Planning Proposal

Hampton Road, Waterview Heights



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Prepared for: Waterview Heights Developments Pty Ltd

UPR	*Description*	*Date Issued*	*Issued By*
2440-1003	First issue.	17/04/2015	Simon Waterworth
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1. Introduction

1.1 Summary of the Planning Proposal

GeoLINK has been engaged by Waterview Heights Developments Pty Ltd to prepare a Planning Proposal for the rezoning of land in Hampton Road, Waterview Heights. The site is described as Lot 5 DP 1179232 (the site). The Proposal is to rezone a portion of the site from RU2 Rural Landscape to R5 Large Lot Residential to allow for the future subdivision of the rezoned land into large lot residential allotments with one larger residue lot containing the existing vegetated land.

The site is located within the Clarence Valley Local Government Area and therefore the Clarence Valley Local Environmental Plan 2011 (CVLEP 2011) applies to the land. The site is currently zoned RU2 Rural Landscape however adjoins land zoned R5 Large Lot Residential. Clause 4.1 - minimum subdivision lot size and associated lot size maps, require that the subdivision of the subject site must result in lots that have a minimum area of 40 ha. It is proposed to undertake a subdivision of the land that involves subdivision of lots less than 40 ha and therefore an amendment to CVCLEP 2011 is required.

1.2 The Site and Locality

Lot 5 DP 1179232 is located in Waterview Heights which is a large lot residential (rural residential) subdivision approximately seven kilometres west of Grafton. Waterview Heights is dissected by the Gwydir Highway with the majority of the large lot residential development on the northern side of the Highway. The subject site is located south of the Gwydir Highway. A locality plan of the site is shown as **Illustration 1.1** and an aerial photograph of the site is shown as **Illustration 1.2**. Photographs of the site are shown in **Plates 1.1 to 1.4**.

Plate 1.1 Site image 1

Plate 1.2 Site image 2

Plate 1.3 Site image 3

Plate 1.4 Site image 4

The site is 51.95 ha in area and comprises a strip of open pastoral land along Hampton Road with individual/ small clusters of trees and forested areas primarily in the west of the cleared land. It is located adjacent to rural (pastoral and forested) land to the west with areas of large lot residential land to the east, north and south-east. **Illustration 1.3** shows the existing zoning of the site and surrounding land.

1.3 Proposed Future Use of the Land

The proponents propose to subdivide the land into 11 lots. Ten lots would have a minimum area of 4,000 m^2 all with frontage to Hampton Drive and one residue lot with an area of approximately 48 ha. A potential lot layout is shown in **Illustration 1.4.**

1.4 Previous subdivision relating to the land

Development Consent No. SUB2011/0059 approved a five lot subdivision of Lot 2411 DP709698 and Lot 9 DP 820604 on 01 February 2012. The subject land (Lot 5 DP 1179232) is the residue parcel of this subdivision. The registered plan of subdivision is attached as **Appendix A**.

Information shown is for illustrative purposes only

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Source of base data: SIXMaps

0 1.5 km

North

Locality Plan

GeoLINK environmental management and design

Planning Proposal - Hampton Road, Waterview Heights
2440-1004

Illustration 1.1

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Source of base data: SIXMaps, Bothamley and O'Donohue Pty. Limited

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North

The Site

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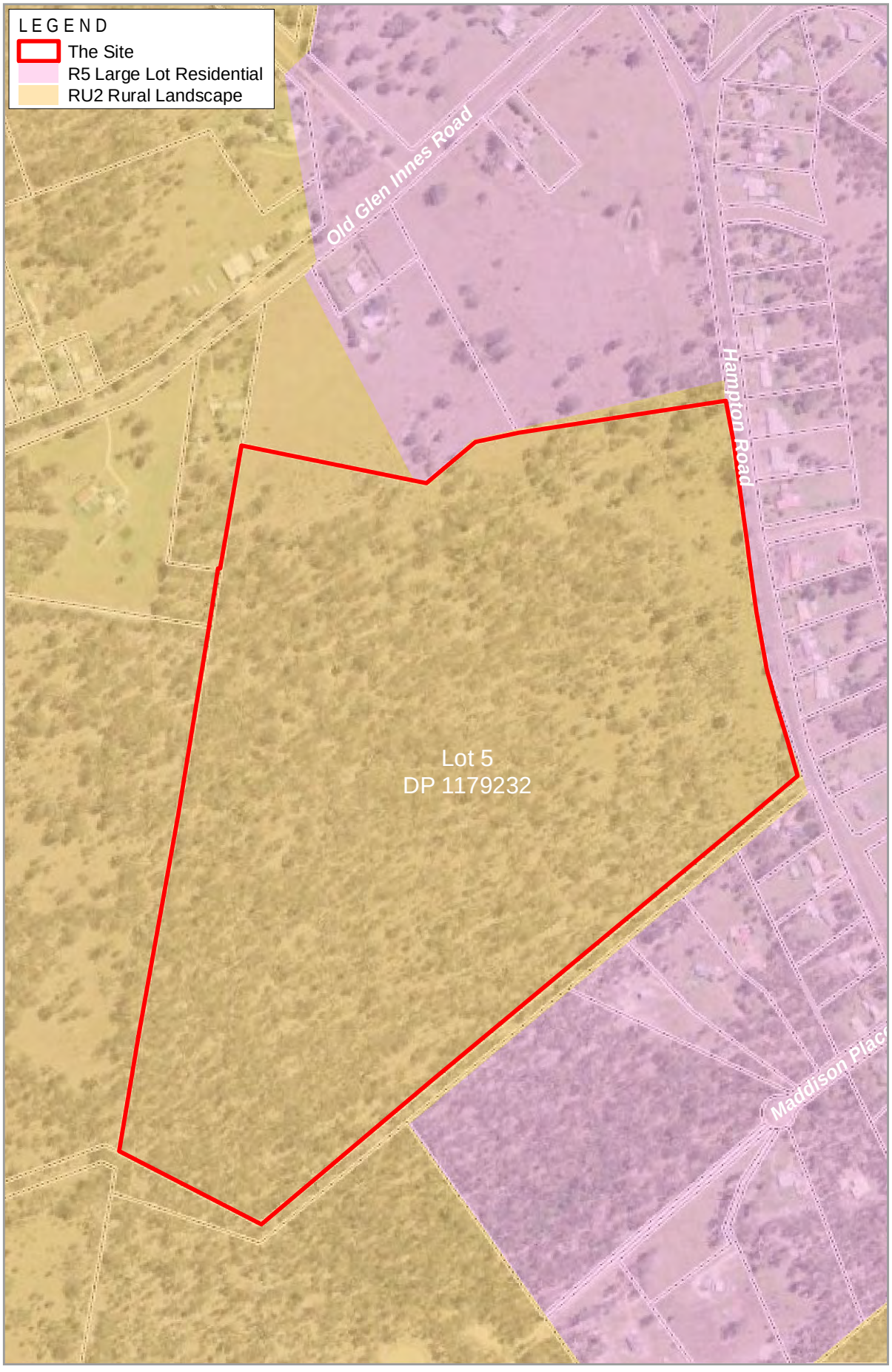
Source of base data: SIXMaps, Bothamley and O'Donohue Pty. Limited



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Zoning Map

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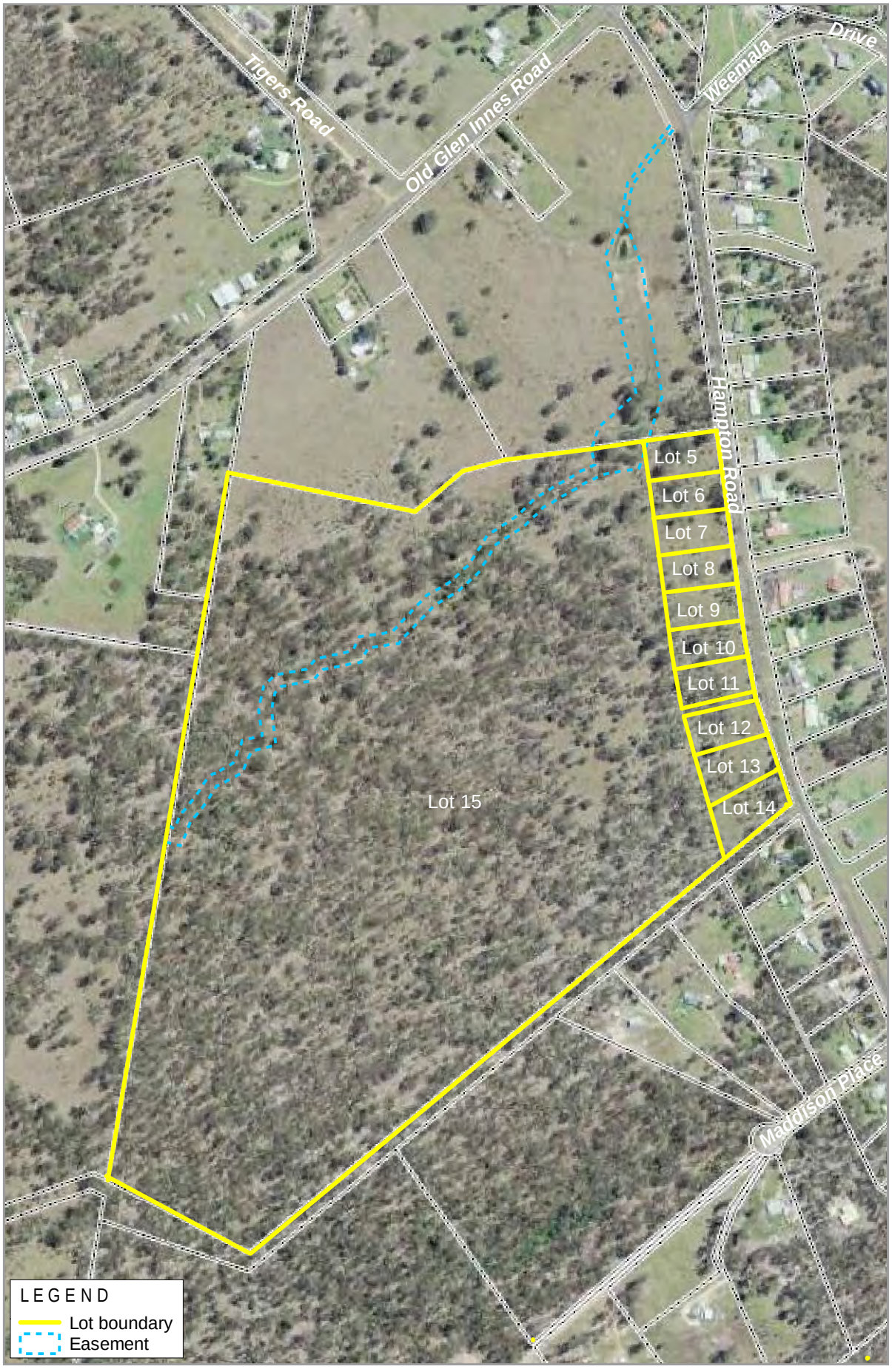

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Proposed Plan of Subdivision

GeoLINK environmental management and design

Planning Proposal - Hampton Road, Waterview Heights
2440-1007

Illustration 1.4

2. Proposal Objective (Part 1)

This Planning Proposal seeks to amend Clarence Valley Local Environmental Plan 2011 by rezoning a portion of Lot 5 DP 1179232 which is located adjacent to the existing Waterview Heights large lot residential estate from the current RU2 Rural Landscape Zone to R5 Large Lot Residential Zone to provide for sustainable infill development. The land will provide opportunities for conventional large lot residential development on land that is suitable for such development. The Planning Proposal also seeks to amend the Lot Size Map to allow for a minimum lot size of 4000 m^2 for the land proposed to be rezoned.

3. Explanation of Provisions (Part 2)

The Planning Proposal will amend CVLEP 2011 by an:

- amendment of the CVLEP 2011 Land Zoning Map in accordance with the proposed zoning amendment map shown in **Illustration 3.1** to change the zoning of part of the subject land from RU2 Rural Landscape to R5 Large Lot Residential; and
- amendment of the CVLEP 2011 Lot Size Map in accordance with the proposed amendment map shown in **Illustration 3.2** change the minimum lot size to 4000 m^2.

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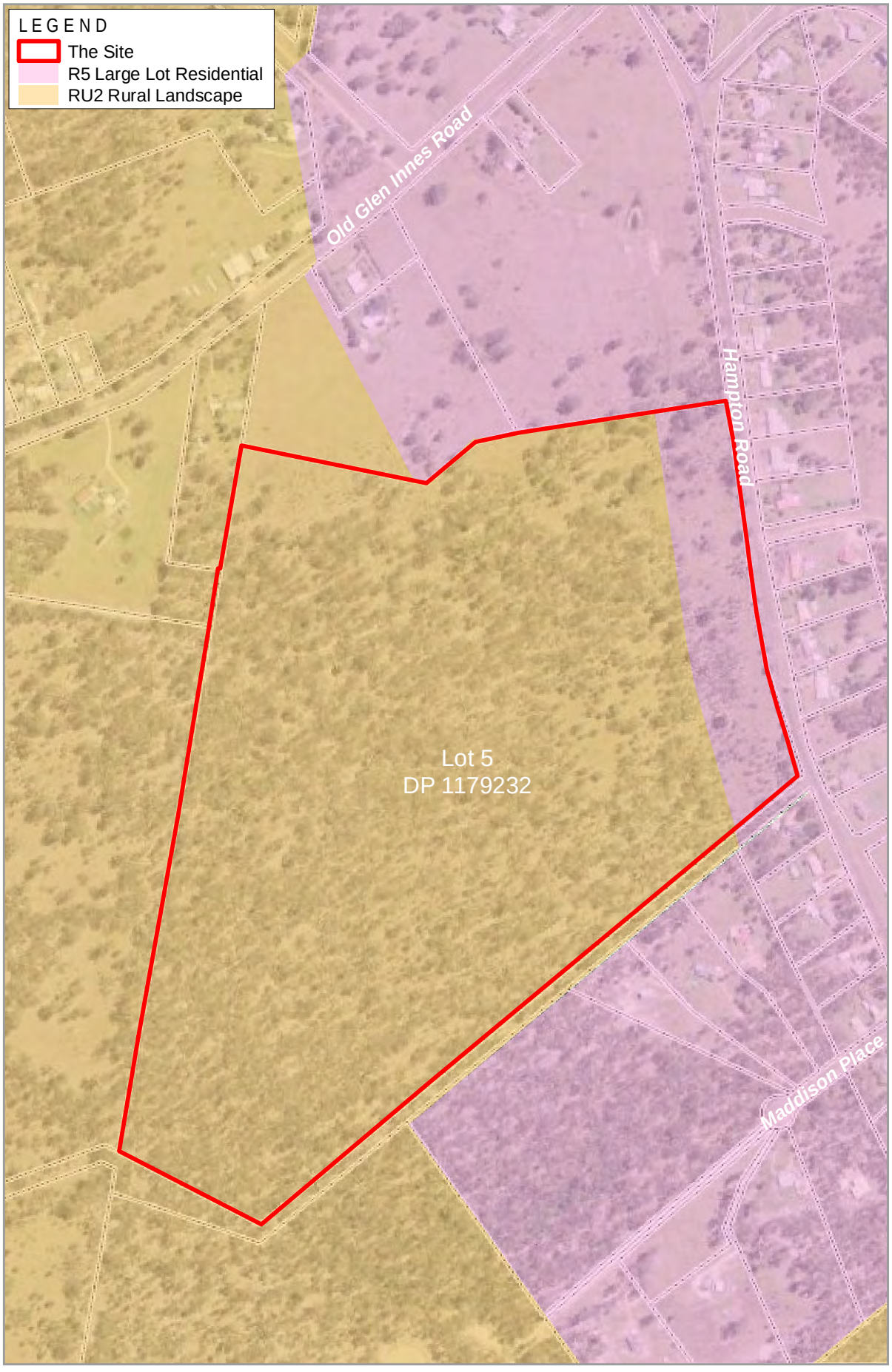

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Proposed Amendment to Zoning Plan

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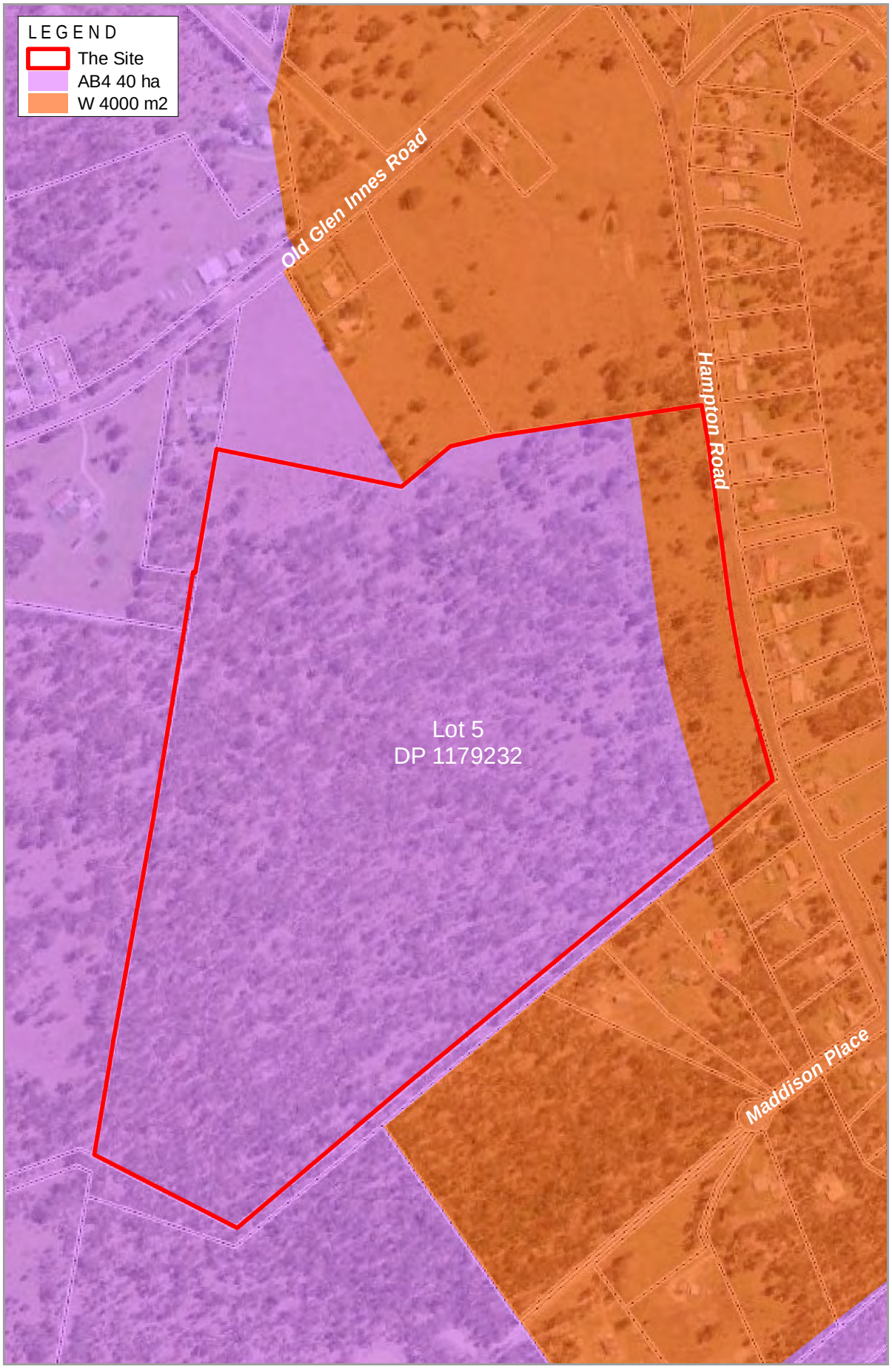
Source of base data: SIXMaps, Bothamley and O'Donohue Pty. Limited



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North

Proposed Amendment to Minimum Lot Size Map

4. Justification (Part 3)

4.1 Need for Planning Proposal

4.1.1 Is the planning proposal a result of any strategic study or report?

There is no local or state strategic study or report that specifically references the site or the planning proposal. The planning proposal is therefore not the result of any such study or report. The sites' relationship to relevant local and state strategic plans is discussed further in **Section 4.2**. The land proposed for rezoning is located between land that is already zoned R5 Large Lot Residential and would provide for infill development.

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

The proposed outcome is to allow for the rezoning and future subdivision of a small strip of land that adjoins and existing large lot residential area that is generally developed. It is considered that the planning proposal is the most appropriate way to achieve this.

4.1.3 Is there a community benefit?

The community benefit associated with the development would be in the provision of additional large lot residential land options/ diversity in a manner that minimises environment, social and economic impacts.

4.1.4 Planning justification for rezoning additional large lot residential land

Council has requested more information on the need for the proposed rezoning. Council has advised that a cursory analysis has indicated that existing land already zoned R5 Large Lot Residential at Waterview Heights has the capability of yielding approximately 180 lots. Which, based on an optimistic demand of 10-12 lots per annum, suggests that a supply of 15 years exists in this locality.

It is agreed that there exists a number of undeveloped parcels of land within the Waterview Heights locality. It is also agreed that Council's preliminary analysis of 180 lots is accurate. However, it is considered that Council is not taking into consideration the numerous development constraints that exist with many of the sites in this locality. Jim O'Donohue from Bothamley & O'Donohue Surveying, who has substantial knowledge of this area, has assessed the development potential and constraints of the vacant land that exists within the Waterview Heights estate. These lots are identified in **Illustration 4.1**. A commentary on the constraints of each lot is outlined in **Table 4.1** below.

