



DARRYL ANDERSON CONSULTING PTY LTD

TOWN PLANNING & DEVELOPMENT CONSULTANTS

**ENVIRONMENTAL ASSESSMENT UNDER PART 3A OF THE ENVIRONMENTAL
PLANNING AND ASSESSMENT ACT, 1979 (AS AMENDED)
MAJOR PROJECT APPLICATION NO. 08_0118**

**PROPOSED 13 LOT RESIDENTIAL SUBDIVISION
AT LOT 4 DP 876253 WILLOW AVENUE, BOGANGAR
(TWEED LOCAL GOVERNMENT AREA)**

PREPARED FOR:

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PREPARED BY:

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FEBRUARY 2010

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**DRAFT ENVIRONMENTAL ASSESSMENT UNDER PART 3A
OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT, 1979 (AS AMENDED)
APPLICATION NO. 08_0118**

EXECUTIVE SUMMARY

Kenmar Farms Pty Ltd has instructed Darryl Anderson Consulting Pty Ltd to prepare this Environmental Assessment Report in respect of a Major Project Application for a proposed subdivision comprising twelve residential lots and a residue lot. The Company (or related Companies) has owned the land since circa 1965.

The site is located at Bogangar which is approximately 10km south of Tweed Heads within the Tweed Local Government Area.

Tweed Local Environmental Plan 2000 Amendment No. 7 was gazetted on 21 October 2005. That Plan rezoned the Willow Avenue section of the site to 2(a) Low Density Residential.

The site is within the existing urban footprint under the Far North Coast Regional Strategy 2006 – 2031.

Bogangar/Cabarita is a coastal village with a population of approximately 3000 persons. The Village contains retail shops, a primary school, a surf club, a hotel/tavern, a sports club, sports fields and a mix of residential and tourist accommodation.

The project site is located on the western edge of the village and has a frontage to Clothiers Creek Road (two lane, sealed road) and Willow Avenue (sealed urban street).

In real property terms, the site is described as Lot 4 DP 876253 having an area of 12.31 hectares. An easement to drain water 33.08m wide and variable width burdens the site (and benefits Tweed Shire Council). An open drainage channel is located generally within the easement. The channel forms a physical barrier between the residentially zoned component of the land and the residue lot. It conveys stormwater from upstream of Rosewood Avenue to Cudgen Lake via an approved water quality control pond adjacent to the Lake.

The open drainage channel and easement divide the site into two separate parts. That part of the site generally north of the channel is zoned 2(a) Low Density Residential and has been filled and contains low closed grasslands and scattered trees. It is proposed to create twelve residential lots on this part of the site with areas ranging from 569m² to 1065m². Each lot will have a frontage and access to Willow Avenue and reticulated water, sewer, power and telephone services will be provided.

That part of the site south of the 2(a) land generally up to and including part of the drainage channel and easement is zoned part 7(l) Environmental Protection (Habitat). That part of the site generally south of the drainage channel is zoned part Rural 1(a) and part 2(a) adjacent to Clothiers Creek Road. No physical works or change of use is proposed within the residue area, being proposed Lot 13, with the exception of vegetation rehabilitation within the 7(l) area between the drainage channel and the proposed residential lots.

That part of the site zoned 2(a) fronting Willow Avenue offers a number of opportunities including availability of services and access; filled land; suitable zoning and convenient access to facilities within the village centre located approximately 1km to the east.

Relatively site development constraints include bushfire hazards, the proximity of Cudgen Lake and the established low density, detached dwelling character of the neighbourhood.

Finalisation of the subdivision layout reflects the key site opportunities and constraints and is informed by the specialist reports and studies contained in the Annexures, including:

- Visual Impact Assessment
- Flora and Fauna Assessment

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- Bushfire Hazard Assessment
- Acid Sulphate Soils Assessment
- Contamination Assessment
- Geotechnical Report
- Cultural Heritage Assessment
- Engineering Assessment

Having regard to these Assessments, this Environmental Assessment concludes that the project is sustainable and compliant with relevant planning controls.

On 24 November 2008 the Department of Planning advised that the Director General (as delegate of the Minister) has formed the opinion that the proposal is a project to which Part 3A of the Environmental Planning and Assessment Act applies.

Subsequently, on 25 February 2009 the Department of Planning issued the Director General's Environmental Assessment Requirements for the project. This Report addresses the Director General's Environmental Assessment Requirements and concludes that the project complies with relevant planning requirements and achieves consistency with ESD principles. It is therefore considered that approval of the application would be in the public interest.

1.0 BACKGROUND

1.1 Director General's Environmental Assessment Requirements

The Director General's Environmental Assessment Requirements are reproduced in Table 1. The table indicates where each of the relevant matters is addressed in this Environmental Assessment.

TABLE 1 – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	
REQUIREMENT	SECTION
General Requirements	
The Environmental Assessment (EA) for the Project Application must include:	
1. An executive summary;	Page 5
2. A detailed description of the proposal;	Section 2.0
3. A thorough site analysis including constraints mapping and description of the existing environment;	Section 3.0
4. Consideration of any relevant statutory and non-statutory provisions and identification of any non-compliances with such provisions, in particular relevant provisions arising from environmental planning instruments, Regional Strategies (including draft Regional Strategies) and Development Control Plans;	Section 4.0
5. Consideration of the consistency of the project with the objects of the Environmental Planning and Assessment Act 1979;	Section 5.0
6. Consideration of impacts, if any, on matters of National Environmental Significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999; 1	Section 6.0
7. An assessment of the potential impacts of the project and a draft Statement of Commitments, outlining environmental management, mitigation and monitoring measures to be implemented to minimise any potential impacts of the project;	Section 7.0
8. The plans and documents outlined in Attachment 2;	Annexures
9. A signed statement from the author of the Environmental Assessment certifying that the information contained in the report is neither false nor misleading; and	Annexure 1
10. An assessment of the key issues specified below and a table outlining where in the EA these key issues have been addressed.	Section 8.0

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TABLE 1 – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	
REQUIREMENT	SECTION
The EA must address the following key issues:	
1. Subdivision Design, Layout and Desired Future Character	
1.1 Demonstrate the consistency of the proposal with the character of existing development in terms of the locality, street frontage, scale, building envelopes and future built form controls, aesthetics, energy and water efficiency and safety.	Section 8.1
1.2 Demonstrate the consistency of the proposed subdivision design and layout with the Coastal Design Guidelines for NSW, NSW Coastal Policy 1997 and SEPP 71 - Coastal Protection.	Sections 8.2 & 8.3
1.3 Identify the type of subdivision proposed across the site ie. community, Torrens, strata. A draft community management statement should be provided if community title is proposed.	Section 2.0
1.4 Provide details of potential building envelope, built form and design quality controls and the means for implementing them.	Section 8.4
1.5 Provide details of any staging that demonstrates the lots will be released in an orderly and coordinated manner.	Section 8.5
1.6 Outline the long-term management and maintenance of any areas of open space or conservation including ownership and control, management and maintenance funding, public access, revegetation and rehabilitation works and bushfire management.	Section 8.6
2. Visual Impact	
2.1 Address the visual impact of the proposal in the context of surrounding development and relevant mitigation measures. In particular address impacts on the amenity of the foreshore, loss of views from public places and cumulative impacts.	Section 8.7
3. Infrastructure Provision	
3.1 Address existing capacity and requirements of the development for sewerage, water, electricity, waste disposal, telecommunications and gas in consultation with relevant agencies. Identify and describe staging, if any, of infrastructure works.	Section 8.8
3.2 Address and provide the likely scope of any planning agreements and/or development contributions with Council ¹ Government agencies (including relevant community/state infrastructure contributions).	Section 4.5.11
4. Traffic and Access	
4.1 Prepare an appropriate traffic impact study.	Section 8.9
4.2 Protect existing public access to and along the coastal foreshore and provide, where appropriate, new opportunities for controlled public access. Consider access for the disabled, where appropriate.	Section 8.9
5. Hazard Management and Mitigation	
Coastal Processes	
5.1 Address coastal hazards and the provisions of the Coastline Management Manual. In particular, consider impacts associated with wave and wind action, coastal erosion, sea level rise and more frequent and intense storms.	Section 8.10.1
Contamination	
5.2 Provide a Preliminary Contamination Assessment, identifying any contamination on site and appropriate mitigation measures in accordance with the provisions of SEPP 55- Remediation of Land.	Section 8.10.2
Acid Sulphate Soils	
5.3 Identify the presence and extent of acid sulphate soils on the site and, where relevant, appropriate mitigation measures. Identify the need for an Acid Sulphate Management Plan (prepared in accordance with ASSMAC Guidelines).	Section 8.10.3
Bushfire	
5.4 Address the requirements of Planning for Bush Fire Protection 2006 (RFS).	Section 8.10.4

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TABLE 1 – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	
REQUIREMENT	SECTION
Geotechnical	
5.5 Provide an assessment of any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations that address these limitations.	Section 8.10.5
Flooding	
5.6 Provide an assessment of any flood risk on site (for the full range of floods including events greater than the design flood, up to probable maximum flood; and from coastal inundation, catchment based flooding or a combination of the two) and having consideration of any relevant provisions of the NSW Floodplain Development Manual 2005. The assessment should determine: the flood hazard in the area; address the impact of flooding on the proposed development, address the impact of the development (including filling) on flood behaviour of the site and adjacent lands; and address adequate egress and safety in a flood event.	Section 8.10.6
5.7 Assess the potential impacts of sea level rise and an increase in rainfall intensity on the flood regime of the site and adjacent lands with consideration of Practical Consideration of Climate Change - Floodplain Risk Management Guideline (DECC, October 2007).	Section 8.10.6
6. Water Cycle Management	
6.1 Address and outline measures for Integrated Water Cycle Management (including stormwater) based on Water Sensitive Urban Design principles which addresses impacts on the surrounding environment, drainage and water quality controls for the catchment, and erosion and sedimentation controls at construction and operational stages.	Section 8.11
6.2 Prepare a conceptual design layout plan for the preferred stormwater treatment train showing location, size and key functional elements of each part of the system.	Section 8.11
6.3 Assess the impacts of the proposal on surface water hydrology and quality during both construction and occupation of the site.	Section 8.11
6.4 Consider the nature and profile of the groundwater regime under the site, including any hydrologic impacts which would affect its depth or water quality, result in increased groundwater discharge, impact on the stability of potential acid sulphate soils in the vicinity, or affect groundwater dependent native vegetation.	Section 8.11
7. Heritage and Archaeology	
7.1 Identify whether the site has significance to Aboriginal cultural heritage and identify appropriate measures to preserve any significance. The assessment must address the information and consultation requirements of the draft Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation (DEC 2005) and Interim Community Consultation Requirements for Applicants (DEC 2004)	Section 8.12
7.2 Identify any items of non-indigenous heritage significance and, where relevant, provide measures for the conservation of such items.	Section 8.12
7.3 Cudgen Nature Reserve is listed on the State Heritage Register as High conservation Old Growth Forest. Describe the actions that will be taken to avoid or mitigate impacts or compensate unavoidable impacts on this area.	Section 8.12
8. Flora and Fauna	
8.1 Assess the potential impacts of the development on flora and fauna taking into consideration impacts on any threatened species, populations, endangered ecological communities and/or critical habitat and any relevant recovery plan in accordance with DECC's Guidelines for Threatened Species Assessment (2005). Describe the actions that will be taken to avoid or mitigate impacts or compensate unavoidable impacts on these species, where relevant.	Section 8.13
8.2 Outline measures for the conservation of existing wildlife corridor values and/or connective importance of any vegetation on the subject land.	Section 8.13
8.3 Address measures to protect and manage adjacent aquatic habitats including Cudgen Lake, including impacts due to increased recreational usage/visitation, having particular consideration for the Cudgen Lake Nature Reserve Plan of Management, NPWS 1998, the Cudgen Lake Coastal Lake Assessment Model and Statement of Intent for Coastal Lakes of NSW.	Section 8.13
8.4 Assess the proposal against the following: Comprehensive Coastal Assessment document 'Wetlands of High Conservation Value and their Threats in the Tweed Catchment (May 2006); and,	Section 8.13

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TABLE 1 – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	
REQUIREMENT	SECTION
The mapped Key Fish Habitat values of Cudgen Lake and advise how upstream barriers to fish passage will be addressed.	Section 8.13
8.5 Address the requirements of the 'North Coast guide for avoiding and reducing rural land use conflict and interface issues'(Centre for Coastal Agricultural Landscapes - Southern Cross University, June 2007) in relation to potential land use conflict occurring between the development and Cudgen Lake.	Section 8.13
9. Mosquito Management	
9.1 Prepare a Mosquito Management Plan in accordance with Tweed Shire Council's Development Control Plan No.25 - Biting Midge and Mosquito Control.	Section 8.14
Consultation	
You should undertake an appropriate and justified level of consultation with the following agencies during the preparation of the environmental assessment:	
(a) <i>Agencies or other authorities</i>	Section 9.0
- Tweed Shire Council; - Department of Environment and Climate Change; - Heritage Branch, Department of Planning; - Department of Primary Industries; - NSW Rural Fire Service; - Department of Water and Energy; - Roads and Traffic Authority; - Department of Lands; - NSW Police Service; - State Emergency Service; - Northern Rivers Catchment Management Authority; - Relevant Local Aboriginal Land Council/s and other Aboriginal community groups; and - Relevant infrastructure providers.	
(b) <i>Public</i> Document all community consultation undertaken to date or discuss the proposed strategy for undertaking community consultation. This should include any contingencies for addressing any issues arising from the community consultation and an effective communications strategy.	Section 9.0
The consultation process and the issues raised should be described in the Environmental Assessment.	
The following plans, architectural drawings and diagrams of your proposal as well as the relevant documents will be required to be submitted for your application:	
1. The existing site survey plan is to be drawn to 1:500 scale (or other appropriate scale) and show: - the location of the land, the measurements of the boundaries of the land, the size of the land and north point; - the existing levels of the land in relation to buildings and roads;	Annexure 3
- location and height of existing structures on the site; and - location and height of adjacent buildings and private open space.	
2. An aerial photograph of the subject site with the site boundary superimposed.	Annexure 4

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TABLE 1 – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	
REQUIREMENT	SECTION
3. A Site Analysis Plan must be provided which identifies existing natural elements of the site (including all hazards and constraints), existing vegetation, property dimensions, footpath crossing levels and alignments, existing pedestrian and vehicular access points and other facilities, slope and topography, natural features such as watercourses, rock outcrops, utility services, boundaries, orientation, view corridors and all structures on neighbouring properties where relevant to the application (including windows, driveways etc.).	Annexure 6
4. A locality/context plan drawn to 1:500 scale (or other appropriate scale) should be submitted indicating: ♦ significant local features such as parks, community facilities and open space, water courses and heritage items; ♦ the location and uses of existing buildings, shopping and employment areas; ♦ traffic and road patterns, pedestrian routes and public transport nodes; and ♦ The existing site plan and locality plan should be supported by a written explanation of the local and site constraints and opportunities revealed through the above documentation.	Annexure 5
5. A zoning plan must be provided which shows the existing zoning overlaid with the proposed development layout. An extract of the land use table or relevant clauses from the subject LEP is required.	Annexure 2
6. Subdivision plans are to show the following:- ♦ The location, boundary dimensions, site area and north point of the land, and names of roads fronting the land; ♦ Title showing description of the land with lot and DP numbers etc; ♦ Existing and proposed subdivision pattern including all measurements and sites areas of existing and proposed allotments; ♦ Location and details of all proposed roads and footpaths; ♦ Location of all structures proposed and retained on site; ♦ Location and details of access points to the subdivision; ♦ Existing vegetation on the land and vegetation to be retained; ♦ Location of services and infrastructure, and proposed methods of draining the land; ♦ Any easements, covenants or other restrictions either existing or proposed on the site; ♦ Type of subdivision proposed (Torrens, strata, community title). ♦ Cross sections of roads, including gradients, widths, road names, footpaths etc. ♦ Existing and proposed finished levels in relation to roads, footpaths and structures;	Annexure 7
7. Stormwater Management Plan - prepared in accordance with Tweed Shire Council's Development Design Specification D7 - illustrating the concept for stormwater management from the site and must include details of any major overland flow paths through the site and any discharge points to the street drainage system. Where an on-site detention system is required, the type and location must be shown and must be integrated with the proposed landscape design. Site discharge calculations should be provided;	Annexure 18
8. Erosion and Sediment Control Plan - prepared in accordance with Tweed Shire Council's Development Design Specification D7 - plan or drawing that shows the nature and location of all erosion and sedimentation control measures to be utilised on the site;	Annexure 18
9. Landscape Concept Plan - showing planting design and plant/tree species to be used, listing botanical and common names, mature height and spread, number of plants to be utilised in relation to the treatment of communal/public open space areas, footpaths, driveways and the public domain including details of street trees, furniture, signage, lighting and surface treatments (ie. pavers).	Annexure 9
10. Habitat Restoration Plan - a plan that includes an analysis of the present condition of remnant vegetation on the site and showing proposed compensation areas, as appropriate, including areas proposed for planting and restoration, listing botanical and common names, methods to be used, timing of proposed works and responsibility for ongoing management and maintenance.	Annexure 15

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TABLE 1 – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	
REQUIREMENT	SECTION
11. Construction Management Plan - a plan which outlines traffic and pedestrian management during construction and management of impacts on amenity of adjoining properties and appropriate mitigation measures including noise, dust and sediment and erosion controls;	Annexure 18
12. View Analysis – artist's impression, photomontages, etc. of the proposed development in the context of the surrounding development.	Annexure 10
Specialist Advice	
Specialist advice, where required to support your Environmental Assessment, must be prepared by suitably qualified and practising consultants in relation to issues including, but not limited to, the following: ♦ Planning; ♦ Flora and Fauna; ♦ Bushfire; ♦ Landscaping; ♦ Geotechnical and/or hydrogeological (groundwater); ♦ Stormwater/drainage; ♦ Contamination; and ♦ Acid Sulphate Soils.	Annexure 15 Annexure 12 Annexure 9 Annexure 16 Annexure 18 Annexure 13 Annexure 17

1.2 Statement of Validity of this Environmental Assessment

This Environmental Assessment has been compiled by the following project team:

TABLE 2 – PROJECT TEAM	
B & P Surveys	Survey
LVO Architecture	Landscape and Visual
Everick Heritage Consultants Pty Ltd	Cultural Heritage
BCA Check Pty Ltd	Bushfire
Border Tech Pty Ltd	Contamination, Geotechnical and Acid Sulphate Soils
HMC Environmental Consulting Pty Ltd	Mosquitoes
James Warren and Associates Pty Ltd	Flora and Fauna
Opus Qantec McWilliam Pty Ltd	Engineering
Darryl Anderson Consulting Pty Ltd	Preparation of the Environmental Assessment Report

The Statement of Validity of the Environmental Assessment signed by Darryl Anderson of Darryl Anderson Consulting Pty Ltd is contained at **Annexure 1**. Darryl Anderson certifies that the information contained in this Environmental Assessment is neither false nor misleading to the best of his knowledge.

2.0 DESCRIPTION OF THE PROPOSAL AND SUBDIVISION TYPE

2.1 Property Description

The land to which this Major Project Application relates is described as Lot 4 DP 876253 Willow Avenue, Bogangar having a total area of 12.31 hectares.

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The site is located on the western edge of the village of Bogangar and comprises land within a Residential 2(a) zone, a Rural 1(a) zone and a 7(l) Environmental Protection (Habitat) zone.

2.2 Development Proposal

This application proposes the creation of thirteen lots by way of a conventional Torrens title land subdivision. Proposed Lots 1 to 12 comprise residential lots within land zoned 2(a) having areas ranging from 569m² to 1065m². Each lot will have access and frontage to Willow Avenue. The residue lot will have an area of approximately 11.37 hectares. No physical development or change of use is proposed in respect of the residue lot, with the exception of vegetation rehabilitation within the 7(l) land between the drainage channel and the 2(a) land adjacent to Willow Avenue.

All normal urban services will be provided to the residential lots (Lots 1 to 12) including underground water supply, reticulated sewer and telephone services. Overhead power lines exist within Willow Avenue and it is expected that they will be utilised to provide electrical power to the proposed lots.

Widening of Willow Avenue and the provision of kerb and gutter is also proposed for the frontage of Lots 1 to 12.

It is also proposed to remove trees from proposed Lots 2, 4, 5, 6, 7 and 10 to facilitate the siting of future dwellings. The trees to be removed are shown on **Annexure 9**.

Full details of the proposal and in particular the proposed Subdivision Layout Plan (**Annexure 7**) are contained within this Environmental Assessment Report and the Annexures.

3.0 SITE ANALYSIS

Figure 1 indicates the regional context of the proposed site in relation to the NSW coast, the town of Tweed Heads and the town of Murwillumbah. In summary, the village of Bogangar is located approximately 15km south of Tweed Heads and adjacent to the Pacific Ocean with Cudgen Lake located immediately to the north of the village.



Figure 1 – Regional Context
Source: Far North Coast Regional Strategy 2006 – 2031, Department of Planning 2006

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Insofar as the local context is concerned, **Figure 2** shows the spatial relationship between the site and the village. In summary, the site is located on the western edge of the village and has access to Willow Avenue which is a residential street connecting to the Tweed Coast Road and the Cabarita Beach town centre by way of an existing street network.

Annexure 5 also provides a Location and Context Plan showing the relationship between the site and the key elements of the village. The town centre is located approximately 1km east of the site.

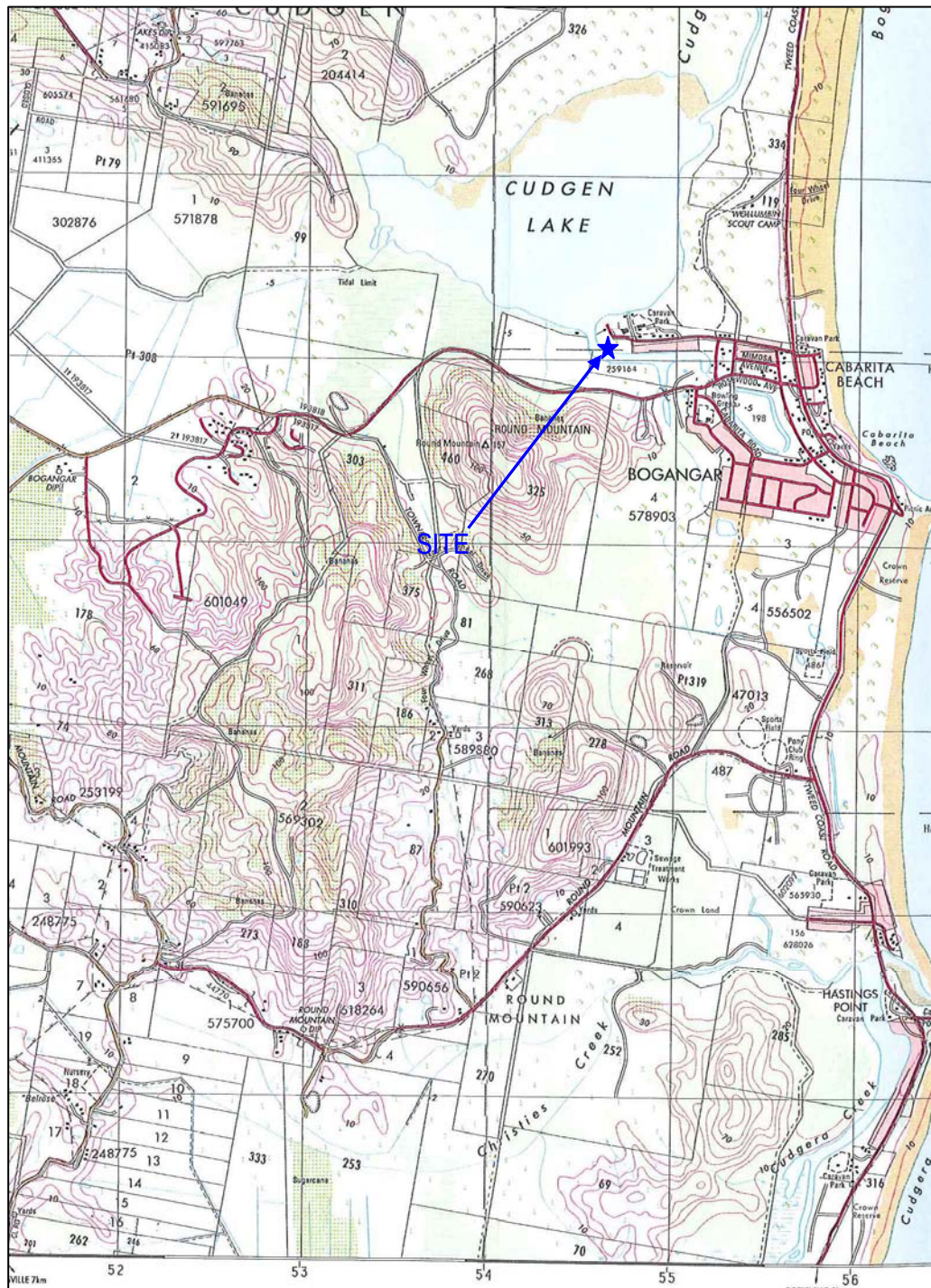


Figure 2 – Local Context Map
Source: Central Mapping Authority 1986

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The existing environment is described on the Site Analysis Plan at **Figure 6**. In summary, the elevated parts of the site adjacent to Willow Avenue range in height from approximately RL 3.5m AHD to approximately RL 0.5m AHD adjacent to the open drain within the residue lot. A major drainage channel traverses the site from Rosewood Avenue to Cudgen Lake and effectively divides the site into two parts. The residential allotments are located on the northern side of the channel with the residue lot and drain located to the south. The existing open drainage channel is located within an easement to drain water 33.08m wide and variable width. Generally the site is flat and contains grassland and scattered trees on the Willow Avenue part of the site and nine vegetation communities as indicated on the Vegetation Map at **Figure 4**.

