson Environment & Planning to assist in the provision of consulting services to land, property, mining industry, legal and government sectors. Covering ecological, project management, environmental, planning services, advices, strategy and representation.

2012-2015 **Ecologist**
RPS, Newcastle

Employed as an ecological consultant at a well-established consultancy during high demand periods of mine expansion works, and maintained employment following the mining downturn as a result of efficiency, versatility and professionalism. Was involved in and was Team Leader of a wide range of ecological surveys, and was responsible for the provision of various documentation including Ecological Assessment Reports, Management Plans and Strategic Assessments. Was responsible for managing and maintaining all GIS data for the ecology and bushfire team, and the production of report-quality maps for all projects.

2011-2012 **Ecologist**
Australasian Resource Consultants (AARC), Brisbane

Employed by local consultancy to undertake flora and fauna surveys for the burgeoning mine expansion sector. Responsible for conducting and reporting on environmental assessments as part of the Environmental Impact Assessment (EIA) process. Gained valuable experience in flora and fauna survey and identification, and utilising GIS at a professional level.



2010 – 2011

Casual Ecologist

Environmental Ground Water and Air Consultants (EGC), Brisbane

Employed as a casual ecologist during Masters studies to assist in flora and fauna surveys on Curtis Island, off Gladstone in Queensland. Works included fauna habitat mapping and threatened flora surveys to inform the development proposal of two large LNG plants on the Island. These works provided valuable experience in fieldwork techniques along with an insight into the professional reality of ecological consultancy.

Relevant Ecological Experience

2007 - 2008

Researcher

Global Vision International (GVI), Mexico and Reef Check Australia, Townsville

Volunteer Coral Reef Monitoring Researcher on both the Meso-American Barrier Reef in Mexico (4 months) and the Great Barrier Reef in Queensland (6 months). Responsible for running and implementing dive trips to various reefs and managing teams of volunteers to ensure rigorous data was collected within tight timeframes and testing weather conditions.

2006 – 2007

Researcher

Kalahari Meerkat Project, South Africa

Volunteer Behavioural Researcher on a collaborative project between Cambridge University, England and the University of Zurich in Switzerland for 12 months. Involved collecting large amounts of behavioural data for several meerkat groups in a small group of researchers for a variety of backgrounds and in isolated environments.



IAN BENSON Curriculum Vitae

Ian works with AEP in the role of Senior Ecologist. He is an experienced field ecologist, bird watcher and a regular participant in wader surveys. Ian has previously had a successful career as a project manager with a local geotechnical engineering firm. His background in project management and soil sciences combined with his ecological knowledge is utilised in a diverse array of applications in his current role.

Qualifications

- Graduate Diploma in Science (Ecology) University of New England (2014)
- Bachelor Engineering (Civil) University of Newcastle (2008)

Further Education & Training (select summary)

- Biobank and Biocertification Assessors Training Course
- Advanced Plant Identification (University of New South Wales)
- NSW Class C Driver's Licence. Experienced 4WD operator
- Occupational Health & Safety Training
- Rail Industry Worker
- ARTC Safety Induction for Contractors (NSW)
- ARTC Hunter Bulk Terminal Induction

Fields of Special Competence

- Biobanking & Biodiversity Offset Commissions – initial scoping and feasibility, BAM impact assessments and BDAR reporting, biobank calculations, Stewardship site creation
- Detailed knowledge of environmental legislation and approval pathways
- Ecological field survey and habitat assessment covering terrestrial and aquatic flora and fauna. Experienced in camera trap methods particularly targeting cryptic and difficult to identify mammal species.
- Highly proficient at avifauna surveys, including challenging wetland and shorebird environs
- Project Management
- Soil science

Professional Affiliations / Memberships (past / present)

- Hunter Bird Observers Club (HBOC)
- Australasian Seabird Group
- Graduate Member of The Institution of Engineers Australia in the Civil College



Relevant Employment History

2018-Current

Senior Ecologist

Anderson Environment & Planning, Newcastle

Currently employed by Anderson Environment & Planning as a Senior Ecologist overseeing all aspects of the business including training and management of field and office staff undertaking ecology and bushfire works to assist in the provision of consulting services to land, property, mining industry, legal and government sectors. Covering ecological, project management, environmental, planning services, advices, strategy and representation.

2016-2018 Ecologist

Anderson Environment & Planning, Newcastle

Currently employed by Anderson Environment & Planning to assist in the provision of consulting services to land, property, mining industry, legal and government sectors. Covering ecological, project management, environmental, planning services, advices, strategy and representation.

2012-2016 Project Manager

Douglas Partners, Newcastle

As a project manager with Douglas Partners I was responsible for proposal and tender preparation, planning, implementation and reporting of geotechnical and geo-environmental investigations for a broad range of projects including site classification, foundations, pavements, bridges and slope stability. I was required to liaise with clients regarding project requirements, project goals and deadlines. I was responsible for the development and implementation of Work Health and Safety Plans as well as Environmental Plans and documentation. This included the development of safe work procedures, safety inspections on site and implementing improved safety procedures with staff. I was responsible for ensuring projects were completed on time and on budget whilst meeting the clients' expectations and achieving quality assurance standards.

2008-2012 Geotechnical Engineer

Douglas Partners, Newcastle

As a geotechnical engineer for Douglas Partners I was involved in the planning and implementation of geotechnical investigations for a wide range of development in the Hunter Valley area. I was primarily involved in site supervision of geotechnical investigations using drilling rigs for boreholes, truck mounted cone penetration testing and test pit excavations using excavators and backhoes. My role also included site inspections involving the assessment of conditions for piles, piers and shallow footings. I also undertook site walkovers for assessment of mine subsidence and slope stability.