Table 4.1 Assessment of Development Yield

Map identifier	*Property Description*	*Comment on development potential*	*Likely lot yield*
1	Lot 14 DP749852	▪ Minimum Lot Size of 4 ha ▪ Half the lot is vegetated	4
2	Lot 5 and 7 DP259600	▪ Lot 5 is dissected by a water course and contains a small amount of flood prone land	8
3	Lot 3 DP827437	▪ Contains scattered vegetation ▪ Was subject of a previous development application which was not supported by the then Pristine Waters Council due to the presence of a square tailed kite nest ▪ Would require construction of a new road	15
4	Lot 6 DP 801497 Lot 1 DP705800	▪ Would require upgrade to Eucalypt Drive ▪ Expensive to develop ▪ Access to Rogan Bridge Road may be very limited due to poor sight distances	10 4
5	Lot 79 DP1101418	▪ Is almost entirely flood prone – very limited development potential	0
6	Lot 3 DP1174732	▪ Is a 'battle axe style block ▪ Access would be problematic due to sight distances ▪ Is vegetated and is likely to contain core Koala Habitat ▪ Has limited development potential and very expensive to develop	10
7	Lot 30 DP 851051	▪ Has been the subject of a long running DA that was withdrawn due to ecological issues ▪ Contains core koala habitat ▪ Has limited development potential and very expensive to develop	40
8	Various	▪ Might be able to be developed to create a few infill lots.	10
9	Various	▪ Minimum Lot Size of 4 ha. ▪ Vegetated land ▪ Limited development potential	0
10	Lot 55 DP621142	▪ Is effectively land locked ▪ Vegetated land ▪ Limited development potential	0
11	Lot 3 DP569153	▪ Relatively constraint free ▪ No access to Gwydir Highway	8
12	Lot 4 DP1179232	▪ Relatively unconstrained	25

Map identifier	*Property Description*	*Comment on development potential*	*Likely lot yield*
13	Lot 281 DP1088091	▪ Previous DA assessment revealed issues with contamination from waste tyre disposal ▪ DA was subsequently reduced from 66 to 16 lots ▪ Contains some vegetated lands ▪ Would require construction of new roads	30
14	Lot 1 DP 528751	▪ Would require construction of new road and be very expensive to develop	15
15	Lot 17 DP1031477	▪ Vegetated ▪ Access limited via cul-de-sac ▪ Limited development potential	3
Maximum land supply in the Waterview Heights area			**182**

As can be identified by the land supply analysis contained in **Table 4.1**, the yield analysis for the Waterview Heights locality is similar to Council's analysis. However, much of the land is subject to constraints that create significant obstacles that delay and often restrict approval of development of the land. These development constraints include ecological, flooding, access and contamination.

As outlined previously, the land proposed for rezoning is located between land that is already zoned R5 Large Lot Residential. We believe that this minor adjustment would simply provide for infill development and would not have a significant impact on the supply of large lot residential land. Although there still remains a number of potential lots (approximately 180) within the locality, it is contended that the land proposed for rezoning should be rezoned as it has very limited development constraints, can utilise existing infrastructure (sealed road, power and telecommunications) without the need for a substantial upgrade and is relatively in expensive to develop. It is also argued that the subject land should have been zoned for rural residential development when the Waterview Estate was previously planned. It is therefore considered that the proposed rezoning is justified and should proceed.

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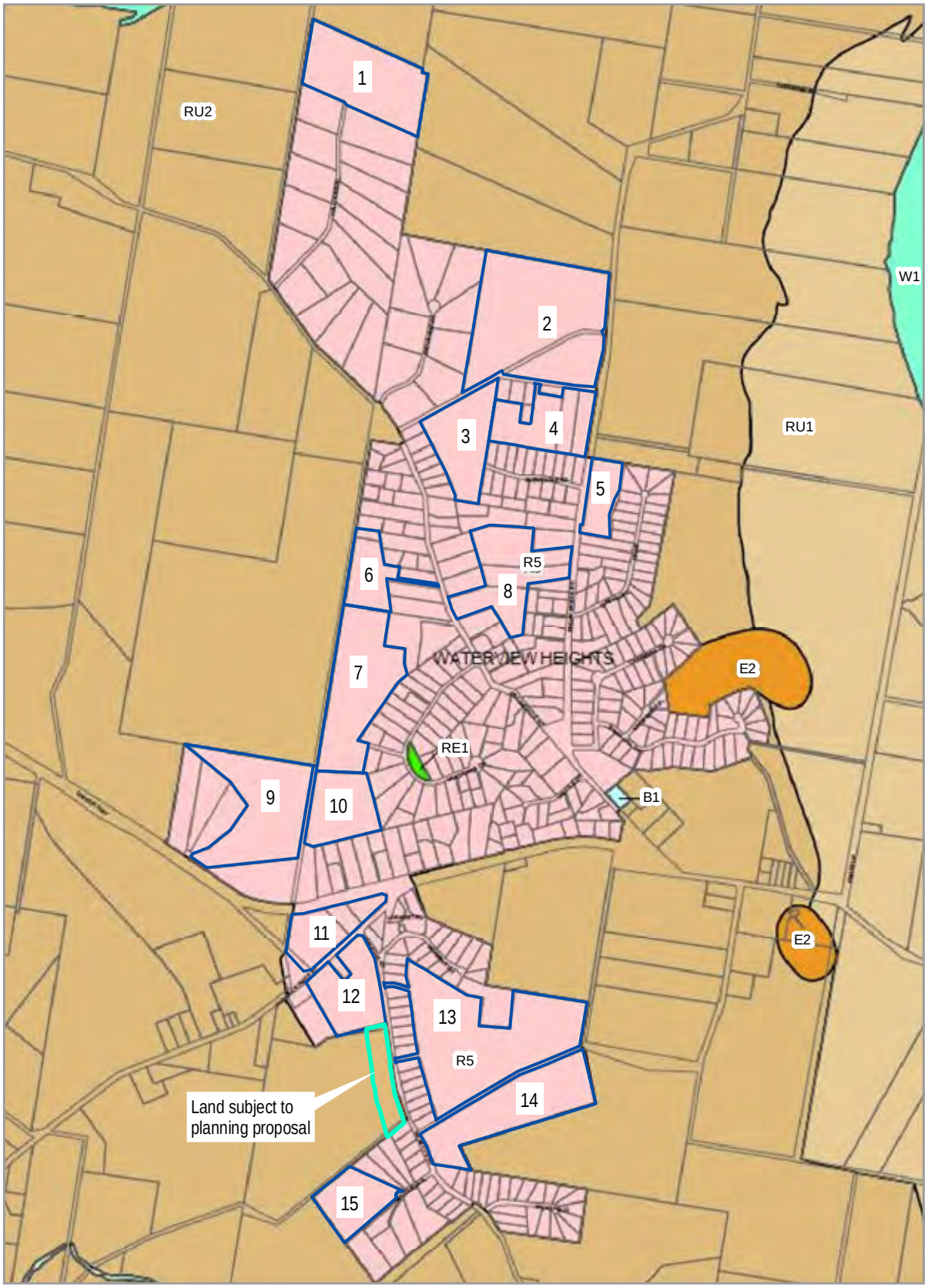
Source of base data: Clarence Valley Council



LEGEND

- Subject site
- Properties
- B1 Neighbourhood Centre
- E2 Environmental Conservation
- R5 Large Lot Residential
- RE1 Public Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- W1 Recreational Waterways

0 600

North

Assessment of Development Yield

4.2 Relationship to Strategic Planning Framework

4.2.1 Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy?

Mid North Coast Regional Strategy

The Mid North Coast area has increased in popularity as a place to live and work. As a result, the region has seen a 70% increase in population over the past 25 years.

The overall aims of the Mid North Coast Regional Strategy (MNCRS) are to:

- *protect high value environments, including significant coastal lakes, estuaries, aquifers, threatened species, vegetation communities and habitat corridors by ensuring that new urban development avoids these important areas and their catchments;*
- *cater for a housing demand of up to 59 600 new dwellings by 2031 to accommodate the forecast population increase of 94 000 and any anticipated growth beyond this figure arising from increased development pressures in the southern part of the Region;*
- *ensure that new housing meets the needs of smaller households and an ageing population by encouraging a shift in dwelling mix and type so that 60 percent of new housing will be in greenfield locations and 40 percent in existing urban areas;*
- *ensure an adequate supply of land exists to support economic growth and the capacity for an additional 48 500 jobs in the Region by protecting existing commercial and employment areas and securing sufficient land to support new employment opportunities;*
- *encourage the growth and redevelopment of the Region's four major regional centres and six major towns through urban design and renewal strategies as a means of protecting sensitive coastal and natural environments and strengthening the economic and administrative functions of these centres as well as meeting increased housing density targets;*
- *protect the coast and the character of coastal villages by limiting growth to the agreed growth areas of towns and villages leaving greenbelts between settlements;*
- *direct new rural residential development to areas close to existing settlements away from the coast;*
- *only consider additional development sites outside of agreed local strategies if they can satisfy the Sustainability Criteria (Appendix1);*
- *designate a Coastal Area east of the proposed final alignment of the Pacific Highway from which application of the Sustainability Criteria will be excluded (noting that approximately 70 per cent of the future dwelling capacity identified within growth areas is already within the Coastal Area;.*
- *limit development in places constrained by coastal processes, flooding, wetlands, important farmland and landscapes of high scenic and conservation value;*
- *protect the cultural and Aboriginal heritage values and visual character of rural and coastal towns and villages and surrounding landscapes; and*
- *where development or rezoning increases the need for State infrastructure, the Minister for Planning may require a contribution to the infrastructure having regard to the NSW Government State Infrastructure Strategy and equity considerations.*

Waterview Heights is located approximately seven kilometres from the town of Grafton which is located in the Clarence Valley subregion, as defined by the MNCRS. Growth in this subregion is expected to occur in a number of new release areas in and around Grafton. As part of the strategy, the Department of Planning has prepared Growth Areas Maps for each of the subregions, to clearly identify where growth will occur. The site is not specifically identified as being a "Proposed Future Urban Release Area" in the Growth Areas Map No. 2 – Clarence South. The reason for this, however, is that the MNCRS did not identify any existing or future Large Lot Residential/ Rural Residential areas outside of the Coastal Zone. As identified in the aims of the MNCRS, additional development sites outside of growth areas can only be considered if they can satisfy the Sustainability Criteria of the strategy. The MNCRS Sustainability Criteria allow the NSW Government to take a strong position in relation to matters of urban settlement in the Mid North Coast confident in the knowledge that innovative development proposals can still be considered even though they may be outside of the Regional Strategy process. The Sustainability Criteria represent a clear, transparent list of matters that any new proposal will be assessed against. **Appendix B** provides and assessment of the planning proposal against this sustainability criteria.

MNCRS also outlines a number of considerations for the release of land for development. This planning proposal has considered the aims and principles and other requirements outlined in the strategy and, as demonstrated in **Appendix B,** it considered that the future development of the site is consistent with the MNCRS given its small scale and proximity to land that is zoned R5 Large Lot Residential.

4.2.2 Is the planning proposal consistent with the local council's Community Strategic Plan, or other local strategic plan?

Clarence Valley Settlement Strategy 1999

Clarence Valley Council has no specific Large Lot Residential/ Rural Residential Strategy that guides the provision of future large lot residential development within the Clarence Valley LGA. The most current plan that provides guidance on the future zoning and subsequent development of land for large lot residential purposes is the Clarence Valley Settlement Strategy 1999 (CVSS 1999).

The objectives of the CVSS 1999 are to:

- Accommodate future growth in suitable locations so as to minimise social, environmental and economic costs to State and local government, and to the wider community;
- Build strong, self-reliant communities emphasising well-being and lifestyle;
- Acknowledge and protect the natural environment and ecological processes;
- Maintain and enhance biodiversity;
- Preserve and enhance the Clarence Valley's urban, rural and scenic character; and
- Build on the role of Grafton as the sub-regional centre and optimise the level of services offered.

CVSS 1999 states that rural residential settlement will be contained in areas linked to existing settlements which can provide services and community identity and is to be clustered in areas having a direct functional relationship with town or village settlements. The Strategy discourages dispersed residential settlement at locations such as Halfway Creek, Kungala, Lanitza, Whiporie, Ewingar, Seelands, Coaldale, Braunstone, Blaxlands Flat-Kangaroo Creek and Pillar Valley, and dispersed agricultural populations in these and other parts of the Upper Clarence Valley:

The Waterview Heights locality is referenced in the Clarence Valley Settlement Strategy as an area that has the potential to be developed as an urban village. The strategy states that:

"Waterview Heights has the potential to increase services for residents while reducing costs and impacts of development, improving energy and water conservation and maintaining some of the elements of the rural lifestyle. This would entail creating a carefully designed village precinct on undeveloped land north of the Gwydir Highway. A precinct could offer a range of smaller allotments from 700-1000 square metres, and would be designed as a whole to achieve a settlement which is oriented to the natural features of the site, and maximises rural outlook while creating a sense of neighbourhood."

The subject land is not located within the area identified for the potential village precinct and therefore would not frustrate its future development. It is, however, located adjacent to land that is zoned R5 Large Lot Residential which is south of the Gwydir Highway and part of the Waterview Heights large lot residential estate. The subject land is located between land that is already zone R5 Large Lot Residential and it is considered that the rezoning of this land would provide for sustainable infill development through the use of existing road, water, electricity and telecommunication services.

4.2.3 Is the planning proposal consistent with applicable State Environmental Planning Policies?

The following section provides an outline of the State Environmental Planning Policies potentially applicable to the planning proposal and future development of the site and provides commentary on issues to be considered by this Planning Proposal.

State Environmental Planning Policy No 44 - Koala Habitat Protection

State Environmental Planning Policy No. 44 (SEPP 44) was gazetted in January 1995. It encourages the conservation and management of naturally vegetated areas that provide habitat for Koalas to ensure that permanent free-living populations will be maintained over their present range. The policy applies to 106 local government areas. Local councils cannot approve development in an area affected by the policy without an investigation of core Koala habitat. The policy provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of Koalas and their habitat.

A Koala Plan of Management (KPoM) was prepared for the site as part of Development Application No. SUB2011/0059 (refer **Section 1.4** for further details on the subdivision) and also for a future subdivision of Lot 4 which has not been submitted as yet. The status of the KPoM is unclear as it is not referenced in Development Consent No. SUB2011/0059. It is also not attached, by way of a "restriction as to user', to any of the lots created by this subdivision. The KPoM is attached as **Appendix C** and the Ecological assessment for the approved subdivision is attached as **Appendix D**.

The land proposed to be rezoned contains a small patch of vegetation (estimated to consist of less than ten trees) that has been assessed as Potential Koala Habitat (refer **Appendix C**). This vegetation would not require removal as part of any future large lot residential development of the site. The KPoM outlines measures to alleviate the impacts of the proposal to at least maintain the current habitat values of the study area for the Koala.

The KPoM could be updated as part of this planning proposal subject to a successful gateway determination if required by the Department of Planning and Environment and/or Council.

State Environmental Planning Policy No 55 - Remediation of Land

GeoLINK has prepared a Stage 1 Preliminary Site Investigation (PSI) report to assess the likelihood of the subject land being contaminated by past practices. The PSI is attached as **Appendix E** and was required by Clarence Valley Council after initial review of the planning proposal.

The subject land has historically been used for extensive agriculture (cattle grazing). Based on a review of the available desktop data and observations made during an inspection of the site, the PSI has determined that the site is unlikely to have been contaminated by previous land uses and practices. No specific contaminants have been identified onsite as a result of observations made during the site inspection and the searches of the various databases related to land contamination did not reveal any potential for contamination on the site. Locations that previously contained waste material (metal, tyres, wire etc.) did not present signs of contamination. As the waste and rubbish material have been removed and the site remediated, it is considered unlikely that contamination to underlying soils from this waste would present a risk to the surrounding environment. The PSI has therefore determined that the proposed rezoning can proceed without laboratory testing or further investigation.

State Environmental Planning Policy (Rural Lands) 2008

The aims of this Policy are as follows:

- To facilitate the orderly and economic use and development of rural lands for rural and related purposes.
- To identify the Rural Planning Principles and the Rural Subdivision Principles so as to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State.
- To implement measures designed to reduce land use conflicts.
- To identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations.
- To amend provisions of other environmental planning instruments relating to concessional lots in rural subdivisions.

This SEPP provides for the protection of agricultural land that is of State or regional significance. The SEPP contains specific provisions that relate to the assessment of development applications over rural land. Under section 117 of the Act, the Minister has directed that councils exercise their functions relating to local environmental plans in accordance with the Rural Planning Principles contained in the Rural Lands SEPP.

The SEPP contains the following rural planning principles:

a. *The promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas.*
b. *Recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State.*
c. *Recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development.*
d. *In planning for rural lands, to balance the social, economic and environmental interests of the community.*

e. *The identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land.*

f. *The provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities.*

g. *The consideration of impacts on services and infrastructure and appropriate location when providing for rural housing.*

h. *Ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.*

The proximity of the proposed rezoning site to existing large lot residential development and vegetated land offers little or no opportunity for broad acre farming and severely limits the scope of agricultural pursuits on the site, given the potential for future land use conflicts. The vegetated land to the east of the land proposed to be rezoned and the presence of the existing and approved large lot residential development would provide a buffer to any surrounding agricultural activities such as small scale cattle grazing and cropping.

The subject site is currently zone RU2 Rural Landscape under the provision of CVLEP 2011. The site is not mapped as State or regionally significant agricultural land on the NSW Government Mid North Coast Farmland Mapping 2008. It is mapped as other rural land and is adjacent to land mapped as rural residential development.

Given the low capability of the land for agricultural land uses and its proximity to existing large lot residential development and vegetated land, the proposed rezoning is considered to be generally consistent with the rural planning principles contained within this SEPP.

4.2.4 Is the planning proposal consistent with applicable Ministerial Directions (s. 117 directions)?

Directions made under section 117 of the Environmental Planning and Assessment Act 1979, issued on 1 July 2009, which are relevant to the site, are identified and addressed in **Table 4.2** below.

Table 4.2 Section 117 Directions

Direction No.	*Requirements/objectives/relevance*	*Consideration*
1. Employment and Resources		
1.1 Business and Industrial Zones	Not Relevant	The Planning Proposal does not affect land within an existing or proposed business or industrial zone.
No. 1.2 – Rural Zones	A planning proposal must: ■ Not rezone land from a rural zone to a residential, business, industrial, village or tourist zone. ■ Not contain provisions that will increase the permissible density of land within a rural zone (other than land within an existing town or village).	This planning proposal seeks to rezone a small section of land that is located between land zoned and developed as lot residential land. The proposal is not specifically referenced in the CVSS 1999 however the Waterview Heights area is specifically referenced in the strategy as having potential to be developed further as a village. The proposed rezoning would not impact on the development/

Direction No.	Requirements/objectives/relevance	Consideration
	A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Department of Planning that the provisions of the planning proposal that are inconsistent are: a. justified by a strategy which: i. gives consideration to the objectives of this direction; ii. identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), and iii. is approved by the Director-General of the Department of Planning. b. justified by a study prepared in support of the planning proposal which gives consideration to the objectives of this direction, or c. in accordance with the relevant Regional Strategy or Sub-Regional Strategy prepared by the Department of Planning which gives consideration to the objective of this direction, or d. is of minor significance	creation of this village precinct. It would, in fact, assist in its development by providing additional large lot residential land around the precinct area. The proposal is not specifically referenced in the MNCRS however an assessment against the Sustainability Criteria of the Strategy demonstrates that the proposal is consistent with the suggested threshold sustainability Criteria for defining potential development boundaries (refer **Appendix B**) . Given the small amount of land proposed to be rezoned and the fact that the proposal adjoins existing large lot residential land, the proposal provides for infill development and is therefore considered to be of minor significance.
1.3 Mining, Petroleum Production and Extractive Industries	Not relevant	The Planning Proposal would not have the effect of prohibiting the mining of coal or other minerals, production of petroleum, or winning or obtaining of extractive materials.
1.4 Oyster Aquaculture	Not relevant	The Planning Proposal does not seek a change in land use which could result in adverse impacts on a Priority Oyster Aquaculture Area or a “current oyster aquaculture lease in the national parks estate”.
1.5 – Rural Lands	A planning proposal must be consistent with the Rural Planning Principles listed in *SEPP Rural Lands*. A planning proposal may be inconsistent with the terms of this direction only if the	See above in **Section 4.2.3**. The proposal is consistent with the Rural Planning Principles and Rural Subdivision Principles listed in SEPP Rural Lands.

Direction No.	Requirements/objectives/relevance	Consideration
	relevant planning authority can satisfy the Department of Planning that the provisions of the planning proposal that are inconsistent are justified by a strategy which: a. gives consideration to the objectives of this direction; e. identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), and f. is approved by the Director-General of the Department of Planning.	
2. Environment and Heritage		
2.1 Environment Protection Zones	Not applicable	The planning proposal would not impact on any existing environmental protection zones.
2.2 Coastal Protection	Not applicable	The planning proposal does not impact on any land that is within the Coastal protection zone.
2.3 Heritage Conservation	Not applicable	The Planning Proposal is considered to be consistent with this direction.
2.4 Recreation Vehicle Areas	Not applicable	The Planning Proposal does not seek to enable land to be developed for the purpose of a recreation vehicle area within the meaning of the Recreation Vehicles Act 1983.
3. Housing, Infrastructure and Urban Development		
3.1 Residential Zones	This direction applies when a relevant planning authority prepares a planning proposal that will affect land within: a. an existing or proposed residential zone (including the alteration of any existing residential zone boundary); b. any other zone in which significant residential development is permitted or proposed to be permitted.	The proposal is adjacent to existing large lot residential development and seeks to rezone the land to allow for such development. The proposal is not inconsistent with this direction.
3.2 Caravan Parks and Manufactured Home Estates	Not applicable	The Planning Proposal does not affect a caravan park or manufactured home estate.

Direction No.	Requirements/objectives/relevance	Consideration
3.3 Home Occupations	The objective of this direction is to encourage the carrying out of low-impact small businesses in dwelling houses. Planning proposals must permit home occupations to be carried out in dwelling houses without the need for development consent.	The proposal is consistent with this direction.
3.4 Integrating Land Use and Transport	To ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives: ▪ improving access to housing, jobs and services by walking, cycling and public transport; ▪ increasing the choice of available transport and reducing dependence on cars; ▪ reducing travel demand including the number of trips generated by development and the distances travelled, especially by car; ▪ supporting the efficient and viable operation of public transport services; and ▪ providing for the efficient movement of freight.	The proposal adjoins and existing large lot residential area and would utilise an existing sealed road for access to all future lots. The proposal is considered to be consistent with this direction.
3.5 Development Near Licensed Aerodrome	Not Applicable	The Planning Proposal does not seek to create, alter or remove a zone or a provision relating to land in the vicinity of a licensed aerodrome.
3.6 Shooting Ranges	Not applicable	The Planning Proposal does not seek to create, alter or remove a zone or a provision relating to land adjacent to and/or adjoining an existing shooting range.
4. Hazard and Risk		
No.4.1 – Acid Sulfate Soils	To avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.	The site is not within land likely to contain acid sulfate soils.