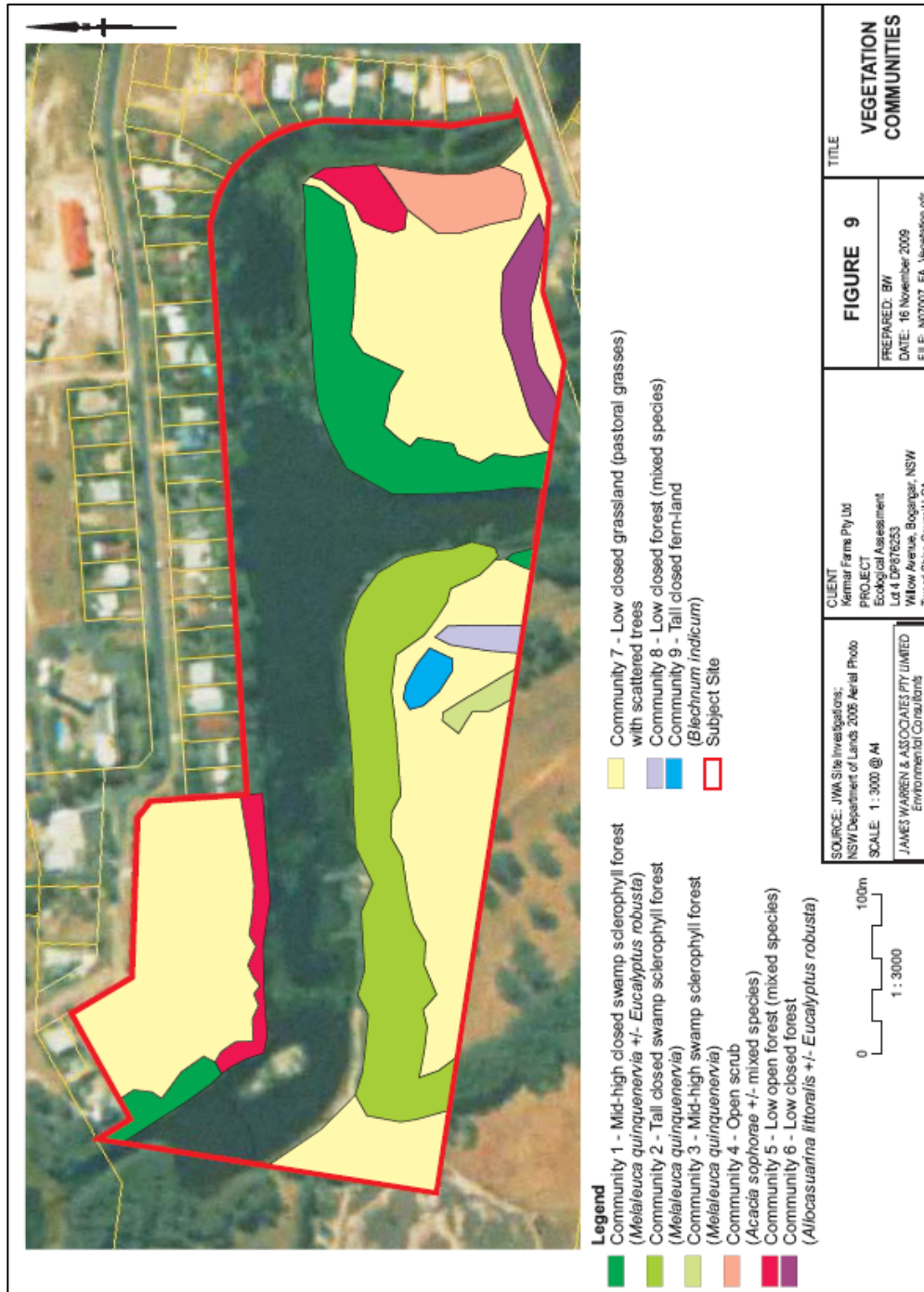


Figure 4 – Vegetation Communities
Source: James Warren and Associates, November 2009

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Climate

Predominant wind direction in the summer is from the northeast and in the winter is from the southwest.

Rainfall

Annual average rainfall for this area is 1722 mm. The monthly minimum of 60mm occurs in September and the monthly maximum of 270mm occurs in March.

Temperature

The November summer maximum is 30°C and the summer minimum is 15°C. In winter, the maximum in August is 23°C and the minimum in July is 5°C.

Transport

Willow Avenue is a dead end street which terminates at Cudgen Lake adjacent to the site. It is an urban street constructed to a sealed standard which links with the Tweed Coast Road approximately 1km to the east. The Tweed Coast Road is a distributor road which provides normal bus services from the Tweed Coast to and from Tweed Heads and other centres. There is no formal public transport available to the proposed residential lots.

All normal infrastructure is available in proximity to the proposed lots including reticulated water, reticulated sewer, power and telephone services. There are no significant capacity constraints insofar as infrastructure is concerned.

Geology and Soils

The Geological Survey of Queensland New South Wales, Moreton Geology Map, 1:500,000 Series indicates that the site is located on a Pleistocene Parabolic dune system. Soils in the area comprise largely quartz sands.

Vegetation

The site contains nine vegetation communities as shown on **Figure 4**. That part of the site on which the twelve residential lots are proposed comprises low, closed grasslands with scattered trees and has low conservation value.

Parts of the site are low lying and are therefore subject to flooding in the Q100 event however that part of the site fronting Willow Avenue which is the subject of the proposed residential allotments is generally filled to approximately RL 3.5m AHD which is above the design flood level. The existing open channel through the site largely controls water table depth and the site's hydrology and that channel drains the upstream catchments of the existing Village and discharges to Cudgen Lake.

The locality generally is characterised by single, detached dwelling houses in one and two storey configurations on adjoining lots to the west, north and east and rural land to the south. **Annexure 6** comprises a Site Analysis Plan showing the existing topographic features of the site and adjacent land uses.

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4.0 STATUTORY PLANNING CONTEXT

4.1 State Environmental Planning Policies

4.1.1 State Environmental Planning Policy No. 71 – Coastal Protection

The land to which this Major Project application relates is within the coastal zone as defined under the provisions of this Policy and as the development involves a subdivision for less than 25 residential lots a Development Control Plan is not required pursuant to Clause 18 of the Policy. In any case, as Part 3A of the Act applies, a Development Control Plan is not required.

In addition, Clause 8 of the Policy requires various criteria to be considered in assessing any development application. The relevant matters for consideration in Clause 8 are addressed in Section 8.0.

4.1.2 State Environmental Planning Policy (Major Development) 2005

On 24 November 2008 the Department of Planning advised that the proposal is a project to which Part 3A applies.

4.1.3 State Environmental Planning Policy No. 44 – Koala Habitat Protection

James Warren and Associates have undertaken an assessment of the project against the provisions of State Environmental Planning Policy No. 44 and concluded that there is no requirement for the preparation of a Plan of Management for identified core Koala habitat on the basis that core Koala habitat is not present at the site. A copy of the report from James Warren and Associates is contained at **Annexure 15**.

4.1.4 State Environmental Planning Policy No. 50 – Canal Estate Development

Clause 3 of this Policy defines canal estate development as follows:

- "(a) incorporates wholly or in part a constructed canal, or other waterway or waterbody, that is inundated by or drains to a natural waterway or natural waterbody by surface water or groundwater movement (not being works of drainage, or for the supply or treatment of water, that are constructed by or with the authority of a person or body responsible for those functions and that are limited to the minimal reasonable size and capacity to meet a demonstrated need for the works), and*
- (b) includes the construction of dwellings (which may include tourist accommodation) of a kind other than, or in addition to:*
- (i) dwellings that are permitted on rural land, and*
 - (ii) dwellings that are used for caretaker or staff purposes, and*
- (c) requires or includes:*
- (i) the use of a sufficient depth of fill material to raise the level of all or part of that land on which the dwellings are (or are proposed to be) located in order to comply with requirements relating to residential development on flood prone land, or*
 - (ii) excavation to create waterways primarily for the purposes of providing water access to dwellings, or both."*

Clause 5 of the Policy provides that a person must not carry out canal estate development.

Whilst the proposed lots will have "frontage" to an existing artificial drainage channel, it is submitted that the proposal is not caught by the provisions of State Environmental Planning Policy No. 50 on the basis that the existing drain was constructed with the authority of Tweed Shire Council (and is within a drainage easement benefiting Tweed Shire Council) solely for the purposes of drainage of upstream properties.

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4.1.5 State Environmental Planning Policy No. 55 – Remediation of Land

In summary, Clause 7 of this Policy provides that the consent authority must not consent to the carrying out of any development on land unless it has considered, among other things, whether the land is contaminated, based on a preliminary investigation of the land carried out in accordance with the Contaminated Land Planning Guidelines.

The Contaminated Land Planning Guidelines (Department of Urban Affairs and Planning, Environment Protection Authority, 1998) provide information relating to preliminary contamination investigations. In addition, Council has adopted a Contaminated Land Policy which contains details of the information required to be submitted with applications for development.

A Preliminary Contaminated Land Assessment has been completed (**Annexure 13**).

Fieldwork was undertaken on 19 June 2009 and involved sampling at the 20 locations displayed on the site-plan (see Appendix 1 of **Annexure 13**). Sample locations were derived using a systemic sampling regime. The area investigated is approximately 8400 m² which means the total number of samples taken was in excess of the minimum requirements of Table A, NSW EPA (1995).

Surface samples to a depth of 150mm were recovered using hand-operated equipment, which was cleaned between each sample to prevent cross-contamination. Samples were sealed in glass jars with Teflon-lined lids and stored on-site below 4OC to prevent degradation. A total of five (5) composite samples comprised of four adjacent individual sub-samples were prepared and registered in our Tweed Heads South laboratory before being couriered to Labmark Environmental Laboratories (NATA Accredited) on 23 June 2009.

Samples were tested for the following analytes:

- Arsenic
- Cadmium
- Chromium
- Copper
- Nickel
- Lead
- Zinc
- Organochlorine Pesticides

The five (5) composite samples were made up of the following sub-samples:

Composite 1: Samples C1 I-C14 located on the north western side of the subject site
Composite 2: Samples C21-C24 located on the western side of the subject site
Composite 3: Samples C31-C34 located on the southern side of the subject site
Composite 4: Samples C41-C44 located on the northern side of the subject site
Composite 5: Samples C51-C54 located on the eastern side of the subject site

A site map showing borehole locations is presented as Appendix 1 of **Annexure 13**.

During the course of the investigation no evidence was uncovered to suggest that potential contaminants had been applied to the subject site or that contaminating activities have occurred within its boundaries. However as the site history is incomplete and incidental applications of contaminants may have occurred in the past, it was decided that a preliminary sampling and analysis program be undertaken

Soil testing of the 12 proposed lots using five (5) composite samples made up of four (4) sub-samples was undertaken to test for a range of organochlorine pesticides and heavy metals. All species tested were found to be below their relevant Health Based Investigation Levels (HBIL's) as per NSW DEC (2006). Consequently, no further action is recommended and from a contaminated land perspective, the site can be considered suitable for the proposed residential use.

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4.1.6 State Environmental Planning Policy No. 14 – Coastal Wetlands

The land to which this Major Project application relates is not affected by the provisions of this State Environmental Planning Policy. The nearest mapped wetlands under the provisions of this Policy are located approximately 500m to the west of the site, approximately 400m to the north and approximately 600m to the south. The location of the mapped wetlands are shown on **Figure 5**.

Given the extensive buffers from the site to the mapped wetland and subject to implementation of normal water quality management measures (as proposed) the existing State Environmental Planning Policy No. 14 – Wetlands do not impose a significant constraint on the development potential of the site.

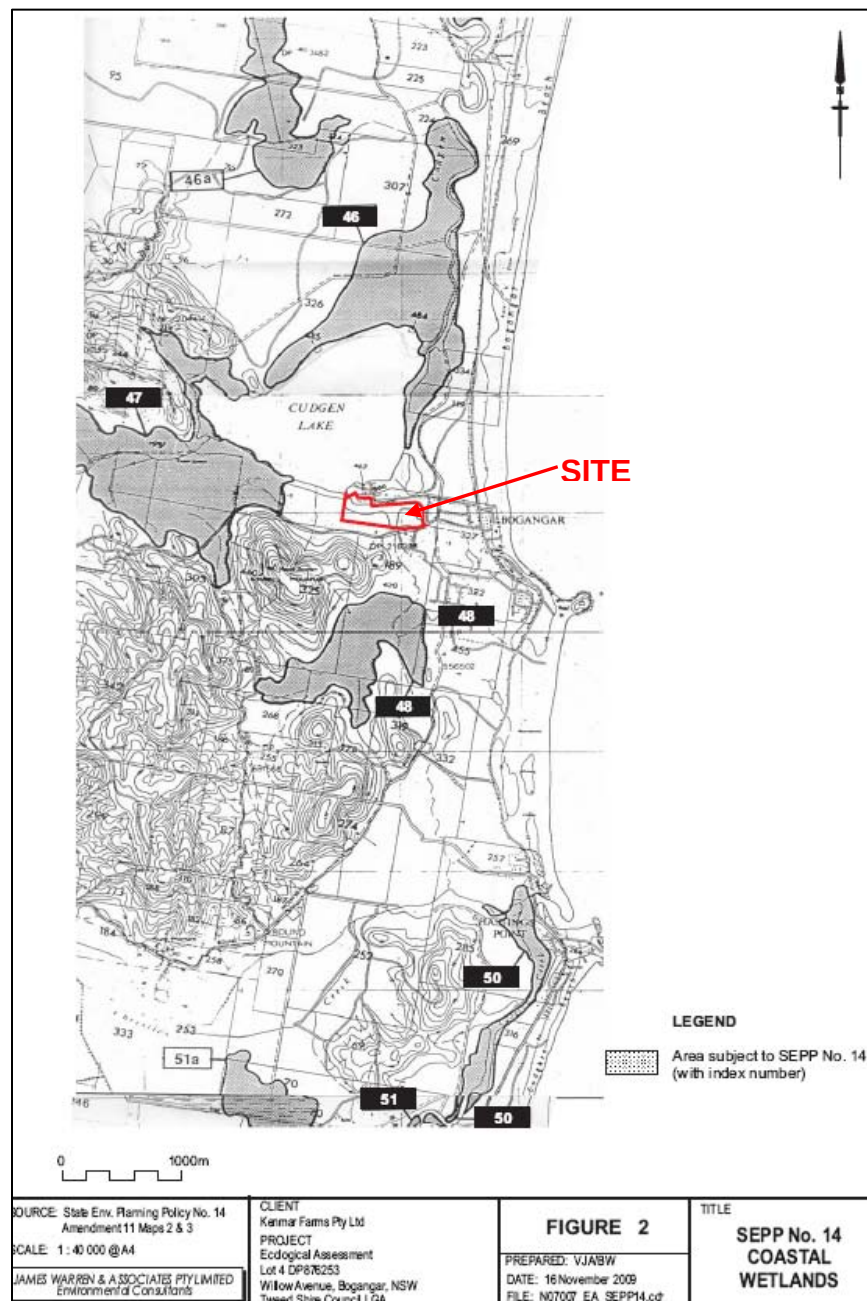


Figure 5 – SEPP14
Source: James Warren and Associates, November 2009

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4.1.7 State Environmental Planning Policy 26 – Littoral Rainforest

The land to which this Major Project application relates is not affected by the provisions of this State Environmental Planning Policy. The nearest mapped Littoral Rainforest under the provisions of this Policy is located approximately 600m to the east of the site as shown on **Figure 6**.

Given the extensive buffers from the site to the Littoral Rainforest the existing State Environmental Planning Policy No. 26 – Littoral Rainforest does not impose a constraint on the development potential of the site.

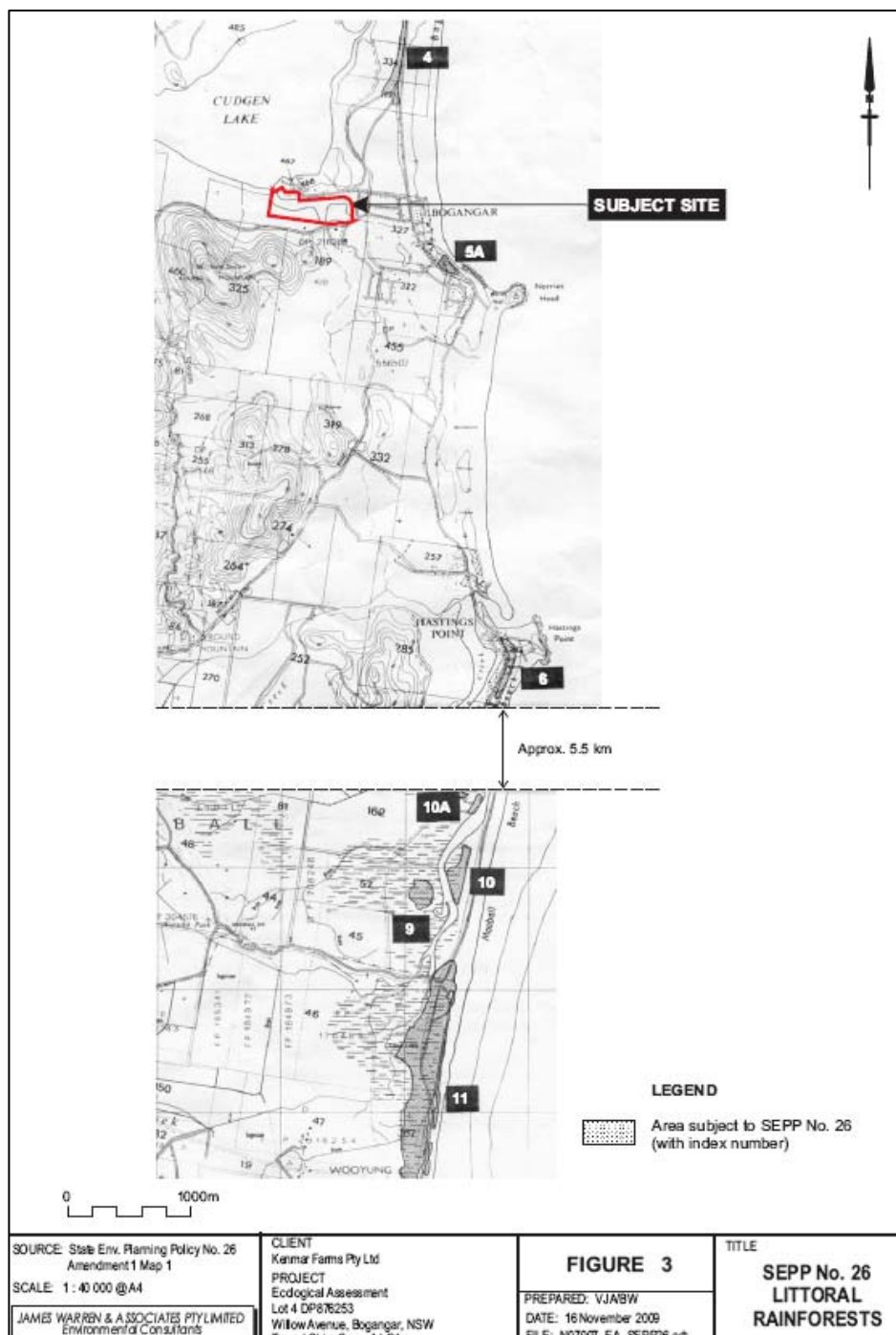


Figure 6 – SEPP26
Source: James Warren and Associates, November 2009

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4.1.8 State Environmental Planning Policy (Infrastructure) 2007

Clause 104 of this Policy provides that certain developments specified in Column 1 of the Table to Schedule 3 of the Policy requires referral to the Roads and Traffic Authority and the consent authority must take into account any submission that the Roads and Traffic Authority may provide within a prescribed timeframe. Schedule 3 includes subdivisions of land involving 200 or more allotments and apartment or residential flat buildings involving 300 or more dwellings, among other things.

Therefore, as this proposal only involves thirteen lots, referral to the Roads and Traffic Authority for comment is not required under this Policy.

A Traffic Impact Assessment Report for the project is contained at **Annexure 18**.

4.1.9 State Environmental Planning Policy – North Coast Regional Environmental Plan, 1988

The key provisions of this Policy are addressed in the following sections:

Clause 15 – Development Control – Rivers, Streams and Wetlands

This Clause seeks to ensure that development proposals do not adversely impact on the water quality and habitat values of downstream water bodies.

The Stormwater Management Plan (**Annexure 18**) includes detailed measures for the control of water quality both during the construction and operational phases such that the objectives of this Clause are complied with.

Clause 32B - Coastal Lands

Relevant provisions of this Clause are addressed in the following table.

TABLE 3 – COASTAL LANDS	
PROVISION	COMMENT
1) <i>"In determining an application for consent to carryout development on land to which the Coastal Policy applies, the Council shall take into account –</i> <i>a) The NSW Coastal Government Policy;</i> <i>b) The Coastline Management Manual; and</i> <i>c) The North Coast Design Guidelines</i>	The Relevant matters for consideration in this Policy are addressed at Section 8.3 of this report. The land is not affected by coastal processes. The key guidelines will be included in the design of the future buildings, particularly in relation to the building form, cladding materials, solar access and energy efficiency.
2) <i>The Council shall not consent to the carryout of development which would impede public access to the foreshore area;</i>	The proposal will not affect public access to the Cudgen Lake foreshore.
3) <i>The Council shall not consent to the carrying out of development –</i> <i>a) On urban land at Tweed Heads, Kingscliff, Byron Bay, Ballina, Coffs Harbour or Port Macquarie, if carrying out the development would result in beaches and adjacent open space being overshadowed before 3 pm mid-winter (standard time) or 6.30 pm mid-summer (daylight saving time); or</i> <i>b) Else where in the region, if carrying out the development would result in beaches or waterfront open space being overshadowed before 4 pm mid-winter (standard time) or 7 pm mid-summer (daylight saving time)."</i>	Not applicable.

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Clause 43 – Development Control – Residential Development

This Clause provides that consent to development for residential purposes shall not be granted unless the consent authority is satisfied that the density of the dwellings have been maximised without adversely affecting the environmental features of the land and that road widths are not excessive.

The proposed layout achieves 52 residential allotments which results in a yield of approximately eleven lots per hectare. The North Coast Urban Planning Strategy 1995 identifies a target yield of fifteen dwellings per hectare.

Without significantly impacting on landforms and the established character and amenity of the area and because of the State Agency requirements for a generous foreshore buffer and perimeter road, it is not feasible to achieve the target densities. Having regard to the site analysis contained in this report it is concluded that the proposed yields are optimal and consistent with this Clause.

Clause 66 – Development Control – Adequacy of Community and Welfare Services

This Clause provides that before granting consent for the subdivision of land intended for residential purposes the consent authority shall consider the adequacy of community and welfare services.

The site is conveniently located in relation to the town of Tweed Heads which provides for all necessary requirements in terms of community services and facilities. In addition, as indicated in Section 4.5.11 of this report, Council requires contributions to be paid in respect of a range of community facilities likely to be required by future residents.

4.1.10 State Environmental Planning Policy (Rural Lands) 2008

This Policy applies to those parts of the site which are zoned Rural 1(a) in particular. The following clauses are particularly relevant:

TABLE 4 – STATE ENVIRONMENTAL PLANNING POLICY (RURAL LANDS)	
CLAUSE 8 – RURAL SUBDIVISION PRINCIPLES	COMMENTS
(a) the minimisation of rural land fragmentation,	The proposed subdivision retains all Rural 1(a) land in one residue lot.
(b) the minimisation of rural land use conflicts, particularly between residential land uses and other rural land uses,	The Rural land is only used for grazing purposes and is buffered from the residential allotments by the open drainage channel and the 7(l) Habitat zoned land.
(c) the consideration of the nature of existing agricultural holdings and the existing and planned future supply of rural residential land when considering lot sizes for rural lands,	The Rural land is small, contains poor quality agricultural soils and is not a viable agricultural production unit.
(d) the consideration of the natural and physical constraints and opportunities of land,	The physical constraints and opportunities of the land are addressed elsewhere in this Environmental Assessment Report. In summary, that part of the site zoned Rural is generally only suitable for informal grazing.
(e) ensuring that planning for dwelling opportunities takes account of those constraints.	No dwelling site has been nominated on the residue Lot 13.
Note. Under section 117 of the Act, the Minister has directed that councils exercise their functions relating to changes in minimum lot sizes under local environmental plans in accordance with the Rural Planning Principles and the Rural Subdivision Principles. Under section 55 of the Act, the Minister may also direct a council to prepare a local environmental plan.	

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TABLE 5 – STATE ENVIRONMENTAL PLANNING POLICY (RURAL LANDS)	
CLAUSE 10 – MATTERS TO BE CONSIDERED	COMMENTS
(1) This clause applies to land in a rural zone, a rural residential zone or an environment protection zone.	Proposed residue Lot 13 is partly zoned Rural 1(a).
(2) A consent authority must take into account the matters specified in subclause (3) when considering whether to grant consent to development on land to which this clause applies for any of the following purposes: (a) subdivision of land proposed to be used for the purposes of a dwelling, (b) erection of a dwelling.	No proposed dwelling site is nominated on the residue lot within the Rural zone. As above.
(3) The following matters are to be taken into account: (a) the existing uses and approved uses of land in the vicinity of the development, (b) whether or not the development is likely to have a significant impact on land uses that, in the opinion of the consent authority, are likely to be preferred and the predominant land uses in the vicinity of the development, (c) whether or not the development is likely to be incompatible with a use referred to in paragraph (a) or (b), (d) if the land is not situated within a rural residential zone, whether or not the development is likely to be incompatible with a use on land within an adjoining rural residential zone, (e) any measures proposed by the applicant to avoid or minimise any incompatibility referred to in paragraph (c) or (d).	The existing and approved uses adjacent to the Rural land are residential, Cudgen Nature Reserve and rural/agricultural. No change of use of physical works are proposed on that part of the site zoned Rural and therefore no significant impacts are likely to arise. Given that the Rural land is only used for informal grazing purposes no potential incompatible issues are likely to arise. No Rural Residential zoned land adjoins the site. The Draft Statement of Commitments contains measures to mitigate potential adverse impacts.

4.2 Tweed Local Environmental Plan 2000

Tweed Local Environmental Plan 2000 is the principal planning instrument controlling development within Tweed Shire generally and the subject land in particular. Under the provisions of this Plan, the land is zoned part 1(a) Rural, part 2(a) Low Density Residential and part 7(l) Environmental Protection Habitat. The zoning of the land is shown on **Annexure 2**.

The aims of the Local Environmental Plan are as follows:

"The aims of this plan are:

- (a) *to give effect to the desired outcomes, strategic principles, policies and actions of the Tweed Shire 2000+ Strategic Plan which was adopted, after extensive community consultation, by the Council on 17 December 1996, the vision of which is:*

"The management of growth so that the unique natural and developed character of the Tweed Shire is retained, and its economic vitality, ecological integrity and cultural fabric is enhanced", and

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-
- (b) *to provide a legal basis for the making of a development control plan that contains more detailed local planning policies and other provisions that provide guidance for future development and land management, such as provisions recommending the following:*
- (i) *that some or all development should be restricted to certain land within a zone,*
 - (ii) *that specific development requirements should apply to certain land in a zone or to a certain type of development,*
 - (iii) *that certain types or forms of development or activities should be encouraged by the provision of appropriate incentives, and*

- (c) *to give effect to and provide reference to the following strategies and policies adopted by the Council:*

*Tweed Heads 2000+ Strategy
Pottsville Village Strategy, and*

- (d) *to encourage sustainable economic development of the area of Tweed compatible with the area's environmental and residential amenity qualities."*

Based on the Assessment at Section 4.5.4 it is concluded that the project is generally consistent with aim (a) relating to the Tweed 2000+ Strategic Plan and the subsequent Tweed Strategic Plan 4/24.

In addition, the project is consistent with aim (d) in the it achieves Council's urban land release objectives by providing additional housing choice to accommodate the continuing population growth within Tweed Shire.

The objectives of the zones are as follows:

"1 (a) Rural

Primary objectives

- *to enable the ecologically sustainable development of land that is suitable primarily for agricultural or natural resource utilisation purposes and associated development.*
- *to protect rural character and amenity.*

Secondary objectives

- *to enable other types of development that rely on the rural or natural values of the land such as agri- and eco-tourism.*
- *to provide for development that is not suitable in or near urban areas.*
- *to prevent the unnecessary fragmentation or development of land which may be needed for long-term urban expansion.*
- *to provide non-urban breaks between settlements to give a physical and community identity to each settlement".*

"2 (a) Low Density Residential

Primary objectives

In the case of land within Zone 2 (a) between the Tweed Heads Bypass and Cobaki Bridge:

- *to minimise the number of dwellings subject to unacceptable aircraft noise and to limit development within the Kennedy Drive traffic catchment so that development is compatible with Kennedy Drive traffic capacity.*

In the case of all other land within Zone 2 (a):

- *to provide for and maintain a low density residential environment with a predominantly detached housing character and amenity.*

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Secondary objectives

- *to allow some diversity of housing types provided it achieves good urban design outcomes and the density, scale and height is compatible with the primary objective.*
- *to allow for non-residential development that is domestically based, or services the local needs of the community, and does not detract from the primary objective of the zone."*

"7 (I) Environmental Protection (Habitat)

Primary objectives

- *to protect areas or features which have been identified as being of particular habitat significance.*
- *to preserve the diversity of habitats for flora and fauna.*
- *to protect and enhance land that acts as a wildlife corridor.*

Secondary objectives

- *to protect areas of scenic value.*
- *to allow for other development that is compatible with the primary function of the zone."*

The following Clauses of the Plan are relevant to this application:

Clause 11 – Land Use Table

The Land Use Table for the 2(a) zone requires a minimum lot size for a dwelling house of 450m². Proposed Lots 1 to 12 comply.