2007-2008 Undergraduate Geotechnical Engineer

Douglas Partners, Newcastle

Whilst an undergraduate engineer with Douglas Partners I experienced a broad range of practice areas and developed a diverse range of engineering skills.



Relevant Ecological Experience

2013 - Current

Bird Surveyor

Hunter Bird Observers Club

Volunteer survey work for Hunter Bird Observers Club for regular wader and water bird counts and Tomago and Kooragang Island.

2017 – Current

Birddata Moderator

Birdlife Australia

Volunteer moderating and vetting bird surveys from *Birddata* which is the Birdlife Australia Atlas to ensure a robust database for both the Hunter Valley and Central Coast reporting areas totalling approximately 5000 surveys per year.

05 H

Bushfire Threat Assessment Report

BUSHFIRE THREAT ASSESSMENT

FOR

REZONING PROCESS

OF

VARIOUS LOTS
KANANGRA DRIVE,
GWANDALAN

Prepared for: QMC PROPERTY GROUP PTY LTD

Revision 1 - 9 May 2019

AEP Ref: 1467



Contents

1.0	Introduction.....	1
2.0	Site Particulars	2
3.0	Proposed Development.....	4
4.0	Bushfire Hazard Assessment.....	6
4.1	Bushfire Prone Land Mapping.....	6
4.2	Vegetation Analysis	7
4.3	Slope Analysis	8
4.4	Required Asset Protection Zones.....	11
5.0	Bushfire Hazard Determination	12
5.1	Construction Standards – AS 3959-2009	12
5.2	Access and Egress.....	13
5.3	Water Supply	14
6.0	Other Considerations.....	17
7.0	Conclusion.....	18
8.0	References.....	19



Figures

Figure 1 – Site Location.....	3
Figure 2 – Proposed Rezoning Plan.....	5
Figure 3 – Extract from Central Coast Council Bushfire Prone Land Map (2018)	6
Figure 4 – Slope and Vegetation Assessment.....	9
Figure 5 - Slope and Vegetation Assessment (Potential Future Scenario).....	10
Figure 6 – Required APZ and BALs.....	15
Figure 7- Required APZ and BALs (Potential Future Scenario)	16

Appendix

Appendix A – RFS Referral Response



1.0 Introduction

At the request of QMC Property Group (the client), Anderson Environment & Planning (AEP) have produced this revised report to assess the bushfire protection measures required by the NSW Rural Fire Service's "*Planning for Bushfire Protection 2006*" (PBP) and the construction requirements of the proposed development in accordance with the provisions of the Building Code of Australia – Volume 2, Edition 2010 and Australian Standard 3959-2009 (AS 3959) – "*Construction of buildings in bushfire-prone areas*".

As part of the proposed development includes rezoning for residential subdivision, it is classed as 'Integrated Development' under Section 91 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). In combination with Section 100B of the *Rural Fires Act 1997* (RF Act), a Bushfire Safety Authority (BSA) is required from the Rural Fire Service (RFS) to enable the development to proceed. This report addresses the required heads of consideration relevant to obtaining a BSA.

We have presented two scenarios; the situation at present and a possible future scenario. The future scenario may result in a reduced fire hazard in the east and south of the site resulting from the application of an 88B Easement arrangement in lands to the east and a future development in lands directly south.

The proponent has also received a referral response from NSW RFS on the planning proposal dated 27 November 2015. A copy of the referral response is attached in **Appendix A**.

For the purposes of referencing, this document should be referred to as:

Anderson Environment & Planning (2019). *Bushfire Threat Assessment for Rezoning Process of Various Lots at Kanangra Drive, Gwandalan NSW*. Unpublished report for QMC Property Group, Revision 1 - May 2019.