Direction No.	Requirements/objectives/relevance	Consideration
4.2 Mine Subsidence and Unstable Land	Not applicable	The Planning Proposal is not within a designated mine subsidence district and is not identified as being unstable.
4.3 Flood Prone Land	Not applicable	The site is not subject to flooding
4.4 Planning for Bushfire Protection	A planning proposal must: a. have regard to Planning for Bushfire Protection 2006, b. introduce controls that avoid placing inappropriate developments in hazardous areas, and c. ensure that bushfire hazard reduction is not prohibited within the APZ.	The Planning Proposal is considered to be consistent with this direction. The land subject of this planning proposal is not mapped as being bushfire prone land on Council's bushfire prone land mapping. However the site is adjacent to vegetated land that would create a bushfire risk for future large lot residential development. As part of this Planning Proposal consultation would be undertaken with the NSW Rural Fire Service subsequent to gateway determination being issued and prior to undertaking community consultation.
5. Regional Planning		
No. 5.1 – Implementation of Regional Strategies	Planning proposals must be consistent with a regional strategy released by the Minister for Planning.	The proposal is subject to the Mid North Coast Regional Strategy. MNCRS does not identify the site as a growth area, a proposed future urban release area or proposed employment lands. The land falls within the "environmental assets and rural land, national parks and state forests" land use category. The strategy however does not identify any existing or future large lot residential areas outside of the Coastal Zone. The planning proposal is therefore not inconsistent with the Regional Strategy. MNCRS requires that additional development sites outside of growth areas should only be considered if they can satisfy the Sustainability Criteria of the strategy. **Appendix B** of the planning proposal provides and assessment of the planning proposal against this sustainability criteria.
5.2 Sydney Drinking Water Catchment	Not applicable	The Planning Proposal is not within the Sydney Drinking Water Catchment.

Direction No.	Requirements/objectives/relevance	Consideration
No. 5.3 – Farmland of State and Regional Significance on the NSW Far North Coast	Not applicable	The site is not identified as being regionally significant farmland.
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	Not applicable	This direction does not apply to the Planning Proposal.
5.8 Second Sydney Airport: Badgerys Creek	Not applicable	This direction does not apply to the Planning Proposal.
5.9 North West Rail Link Corridor Strategy	Not applicable	This direction does not apply to the Planning Proposal.
6. Local Plan Making		
6.1 Approval and Referral Requirements	Not applicable	The Planning Proposal does not include provisions that require the concurrence, consultation or referral of development applications to a minister or public authority and does not identify development as designated development.
6.2 Reserving Land for Public Purposes	Not applicable	This direction does not apply to the Planning Proposal.
6.3 Site Specific Provisions	Not applicable	The Planning Proposal is considered to be consistent with this direction. The proposal does not intend to amend another environmental planning instrument in order to allow a particular development proposal to be carried out. The planning proposal does not refer to drawings for any such development.

Direction No.	Requirements/objectives/relevance	Consideration
7. Metropolitan Planning		
7.1 Implementation of the Metropolitan Plan for Sydney 2036	Not applicable	This direction does not apply to the Planning Proposal.

4.3 Environmental, Social and Economic Impact

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

The site was previously subject to an application for subdivision (approved under Development Consent SUB2011/0059). A flora and fauna survey and impact assessment (GeoLINK 2011) was prepared to accompany a development application (refer **Appendix D**). The purpose of this assessment was to:

- provide baseline data on the ecological attributes of the site via intense ecological survey;
- identify any ecological constraints for the proposed developments;
- identify opportunities to avoid or mitigate potential impacts;
- address the following legislation in relation to native flora and fauna:
  - *Environmental Planning and Assessment Act 1979 (EP&A Act);*
  - *Threatened Species Conservation Act 1995 (TSC Act);*
  - *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act); and*
  - *State Environmental Planning Policy (SEPP) 44 – Koala Habitat Protection.*

The flora and fauna survey and impact assessment found that the study area and surrounding properties have experienced an extensive disturbance history due to agricultural and rural-residential development. The local landscape now comprises a mosaic of cleared grazing land, rural-residential development and forest/ woodland. Three vegetation communities were identified on the site: Pastoral Grassland, Spotted Gum Forest and Aquatic Dam Vegetation. No threatened flora species or EECs listed under the TSC Act or EPBC Act were recorded or considered likely occurrences on or directly adjacent to the site.

Three threatened fauna species were recorded during the survey: the Koala, Grey-headed Flying-fox and the Little Bent-wing bat. Fifteen other threatened fauna species listed under the TSC Act were variably considered potential occurrences. A SEPP 44 Koala Habitat Assessment identified the site as SEPP 44 Potential Koala Habitat. A subsequent Core Koala Habitat assessment was undertaken. Review of local records found scattered Koala records in the Waterview Heights area. While no Koalas were directly recorded during the previous survey, Koala scats (and scratches) were detected across the study area at varying intensities indicating variable levels of Koala activities from low and no activity, to medium and high levels of activity. The areas indicating medium and high levels of Koala activity were located in the large stand of Spotted Gum forest on the subject lot. Overall it was

found that the study area supports a core part of local Koala/s range, and constitutes core Koala habitat as defined under SEPP 44. A Koala Plan of Management was therefore prepared to accompany the Development Application (Refer **Appendix C**). The status of the KPoM is unclear as it is not referenced in Development Consent No. SUB2011/0059. It is also not attached, by way of a "restriction as to user', to any of the lots created by this subdivision.

The area of the site proposed for rezoning comprises mostly cleared grazing land, with the main area of habitat in the study area being retained in the existing RU2 Rural Landscape zone. Despite an extensive disturbance history, the previous ecological study found that the Spotted Gum forest still retained some ecological values for the Koala and mobile and somewhat habitat generalist threatened fauna. Key habitat features on the site include Koala browse species and three hollow-bearing trees.

The main ecological impacts of the planning proposal would be associated with removal of scattered pastoral grassland trees and associated small patches of forest and would likely cause minimal loss of vegetation and habitat. The other main potential impacts of the proposal are generally low risk, existing threats which would not be significantly increased (e.g. traffic collision), minor in nature (e.g. erosion and sedimentation impact) and/or can be readily mitigated against (e.g. domestic pet predation). A range of mitigation measures would be provided to minimise the impacts of any future development of the land on local biodiversity. The approximately 44 ha of Spotted Gum forest in the remainder of the study area, would be retained and would not be directly affected by the Planning Proposal.

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

Aboriginal Heritage

A search of the Aboriginal Heritage Information Management System (AHIMS) indicated that there are no Aboriginal objects or places registered with the Office of Environment and Heritage, NSW. In addition, most of the site is cleared of vegetation and has been highly disturbed from past agricultural practices. It is considered unlikely that the rezoning and development of the site would impact on Aboriginal Cultural Heritage.

European Heritage

Heritage database searches and CVC 2011 revealed that no items of non-Indigenous/ European heritage significance are known within or immediately adjacent to the subject site. No impacts are anticipated.

Contamination

A PSI was prepared to determine the likelihood of site being contaminated from previous land uses and practices (refer **Appendix E**). The subject land has historically been used for cattle grazing. Based on an analysis of historical photographs and previous use, the PSI has determined that it is unlikely that any source of contamination would have impacted on the site. Searches of relevant databases indicate that the site or adjacent sites are not affected by contamination (refer **Section 4.2.3**).

Visual Amenity

Impacts of the Planning Proposal would be minor. Future development of the site would involve removal of some vegetation, yet this would be minor and considering that any trees that may potentially be removed make up pastoral woodland, are relatively sparse and are not combined with understory bushland, the removal of such trees would have a negligible visual impact. The creation of additional residential large lots would not constitute significant change in terms of visual impacts on the Waterview Heights estate or the surrounding rural areas. Considering the presence and nature of surrounding rural and rural residential development, further rural residential development in this area would be appropriate and be consistent with the character of the area.

Cumulative Impacts

The proposed future development of the land has the potential to result in cumulative environmental effects with other existing or likely future development and activities, however the effects would be negligible due to the limited scope of works and the existing disturbed state of the site. In addition, potential impacts on the environment would be minimised with the effective implementation of the safeguards and mitigation measures required under a future development application.

4.3.3 How has the planning proposal adequately addressed any social and economic effects?

The Planning Proposal is not expected to generate any significant adverse social or economic impacts. The proposal will enable a minor expansion (10 lots) to the existing Waterview Heights large lot residential estate.

4.4 State and Commonwealth Interests

4.4.1 Is there adequate public infrastructure for the planning proposal?

The site is adjacent to the Waterview Heights large lot residential area west of Grafton. The estate does not have reticulated sewer. The estate is serviced by a sealed road, reticulated water and electricity and telecommunication infrastructure. The land proposed for rezoning would be accessed via Hampton Road which is sealed and would connect to existing electrical and telecommunication infrastructure.

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

This section of the planning proposal will be completed following consultation with the State and Commonwealth Public Authorities identified in the gateway determination. This section will summarise any issues raised by public authorities not already dealt with in the planning proposal, and will address issues as required.

Public authorities expected to be consulted on the Planning Proposal are:

- NSW Office of Environment and Heritage;
- NSW Rural Fire Service;
- Telstra; and
- Essential Energy.

5. Community Consultation (Part 4)

The Planning Proposal is considered to be low impact as described in *A Guide to Preparing Local Environmental Plans* (Department of Planning, 2009) and would be made publically available for 28 days. Consultation would occur in accordance with any Gateway Determination.

6. Conclusions and Recommendations

This proposal is to rezone part of Lot 5 DP 1179232 from RU2 Rural Landscape to R5 Large Lot Residential, to enable subdivision of the site into an estimated 10 large residential lots. The site is located adjacent to the existing Waterview Heights large lot residential estate and is not inconsistent with the Clarence Valley Settlement Strategy 1999.

An analysis of potential environmental constraints to rezoning the subject land include a Flora and Fauna Survey and Impact Assessment and Koala Plan of Management which were prepared as part of a previous subdivision of the land. The results of this analysis indicate that part of the site is suitable for rezoning and development. The Planning Proposal is also generally consistent with strategic and statutory planning framework that applies to the site.

The objective of the Planning Proposal is to rezone part of Lot 5 DP 1179232 from RU2 Rural Landscape to R5 Large Lot Residential. The rezoning is considered the most appropriate way for the proposal to proceed.

Simon Waterworth

Senior Planner / Principal

References

GeoLINK, (2011) *Ecological Assessment Old Glen Innes Road Subdivision – Stage 1 of 2*, GeoLINK Coffs Harbour

GeoLINK, (2011) *Koala Plan of Management Old Glen Innes Road Subdivision – Stage 1 of 2*, GeoLINK Coffs Harbour

GeoLINK, (2011) *Statement of Environmental Effects Old Glen Innes Road Subdivision – Stage 1 of 2*, GeoLINK Coffs Harbour

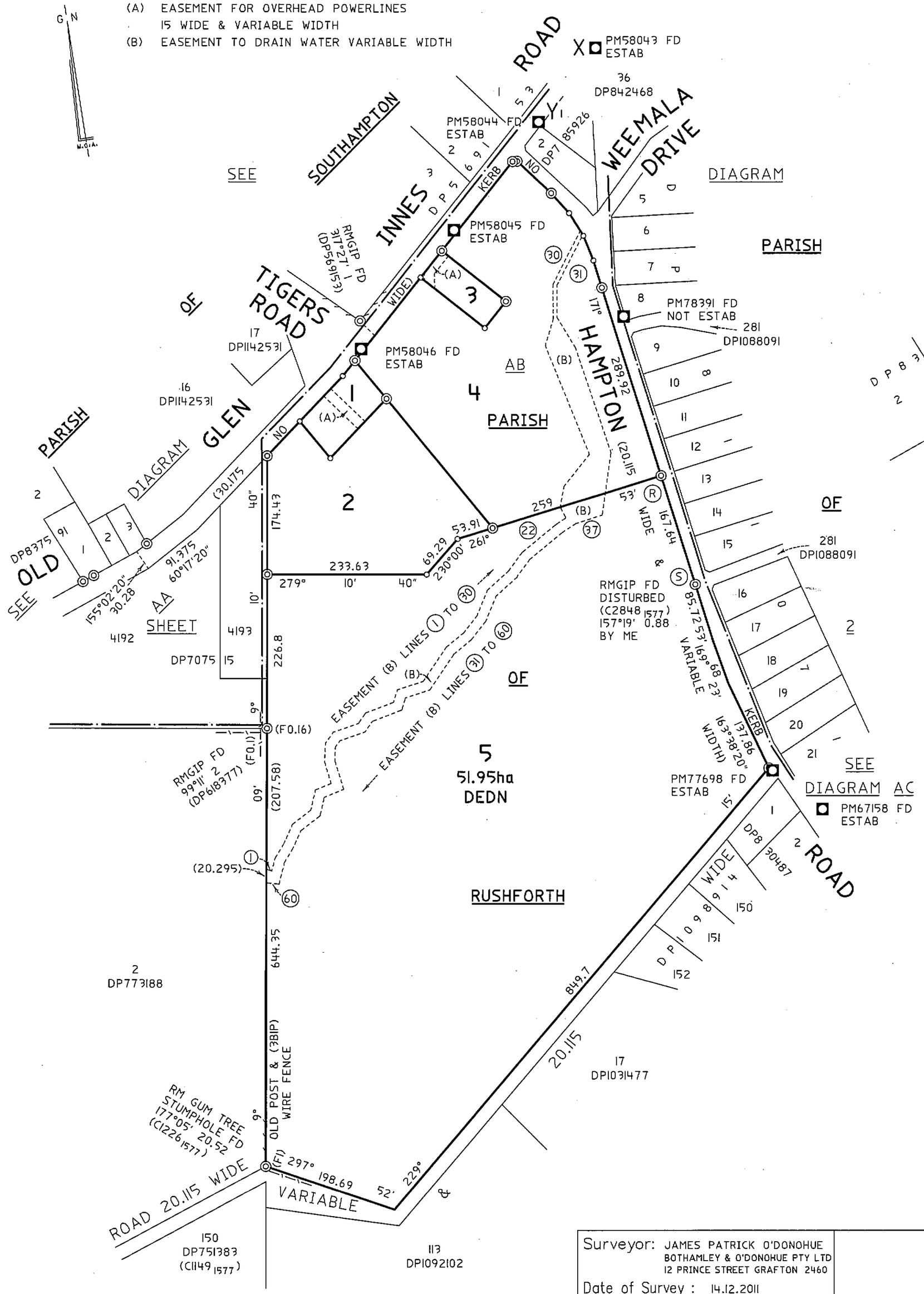
Parliamentary Counsels Office, (2015) Government of New South Wales Legislation home page, [Online]. Available: http://www.legislation.nsw.gov.au. [Accessed March 2015]

Copyright and Usage

Appendix A

Registered Plan of Subdivision

(A) EASEMENT FOR OVERHEAD POWERLINES 15 WIDE & VARIABLE WIDTH
(B) EASEMENT TO DRAIN WATER VARIABLE WIDTH



CLAUSE 43 CONNECTIONS

PM58043 TO COR (R): 183°39'20" 670.82
PM67158 TO COR (S): 339°21'10" 383.46

DIAGRAM AA
RR 1:1000

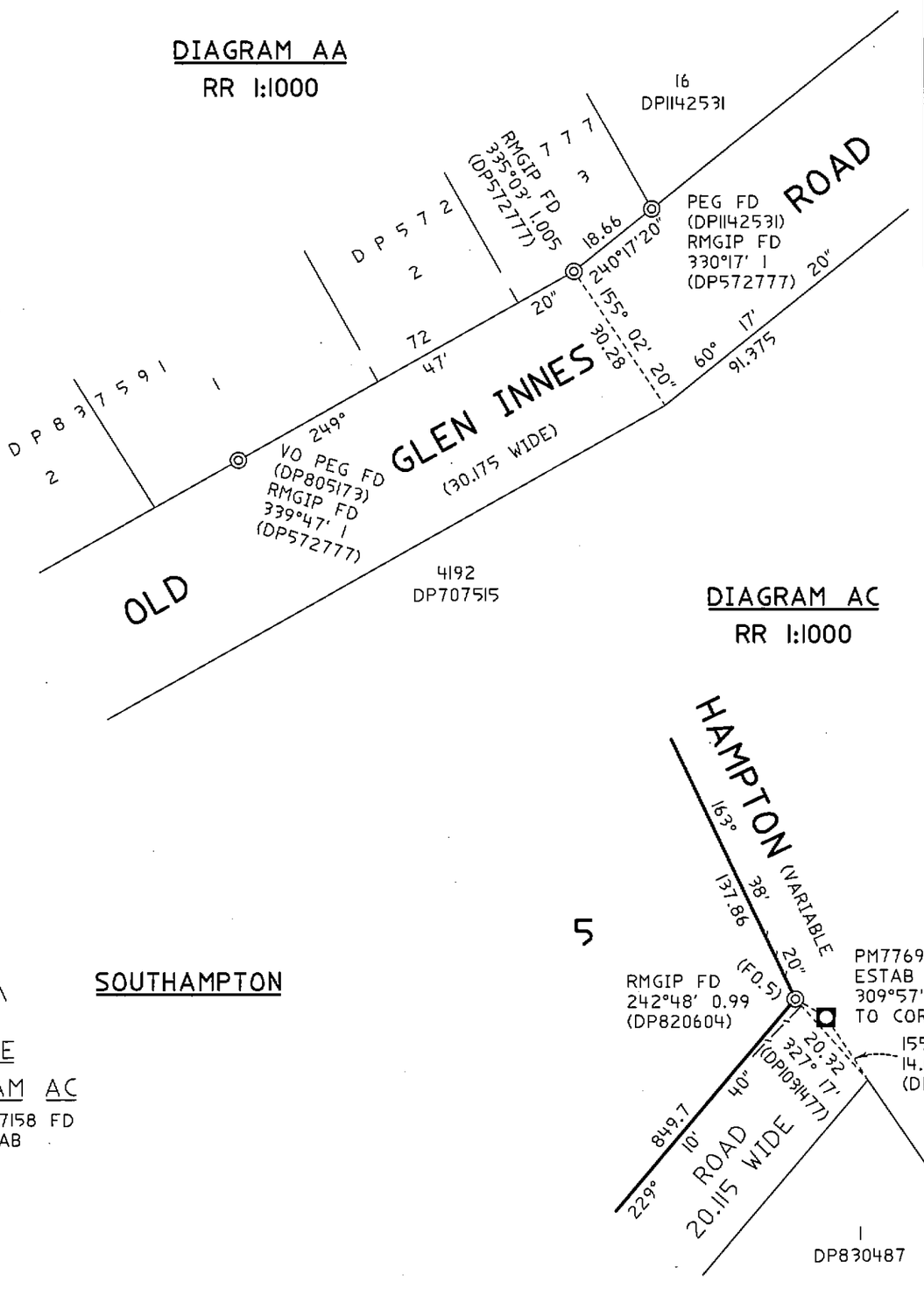
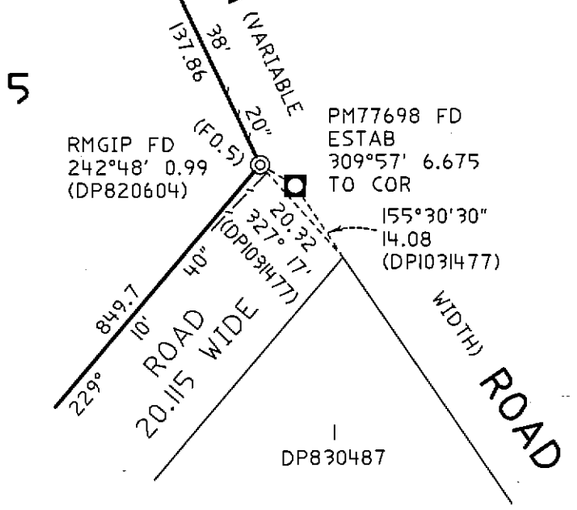


DIAGRAM AC
RR 1:1000



CLAUSE 35(1)(b) & CLAUSE 61(2) OF THE SURVEYING & SPATIAL INFORMATION REGULATION 2006

MARK	MGA EASTING	MGA NORTHING	CLASS	ORDER	METHOD	ORIGIN
PM58043	487233.476	6716082.911	B	2		SCIMS
PM58044	487097.241	6715956.397	B	2		SCIMS
PM58045	486949.108	6715818.832	B	2		SCIMS
PM58046	486786.720	6715667.989	B	2		SCIMS
PM67158	487349.570	6714889.189	B	2		SCIMS
PM77698	487282.952	6714959.725	B	2		SCIMS
PM78391	487189	6715725	U	U		SCIMS

MGA COORDINATES ADOPTED FROM SCIMS AS AT 16TH JANUARY, 2012 ZONE 56
COMBINED SCALE FACTOR = 0.999586
ALL DISTANCES SHOWN ARE GROUND DISTANCES

X-Y:	PM58043 TO PM58044:	227°07'08" 185.996 ME & MGA
	PM58044 TO PM58045:	227°07'09" 202.245 ME 227°07'06" 202.241 MGA
	PM58045 TO PM58046:	227°06'40" 221.716 ME 227°06'39" 221.730 MGA
	PM58043 TO PM78391:	187°47'19" 433.184
	PM78391 TO PM77698:	171°08'43" 702.845
	PM58043 TO PM77698:	177°28'42" 1124.745 ME 177°28'40" 1124.741 MGA
	PM77698 TO PM67158:	136°38'30" 97.063 ME 136°38'11" 97.062 MGA
	PM67158 TO PM58046:	324°08'44" 961.302 ME 324°08'38" 961.298 MGA