Clause 15 – Availability of Essential Services

All normal urban services are available to the site including reticulated sewer. The Engineering Impact Assessment at **Annexure 18** concludes that there is sufficient capacity in the existing water, sewer, drainage and road networks to accommodate the proposed development.

Clause 16 – Height of Building

A three storey height limit applies to this site. Any future residential buildings on the proposed allotments (Lots 1 to 12) will also comply with this requirement.

Clause 17 – Social Impact Assessment

In accordance with the provisions of this Clause and Tweed Development Control Plan 2007, Part A13 a Socio-Economic Impact Assessment would normally be required to accompany a Development Application for a subdivision greater than 50 lots however, as this project only involves thirteen lots and as this is a Major Project Application a Socio-Economic Impact Statement is not required. Nevertheless, information relating to social and economic issues is provided in this Environmental Assessment Report.

Clause 19 – Subdivision General

This Clause provides that development consent is required to subdivide land.

Clause 20 – Subdivision in Zones 1(a) and 7(I)

There is a general minimum lot size of 40 hectares applicable to subdivisions within these zones. The 40 hectare requirement is a development standard and is therefore amenable to variation under the provisions of State Environmental Planning Policy No. 1. However, as this is a Major Project Application, the provisions of State Environmental Planning Policy No. 1 do not apply.

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In the circumstances of this case, given that the land is within a split zone and that implementation of the 2(a) Residential zoning and the Far North Coast Regional Strategy provisions inevitably leads to the creation of a noncompliant residue lot and given that the parent lot is also well below the 40 hectare standard, it is submitted that the 40 hectare requirement is unreasonable and unnecessary in the circumstances of this case. In this regard it should be noted that there is no proposed change in land use or physical works on the residue lot.

Clause 31 – Development Adjoining Waterbodies

The site adjoins an existing tidal open drainage channel and therefore the provisions of this Clause apply. Relevant matters are addressed in the following table:

TABLE 6 – DEVELOPMENT ADJOINING WATERBODIES	
CLAUSE	COMMENTS
(1) Objectives - to protect and enhance scenic quality, water quality, aquatic ecosystems, bio-diversity and wildlife habitat and corridors. - to provide adequate public access to waterways. - to minimise the impact on development from known biting midge and mosquito breeding areas.	In rezoning the land by way of Local Environmental Plan Amendment No. 7 an appropriate environmental buffer, suitably zoned has been established between the water body and the boundary of the residential allotments.
(2) This clause applies to land that adjoins the mean high-water mark (or the bank where there is no mean high-water mark) of a waterbody.	
(3) Consent must not be granted to development on land to which this clause applies, within such distance as is determined by the consent authority of the mean high-water mark or, where there is no mean high-water mark, the top of the bank or shore of a stream, creek, river, lagoon or lake unless it is satisfied that: (a) the development will not have a significant adverse effect on scenic quality, water quality, marine ecosystems, or the bio-diversity of the riverine or estuarine area or its function as a wildlife corridor or habitat, and (b) adequate arrangements for public access to and use of foreshore areas have been made in those cases where the consent authority considers that public access to and use of foreshore areas are appropriate and desirable requirements, and (c) the development is compatible with any coastal, estuary or river plan of management adopted by the Council under the <i>Local Government Act 1993</i> that applies to the land or to land that may be affected by the development, and	Council has not adopted a distance in respect of this Clause other than by the contemporary adoption of the 7(l)/2(a) zone boundary as referred to above. As indicated on the Indicative Building Footprint Plan at Annexure 8, proposed dwellings will be set back a considerable distance from the foreshore and appropriate measures will be implemented to address water quality. The Flora and Fauna Assessment at Annexure 15 does not identify any significant adverse impacts on the estuarine ecosystem. The existing drain is within an easement for drainage which benefits Tweed Shire Council and there is currently no public access. Given that the waterbody is predominantly a drainage channel rather than a recreational waterway it is considered that public access is not appropriate however it is already available from Rosewood Avenue/Clothiers Creek Road and Cudgen Lake. The Tweed Coast Estuaries Management Plan, 2004 – 2008 applies to Cudgen Lake and the Cudgen Creek estuary. Given that the site is well buffered from Cudgen Lake and disturbance will be limited to that part of the site zoned 2(a) it is submitted that the proposal is not inconsistent with the provisions of this Plan.

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TABLE 6 – DEVELOPMENT ADJOINING WATERBODIES	
CLAUSE	COMMENTS
(d) the development addresses the impact of increased demand from domestic water supply on stream flow; and (e) the development addresses the likely impact of biting midge and mosquitoes on residents and tourists and the measures to be used to ameliorate the identified impact.	The Engineering Impact Assessment Report at Annexure 18 addresses infrastructure capacity issues and concludes that the proposed development will not exceed existing capacity. The application is accompanied by a Mosquito Management Plan at Annexure 14 addressing this issue.
(4) The consent authority may require as a condition of consent to any development that the following be carried out: (a) the rehabilitation of land adjoining the waterbed to create a vegetated riparian zone or wetland, (b) works to stabilise the bank or shoreline of a waterbed.	The Flora and Fauna Assessment at Annexure 15 recommends that a Vegetation Management Plan be prepared to address certain rehabilitation works adjacent to the open drainage channel. No foreshore stabilisation works are considered to be required.
(5) In determining a distance for the purposes of this clause, the consent authority shall have regard to: (a) the preservation of the scenic quality of foreshores, and (b) minimising the risk of pollution of waterways, and (c) the protection of foreshore ecosystems, and (d) the intended or planned use for the foreshore.	See comments above.

Clause 32 – Aircraft Noise

The site is not located on land within the 20 or higher ANEF contour and therefore this Clause is not applicable.

Clause 34 – Flooding

The adopted design flood level for Bogangar is RL 3.4m AHD. Land levels on the site range from approximately RL 0m AHD (within the drainage channel) to approximately RL 1m AHD on the residue Lot 13 and approximately 3m to 3.5m AHD on proposed Lots 1 to 12. The site is therefore subject to flooding and accordingly this Clause applies.

TABLE 7 – FLOODING	
CLAUSE	COMMENTS
(1) Objectives - to minimise future potential flood damage by ensuring that only appropriate compatible development occurs on flood liable land. - to minimise the adverse effect of flooding on the community.	The land is subject to flooding.
(2) Where, in the consent authority's opinion, land is likely to be subject to flooding, then it must not grant consent to development on that land unless it has considered:	The land is subject to flooding.

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TABLE 7 – FLOODING	
CLAUSE	COMMENTS
(a) the extent and nature of the flooding hazard affecting the land, and (b) whether or not the development would increase the risk or severity of flooding of other land in the vicinity, and (c) whether the risk or severity of flooding affecting the development could be reasonably mitigated, and (d) the impact of the development on emergency services, and (e) the provisions of Section A3 - Development of Flood Liable Land of <i>Tweed Development Control Plan</i> .	Issues relating to flooding contained in Clauses a) to e) are addressed in the Engineering Impact Assessment Report at Annexure 18 . In summary, that Report concludes that the proposed development will not have a significant impact on flood hazards and flood flows and it is generally consistent with the provisions of Tweed Development Control Plan 2007, Section A3 – Development of Flood Liable Land.

Clause 35 – Acid Sulphate Soils

In summary, this Clause provides that a person must not, without development consent, carry out works on land shown as being Class 1, 2, 3, 4 or 5 land on the series of maps held in the office of the Council and marked Acid Sulphate Soil Planning Map.

Council's Acid Sulphate Soils Planning Maps indicate that the site does contain Class 2, 3 and 4 land. Therefore, an Acid Sulphate Soils Management Plan is normally required pursuant to this Clause. However Geotechnical investigations, sampling and testing did not suggest the presence of Acid Sulphate Soils (**Annexure 17**) on the site and therefore an Acid Sulphate Soils Management Plan is not required.

Clause 39 – Remediation of Contaminated Land

See comments under State Environmental Planning Policy No. 55.

Clause 39A – Bushfire Protection

The land is mapped as bushfire prone and accordingly compliance with the publication "Planning for Bushfire Protection 2006" must be demonstrated.

A Bushfire Threat Assessment Report has been prepared (**Annexure 12**) and the Report concludes that:

"This assessment demonstrates that the proposed development complies with Planning for Bushfire Protection 2006 and the criteria identified in clause 44 of the Rural Fires Regulation. All building envelopes including on the residual lot are capable of complying with the requirements of Planning for Bushfire Protection 2006 that relate to asset protection zones, construction standards, water supply, access and landscaping.

It is therefore recommended that a Bushfire Safety Authority under section 100B of NSW Rural Fires Act 1997 be issued."

Clause 44 - Development of Land Within Likely or Known Archaeological Sites

This Clause is in the following terms:

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"(1) The consent authority may grant consent to the carrying out of development on an archaeological site that has Aboriginal heritage significance (such as a site that is the location of an Aboriginal place or a relic within the meaning of the National Parks and Wildlife Act 1974), or a potential archaeological site that is reasonably likely to have Aboriginal heritage significance only if:

- (a) it has considered an assessment of how the proposed development would affect the conservation of the site and any relic known or reasonably likely to be located at the site prepared in accordance with any guidelines for the time being notified to it by the Director-General of National Parks and Wildlife, and*
- (b) it has notified the Director-General of its intention to do so and taken into consideration any comments received from the Director-General within 28 days after the notice was sent, and*
- (c) it is satisfied that any necessary consent or permission under the National Parks and Wildlife Act 1974 has been granted."*

No Aboriginal archaeological sites or potential relics have been identified on the land. The Cultural Heritage Assessment at **Annexure 11** contains recommendations in relation to the Aboriginal cultural heritage which are included in Section 8.12.1.

"(2) The consent authority may grant consent to the carrying out of development on an archaeological site that has non-Aboriginal heritage significance or a potential archaeological site that is reasonably likely to have non-Aboriginal heritage significance only if:

- (a) it has considered an assessment of how the proposed development would affect the conservation of the site and any relic known or reasonably likely to be located at the site prepared in accordance with any guidelines for the time being notified to it by the Heritage Council, and*
- (b) it has notified the Heritage Council of its intention to do so and taken into consideration any comments received from the Heritage Council within 28 days after the notice was sent, and*
- (c) it is satisfied that any necessary excavation permit required by the Heritage Act 1977 has been granted."*

No items of historic (non Indigenous) cultural heritage were identified in the Cultural Heritage Assessment at **Annexure 11**.

Clause 45 – Development In The Vicinity of Heritage Items, Heritage Conservation Areas, Archaeological Sites or Potential Archaeological Sites

The consent authority must take into consideration the likely effect of the proposed development on the heritage significance of a heritage item, heritage conservation area, archaeological site or potential archaeological site, and on its setting, when determining an application for consent to carry out development on land in its vicinity.

No heritage items, heritage conservation areas, archaeological sites or potential archaeological sites exist on the development site based on the provision of Schedule 2 of Tweed Local Environmental Plan 2000; Schedules 1 and 2 of the North Coast Regional Environmental Plan 1988 and the findings of the Cultural Heritage Assessment at **Annexure 11**.

4.3 Draft Tweed Local Environmental Plan 2010

The Draft Plan was publicly exhibited from 27 January 2010 to 31 March 2010.

The Draft Plan has been prepared in response to the State Government's requirement for all NSW Councils to prepare a single LEP which conforms to the requirements of the Standard Instrument (Local Environmental Plans) Order 2006 (the Template). The requirements of this Order prescribe that all Councils in NSW prepare a single LEP which conforms to the format and general content of the Template prepared by the Department of Planning.

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The attached table summarises the current and proposed zonings in respect of the subject land and the key current and proposed controls in each zone.

TABLE 8 – LOCAL ENVIRONMENTAL PLAN COMPARISON TABLE										
Lot & DP	TWEED LOCAL ENVIRONMENTAL PLAN 2000					DRAFT TWEED LOCAL ENVIRONMENTAL PLAN 2010				
	Zoning	Key Controls				Zoning	Key Controls			
		Lot Size	Building Height	FSR	Permitted Uses		Lot Size	Building Height	FSR	Permitted Uses
Lot 4 DP 876253	2(a) Low Density Residential	450m ²	3 storey	Nil	Dwellings	R2 Low Density Residential	450m ²	9m	0.8:1	Dwellings and Multi Dwelling Housing
	1(a) Rural	40ha	3 storey	Nil	Agriculture	W1 Natural Waterways	N/a	Nil	Nil	Drainage & Environmental
	7(l) Environmental Protection (Habitat)	40ha	3 storey	Nil	Environmental	E2 Environmental Conservation	40ha	9m	Nil	Environmental
	1(a) Rural	40ha	3 storey	Nil	Agriculture	RU2 Rural Landscape	40ha	10	Nil	Agriculture

In summary, the project is not inconsistent with the key provisions in the exhibited Draft Local Environmental Plan.

4.4 Development Control Plans

4.4.1 Tweed Development Control Plan 2007, Part A1 – Residential and Tourist Code

This Plan includes development standards relating to the design and siting of dwelling houses on residential lots. As indicated on the Plan of Proposed Subdivision at **Annexure 7** and the Indicative Building Envelope Plan at **Annexure 8**, the size and shape of the lots are adequate to enable compliant dwellings to be constructed on each of Lots 1 to 12.

4.4.2 Tweed Development Control Plan 2007, Part A2 - Site Access and Car Parking Code

The car parking rates specified by Tweed Development Control Plan 2007 for dwelling houses indicate that on site parking is to be provided in accordance with the following table:

TABLE 9 – CAR PARKING						
Land Use	Public Transport, Bus Stop Seating	Bicycle Parking	Delivery, Service Vehicle Parking (50% must be truck size)	Resident/ Visitor Parking	Staff Parking	Customer Parking
Dwelling House	Nil	Nil	Nil	1 per dwelling + provision for driveway parking for another vehicle	Nil	Nil

The size, design and shape of each of the allotments are such that compliance with this code requirement can be readily achieved in the design and construction of future dwellings on the proposed lots.

Council's Code also requires one on street car park (for visitors). Allowing for a 3m wide driveway penetration and a 6m parallel car park results in a requirement for a minimum kerb frontage of 9m. All lots comply with the exception of Lots 3, 4 and 12.

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An on site visitor car park is proposed on these lots as shown on the plans at **Annexure 8** and in addition, a Section 88B Instrument creating a restriction as to user on each of those lots requiring the provision of the on site visitor car park will be created.

4.4.3 Tweed Development Control Plan 2007, Part A3 - Development of Flood Liable Land

Section A3.9 provides that the adopted design flood level for Bogangar is RL 3.4m AHD and the adopted minimum floor level for residential development is RL 3.7m AHD.

The proposed allotments 1 to 12 have generally been filled to the adopted design flood level as indicated on the Plans at **Annexure 3**. Minor filling and/or site regrading will be required to achieve RL 3.4m AHD for all proposed residential Lots 1 to 12.

In terms of probable maximum flooding (PMF), the subject site is located outside of the Tweed Shire Flood Liable Land maps. The DCP proposes an interim PMF level outside of the mapped areas of 2.0 metres above the 100 year ARI flood level. A PMF level of RL 5.4m AHD would be applicable.

Section A3.2.5 a) of the policy outlines the Emergency Response Provisions for Habitable Developments in areas affected by PMF. The proposed subdivision would be classified as an 'infill subdivision'. A requirement of this policy is for "the creation of covenants on land titles of all new allotments that cannot achieve suitable high level road/pedestrian evacuation routes to land above PMF level, requiring adequate PMF refuges in all future dwellings".

The existing surrounding roadways and landforms restrict the ability to provide suitable high level evacuations routes for the proposed subdivision. Therefore, in accordance with the Council's Development of Flood Liable Land policy the flood response action for the subdivision would be for a 'shelter in place' option with a PMF refuge to be required as part of the future dwellings.

Each of the new allotments would contain a single new dwelling consisting typically of two to four residents. Demographics of occupants would vary depending on purchasers, but would likely consist of couples and families with children.

The covenant for the proposed allotments would note the following:

In accordance with the Council's Development of Flood Liable Land policy a probable maximum flooding (PMF) refuge is required as part of the future dwelling.

The refuge must meet the following minimum requirements:

- Refuge may be an additional second storey, mezzanine level or other raised refuge area above the PMF level of RL 5.4m AHD.
- Minimum floor level to be PMF level. No freeboard required.
- Minimum floor area for a single bedroom dwelling 9m², add 4m² for each additional bedroom.
- Refuge must comply with Building Code Australia requirements, with external components rated appropriately for storm, wind and moisture.
- Minimum 2.1m floor to ceiling/roof frame height.
- Refuge must be provided with permanent internal and external access, (may be a fixed ladder).
- The external access must be unobstructed (by trees, chimneys, aerials etc) for emergency boat access during flooding
- Refuge must have natural lighting and ventilation
- Support structures below PMF level must be capable of withstanding flood forces (water flow, debris impact, and buoyancy) and continuous submergence for up to one week, requiring an engineering certification.
- Refuge must meet all planning and building controls applicable to the site.

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- Refuge must have a cupboard storage area for flood emergency kit to service all residents with provisions for isolation up to one week, consisting of food and fresh water supplies, first aid kit including medication, battery powered torch, portable radio, spare batteries, candles and water proof matches, plastic bags and rubber gloves."

4.4.4 Tweed Development Control Plan 2007, Part A5 – Subdivision Manual

Section A5.3 of this Development Control Plan provides planning and design information relating to subdivisions. Relevant provisions are addressed in the following tables.

TABLE 10 – SUBDIVISION REQUIREMENTS	
PROVISION	COMMENTS
A5.3.1 – Master Plans	
The subject site is located within the coastal zone and involves more than 25 lots and therefore a Development Control Plan would normally be required under the provisions of State Environmental Planning Policy No. 71. However, as this is a Major Project to which Part 3A applies a Development Control Plan is not required under State Environmental Planning Policy No. 71. However, this Section of the Development Control Plan provides that a Master Plan is still required for more than 25 lots and, where the urban pattern (street and open space network, neighbourhood structure, etc.) is not determined by: • Development and street/neighbourhood development patterns; or • An existing site specific section that determines the general street and neighbourhood layout.	The project only involves 12 residential allotments and the urban pattern is fixed by Willow Avenue, the open drainage channel and abutting residential development. A Development Control Plan is therefore not required.
A5.3.4 – Subdivision Design	
Site investigation, survey and analysis	In preparing the proposed layout, all relevant site opportunities and constraints have been identified as reflected elsewhere in this Environmental Assessment Report and the subdivision layout proposed reflects those site opportunities and constraints.
Statutory and Council requirements	Integrated development provisions do not apply to Part 3A Major Projects.
Subdivision design trial layouts and optimisation	Given the small size and shape of the site and site constraints, there is only one feasible layout option.
Pre-application consultation	See Tweed Shire Council letter at Annexure 19 .

Urban Design Guidelines and Development Standards

The following table summarises the key guidelines contained in this Section. In this regard it should be noted that Section A5.4.2 provides that in respect of infill subdivisions, they may be constrained by an existing urban structure that may make it difficult to comply with some of the urban design objectives and criteria in this Manual. Infill subdivisions will therefore be exempt from these requirements where their application is so constrained. This development proposal is an "infill subdivision" and there are constraints imposed by existing biophysical and cultural features which limit compliance in some cases.

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TABLE 11 – DESIGN GUIDELINES	
PROVISION	COMMENTS
A5.4.3 – Physical Constraints	
In summary, this section provides that prior to detail Master Planning of a site, the physical constraints of the site must be identified, mapped and constraint issues resolved.	Constraints relating to slope, geotechnical stability, bushfire, contamination and threatened species have been identified in the various plans and annexures and the subdivision layout reflects those constraints and the site's opportunities.
A5.5.4 – Environmental Constraints	
Contaminated land.	Annexure 13 comprises a soil contamination assessment for the site. The report concludes that the site is suitable for the proposed residential development.
Landslip or subsidence.	Annexure 16 comprises a Geotechnical Report which concludes that the proposed subdivision is a suitable and feasible land use for the subject site in terms of geotechnical conditions.
Bushfire risk.	The Bushfire Assessment at Annexure 12 does not identify bushfire threats as an absolute constraint.
Threatened species, population or ecological communities or their habitats.	Annexure 15 comprises a Flora and Fauna Assessment addressing all relevant statutory provisions under the Threatened Species Conservation Act. The report concludes that all vegetation loss will involve low, closed grassland and therefore no threatened species will be affected..
Koala habitat.	The Flora and Fauna Assessment concludes that for the purposes of State Environmental Planning Policy No. 44 there is no requirement for a Koala Plan of Management.
Significant vegetation.	The site contains nine vegetation communities including mid-high closed swamp sclerophyll forest, tall closed swamp sclerophyll forest, mid-high swamp sclerophyll forest, open scrub, low open forest and low closed forest as indicated on Figure 9 of Annexure 15 (Flora and Fauna Assessment). Vegetation loss is confined to Community 7 which is of low conservation value.
Landscape visual character.	This issue is addressed in Section 8.7 and Annexure 10 .
Acid Sulphate Soils.	See Annexure 17 and Section 8.10.3.
Heritage or cultural items of Aboriginal or European origin.	This issue is addressed in the Cultural Heritage Report at Annexure 11 .

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TABLE 12 – LAND FORMING	
PROVISION	COMMENTS
A5.4.5 – Land Forming	
A. General Criteria	
1. Significant Natural Features Site regrading is not to take place on: • topographical features that are significant to the character of the site or locality. • existing or natural watercourses with catchment areas of 100ha or more. • riparian zones (see Table A5-5) associated with above. 2. External & Perimeter Issues (a) Cross Boundary Drainage; • Runoff from the subject land to other land shall not be significantly increased; • Runoff from upstream or upslope of the subject land shall be conveyed unimpeded across the land; • Public infrastructure in land to be regraded shall be preserved and if necessary for its continued viability be reconstructed to suit the new landform. Public infrastructure continuity shall be preserved at external boundaries. • Alteration of the locations of cross boundary stormwater drainage/watercourse discharge should be avoided. If alterations are proposed, then the written agreement of all effected downstream landowners is required. (b) Perimeter levels; Pre development levels must be preserved at external (perimeter) boundaries of a subdivision, preferably without the use of boundary (or within 3m of the boundary) retaining walls exceeding 1.2m in height. The application of this criteria may be varied in infill subdivisions in flood liable areas where there is general filling to provide flood immunity.	The development site for the twelve residential lots has been filled and only requires minor filling and/or regrading. There are no significant natural features on the site. These matters are addressed in the Engineering Impact Assessment at Annexure 18. The proposal complies with landforming requirements.
B. Mass Landform Change Criteria	
1. Residential, includes residential subdivisions in Village, Urban Expansion and Rural Living zones. The proportion of a subdivision site (plan area) that contains cut or fill areas with finished surface levels that depart from natural surface levels by more than 5m shall not exceed 10%. Variations up to 15% of site area may be considered if such variations have a demonstrated environmental benefit (eg. avoidance of importing borrowed fill off site). 2. Industrial, Business and Mixed Use Subdivision, includes industrial, business and mixed use subdivisions in Village and Urban Expansion zones. The proportion of a subdivision site (plan area) that contains cut or fill areas with finished surface levels that depart from natural surface levels by more than 8m shall not exceed 20%.	No significant landforming changes are proposed, only minor filling and/or site regrading involving approximately 500m³ of material.

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TABLE 12 – LAND FORMING	
PROVISION	COMMENTS
A5.4.5 – Land Forming	
For the purpose of this Section "subdivision site" includes the parcels of land created for private sale and formal parks, and does not include undeveloped areas, areas retained for environmental purposes, roads, or residual allotments. If a subdivision contains a mix of urban and rural/rural residential uses, the rural/rural residential areas must be excluded from the urban areas for the purposes of complying with this Clause.	
C. Shape/Surface Criteria 1. Residential and Rural Living Subdivision, includes residential subdivisions in Village and Urban Expansion zones: • The finished landform shape (concave/convex, rolling, stepped etc) of the subdivision site should mimic existing and local surrounding natural topography. • Except as provided in Note 1 below, no sharp changes of gradient (eg associated with batters or retaining walls) are permitted at or near inter lot boundaries or within lots. • Batters and retaining walls are not permitted for the purpose of creating terraced lots. • Sharp changes of gradient are permitted at road and public land boundaries. • See Figure 4.2.2.	As above.
Note 1: A retaining wall or batter of maximum "combined height" (as defined in Section E) of 1.2m at or adjacent to inter lot boundaries may be permitted to ease lot gradients, where lot longitudinal or cross gradient would exceed 10% in the absence of such retaining wall or batter. 2. Industrial, Business and Mixed Use Subdivision, includes industrial, business and mixed use subdivisions in Village and Urban Expansion zones: • Terraced lots with sharp changes of gradient associated with retaining walls or batters are permitted. Sharp changes of gradient (ie. associated with batters or retaining walls) are permitted at or near lot, road and public land boundaries. Sharp changes of gradient are permitted within lots.	Not Applicable.
D. Plans Criteria Site regrading proposals must be accompanied by the plans specified in Development Design Specification D13 – Engineering Plans (Subdivisions) clause D13.03 5(a)	See above. No significant site regrading is proposed.
E. Retaining Walls and Batters Criteria 1. Definitions: “retaining wall” is defined as a structure required to retain soil, rock and other materials. It includes retaining and revetment structures as defined in clause 1.1 of AS 4078 - 2002. “batter” is defined as the sloping surface of artificial cuttings and embankments that have a gradient exceeding 25%. It excludes natural slopes.	See above, no retaining walls or batters are required.

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TABLE 12 – LAND FORMING																																										
PROVISION				COMMENTS																																						
A5.4.5 – Land Forming																																										
"Combined height" is defined as the vertical height difference at or adjacent to the boundary between top of batter or retaining wall and bottom of batter or retaining wall. Adjacent to a boundary includes any batters or retaining walls that lie either wholly or partly within a distance of 5m measured horizontally from the allotment boundary. 2. Criteria (a) The combined height of retaining walls or cut/fill batters on an allotment boundary shall not exceed the following <table><tr><th colspan="5">MAXIMUM PERMISSIBLE COMBINED HEIGHT OF RETAINING WALLS OR BATTERS</th></tr><tr><th rowspan="2">Type of Subdivision</th><th rowspan="2">Perimeter boundary of subdivision</th><th colspan="3">Boundaries of lots created within subdivision</th></tr><tr><th>Side and Rear Boundaries</th><th colspan="2">Street Boundary</th></tr><tr><th></th><th></th><th></th><th>Above Street Level</th><th>Below Street Level</th></tr><tr><td>Residential</td><td>1.2</td><td>1.2 see Note 1 of Table A5-3(C)(1)</td><td>1.8</td><td>2.4</td></tr><tr><td>Industrial</td><td>1.2</td><td>5</td><td>2.5</td><td>5</td></tr><tr><td>Business</td><td>1.2</td><td>5</td><td>1.2</td><td>2.4</td></tr><tr><td>Rural Living</td><td>1.2</td><td>Nil</td><td>1.2</td><td>2.4</td></tr></table>				MAXIMUM PERMISSIBLE COMBINED HEIGHT OF RETAINING WALLS OR BATTERS					Type of Subdivision	Perimeter boundary of subdivision	Boundaries of lots created within subdivision			Side and Rear Boundaries	Street Boundary					Above Street Level	Below Street Level	Residential	1.2	1.2 see Note 1 of Table A5-3(C)(1)	1.8	2.4	Industrial	1.2	5	2.5	5	Business	1.2	5	1.2	2.4	Rural Living	1.2	Nil	1.2	2.4	These matters are addressed in the Engineering Impact Assessment at Annexure 18 .
MAXIMUM PERMISSIBLE COMBINED HEIGHT OF RETAINING WALLS OR BATTERS																																										
Type of Subdivision	Perimeter boundary of subdivision	Boundaries of lots created within subdivision																																								
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Industrial	1.2	5	2.5	5																																						
Business	1.2	5	1.2	2.4																																						
Rural Living	1.2	Nil	1.2	2.4																																						
(b) Where retaining walls or batters are utilised to create a level difference between adjacent allotments or an allotment and a road and the retaining wall is located in the lower allotment, the top of batter or top of retaining wall shall be located a minimum 0.5m horizontally from the boundary																																										

TABLE 13 – STORMWATER MANAGEMENT	
A5.4.6 – Stormwater Runoff, Drainage, Waterways and Flooding	
PROVISION	COMMENTS
Water Sensitive Urban Design	This issue is addressed in the Stormwater Management Plan at Annexure 18 .
Erosion and Sedimentation Control	This issue is addressed in the Stormwater Management Plan at Annexure 18 .
Permanent Stormwater Quality Facilities	This issue is addressed in the Stormwater Management Plan at Annexure 18 .
Drainage (lawful point of discharge)	This issue is addressed in the Stormwater Management Plan at Annexure 18 .
Riparian Buffer Widths	The buffer width to the open drainage channel was fixed by Local Environmental Plan Amendment No. 7 which determined the location of the zone boundary between the Environmental Protection zone and the Residential zone.