2.0 Site Particulars

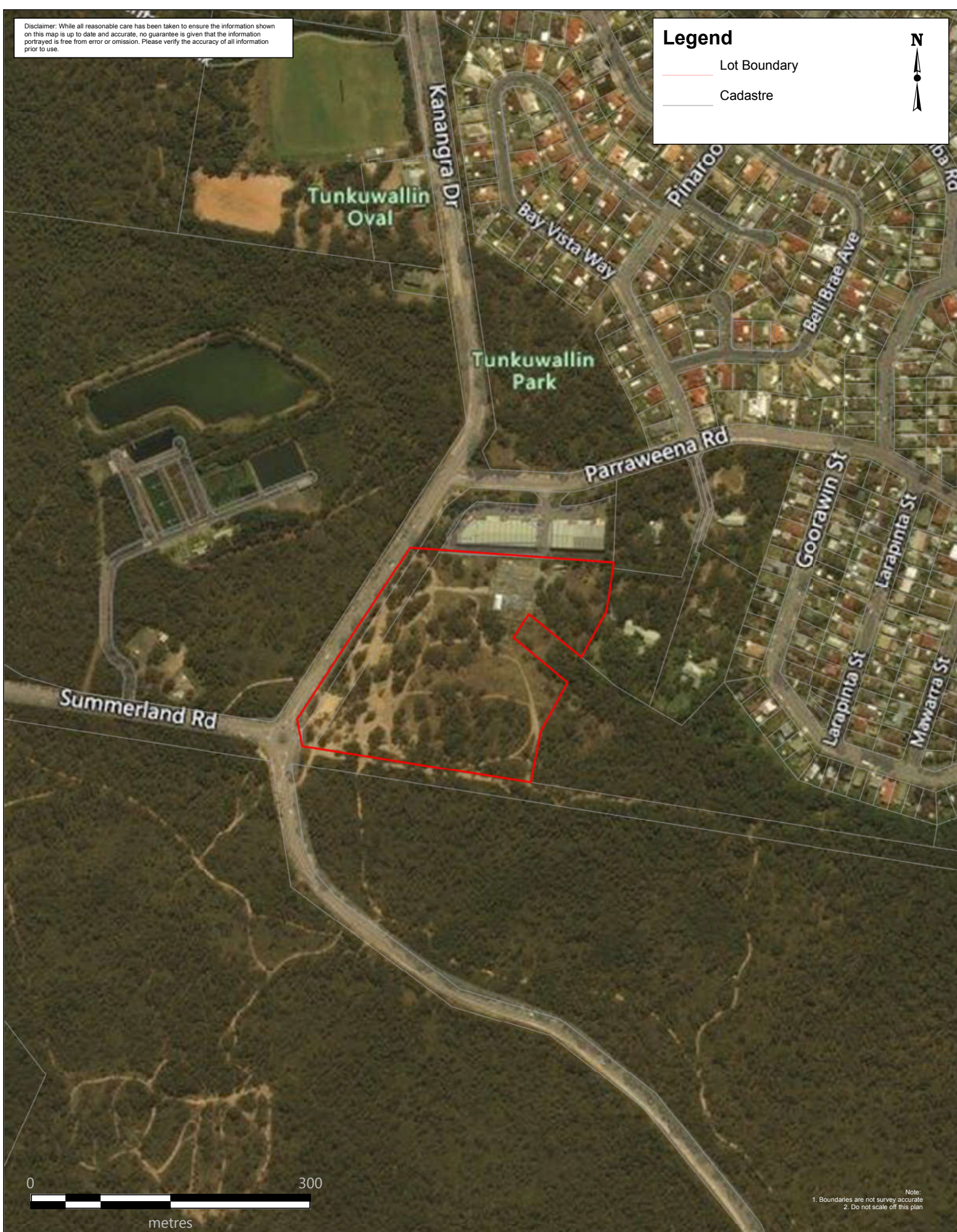
- **Address** – 60 and part 50W, part 44W Parraweena Road, Gwandalan.
- **Title Details** – Part Lot 1 DP 1043151 and Lot 20 DP 1089946.
- **LGA** – Central Coast.
- **Subject Site** – The above-mentioned lot that encompasses approx. 5.2 hectares (ha).
- **Study area** – The study area includes the subject site and the immediate surrounds of the proposed development.
- **Zoning** – As per Wyong Shire Council LEP 2013, the site is zoned RE1 – Public Recreation and IN2 – Light Industrial.
- **Current Land Use** – The site includes disused hardstand areas as well as disturbed remnant habitat with a managed understorey and numerous trail bike tracks traversing the site. There is a small dam located in the central north-east of the site. Some parts of the site are devoid of remnant vegetation and comprise rank grassland.
- **Surrounding Land Use** – The site is bounded by Kanangra Drive to the west, IN2 - Light Industrial to the north, remnant vegetation and a creek line to the east zoned E2 - Environmental Conservation, land in the east north of the creek line is zoned E4 – Environmental Living and contains a number of residences, to the east south of the creekline is zoned RE1 – Public Recreation and land to the south is zoned R2 – Low Density Residential. A large residential subdivision has been proposed in lands directly south of the proposed development.

Figure 1 depicts the location of the site laid over an aerial photograph of the locality.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Lot Boundary
- Cadastre



AEP

Title: Figure 1 - Site Location

Location: Gwandalan, NSW

Client: QMC Property Group

Date: April 2019

Our Ref: 1467



3.0 Proposed Development

Following the rezoning of the site from RE1 – Public Recreation and IN2 – Light Industrial to B2 – Local Centre, R1 – General Residential and R2 – Low Density Residential, the following development is proposed for the site:

- A mix of retail, commercial and community service use type buildings;
- Town square / park area; and
- General and low-density residential subdivision.

Figure 2 depicts the rezoning proposal within the study area.



4.0 Bushfire Hazard Assessment

4.1 Bushfire Prone Land Mapping

Examination of the Planning Portal (2018) confirms a classification of Vegetation Buffer and Vegetation Category 1. This designation has triggered the need for this Bushfire Threat Assessment.



Figure 3 – Extract from Central Coast Council Bushfire Prone Land Map (2018)



Appendix 3 of the PBP provides the steps required to determine the level of bushfire hazard that applies to the site. Factors influencing the hazard level include:

- The formation of vegetation surrounding the site (as defined by Keith 2004);
- The distance between vegetation and the site (or proposed buildings therein);
- The effective slope for each patch of vegetation; and
- The Fire Danger Index (FDI) of the council area within which the development occurs.

These factors together provide an indication of the level of threat posed to the development from any vegetation retained within the site and surrounding vegetation in the event of a bushfire, and the required mitigation measures to be taken in the form of Asset Protection Zones (APZs) and building construction standards. These measures are detailed further in **Section 5** below.

4.2 Vegetation Analysis

The site and surrounds occur within the Greater Hunter region, with existing vegetation subsequently classified with a Fire Danger Index (FDI) of 100 as per Appendix 2 of the PBP.

Remnant vegetation identified in areas adjacent to the subject site pose a bushfire hazard to the development, AEP understands that vegetation within the subject site is to be removed, therefore only off-site vegetation is considered within this BTA. The adjoining hazard vegetation is considered to constitute “Forest” under the PBP and consists of areas in the north, east, south and west of the site. A drainage line and small area of riparian vegetation exists to the east and has been classed as “Rainforest” under the PBP (**Figure 4**).

Land zoned E4 – Environmental Living located northeast of the subject site contains a number of residences, associated infrastructure and native vegetation. Although vegetation is present, the fire hazard is reduced as these properties have a managed understorey maintaining a minimal fuel load resulting in a reduced hazard to surrounding areas.