SCHEDULE OF EASEMENT(B) LINES

LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE
1	117° 24'	8.92	16	42° 50' 20"	60.59	31	216° 00' 40"	83.41	46	260° 55'	37.625
2	23° 00'	19.515	17	59° 14'	33.245	32	188° 53' 20"	48.16	47	205° 51'	18.655
3	40° 08'	24.535	18	47° 04'	31.415	33	158° 00' 40"	51	48	258° 02'	46.33
4	32° 51'	31.555	19	31° 19'	40.985	34	170° 35'	163.32	49	223° 27'	18.995
5	61° 05'	33.975	20	56° 49'	42.035	35	197° 21'	60.36	50	259° 47'	38.78
6	21° 50'	30.415	21	44° 59'	33.43	36	197° 21'	32.23	51	224° 19'	10.955
7	76° 20'	24.79	22	59° 19' 40"	64.69	37	260° 54' 40"	40.57	52	190° 27'	21.305
8	352° 07'	31.965	23	65° 39'	17.615	38	245° 39'	24.33	53	172° 07'	43.1
9	10° 27'	28.29	24	341° 52'	17.765	39	239° 19' 40"	61.97	54	256° 20'	30.62
10	44° 19'	20.32	25	18° 50'	30.86	40	224° 59'	33.1	55	201° 50'	28.035
11	79° 47'	38.655	26	47° 31' 40"	60.33	41	236° 49'	40.195	56	241° 05'	35.55
12	43° 27'	18.745	27	347° 18'	172.41	42	211° 19'	39.665	57	212° 51'	28.735
13	78° 02'	43.655	28	25° 54'	40.23	43	227° 04'	35.085	58	220° 08'	23.23
14	25° 51'	19.13	29	8° 52' 20"	52	44	239° 14'	32.685	59	203° 00'	33.45
15	80° 55'	40.265	30	36° 00' 40"	88.48	45	222° 50' 20"	63.6	60	284° 34'	19.245

Surveyor: JAMES PATRICK O'DONOHUE
BOTHAMLEY & O'DONOHUE PTY LTD
12 PRINCE STREET GRAFTON 2460
Date of Survey: 14.12.2011
Surveyor's Ref: 9689 CHECKLIST

PLAN OF SUBDIVISION OF LOT 2411 IN DP709698 & LOT 9 IN DP820604

LGA: CLARENCE VALLEY
Locality: WATERVIEW HEIGHTS
Subdivision No: SUBCT 2012/0049
Lengths are in metres. Reduction Ratio 1 : 5000

Registered 5.10.2012

DP1179232 P

(A) EASEMENT FOR OVERHEAD POWERLINES 15 WIDE & VARIABLE WIDTH
(B) EASEMENT TO DRAIN WATER VARIABLE WIDTH
(BI) BRICK COTTAGE & TILE ROOF NO. 73
(B2) CONCRETE BLOCK & METAL SHED
(R) RESTRICTION ON THE USE OF LAND - DP709698

DIAGRAM AB
RR 1:2000

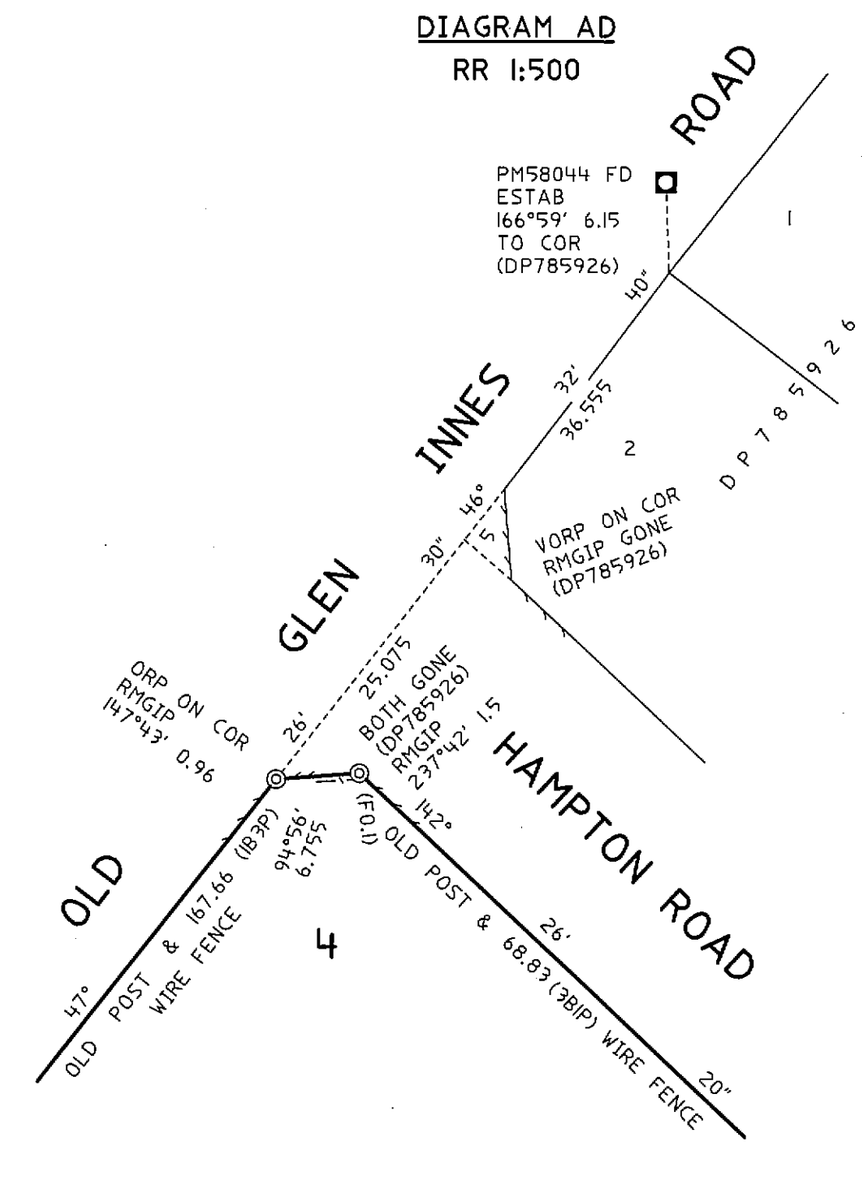
SCHEDULE OF EASEMENT (A) LINES

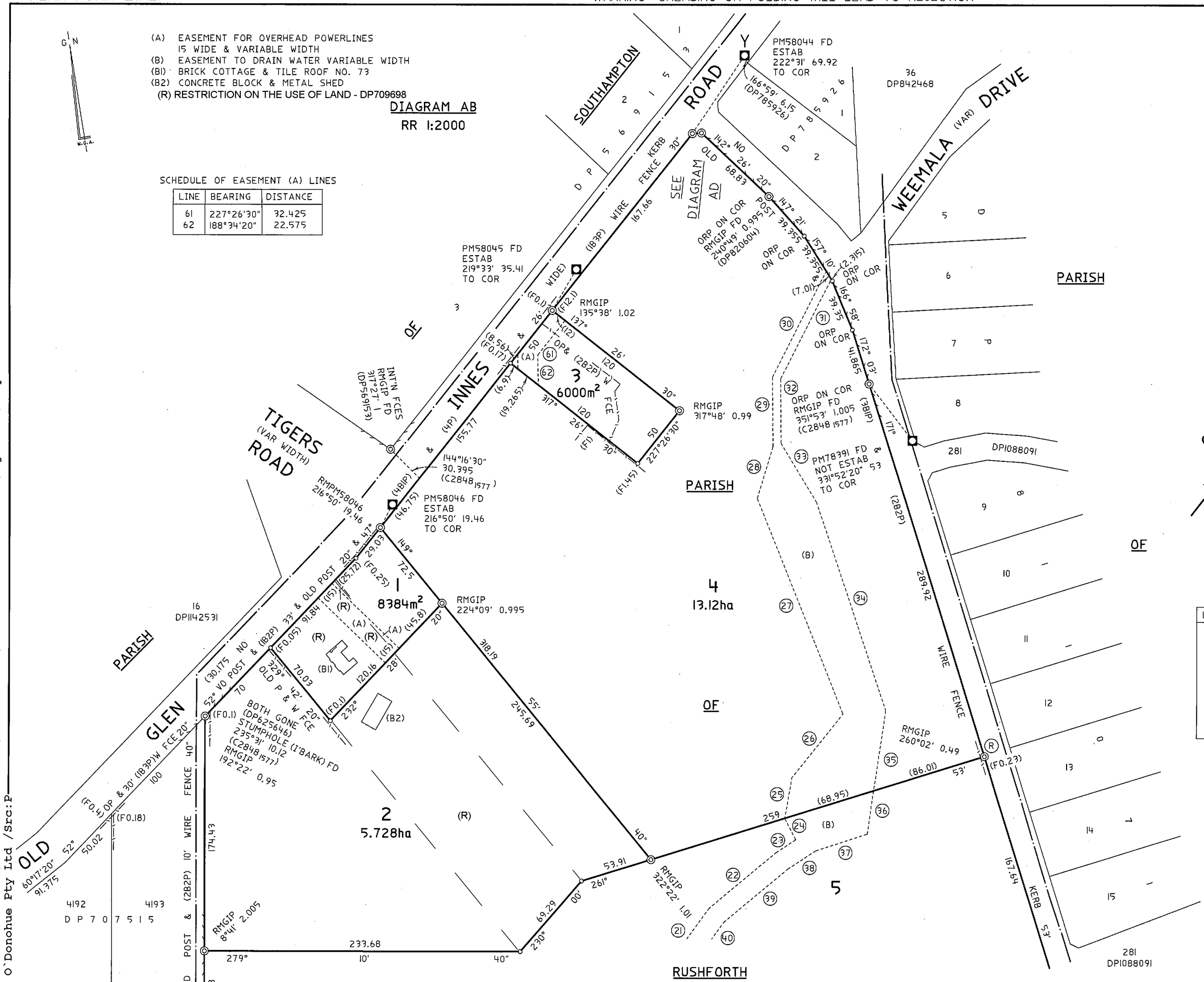
LINE	BEARING	DISTANCE
61	227°26'30"	32.425
62	188°34'20"	22.575

SCHEDULE OF EASEMENT(B) LINES

LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE
21	44° 59'	33.43	31	216° 00' 40"	83.41
22	59° 19' 40"	64.69	32	188° 53' 20"	48.16
23	65° 39'	17.615	33	158° 00' 40"	51
24	341° 52'	17.765	34	170° 35'	163.32
25	18° 50'	30.86	35	197° 21'	60.36
26	47° 31' 40"	60.33	36	197° 21'	32.23
27	347° 18'	172.41	37	260° 54' 40"	40.57
28	25° 54'	40.23	38	245° 39'	24.33
29	8° 52' 20"	52	39	239° 19' 40"	61.97
30	36° 00' 40"	88.48	40	224° 59'	33.1

DIAGRAM AD
RR 1:500





Surveyor: JAMES PATRICK O'DONOHUE, BOTHAMLEY & O'DONOHUE PTY LTD, 12 PRINCE STREET GRAFTON 2460 Date of Survey : 14.12.2011 Surveyor's Ref : 9689 CHECKLIST	PLAN OF SUBDIVISION OF LOT 2411 IN DP709698 & LOT 9 IN DP820604	LGA: CLARENCE VALLEY Locality : WATERVIEW HEIGHTS Subdivision No: SUBCT 2012/0049 Lengths are in metres. Reduction Ratio 1 :	Registered 5.10.2012	DP1179232

DEPOSITED PLAN ADMINISTRATION SHEET

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919 AS AMENDED IT IS INTENDED TO CREATE:-

1. EASEMENT FOR OVERHEAD POWERLINES 15 WIDE & VARIABLE WIDTH
2. RESTRICTION(S) ON THE USE OF LAND
3. EASEMENT TO DRAIN WATER VARIABLE WIDTH
4. EASEMENT TO DRAIN WATER VARIABLE WIDTH

Use PLAN FORM 6A
for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

I.....in approving this plan certify
(Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown herein have been given

Signature:.....
Date:.....
File Number:.....
Office:.....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed.....SUBDIVISION.....set out herein
(insert 'subdivision' or 'new road')

Mindi Naylor
.....
* Authorised Person/~~General Manager/Accredited Certifier~~

Consent Authority:.....CLARENCE VALLEY COUNCIL.....
Date of Endorsement: ...7 September 2012.....
Accreditation no: .....
Subdivision Certificate no: SUBD2012/00049.....
File no: GS11/0059.....

* Delete whichever is inapplicable.

DP1179232 S

Registered: 5.10.2012

Title System: TORRENS

Purpose: SUBDIVISION

PLAN OF SUBDIVISION OF
LOT 2411 IN DP709698 &
LOT 9 IN DP820604

LGA:	CLARENCE VALLEY
Locality:	WATERVIEW HEIGHTS
Parish:	RUSHFORTH
County:	CLARENCE

Surveying & Spatial Information Regulation, 2006

I, JAMES PATRICK O'DONOHUE
of BOTHAMLEY & O'DONOHUE PTY LTD
12 PRINCE STREET GRAFTON NSW 2460
a surveyor registered under the *Surveying and Spatial Information Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying and Spatial Information Regulation, 2006* and was completed on: 14.12.2011

The survey relates to LOTS 1, 2, 3 & 4
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature .....*Dated:* 31.01.2012
Surveyor registered under the Surveying Act, 2002

Datum Line: X - Y
Type: ~~Urban~~/Rural

Plans used in the preparation of survey/compilation

$C2848_{1577}$	DP572777	DP625646
DP709698	DP785926	DP811071
DP820604	DP1031477	DP1142531

(if insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE: 9689 CHECKLIST

* OFFICE USE ONLY

DEPOSITED PLAN ADMINISTRATION SHEET

PLAN OF SUBDIVISION OF
LOT 2411 IN DP709698 &
LOT 9 IN DP820604

DP1179232

Registered: 5.10.2012

* OFFICE USE ONLY

Subdivision Certificate No: Subdct 2012/0049

Date of Endorsement: 7 September 2012

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

a.j. milligan

Wendy K Good
Raymond Good

SUNCORP METWAY LTD ABN 66 010 831 722
BY ITS DULY CONSTITUTED ATTORNEY
UNDER POWER OF ATTORNEY
BOOK 3859 No. 372

DEBRA ENID MULLIGAN LEVEL 1

WITNESS:
ANITA KEARNS
36 WICKHAM TCE.,
BRISBANE QLD 4000.

SURVEYOR'S REFERENCE: 9689 CHECKLIST

Instrument setting out terms of Easements or Profits à Prendre intended to be created or released and of Restrictions on the Use of Land or Positive Covenants intended to be created pursuant to Section 88B Conveyancing Act 1919

DP1179232 B

Subdivision of Lot 2411 in DP709698 comprised in Folio Identifier 2411/709698 and Lot 9 in DP820604 comprised in Folio Identifier 9/820604 and covered by Subdivision Certificate No. 20121004 of 7.09.2012

Full name and address of the owner of the land:

RAYMOND CHARLES GOOD & WENDY KAY GOOD of 73 Old Glen Innes Road Waterview Heights as to the land in Folio Identifier 2411/709698 and AUDREY JOAN MILLIGAN of 49 Old Glen Innes Road Waterview Heights as to the land in Folio Identifier 9/820604

PART 1 (CREATION)

Number of item shown in the intention panel on the plan	Identity of easement, profit à prendre, restriction or positive covenant to be created and referred to in the plan	Burdened lot(s) or parcel(s):	Benefited lot(s), road(s), bodies or Prescribed Authorities
1	Easement for overhead powerlines 15 wide and variable width	Lots 1 & 3	Essential Energy
2	Restriction(s) on the Use of Land	Lot 4	Clarence Valley Council
3	Easement to drain water variable width	Lot 5	Clarence Valley Council Lots 1 2 3 & 4
4	Easement to drain water variable width	Lot 4	Clarence Valley Council Lot 3

A.J. Milligan

Instrument setting out terms of Easements or Profits à Prendre intended to be created or released and of Restrictions on the Use of Land or Positive Covenants intended to be created pursuant to Section 88B Conveyancing Act 1919

Plan:

DP1179232

Subdivision of Lot 2411 in DP709698 comprised in Folio Identifier 2411/709698 and Lot 9 in DP820604 comprised in Folio Identifier 9/820604 and covered by Subdivision Certificate No. 2012/0049 of 7.09.2012

PART 2 (TERMS)

Terms of Easement, profit à pendre, restriction or positive convenant numbered 1 in the plan.

Terms of Easement for Overhead Powerlines 15 wide and variable width

Easement for Overhead Powerlines the terms of which are set out in Part A of Memorandum AG189384 as registered at Land and Property Information, NSW.

Terms of Easement, profit à pendre, restriction or positive convenant numbered 2 in the plan.

Terms of Restriction(s) on the Use of Land

Direct access from Lot 4 to Old Glen Innes Road is prohibited without the prior written consent of Clarence Valley Council.

A.J. Milligan.

Instrument setting out terms of Easements or Profits à Prendre intended to be created or released and of Restrictions on the Use of Land or Positive Covenants intended to be created pursuant to Section 88B Conveyancing Act 1919

DP1179232

Subdivision of Lot 2411 in DP709698 comprised in Folio Identifier 2411/709698 and Lot 9 in DP820604 comprised in Folio Identifier 9/820604 and covered by Subdivision Certificate No. 2012/0049 of 7.09.2012

Signed in my presence by)
Raymond Charles Good)
Who is personally known to me)

Raymond C Good

Witness

DAVID McARTHUR MILLER
Solicitor
82 Victoria Street, Grafton

Signed in my presence by)
Wendy Kay Good)
Who is personally known to me)

Wendy K Good

Witness

DAVID McARTHUR MILLER
Solicitor
82 Victoria Street, Grafton

Signed in my presence by)
Audrey Joan Milligan)
Who is personally known to me)

A J Milligan

Witness

DAVID McARTHUR MILLER
Solicitor
82 Victoria Street, Grafton

Instrument setting out terms of Easements or Profits à Prendre intended to be created or released and of Restrictions on the Use of Land or Positive Covenants intended to be created pursuant to Section 88B Conveyancing Act 1919

DP1179232

Subdivision of Lot 2411 in DP709698 comprised in Folio Identifier 2411/709698 and Lot 9 in DP820604 comprised in Folio Identifier 9/820604 and covered by Subdivision Certificate No. 2012/0049 of 7.09.2012

Executed by the Mortgagee:

SIGNED in my presence for and on behalf of
SUNCORP-METWAY LIMITED
ACN by its
Duly constituted Attorney

SUNCORP METWAY LTD ABN 66 010 831 722
BY ITS DULY CONSTITUTED ATTORNEY
UNDER POWER OF ATTORNEY,
BOOK 3859 No. 372

DEBRA ENID MULLIGAN LEVEL 1

Under Power of Attorney No.
In the presence of:

Signature of witness

Signature of attorney

Name of witness – please print

ANITA KEARNS

Address of witness 36 WICKHAM TCE,
BRISBANE QLD 4000

REGISTERED 5.10.2012

Appendix B

Assessment Against MNCRS Sustainability Criteria

Table B1 Assessment against MNCRS Sustainability Criteria

Sustainability Criteria	*Measurable explanation of criteria*	*Assessment*	*Location in Planning Proposal*
1.Infrastructure Provision Mechanisms in place to ensure utilities, transport, open space and communication are provided in a timely and efficient way	■ Development is consistent with the Mid North Coast Regional Strategy, any sub-regional strategy, the State Infrastructure Strategy and relevant section 117 directions. ■ The provision of infrastructure (utilities, transport, open space and communications) is costed and economically feasible based on Government methodology for determining infrastructure development contributions. ■ Preparedness to enter into development agreement.	■ The site is not specifically identified as being a "Proposed Future Urban Release Area" in the Growth Areas Map No. 2 – Clarence South. The reason for this, however, is that the MNCRS did not identify any existing or future Large Lot Residential/ Rural Residential areas outside of the Coastal Zone. It considered that the future development of the site is consistent with the MNCRS given its small scale and proximity to land that is zoned R5 Large Lot Residential. ■ The site is serviced by a sealed road, reticulated water and electricity and telecommunication infrastructure. The site is not connected to reticulated sewer however its development would not require connection to reticulated sewer. The planning proposal would utilise existing infrastructure (sealed road, water, power and telecommunications) without the need for upgrade. ■ No planning or development agreement would be required as a result of the proposal given its small scale.	■ Section 4.2.2 ■ Section 4.1.4, Section 4.2.4, Section 4.4.1 ■ Not applicable
2. Access Accessible transport options for efficient and sustainable travel between homes, jobs, services and recreation to be existing or provided	■ Accessibility of the area by public transport and/or appropriate road access in terms of: – Location/land use – to existing networks and related activity centres. – Network – the area's potential to be serviced by economically efficient transport services. – Catchment – the area's ability to contain, or form part of the larger urban area which contains adequate transport services. Capacity for land use/transport patterns to make a positive contribution to achievement of travel and vehicle use goals. ■ No net negative impact on performance of existing subregional road, bus, rail, ferry and freight network	■ The proposal adjoins and existing established large lot residential area. All future lots would front Hampton Road which is an existing sealed road. ■ It would not impact upon or require any substantial upgrades to roads, footpaths, cycleways or other transport services.	■ Section 4.1.4 ■ Section 4.2.4

Sustainability Criteria	*Measurable explanation of criteria*	*Assessment*	*Location in Planning Proposal*
3. Housing Diversity Provide a range of housing choices to ensure a broad population can be housed	■ Contributes to the geographic market spread of housing supply, including any government targets established for aged, disabled or affordable housing	■ The proposal provides for approximately 10 additional lots that would be serviced by existing infrastructure (sealed road, water, power and telecommunications). This minor adjustment would simply provide for infill development and would not have a significant impact on the supply of large lot residential land.	■ Section 4.1.4
4. Employment Lands Provide regional/local employment opportunities to support the Mid North Coast's expanding role in the wider regional and NSW economies	■ Maintain or improve the existing level of subregional employment self-containment. ■ Meets subregional employment projections. ■ Employment related land is provided in appropriately zoned areas.	Not applicable to the Planning Proposal	Not applicable
5. Avoidance of Risk Land use conflicts, and risk to human health and life, avoided	■ No residential development within 1:100 floodplain. ■ Avoidance of physically constrained land, e.g. – High slope. – Highly erodible. ■ Avoidance of land use conflicts with adjacent existing or future land use as planned under relevant subregional or regional strategy. ■ Where relevant available safe evacuation route (flood and bushfire).	■ No residential development is proposed on flood liable land. ■ The site does not contain land that his steep or highly erodible and is generally free of other environmental constraints. ■ The proposal would not create or exacerbate any land use conflicts.	
6. Natural Resources Natural resource limits not exceeded / environmental footprint minimised	■ Demand for water within infrastructure capacity to supply water and does not place unacceptable pressure on environmental flows. ■ Demonstrates most efficient/suitable use of land. – Avoids identified significant agricultural land	■ Waterview Estate is currently serviced by reticulated water and there is sufficient capacity to service the additional lots that would be created from this proposal. No additional riparian access rights would be created as a result of the proposal.	■ Section 4.1.4 ■ Section 4.2.2 ■ Section 4.2.2.