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The following table summarises the key principles applicable to urban structure.

TABLE 14 – SECTION A5.4.7 – URBAN STRUCTURE	
Requirement	Compliance
No more than 15% of lots fronting cul-de-sac.	No cul-de-sacs proposed.
Maximum cul-de-sac length 100m serving no more than 12 dwellings with clear view for full length of cul-de-sac.	Not applicable.
Linking access for pedestrians and cyclists.	Normal contributions will apply towards Council's cycleway network.
Bus route/stops should be located at an average spacing of 300 – 400m.	Tweed Coast Road comprises a bus route which approximately 1km to the east.
Street design to achieve target street speeds.	Complies – Willow Avenue is a cul-de-sac, the width and alignment of which is designed to discourage high speeds (see plans).
Cycleway network required.	Normal contributions under Section 94 Plan No. 22 will be applicable.
Dedication of environmentally sensitive areas.	Approximately 1.3 hectares of the site comprises vegetation which is indicative of an EEC. These areas will not be disturbed by the proposal and therefore their dedication is not warranted.
Casual parks – 1.13 hectares/1000 population (11.3m ² /person). Desirable minimum area 2500m ² – 4000m ² .	Given that 12 lots only generates a demand for approximately 340m ² of usable casual open space, a contribution in lieu is proposed in accordance with Section 94 Contribution Plan No. 5.
95% of residences within 400m walking distance of casual parks.	Complies – all lots are within 400m walking distance of Cudgen Lake foreshore.
Land form of casual park – slopes less than 8%.	Not applicable.
Access from more than one local road.	Not applicable.
Road frontage – 50% of perimeter.	Not applicable.
Embellishment.	Not applicable.
Sports playing field – 1.7 hectares/1000 persons (structured or active open space).	Contribution in lieu is applicable in accordance with Section 94 Plan No. 5.
Minimum residential lot size of 450m ² and 10 x 15m building envelopes for dwellings.	Complies lots range from 569m ² – 1065m ² . Indicative building envelope plans are at Annexure 8 .
Dual occupancy lots minimum 900m ² or 1000m ² for corner lots.	Proposed Lots 1 to 5 satisfy this requirement.
Solar access – 70% of lots oriented from 340° to 20° or 70° to 120°.	Complies – approximately 80% of lots have predominantly north/south or east/west axes.
Generally rectangular shaped lots.	Complies – see Application Plans.
East – west lots must have a minimum width of 14m.	Complies – see plans.

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TABLE 15 – SECTION A5-10 – SUBDIVISION INFRASTRUCTURE REQUIREMENTS			
Infrastructure Required	Where Required	Standard of Infrastructure	Comments
Sealed road frontage with kerb and gutter both sides	All lots for private occupation, community facilities lots and public open space lots.	See Development Design Specification D1.	Complies see Annexure 18.
Landform			Complies see Annexure 18.
Water Supply	All lots for private occupation, community facilities lots, sports fields, parks, play areas, other utility facilities (pump stations etc.).	See Development Design Specification D11.	Complies see Annexure 18.
Sewerage	As above.	See Development Design Specification D12.	Complies see Annexure 18.
Electricity	As above.	Must be underground and provided in accordance with suppliers and Australian standards. Verge service location is to comply with Development Design Specification D1.	Complies – internal reticulation will be underground.
Telecommunications	All lots for private occupation, community facilities lots and sports fields. As required for other utility facilities).	As above, service must be such that standard connection is available to local/national/ overseas networks.	Complies – telecommunication facilities will be provided underground.
Gas	Optional.	As above.	Not applicable.
Drainage system	Must provide Q100 local flooding immunity for all lots for private occupation and community facilities. Major/minor system required, roads public open space may (subject to other development standards) be used for Q100 overland flow paths. Must be equipped with stormwater treatment facilities to meet Chapter 3, PC7.15 standards.	See Development Design Specifications D5 and D7.	Complies see Annexure 18.
Flood Immunity	All lots for private occupation must have surface levels above the Q100 level for regional creek/river flooding. See section 4.26 of this chapter for public open space standards.	See Section A3 - Development of Flood Liable Land for detailed requirements.	Complies see Annexure 18.
External Connections and/or upgrades	The subdivider must provide all external connections required to connect subdivision infrastructure and upgrade external infrastructure to cater for the additional subdivision load. See also D1, D5, D7, D11, D12.		Complies see Application Plans and Annexure 18.

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4.4.5 Tweed Development Control Plan 2007, Part A13 – Socio-Economic Impact Assessment

Section A13.5.1 of this Development Control Plan nominates development and land use types for which any Development Application must be accompanied by a formal Socio-Economic Impact Assessment. Development for the purposes of a residential subdivision creating more than fifty lots is included in Section A13.5.1 and therefore a formal Socio-economic Impact Assessment is not required as this project only involves thirteen lots. In addition, as this is a Major Project Application, a Socio-Economic Impact Statement is not required.

4.4.6 Tweed Development Control Plan 2007, Part B19 – Bogangar/Cabarita Beach Locality Plan

Under the provisions of this Plan, the subject lands fall within the Detached Residential Precinct.

The objectives of this Precinct include complementing the existing single detached dwelling character and amenity of the Precinct, ensuring development of the area is undertaken so that it is sympathetic to its surroundings and encouraging landscape design that complements the low density residential environment.

This project involves twelve residential lots of a similar size and shape to those in the locality generally with a view to erecting future detached dwelling houses. Appropriate landscaping is also proposed as identified in the Landscape Concept Plans at **Annexure 9**.

It is therefore submitted that the proposal consistent with the Precinct objectives. The Plan also provides for preferred outcomes and requires that proposals are consistent with them. Those preferred outcomes include:

- The vision for Bogangar/Cabarita Beach.

The vision for Bogangar/Cabarita Beach is:

"To retain and enhance the unique natural environmental character and coastal lifestyle offered by Bogangar/Cabarita Beach, whilst embracing high quality development promoting the area as a popular location for residential living, tourism and business."

Given the established low density residential character and amenity of the area, it is submitted that the proposal will be entirely consistent with that character and the vision for Bogangar.

- The Development Design Guidelines stipulated within Clauses B19.15 and B19.16 of the Plan.

Section B19.15 contains residential design guidelines which future dwelling houses on each lot will need to address. Dwelling houses will, of course, be the subject of separate Development Applications and/or Complying Development Certificate Applications. However, the size, shape and orientation of the allotments facilitate compliance with the relevant guidelines. Insofar as Section B19.16 is concerned, relating to building heights, it is noted that a three storey height limit applies under the Tweed Local Environmental Plan 2000, however the proponent proposes to limit future dwellings to two storeys by virtue of a title restriction on each residential lot.

In summary, it is concluded that the proposal is consistent with the provisions of the Bogangar/Cabarita Beach Locality Plan.

4.5 Legislation and Policies

4.5.1 North Coast Urban Planning Strategy, 1995

Under the provisions of this Strategy, the site is identified as a "committed urban area". Development of the site for residential purposes is consistent with the provisions of this Strategy.

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4.5.2 Tweed Shire Council Residential Development Strategy, 1991

Figure 12 of this Strategy includes the development site as a residential development area.

4.5.3 Far North Coast Regional Strategy, 2006 – 2031

The Strategy was adopted by the Minister on 17 January 2007. The site is identified as existing urban on Sheet 1 of the Town and Village Growth Boundary Map contained in the Strategy. The project is therefore consistent with the Strategy.

4.5.4 Tweed 2000+ Strategic Plan and Tweed Strategic Plan 4/24

Following lengthy community consultation, Tweed Shire Council adopted the Tweed 2000+ Strategic Plan in December 1996.

Insofar as the Tweed Strategic Plan 2004/2024 (adopted by Council September 2004) is concerned, Section 1 indicates that the Tweed 04/24 is a new whole of Shire whole of Council Strategy to replace the Tweed Shire 2000+ Strategic Plan prepared a decade ago. It sets forward directions for the next two decades and provides a framework for more detailed plans and policies. The previous Strategic Plan (Tweed 2000+) was heavily concerned with managing urban expansion. The Tweed 04/24 retains the framework of the Tweed 2000+ Strategic Plan but places greater emphasis on sustainability and locality planning.

The following table summarises and comments on the key provisions of this Strategic Plan.

TABLE 16 – TWEED STRATEGIC PLAN 4/24		
ELEMENT	STRATEGY	COMMENTS
Sustainability	Retain the special character of the Tweed. Sustainability as an over-arching, guiding principle for all decision-making. Introduce sustainability indicators and a new annual 'State of the Shire' report.	Future dwellings will comply with BASIX and NatHERS requirements in terms of energy efficiency and water consumption.
Triple Bottom Line	Balance economic, social and environmental objectives. A leadership role for Council in tackling the full range of issues facing the Tweed.	It is considered that this project achieves the objectives of this element in that it will deliver a range of housing types to satisfy continuing growth and demand for dwelling houses in this locality. The project also incorporates contemporary environmental management and impact mitigation measures and ensures that all necessary social infrastructure is provided (or contributions in lieu paid) for a development of this type.
Community Values	Reflect the needs and values of the existing community. Safeguard quality of life and the character of towns and villages. Stability and consistency in policies and decision-making. Effective community involvement in planning.	The character of the existing area has been identified and the design, density and layout of the proposed subdivision are compatible with the existing and desired future character and urban form of the locality.

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TABLE 16 – TWEED STRATEGIC PLAN 4/24		
ELEMENT	STRATEGY	COMMENTS
Economic Growth	A concerted program to generate more local jobs, tackle youth unemployment, offset the decline in rural industries, and balance the population mix by attracting residents in the 30-55 age groups. Link economic growth to education and to the Tweed's environmental quality.	The project will implement the Government's Far North Coast Regional Strategy and provide jobs during the construction and operational phase.
Environmental Quality	Continued improvements in environmental management, including establishment of a Regional Open Space System. Strengthen coastal zone management.	The development footprint will not significantly impact on existing areas of native vegetation and threatened species will also be conserved. Appropriate management measures are planned to mitigate potential adverse impacts and contributions will be paid by way of Section 94 towards the regional open space system.
Water Resources	Conserve water resources. Maintain and improve water quality in rivers and estuaries. Complete Integrated Water Cycle Management Study and promote use of recycled and 'grey' water. Upgrade Clarrie Hall dam.	Stormwater management measures during both the construction and operational phases will be implemented to ensure that water quality objectives are achieved. Future dwelling houses will incorporate water efficiency devices including rainwater tanks.
Rural Change	A 'Rural Partnership' to address problems associated with the decline of rural industries. A Rural Settlement Strategy to guide rural subdivision and expansion of villages, consistent with protecting landscape values.	Not applicable.
Social Support	A new Social Plan. Greater emphasis on the needs of the elderly, disabled, youth and Indigenous people. A stronger framework for social planning and integrated provision of community services.	Development of this site as proposed is not inconsistent with Council's social objectives insofar as it implements the Tweed Residential Development Strategy 1991 and the Far North Coast Regional Strategy 2006-2031. It will provide a range of housing choices together with all normal urban infrastructure required by a project of this type.
Housing Affordability	New measures to provide more housing for both purchase and rental within the reach of lower and middle income groups.	The project involves a range of lot sizes to enable housing choice and greater affordability to be provided for prospective purchasers.
Urban Development	Implement current plans for urban expansion including Cobaki and Bilambil Heights. Complete assessments of Terranora 'Area E' and Kings Forest. Retain green belts or buffers between settlements.	The project is entirely consistent with this provision as it implements Council's 1991 Residential Strategy.

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TABLE 16 – TWEED STRATEGIC PLAN 4/24		
ELEMENT	STRATEGY	COMMENTS
Land Use Structure Plan and Urban Design Framework	A new Structure Plan to set out more detailed proposals for urban and rural land use. Revised guidelines to promote the highest possible standards of urban and landscape design.	It is understood that Council has not completed this Structure Plan.
Infrastructure	A new Tweed Community Infrastructure Program and other measures to ensure adequate provision of infrastructure to both new and existing areas. Minimise the cost to government of servicing new development.	It is understood Council has not completed the new Community Infrastructure Program.
Locality Plans	Detailed plans for local areas prepared in conjunction with the community to guide physical, economic and social development, environmental management, infrastructure and services.	See Tweed Development Control Plan 2007, Part B19 – Bogangar/Cabarita Beach Locality Plan which is addressed at Section 4.4.6.
Partnerships	Council to form partnerships with government agencies and other parties to tackle priority issues eg. Tweed Heads revitalisation. Expert Advisory Panels to help implement key components of the strategy	Not applicable.
Regional Links	Closer integration with planning for the Gold Coast and South East Queensland. Continued involvement with the Northern Rivers Region and Premier's Department coordination group.	Not applicable.
Council Management	Strategic Directions and Four Year Priorities to be pursued through Council's Management Plan and budget. Further adjustments where necessary to Council's organisation structure.	Not applicable.

4.5.5 Threatened Species Conservation Act, 1995

The Flora and Fauna Assessment at **Annexure 15** addresses relevant threatened species under the Threatened Species Conservation Act, 1995 and generally concludes that subject to certain mitigation measures, the project will not impact significantly on threatened species. Details of mitigation measures are provided in Section 8.13.

4.5.6 Native Vegetation Act, 2003

Section 5 of this Act provides that the Act does not apply to land described in Part 3 of Schedule 1. Schedule 1, Part 3, Paragraph 14 provides that land within a zone designated "residential" under an Environmental Planning Instrument is excluded from the operation of the Act. The physical development and tree removal will occur on land zoned 2(a) Residential and therefore this Act does not apply.

It should also be noted that Section 75U of the Environmental Planning and Assessment Act provides that an authorisation referred to in Section 12 of the Native Vegetation Act, 2003 does not apply to a Major Project Application.

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4.5.7 Roads Act, 1993

Section 138 of this Act requires approval to be obtained for certain works and access connections to a public road. However, Section 75V of the Environmental Planning and Assessment Act provides that an approval under Section 138 must be consistent with any Part 3A approval granted by the Minister. Widening of Willow Avenue and installation of kerb and gutter for the site frontage is proposed (see **Annexure 18**).

4.5.8 Rural Fires Act, 1997

This Act requires an authority from the Rural Fire Service for certain development types including subdivisions to be used for residential purposes and aged persons housing. These forms of development would normally also be integrated development under the provisions of Section 91 of the Environmental Planning and Assessment Act. However, Section 75U provides that a Bushfire Safety Authority under Section 100B of the Rural Fires Act is not required in respect of a Major Project Application. The land is mapped as bushfire prone and a Bushfire Threat Assessment Report accompanies the application at **Annexure 12**.

4.5.9 Water Management Act, 2000

Approvals would normally be required under this Act for certain activities including dewatering however, Section 75U of the Environmental Planning and Assessment Act provides that a Water Use Approval under Section 89, a Water Management Work Approval under Section 90 or an Activity Approval under Section 91 of this Act is not required in respect of a Major Project Application.

Groundwater was encountered at approximately 2.0 to 3.0m below the existing surface level across the site. The water table may fluctuate in this area as a result of tidal movement and during periods of high rainfall.

4.5.10 Commonwealth Environmental Protection and Biodiversity Conservation Act, 1999

The advice from James Warren and Associates dated 2 February 2010 at **Annexure 15** concludes that the proposed development does not give rise to a requirement for any approvals under the Commonwealth Environmental Protection and Biodiversity Conservation Act, 1999.

4.5.11 Development Contributions

Tweed Shire Council has adopted a number of Shire wide Section 94 Contribution Plans which may apply to the project. In addition, Council has adopted Water and Sewer Headworks Charges for the Tweed Local Government Area.

Table 17 summarises the development contributions applicable to each residential lot.

TABLE 17 – CONTRIBUTIONS (SECTION 94 PLANS)			
PLAN NO.	PLAN NAME	QUANTUM OF CONTRIBUTION (per lot)	PURPOSE
4	Tweed Road Contribution Plan Sector 7	\$6208.00	This Plan enables the Council to collect contributions towards upgrading of the distributor road network to accommodate additional traffic resulting from population growth and urban expansion.

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TABLE 17 – CONTRIBUTIONS (SECTION 94 PLANS)			
PLAN NO.	PLAN NAME	QUANTUM OF CONTRIBUTION (per lot)	PURPOSE
5	Open Space Contributions (Structured)	\$602.00	This Plan enables Council to collect contributions for the acquisition and embellishment of structured open space (playing fields) and casual open space (local parks) where dedication and embellishment on site is not appropriate and not consistent with Council's normal policy, as is the case with this project.
	Open Space Contributions (Casual)	\$526.00	
11	Library Facilities	\$792.00	This Plan enables the Council to levy contributions towards the cost of upgrading and improving existing library facilities at Tweed Heads, Murwillumbah and Kingscliff.
12	Bus Shelters	\$60.00	This Plan enables Council to levy contributions towards the cost of constructing public bus shelters on roads and streets in accordance with normal Surfside Bus route requirements.
13	Eviron Cemetery/Crematorium Facility	\$120.00	This Plan enables Council to levy contributions towards the cost of providing and expanding the existing Eviron Cemetery and Crematorium facility to meet additional demand generated by population growth.
18	Council Admin Offices and Technical Support Facilities	\$1759.90	This Plan enables Council to levy contributions towards the cost of alterations and additions to the Council offices at Tweed Heads and Murwillumbah and the Council's Technical Support facilities (Works Depots) to meet the additional demand generated by growth.
22	Cycleways	\$447.00	This Plan enables Council to levy contributions towards the cost of providing cycleways in accordance with Council's Cycleway Strategy, throughout the Shire.
26	Shire Wide Regional Open Space (Structured)	\$3619.00	This Plan enables Council to levy contributions towards the cost of providing a new regional sporting facility at Arkinstall Park, to meet demand for active open space activities in addition to those normally require at sports fields (see Section 94 Plan No. 5)
26	Shire Wide Regional Open Space (Casual)	\$1031.00	This Plan enables Council to levy contributions towards the cost of regional casual open space such as beach foreshore areas, river foreshore areas and the like to meet the demand generated by growth, in addition to casual open space parks which might be dedicated and embellished on a particular development site.

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Section 64 Headworks Contributions

Sewer

The current contribution is \$5,146.00 per equivalent tenement. One equivalent tenement is nominally equivalent to one lot. The contributions are required to fund conveyance, treatment and disposal of sewerage generated by the project.

Water

The current contribution is \$10,709.00 per equivalent tenement. One equivalent tenement is nominally equivalent to one lot. The contributions are required to fund storage, treatment and conveyance of water supply required by the development.

4.5.12NSW Coastal Policy 1997

The maps accompanying the Coastal Policy indicate that the site falls within the area to which the Policy applies.

Table 2 of the Coastal Policy contains a number of strategic actions relevant to development control. Section 8.3 of this Environmental Assessment Report addresses Coastal Policy provisions.

5.0 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979 (AS AMENDED) OBJECTS

The following table (Table 18) identifies the objects of the acts and demonstrates how the project is consistent with those objects.

TABLE 18 – ENVIRONMENTAL PLANNING AND ASSESSMENT ACT OBJECTS	
OBJECT	COMMENTS
(a) to encourage: (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment, (ii) the promotion and co-ordination of the orderly and economic use and development of land, (iii) the protection, provision and co-ordination of communication and utility services, (iv) the provision of land for public purposes, (v) the provision and co-ordination of community services and facilities, and	 That part of the site which is the subject of the proposed 12 residential lots has been highly modified by filling and urban activities. The site does not have any significant natural values and that is reflected in its recent rezoning to residential. Development of the site in accordance with the residential zoning and as proposed in this Environmental Assessment would be entirely consistent with the site's physical capabilities and constraints, relevant statutory planning controls and would achieve compliance with the Far North Coast Regional Strategy, 2006 – 2031. Those parts of the site which have ecological values will be contained within the residue Lot 13 within which no physical development or disturbance is proposed.

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TABLE 18 – ENVIRONMENTAL PLANNING AND ASSESSMENT ACT OBJECTS	
OBJECT	COMMENTS
(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and (vii) ecologically sustainable development, and (viii) the provision and maintenance of affordable housing, and	Threatened species will be retained and protected. The layout provides for a range of lot sizes and is consistent with affordable housing objectives.
(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and	The Minister for Planning is the consent authority for this Major Project Application and Tweed Shire Council has been consulted in preparing this Environmental Assessment Report.
(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.	The application will be advertised and notified by the Department of Planning.

6.0 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The Environment Protection & Biodiversity Conservation (EPBC) Act (1999) was passed by Commonwealth Parliament in June 1999 and came into force on 16 July, 2000. A person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on a matter of National Environmental Significance (NES).

These matters are listed as:

- (a) the world heritage values of a declared World Heritage property;
- (b) the ecological character of a declared Ramsar wetland;
- (c) a threatened species or endangered community listed under the Act;
- (d) a migratory species listed under the Act; or
- (e) the environment in a Commonwealth marine area or on Commonwealth land.

The Act also prohibits the taking, without an approval under the Act, of:

- (a) a nuclear action; or
- (b) an action in a Commonwealth marine area or on Commonwealth land that has or will have, or is likely to have, a significant impact on the environment.

An action includes a project, development, undertaking or an activity or series of activities. An action does not require approval if it is a lawful continuation of a use of land, sea or seabed that was occurring before the commencement of the Act. An enlargement, expansion or intensification of a use is not a continuation of a use.

Matters of NES in NSW are:

- (a) Declared World Heritage Areas;
- (b) Declared Ramsar Wetlands;
- (c) Listed Threatened Species (Schedule 1 and 2 of Commonwealth Endangered Species Protection Act 1992);

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-
- (d) Listed Ecological Communities in Queensland; and
 - (e) Listed migratory species (JAMBA and CAMBA).

"The Environment Protection & Biodiversity Conservation (EPBC) Act (1999) was passed by Commonwealth Parliament in June 1999 and came into force on 16 July, 2000. A person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on a matter of National Environmental Significance (NES). These matters are listed as:

- (a) the world heritage values of a declared World Heritage property;*
- (b) the ecological character of a declared Ramsar wetland;*
- (c) a threatened species or endangered community listed under the Act;*
- (d) a migratory species listed under the Act; or*
- (e) the environment in a Commonwealth marine area or on Commonwealth land.*

The Act also prohibits the taking, without an approval under the Act, of:

- (a) a nuclear action; or*
- (b) an action in a Commonwealth marine area or on Commonwealth land that has or will have, or is likely to have, a significant impact on the environment.*

An action includes a project, development, undertaking or an activity or series of activities. An action does not require approval if it is a lawful continuation of a use of land, sea or seabed that was occurring before the commencement of the Act. An enlargement, expansion or intensification of a use is not a continuation of a use.

Occurrence of Matter of NES on Subject Site

A Commonwealth Assessment will be required for proposed activities on the subject site if they affect a matter of NES.

There are no declared World Heritage Areas or Ramsar Wetlands in the Locality, Study area or Subject site.

Listed Threatened species

No Commonwealth listed flora species or endangered Ecological Communities were recorded on the site.

*One (1) Commonwealth listed threatened fauna species, Grey-headed flying-fox (*Pteropus poliocephalus*) (Vulnerable) - was considered to potential occur on the site over time.*

Listed Migratory Species

Listed migratory species in NSW are considered predominantly in the Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA).

No migratory species as listed within schedules of the EPBC Act (1999) were recorded on site or considered as possible occurrences on site.

Assessment against EPBC Act Principal Significant Impact Guidelines

The Assessment against the EPBC Act is made using Principal Significant Impact Guidelines 1.1 (DEH 2006). The guidelines outline a self-assessment process to assist in determining whether an action should be referred to the Department of Environment Water Heritage and the Arts (DEWHA) for a decision on whether Commonwealth assessment and approval is required under the Act. The following section is an assessment of the proposed development (the action) against these guidelines.

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Vulnerable Species

Significant Impact Criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species;*
- *reduce the area of occupancy of an important population;*
- *fragment an existing important population into two or more populations;*
- *adversely affect habitat critical to the survival of a species;*
- *disrupt the breeding cycle of an important population;*
- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;*
- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;*
- *introduce disease that may cause the species to decline; or*
- *interfere substantially with the recovery of the species.*

Assessment of Proposed Action

One (1) fauna species, listed as vulnerable within schedules of the EPBC Act (1999), was recorded from the subject site:

It is considered that the Proposed development will not result in any of the above listed impacts on the Grey-headed flying-fox.

It is considered that the subject site does not support an important population of any species listed in the EPBC Act (1999) and a significant impact on these species will not be incurred.

Requirement for Commonwealth Referral

Based on the assessment provided above, Referral to the Commonwealth Department of Environment Water Heritage and the Arts (DEWHA) is not required. The proposed action is unlikely to result in a significant impact on any matter of NES. It is concluded that Commonwealth Assessment is not required for the Proposed development of the subject site."

7.0 ASSESSMENT OF POTENTIAL IMPACTS AND DRAFT STATEMENT OF COMMITMENTS

Section 8.0 of this Environmental Assessment contains a detailed consideration of the key issues relating to the site and the proposed development.

In particular, issues relating to coastal processes, contamination, acid sulphate soils, bushfire hazards, geotechnical constraints, flooding impacts, cultural heritage issues, impacts on wetlands and aquatic habitats, impacts of mosquito breeding areas and the relationship of the development with Cudgen Nature Reserve and Cudgen Lake are addressed in detail. That assessment does not identify any significant constraints on the creation of the proposed twelve residential allotments on that part of the site which is zoned 2(a) Low Density Residential and which has been filled to the approximate design flood level.

The various key issues can be suitably managed and appropriate mitigation measures can be implemented to address potential adverse impacts however, the design of the subdivision itself achieves significant mitigation measures by precluding any development outside of the 2(a) zone footprint other than vegetation management and rehabilitation within the 7(l) corridor between the proposed residential allotments and the open drainage channel.

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In summary, it is concluded that the project will not have any significant adverse impacts and potential impacts relating to bushfire, buffering of endangered ecological communities, rehabilitation of existing vegetation communities, provision of appropriate infrastructure and protection of threatened species are adequately addressed in the Draft Statement of Commitments at Section 7.1.

7.1 Draft Statement of Commitments

The following table comprises a Draft Statement of Commitments designed to manage and mitigate potential adverse impacts during the construction and operational stages.