It should be noted that there is significant development approved to the south of the subject site, it is likely that this area will be developed prior to a Development Application being submitted for this site. Forested areas proposed for residential development that would otherwise constitute a hazard have been removed from the hazard vegetation assessment.

Two scenarios have been presented below, one showing the situation as is currently stands; “Forest” hazard vegetation surrounding the site and a possible future scenario where these hazards are removed in the east and south. This will involve the application of an 88B instrument with landholders to the east to ensure their land is managed to an acceptable standard and the development a residential subdivision in lands to the south removing hazard vegetation adjoining the site.



4.3 Slope Analysis

The site slopes down from the west to east.

Examination of slope class to relevant hazard areas reveals:

- **North** – Flat/ upslope towards Forest Vegetation;
- **East** – >0-5 degrees downslope towards Forest and Rainforest Vegetation;
- **South** – Flat/ upslope towards Forest Vegetation; and
- **West** – Flat/ upslope towards Forest Vegetation.

Figures 4 and 5 provide a visual representation of the vegetation and effective slope as it applies to the proposal both for present and future scenarios.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

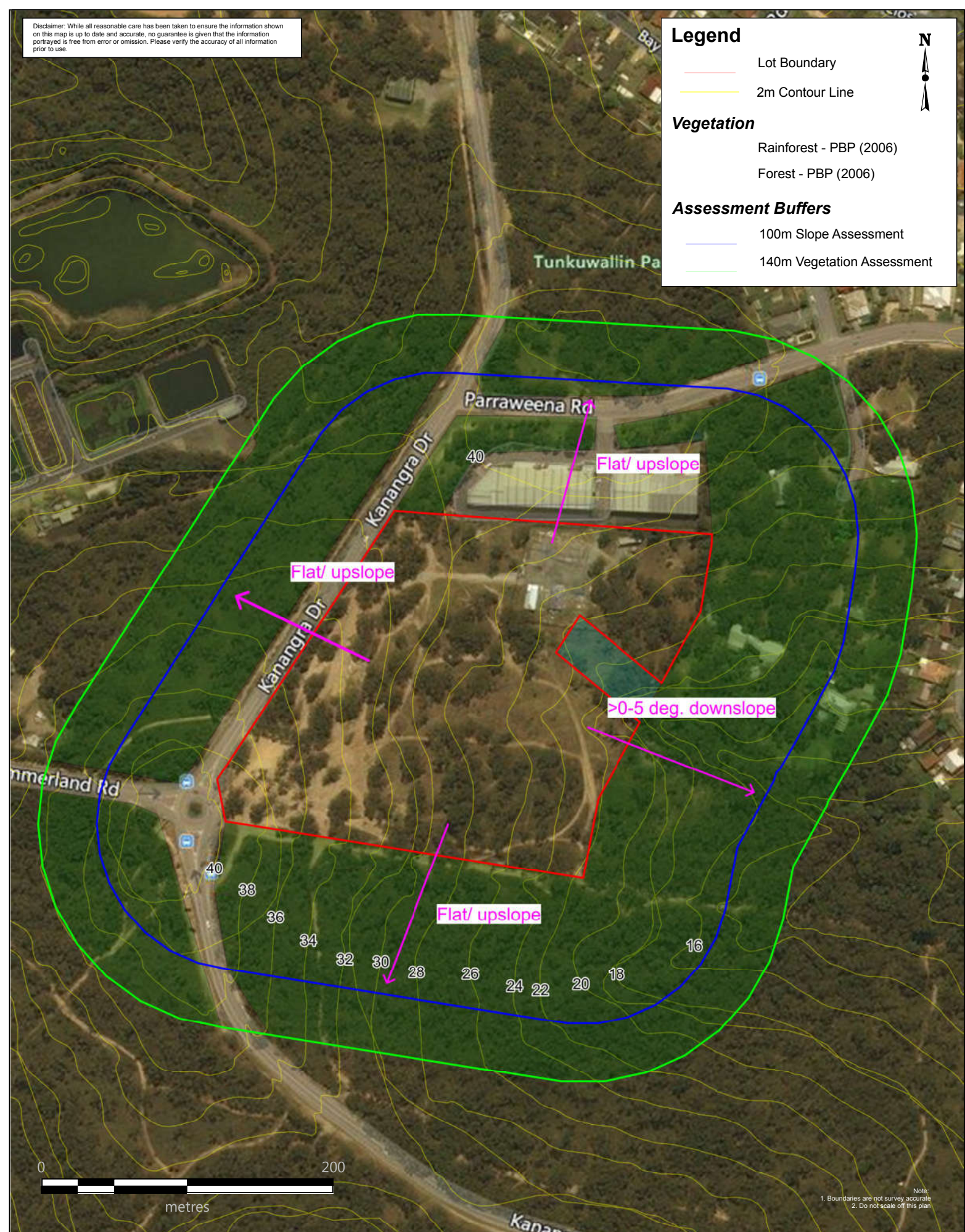
- Lot Boundary
- 2m Contour Line

Vegetation

- Rainforest - PBP (2006)
- Forest - PBP (2006)