Sustainability Criteria	*Measurable explanation of criteria*	*Assessment*	*Location in Planning Proposal*
	– Avoids productive resource lands – extractive industries, coal, gas and other mining, and quarrying. ■ Demand for energy does not place unacceptable pressure on infrastructure capacity to supply energy – requires demonstration of efficient and sustainable supply solution.	■ The subject land is located between land that is already zone R5 Large Lot Residential and it is considered that the rezoning of this land would provide for sustainable infill development through the use of existing road, water, electricity and telecommunication services. ■ Waterview Estate is currently serviced by reticulated electricity and there is sufficient capacity to service the additional lots that would be created from this proposal.	
7. Environmental Protection Protect and enhance biodiversity, air quality, heritage, and waterway health	■ Consistent with government approved Regional Conservation Plan (if available). ■ Maintains or improves areas of regionally significant terrestrial and aquatic biodiversity (as mapped and agreed by DECC). This includes regionally significant vegetation communities, critical habitat, threatened species, populations, ecological communities and their habitats. ■ Maintain or improve existing environmental condition for air quality. ■ Maintain or improve existing environmental condition for water quality: – Consistent with community water quality objectives for recreational water use and river health (DECC and CMA). – Consistent with catchment and stormwater management planning (CMA and council). ■ Protects areas of Aboriginal cultural heritage value (as agreed by DECC).	■ No Applicable ■ The proposal would not result in the removal of any regionally significant vegetation communities, critical habitat, threatened species, populations, ecological communities and their habitats. ■ The proposal would not impact on air quality. ■ The proposal would not impact on existing water quality. ■ A search of the Aboriginal Heritage Information Management System (AHIMS) indicated that there are no Aboriginal objects or places registered with the Office of Environment and Heritage, NSW. In addition, most of the site is cleared of vegetation and has been highly disturbed from past agricultural practices. It is considered unlikely that the rezoning and development of the site would impact on Aboriginal Cultural Heritage	■ Not Applicable ■ Section 4.3.1 and Appendix B and C ■ Section 4.3 ■ Section 4.3 ■ Section 4.3.2

Sustainability Criteria	*Measurable explanation of criteria*	*Assessment*	*Location in Planning Proposal*
8. Quality and Equity in Services Quality health, education, legal, recreational, cultural and community development and other government services are accessible	■ Available and accessible services. – Do adequate services exist? – Are they at capacity or is some capacity available? – Has Government planned and budgeted for further service provision? – Developer funding for required service upgrade/access is available.	■ Adequate services exist within the nearby regional city of Grafton. The proposal would not significantly impact on the demand for these serviced given the small scale nature of the proposal.	■ Section 4.3

Appendix C

Koala Plan of Management

Koala Plan of Management

Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

quality solutions **sustainable** future

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Koala Plan of Management

Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

Project Manager: David Andrighetto
Ref: 1837694
Date: November 2011

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1 Introduction

1.1 Preamble

GeoLINK has been engaged by Bothamley & O'Donohue Pty Ltd and McLennan Earthmoving Pty Ltd to prepare a Koala Plan of Management (KPoM) to support two development applications with respect to the proposed subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights, NSW (refer to **Illustration 1.1**). This KPoM should be attached to the title of any lots subdivided as part of this subdivision to ensure all existing and future landowners are aware of their responsibilities with respect to Koala management.

A *State Environmental Planning Policy No. 44 – Koala Habitat Protection* (SEPP 44) assessment by GeoLINK (2011, Ref. No. 1837542) found that the subject property supports core Koala habitat. The findings of this assessment are incorporated into the SEPP 44 checklist in **Section 1.2**.

For this KPoM:

- '***the study area***' refers to the entire property, that is, Lot 2411 DP 709698 and Lot 9 DP 820604. It comprises approximately 72.2 ha (refer to **Illustration 1.2**).
- '***the site***' refers to the development footprint encompassing all areas that may be directly affected by the proposed subdivision (refer to **Illustration 1.2**). The site comprises approximately 25 ha.
- '***the locality***' refers to land within a 10 km radius of the study area.

1.2 Relevant Legislation

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

State Environmental Planning Policy No. 44 (SEPP 44) was gazetted in January 1995. It encourages the conservation and management of naturally vegetated areas that provide habitat for Koalas to ensure that permanent free-living populations will be maintained over their present range. The policy applies to 106 local government areas. Local councils cannot approve development in an area affected by the policy without an investigation of core Koala habitat. The policy provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of Koalas and their habitat.

A checklist of the study area's relevance to SEPP 44 is provided below:

Does the subject land occur in a Local Government Area identified in Schedule 1?
The study area is located in the Clarence Valley Council (CVC) local government area (LGA), which encompasses the former Nymboida LGA. The Nymboida LGA is listed in Schedule 1.

Is the land to which the development application applies smaller than 1 hectare in area?
The study area is approximately 72.2 ha in area.

Does the site contain areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15 percent of the total number of trees in the upper or lower strata of the tree component?
The study area contains areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15 percent of the total number of trees in the upper or lower strata of the tree component (GeoLINK 2011a). These areas are mapped in **Illustration 1.3**.

Is the land potential Koala habitat?
Under SEPP No. 44, potential Koala habitat is defined as an area of native vegetation where the trees listed in Schedule 2 of the SEPP constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. The study area fits this definition and therefore is considered to be SEPP 44 defined potential Koala habitat.

Is there core habitat on the subject land?
Under SEPP No. 44, core Koala habitat is defined as an area of land with a resident population of Koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of, and historical records of, a population. These attributes are provided as examples only, hence other attributes (e.g. presence of areas of major Koala activity) may be used to identify the presence of core Koala habitat with or without the example attributes provided in the SEPP 44 definition.

The GeoLINK (2011a) assessment failed to identify the SEPP 44 example attributes of core Koala habitat detailed as follows:

1) "*Breeding females (that is, females with young)"*. No Koalas were directly recorded during the survey.

2) "*Recent sightings and historical records of a Koala population*". No Koalas were directly recorded during the survey and there are no known records of Koalas in the study area. Atlas of NSW Wildlife records (OEH – Grafton 1:100,000 threatened species map sheet), however suggest long-term Koala activity in the general Waterview Heights area, including records of Koalas in habitats that are interconnected to the study area.

Field investigations including Koala scat / scratch searches on most trees on site including all Forest Red Gum and Spot Analysis Technique (SAT) sampling in accordance with Australian Koala Foundation (AKF undated) methods were undertaken at 10 sites across the remainder of the study area. These identified areas of medium and high levels of Koala activity (refer to **Illustration 1.3**), which are indicative of sedentary ranging Koala patterns and thus an area of major Koala activity (AKF undated). Given the size of the study area, vegetation composition and levels of Koala activity detected, at least one member (possibly more) of this local Koala aggregate includes the study area as a core part of their range. Additionally as the study area is interconnected to other forest / woodland areas where Koalas have previously been recorded (OEH Grafton 1:100,000 threatened species map sheet), it may provide additional functions such as a part of a local linkage.

SEPP 44 does not distinguish between a site that contains all of a population, or part of it. However core Koala habitat must be considered to include all areas of habitat required to meet a Koala population's needs, i.e. foraging habitat, refugia and habitat linkages. Overall the study area constitutes the SEPP 44 definition of core Koala habitat (GeoLINK 2011a).

Is there a requirement for the preparation of a Plan of Management for identified core Koala habitat?
The preparation of a site specific Plan of Management is required to accompany the proposed development applications (DAs) for the subdivision of the study area.

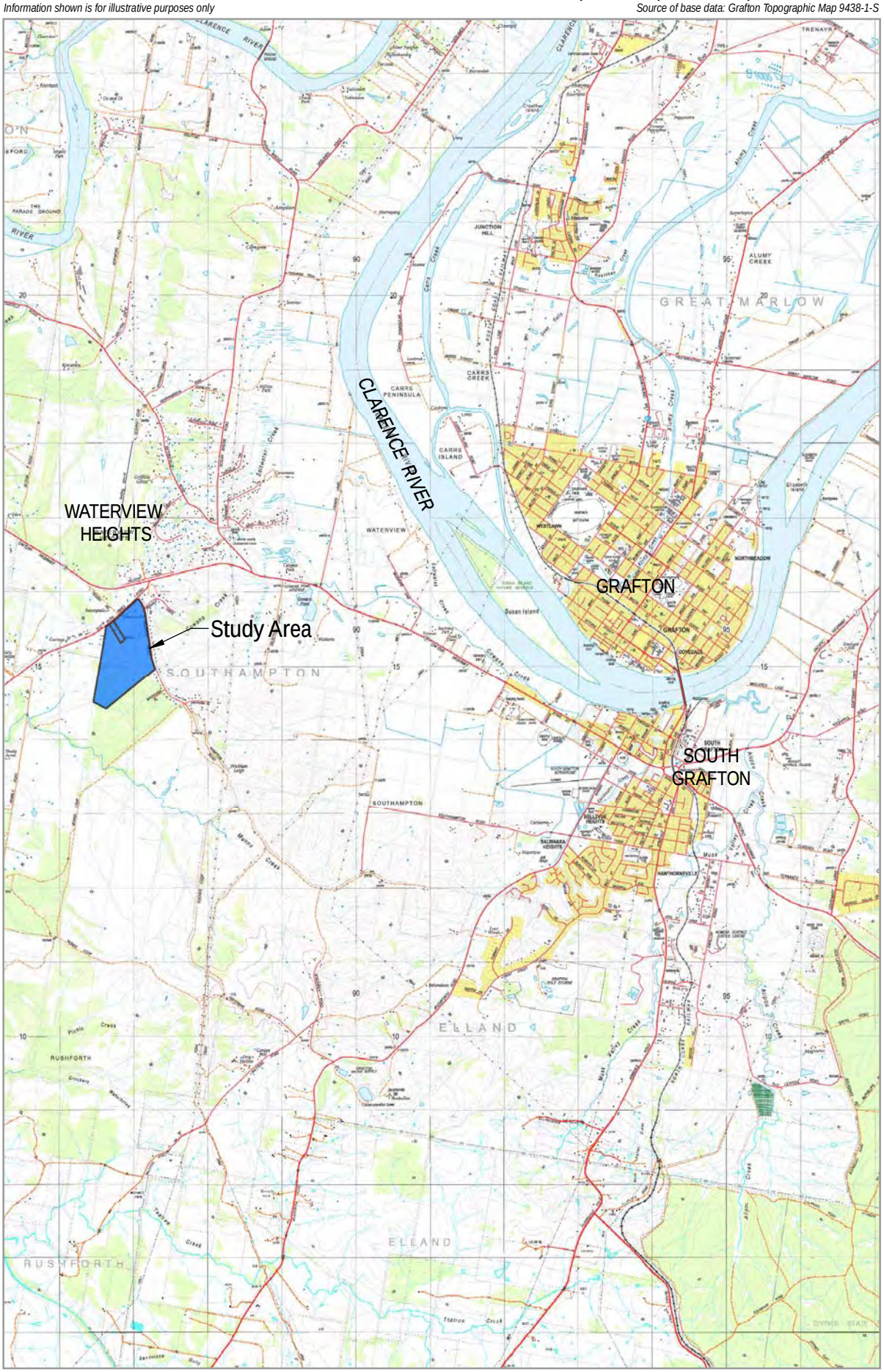
1.2.2 Threatened Species Conservation Act 1995

The Koala (*Phascolarctos cinereus*) is listed as Vulnerable on Schedule 2 of the NSW *Threatened Species Conservation* (TSC) *Act 1995*. The species was listed because:

- its population and distribution have been severely reduced;
- it faces severe threatening processes;
- it is an ecological specialist (it depends on particular types of diet or habitat); and
- it has poor recovery potential.

Information shown is for illustrative purposes only

Drawn by: RE Checked by: MVE Reviewed by: DSA Date: November 2011
Source of base data: Grafton Topographic Map 9438-1-S



0 1.5 km

North

Site Locality

Koala Plan of Management: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837695

Illustration 1.1

Drawn by: DSA Checked by: RE Reviewed by: MVE Date: November 2011

Information shown is for illustrative purposes only

Source of base data: Google Earth

North

0 150

Aerial Photo

Koala Plan of Management: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

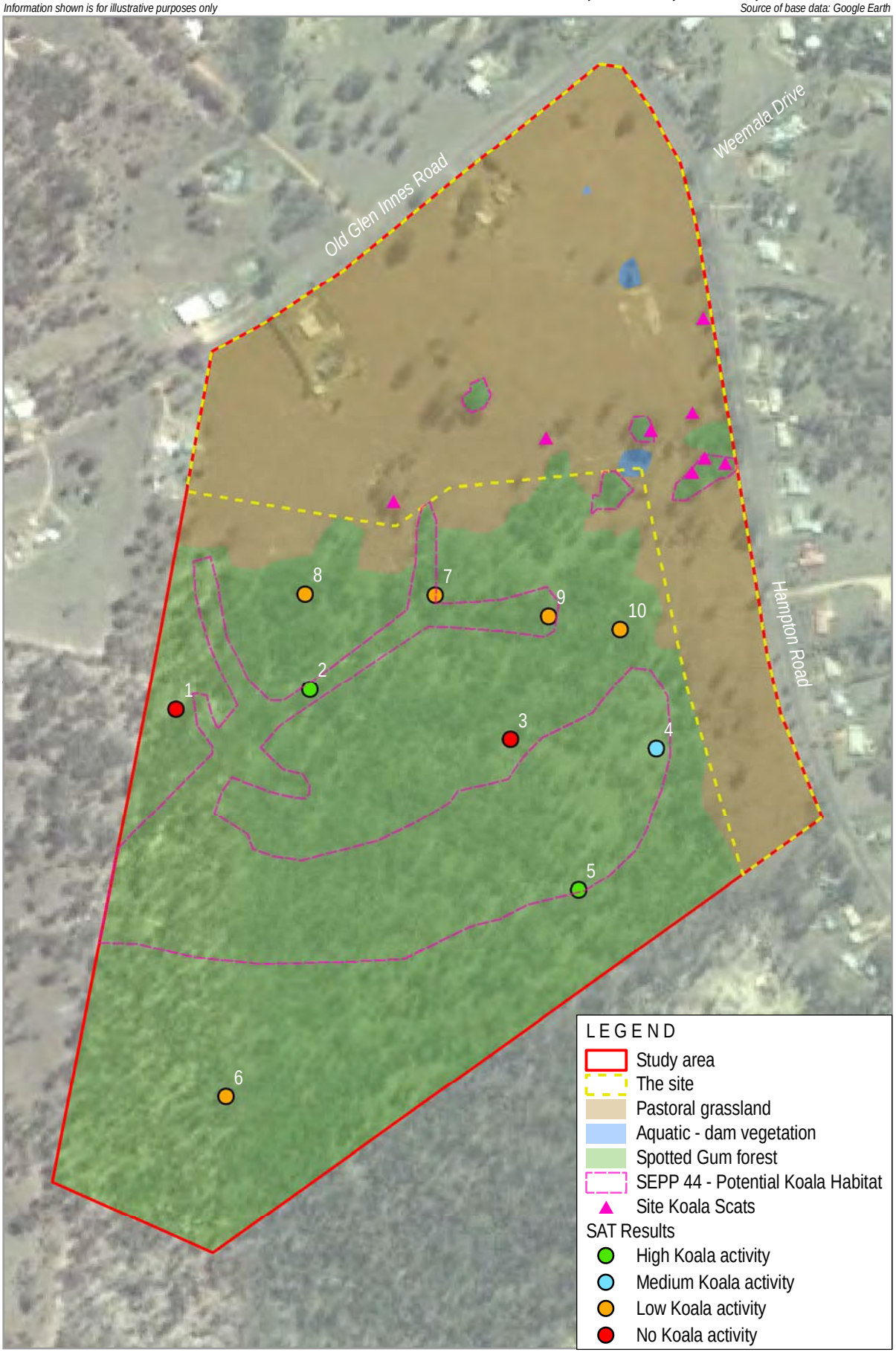
1837696

Illustration 1.2

Drawn by: DSA Checked by: RE Reviewed by: MVE Date: November 2011

Information shown is for illustrative purposes only

Source of base data: Google Earth



North

0 150

Koala Habitat Features

GeoLINK environmental management and design

Koala Plan of Management: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

1837698

Illustration 1.3

1.3 Aims and Objectives

The aim of this Koala Plan of Management (KPoM) is to maintain current Koala usage of the study area. The principle objectives are to:

- identify preferred feed trees and the extent of resources available within the study area;
- assess the regional and local distribution of Koalas;
- identify the extent of Koala habitat in the study area;
- identify linkages of core Koala habitat and strategies to enhance and manage these corridors;
- identify opportunities to maintain and protect existing key Koala habitat features;
- identify threats to Koalas and their habitat posed by the subject DAs;
- provide mitigation measures to alleviate these threats; and
- provide for effective implementation and monitoring of this Koala Plan of Management.

2

Study Area and Proposal Description

2.1 Study Area Location

The study area is located at Waterview Heights; approximately 7 km west of Grafton on the North Coast of NSW, in the CVC LGA (refer to **Illustration 1.1**). Specifically, it is located on the corner of Old Glen Innes Road and Hampton Road, and comprises approximately 72.2 ha.

2.2 Study Area Description

The study area comprises both open pastoral land with individual / small clusters of trees and forested areas primarily in the south. It is located adjacent to rural (pastoral and forested) land to the south and west, with areas of large lot residential land (also known as small holdings or rural residential) to the east (refer to **Illustration 1.2**). At present the study area is currently zoned as 1(b) General Rural (southern and western portions of the study area) and 1(c) Small Holdings (north-eastern portion of the study area) under the Nymboida Local Environment Plan 1986 (NLEP).

Three vegetation communities occur at the site (refer to **Illustration 1.3**):

- Pastoral Grassland: Occurs across the northern and eastern portions of the study area (including the majority of the development footprint) and has been cleared of native vegetation apart from isolated individual or small clusters of trees (refer to **Plate 2.1**). Emergent canopy trees include Spotted Gum (*Corymbia variegata*), Grey Box (*Eucalyptus moluccana*), Forest Red Gum (*E. tereticornis*) and Northern Grey Ironbark (*E. siderophloia*). The emergent shrub-layer trees are largely absent, except some eucalypt saplings occur in unslashed areas where livestock grazing has been reduced in recent times. The groundcover comprises mostly exotic pastoral grasses in the open areas and a mix of native and exotic pastoral species in the smaller forested areas amongst the pastoral grassland.
- Spotted Gum Forest: Occurs as the large stand of forest in the south-western portion of the study area (moderate – high condition - refer to **Plate 2.2**), as well as some smaller, denser patches of trees amongst the pastoral grassland (low condition). Canopy trees include Spotted Gum (*Corymbia variegata* and to a lesser extent *C. henrii*), Forest Red Gum, Northern Grey Ironbark, Red Bloodwood (*C. gummifera*) and Swamp Box (*Lophostemon suaveolens*). The mid-storey is generally open (though absent in small areas of forest used for pastoral purposes) and comprises canopy samplings and a mix of common native understorey species such as. Maidens Wattle (*Acacia maidenii*), Coffee Bush (*Breynia oblongifolia*) and Red Ash (*Alphitonia excelsa*). Groundcover comprise mostly native grasses and herbs.
- Aquatic Dam Vegetation: Occurs in the three dams in the eastern portion of the study area (refer to **Plate 2.3**), supporting a range of common aquatic species.

Plate 2.1 Pastoral grassland with isolated trees in the background

Plate 2.2 Typical view of Spotted Gum forest in the southern portion of the study area

Plate 2.3 Aquatic dam vegetation

The site is / has been subject to the following land uses practices:

- two existing dwellings occur in the northern portion of the study area off Old Glen Innes Road. Beekeeping activities occur in proximity to the western dwelling;
- the northern and eastern portions of the site have been cleared and utilised as pastoral grassland; and
- the structure and composition of the forested portions are consistent with historic clearing and selective logging, and low intensity livestock grazing. In recent years, however, it appears to have been left as unmanaged forest.

2.3 Description of Proposed Subdivision

The proposal is a two stage subdivision:

- DA stage 1 subdivision: Subdivide the property into 5 lots ranging from 0.6 to 51.97 ha. All new lots would have direct access to Old Glen Innes Road or Hampton Road. Lots 1 and 3 encompass the existing dwellings. This DA is consistent with the requirements of the current NLEP (GeoLINK 2011b).
- DA stage 2 subdivision: Subdivide Lot 4 from DA 1 Subdivision (13.11 ha) into 27 rural residential / small holdings lots comprising a minimum lot size of 0.4 ha. An internal cul-de-sac road would be established off Old Glen Innes Road, providing access to 16 of the lots. The remaining lots would be accessed directly from Old Glen Innes Road or Hampton Road. This DA is planned to be lodged upon the draft Clarence Valley LEP 2010 being adopted.

The layout of each stage of the subdivision is provided in **Appendix A**. The proposal footprint (the site – refer to **Illustration 1.2**) encompasses mostly pastoral grassland areas and only small stands of low condition Spotted Gum forest. Key additional features that would be established (either as part of the subdivision or by future lot owners) include:

- dwellings and associated assets on all lots, excluding Lot 1 and 3 of DA stage 1;
- on-site waste water management systems on all lots, excluding Lot 3 of DA stage 1. The on-site waste water management system for Lot 1 of stage 1 would be upgraded as part of the proposal; and
- boundary fences and driveways.

The proposal allows for retention of the main area of Spotted Gum forest (approximately 44 ha – medium

to high condition vegetation) to be retained on DA Stage 1 Lot 5 (residual Lot) which is under a rural zoning.

3

Koala Habitat Identification

3.1 General Distribution

The Koala occurs in a fragmented distribution throughout eastern Australia, from north-east Queensland to Eyre Peninsula in south-eastern South Australia and west of the Great Dividing Range, where it mostly occurs along inland rivers (DECC 2008, Martin and Handasyde 1995). In NSW, the Koala mainly occurs on the Central and North Coast's (Reed and Lunney 1990), although some populations occur in the South Coast and western region (such as in the Pilliga region, to the west of Gunnedah).