TABLE 19 – STATEMENT OF COMMITMENTS					
Project Component	Environmental Outcome (Commitment)	Measure (Commitment)	Purpose of Measure	Timing for Completion	Monitoring and Reporting
1. Erosion and Sediment Control (Construction Phase)	1.1 Minimise the escape of wind-borne particles by complying with the Erosion and Sedimentation Control Plan	1.1.1 Minimise disturbance area 1.1.2 Promptly rehabilitate disturbed areas 1.1.3 Regularly water disturbed areas of the site	To ensure that air pollution does not exceed DECC standards	Ongoing during the construction phase	Any complaints to be recorded in the Complaints Register and valid claims to be acted on within one hour. Details to be provided in the quarterly Compliance Report.
	1.2 Minimise mobilisation of sediments by complying with the Erosion and Sedimentation Control Plan	1.2.1 Erect sedimentation fences, inlet filters, hay bale barriers and diversion drains in accordance with the Erosion and Sedimentation Control Plan. 1.2.2 The controls shall be maintained during the construction phase and defects liability period.	To ensure that water quality in receiving waters is not decreased in quality by sediment and nutrient loads	All sediment and erosion control measures to be in place prior to commencing site work or demolition.	Visual monitoring shall be carried out by the Project Manager on a weekly basis and after each storm event. Details to be contained in the quarterly Compliance Report.
2. Site Safety	2.1 Minimise risk of injury to construction workers and members of the public by generally complying with the Safety Management Plan	2.1.1 The principal contractor shall prepare a Health and Safety Plan and submit the Plan to the Project Manager for approval. The contractor shall comply with the approved Plan.	To ensure that Occupational Health and Safety Act 2000, Occupation Health and Safety Regulation 2001 and relevant Codes of Practice are complied with.	Prior to commencing any work on the site.	Monitoring and reporting incidents to be recorded in the Incident Register and details to be included in the quarterly Compliance Report. Work Cover to be notified in appropriate circumstances.
		2.1.2 The principal contractor shall prepare a Traffic and Pedestrian Plan for approval by the Project Manager.	To ensure that traffic and pedestrian management during the construction phase complies with the RTA Traffic Control Worksite Manual and AS1742.3	Prior to commencing work on site.	As above.
3. Acid Sulphate Soil	3.1 Minimise disturbance of acid sulphate soils by limiting excavations in accord with Acid Sulphate Soils Assessment, Border Tech, November 2009	3.1.1 Comply with the provisions of the Acid Sulphate Soils Manual (ASSMAC, 1998) and prepare an Acid Sulphate Soil Management Plan if acid sulphate soils are likely to be disturbed.	To ensure that significant volumes of acid sulphate soils are not disturbed.	During the excavation phase.	Project Manager to monitor excavation and address compliance in the quarterly Compliance Report.

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TABLE 19 – STATEMENT OF COMMITMENTS					
Project Component	Environmental Outcome (Commitment)	Measure (Commitment)	Purpose of Measure	Timing for Completion	Monitoring and Reporting
4. Construction of Subdivision	4.1 Minimise noise, dust and vibration and amenity impacts by generally complying with the Construction Management Plan and the Safety Management Plan to be prepared prior to construction commencing.	4.1.1 Limit work hours to 7.00am to 6.00pm Monday to Saturday. 4.1.2 Limit noise levels to 5dBA above background at the nearest residential receivers.	To mitigate adverse construction impacts.	During construction.	Project Manager to address compliance in quarterly Compliance Report.
5. Landscaping and Embellishment	5.1 Achieve improved aesthetics and useability of the site.	5.1.1 Carry out the embellishment and landscaping works in accordance with Landscape Concept Plan	To soften the appearance of the building and hardstand areas and provide a more attractive pedestrian environment and car parking area.	Prior to the issue of a final Subdivision Certificate.	Project Manager to address compliance in quarterly Compliance Report.
	5.2 Soften the visual impact of the future buildings and surrounding hardstand areas	5.2.1 Carry out site landscaping in accordance with the Landscape Concept Plan, LVO Architecture, 31 August 2009.	As above.	Prior to the issue of a Subdivision Certificate.	As above.
6. Land Forming	6.1 Limit major landform changes to those shown on Annexure 18 subject to detailed engineering design to accompany the Construction Certificate.	6.1.1 Minimise landform changes.	To minimise visual impacts on the landscape and changes in hydrology and comply with Tweed Shire Council Landforming Policy.	Ongoing during the construction phase.	Certification to be provided by the Consulting Engineer prior to the issue of the Subdivision Certificate.
7. Threatened Species Protection	7.1 Protect all threatened species of flora as identified in the James Warren and Associates Report (November 2009).	7.1.1 A Vegetation Management Plan will set out strategies and procedures to protect and enhance the retained vegetation (habitat) within Land Parcel A. 7.1.2 Potential habitat will be extended to include the revegetated buffer between the rear lot boundaries EEC.	To ensure compliance of the Threatened Species Conservation Act, 1995 and mitigate potential adverse impacts.	Prior to the issue of a Subdivision Certificate.	Monitoring and reporting incidents to be recorded in the Incident Register and details to be included in the quarterly Compliance Report.

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TABLE 19 – STATEMENT OF COMMITMENTS					
Project Component	Environmental Outcome (Commitment)	Measure (Commitment)	Purpose of Measure	Timing for Completion	Monitoring and Reporting
8. Aboriginal Cultural Heritage	8.1 Avoid disturbing any areas of Aboriginal Cultural Heritage.	8.1.1 Comply with Recommendations 1 to 4 contained in the Cultural Heritage Assessment, Everick Heritage Consultants, November 2009.	To ensure compliance with the National Parks and Wildlife Act 1974.	Ongoing during the construction phase.	Monitoring and reporting incidents to be recorded in the Incident Register and details to be included in the quarterly Compliance Report.
9. Maintaining Asset Protection Zones	9.1 The owners of Lots 1 to 12 to be responsible for maintaining bushfire asset protection zones.	9.1.1 Compliance with the Bushfire Threat Assessment, BCA Check Pty Ltd, August 2009.	To ensure compliance with the Rural Fires Act and Regulations and Planning for Bushfire Protection, 2006.	Ongoing during the operational phase.	Not applicable.
10. Adjacent Land Uses	10.1 To minimise conflicts between the proposed urban development and adjacent non-urban uses.	10.1.1 Limit construction times to 7.00am to 6.00pm Monday to Saturday 10.1.2 Implement sedimentation and erosion control during the construction phase in accordance with the Erosion and Sedimentation Control Plan.	To minimise conflicts and adverse impacts between potentially incompatible land uses.	Ongoing during construction.	Monitoring and reporting incidents to be recorded in the Incident Register and details to be included in the quarterly Compliance Report.
11. Plan of Proposed Subdivision	11.1 The project to be carried out generally in accordance with the Plan Ref 17199D, Rev B, B & P Surveys, 26.08.09.	11.1.1 Plans of Subdivision to be lodged for registration shall be generally in accordance with the Plan of Proposed Subdivision.	To ensure that the lots comply with the proposal plan.	In conjunction with registration of the Plan of Subdivisions in the Land Titles Office.	Not applicable.
12. Traffic and Transport	12.1 Ensure that sufficient physical and environmental capacity exists in the local road network.	12.1.1 Upgrade Willow Avenue in accordance with the Engineering Impact Assessment, OPUS, 18.11.09.	To ensure that appropriate accessibility and connectivity is provided.	Prior to release of the final Plan of Subdivision.	Monitoring and reporting incidents to be recorded in the Incident Register and details to be included in the quarterly Compliance Report.
13. Water Supply	13.1 Ensure that an adequate potable water supply is provided to the development.	13.1.1 Provide water supply to each of Lots 1 to 12 in accordance with the Engineering Impact Assessment, OPUS, 18.11.09.	To ensure that an adequate potable water supply is provided.	Prior to release of the final Linen Plan of Subdivision.	As required.

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TABLE 19 – STATEMENT OF COMMITMENTS					
Project Component	Environmental Outcome (Commitment)	Measure (Commitment)	Purpose of Measure	Timing for Completion	Monitoring and Reporting
14. Sewerage	14.1 To provide a reticulated sewer system to the estate.	14.1.1 Provide sewer supply to each of Lots 1 to 12 in accordance with the Engineering Impact Assessment, OPUS, 18.11.09.	To ensure that a public standard reticulation system is provided and minimise potential adverse impacts arising from pollution events on local water bodies.	Prior to the release of the final Linen Plan of Subdivision.	As required.
15. Contributions	15.1 Ensure that appropriate contributions are paid based on the demands generated by the subdivision.	15.1.1 Payment of relevant Section 94 and Section 64 Contributions.	To achieve the objectives of the Environmental Planning and Assessment Act in relation to the levying of contributions and comply with Tweed Shire Council policies.	Prior to the issue of a Subdivision Certificate.	As required.
16. Architectural Design Guidelines	16.1 Achieve a high standard of built form for the development.	16.1.1 The developer will establish Architectural Design Guidelines for the development by way of Section 88B restrictions on each lot.	To establish appropriate design controls and achieve contemporary urban design outcomes.	Prior to the issue of a Subdivision Certificate.	As required.
17. Mosquito Management	17.1 Mitigate impacts of mosquitoes on future residents.	17.1.1 Comply with the recommendations contained in Section 8 of the Mosquito Management Plan, HMC, September 2009.	To comply with the Tweed Development Control Plan 2007, Part A6 Biting Midge and Mosquito Control.	Prior to the issue of a Subdivision Certificate.	As required.

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8.0 KEY ISSUES

8.1 Consistency With Character of Existing Development

Annexure 4 comprises an Aerial Photograph including a cadastral overlay showing the spatial relationship between the subject land and abutting urban and rural uses. To the north of the site of the proposed residential lots is Willow Avenue which is a constructed urban street. To the north of Willow Avenue are a number of detached dwelling houses on relatively large lots of approximately 700 m² to 800m² in area. To the northeast of the site is the Cabarita Gardens Resort Apartments which comprises a three and four storey residential/tourist building (Cabarita Lake Apartments).

Immediately to the west of the resort apartments is a single storey commercial building formerly used as a restaurant (currently vacant). To the west of the proposed residential lots are two existing detached dwelling houses and to the east fronting Tamarind Avenue are a number of detached dwelling houses on lots of approximately 700 m² to 800m².

The existing open drainage channel abuts the residential lots to the south and west and Cudgen Lake (which forms part of Cudgen Nature Reserve) is located approximately 100m to the west of the site.

In summary, the area is predominantly characterised in terms of built form by one and two storey detached dwelling houses on residential allotments of one and two storeys in height.

The proposed residential allotments with areas ranging from approximately 569m² to approximately 1065m² are compatible with the established low density residential character and amenity of the area and it is likely that one and two storey dwellings will ultimately be erected on those allotments, consistent with the existing built form in the locality.

8.2 Consistency With Coastal Design Guidelines

The following tables demonstrate the consistency of the subdivision design and layout with the Coastal Design Guidelines for NSW, February 2003, NSW Coastal Policy 1997 and State Environmental Planning Policy No. 71 – Coastal Protection.

Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
PART 1 – HIERARCHY OF SETTLEMENTS		
1.3 – Coastal Villages		
1.	Relationship to the environment.	
a.	The relationship between the village and the coast reinforces: - the way in which the settlement sits within the landscape - the visual and environmental dominance of the landscape and surrounding ecological systems - the ecological corridors that surround the settlement.	The subject site is located on the western fringe of the existing village of Bogangar within land zoned Residential 2(a) by way of Local Environmental Plan Amendment No. 7 in 2007. The proposed development is compatible with the site's opportunities and constraints and does not impact on areas of environmental significance or ecological corridors.
b.	Separation between settlements is maintained by excluding urban development from surrounding rural and natural lands.	The proposed development maintains separation between settlements.
c.	Clear boundaries around the settlement are established.	Clear boundaries are established by existing urban zone limits and by the existing open drainage channel.
d.	New buildings and other urban development are located within the boundaries of the village.	The proposed development is located within the boundaries of the existing village of Bogangar as reflected in the residential zoning.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
e.	Land with high ecological, agricultural and visual integrity surrounding the village is protected.	Detailed Site Analysis relating to acid sulphate soils, geotechnical constraints, visual amenity, flora and fauna and cultural heritage issues have not identified any significant constraints on that part of the site which is the subject of the twelve residential lots.
f.	Aboriginal and European places, relics and items are protected.	The Cultural Heritage Assessment at Annexure 11 has not identified any Aboriginal or European places, relics or items on the site.
g.	Total water cycle management and water sensitive, urban design initiatives are implemented.	Given that scale of the development and as it is an infill subdivision there are limited opportunities for total water cycle management however this issue is generally addressed at Annexure 18 .
h.	The settlement's micro-climatic conditions are improved through landscaping and mature trees.	The Landscaping Concept at Annexure 9 proposed landscaping of the allotments to achieve a coastal character similar to the existing village.
i.	Development is set well back from areas affected by coastal processes, flooding, erosion and sea level rise.	The site is located approximately 1km from the coast and is not subject to coastal processes. Flooding and sea level rise are addressed in the Engineering Assessment at Annexure 18 .
j.	Waste and water services match seasonal tourism influxes.	The availability and adequacy of all normal urban infrastructure is addressed at Annexure 18 . In summary, adequate capacity exists in existing systems.
k.	Invasive plant species are removed from ecological areas.	The Flora and Fauna Assessment at Annexure 15 proposes that a Vegetation Management Plan be prepared which will ensure that all non-native species including invasive plants are appropriately managed.
l.	Bush fire protection and vegetation clearance are balanced to maintain ecological integrity and visual quality.	The Bushfire Threat Assessment at Annexure 12 addresses appropriate asset protection zones and concludes that these can be achieved without the removal of native vegetation.
2.	Visual Sensitivity	
a.	Visual character is critical in coastal villages. New development responds sensitively in form and character to the village and to the existing proportions and materials of existing buildings.	This issue is addressed in the Visual Impact Assessment at Annexure 10 . In summary, given the flat terrain and limited views from public places to the site it is concluded that the proposal will not have a significant impact on the landscape and scenic quality of the locality.
3.	Edges to the water and natural areas	
a.	Foreshore access in proximity to primary streets and public places within the village are reinforced.	The subject land has access to and frontage to Willow Avenue which terminates adjacent to the foreshore of Cudgen Lake approximately 100m west of the site. There are no other opportunities to provide for foreshore access to Cudgen Lake or any other public water body.
b.	Connection between the village park, other public open spaces, the main street and the foreshore edge is strengthened.	Given the scale and infill nature of the development there are no opportunities for connection with other open spaces however normal contributions towards Council's cycleway network will apply.
c.	Pathways to the foreshore are aligned with existing streets.	See comments above.
d.	Along the foreshore reserve and other public open spaces the boundary between public and private land is defined with public streets or pedestrian pathways.	The subject land does not have frontage to a foreshore reserve or public reserve.
e.	Walking tracks and vehicular access points (where appropriate) to the beach and through the dunes are defined.	See comments above regarding Council's cycleway network.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
4.	Streets	
a.	Coastal villages have a range of street types including: ♦ an access road leading from the freeway or highway and passing through the village ♦ a mixed-use main street which is the key economic and social street linking important places in the settlement ♦ streets revealing important views and vistas of and through the settlement to natural features ♦ streets defining public open spaces; parks, squares, conservation areas and the 1:100 year flood line ♦ streets separating natural areas from urban development ♦ streets following the original subdivision pattern ♦ residential streets and laneways ♦ pedestrian and cycle pathways and routes	The subject land has frontage to Willow Avenue which is an existing public street constructed to a bitumen sealed standard. Widening of the street for the site frontage and the provision of kerb and gutter is proposed. Willow Avenue terminates in a cul-de-sac adjacent to Cudgen Lake and as this application does not require the construction of any new streets it is submitted that this Clause is not specifically relevant.
b.	The original street pattern of the village is reinforced.	See above.
c.	The layout of new streets responds to geographic features.	See above.
d.	The settlement has an interconnected and permeable system of streets; the central main street is linked to residential blocks and connects places of importance within the settlement.	See above.
e.	All streets within the settlement are walkable and safe.	See above.
f.	Pedestrian and cycle access ways follow the streets.	See above.
5.	Buildings	
a.	Development within the village comprises: ♦ small-scale development within the natural setting ♦ buildings defining public open spaces within the centre ♦ public buildings within the village centre ♦ small-scale tourism and eco-tourism facilities, residential and tourist/residential development.	It is anticipated that given the zoning and statutory building controls comprised in Tweed Local Environmental Plan 2000 (maximum building height three storeys) and the design controls contained in Tweed Development Control Plan 2007, Part A1 – Residential and Tourist Code, that future dwellings on each allotment will comprise up to two storey detached dwelling houses of a scale similar to those existing on adjacent allotments.
b.	Within the village main street and centre an appropriate mix may contain community, education, retail, commercial buildings, shop-top housing, town houses, detached housing for either residential or tourist uses. These buildings: ♦ are oriented towards and address the street ♦ have on-grade, active street level uses on the main street.	Not applicable as the site is not within the village main street and centre.
c.	Areas surrounding the village centre may have coastal cottages and outhouses, detached houses and project homes. These buildings: ♦ address the street and respond to the streetscape in terms of building setbacks, landscaping and parking ♦ have materials, forms and colours that produce cohesion throughout the village as a whole ♦ have adequate and amenable private open space.	It is anticipated that future dwellings on the proposed allotments will not be inconsistent with this requirement in that they will be predominantly detached one and two storey dwelling houses.
6	Height	
a.	The village centre and the main street have a maximum of up to three storeys.	The site is not within the village centre.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
b.	Some elements of important public buildings within the centre may be marginally higher than surrounding buildings.	There are no public buildings in close proximity.
c.	Residential buildings surrounding the centre have a maximum of two storeys.	The statutory building height is three storeys however it is anticipated that future dwellings will be limited to two storeys in height compatible with surrounding residential development.
d.	Heights are subject to place specific urban design studies. New development is appropriate to the predominant form and scale of surrounding development (either present or future), surrounding landforms and the visual setting of the settlement. Buildings avoid overshadowing of public open spaces, the foreshore and beaches in centres before 3.00pm midwinter and 6.30pm summer daylight saving time. Elsewhere avoid overshadowing of public open spaces, the foreshore and beach before 4.00pm midwinter and 7.00pm summer daylight saving time.	The site is within the Detached Residential Precinct under the Bogangar/Cabarita Beach Locality Plan. Compliance with the Plan is addressed in Section 4.4.6. Buildings will not overshadow the Cudgen Lake foreshore at the prescribed times given the spatial separation between the lots and the foreshore.
PART 2 – DESIGN PRINCIPLES FOR COASTAL SETTLEMENTS		
2.1 – Defining the Footprint and Boundary		
Maintaining a Compact Development Footprint		
2 .	Strategies for development within a settlement centre occur through place-specific urban design plans and development controls. As a minimum this results in working with the existing settlement character to have regard for:	
a.	the public domain, open spaces, streets and heritage	This is an infill development which does not involve the creation of any new streets or open spaces.
b.	the subdivision, block, lot and street pattern and character	The proposed layout and lot sizes are compatible with adjacent residential development.
c.	views and visual setting	The site is low lying and has limited view opportunities and is not visually prominent.
d.	bulk, scale, height and building type	Future dwellings will be limited to mainly two storey detached dwelling houses.
e.	extent and location of private open spaces	No private open space is proposed to be dedicated as part of this development given its scale, location and limited opportunities.
f.	configuration of car parking and driveways	Driveways will be limited to one per allotment with normal on site car parking for visitors together with one on street car park in accordance with Council's Code.
g.	setbacks from the street and from side and rear boundaries	Setbacks for future dwellings will comply with Tweed Development Control Plan 2007, Part A1 and as indicated on the indicative building envelope plan at Annexure 8 compliant dwelling sites can be achieved on each allotment.
h.	landscaping	Details of proposed landscaping are contained in Annexure 9 .
i.	materials and detailing of buildings.	Materials and details of buildings will be controlled by Section 88B Title Restrictions which will limit building types to predominantly masonry and Colorbond.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
2.2 - Connecting Open Spaces		
Design Guidelines for the Open Space Network		
1.	Locate and connect new and existing open spaces which protect and maintain: a. nature reserves, conservation areas, parklands and environmental protection areas. b. the natural and rural settling of the settlement including the scenic values of the visual catchment. c. remnant native vegetation.	No new open space areas are proposed as part of this project given its location, scale and nature. As above. Remnant native vegetation on the site will be retained in the Environmental Protection zones and the adjacent Rural 1(a) zone and will not be disturbed.
2.	Establish continuous ecological corridors to incorporate existing remnant vegetation by connecting reserves and conservation areas from the hinterland or surrounding mountains to the coastal edge.	The proposal does not impact on ecological corridors.
3.	Provide setbacks to protect property from the effects of coastal erosion, flooding and bushfire.	As indicated on the Application Plans and in particular Appendix 8 building footprints will be located well clear of the potential bushfire hazard to the west.
4.	Locate open-spaces to build on the special attributes of an area for long-term public amenity and identity of the place. An open-space network may include hill tops, river frontage, mature trees, places with panoramic views, rocky outcrops and remnant vegetation.	No new open space areas are proposed.
5.	Where feasible preserve settings for places of cultural heritage within the open-space network.	No cultural heritage items exist on or adjacent to the site.
6.	Provide areas within the open-space network sufficient to detain and cleanse stormwater runoff and avoid impacting sensitive ecologies.	Not applicable.
7.	Establish edge open spaces with street and pedestrian pathways. These are best located within the development footprint of the settlement rather than in an open space zone.	Not applicable.
8.	Provide pedestrian and cycle access that: a. does not compromise the ecological values of high conservation areas b. connects important places throughout the settlement c. connects residential areas to commercial and retail locations without compromising the visual, aesthetic or ecological values of the foreshore.	Contributions are payable towards Council's cycleway network in accordance with the relevant Section 94 Contribution Plan.
9.	Provide a variety of large and smaller open spaces to serve a range of different active and passive recreational roles, eg: a. playing fields; b. playgrounds and small pocket parks; c. walking and cycling connections; d. places and activities for people with physical disabilities.	Not applicable.
10.	Co-locate recreational facilities with shops, schools and other community facilities to reduce parking and minimise walking distances.	Not applicable.
11.	Landscape design of open spaces should reflect the different qualities of the location and their functions.	Not applicable.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
2.3 – Protecting the Natural Edges		
Design Guidelines for the Natural Edge		
1.	Define the key characteristics and functions of public spaces along the foreshore with particular regard for sites of significant social and cultural importance.	Not applicable.
2.	Maintain foreshore areas and setbacks in public ownership	This proposal does not impact on existing foreshore areas in public ownership adjacent to Cudgen Lake.
3.	Ensure that existing and remnant native vegetation is protected through generous setbacks and defined points of access.	Existing remnant native vegetation on that part of the site zoned 7(l) and Rural 1(a) will not be impacted by the proposal.
4.	Provide pedestrian access to and along the foreshore with provision for those with less mobility.	Pedestrian access to and along the Cudgen Lake foreshore will not be impacted by the proposal.
5.	Avoid the remodelling of foreshore areas to ameliorate coastal processes by buildings or other structures.	As above.
6.	In new areas provide edge roads (or unformed pedestrian pathways) between all urban areas, foreshore reserves and orient streets to provide:	No new roads are proposed as the site fronts an existing public street.
a.	direct pedestrian access to the foreshore	
b.	views to the foreshore as well as distant views and vistas.	
7.	Define clear pedestrian and vehicular entry points and access routes through the foreshore reserve to reduce the impact of traffic through dunes, coastal vegetation and other fragile areas.	No impact on the Cudgen Lake foreshore reserve is likely.
8.	Design and locate foreshore facilities such as car parks, toilet blocks and picnic areas to reduce their visual intrusion on the foreshore, view corridors and vistas.	No foreshore facilities are proposed.
9.	Encourage public rather than private jetties and boat facilities.	No jetties are proposed.
10.	Ensure the ecological integrity of vegetation on the foreshores and headlands is not compromised by creating views and outlook from private properties and by encouraging filtered views.	No impact on the ecological integrity of the vegetation on the foreshore is likely to occur as no physical development or works are proposed within that locality.
Setbacks		
11.	Areas adjoining freshwater estuarine, coastal habitats and the coastal edge are managed to reduce land use impacts through setbacks that also supports the protection of properties from erosion, protection of sensitive ecologies, provision of public access along the foreshores and to natural areas, provision of visual amenity along the foreshore, protection of properties from the effects of sea-level rise, improvement of water quality.	Generous setbacks are proposed from future dwelling sites to the artificial open drainage channel to the west of the proposed residential lots.
12.	Setbacks should also address coastal erosion hazards such as storm surge events and river flooding, long-term shoreline recession and sea-level rise, cliff retreat and catastrophic collapse, sand drift hazard, entrance stability, estuarine erosion and changes in tidal current position.	Coastal erosion hazards are not applicable to this site as it is more than 1km from the beach.
13.	Setbacks are designed to protect ecosystems and reserves covered under SEPP 14 wetlands, SEPP 26 littoral rainforest, SEPP 44 koala habitat as well as salt-marsh and mangrove communities, riparian vegetation, frontal dunes and headlands, national parks, protected areas and reserves.	The site is well removed from coastal wetlands and littoral rainforests and there is no SEPP44 Koala habitat in the locality.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
14.	For new developments the foreshore setbacks should be at least 50m wide as a precautionary measure where possible.	The site does not have frontage to a public foreshore area.
15.	Setbacks may need to be marked and their vegetation preserved. Setbacks should where possible be increased to 100m or more where they are adjacent to ecologically sensitive areas or in situations where the coastal erosion hazard requires greater distance.	Appropriate setbacks were achieved at the zoning stage when the 7(l)/2(a) zone boundary was determined.
16.	Setbacks for redevelopment should consider a 100 year planning timeframe to address shore line retreat and sea-level rise.	Not applicable.
17.	Coastal estuary planning for local areas must detail the issues place-specifically and follow guidelines in the Coastal Zone Management Manual.	The provisions of the Coastal Estuaries Management Plan are addressed in Section 4.2 of this Report.
18.	Development on frontal dunes is avoided.	Not applicable.
19.	Set new development back from the foreshore edges of the ocean, lakes and other waterways to protect visual amenity and create opportunities for public access.	Not applicable.
20.	The design of buildings and other structures adjoining the foreshore complements the function and character of the foreshore.	Not applicable as the site does not abut a coastal foreshore.
21.	Setbacks in public ownership wherever possible, allow opportunities for public access and have limited development including no roads, private allotments, infrastructure and retaining walls in these locations.	Not applicable.
2.4 – Reinforcing the Street Pattern		
Design Guidelines for Reinforcing the Street Pattern		
1	Building on the original and established street and block patterns in terms of the pattern of circulation, access to lots and uses.	The site abuts an existing public street.
The street hierarchy can be strengthened by:		
9.	Protecting the rural and natural character of the main access roads by restricting development fronting onto them.	The proposal will front Willow Avenue which is an existing public street.
11.	Developing public edge roads around the settlement to provide separation between urban areas and sensitive ecologies and open-space areas. This provides asset protection zones for bushfire management and access to open spaces, foreshores and headlands.	See above.
12.	Limiting fast moving through traffic in residential streets.	The geometry and design of Willow Avenue will discourage high speed traffic movements.
14.	Establishing a system of pedestrian pathways throughout the settlement and between settlements	Appropriate contributions apply to the Council's cycleway network.
15.	Reinforcing streets with appropriate street vegetation planting.	Landscaping of the site as proposed as indicated in the Annexures to the Environmental Assessment Report.
2.5 – Appropriate Buildings for a Coastal Context		
Design Guidelines for Appropriate Buildings in a Coastal Context		
Built Form Guidelines for all Sites		
2.	Reinforce the clarity of the settlement structure with new buildings that are appropriate in terms of location, uses, scale, height and site configuration.	This project does not involve any buildings and these guidelines therefore will be applicable to future applications for the erection of dwelling houses on each lot.
3.	Reinforce the desired future character of the settlement.	