Assessment Buffers

- 100m Slope Assessment
- 140m Vegetation Assessment



AEP

Title: Figure 4 - Slope and Vegetation Assessment

Date: April 2019

Location: Gwandalan, NSW

Client: QMC Property Group

Our Ref: 1467

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

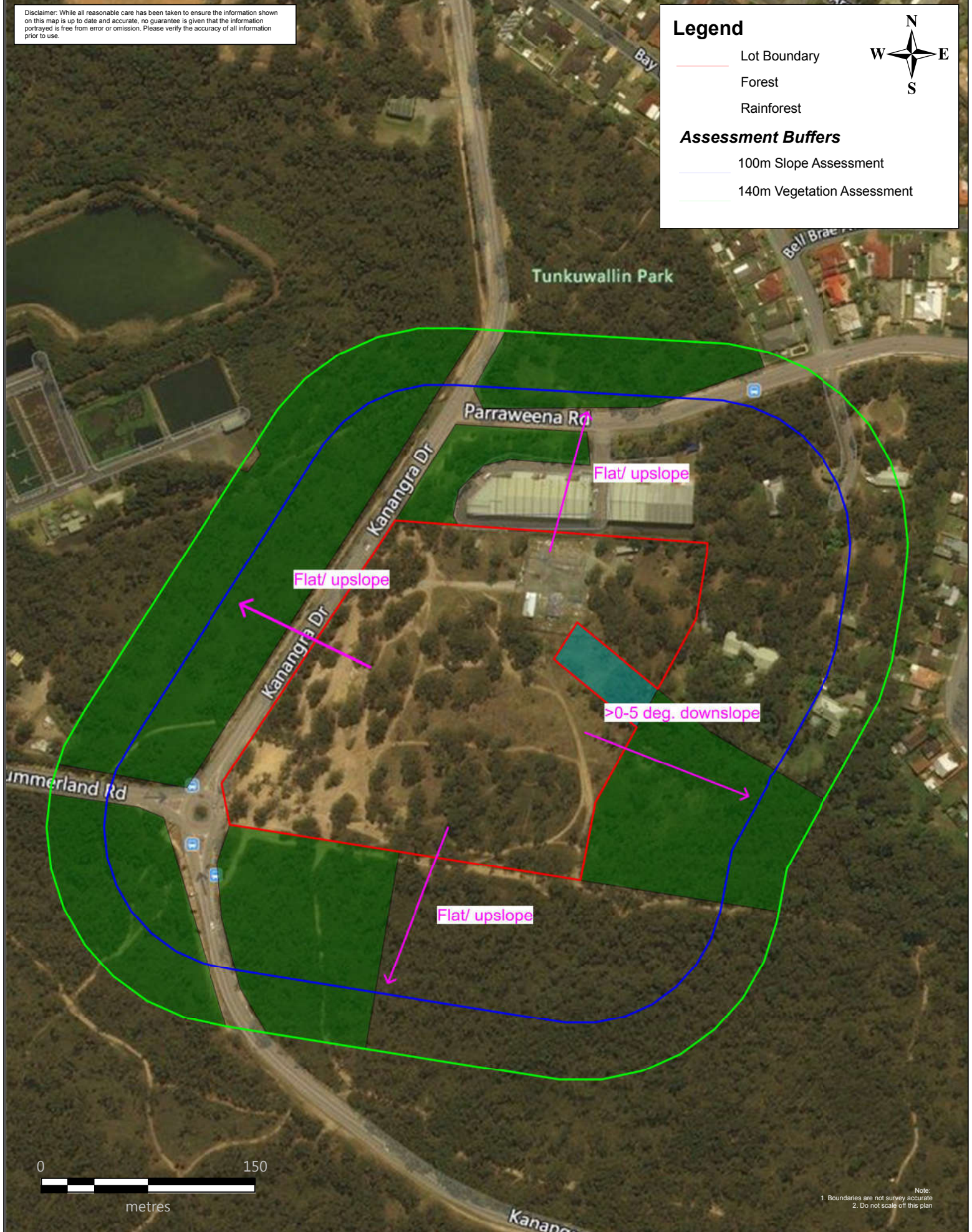
Legend

- Lot Boundary
- Forest
- Rainforest



Assessment Buffers

- 100m Slope Assessment
- 140m Vegetation Assessment



AEP

Title: Figure 5 - Slope and Vegetation Assessment (Future) Date: May 2019

Location: Gwandalan, NSW

Client: QMC Property Group

Our Ref: 1467



4.4 Required Asset Protection Zones

Based on the information presented previously, the following derivation of required Asset Protection Zones (APZs) was concluded.

Fire Danger Index Rating = 100

North

- Predominant Vegetation – Forest
- Effective Slope – Flat/ upslope
- Required minimum APZ – 20m

East

- Predominant Vegetation – Forest
- Effective Slope – >0-5 degrees downslope
- Required minimum APZ – 25m

East

- Predominant Vegetation – Rainforest
- Effective Slope – >0-5 degrees downslope
- Required minimum APZ – 10m

South

- Predominant Vegetation – Forest
- Effective Slope – Flat/ upslope
- Required minimum APZ – 20m

West

- Predominant Vegetation – Forest
- Effective Slope – Flat/ upslope
- Required minimum APZ – 20m

5.0 Bushfire Hazard Determination

5.1 Construction Standards – AS 3959-2009

As outlined above. The identification of proximate hazards post development has resulted in the need for APZs, and hence consideration of related construction standards.

Bushfire Impact and AS-3959-2009

The Australian Standard 3959-2009 “Construction of buildings in bushfire prone areas”, details six (6) levels of construction standard that are required for buildings, depending upon the expected impact of a bushfire from adjacent areas. These Bushfire Attack Levels (BALs) are measured from the edge of the hazard and incorporate vegetation type and slopes (see Section 4 above) to determine the relevant distance for each BAL rating (and associated construction standard). The relationship between the expected impact of a bushfire and the BAL rating is provided in **Table 1** below.