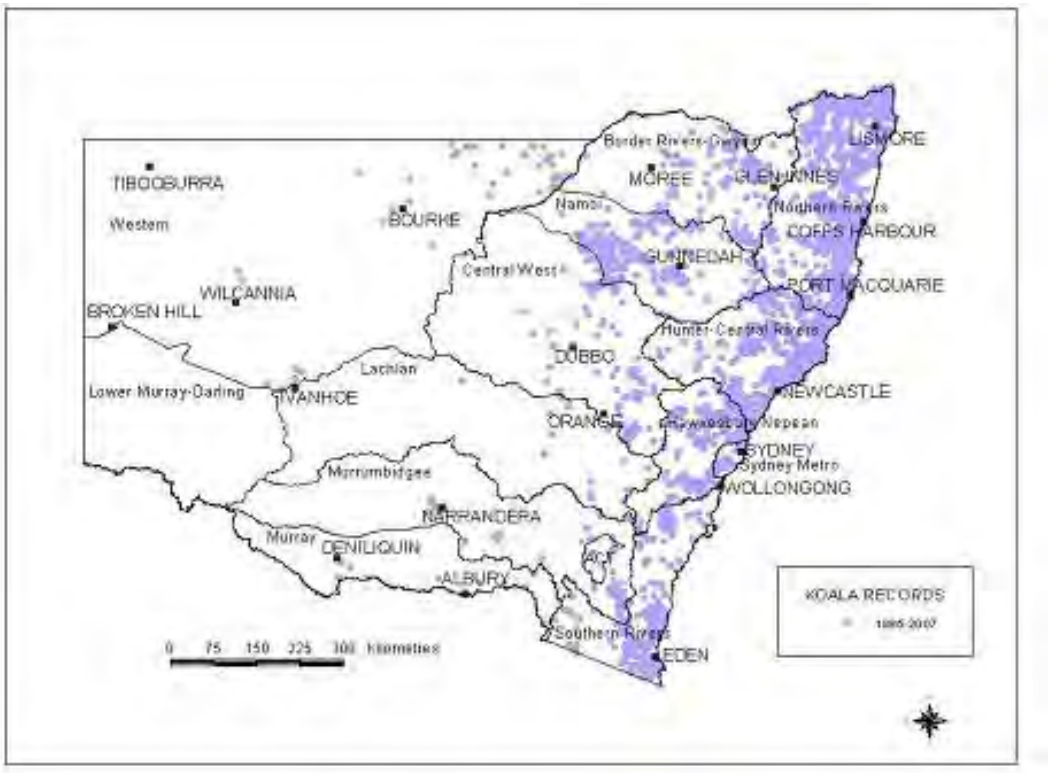


Plate 3.1 Koala Sightings in NSW from DECC Atlas of NSW Wildlife

NOTE: The sightings represented on this map are only indicative. They cannot be considered as a comprehensive inventory and may contain errors or omission.
SOURCE: DECC 2008

3.2 Regional Occurrence

Koala populations on the North Coast are generally scattered, of medium density, and occur within areas of secondary habitat (Class A). There are, however, some areas of high density populations occupying primary habitat (DECC 2008).

Reed *et al*. (1990 in DECC 2008) reports that important Koala population centers occur on the NSW North Coast at Port Stephens, Port Macquarie, Coffs Harbour, Ballina, Lismore and Tweed. In addition to these population centers, numerous small Koala populations occur along the North Coast of NSW, but many are isolated as a result of urban and rural development, roads and other forms of fragmentation.

There appears to be two distinct populations of Koalas within the CVC LGA:

- one in the south and west of the LGA around Shannon Creek, Waterview Heights, Clouds Creek State Forest, and north of Nymboida; and
- one in the north of the LGA in the Ashby, Woombah and Iluka region (CVC 2010).

3.2 Local Occurrence

There are 27 Koala records on the south-western side of the Clarence River within the locality (10 km radius of the study area) on the Grafton 1:100,000 threatened species map sheet (obtained from OEH under a data licence agreement – refer to **Illustration 3.1**). These records are dated between 1996 and 2004, and occur mostly on the vegetated foothills which surround the mostly cleared floodplain in all directions from the site. Approximately 17 Koala records occur within 5 km of the site, including 5 records between 0.4 and 2 km to the north and north-east. Sufficient habitat is available locally to support the potential movement of the Koala across the general locality of the study area in all directions associated with these records (refer to **Illustration 3.2**).

3.3 Identification of Preferred Food Tree Species

A list of Koala food tree species that occur in the North Coast area have been identified in the Department of Environment and Climate Change (DECC, now OEH) *Approved Recovery Plan; recovery Plan for the Koala* (DECC 2008). This list is divided into three categories: primary, secondary and supplementary. These categories signify the order of importance to the Koala of the various tree species within the North Coast area.

The tree species and their presence in the study area is identified in **Table 3.1**

Table 3.1 North Coast Koala Food Tree Species

	Scientific Name	***Common Name***	***Presence***
Primary Food Tree Species	*Eucalyptus microcorys*	Tallowwood	
	E. tereticornis	Forest Red Gum	✓
	E. robusta	Swamp Mahogany	
	E. parramattensis	Parramatta Red Gum	
	E. bancroftii	Orange Gum	
	E. amplifolia	Cabbage Gum	
Secondary Food Tree Species	*E. seeana*	Narrow-leaved Red Gum	
	E. glaucina	Slatey Red Gum	
	E. propinqua	Small-fruited Grey Gum	
	E. resinifera	Red Mahogany	
	E. notabilis	Mountain Mahogany	
	E. moluccana	Grey Box	✓
	E. melliodora	Yellow Box	
	E. largeana	Craven Grey Box	
	E. biturbinata	Grey Gum	
	E. canaliculata	Large-fruited Grey Gum	
	E. rummeryi	Steel Box	
	E. rudderi	Rudder's Box	
	E. quadrangulata	White-topped Box	
Stringybarks/ Supplementary species	*E. eugeniodes*	Thin-leaved Stringybark	
	E. agglomerata	Blue-leaved Stringybark	
	E. tindaliae	Stringybark	
	E. globoidea	White Stringybark	
	E. cameronii	Diehard Stringybark	

SOURCE: Phillips 2000 in Appendix 1 - Koala Food Tree Species in North Coast Koala Management Area of Koala Recovery Plan DECC 2008

Schedule 2 of SEPP 44 lists feed trees preferred by Koalas. If the species within this list constitute at least 15% of the total number of trees in the upper or lower strata of the tree component, the area is

defined as potential Koala habitat. **Table 3.2** indicates the presence within the study area of Koala feed trees listed in Schedule 2 of SEPP 44.

Table 3.1 SEPP 44 Schedule 2 Feed Tree Species

Scientific Name	*Common Name*	*Presence*
Eucalyptus albens	White Box	
Eucalyptus camaldulensis	River Red Gum	
Eucalyptus haemastoma	Broad Leaved Scribbly Gum	
Eucalyptus microcorys	Tallowwood	
Eucalyptus populnea	Bimble Box or Poplar Box	
Eucalyptus punctata	Grey Gum	
Eucalyptus robusta	Swamp Mahogany	
Eucalyptus signata	Scribbly Gum	
Eucalyptus tereticornis	Forest Red Gum	✓
Eucalyptus viminalis	Ribbon or Manna Gum	

The GeoLINK (2011a) SAT analysis results are shown in **Table 3.3** and **Illustration 1.3**. The analysis found that Koalas were primarily using Forest Red Gums, however other species in the vicinity of Forest Red Gums also evidenced Koala usage. Koala activity level classes varied at each SAT point, with:

- two SATs evidencing high Koala activity levels;
- one SAT evidencing medium Koala activity levels;
- five SATs evidencing low Koala activity levels; and
- two SATs evidencing no Koala activity.

Table 3.3 SAT Analysis Results

SAT Number	*Number of Trees with Koala Scats*	*% Trees with Koala Scats*	*Koala Activity Level*	*Trees Species with Evidence of Koala Activity (Number of Trees)*
1	0	0	No Koala Activity	N/A
2	10	33.3	**High** Koala Activity	Forest Red Gum (7), Spotted Gum (3)
3	0	0	No Koala Activity	N/A
4	8	2.7	**Medium** Koala Activity	Forest Red Gum (7), Spotted Gum (1)
5	10	33.3	**High** Koala Activity	Forest Red Gum (4), Spotted Gum (3), Grey Box (3)
6	2	6.7	Low Koala Activity	Forest Red Gum (2)
7	2	6.7	Low Koala Activity	Forest Red Gum (1), Northern Grey Ironbark (1)
8	4	13.3	Low Koala Activity	Forest Red Gum (3), Spotted Gum (1)
9	2	6.7	Low Koala Activity	Forest Red Gum (2)
10	2	6.7	Low Koala Activity	Forest Red Gum (2)

Areas with medium and high levels of Koala usage were typically in proximity to the main drainage lines; and in an elevated portion of the study area in the south-east of the proposed Lot 5 DA stage 1. The age of the scats ranged from old to fresh (GeoLINK 2011a). The development footprint evidenced only low levels of Koala activity (**Illustration 1.3**).

3.4 Extent of Alternative Habitat / Corridor Linkages

The general area encompassing the study area comprises a mosaic of cleared grazing land, small holding developments and patches of forest/woodland. The Koala is highly mobile and able to disperse across grasslands and within urban environments, suggesting the Koala may move across the study area to adjacent land in all directions pre and post development (refer to **Illustration 3.2**). The main treed local links associated with the study area for the Koala, however, include:

- scattered trees and small patches of Spotted Gum forest in the east near the southern dam forms part of a link

between a local patch of forest around Weemala Drive (east), and the Spotted Gum forest and interconnected habitat in the south-western portion of the study area; and

- Spotted Gum forest in the south-western portion of the study area is continuous with the forest/woodland vegetation to the west and south. For habitat generalists capable of crossing modified landscapes such as the Koala, these habitats may be interconnected with large areas of habitat to the far west and south.

3.5 Estimate of Population Size

Koalas live in breeding aggregations that generally comprise a dominant male, a small number of mature females, as well as juveniles of various ages (Phillips 1997 cited in DECC 2008). Home range sizes vary depending on the quality of the habitat and the number of available food trees, and have been recorded between 0.2 to 500 ha (DECC 2008). A number of studies in north-eastern NSW have identified home ranges for individual Koalas of 13–15 ha (Phillips 1994; Callaghan and Phillips 1998 cited in DECC 2008), with average Koala densities of medium to high density populations being 0.6 Koalas/ha (Australian Koala Foundation 2003).

GeoLINK (2011a) survey results suggest the study area and local Koala population is of a low –medium density as:

- local Koala records in the Waterview Heights area are scattered (Grafton 1:100,000 threatened species map sheet);
- recorded Koala activity levels were low in most areas (including on the site). Medium and high level Koala usage areas were confined to the large Spotted Gum forest stand in the southwest (refer to **Illustration 1.3**);
- occurrences of primary (Forest Red Gum) and secondary (Grey Box) browse species varied across the study area and within the stands of forested, from co-dominant to absent; and
- the vegetation floristic composition suggests a low to medium soil fertility.

The study area is likely to contain a large portion of an individual Koala's range, with the range of other individuals within the local breeding aggregate likely to overlap in some areas. Vagrant Koalas may also occur at times (e.g. sub-adults, breeding movements), especially considering the study area is interconnected with other known habitat areas locally in all directions. Overall the study area population is estimated to constitute 1 individual during most periods and up to around 3 individuals periodically.

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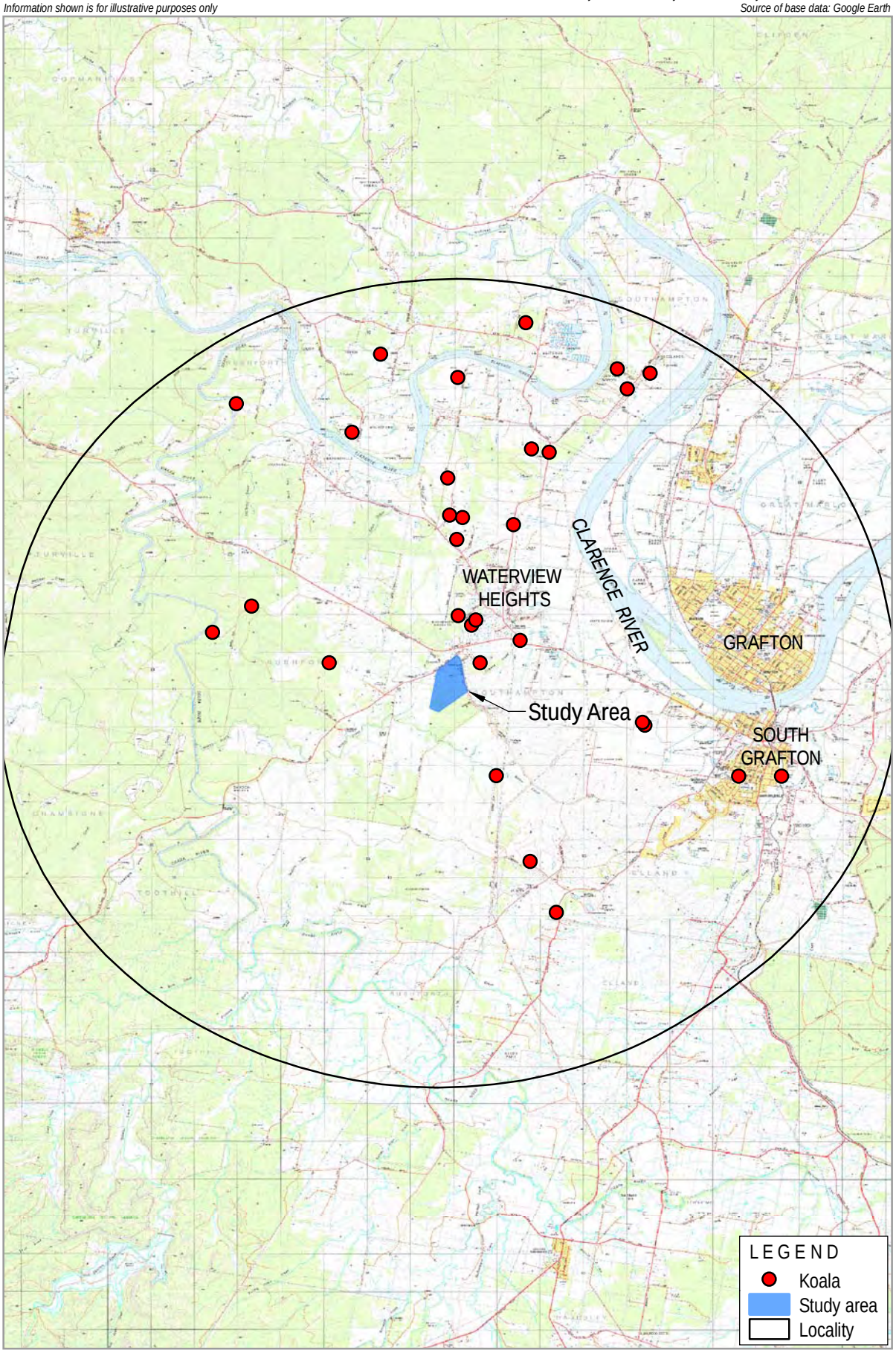
Source of base data: Google Earth



0 3 km

North

Local OEH Koala Records

GeoLINK environmental management and design

Koala Plan of Management: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

1837701

Illustration 3.1

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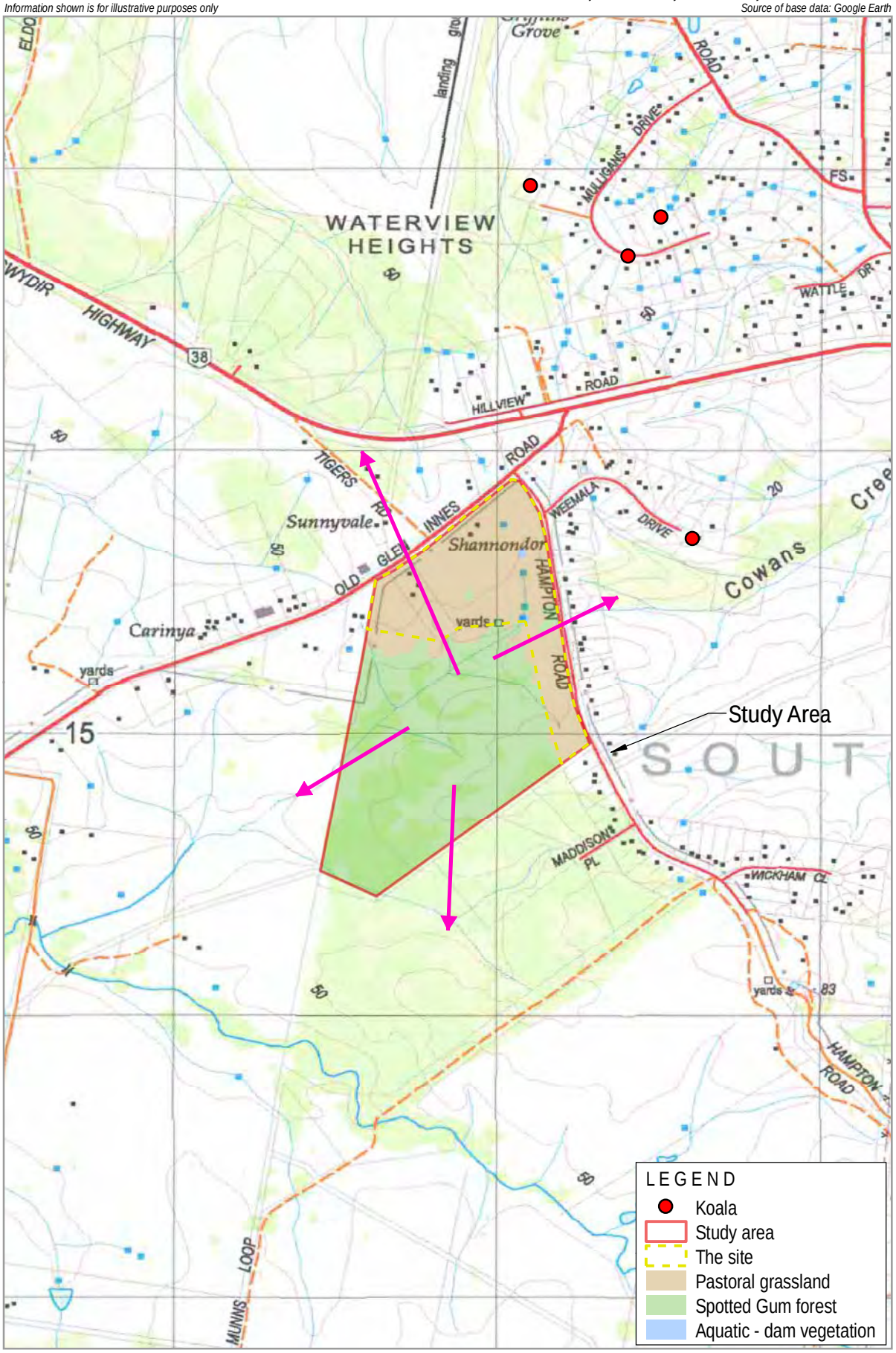
Source of base data: Google Earth



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North

Potential Koala Linkages

Koala Plan of Management: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837705

Illustration 3.2

4 Threat Identification and Abatement

4.1 Threats

The approved Koala Recovery Plan (DECC 2008) lists the following current threats to the Koala:

- Habitat loss and fragmentation
- Habitat degradation
- Road kills
- Dog attacks
- Fire
- Logging
- Disease
- Severe weather conditions
- Swimming pools (drowning)
- Over browsing

Loss, fragmentation and degradation of habitat is considered the most important threats to Koalas throughout their range (DECC 2008).

An assessment of the impact of the subject DAs to the Koala in relation to these threats and corresponding mitigation measures are provided below. Severe weather conditions and over browsing are not relevant to the proposed developments, hence are not considered further. Potential physical barriers associated with fences are also considered.

4.2 Habitat Loss and Fragmentation

4.2.1 Development Assessment

The proposed development would result in the direct loss/modification of pastoral grassland with isolated trees and associated small patches of Spotted Gum forest. These areas currently appear to support low levels of Koala usage. DA stage 1 would have minimal vegetation/habitat loss, as:

- proposed Lots 1 and 3 support existing dwellings;
- proposed Lot 2 does not have a dwelling entitlement and would continue to be managed as rural land post development;
- proposed Lot 4 would be subdivided at DA stage 2 (impacts are detailed below); and
- proposed Lot 5 supports mostly cleared grassland areas along the eastern boundary which would be able to support a future building envelope, driveway and associated rural living infrastructure without the removal of any canopy trees (only minor regrowth clearing may be required).

New boundary fences as part of DA stage 1 would follow existing fence lines and/or traverse cleared land. The exception to this is in the south-east corner of proposed Lot 4 / north-east corner of proposed Lot 5.

DA stage 2 has potential to result in the removal of isolated pastoral grassland trees and reduction/removal of small patches of low condition Spotted Gum forest, particularly on proposed DA stage 2 Lot 4, 11, 22, 25, 26 and 27 to

allow for sufficient room for future dwelling establishment. The proposal has been designed to allow for retention of some of the isolated grassland trees and the main area of Spotted Gum forest on site located on proposed DA stage 2 Lot 11.

This assessment will assume the worst case-scenario in that all trees and patches of Spotted Gum forest within the footprint of DA stage 2 (i.e. on DA stage 1 Lot 4) require removal, excluding the Spotted Gum forest and trees in the southern half of DA stage 2 Lot 11. This comprises removal of approximately 60 trees, including small patches of Spotted Gum forest with a total area of approximately 0.24 ha.

No tree removal would be required for construction of the proposed road off Glen Innes Drive, as part of DA stage 2.

The approximately 44 ha of Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would not be affected by the proposal. This encompasses the majority of potential Koala habitat, including all areas currently subject to high and medium levels of Koala usage.