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
4.	Consider the appropriateness of new buildings within the whole streetscape rather than each building as a stand-alone object.	
5.	Maintain consistent street setbacks and street edge configurations.	
6.	Ensure buildings address the street by providing direct and on-grade entries to the street for residential, commercial and retail purposes.	
8.	Protect views from public places and streets by maintaining consistent setbacks along streets and not placing buildings in view corridors.	
9.	Protect local views and vistas throughout and surrounding the settlement from public places by relating new buildings to the topography, reducing heights to maintain views of the surrounding landscape and maintaining consistent height, bulk and scale with the street and local context	
10.	Ensure that controls are coordinated to produce the desired building form and site configuration for developments. These controls include uses, building height, building depth, building separation, street setbacks, side and rear setbacks, and floor space ratio.	
11.	Ensure development and neighbouring properties have: a. access to daylight b. access to natural ventilation c. visual privacy and acoustic privacy d. private open space e. a pleasant micro-climate	
12.	Achieving amenity relates to the design of individual buildings and, in particular to: a. building orientation depth; b. the size of the lot; c. open space location, size and connection with the inside of the building; d. car parking location and access; e. pedestrian access from the street; f. street edge configuration and building separation; g. mature trees, vegetation and soil areas.	
Built Form Design Guidelines for Specific Locations within a Settlement		
2.	Ensure development (or redevelopment) on these sites is no bigger in scale, depth, floor space ratio, height and footprint than existing buildings on the site unless urban design control generates an alternative solution which responds to the site's significant characteristics and the desired future character of the area. This is particularly important for visually prominent sites such as headlands, cliff edges and prominent coastal ridges.	This project does not involve any buildings and these guidelines therefore will be applicable to future applications for the erection of dwelling houses on each lot.

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Table 20 – COASTAL DESIGN GUIDELINES		
PART	GUIDELINE	COMMENT
3.	Create a public interface to the site and ensure development does not degrade the public nature of the site or the public open spaces adjoining or surrounding the site by: ♦ reinforcing public and active uses; ♦ setting development back a sufficient distance to ensure adjoining public open spaces are not effectively privatised; ♦ ensure building edges adjoining public spaces reinforce public uses along and within public land.	
4.	Mitigate overshadowing of public open space and the foreshore by applying the standard, no overshadowing before 4.00pm midwinter and 7.00pm summer daylight saving time.	
5.	Define the boundaries of the site with a public edge, such as pedestrian pathways, public laneways or public streets, that connect to the street hierarchy.	
6.	Ensure buildings have well articulated and scaled elevations.	
Along the Settlement Edges		
1.	Prevent the privatisation of public open space by ensuring development adjacent to the edge maintains public access. Generally the boundary between public and private land may be defined with pedestrian pathways, public laneways or public streets that connect to the street hierarchy. The transition from private to public uses should be designed to consider security and privacy for residential uses.	This project does not privatise any existing public open space.
2.	Provide adequate building setbacks to allow for asset protection zones for bushfire management.	Appropriate asset protection zones are proposed from the nominated building envelopes to the hazard to the west of the site.
3.	Design buildings to address open spaces and edge roads.	Future buildings will be designed to address Willow Avenue.

8.3 Consistency With NSW Coastal Policy, 1997 and State Environmental Planning Policy No. 71 – Coastal Protection

TABLE 21 – NSW COASTAL POLICY 1997		
STRATEGIC ACTION NO.	SUMMARY PROVISION	COMMENT
Natural Environment		
1.1.6	Voluntary conservation agreements.	Not applicable.
1.1.7	Seagrass, mangroves, saltmarsh and other wetland associated species.	The Flora and Fauna Assessment at Annexure 15 addresses key fish habitat values at Section 2.6.2 and concludes that the proposed development will not create any barriers to fish passage between the canals and Cudgen Lake. The report also concludes that there will be no significant impacts on salt marsh mangroves and seagrass.
1.2.3	Fish habitat modification or alienation.	As above.
1.2.5	Threatened Species Conservation Act.	A Flora and Fauna Assessment has been completed (Annexure 15) which concludes that the proposed development is not likely to have a significant effect on threatened species.
1.3.1	EPA licensing of STP and other point source discharges.	Not applicable.

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TABLE 21 – NSW COASTAL POLICY 1997		
STRATEGIC ACTION NO.	SUMMARY PROVISION	COMMENT
1.3.2	Non-point source pollution.	Appropriate stormwater management measures will be implemented during the construction phase and the operational phase to ensure that water quality is not diminished.
1.3.7	Waste water discharge limits.	Not applicable.
1.3.8	Contaminated stormwater.	Appropriate stormwater management measures will be implemented during the construction phase and the operational phase to ensure that water quality is not diminished.
1.3.12	Vessel sewage pumpout facilities.	Not applicable.
1.3.13	Re-use of treated biosolids and effluent.	Not applicable.
1.4.5	Assessment of coastline development proposals.	Not applicable.
1.4.7	Assessment of estuarine development proposals.	This Environmental Assessment addresses all relevant site opportunities and constraints applicable to estuarine development and concludes that the proposed subdivision is entirely consistent with relevant statutory planning considerations and will not have significant impacts on the ecological values of the site and surrounds subject to appropriate mitigation measures.
Natural Processes and Climate Change		
2.1.3	Physical and ecological processes to be considered when assessing development applications.	All relevant issues are addressed in this Environmental Assessment Report.
2.1.4	Acid sulphate soils – environmental studies; DLWC mapping and EPA guidelines; requirement for EIS; monitoring and restoration works; management plans.	Acid sulphate soils are not present to a depth of 2m (see Annexure 17).
2.2.2	Sea level change.	This issue is addressed in the Engineering Assessment at Annexure 18 .
Aesthetic Qualities		
3.2.1	North and South Coast Design Guidelines and Guidelines for Tourism Development along the NSW Coast.	Future dwellings will generally be consistent with these guidelines.
3.2.4	Design and locational principles for development applications.	The development is not inconsistent with the key design and locational principles.
3.2.5	Siting of navigational aids, marine communication towers, warning signs and moorings.	Not applicable.
Cultural Heritage		
4.2.3	Coastal sites of Aboriginal heritage significance.	The Cultural Heritage Assessment Report at Annexure 11 concludes that the development is not likely to impact on items of Aboriginal cultural heritage.
Ecologically Sustainable Use of Resources		
5.1.11	Ecotourism developments and Guidelines for Tourism Developments Adjacent to Natural Areas.	Not applicable.
5.3.3	Aquaculture procedures, permits and guidelines.	Not applicable.
5.3.4	Development consent for mining.	Not applicable.
Ecologically Sustainable Human Settlement		
6.1.4	Canal estate developments.	Not applicable.

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TABLE 21 – NSW COASTAL POLICY 1997		
STRATEGIC ACTION NO.	SUMMARY PROVISION	COMMENT
Public Access and Use		
7.1.5	Tourism development and public foreshore access.	Not applicable.
7.2.3	Coastal developments and surf life saving facilities.	Not applicable.
7.2.4	Surf life saving facilities and Section 94 levies.	Contributions are not applicable as Section 94 Plan No. 16 (Surf Life Saving) has been repealed. A Surf Club exists at Cabarita Beach approximately 1km east of the site.

TABLE 21 – STATE ENVIRONMENTAL PLANNING POLICY NO. 71 – CLAUSE 8 CONSIDERATIONS	
MATTERS FOR CONSIDERATION	COMMENT
a) The aims of this Policy set out in Clause 2.	The proposal is consistent with the aims of this Policy particularly as it involves a minor urban infill subdivision on a site which has recently been rezoned to facilitate the development.
b) Existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved.	The site does not have frontage to the coastal foreshore and the project does not affect public access to Cudgen Lake.
c) Opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability.	See above.
d) The suitability of development and its type, location and design and its relationship with the surrounding area.	The development is consistent with the zone objectives and is compatible with the existing and desired future character of the area.
e) Any detrimental impact that the development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore.	The site is not located adjacent to the coastal foreshore.
f) The scenic qualities of the NSW coast, and means to protect and improve these qualities.	As above.
g) Measures to conserve animals (within the meaning of the Threatened Species Conservation Act, 1995) and plants (within the meaning of that Act) and their habitats.	The Flora and Fauna Assessment at Annexure 15 identifies appropriate means to manage and mitigate impacts on threatened species.
h) Measures to conserve fish (within the meaning of Part 7A of the Fisheries Management Act, 1994 and marine vegetation within the meaning of that part) and their habitats	As above.
i) Existing wildlife corridors and the impact of development on these corridors.	No significant impact is likely (see Annexure 15).
j) The likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards.	The site is not subject to coastal processes.
k) Measures to reduce the potential for conflict between land based and water based coastal activities	No impacts are likely as the site does not adjoin a recreational waterway.
l) Measures to protect the cultural places, values, customs, beliefs and traditional knowledge of aboriginals.	No items of Aboriginal cultural heritage significance have been identified in the Cultural Heritage Assessment at Annexure 11 .
m) Likely impacts of development on the water quality of coastal water bodies.	Subject to the implementation of water quality management measures as proposed no significant adverse impact on water quality is likely.

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TABLE 21 – STATE ENVIRONMENTAL PLANNING POLICY NO. 71 – CLAUSE 8 CONSIDERATIONS	
MATTERS FOR CONSIDERATION	COMMENT
n) The conservation and preservation of items of heritage, archaeological or historic significance.	No items of European heritage or archaeological significance have been identified on the site.
o) Only in cases in which a Council prepares a draft Local Environmental Plan that applies to land to which this policy applies, the means to encourage compact towns and cities.	Not applicable.
p) Only in cases in which development application in relation to proposed development is determined;	
i) The cumulative impacts on the proposed development on the environment;	No other known developments are occurring in this locality which would result in cumulative impacts.
ii) Measures to ensure that water and energy usage by the proposed development is efficient.	Normal water and energy saving devices will be installed in all future dwellings in accordance with BASIX requirements.

8.4 Built Form – Design Quality Controls

Annexure 8 shows indicative building envelopes on each of the proposed residential lots (Lots 1 to 12). The building envelopes comply with the provisions of Tweed Development Control Plan 2007, Part A1 – Residential and Tourist Code in relation to street setbacks (6m) side boundary setbacks (1.5m) and rear deep soil zones (minimum 5m).

The size and shape of the proposed lots enables flexibility in the design and siting of dwelling houses within the parameters established by Part A1.

Given the very minor scale of the development and the detailed and prescriptive built form controls contained in Tweed Local Environmental Plan 2000 (three storey height limit) and Part A1, it is considered that site specific built form controls are unnecessary.

Similarly, the design quality controls contained in Part A1 are also considered to be adequate.

However, to ensure that future dwellings are compatible with the established character and amenity of the area, the proponent intends to create a restriction on use (pursuant to Section 88B of the Conveyancing Act) on each of Lots 1 to 12 requiring future dwelling houses to comply with the following key standards:

- A maximum building height of two storeys.
- Roofing to be Colorbond or tiles or low reflectivity.
- External cladding to be predominantly masonry of low reflectivity.
- Landscaping to generally comply with the Landscape Concept Plan at **Annexure 9**.
- Fencing to comply with the provisions of Tweed Development Control Plan 2007, Part A1 which will be limited to generally 1.5m maximum height for a front fence and 2m maximum height for a side fence.
- No caravans are to be permanently occupied on any of the allotments.
- No detached outbuildings are to be erected on site other than garden sheds with a maximum size of 10m².

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8.5 Staging

Given the modest scale of the project staging is not proposed.

8.6 Management and Maintenance of Open Space and Conservation Land

- Ownership

It is not proposed to dedicate any open space or conservation land. The residue lot will remain in private ownership, subject to the existing drainage easement which benefits Tweed Shire Council.

- Management

Council will continue to be responsible for management of the open drainage channel within the easement.

- Maintenance

Council will continue to be responsible for maintenance of the open drainage channel within the easement and for the maintenance and management of Willow Avenue.

- Public access

Public access to the open drainage channel is available from Clothiers Creek Road and Cudgen Lake. However, given the nature, function and character of the drain, public access should be discouraged.

- Revegetation and Rehabilitation

Revegetation of the open drain foreshore is proposed as indicated on the Concept Landscape Plans at **Annexure 9**. In addition, the Flora and Fauna Assessment at **Annexure 15** recommends that a Vegetation Management Plan be prepared.

- Bushfire Management

As indicated in Table 2 and Section 4 of the Bushfire Threat Assessment at **Annexure 12**, the required 9m asset protection zone can be accommodated within the rear of each lot. The asset protection zone will be maintained by individual lot owners.

8.7 Visual Impact

The project site and immediate surrounds are generally level and low lying. There are no elevated public view points in close proximity and in this context visual impacts arising from the subdivision and the erection of future one and two storey dwellings on each lot are unlikely to be significant.

The Visual Impact Assessment at **Annexure 10** addresses visual impacts in detail and contains the following key findings:

"Impacts on Scenic Amenity

When assessing the extent of impacts on the visual amenity of the local area it is important once again to bear in mind that the proposed development does not include the development of any built form, only the revegetation and rehabilitation of landscaping to accommodate future built form.

It is also important to acknowledge the intended use of the site. If the site is identified as an appropriate area for residential development (as the subject site is), then the general public will have a reasonable expectation that such development will occur, and as a consequence the natural environment will be modified to a degree.

Finally, it is also important to acknowledge that future built form will inevitably result in some modification of the natural scenic elements of the local area, it is quite possible for development to occur and retain the inherent qualities of the natural scenic elements, specifically by maintaining a dominance of natural elements over built form and the sense of habitat and enclosure offered by existing vegetation.

The part of the subject site that will accommodate future built form is really only visible from Willow Avenue, Tamarind Avenue and the creek. From these vantage points, what would be seen of future built form on the site development would appear as detached residential development in a detached residential area.

The proposed development does not require a significant amount of landform modification or vegetation removal and the proposed landscaping will do much to retain the existing scenic qualities of the site, improve the streetscape treatment, and integrate any future built form.

Furthermore, the fact that the proposed development maintains and enhances the scenic amenity of the local area ensures that elements of the character and identity of the area will also be maintained. Cudgen Lake and Cudgen Reserve are key contributors to visual amenity of the local area.

For these reasons the proposed development can be seen to protect and enhance the scenic amenity of the natural landscape features, and thus would comply with the relevant planning provisions and guidelines.

Impacts on Views

The visual catchment of the subject site is quite limited, due largely to the flat topography of the local area and extent of screening vegetation. Specifically the catchment includes locations along Willow Avenue and Tamarind Avenue, and Cudgen Nature Reserve (refer Figures 11-13). It is important to note that only some parts of the site are visible from locations along Willow Avenue and Tamarind Avenue due to the screening effect of vegetation around the periphery of the site (refer Figures 12).

Some of the site (parts to the south of the creek) are visible from locations along Clothiers Creek Road, but the parts of the site to the north of the creek are not visible from this road refer Figure 9).

None of the site is visible from Cudgen Lake due to vegetation along the foreshore and existing houses.

A limited visual catchment obviously significantly limits the potential for visual impacts from future development of the site.

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Figure 11: Aerial view showing visual catchment of the subject site.



Figure 12: View to site from Tamarind Avenue.



Figure 13: Dense vegetation to subject site from Willow Avenue.

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Significant principal view corridors in the local area are views from public spaces to the creek, Cudgen Lake and Cudgen Reserve, and surrounding topographical features (such as the hill to the south of the site).

There are no significant views from private properties to surrounding landscape features that warrant special consideration.

Any development on the proposed residential lots would not obscure any portion of these significant views - on all proposed lots potential development would not intrude into these principal view corridors.

In terms of general views from the local area:

- i. in the first instance, the limited visual catchment means that the subject site is only partly visible from very few vantage points; and secondly*
- ii. it is unlikely that the proposed development and any future development on the site would have any adverse or unexpected impacts - such future development would simply appear as residential development in a residential area.*

These points are illustrated by a review of one of the most prominent vantage points in the visual catchment – from Tamarind Avenue (refer Figure 12). Views to the subject site from Tamarind Avenue centres on one residential lot. As a result of view obstruction from vegetation that will be retained, only part of one or two buildings would be likely to be visible from this vantage point. No future built form would obscure significant primary views identified above, nor would such a minimal amount of visible built form detract from the scenic amenity of the local area, and the built form would simply appear to be consistent with the context of residential development.

For the reasons identified above, the preparation of photomontages to illustrate impacts on views is considered unnecessary as the extent of built form that will be visible, and the extent of impacts from the identified visual catchment are obviously negligible."

8.8 Infrastructure Provisions

The Engineering Impact Assessment at **Annexure 18** addresses infrastructure issues. Relevant considerations in relation to infrastructure are addressed in the following section.

SEWER RETICULATION

There is an existing 150mm diameter gravity sewer main located within the Willow Avenue road reserve. The existing sewer discharges from the frontage of Lot 634 DP 216389 east along Willow Avenue and into a sewer pump station located in Tamarind Avenue at the frontage of Lot 636 DP 216389. A 100mm diameter sewer rising main transports waste from the sewer pump station along Tamarind Avenue east for approximately 400 metres into manhole number BBC/5.

The existing sewer pump station currently serves four (4) residential lots and a function centre in Willow Avenue and twenty eight (28) residential lots and the Cabarita Lakeside Resort in Tamarind Avenue. Table 12.3 summarises the existing sewer demands.

The proposed development will increase the proposed sewer demands for the proposed twelve (12) lot residential subdivision. A new 150mm diameter sewer main will be constructed within the Willow Avenue road reserve to service Lots 3 to 10 (inclusive). The new sewer main is proposed in the road reserve to avoid impact to existing trees and vegetation on the site proposed to be retained. No other utility services will be impacted as overhead power and communications are located on the opposite road frontage and there is sufficient clearance to an existing adjacent 100mm diameter water main.

The proposed main will connect into existing manhole BCB/4 and extend along the verge to the western boundary of proposed Lot 10. Lots 1, 2, 11 and 12 will utilise the existing 150mm diameter gravity sewer line for new house connections.

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House connections to the proposed new sewer main and existing reticulation will be located clear of trees to be retained where possible. Where this cannot be achieved, new services will be tunnel bored under trees to preserve the existing vegetation and limit future impact from the connection of house drainage.

Tweed Shire Council's Water & Sewer Design Engineer Peter Pennycuik has indicated that the existing sewer pump station has sufficient capacity for the proposed twelve (12) lot subdivision. Peter Pennycuik mentioned that the sewer pump station was designed for the future increased loads and each separate proposed development will be individually assessed.

WATER RETICULATION

On the frontage of the proposed site is an existing 100mm diameter water main. The water main is located within the Willow Avenue road reserve and follows the entire length of road adjacent to the proposed site. There are two fire hydrants located on the frontage of the proposed site. The first hydrant is located opposite lot number 11 of the proposed subdivision and the second opposite lot number 5 of the proposed subdivision.

There are two vacant lots opposite the proposed subdivision in Willow Avenue for future residential water demands. The Cabarita Lakeside Resort in Tamarind Avenue has provision for a further sixty (60) apartments and a sporting complex for future water demands. The future number of resort dwellings were obtained from their web site.

The proposed twelve (12) Lot subdivision and the predicted future demands is expected to have an increase of 40.5% on the existing network.

Tweed Shire Council's Water & Sewer Design Engineer Peter Pennycuik has indicated that the existing 100mm diameter water reticulation has sufficient capacity for the proposed twelve (12) lot subdivision.

Water connections to the proposed twelve new allotments will utilise the existing 100mm diameter water main on the frontage of the proposed subdivision.

ELECTRICITY

There are existing overhead power lines located within the Willow Avenue road reserve on the opposite verge. An existing power pole is located on Willow road reserve on the frontage of the proposed Lot 11 and a stay pole on the western side of the proposed Lot 5. Prior to subdivision works any existing electrical services the development site will need to be de-commissioned.

Power supply to the proposed twelve (12) allotments will be from the existing overhead power lines. Prior to issue of a construction certificate the local power authority, Country Energy will provide a Notice of Arrangement letter for electricity supply to a new subdivision. The existing electrical infrastructure is clear of the proposed works and no relocation or augmentation is expected. At the completion of electrical supply to the proposed subdivision a letter is required from Country Energy stating completion of the supply works.

TELECOMMUNICATIONS

There are existing under ground Telstra lines located within the Willow Avenue road reserve terminating adjacent to lot 2 to service a previous building on site. Prior to subdivision works any existing Telstar within the development site will need to be de-commissioned.

Telecommunication to the proposed twelve (12) allotments service will be extended from the existing pit adjacent to Lot 11 for connection by the new services.

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Prior to the issue of a construction certificate the local authority, Telstra will be given notice for a Pre-Provisioning Confirmation of the electrical services. At the completion of electrical supply to the proposed subdivision a letter is required from Telstra stating Provisioning Confirmation of the supply works.

Relevant Section 94 and Section 64 Contributions are identified in Section 4.5.11 of this Assessment.

There is no need arising as a result of this development for a Planning Agreement.

8.9 Traffic and Access

The site is currently vacant and does not generate traffic.

Access to Willow Avenue is solely from Tamarind Avenue. Both Tamarind Avenue and Willow Avenue are residential access streets. Clothiers Creek Road and Tweed Coast Road are the two possible access paths to Tamarind Avenue. Clothiers Creek Road is classified as an Urban Arterial and Tweed Coast Road a Rural Distributor, as defined in Tweed Shire Local Traffic Data Counts. From Tweed Coast Road commuters will utilise Tamarind Avenue directly to Willow Avenue. Clothiers Creek Road merges into Rosewood Avenue at the intersection of Kauri Avenue. Rosewood Avenue is an Urban Distributor, as defined in Tweed Shire Local Traffic Data Counts. The shortest access to Willow Avenue from Clothiers Creek Road is via Rosewood Avenue through Poplar Avenue which intersects with Tamarind Avenue.

There is existing barrier kerb and channel on the frontage of proposed allotments 10, 11 and 12. The width of the road section with kerb is nine (9) metres wide. The remainder of Willow Avenue is asphalt pavement with out kerb and has a reduced width of approximately 5.3 metres. The designated speed is 50 km/h. Willow Avenue has a minor gradient of approximately 0.2% in the direction of Tamarind Avenue to the east.

Tweed Shire Council does not have any traffic data for Willow Avenue and Tamarind Avenue. Based on Table 7.1 – Tweed Shire Council, Tweed Road Contribution Plan, Section 94 (January 2009). An assessment of the existing approximate traffic volumes has been calculated using the number of existing residential dwellings and apartments identified by use of aerial photographs. The number of existing resort dwellings were obtained from their web-site. Traffic rates for the function centre were based on a restaurant type development as there is no specific rate for this type of development. The resulting estimated traffic volume for Willow Avenue and Tamarind Avenue is 933 daily vehicles..

The proposed development is expected to increase the number of daily vehicle trips by 108.

The traffic volumes on Willow Avenue and Tamarind Avenue due to the proposal are detailed in Table 23 below.

TABLE 23 – ROAD OPERATING CAPACITY						
	Road Class	Existing AADT	Design AADT	Increased AADT	Proposed AADT	% Increase
Willow Avenue	Access Street	156	1000	108	264	69.2
Tamarind Avenue	Access Street	777	3000	108	885	1.38

The proposal will not impact significantly on the main local or regional road network capacity. The increase in traffic is minor and is within Council's specified functional capacity for this class of road.

Table D1.7 of Tweed Shire Council Road Design Specification D1 (2004) indicates the maximum desirable traffic volume in a six metre wide access street is 1000 vehicles per day. The proposal will increase Willow Avenue traffic to 264 vehicles per day.

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As part of the subdivision it is proposed to construct road widening to the Willow Avenue site frontage. Works in the road reserve would include provision for kerb and gutter along the site frontage only and underground drainage and the provision of water, sewer, power and telephone services to each lot. The construction of Willow Avenue will improve on the existing road operating capacity from 1000 vehicles per day to 3000 vehicles per day for an ultimate future width of 9.0 metres to match the existing kerbed section. Road widening to the opposite site frontage would be completed by others.

Proposed access to the each of the twelve (12) lots will be off Willow Avenue. The proposed access to the site is flat with minor gradients sloping toward Willow Avenue at approximately 1% to 4%. The proposed access and grades comply with Tweed Shire Councils Driveway Access to Property Design Specification, Part 1, June 2004.

During the construction phase, heavy vehicle traffic could be expected. This would comprise of earthmoving equipment, construction plant equipment and builder's vehicles. Impacts resulting from the traffic generated by construction would be mitigated by the low existing traffic volumes and relatively short duration of works.

It is concluded that the development does not have a significant impact on the existing traffic environment and the widening of Willow Avenue with kerb and gutter along the sites frontage will improve on the existing road operating capacity."

This development proposal does not impact on existing public access to the Cudgen Lake foreshore. The site is well removed from the foreshore and access will continue to be available from Willow Avenue.

8.10 Hazard Management and Mitigation

8.10.1 Coastal Processes

A study has been completed on the coastal process hazards for the Tweed Shire Council by WBM Oceanics Australia titled Tweed Shire Coastline Hazard Definition Study, (TCHDS 2001). The study has assessed the hazards identified by zones of land under threat from events such as climate change, sea level rise, wave action and wind action. Hazard bands have been delineated for each planning period of coastal inundation where elevated water levels occur from a combination of storm tide, wave setup, wave runup and sea water level rise. The hazard bands being the immediate / post storm, presently developed areas 50 years and future developments 100 years. Council has determined that for risks to existing developments a 50 year planning period was appropriate and undeveloped (and future developed) land a 100 year planning period appropriate, Tweed Shire Council, Tweed Shire Coastline Management Study Stage 2, Management Objectives, 2005. A 100 year planning period has been adopted for the proposed development site.

Section 8.4.1 of the TCHDS has identified that wind transport losses are not presently significant at Bogangar Beach region as there is good coverage of vegetation. The location of the subject site and the considerable vegetation present on the existing canal banks and makes it unlikely for wind transport losses to occur. Table 4.3 of TCHDS contains storm tide and wave setup levels for the Tweed Coast region. The 100 year planning period as adopted for the proposed site is RL 1.85 m AHD for storm tide and RL 3.01 m AHD for wave setup level. The proposed site has levels ranging from RL 3.09m AHD to RL 3.67m AHD which is greater than the 100 year planning period for storm tides and wave setup levels. The distant location of the proposed site from the coastline will unlikely present any significant wave issues.

Table 4.4 of TCHDS anticipates the future sea level rise for the years 2020, 2050 and 2100. The table estimates the latest low, mid (best) and high global mean sea level rise. The anticipated sea level rise for a 100 year planning period is 0.15m (low), 0.5m (best estimate) and 0.95m (high). The distant location of the proposed site from the coastline will unlikely present any significant wave issues.

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The increase in sea level rise is likely to impact on the downstream Cudgen Lake level and canal water level adjacent to the site. The flood modelling results and analysis in Section 8 of **Annexure 18** have demonstrated the impacts do to global warming for all of the anticipated sea levels.

The location of the subject site in relation to the coast line means that coastal erosion impacts are not applicable in this instance.

8.10.2 Contamination

A preliminary contaminated land investigation has been completed and the results are contained in **Annexure 13**.

During the course of the investigation no evidence was uncovered to suggest that potential contaminants had been applied to the subject site or that contaminating activities have occurred within its boundaries. However as the site history is incomplete and incidental applications of contaminants may have occurred in the past, it was decided that a preliminary sampling and analysis program be undertaken.