Table 1 – BAL Construction Standard

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction standard under AS 3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL – 12.5
19	12.6 to 19.0	BAL – 19
29	19.1 to 29	BAL - 29
40	29 to 40	BAL – 40
Flame Zone	≥40	BAL – FZ (Not deemed to satisfy provisions)

The BAL construction standards applicable for the proposed development are:

Flat/upslope towards Forest vegetation to the north, south and West

- <19m – BAL-FZ
- 19 to <25m – BAL-40
- 25 to <35m – BAL-29
- 35 to <48m – BAL-19
- 48 to < 100m – BAL-12.5



>0 – 5 degrees downslope to Forest vegetation to the east

- <24m – BAL-FZ
- 24 to <32m – BAL-40
- 32 to <43m – BAL-29
- 43 to <57m – BAL-19
- 57 to < 100m – BAL-12.5

>0 – 5 degrees downslope to Rainforest vegetation to the east

- <10m – BAL-FZ
- 10 to <14m – BAL-40
- 14 to <20m – BAL-29
- 20 to <29m – BAL-19
- 29 to < 100m – BAL-12.5

These BALs are to be adopted as the minimum requirement for each specific zone. Any lessening of these requirements would require reassessment to ensure increased APZs are provided, or other acceptable mitigation measures are in place.

Required Asset Protection Zones and associated BAL construction standards have been derived and applied to the site.

As discussed previously the future scenario may require the application of section 88b instruments under the '*Conveyancing Act 1919*' as this may be necessary for the vegetation to the east of the subject site to provide assurances that this vegetation remains in an actively managed state.

Figures 6 and 7 depict the BAL construction standards applicable for the proposed development, both present and potential future scenarios.

5.2 Access and Egress

The proposed development will have access to Kanangra Drive and Summerland Drive. Internal roads would need to comply with section 4 of the PBP.

Emergency response times would be expected to be rapid with the Lake Munmorah Fire Brigade located approximately 7km away with an expected response time of approximately 8 minutes.



5.3 Water Supply

It is expected that the development will be serviced by a reticulated water supply system extended from existing and proposed industrial areas.

The reticulated water supply and street hydrant access will need to be delivered in accordance with AS 2419.1-2005.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Lot Boundary
- Required APZ

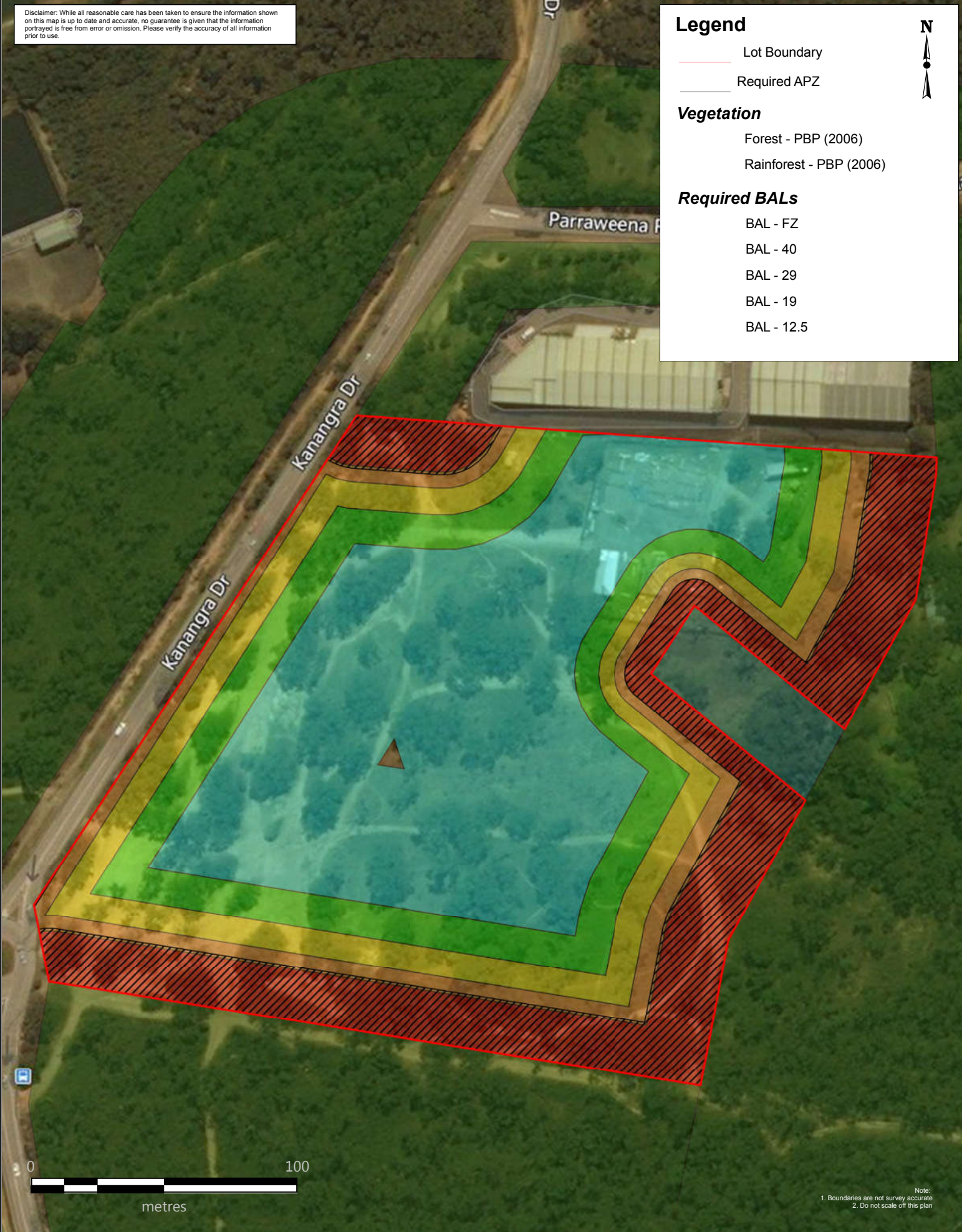


Vegetation

- Forest - PBP (2006)
- Rainforest - PBP (2006)