4.2.2 Mitigation Measures: Habitat Loss and Fragmentation

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
1.1 **Selective tree retention within the development footprint (the site)**	▪ Trees are to be retained on the site to the maximum extent possible, prioritising (refer to **Illustration 4.1**): - trees evidencing Koala usage - must retain; - primary Koala browse trees (Forest Red Gum) with no evidence of Koala usage - retain to maximum extent possible; - secondary Koala browse species (Grey Box) with no evidence of Koala usage - retain to maximum extent possible; and - trees in the south-east portion of DA stage 1 Lot 4	**Current and Future Proponents:** ▪ To comply with KPoM and DA consent conditions (including ensuring any contractors comply). ▪ To comply with requirements under the Native Vegetation Act 2003. **CVC:** ▪ Restrict tree and vegetation removal to specified areas via title covenants / development consent conditions. ▪ Ensure compliance during	▪ DA approval with appropriate title covenants / consent conditions specifying tree and vegetation removal / retention requirements. ▪ Post-sale of individual Lots, proponents submit plan of tree / habitat retention / removal with future DAs (e.g. for dwellings), and comply with KPoM. ▪ No further clearing outside that specified in KPoM without Council / DoP approval, or if required, approvals from	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance. Monitoring report to be submitted to CVC and Department of Planning (DoP) / OEH (refer to **Section 5**). **CVC**: ▪ Undertake inspections during compliance / certification stages of DA. ▪ Prosecute or order restoration if non-compliance. **Environmental Protection Agency (EPA):**

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
	which form part of an east-west link. Trees in the southern half of DA stage 2 Lot 11 must be retained. Other trees in this general area should be retained to the maximum extent possible. ▪ All new or upgraded fencing is to be aligned / designed to allow for retention and avoid damage to all trees ≥ 20 cm DBH.	inspections. **Northern River Catchment Management Authority (NRCMA):** ▪ Assess clearing applications under *Native Vegetation Act 2003* on rural zoned lots (where required).	the CMA under the Native vegetation Act 2003.	▪ Undertake compliance action if non-compliance occurs with respect to the *Native Vegetation Act 2003* on rural zoned lots.
1.2 **Retention of habitat on DA stage 1 Lot 5 (residual Lot).**	▪ No removal of Spotted Gum forest (approximately 44 ha) or mature grassland trees on DA stage 1 Lot 5 is permitted. This area includes the majority of Koala habitat and all areas evidencing major Koala activity.	As per mitigation measure **1.1**.	As per mitigation measure **1.1**.	As per mitigation measure **1.1**.
1.3 **Compensatory plantings**	▪ Should any Forest Red Gums not evidencing Koala usage require removal, they would be compensated for at a rate of 10:1 tree plantings with Forest Red Gum (i.e. 10 Forest Red Gums planted for any Forest Red Gum not evidencing Koala usage removed). Compensatory planting would be located in areas where they do not pose a hazard to future dwellings,	**Current and Future Proponents:** ▪ To comply with KPoM and DA consent conditions (including ensuring any contractors comply). ▪ Undertake compensatory replanting and adequate management of plants trees until self-sufficient.	▪ DA approval with appropriate title covenants / consent conditions specifying compensatory tree planting requirements. ▪ Post-sale of individual Lots, proponents submit plan of tree / habitat retention / removal and compensatory	**Current and Future Proponents:** ▪ In KPoM monitoring report, include tree removal and compensatory plantings undertaken (assistance from suitably qualified ecologist where required). **CVC**: ▪ Undertake inspections during

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
	preferably: – on the site along the drainage line between the two larger dams in the east to improve north-south connectivity; – in the south-east corner of DA stage 1 Lot 4 / north-east corner of DA stage 1 Lot 5 to maximise east-west habitat connectivity; and – within the more open areas on DA stage 1 Lot 5. All plantings should be sourced from endemic seed stock.	**CVC:** ▪ Include compensatory tree planting requirements in title covenants / development consent conditions. ▪ Ensure compliance during inspections.	tree planting with future DAs (e.g. for dwellings), and comply with KPoM.	compliance / certification stages of DA. ▪ Prosecute or order restoration if non-compliance.
1.4 **Habitat protection**	▪ The Spotted Gum forest on DA stage 1 Lot 5 (refer to **Illustration 4.2**) would be protected under a title covenant/ Restriction as to User pursuant to section 88B of the Conveyancing Act 1919. Restrictions as to user on this land would include: – no native vegetation removal is permitted (including clearing for fence lines, firewood collection, logging, etc); – livestock would be excluded from this area; – only low impacts	**Current and Future Proponents:** ▪ To comply with KPoM and DA consent conditions. ▪ To comply with requirements under the Native Vegetation Act 2003. **CVC:** ▪ DA approval with title covenants / consent conditions specifying habitat protection measures. ▪ Ensure compliance during	▪ DA approval with title covenants / consent conditions specifying habitat protection measures. ▪ Spotted Gum forest on DA stage 1 Lot 5 maintained has habitat.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance. **CVC**: ▪ Undertake inspections during compliance / certification stages of DA. ▪ Prosecute or order restoration if non-compliance. **EPA:** ▪ Undertake compliance action if non-compliance occurs with respect to the

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
	passive uses (e.g. bushwalking) or practices undertaken for habitat conservation, improvement or maintenance purposes are permitted (e.g. drainage line erosion protection works, weed control, pest fauna control, etc); and – only ecologically sustainable bushfire regimes are permitted.	inspections. **NRCMA:** ▪ Assess clearing applications under *Native Vegetation Act 2003* on rural zoned lots (where required) in a manner consistent with the Section 88B restrictions.		*Native Vegetation Act 2003* on rural zoned lots.

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Source of base data: Bothamley and O'donohue Pty Ltd

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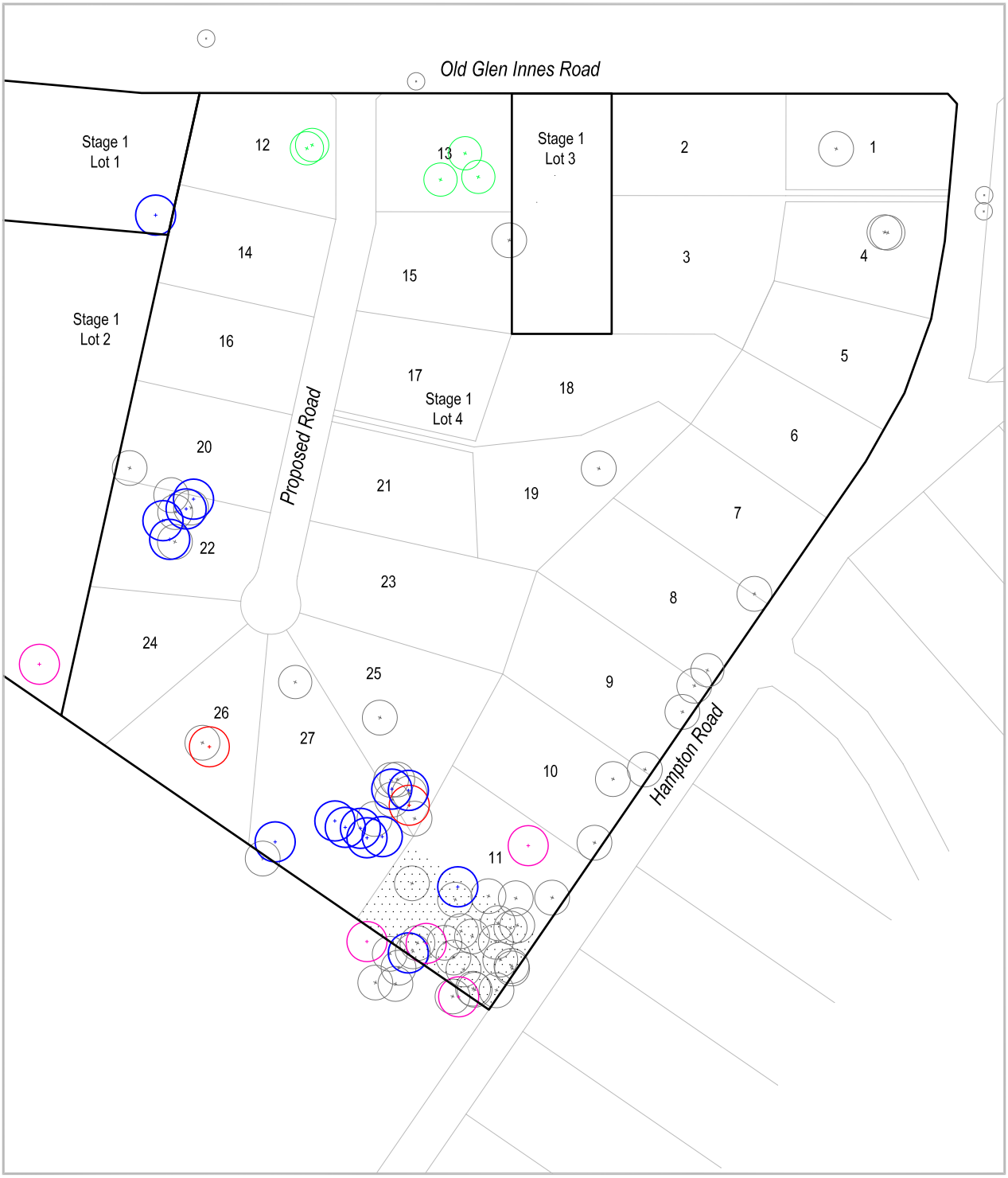

LEGEND

- Primary Koala browse tree (Forest Red Gum) evidencing Koala usage
- Other species evidencing Koala usage
- Primary Koala browse tree (Forest Red Gum) not evidencing Koala usage
- Secondary Koala browse tree (Grey Box) not evidencing Koala usage
- Tree
- Linkage vegetation to be retained

0 60

North

Priority Trees for Retention

GeoLINK environmental management and design

Koala Plan of Management:
Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837542

Illustration 4.1

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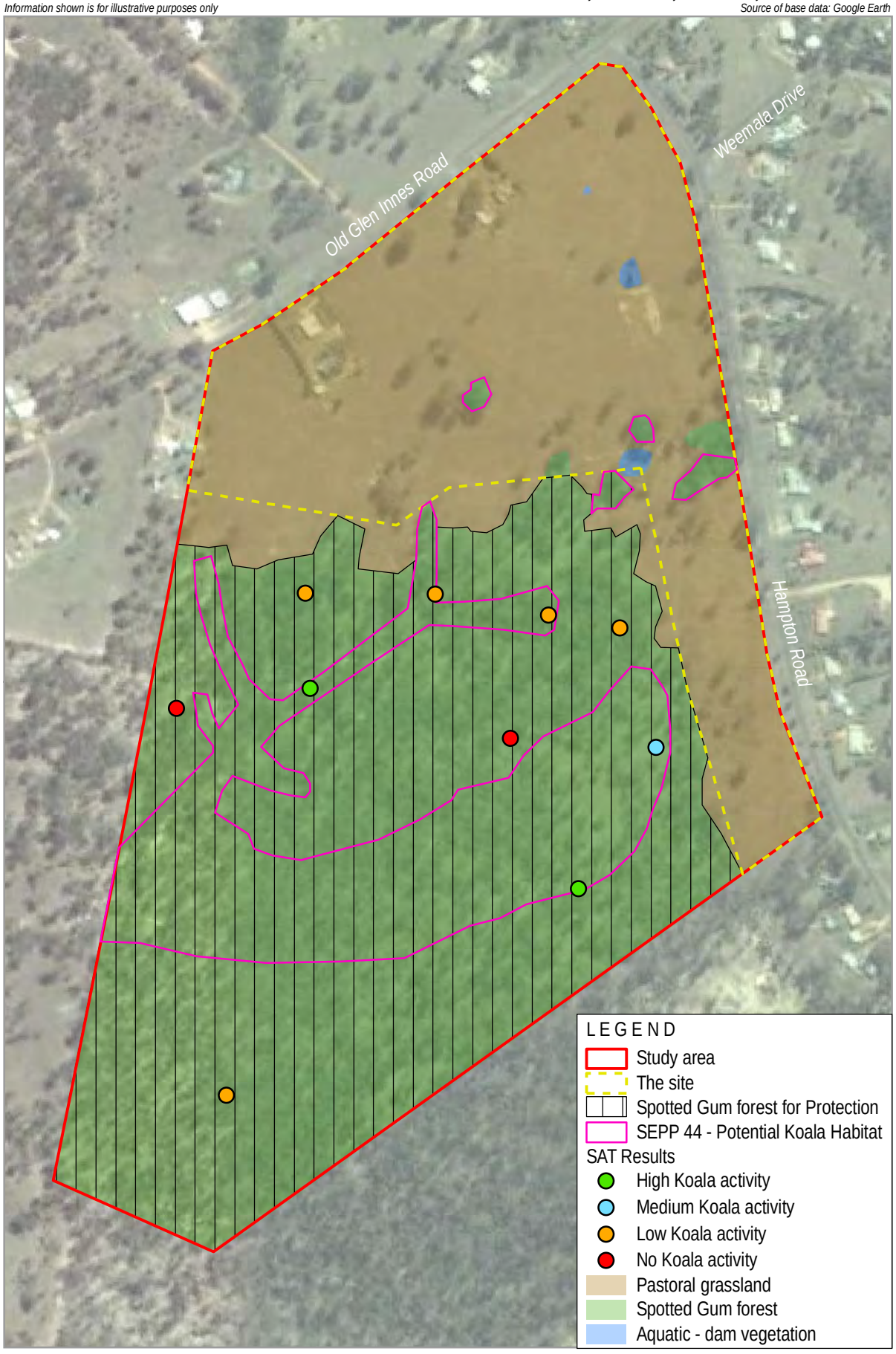
Source of base data: Google Earth



North

0 150

Spotted Gum Forest on Lot 5 DA Stage 1 to be Protected

GeoLINK environmental management and design

Koala Plan of Management: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

Illustration 4.2

1837722

4.3 Habitat Degradation

4.3.1 Development Assessment

Degradation of habitat as a result of weed invasion, tree dieback and changes in species composition is a recognised threat to Koalas (DECC 2008). The main risk of habitat degradation associated with the proposal is with regards to weed invasion, as establishment of lawns and gardens would incrementally increase the occurrence of exotic species and potential garden escapees locally. At present the occurrence of weeds on site is low, despite the study area and general locality being subject to moderate disturbance history (including clearing for agricultural development, infrastructure construction and rural-residential development). However, most gardens would be in proximity to established dwellings, away from retained habitat areas. Overall the subject DAs are unlikely to significantly increase the risk of habitat degradation from weed invasion in retained habitat areas.

The risk of significant habitat degradation from water quality and hydrological changes is considered low (e.g. all on-site sewage treatment systems should be installed and maintained to Council stands, GeoLINK 2011a).

4.3.2 Mitigation Measures: Habitat Degradation

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
2.1 **Weed management**	▪ Implement requirements under *Noxious Weeds Act 1993* (NW Act).	**Current and Future Proponents:** ▪ To comply with requirements of NW Act. **CVC:** ▪ Enforcements of NW Act.	▪ Noxious weeds managed as per requirements of the NW Act.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail any noxious weed management undertaken. **CVC**: ▪ Inspect for noxious weeds during inspections associated with compliance / certification stages of DA.

4.4 Road Kill

4.4.1 Development Assessment

The proposal would increase the traffic collision risk both on site and locally (through incremental increases in traffic volume). DA Stage 2 includes a new local road being established on site to provide access for 16 small rural holdings / large residential lots. The road is located in the northern portion of the site in existing grassland areas, directly off Old Glen Innes Road and has a length of approximately 250 m. It is considered unlikely that the proposal would create a significant Koala traffic collision risk on the site as:

- the proposed road has a short, straight alignment, allowing for good sight distances and low traffic speed;
- the proposed road and future driveways would be located in a largely cleared rural-residential landscape and would not intersect any forest or areas evidencing major Koala activity; and
- the proposed road is a cul-de-sac road, servicing only local traffic associated with the proposal.

Given the levels of traffic along local roads, the minor incremental extent to which the proposal may increase the risk of traffic to fauna along these roads should not be substantial.

4.4.2 Mitigation Measures: Road Kill

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
3.1 **Vehicle collision management**	▪ Proposed road to be sign posted a maximum of 50 km/ hr. ▪ Signage at the proposed new road and entrance to Hampton Road to be posted stating 'Care Koalas' and 'Call WIRES for Injured Wildlife' (or equivalent). ▪ Contact details of the local animal welfare/rescue group would be held by occupants to facilitate prompt reporting of sick or injured Koalas.	**Current and Future Proponents:** ▪ To establish subject signage. ▪ Report sick or injured Koalas to local animal welfare/rescue groups. **CVC:** ▪ DA consent conditions to specify subject signage. ▪ Maintain signage in the long-term.	▪ Proposed road sign posted a maximum of 50 km/ hr. ▪ Traffic collision risk on site remains low. ▪ Sick or injured Koalas are reported and appropriate treated.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance and document any Koala / vehicle collisions. **CVC**: ▪ Inspect for signage during inspections associated with compliance / certification stages of DA.

4.5 Dog Attacks

4.5.1 Development Assessment

Predation by domestic dogs is more common in urban/ rural subdivision areas and by foxes in rural areas (Lunney *et. al*., 1999, DECC 2008). Future residents are considered likely to own domestic dogs which will incrementally increase the risk of predation on local fauna. However, the majority of future dwellings/lots are located in an existing pastoral grassland area, which post development would comprise a highly modified rural-residential landscape, away from retained habitat areas (and areas of major Koala activity).

4.5.2 Mitigation Measures: Dog Attack

Mitigation Measures	*Action*	*Responsibility*	*Milestone*	*Monitoring and Compliance*
4.1 **Dog Restrictions**	▪ Dogs would be restricted to dwellings or enclosures that do not encompass any Koala food trees (i.e. Koala food trees must not be encompassed by dog enclosures). ▪ No dog must be allowed to come into contact or be found threatening a Koala. ▪ Dogs would only be allowed in Spotted Gum forest on Lot 5DA stage 1 when on a leash. ▪ All non-resident dogs are to be reported to Council's Rangers for removal. ▪ Feral dogs or foxes to be reported to Livestock Health and Pest Authority (LHPA) for control measures as part of local strategies. ▪ Contact details of the local animal welfare group would be held by occupants to	**Current and Future Proponents:** ▪ Comply with KPoM requirements. ▪ Report sick or injured Koalas to local animal welfare/rescue group. **CVC:** ▪ DA consent conditions to specify dog restrictions.	▪ Dogs be restricted to dwellings or enclosures which do not encompass any Koala food trees. ▪ All non-resident dogs are removed by Council's Rangers. ▪ Study area incorporated in LHPA local pest control strategy for feral dogs or foxes if present. ▪ Sick or injured Koalas are reported and appropriate treated.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance and document any dog attacks. **CVC**: ▪ Ensure compliance with all aspects of the Companion Animals Act are also enforced. ▪ Undertake inspections during compliance / certification stages of DA. ▪ Prosecute or order compliance if non-compliance.

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
	facilitate prompt reporting of sick or injured Koalas.			

4.6 Fire

DECC (2008) notes that high-intensity fires burn the canopy and can cause the death or injury of Koalas and a reduction in the availability of foraging habitat. In addition, fast-moving fires fanned by strong winds reduce the ability for Koalas to escape to refuge areas.

4.6.1 Development Assessment

Increased human presence associated with the proposal may increase the desire for prescription burning and/or arson locally. Conversely increased human presence may result in more rapid response to local fires.

The majority of future dwellings/lots are located in an existing pastoral grassland area, which post development would comprise a highly modified rural-residential landscape, away from retained habitat areas (and areas of major Koala activity). The main fire threat associated with Koalas is with regards to the approximately 44 ha stand of Spotted Gum forest on Lot 5 DA stage 1.

4.6.2 Mitigation Measures: Fire

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
5.1 **Bushfire management**	▪ Proponents of Lot 5 DA stage 1 would be encouraged to undertake non-burning methods to reduce fuel loads around dwellings and assets (e.g. slashing, clean up of sticks, etc) to prevent the accidental spread of fire into retained habitats on and adjacent to the study area. ▪ A Bushfire Hazard Reduction Certificate (BFHRC) would be obtained prior to	**Current and Future Proponents:** ▪ Comply with KPoM requirements. ▪ BFHRC obtained from NSW Rural Fire Service (RFS) prior to commencement of any hazard reduction burning.	▪ Any prescription burning on the study area is environmentally sustainable.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance and document any fire incidences (wildfire, arson and prescription). **RFS**: ▪ Review of application and issue BFHRC. **CVC** ▪ Prosecute or order rehabilitation if non-compliance.

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
	undertaking any prescription burning, to ensure any prescription burning is ecologically sustainable.			

4.7 Logging

4.7.1 Development Assessment

Any future proposed logging of retained habitat areas on the rural would be governed by the requirements of the NV Act. Additional the Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would be protected under a Section 88B title covenant (refer to **Section 4.2.2**).

4.7.2 Mitigation Measures: Logging

No further mitigation measures are required.

4.8 Disease

Koala populations in NSW carry the pathogens *Chlamydia spp*. However, clinical signs (commonly conjunctivitis and urogential tract infections) of this infection, chlamydiosis, are expressed when animals are exposed to environmental stresses, such as loss of habitat, harassment by predators, nutritional stress or overcrowding (Canfield, 1990a; Canfield, 1990b; Hume, 1990; Reed & Lunney, 1990; Phillips, 1997; Melzer *et. al*., 2000; Phillips, 2000a). Chlamydiosis weakens Koalas, making them more vulnerable to death from other causes, in particular dog attack and severe weather conditions (Wilkes *et. al*., 1998).

4.8.1 Development Assessment

The proposal, with effective implementation of this KPoM would see:

- only affect areas evidencing low Koala activity being affected by the proposal, which comprise largely of pastoral grassland;
- retention of the majority of habitat on the study area including areas of major Koala activity and local linkages;
- retention of all trees evidencing Koala usage;
- compensatory planting any primary food tree requiring removal; and
- management of threats such as dog attack, fire and road kill.

Consequently it is considered unlikely that the proposal would increase stress and incidences of disease in the local Koala population.

4.6.2 Mitigation Measures: Disease

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
6.1 Disease treatment	▪ Contact details of the local animal welfare/rescue group would be	**Current and Future Proponents:** ▪ Comply with KPoM	▪ Sick or injured Koalas are reported and appropriate treated.	**Current and Future Proponents:** ▪ KPoM monitoring

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
	held by occupants to facilitate prompt reporting of sick or injured Koalas.	requirements. ▪ Report sick or injured Koalas to local animal welfare/rescue group. **CVC:** ▪ Incorporate KPoM requirements into DA consent conditions / title covenants.		report to detail compliance and document any Koala disease incidences.