Soil testing of the 12 proposed lots using five (5) composite samples made up of four (4) sub-samples was undertaken to test for a range of organochlorine pesticides and heavy metals. All species tested were found to be below their relevant Health Based Investigation Levels (HBIL's) as per NSW DEC (2006). Consequently, no further action is recommended and from a contaminated land perspective, the site can be considered suitable for the proposed residential use.

8.10.3 Acid Sulphate Soils

An acid sulphate soils investigation has been completed and the results are contained in **Annexure 17**.

The results of the investigation suggest that acid sulphate soils are not present at the subject site to a depth of 2.0m below existing surface level. The dark grey - brown sands found across the site did exhibit a relatively low initial pH, however showed little, if any, potential to oxidise and produce additional acidity. Disturbance of this material is not going to lead to sulphate oxidation or significant levels of mobilised acidity, and therefore no further action is proposed. In fact, "liming these ecosystems to neutralise their natural acidity can be [environmentally] devastating" (Sullivan, L.A 2008).

8.10.4 Bushfire

A Bushfire Threat Assessment has been completed and the results are contained in the report at **Annexure 12**.

The report has assessed the proposed subdivision of the existing allotment into 12 residential allotments and the residual lot and provides supporting information to enable the NSW Department of Planning and NSW Rural Fire Service to assess the proposal against the requirements of Planning for Bushfire Protection 2006 as directed by the Director Generals Environmental Assessment Requirements.

Although the application does not require a Bush Fire Safety Authority (s75U EP&A Act 1979) an assessment has been undertaken against the heads of consideration of clause 44 of the Rural Fires Regulation for format purposes to demonstrate compliance with the Performance Criteria of Planning for Bushfire Protection 2006.

The land is classified bushfire prone due to a remnant finger of forested wetland and low open forest located on and adjacent to the bank of the water channel to the rear of the proposed sites.

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The report establishes that compliance with the acceptable solutions of Planning for Bushfire Protection 2006 is achievable however an alternate solution has been provided for access relating specifically to the requirement of a perimeter road.

The alternate solution concludes that given the bushfire risk to the future dwellings and merits of the subdivision a perimeter road is not required and that the existing public road allows safe access for fire fighters while residents are evacuating an area. The egress from the subdivision is via Willow Avenue and will not involve passing a bushfire hazard or a potential pinch point. The subdivision will not require any changes to the existing public access via Willow Avenue it being noted that hydrants adjacent to Willow Avenue provide adequate coverage of the future building envelopes.

A minimum 9m Asset protection zones to the rear (south and southwest) of the proposed building envelopes is shown as being achievable and in turn a future dwelling should be capable of being constructed on each allotment in accordance with Table A3.4 of Planning for Bushfire Protection 2006.

The report concludes with the recommendation that a Bush Fire Safety Authority be granted for the proposed subdivision.

8.10.5 Geotechnical

Annexure 16 comprises a Geotechnical Report prepared by Border Tech. The Geotechnical Investigations involved the drilling of a total of nine bore holes over the site to varying depths from 3m to 12.5m. Based on the bore hole drillings, the soils across the majority of the site are characterised by a filled layer of grey brown and dark grey medium dense to dense silty sands extending to varying depths up to 3.1m. The fill material is underlain by an alluvial sequence of loose and medium dense sands.

The fill material encountered on the site has been placed recently.

Groundwater was encountered at approximately 2m to 3m below the existing surface levels across the site however the water table may fluctuate in this area as a result of tidal movement and during periods of high rainfall.

The Geotechnical Report does not identify any significant geotechnical constraints on the development potential of that part of the site on which the proposed residential allotments are to be developed. In summary, Section 7 of the Report contains the following recommendations and conclusions:

- "1. The subsurface conditions encountered predominantly consisted of clean filled sands underlain with alluvial sands and silty sands. Layers of indurated very dense sand were encountered on the site.*
- 2. All site preparation works and earthworks should be carried out in accordance with AS 3798-2007 'Guidelines on earthworks for residential and commercial developments: Refer to Sections 6.1 for details on recommendations for earthworks operations.*
- 3. Based on the preliminary investigations the typical site classifications for isolated structures in accordance with AS 2870-1996 include equivalent Class S and Class M conditions subject to individual site assessments. In saying this construction loads are to be founded into competent strata as detailed in Section 6.4. Typically shallow standard foundation designs and conventional raft slab construction will be required over the site.*
- 4 In general it is recommended that the proposed development is feasible and the subsurface conditions are suitable for the likely structures.*
- 5. All building and development should follow good engineering and construction practice."*

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8.10.6 Flooding

Changes to the intensity of storms as a result of climate change are outlined in the Department of Environment and Climate Change (DECC) document Flood Risk Management: Practical Consideration of Climate Change. Increases in rainfall intensity as a result of climate change are suggested for flood modelling and analysis are detailed in the DECC document with respect to the 2030 and 2070 projections. The intensity impacts are as follows for the 2030 and 2070 cases respectively, -5, +5 % and 5%, 10%. The intensity increase is likely to increase flood levels and flood modelling discusses this impact.

Analysis and interpretation of the various calculated results reveal the following impacts.

- The three lake levels investigated (RL 1.0, 1.5 and 2.0 m) resulted in a maximum 1m difference in peak water levels upstream boundary of the model for the existing undeveloped case.
- For all major flow cases (Q100 flows) modelled with alternate lake levels due to sea level rise and intensity increase as a result of global warming there is no impact on neighbouring properties due to development. The development does not cause a noticeable increase in flows to the canal and flood levels are generally much lower than the site, therefore any obstructions on the site have no affect on overland flow paths and consequently flood levels.
- For minor flow cases (Q5 flows) modelled with Q100 downstream flood levels, inundation of the site is apparent in both the existing and design case. Filling of building pad sites to comply with Council freeboard level requirements for the future buildings appears to have no affect on the flow in the channel however it does restrict flow from Willow Avenue to the canal causing increased flow in Willow Avenue. The development reduces flows from Willow Avenue to the canal and flood levels are increased in the road. To mitigate the affects of the development on flood levels it is proposed to ensure that any fencing between lots to have high permeability with frequent openings to reduce restriction of flow from Willow Avenue to the canal.
- The calculated flood levels due to the average recurrence interval (ARI) increase are consistently higher for both the existing and design case. Flows within the canal are increased due to the increased intensity. The Increase in ARI causes an increase in flow however it does not affect the difference in flood levels.

We conclude that the proposed development has no impact on water levels in the adjoining residential properties. The development slightly increases levels in Willow Avenue during events with flood levels greater than RL 3.0m with no additional increase in flood levels in adjoining residential properties. We are of the opinion that the increase has no practical significance as the area is already filled to the Council nominated flood level and the development has no effect on flood levels in adjoining properties.

The sea level rise due to the enhanced greenhouse effect has the potential to affect coastal regions. Table 4.4 of Tweed Coastline Hazard Definition Study, 2001 anticipates the future sea level rise for the years 2020, 2050 and 2100. The table estimates the latest low, mid (best) and high global mean sea level rise. The anticipated sea level rise for a 100 year planning period is 0.15m (low), 0.5m (best estimate) and 0.95m (high).

The adopted design flood level for Bogangar is RL 3.4m AHD as specified under section A3.6 Coastal Villages of Tweed Shire Development Control Plan, Section A-3 – Development of Flood Liable Land. Tweed Shire Council requires a minimum floor level for residential developments to be at least 300mm above the 100 year ARI flood level. Hence, the minimum habitable floor elevations must be a minimum of RL 3.7m AHD. The proposed site has sections above the adopted design flood level of RL 3.4m AHD but requires minor filling to meet Tweed Shire Council standards.

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In terms of probable maximum flooding (PMF), the subject site is located outside of the Tweed Shire Flood Liable Land maps. The DCP proposes an interim PMF level outside of the mapped areas of 2.0 metres above the 100 year ARI flood level. A PMF level of RL 5.4m AHD would be applicable.

Section A3.2.5 a) of the policy outlines the Emergency Response Provisions for Habitable Developments in areas affected by PMF. The proposed subdivision would be classified as an 'infill subdivision'. A requirement of this policy is for "the creation of covenants on land titles of all new allotments that cannot achieve suitable high level road/pedestrian evacuation routes to land above PMF level, requiring adequate PMF refuges in all future dwellings".

The existing surrounding roadways and landforms restrict the ability to provide suitable high level evacuations routes for the proposed subdivision. Therefore, in accordance with the Council's Development of Flood Liable Land policy the flood response action for the subdivision would be for a 'shelter in place' option with a PMF refuge to be required as part of the future dwellings.

Each of the new allotments would contain a single new dwelling consisting typically of two to four residents. Demographics of occupants would vary depending on purchasers, but would likely consist of couples and families with children.

The covenant for the proposed allotments would note the following:

In accordance with the Council's Development of Flood Liable Land policy a probable maximum flooding (PMF) refuge is required as part of the future dwelling.

The refuge must meet the following minimum requirements:

- Refuge may be an additional second storey, mezzanine level or other raised refuge area above the PMF level of R.L 5.4m AHD.
- Minimum floor level to be PMF level. No freeboard required.
- Minimum floor area for a single bedroom dwelling 9m², add 4m² for each additional bedroom.
- Refuge must comply with Building Code Australia requirements, with external components rated appropriately for storm, wind and moisture.
- Minimum 2.1m floor to ceiling/roof frame height.
- Refuge must be provided with permanent internal and external access, (may be a fixed ladder).
- The external access must be unobstructed (by trees, chimneys, aerials etc) for emergency boat access during flooding
- Refuge must have natural lighting and ventilation
- Support structures below PMF level must be capable of withstanding flood forces (water flow, debris impact, and buoyancy) and continuous submergence for up to one week, requiring an engineering certification.
- Refuge must meet all planning and building controls applicable to the site.
- Refuge must have a cupboard storage area for flood emergency kit to service all residents with provisions for isolation up to one week, consisting of food and fresh water supplies, first aid kit including medication, battery powered torch, portable radio, spare batteries, candles and water proof matches, plastic bags and rubber gloves"

8.11 Water Cycle Management

The existing drainage patterns are defined with the majority of overland flow from the site grading north to the Willow Avenue road reserve. The existing gully pits in Willow Avenue discharge stormwater via a 300mm diameter pipe to the north through Lot 618 DP508200 and into Cudgen Lake. The existing gully pits in Tamarind Avenue discharge stormwater via a 375mm diameter pipe to the south through Lot 641 DP216389 and into the existing canal.

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Drainage calculations for the site catchments have been carried out using the Rational Method as described in the Queensland Urban Drainage Manual, Tweed Shire Design Specification D5 and Australian Rainfall & Runoff (1987) for a 5 year ARI minor storm event and a 100 year ARI major storm event.

The existing runoff conditions for the existing drainage in Willow Avenue for various recurrence interval storms are presented below in Table 24. The time of concentration in accordance with Queensland Urban Drainage Manual (QUDM) is 15 minutes for urban and residential areas where average slope is up to 3%. An existing fraction of impervious of 7.5% was determined from the detailed site survey information. Figure 4.1 illustrates the existing catchments and runoff rates.

Table 24 - Existing Stormwater from site and road reserve

Storm ARI	f_i	C_{10}	$I_{15 \text{ minute}}$ (mm/hr)	A (ha)	Q (L/s)
5 yr	0.075	0.715	130.15	1.36	336
100 yr	0.075	0.715	204.92	1.36	668

Roof water runoff from the new allotments will be diverted into the canal at the rear of the site reducing the catchment to Willow Avenue by 1800m² (12 lots by 150m², 150m² being the typical roof area as defined in the Tweed Shire Council DCP Section A5 Subdivision Manual). The proposed development will increase runoff from the site however the increased stormwater from the development and road reserve will be mitigated by discharging roof water to the canal at the rear of the site, where the whole of the site runoff previously discharged to the street. The proposed development will increase the impervious site area from 0% to approximately 5% for proposed driveways. The proposed road widening will increase the impervious area from 24% to 39%. The combined site and road reserve impervious area will increase from 7.5% to 14%.

The proposed diversion of roof water reduces the stormwater runoff to the Willow Avenue road reserve such that there is no impact from the proposed development to the existing drainage infrastructure in the street. Thus the proposed development will reduce the stormwater flow into the existing Willow Avenue piped drainage by 39 l/s for a 5 year ARI minor storm event and 77 l/s for a 100 year major storm event.

The existing site is grassed, with scattered trees throughout and patches of densely populated vegetation along the northern and southern property boundary. The maximum grade on the development site is approximately 1% towards Willow Avenue.

A number of measures or best management practices (BMP) should be implemented to reduce soil erosion and achieve discharge water quality in compliance with Tweed Shire Council Design Specification D7 Stormwater Quality.

The best management practices should be implemented according to the Department of Housing Manual 'Managing Urban Stormwater, Soils and Construction' (2004). These measures include hay bales, silt fencing and diversion channels which should be placed in accordance with the proposed management plan during both the construction and re-vegetation phases. Disturbed areas should generally be controlled to drain to these features. There are no external catchment to the site. Disturbed areas will be limited to minor filling to provide building pads for flooding immunity.

The lot layout indicates that approximately 1800m² (12 lot by 150m²) of disturbed area would be created by clearing of house pads. Design Specification D7 of Tweed Development Control Plan 2007, Part A5 indicates that for disturbed areas of less than 1.0 ha, provision of silt fencing or other sediment traps/barriers is satisfactory treatment and a sediment basin is not required. Figure 9.0 of **Annexure 18** shows the erosion control measures for the proposed development. The stabilised site entry will be located off Willow Avenue on the proposed driveway access footprint to the proposed Lot 3.

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The implementation and maintenance of erosion control measures would result in manageable impacts on the downstream water system. The impact of transported sediment would be ameliorated by utilising the proposed sediment traps/barriers around the site and a temporary stabilised site entry/exit."

Groundwater was encountered at approximately 2.0 to 3.0m below the existing surface level across the site. The water table may fluctuate in this area as a result of tidal movement and during periods of high rainfall. Interception of the water table during construction of services is not anticipated.

8.12 Heritage and Archaeology

8.12.1 Aboriginal Cultural Heritage, Non-Indigenous Heritage and Cudgen Nature Reserve

Cultural heritage issues have been investigated and are addressed in the report at **Annexure 11**.

The report presents the results and outcomes of a cultural heritage assessment for Indigenous and non-Indigenous heritage items for the proposed residential subdivision).

As part of a desktop study, Everick undertook searches of the relevant Aboriginal and historic heritage registers. A search of applicable European heritage registers did not identify any items of cultural heritage significance within the Subject Lands. A search conducted on 7 July 2009, of the Department of Environment, Climate Change and Water ('DECCW') Aboriginal Heritage Information Management System ('AHIMS'), found 41 recorded sites for the broader search area. These are indicated in Figure 8 of **Annexure 11**. None were recorded within the Subject Lands. There are no Indigenous places within the Subject Lands listed in other heritage registers.

The Subject Lands are within the area administered for Aboriginal cultural heritage purposes by the Tweed Byron Local Aboriginal Land Council ('LALC'). A survey for historic and Aboriginal cultural heritage was carried out by the consultant and Cyril Scott, Sites Officer for the Tweed Byron LALC, on 10 July 2009. The Land Council's views on the conduct and outcomes of the assessment are provided in Appendix A of **Annexure 11**. Further site inspections were undertaken by Aboriginal and other community representatives on 25 July 2009. Their opinions are provided in correspondence in Appendix A and the meeting minutes in Appendix C of **Annexure 11**.

No Aboriginal archaeological sites or relics were found as a result of the literature review or field inspection of Lot 4 DP 876253 at Willow Avenue, Bogangar, NSW. No items of historic (non-Indigenous) cultural heritage were identified.

8.13 Flora and Fauna

8.13.1 Potential Impacts

The Flora and Fauna Assessment at **Annexure 15** addresses the relevant considerations contained in the Director General's Environmental Assessment Requirements. Relevant extracts from the Assessment are reproduced as follows:

Assess the potential impacts of the development on flora and fauna and describe actions to avoid or mitigate impacts

Summary of Existing Flora and Fauna Values

Flora values

A detailed flora survey was undertaken of the entire site (i.e. 3 Land Parcels). The assessment including location, methods, composition and extent of the vegetation communities and a species list is provided (APPENDIX 1 and 2 of **Annexure 15**).

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The flora assessment recorded:

- nine (9) vegetation communities;
- one (1) Endangered Ecological Communities (EEC);
 - Swamp Sclerophyll Forest on Coastal Floodplains
- seventy nine (79) flora species.

No threatened flora species were recorded.

Fauna values

A fauna survey was undertaken of the entire site (i.e. 3 Land Parcels). In addition to recording fauna observed, habitat was assessed to determine which fauna species use, or are likely to use, the site. The assessment including location, methods and a discussion of the results is provided (APPENDIX 3).

Fauna surveys indicated the presence of thirty (30) bird and three (3) mammal species. No amphibians or and reptiles were recorded.

Two (2) Threatened fauna species were recorded as follows:

- Osprey (*Pandion haliaetus*)
- Rose-crowned Fruit-dove (*Ptilinopus regina*)

In addition, a twelve (12) Threatened fauna species predicted to occur on the Subject site over time are as follows;

- Black-necked stork (*Ephippiorhynchus asiaticus*)
- Common blossom bat (*Syconycteris australis*)
- Common planigale (*Planigale maculata*)
- Eastern bent-wing bat (*Miniopterus schreibersii oceanensis*)
- Eastern long-eared bat (*Nyctophilus bifax*)
- Glossy black cockatoo (*Calyptorhynchus lathami*)
- Grey-headed flying-fox (*Pteropus poliocephalus*)
- Koala (*Phascolarctos cinereus*)
- Large-footed myotis (*Myotis macropus*)
- Little bent-wing bat (*Miniopterus australis*)
- Wallum froglet (*Crinia tinnula*)
- White-eared monarch (*Monarcha leucotis*)

Impacts and Amelioration

Plant Communities

Impacts

The proposed development will result in the minor loss of vegetation. Indicative building envelopes are shown in **Annexure 8**. NB: There is no building envelope for Lot 13. Access to the 12 residential lots is proposed via Willow Avenue. The impact of the proposed development is shown in FIGURE 7 of **Annexure 16**. Table 25 summaries the area to be lost within each vegetation community.

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Table 25 – Vegetation To Be Lost As A Result Of The Proposed Development

Community	Total Area (ha)	Loss (ha)	Retained (ha)
1*	0.9960	0	0.9960
2*	1.3420	0	1.3420
3	0.0665	0	0.0665
4	0.2664	0	0.2664
5*	0.3092	0	0.3092
6	0.2326	0	0.2326
7	4.5296	0.9469	3.5827
8	0.0738	0	0.0738
9	0.0691	0	0.0691
TOTAL	7.8852	0.9469	6.9383

* indicates an EEC

In total 0.9469 (12%) hectares of vegetation will be lost from the subject site. All vegetation loss will occur within Community 7, the low closed grasslands (pastoral grasses) with scattered trees.

Additional impacts on vegetation communities include:

- Potential for degradation of retained areas of vegetation.
- Clearance of areas of the subject site represent a minor loss of habitat available for dispersal for plants and will reduce visits by pollination and dispersal vectors;
- Disturbance to the subject site creates opportunities for weeds to colonise. Weeds may be introduced to the study site in construction materials or by vehicles. Occupation of the subject site creates opportunities for weeds to become established. Landscape species may escape to retained areas of vegetation;
- The removal of vegetation from the subject site represents the loss of organic material from the site;
- Occupation of the site may increase the risk of fire release into the surrounding bushland.
- Residents may create walking tracks through bushland areas. This may result in direct loss of vegetation, change in vegetation structure and increased opportunities for weed and disturbance adapted animal species.

Avoidance or Mitigation

The development is proposed for the cleared and disturbed area of vegetation. Mature eucalypt trees within this area should be retained wherever possible. The EEC, Swamp Sclerophyll Forest, occurs along the creek and will be retained. Furthermore, the building envelopes are situated towards the front of the proposed lots, adjacent to Willow Avenue, minimising the impacts on the EEC. Mitigation measures should also include:

- Buffer works, including revegetation along the edges of the EEC, should be completed before any works commence within the proposed lots;
- Mature eucalypt trees chosen for retention should be appropriately protected with brightly coloured temporary fencing at a diameter to protect the root zone (i.e. the drip line of the canopy)
- Weeds should be controlled during development;
- Vegetation removed during development should be mulched for use on the site preventing the introduction of weeds from seeds in mulch brought in from elsewhere;

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-
- Weeds should be controlled in landscaped areas and areas of retained vegetation;
 - Landscape plantings should include a majority of native species that will provide forage habitat for nectarivorous and frugivorous birds and bats;
 - Known environmental weeds (e.g. Umbrella tree) should be avoided; and
 - Landscaping trees should be situated where possible to reduce the amount of disturbance to retained areas of habitat.

Compensation

A Vegetation Management Plan (VMP) should be completed to protect and enhance the vegetation (EEC) within Land Parcel A of **Annexure 15**. Such a management plan should address the following issues:

- Protection of the EEC vegetation during any construction works;
- Enhancement planting within the zoned 7(l) land to create a buffer between lots and the EEC;
- Replacement of Koala food trees;
- Restoration of the EEC (i.e. weed removal and facilitation of natural regeneration);
- A maintenance and monitoring programme; and
- Restrictions on domestic animals.

The VMP should be completed prior to the issue of a Construction Certificate for the subdivision.

Endangered Ecological Ecosystems

Impacts

The proposed development is unlikely to impact on the EEC Swamp Sclerophyll forest at the rear of the proposed lots. No vegetation within this community will be lost (APPENDIX 1, FIGURE 10; TABLE 1 of **Annexure 15**).

Avoidance or Mitigation

The development is planned within a cleared and disturbed area of vegetation. The lots are situated outside the EEC, Swamp Sclerophyll Forest, and the 7(l) zoned land. The building envelopes are situated towards the front of the proposed lots, adjacent to Willow Avenue, minimising the impacts on the EEC. Further mitigation measures should include:

- Buffer works, including revegetation along the edges of the EEC, before any works commence within the proposed lots;
- A restoration and revegetation plan should be completed outlining strategies with the primary aim of creating a vegetated buffer between the lot boundaries and the EEC;
- Weeds should be controlled during development;
- Vegetation removed during development should be mulched for use on the site preventing the introduction of weeds from seeds in mulch brought in from elsewhere;
- Weeds should be controlled in landscaped areas and areas of retained vegetation;
- Landscape plantings should include a majority of native species that will provide forage habitat for nectarivorous and frugivorous birds and bats;
- Known environmental weeds (e.g. Umbrella tree) should be avoided; and
- Landscaping trees should be situated where possible to reduce the amount of disturbance to retained areas of habitat.

Compensation

A Vegetation Management Plan should be completed to protect and enhance the EEC within Land Parcel A of **Annexure 15**. Such a management plan should address the following issues:

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- Protection of the EEC vegetation during any construction works;
- Enhancement planting to create a buffer between dwelling yards and the EEC;
- Replacement of Koala food trees in the buffered or retained area of the study site;
- Restoration of the EEC (i.e. weed removal and facilitation of natural regeneration);
- A maintenance and monitoring programme; and
- Restrictions on domestic animals.

The VMP should be completed prior to the issue of a Construction Certificate for the subdivision.

Fauna

Impacts

No areas zoned 7(l) Environment Protection (Habitat) will be affected. The proposed development will result in some loss of foraging, sheltering and breeding habitat for native fauna occurring in the locality. This loss may have a range of impacts including:

- Loss of forage habitat for nectarivorous and insectivorous fauna species, including the loss of autumn/winter flowering plants;
- Minor decrease in the size of local fauna populations and increased susceptibility to threatening processes acting in the locality;
- Minor decrease in the size of the prey base for carnivorous species;
- Loss of sheltering and breeding habitat for native fauna;
- Reduction in opportunities for movement through the site;
- The loss of sub-mature eucalypts represents a decrease in the future recruitment of hollows.
- Loss of eucalypts, paperbarks, banksias and flowering shrubs decrease the food supply for nectarivores.
- Animals may be killed or injured during the clearance of vegetation.
- Domestic dogs and cats prey on native fauna and may have significant impacts on the populations of native species.
- Development of the subject site may favour native and introduced disturbance adapted competitors. For example, Cane toads may out-compete other Amphibians and Reptiles, aggressive open country bird species (e.g. Noisy miner, Crow, Pied currawong) may out-compete other birds, and non-native mammals (Black rat and House mouse) may out-compete other native small mammals).
- Increased light, noise and activity may cause reclusive species to move away from habitat edges.

Avoidance or mitigation

The development is planned for the cleared and disturbed area of vegetation within Land Parcel A (FIGURE 4 of **Annexure 15**).

Mature eucalypts in this area are potential fauna nesting sites and should be retained wherever possible. Mitigation measures should also include:

- Buffer works including revegetation along the edges of the EEC before any works commence within the proposed lots;
- Mature habitat trees should be retained where possible;
- Protection of the mature eucalypt trees chosen for retention;
- A qualified fauna handler should be on site if and when clearing occurs;
- Landscape plantings should include a majority of native species that will provide forage habitat for nectarivorous and frugivorous birds and bats; and
- Landowners should control dogs and cats. All animals should reside within fenced enclosures and be on a leash when outside of the enclosure or be subject to the Control measure set out by the Tweed Shire Council. Consideration should be given to banning cats to reduce likely impacts on local fauna;

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- Appropriate disposal of rubbish and food scraps reduces opportunities for nonnative predators and disturbance adapted competitors; and
- Landscape and landfill materials should be sourced from a supplier where Cane toads do not occur.

Compensation

A VMP should be completed to protect and enhance the EEC within Land Parcel A of **Annexure 15**. Such a management plan should address the following issues:

- Enhancement planting to create a buffer between dwelling yards and the EEC;
- Protection of fauna habitat (i.e. EEC);
- Replacement of an large potential habitat trees;
- Restoration of the EEC (i.e. weed removal and facilitation of natural regeneration);
- A maintenance and monitoring programme; and
- Restrictions on domestic animals.

Threatened Fauna

Impacts

The proposed development will result in some loss of foraging, sheltering and breeding habitat for native fauna occurring in the locality. Further potential impacts have been outlined in the previous section. Impacts, avoidance and mitigation as well as compensatory measures for threatened fauna are outlined in the following table (Table 26).