Required BALs

- BAL - FZ
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 6 - Required APZ and BALs

Date: April 2019

Location: Gwandalan, NSW

Client: QMC Property Group

Our Ref: 1467

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

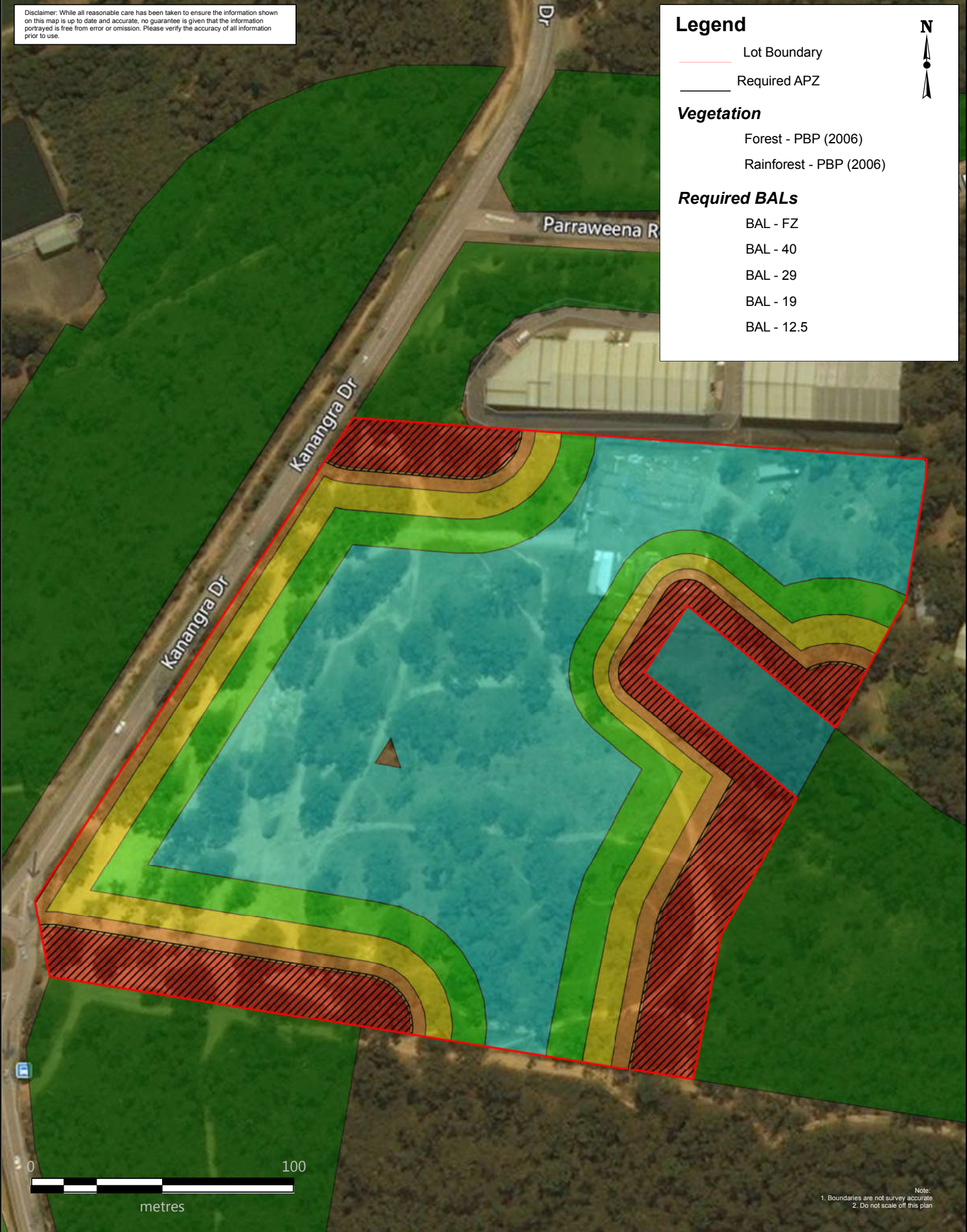
- Lot Boundary
- Required APZ

Vegetation

- Forest - PBP (2006)
- Rainforest - PBP (2006)

Required BALs

- BAL - FZ
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 7 - Required APZ and BALs (Future)

Date: May 2019

Location: Gwandalan, NSW

Client: QMC Property Group

Our Ref: 1467



6.0 Other Considerations

The following analysis applied to the site in reference to environmental features present.

- **Riparian Corridors** – One exists east of the site.
- **SEPP (Coastal Management)** – none present.
- **SEPP 44 Koala Habitat** – no ‘Core Koala Habitat’ present.
- **Areas of geological interest** – none present.
- **Environmental protection zones or steep lands (>18°)** – none present.
- **Land slip or flood prone areas** – none present.
- **National Parks estate or various other reserves** – none present.
- **Threatened species matters** –threatened species could potentially utilise the site. Impact to such entities have been assessed via an Ecological Assessment Report that will also accompany the Gateway Proposal. Impact to threatened species matters will require a Biodiversity Development Assessment Report under the BC Act 2017 to accompany any future development applications.
- **Aboriginal Heritage** – none known to be present.



7.0 Conclusion

Investigations undertaken for this Bushfire Threat Assessment have revealed that the subject site will be affected by offsite bushland hazard to the north, east, south and west.

It should be noted that there is significant development approved to the south of the subject site, it is likely that that area will be developed prior to a Development Application being lodged. As such, we have presented a potential future scenario where hazard vegetation to the south of the subject site has been excluded.

Forested land adjoining the site to the northeast may be removed as a hazard provided an 88B Easement arrangement under the '*Conveyancing Act 1919*' can be established.