Table 26 – Potential Impacts, Avoidance and Mitigation and Offsets for Threatened Fauna Predicted To Occur On the Site

Species	Habitat	Vegetation communities on site	Impacts	Avoidance or Mitigation	Offsets
Black-necked stork	Swamp, mangroves, mudflats, dry floodplains and irrigated land	May forage on the canal edges of communities 1, 2 and 5	Communities 1 and 5 occur adjacent to the canals and will be unaffected by the proposed development. Community 2 occur in Land Parcel C and will also be unaffected by the proposed development.	The development is proposed for the cleared and disturbed area of vegetation within Land Parcel A. Mature eucalypt trees should be retained wherever possible. The EEC, Swamp Sclerophyll Forest, will be retained, the building envelopes are situated towards the front of the proposed lots minimising the impacts on the EEC.	A Vegetation Management Plan should be completed to protect and enhance the vegetation (EEC) within Land Parcel A. The EECs communities should be restored (i.e. weeding and maintenance) and enhancement planting should form vegetated buffer between the EEC and the lot boundaries.
Collared kingfisher	Mangroves stands	Although the Collared kingfisher has been recorded in Cudgen Creek, it is unlikely to be found	NA	As above	As above

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		along the canals within the subjects site as there are no mangrove stands			
Common blossom bat	Vegetation containing plants with nectar producing flowers	The entire site	The Common blossom bat may utilise the isolated trees, to be lost, within Community 7.	As above	As above
Common planigale	Rainforests, sclerophyll, grasslands and marshlands	Communities 1 and 5. The common is unlikely to forage in the exposed grassland vegetation on the site.	Communities 1 and 5 occur adjacent to the canals and will be unaffected.	As above	As above
Eastern bent-wing bat	Caves are the primary roosting habitat. Forage in forested areas, catching flying insects.	The entire site	Vegetation within Community 7 will be affected, however this represents only marginal habitat for this species.	As above	As above
Eastern long-eared bat	Lowland subtropical rainforest and wet and swamp eucalypt forest.	Communities 1 and 5	Communities 1 and 5 occur adjacent to the canals and will be unaffected.	As above	As above
Glossy black cockatoo	Vegetation containing <i>Allocasuarina littoralis</i> , <i>A. torulosa</i> or <i>A.</i>	Community 6	Community 6 occurs in Land Parcel B which is unaffected.	As above	As above
	<i>verticillata</i>				
Grey-headed flying-fox	Vegetation containing flowering and edible fruit bearing species	Communities 1 and 5	Unaffected	As above	As above
Koala	Koalas occur in eucalypt woodlands and forests throughout eastern Australia (i.e. where favourable food trees are found)	Communities 1 and 7	Mature trees will be retained where possible.	Mature Koala habitat trees will be retained wherever possible	Compensatory koala food trees and habitat should be planted.
Large-footed myotis	Habitats containing water creeks, rivers, estuaries and dams	Communities 1 and 5	Communities 1 and 5 occur adjacent to the canals and will be unaffected.	The development is proposed for the cleared and disturbed area of vegetation within Land Parcel A. Mature eucalypt trees should be retained wherever possible. The EEC, Swamp Sclerophyll Forest, will be retained, the building envelopes are situated towards the front of the proposed lots minimising the impacts on the EEC.	As above

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Little bent-wing bat	Occupies well timbered areas	Communities 1 and 5	Communities 1 and 5 occur adjacent to the canals and will be unaffected.	As above	As above
Osprey	Feeding on fish the Osprey hunts over coastal rivers, estuaries & streams	May nest in forest communities which be retained	Communities 1 and 5 occur adjacent to the canals and will be unaffected	As above	As above
Rose-crowned fruit-dove	Subtropical and dry rainforest. Occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	The entire site is potential habitat however, community 7 is considered marginal.	The Rose-crowned fruit-dove may utilise the isolated trees within Community 7.	As above	As above
Wallum froglet	Acid Paperbark swamps and sedge swamps of the coastal 'wallum' country.	Communities 1, 2, and 5	Communities 1 and 5 occur adjacent to the canals and will be unaffected by the proposed development. Community 2 occur in Land Parcel C and will also be unaffected.	As above	As above
White-eared monarch	Coastal rainforest, swamp forest and wet eucalypt forest	Communities 1 and 5	Communities 1 and 5 occur adjacent to the canals and will be unaffected.	As above	As above

8.13.2 Conservation of Wildlife Corridors

The Director General's Environmental Assessment Requirements require the Environmental Assessment to outline measures for the conservation of existing wildlife corridor values and/or connective importance of any vegetation on the subject land.

The NPWS Key Habitats and Corridors database shows several regional and sub-regional habitat corridors within the locality (FIGURE 8 of **Annexure 15**). The subject site occurs adjacent to the Mooball-Cudgen Regional Corridor which links Mooball National Park and Cudgen Nature Reserve.

The Cudgen Link Regional Corridor occurs approximately 1.5km the north which links Cudgen Nature Reserve north with the Cudgen Nature Reserve south.

The land is connected by the water and the vegetation along the canals (ie. EECs). This habitat also connects the site to Cudgen Lake.

Possible impacts for Wildlife Corridors and Connectivity

The vegetation along the canals will be retained and will continue to be an effective habitat corridor for fauna moving through the area adjacent to the canals and to Cudgen Lake.

Avoidance and Mitigation of impacts for Wildlife Corridors and Connectivity

The development layout was constrained within the cleared and disturbed area of vegetation (ie. outside the land zoned 7(L) environmental protection and the EECs). Furthermore, the building envelopes are situated towards the front of the proposed lots, adjacent to Willow Avenue, minimising the impacts on the habitat adjacent to the canals.

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Offsets for Wildlife Corridors and Connectivity

A Vegetation Management Plan should be prepared for the area outside the Lots. This should include revegetating the land from the EEC to the lot boundaries forming a buffer to the EEC and increasing the width and habitat value of the vegetation along the canal.

8.13.3 Aquatic Habitats

The Director General's Environmental Assessment Requirements require the Environmental Assessment to address measures to protect and manage adjacent aquatic habitats including Cudgen Lake.

The Cudgen Nature Reserve Plan of Management (CNRPoM) establishes the scheme of operations for the reserve. In accordance with the provisions of Section 76 of the National Parks and Wildlife Act, 1974, the plan was adopted in November 1998. The strategies outlined in the plan have been devised following detailed consideration of public submissions received on the Cudgen Nature Reserve Land Management Issues Paper (released in October 1996) and the Cudgen Nature Reserve Draft Plan of Management (released in August 1997).

This section considers the impact of the proposed development on Cudgen Nature Reserve having particular consideration for the:

- Cudgen Lake Nature Reserve Plan of Management (NPWS 1998);
- Cudgen Lake Coastal Lake Assessment Model; and
- Statement of Intent for Coastal Lakes of NSW.

Applicability to the Subject Site

The Cudgen Lake Nature Reserve Plan of Management (NPWS 1998) is part of a system of management developed by the National Parks and Wildlife Service.

The system includes the National Parks and Wildlife Act, management policies, established conservation and recreation philosophies, and strategic planning at corporate, Regional and District levels.

The plan identifies Cudgen Nature Reserve as part of the largest remnant of native vegetation on the Tweed Coast. It is of local, regional and state significance for its natural values, coastal landscapes and provision of significant habitat for native wildlife. Nature conservation is the primary focus of management for the Reserve, with emphasis to be given to rehabilitation of disturbed lands and improvement of the Cudgen Lake ecosystem through an improvement in water quality.

The plan lists specific objectives for Cudgen Nature Reserve which include providing minimum impact public access to designated areas for appropriate nature based recreation so that the natural and cultural values of the Reserve are not threatened.

In April 2002, the Healthy Rivers Commission presented the final Report of its independent inquiry into Coastal Lakes to the NSW Government. This Statement of Intent is the NSW Government's response to the Final Report. The Commission has classified each coastal lake using the classification system, which, in accordance with the management framework, indicates the level of protection required to achieve the primary and other outcomes for that class.

Cudgen Lake is classified as "Healthy Modified Conditions" and has a recognised conservation value of Moderate. A Moderate conservation value establishes 'boundaries' of discretion, within which the lake managers (councils and agencies), together with citizens, may determine the detailed actions for an individual lake, in light of its specific local circumstances and priorities.

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Managers' discretion in determining outcomes and actions for specific lakes is greatest for those coastal lakes classified as Healthy Modified Conditions, given the potential capability of many such systems to sustain some further development, and often, the presence of human factors that entrench their status.

Possible Impacts on Cudgen Lake Nature Reserve

Cudgen Lake is located less than one hundred metres (100m) to the north-east of the site and the Reserve is approximately five hundred (500) metres to the south-west. The proposed development has the potential to impact on the Cudgen Nature Reserve and the wetland within it, in the following ways:

- Residents from the site may create walking tracks through the Nature Reserve, resulting in direct loss of vegetation, reduced visitation by pollinators and dispersal vectors, changes in vegetation structure, and increased opportunities for weeds and disturbance-adapted pest species.
- Occupation of the site may increase the risk of fire release into the Nature Reserve.
- Occupation of the site may cause an increase in local populations of invasive pest species (e.g. rats, cane-toads, foxes) and invasive weeds. Residents of the site may dump rubbish and garden wastes into or near the Nature Reserve, encouraging pest species and allowing the release of weed species, parasites and diseases into the Nature Reserve.
- Domestic animals may predate on or disturb fauna within the Nature Reserve if they are allowed to roam.
- Increased light and noise from the site may disturb the more reclusive species, in effect increasing the penetration of edge effects into the Nature Reserve.
- Occupation of the site may reduce the effectiveness of dispersal vectors and dispersal life-cycle stages of fauna and flora from the Nature Reserve to the nearest wetlands in the south-east.

Avoidance of impacts for Cudgen Lake Nature Reserve

The layout of the site has been planned in a manner which will be sensitive to the conservation of plant communities and fauna. The proposed development is unlikely to impact on the Cudgen Lake.

Mitigation for Cudgen Lake Nature Reserve

The proposed development is located less than one hundred metres (100m) to the north-east of the site and approximately five hundred (500) metres to the south-west of Cudgen Nature Reserve. Signage erected in Willow Avenue and a public awareness campaign involving the distribution of pamphlets to land owners of the proposed subdivision will facilitate appropriate use of the Cudgen Nature Reserve in designated areas.

Offsets for Cudgen Lake Nature Reserve

Buffers proposed for the area between the proposed development footprint and the canal include revegetating and extending vegetation Communities 1 and 3.

Assessment of the Cudgen Nature Reserve Plan of Management

An assessment of the CNRPoM has been completed (NPWS 1998). The following strategies (in bold) within the CNRPoM are considered to be relevant to the proposed development. Recommendations to avoid and/or mitigate potential impacts on the Cudgen Nature Reserve are provided for each.

Undertake appropriate control measures where erosion has been accelerated by human activity or is threatening significant habitats or other values.

No evidence of accelerated erosion was observed on the subject site.

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It is not considered that accelerated erosion is likely to occur within the Cudgen Nature Reserve as a result of the proposed development. A detailed Erosion & Sediment Control Plan should be prepared by a suitably qualified firm to direct management procedures during construction activities.

All works will be designed and undertaken in a manner which minimises soil erosion.

An Erosion Sediment Control Plan has been prepared by Opus (2009).

The NPWS supports the principles of total catchment management and estuaries management and will liaise with local government and other authorities to maintain and improve the water quality in the Reserve and its catchment.

A Stormwater management Plan has been prepared by Opus (2009).

The NPWS will encourage education of water quality and related issues with the Department of Land and Water Conservation's 'Streamwatch' Program involving local schools and community members.

An Information Kit should be provided to all new landowners providing the relevant contact details and inviting participation in the Department of Land & Water Conservation's 'Streamwatch' program.

Encourage and where possible assist Tweed Shire Council in preparing development controls on adjacent lands and in the catchment to retain the scenic amenity of the area and improve water quality for Cudgen Lake and Creek.

The scenic amenity of the area will be maintained by retaining the majority of vegetation on the subject site, particularly adjacent to the canals. A detailed Stormwater Management Plan should be prepared for the subject site to ensure no impacts on water quality within the canals and the adjoining Cudgen Lake.

Assess the conservation status of adjoining lands and investigate appropriate protection measures, including the feasibility of acquisition and incorporation into the Reserve.

The area of the site where the development is proposed is zoned for residential development and is not considered suitable for incorporation into the reserve. Ecologically significant areas on the site have been identified (i.e. the 7(l) land at the rear of the proposed allotments) and will be retained and buffered.

Encourage and assist in the formation of local Landcare and Dunecare groups in the Cudgen Catchment and Coastal areas.

The Information Kit to be provided to all new landowners should provide the relevant contact details and inviting participation in local Landcare groups.

Protect threatened and significant species, populations and communities, and implement any actions required by any recovery plan or similar document.

Ecologically significant areas on the site have been identified and will be retained and buffered.

Introduced plant species will be controlled, and where practicable or where required by law, eradicated. Priority will be given to those which have been outlined in Joseph (1996) as:

- **declared noxious ;**
- **threaten the integrity of native communities, such as the littoral rainforest, palm forest and Reserve edges;**

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-
- **have a high capacity for dispersal; and/or**
 - **are new isolated occurrences.**

A Regeneration & Revegetation Plan should be prepared for the subject site to direct proposed rehabilitation works, and should include protocols for the eradication of weed species as well as a monitoring and maintenance program.

The cooperation of local authorities and Reserve neighbours will be sought in assisting with implementing weed control programs, regeneration works, and to encourage retention of native vegetation in the vicinity of the Reserve.

A Regeneration & Revegetation Plan should be prepared for the subject site to direct proposed rehabilitation works, and should include protocols for the eradication of weed species as well as a monitoring and maintenance program.

Information brochures designed to address the problems of dumping garden refuse and other rubbish in the Reserve will be prepared and distributed explaining the impact naturalised plants and added nutrients from garden refuse has on native vegetation.

The Information Kit to be provided to all new landowners should include the above information.

Subject to demand, organise a workshop for local residents and other interested people to explain:

- **the impact of weeds and added nutrients on native vegetation;**
- **characteristics and destructive potential of weeds;**
- **garden plants which have become or are likely to become naturalised in the bushland, and**
- **removal / control methods for these plants.**

A workshop for residents of the development should be considered.

Assess the interest of local community members and neighbouring residents to form a 'Friends of Cudgen Nature Reserve' or similar group, to assist with the management of the Reserve.

The Information Kit to be provided to all new landowners should include the relevant details of the Friends of Cudgen Nature Reserve or similar group.

Introduced animals will be controlled, or where possible eradicated. Species will be targeted in order of priority which is reviewed in line with assessment of data from a pest species monitoring program. Control programs will be designed to avoid impact on non-target species and will be undertaken in cooperation with the Tweed-Lismore Rural Lands Protection Board and neighbouring landholders where appropriate.

Residents of the proposed development will be encouraged to keep domestic pets within fenced enclosures and to control them on a leash when not in the enclosures. The Information Kit to be provided to all new residents should warn of the potential damage that domestic pets can cause to local native fauna populations and should request that domestic cats are kept in doors overnight and that dogs are not left to wander unrestrained.

Wild dog control may be undertaken on the Reserve boundaries to reduce the impact to livestock on adjoining land, in accordance with the NPWS's Field Management Policy on wild dogs.

The Information Kit to be provided to all new residents should advise that wild dog control will occasionally be undertaken within the Nature Reserve.

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Domestic animals and livestock will be prohibited in the Reserve with the exception of guide dogs being used for the blind.

As discussed previously, residents of the proposed development will be encouraged to keep domestic pets within fenced enclosures and to control them on a leash when not in the enclosures.

As far as possible fuel management will be carried out in cooperation with neighbours for mutual protection.

Any fuel maintenance requirements on the subject site by the Rural Fire Service will be complied with. A detailed Bushfire Threat Assessment Report has been prepared for the subject site and all management strategies devised for the site will be adhered to.

Land use planning and development authorities and private developers will be encouraged to incorporate boundary fire breaks and other fuel reduction measures in any development adjacent, or in proximity, to the Reserve.

As discussed above all bushfire management strategies devised for the site will be adhered to.

Public understanding and appreciation of the natural and cultural values of the Reserve will be promoted. The following themes will be emphasised in interpretation programs:

- The geological evolution of the present day coastline and lake;
- The importance of the local area and regional significance to the Aboriginal community;
- Environmental damage resulting from mining operations and land use activities;
- The importance of conserving remnant vegetation associations for the preservation of natural, cultural and landscape values;
- The appropriate recreational use of the Reserve, especially the lake and ocean foreshore, and
- Appropriate research activities.

The Information Kit to be provided to all new residents should include a brief outline of the above details.

Promotional material and interpretive programs, such as discovery ranger activities and 'Streamwatch', will be designed to promote care for the environment and thereby assist management to protect natural and cultural heritage values.

The Information Kit to be provided to all new landowners should include the relevant contact details and invite participation in the Discovery Ranger and 'Streamwatch' programs.

Gates will be erected at appropriate access points in the Reserve to restrict use to authorised vehicles only.

The Information Kit to be provided to all new landowners should include details of restricted access areas.

A locked gate will be erected to the entrance to the Reserve on the eastern side of Round Mountain to prevent illegal rubbish dumping and minimise public use.

The Information Kit to be provided to all new landowners should include an explanation of the negative impact naturalised plants and added nutrients from garden refuse has on native vegetation.

Camping will be prohibited in Cudgen Nature Reserve.

The Information Kit to be provided to all new landowners should advise residents of the "no camping" policy.

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Only non-motorised craft (e.g. yachts and canoes) will be permitted on Cudgen Lake, except for motorised vessels used for management, law enforcement, licensed commercial fishing or emergency purposes. The NPWS will seek the cooperation of the Waterways Authority of NSW to manage the use of vessels on the Lake.

The Information Kit to be provided to all new landowners should advise residents of the restrictions on motorised craft on Cudgen Lake.

8.13.4 Wetlands of High Conservation, Value and Mapped Key Fish Habitat Values

The Director General's Environmental Assessment Requirements require the Environmental Assessment to assess the proposal against the 'Wetlands of High Conservation Value and their Threats in the Tweed Catchment' and the mapped Key Fish Habitat values of Cudgen Lake and advise how upstream barriers to fish will be addressed.

Wetlands of High Conservation Value and their Threats in the Tweed Catchment

The NSW Department of Planning have produced a document to enable the assessment of the conservation value of wetlands to enable informed critical decisions by policy makers and conservation managers (DoP 2006). Decisions can be made on protected area acquisitions, allocation of environmental flows, natural resource management and inclusions of important wetlands in national and international listings. A total of 69 indicators have been developed for:

- Wetland ecological conservation value -based on Atlas of NSW Wildlife database and mapping of key habitat and corridors for threatened fauna;
- Threat - based on sub-catchment/wetland disturbance due to agriculture, water regulation and urbanisation;
- Data quality - based on species record reliability and spatial accuracy and wetland size.

Scores for each indicator were estimated and then summed to arrive at a ranking of a wetland's ecological conservation value and level of threat. For the Tweed catchment, the project identified:

- 463 individual wetlands with a total area of 12,890 Ha, the majority (94%) located in flood plain and estuarine areas.
- The majority of wetlands ranked highly for overall ecological conservation value were in sub-catchments closer to the coast. Individual groups of species, however, which are of conservation interest, are required to be looked at separately.
- Overall the greatest level of threat to wetlands was in the lower sub-catchments due to water regulation, acid sulphate soils and agriculture; the least threatened wetlands are in the upper sub-catchments remote from the coast.
- Wetlands with the highest threat levels occur in areas with the most data for assessing conservation value, a likely benefit to management of the threats.

Tweed Shire Council has not adopted a setback line from the existing canal, however, as it is a recent rezoning the 2 (a) Low Density Residential and 7(l) Environmental Protection zone boundary is considered to appropriately determine a setback line. In addition to this Communities 1 and 3 abutting the canal and adjacent to the development footprint will be furthered buffered through revegetation.

The proposed development will not increase the levels of these threats identified in the assessment of wetlands in the Tweed (i.e. alter the current water regulation regime, contribute to acid sulphate soils or increase agricultural activities in the area).

Fish passage along our waterways is critical to the survival of Australian native fresh and saltwater fish. Fish move within waters at different times to access food and shelter, to avoid predators, and to seek out mates to breed and reproduce. Fish passage barriers may result from the actual physical blockage of the waterway by a dam, weir, floodgate or even debris blocking a culvert.

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Local extinction is likely to occur where barriers have stopped fish undertaking migrations (Fairfull & Witheridge 2003).

The canals within the subject site are connected to the southern boundary of Cudgen Lake. The proposed development will not create any of the above mentioned barriers to fish passage between the canals and Cudgen Lake.

8.13.5 Rural Land Use Conflict and Interface Issues

The Director General's Environmental Assessment Requirements require the Environmental Assessment to address the requirements of the 'North Coast guide for avoiding and reducing rural land use conflict and interface issues'

The subject site is divided into three parcels of land. Land Parcels A and B are zone residential and Land Parcel C is zoned 1(a) Rural (FIGURE 5 of **Annexure 15**). The residential and rural land parcels are separated by the canals and land zoned for environmental protection. Conflict issues, between the rural and residential land, are unlikely to arise because of the separation by the canals and 7 (l) land. The rural land, in Parcel C, is currently used for cattle grazing as is Land Parcel B which is zoned residential but not subject to development this stage.

Living and Working in Rural Areas (Learmonth et al 2007) addresses conflict issues between land uses on the North Coast. The handbook is published by the Centre for Coastal Agricultural Landscapes in partnership with the Northern Rivers Catchment Management Authority. Chapter 4 of this handbook addresses "common rural land use conflict issues". Conflict issues addressed in the handbook and a discussion in relation to the proposed development is provided below.

Burning off and fire hazards

A bush fire management plan should be prepared for the subject site addressing fire issues in relation to the rural and residential land, and the land under environmental protection.

Chemical spray drift

Land Parcel B and C are currently used for cattle grazing and it is unlikely that large scale chemical spraying will be undertaken.

Domestic pets – dogs and cats

Domestic animals such as cats and dogs should be under control at all times. Domestic animals should be subject to the Regulations set down by the Tweed Shire Council. This will ensure that both wildlife (i.e. Koalas or kangaroo) and rural animals (i.e. young cattle) are adequately protected.

Dumping and burying rubbish

Dumping of rubbish should be STRICTLY prohibited on the vacant land on the subject site. Warning signs displaying the conditions and penalties should be erected.

Dust

It is unlikely that the farming activities (i.e. cattle grazing) will generate dust.

Fences

Fences should separate the rural land from the canals and the areas of land zoned for environmental protection. The vegetation adjacent to the canal in Land Parcel C is, although zoned rural, representative of the EEC Swamp Sclerophyll Forest. The vegetation should be adequately fenced from the land used for rural activities.

Noxious Weeds

A Vegetation Management Plan is suggested for the land adjacent to the canals at the rear of the proposed allotments in land Parcel A. Consideration should be given to extending this plan to include weed management in Land Parcels B and C. Agriculture activities such as grazing can often facilitate the spread of noxious weeds.

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Odour

It is unlikely that the farming activities (i.e. cattle grazing) will generate an intolerable odour problem.

Stock

Grazing animals within Land Parcel C should be controlled at all times. Fences should be well maintained to prevent stock from straying onto Clothiers Road, or into the EEC adjacent to the canal or into the canals.

8.14 Mosquito Management

The Director General's Environmental Assessment Requirements require mosquito management issues to be addressed. HMC Environmental Consulting Pty Limited (HMC) prepared a Mosquito Management Plan. The purpose of the Plan is to provide strategies to assist in minimising biting insect nuisance on and surrounding the development site. A copy of the Plan is at **Annexure 14**.

The current proposal is for a residential subdivision of Lot 4 DP 876253 to create 12 residential lots and the residual lot comprising the existing artificial canal and environmental protection (habitat) zone.

An existing tourist accommodation business has been operated in Willow Avenue, opposite the subject site, for more than thirty years. Existing residential dwellings occupy the adjacent properties along Willow Avenue and Tamarind Avenue.

A site inspection was carried out by HMC Environmental Consulting, including a walkover of nearby Melaleuca sp. communities. Consultation with Tweed Shire Council's Entomological Control Officer was also carried out prior to developing the management plan.

Based on the information presented in **Annexure 14**, it is concluded that habitation of the proposed residential lots will not occur within 1 km of extensive biting mosquito breeding areas as mapped by Tweed Shire Council. Of most concern with respect to biting nuisance, is the impact of *Verrallina funerea*. The mosquito species known to breed on a seasonal basis in the shaded ponds under the cover of the nearby melaleuca wetlands surrounding Cudgen Lake.

It is concluded that the biting insect nuisance and risk of disease transmission to future inhabitants of the subject site can be adequately minimised by implementing the recommendations of the Management Plan during development of the subdivision.

9.0 CONSULTATIONS

On 14 September 2009 the following State Agencies were consulted. Issues raised in responses received are addressed in the following sections. Copies of responses received are contained at **Annexure 19**.

9.1 State Agencies

TABLE 27 – STATE AGENCY CONSULTATION RESPONSES		
AGENCY	ISSUE	COMMENTS
Tweed Shire Council	Council advised that it has no further issues or assessment requirements to add to those contained in Council's letter to the Department of Planning dated 12 February 2009 which identified Council's key issues and assessment requirements. Those requirements were generally incorporated into the DGEARs.	Relevant issues raised by Council contained in the DGEARs have been addressed in this Report.

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TABLE 27 – STATE AGENCY CONSULTATION RESPONSES		
AGENCY	ISSUE	COMMENTS
Department of Environment, Climate Change and Water NSW	The Department responded by letter dated 24 September 2009. the Department has advised that it has previously been consulted by the Department of Planning in relation to this proposal and the Department's issues were addressed in the DGEARs.	All relevant matters raised by the Department have been addressed in this Environmental Assessment.
NSW Rural Fire Service	Response received 18 September 2009. The Rural Fire Service advised that the matters raised are receiving appropriate attention and a response will be forwarded as soon as possible.	No further comments have been received from the Rural Fire Service at the date of preparing this Report.
Department of Water and Energy	No response received.	
Roads and Traffic Authority	No response received.	
Northern Rivers Catchment Management Authority	Response received 15 September 2009. The Authority advises that it has no further issues or comments to add to those referred by the Authority to the Department of Planning in relation to this proposal.	All relevant matters in the DGEARs which incorporates comments by the NRCMA have been addressed in this Environmental Assessment.
Relevant Local Aboriginal Land Council/s and other Aboriginal community groups	Relevant Local Aboriginal Land Council/s and other Aboriginal community groups were consulted by Everick in the preparation of their Cultural Heritage Assessment. On 11, 12 and 13 June 2009 public notices were placed in the Tweed Daily Newspaper inviting Aboriginal persons/organisations with cultural heritage interests in the area to advise Everick Heritage Consultants. NSW Native Title Services, the cultural heritage unit of the DECCW and TSC were also notified.	An onsite meeting was arranged for 25 June 2009 and was attended by representatives of the Aboriginal Community. Copies of the Draft Cultural Heritage Assessment Report were distributed to the Aboriginal stakeholders on 25 August 2009 and a response was received from one of the stakeholders on 23 September 2009. Full details of Aboriginal community consultation are contained in Section 2 of the Cultural Heritage Assessment at Annexure 11 .
Telstra	Response received 21 August 2009. Telstra has advised that it maintains existing network adjacent to the site however the network is currently not sufficient to meet likely demands of the development. However Telstra has incorporated the forecast telephone service demand for the development into overall planning processes for the area and has planned to roll out upgrades in telecommunications infrastructure as growth occurs.	This is a standard Telstra response and any future Subdivision Certificate Application will need to be accompanied by documentary evidence from Telstra demonstrating that satisfactory arrangements have been made for the provision of Telstra services.
Country Energy	No response received.	

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9.2 Community Consultation

No formal community consultations have been undertaken to date however it is intended, if required, to arrange and conduct a public meeting during the formal public exhibition process, (or immediately thereafter), for the Major Project Application. This will enable stakeholders, residents and other interested parties to clarify any issues and provide comments on the project.

10.0 SUMMARY AND CONCLUSION

Prior to finalising the proposed layout, a detailed site opportunities and constraints analysis has been undertaken including biophysical and geophysical site surveys and analysis.

In addition, the existing statutory planning controls applicable to the site have been considered following which the development proposal for twelve residential allotments within that part of the site zoned 2(a) abutting Willow Avenue and a residue lots has been developed. That proposal is considered to achieve the optimal development outcome for the site having regard to the site's opportunities and constraints, the established character and amenity of the area and the commercial viability of the development.

Whilst it may be possible to achieve higher densities on the site, that would be incompatible with the established low density residential character and amenity of the area in particular and would also result in greater impacts on infrastructure capacity and the natural environment.

In summary, this Environmental Assessment concludes that the project will not result in any significant adverse impact on the environment and is consistent with the principles of ecologically sustainable development. The project is also consistent with the public interest in that it implements existing statutory planning controls and in particular the objectives of the Far North Coast Regional Strategy insofar as it will contribute towards additional dwellings to meet the identified demands within the timeframes identified within that Strategy.