Suitable access and egress to the site will be provided via Kanangra Drive and Summerland Drive, new internal roads of the subdivision will need to be compliant with Section 4.6 of the PBP (2006). It is also noted that any future development application will likely occur under PBP 2018 which is currently under pre-release and is expected to be enacted later this year.

It is expected that the development will be serviced by a reticulated water supply system extended from existing and proposed industrial areas and street hydrant access is to be delivered in accordance with AS2419.1 – 2005.

Any future development on the site will require a project specific Bushfire Threat Assessment which will address the specific requirements of individual development being residential, commercial/retail or potentially Special Fire Protection Purposes.

It is considered that the subject site is suitable for the proposed zones and that development specific to each of the proposed zones is able to occur with regards to bushfire considerations, principally APZs and relevant construction standards, comply with the relevant requirements of Planning for Bushfire Protection and AS-3959. When applied, these measures should provide adequate protection to life and property within the proposed development in the event of a bushfire occurring in the immediate locality. However, it can never be guaranteed that the site and residents and property therein will not at some stage be affected by a bushfire event.



8.0 References

NSW Government (2013) – *Wyong Local Environment Plan 2013*.

NSW Government (2013) *Rural Fires Act 1997*. NSW Government, Sydney.

NSW Government (1979) *Environment and Planning & Assessment Act 1979*. NSW Government, Sydney.

NSW Government (2008) *Rural Fires Regulation 2008*. NSW Government, Sydney.

NSW Rural Fire Service (2006). *Planning for Bushfire Protection*. NSW Rural Fire Service / NSW Department of Planning, Sydney.

Standards Australia (2009) AS-3959 *Construction of Buildings in Bushfire-Prone Areas*. Standards Australia, Sydney.



Appendix A – RFS Referral Response



NSW RURAL FIRE SERVICE



The General Manager
Wyong Shire Council
PO Box 20
WYONG NSW 2259

Your reference: RZ/2/2015
Our reference: L14/0001

27 November 2015

Attention: Rod Mergan

Dear Sir/Madam,

Planning Proposal 44W, 50W & 60 Parraweena Road, Gwandalan

I refer to your letter dated 8 October 2015 seeking advice on the above Planning Proposal in accordance with section 56(2)(D) of the *Environmental Planning and Assessment Act 1979*.

Given the limited detail available at this stage of the planning proposal it is difficult to make specific comment, however the following advice is provided.

- The entire site is mapped as bush fire prone land, as is all of the land surrounding the development. Therefore, future development must be able to ensure an appropriate level of protection to adequately protect life and property from the threat of bush fire. In particular any residential development must be able to provide asset protection zones (APZs), safe access, and a satisfactory water supply. APZs would require removal and ongoing management of vegetation around future development.
- In this regard it is appropriate that a comprehensive bush fire assessment be carried out by a recognised bushfire planning practitioner. The assessment should identify the relevant vegetation type or types within 140m of the subject land, as well as the relevant slopes underneath the hazard (vegetation) for a distance of 100m from the site boundaries in all directions. From this a recommendation should be made for appropriate APZs and other bushfire protection measures.
- The RFS has made a preliminary assessment that the relevant vegetation category affecting the subject land would be forest, with slopes generally falling within the range of 0-5°. On this basis APZs of 25m width would be required for residential development.
- APZs are generally not required for commercial land, however, if residential or mixed residential/commercial development is permissible under the proposed zoning, then the appropriate APZs must be provided.
- The NSW Rural Fire Service (NSW RFS) would expect that reticulated water supply would be extended to the subject land.
- The NSW RFS is aware of the proposed development to the south of the subject land. It is expected that development of that land will remove the majority of the vegetation and therefore the bush fire hazard. However, until that has occurred the NSW RFS will consider the planning proposal on the basis of the hazard remaining, and require appropriate APZs to be in place.

Postal address

NSW Rural Fire Service
Glendenning Customer Service Centre
Locked Bag 17
GRANVILLE NSW 2142

Street address

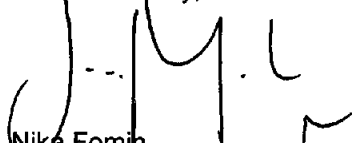
NSW Rural Fire Service
Customer Service Centre East
42 Lamb Street
GLENDENNING NSW 2761

T (02) 8867 7958
F (02) 8867 7983
www.rfs.nsw.gov.au

- It should be noted that future developments located on bush fire prone land may require assessment under Section 79BA and/or section 91 of the *Environmental Planning and Assessment Act 1979* and may require the issue of a Bush Fire Safety Authority under Section 100B of the *Rural Fires Act 1997*.
- Where residential development adjoins a bush fire hazard a perimeter road should be provided between the development and the hazard with the road having a minimum carriageway width of 8 metres. The perimeter road may form part of the required APZ. The construction of public roads shall otherwise comply with Section 4.1.3(1) of *Planning for Bush Fire Protection 2006*.
- It is noted that the proposal may permit a number of development types which are classified as Special Fire Protection Purpose (SFPP) developments, e.g. schools, child care centres, aged person accommodation. SFPP developments require the issue of a Bush Fire Safety Authority under section 100B of the *Rural Fires Act 1997*. It is advised that the assessment of SFPP developments differs to residential developments. SFPP developments will need to comply with Section 4.2.7 of *PBP 2006* and will require larger APZs between the development and unmanaged vegetation in accordance with Table A2.6 of *PBP 2006*, based on 10kW/m^2 radiant heat flux in the event of a bush fire.

If you have any queries regarding this advice, please contact Peter Eccleston on 1300 NSW RFS.

Yours sincerely,



Nika Fomin
Manager, Customer Service Centre East