4.9 Swimming Pool Drowning

Although Koalas are able to swim, if they fall into a swimming pool they are usually unable to get out and they can drown (DECC 2008).

4.9.1 Development Assessment

The majority of future dwellings/lots are located in an existing pastoral grassland area, which post development would comprise a highly modified rural-residential landscape, away from retained habitat areas (and areas of major Koala activity). Also any established pools would be fenced with child-proof fencing as per the requirements of the *Swimming Pools Act 1992*. Consequently Koala swimming pool drownings would be a very low threat.

4.9.2 Mitigation Measures: Swimming Pool Drowning

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
6.1 **Pool design requirements**	▪ Any swimming pools established would not be located below trees evidencing Koala usage or primary browse species. ▪ For any swimming pools established, if the pool design (e.g. above ground pool) or fencing is not Koala proof, it would be installed with a thick, sturdy	**Current and Future Proponents:** ▪ Comply with KPoM requirements. **CVC:** ▪ DA consent conditions / title covenant to specify pool requirements.	▪ Pool design requirements implemented where necessary.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance and document any Koala drownings. **CVC**: ▪ Undertake inspections during compliance / certification stages of DA. ▪ Prosecute or order

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
	rope (50 mm diameter or greater) attached to a poolside fixture which could be left draped in the pool at all times and also maintained to ensure it does not deteriorate .			compliance if non-compliance.

4.10 Fence Barriers

Fences, depending on design, can great a physical barrier to Koala movements. Port Stephens Council (2001) states that Koalas can climb sturdy chain mesh, wooden paling or solid-type fences with wooden posts on both sides.

4.9.1 Development Assessment

New / upgraded fences associated with the proposal would be expected to be mostly post and wire, similar to those on adjacent rural-residential land. Such fences typically do not create a barrier to Koala movement. Additionally the majority of future dwellings/lots are located in an existing pastoral grassland area, which post development would comprise a highly modified rural-residential landscape, away from retained habitat areas (and areas of major Koala activity). The only fences likely to be Koala proof would be associated with dog yard or pool fencing. Overall the risk of the proposal creating significant fence barriers to local Koala movement is low.

4.9.2 Mitigation Measures: Fence Barrier

Mitigation Measures	Action	Responsibility	Milestone	Monitoring and Compliance
7.1 **Fence design requirements**	▪ Any new fences would be of a design and contain materials that allow for Koala movement and minimise the risk of fauna entanglement (e.g. no barbed wire). The exception to this is internal pool or dog yard fences.	**Current and Future Proponents:** ▪ Comply with KPoM requirements. **CVC:** ▪ DA consent conditions / title covenant to specify fence requirements.	▪ Potential Koala movement across the study area maintained.	**Current and Future Proponents:** ▪ KPoM monitoring report to detail compliance. **CVC**: ▪ Undertake inspections during compliance / certification stages of DA. ▪ Prosecute or order compliance if non-compliance.

5 Monitoring and Reporting

This section of the report provides a framework for the monitoring, review and reporting process for sustainable Koala management.

5.1 Monitoring and Review

Upon adoption of the KPoM and commencement of construction works, annual KPoM monitoring reports would be prepared by a suitably qualified and experienced ecological consultant, on behalf of the proponent. The reporting would be undertaken annually for a minimum of three years, until CVC are satisfied that the KPoM has been effectively implemented, and allows for long-term protection of the Koala.

The monitoring report would include:

- KPoM compliance / non-compliance with mitigation measures detailed in **Section 4**. This would include plans / mapping of trees removed, and inspections and mapping of any corresponding compensatory tree plantings (if required);
- records of Koalas observed by residents of the study area locally, including any Koala mortalities, injuries and rescues. Locations should be documented/mapped;
- undertaking at least five SATs along a fixed transect across the study area during the peak of the Koala breeding season (September - October) and Koala scat searches below retained primary browse species (Forest Red Gums) on the site; and
- any additional recommendations to achieve aims of KPoM and SEPP 44.

The monitoring report would be submitted to CVC, OEH and DOP for review.

6

Conclusions

This Koala Plan of Management (KPoM) has been prepared to support two Development Applications (DAs) associated with the subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights. This Plan has been written in accordance with SEPP 44 requirements and guidelines, which aims to encourage the conservation and management of natural vegetation areas that provide habitat for Koalas to ensure permanent free-living populations will be maintained over their present range.

Three vegetation communities have been identified on the subject site including pastoral grassland and Spotted Gum forest. The approximately 44 ha of Spotted Gum forest proposed for retention on Lot 5 DA Stage 1 (refer to **Illustration 4.2**) has been identified as the main area of potential Koala habitat, and supports all areas of major Koala activity. The direct development footprint (the site) appears to be subject only to low levels of Koala usage, and comprises mostly pastoral grassland.

The proposal will incrementally contribute to a number of threats to the Koala locally (refer to **Section 4**), with the main threats being habitat loss (restricted to areas of low Koala usage and comprising a total of approximately 60 trees), dog attacks and bushfire. An outline of mitigation measures is provided to alleviate the impacts of the proposal to at least maintain the current habitat values of the study area for the Koala (refer to **Section 4**).

It is not expected that the existing Koala population would be substantially adversely affected by the proposed subdivision. Effective implementation of this KPoM would ensure all efforts are employed to ensure that the existing habitat, linkages and population remain sustainable and healthy.

Project Team

The project team members included:

David Andrighetto
Ecologist

Anna Lloyd
Ecologist

Simon Waterworth
Senior Planner

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A

Subdivision Layout

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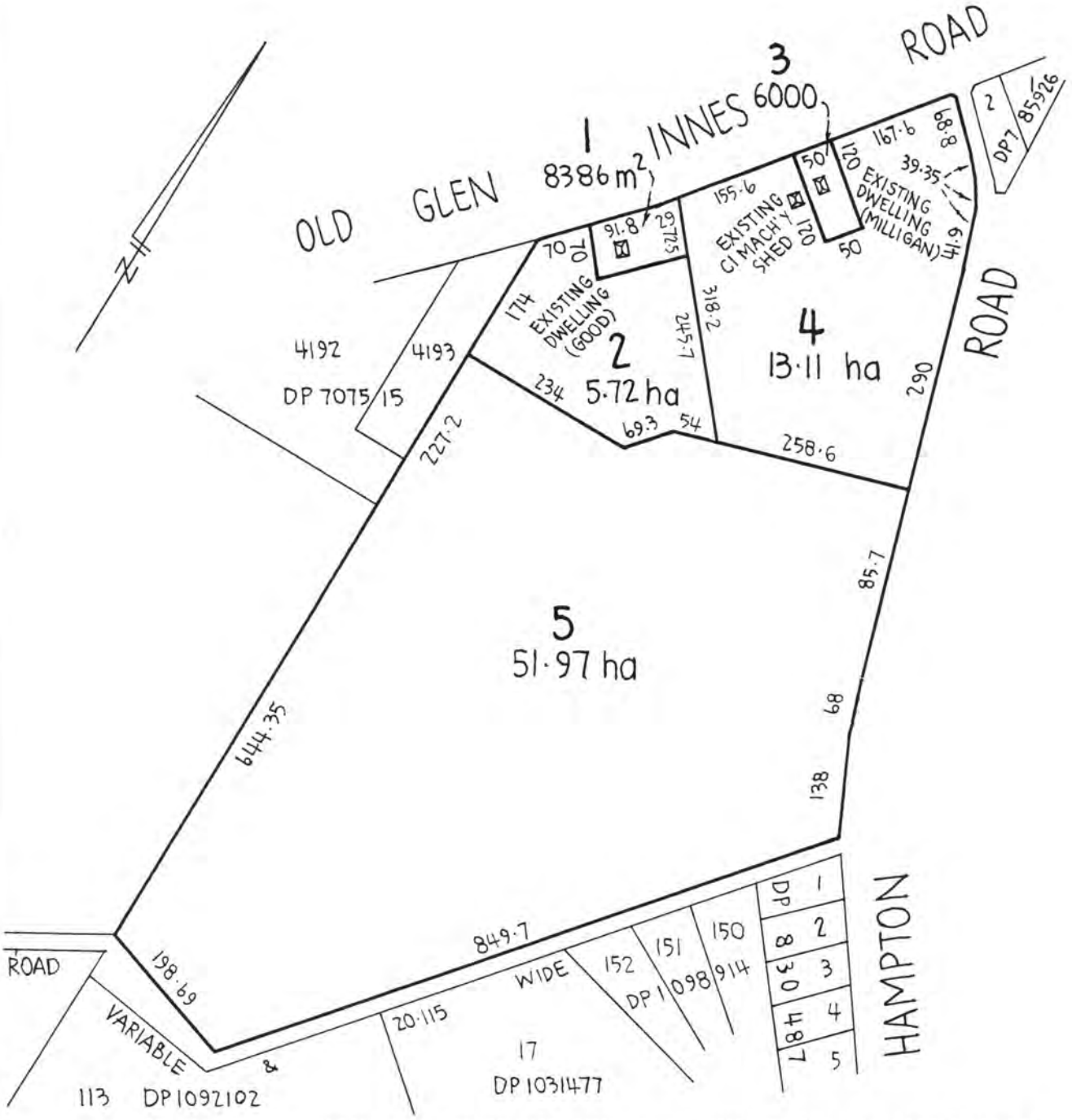
PLAN OF THE PROPOSED SUBDIVISION OF LOT 2411 IN DP709698 & LOT 9 IN DP820604

LOCALITY:	WATERVIEW HEIGHTS.	REFERENCE NO.:	9689
LGA.:	CLARENCE VALLEY.	DATE:	22ND JANUARY, 2007.
PARISH:	RUSHFORTH.	REDUCTION RATIO:	1 : 8,000.
COUNTY:	CLARENCE.	DATUM:	N/A
CLIENT:	MILLIGAN & GOOD.	SURVEYOR:	J. P. O'DONOHUE



NB. ALL MEASUREMENTS & AREAS ARE SUBJECT TO FINAL SURVEYS & MAY DEPEND UPON THE NATURAL & BUILT FEATURES OF THE LAND.

BOTHAMLEY AND O'DONOHUE PTY. LIMITED

ABN. 17 002 718 185

LAND AND ENGINEERING SURVEYORS, DEVELOPMENT CONSULTANTS

THE PROPERTY CENTRE,
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(02)6643 1066 (ah)
Fax: (02)6642 7808
email: bodsurvey@exemail.com.au

J. P. O'DONOHUE (B.SURV.) MIS. NSW.
REGISTERED SURVEYOR

GRID NORTH - MGA

OLD GLEN INNES ROAD

TIGERS ROAD

WEEMALA DRIVE

HAMPTON ROAD

PROPOSED ROAD 20 WIDE

(ROAD 20 WIDE)

4913
DP707515

2
5.727ha

5
51.97ha

4
13.12ha

3
6000m²

8382m²
BRICK COTTAGE
& TILE ROAD

TWO STORY
BRICK COTTAGE
& TILE ROOF
'SHANNONDOR'

OLD CI
SHED

LARGE METAL SHED

DAM

EXISTING DRIVEWAYS

EXISTING DRIVEWAY

TELSTRA PITS & POLE

TELSTRA PITS & ELEC POLE

TELSTRA PIT

TELSTRA PITS

TELSTRA POLE

ELEC POLE

ELEC POLE & TRANSFORMER

STAY WIRE

STAY POLE

SIGN

MAILBOX

OUTLET INVERT RL63.25
DIA 600 RCP
& RC HEADWALL
INLET INVERT RL63.49

OUTLET INVERT RL64.44
DIA 600 RCP
& RC HEADWALLS
INLET INVERT RL64.61

OUTLET INVERT RL66.08
DIA 375 RCP
& RC HEADWALL
INLET INVERT RL66.14

INLET INVERT RL65.63
DIA 375 RCP
& RC HEADWALL
OUTLET INVERT RL65.57

DIA 750 RCP
& RC HEADWALL
OUTLET INVERT RL63.43

INLET INVERT RL63.67

DIA 450 RCP
& RC HEADWALL
OUTLET INVERT RL57.57

INLET INVERT RL57.6

ELECTRICITY
& TELSTRA PITS

HYDRANT
ELECTRICTY PIT

TELSTRA PIT
STOP VALVE

STOP VALVES

HYDRANT

ELEC POLE & TRANSFORMER

1 DP785926

2 DP785926

36 DP842468

5 DP811071

6 DP811071

7 DP811071

8 DP811071

9 DP811071

10 DP811071

11 DP811071

12 DP811071

13 DP811071

14 DP811071

LEGEND & NOTES:-

- OVERHEAD ELECTRICITY &/OR TELEPHONE CABLES
- UNDERGROUND TELEPHONE CABLES
- WATER SUPPLY MAINS
- EDGE OF BITUMEN SURFACE/LANE
- EDGE OF GRAVEL FORMATION
- FENCE
- HYDRANT
- STOP VALVE
- ELECTRICITY POLE
- ELECTRICITY POLE WITH STREET LIGHT
- TELSTRA PIT
- CABLE MARKER
- SIGN/SIGN END
- GATE
- TREE(APPROX SPREAD)

ALL SERVICES ARE SHOWN AS A RESULT OF FIELD SURVEYS & ENQUIRIES TO THE RELEVANT AUTHORITIES INCLUDING 'DIAL BEFORE YOU DIG'. THE LOCATION & LEVEL OF ALL SERVICES MUST BE VERIFIED BY THE RELEVANT AUTHORITY PRIOR TO ANY EXCAVATION OR CONSTRUCTION

ALL MEASUREMENTS & AREAS ARE SUBJECT TO SURVEY & MAY DEPEND UPON THE NATURAL & BUILT FEATURES OF THE LAND

RIGHTS OF CARRIAGEWAY & EASEMENTS NOT SHOWN

MINIMUM AREA LOTS 6 TO 27 = 4,000m² (DRAFT CLARENCE VALLEY LEP 2010)

SCALE 1 : 250 0 2.5 5 7.5 10 12.5

SURVEYED: BT
DRAWN: JOD
DWG No.:DWG9689B

DATUM: AHD
CONTOUR INTERVAL: 0.5
REFERENCE No.: 9689

ISSUE	DETAILS	DATE
5		
4		
3		
2		
1	FIRST ISSUE	07/07/11

PROPOSED SUBDIVISION & DEVELOPMENT OF LOT 2411 IN DP709698 & LOT 9 IN DP820604 OLD GLEN INNES & HAMPTON ROADS, WATERVIEW HEIGHTS

DTM & DETAIL PLAN - LOT & ROAD LAYOUT

BOTHAMLEY AND O'DONOHUE PTY LTD
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CLIENT: BOTHAMLEY & O'DONOHUE PTY LTD
McLENNAN EARTHMOVING PTY LTD

SHEET 1 OF 1

Appendix D

Flora and Fauna Survey and Ecological Impact Assessment

Flora and Fauna Survey and Impact Assessment

Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

quality solutions **sustainable** future

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Flora and Fauna Survey and Impact Assessment

Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

Project Manager: David Andrighetto
Ref: 1837542
Date: October 2011

PO Box 9
Lennox Head NSW 2478
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C Floristic Data
D Threatened Species Potential Occurrence Potential
E Part 5A Assessment of Significance
F EPBC Act Matters Of National Environmental Significance – Significant Impact Criteria Assessment for Migratory and Threatened Species

1 Introduction

1.1 Background

GeoLINK has been engaged by Bothamley & O'Donohue Pty Ltd and McLennan Earthmoving Pty Ltd to prepare a flora and fauna survey and assessment to accompany the Statement of Environmental Effects (SEE) for two development applications with respect to the proposed subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights, NSW. Waterview Heights is located approximately 7 km west of Grafton on the North Coast of NSW, in the Clarence Valley Council (CVC) local government area (LGA).

For the purposes of this assessment:

- '***the site***' refers to the northern and eastern portions of Lot 9 DP 820604 and whole of Lot 2411 DP 709698. The site is defined by proposed Lots 1, 2, 3 and 4 (DA stage 1); and the relatively open north-eastern portion of Lot 5 that would be suitable for a building envelope with minimal vegetation clearing. Together, these areas represent the total area which may be directly affected by the proposal, which comprises approximately 25 ha.
- '***the study area***' refers to the entire property, that is, Lot 2411 DP 709698 and Lot 9 DP 820604. It comprises approximately 72.2 ha.
- '***the locality***' refers to land within a 10 km radius of the site.

A description of the study area context, topography and existing land uses is provided in the corresponding SEE (GeoLINK 2011).

The purpose of this assessment is:

- provide baseline data on the ecological attributes of the site via intense ecological survey;
- identify any ecological constraints for the proposed developments;
- identify opportunities to avoid or mitigate potential impacts;
- address the following legislation in relation to native flora and fauna:
  - *Environmental Planning and Assessment Act 1979* (EP&A Act);
  - *Threatened Species Conservation Act 1995 (*TSC Act);
  - *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act); and
  - *State Environmental Planning Policy (SEPP) 44 – Koala Habitat Protection.*

Information shown is for illustrative purposes only

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Source of base data: Google Earth

North

0 150

The Site and Study Area

GeoLINK environmental management and design

Flora and Fauna Survey and Impact Assessment: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837543

Illustration 1.1

2 The Proposal

2.1 Description of Proposed Subdivision

The proposal is a two stage subdivision:

- DA stage 1 subdivision: Subdivide the property into 5 lots ranging from 0.6 to 51.97 ha. All new lots would have direct access to Old Glen Innes Road or Hampton Road. Lot 1 and 3 encompass the existing dwellings.
- DA stage 2 subdivision: Subdivide Lot 4 from DA 1 Subdivision (13.11 ha) into 27 rural residential / small holdings lots comprising a minimum lot size of 0.4 ha. An internal cul-de-sac road would be established off Old Glen Innes Road, providing access to 16 of the lots. The remaining lots would be accessed directly from Old Glen Innes Road or Hampton Road.

The layout of each stage of the subdivision is provided in **Appendix A**. **Plates 2.1** to **2.4** provide views of the site. Key additional features that would be established (either at part of the subdivision or by lot future owners) include:

- dwellings and associated assets on all lots, excluding Lot 1 and 3 of stage 1;
- on-site waste water management systems on all lots, excluding Lot 3 of stage 1. The on-site waste water management system for Lot 1 of stage 1 would be upgraded as part of the proposal; and
- boundary fences and driveways.

Plate 2.1 Central portion of the site viewed from the north to south

Plate 2.2 Dam in the central eastern portion of the site

Plate 2.3 Stand of trees in the southern portion of the site

Plate 2.4 Typical view of eastern portion of Lot 5 stage 1 (residual lot)

3 Methodology

3.1 Report Methodology

The methodology for this ecological survey and assessment has been formulated based on a review of the NSW Office of Environment and Heritage (OEH) *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft, November 2004* (DEC 2004a). The report methodology is as follows:

- literature review of background information;
- conduct a search of the following databases to identify potential issues:
  - OEH Atlas of NSW Wildlife flora and fauna records;
  - OEH 1:100,000 Grafton threatened species map sheet; and
  - EPBC Act Protected Matters Search Tool.
- undertake flora and fauna field surveys;
- assess the habitat;
- assess the ecological impacts; and
- outline mitigation measures to be implemented to reduce potential impacts.

Specific flora and fauna survey methodology is provided in **Sections 3.4** and **3.5**.

3.2 Site Survey

Flora and fauna surveys within the site were undertaken by GeoLINK over three days and two nights on the 21, 22 and 23 September 2011. The field survey approach, outlined below, focused on specific flora and fauna surveys and habitat assessments in accordance with the *Threatened Species Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft November 2004* (DEC 2004a).

3.3 Weather

The specific weather conditions during the survey and survey dates are described in **Appendix B**. In general weather conditions were fine, warm and dry.

3.4 Flora Surveys

Flora surveys were conducted in order to provide a list of all species observed within the site, identify vegetation communities and determine the likely occurrence on the site of threatened species that were identified during threatened species database searches. A total survey effort of five field hours was dedicated to flora surveys.

3.4.1 Random Meander Surveys

The 'random meander' method, as explained within the *Threatened Species Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft November 2004* (DEC 2004a), was undertaken to record general flora species and also target potential threatened species as outlined in Cropper (1993). **Illustration 3.1** shows the location of random meander transects undertaken during the

survey.

The floristic composition and structure of vegetation communities within the site were recorded. The identification of flora species were recorded in the field and those that required further clarification were collected and keyed out using relevant literature.

3.4.3 Targeted Threatened Flora Searches

Targeted threatened flora surveys were incorporated into the random meander surveys as indicated above. The full area of the site was traversed; with some transects extending into the remainder of the study area.

3.5 Fauna Surveys

3.5.1 General Fauna Surveys

Opportunistic sightings of fauna species were recorded during field surveys. This included noting the location and species of any fauna encountered during general field work (i.e. not specific targeted surveys). In general, the following fauna survey methodology follows guidelines set out in DEC (2004a) and Murray *et al.,* (2002).

Following an initial habitat assessment, target fauna species were determined and surveys were undertaken for those species that were identified as having potential habitat within the site.

3.5.2 Amphibian Survey

In order to adequately survey for frogs species, a number of specific survey techniques were employed. These are as follows:

Diurnal Searches

Surveys were concentrated in the dams and drainage lines in the south of the site. Specific habitat searches included the investigation of potential basking and sheltering sites such as emergent aquatic vegetation and areas of dense clumps of groundcover vegetation. A total of two and a half hours were spent on diurnal searches specifically for amphibians.

Nocturnal Searches

Surveys were concentrated in the dams and drainage lines in the south of the site (refer to **Illustration 3.2** for spotlighting locations). This involved call playback of pre-recorded frog calls, listening for calls and spotlight searches. Targeted threatened species included the Green-thighed Frog (*Litoria brevipalmata*) and Green and Golden Bell Frog (*Litoria aurea*). Frog calls not able to be identified during field surveys were recorded and played back against pre-recorded frog calls for positive identification. A total of five hours (two and a half hours per night for two nights) was spent on nocturnal surveying specifically for amphibians.

3.5.3 Reptile Survey

Herpetofauna searches were undertaken across the site within areas representing potential reptile habitat (refer to **Illustration 3.2** for survey locations). This involved searching under logs, decorticated bark and deeper leaf litter accumulations, and was combined with general fauna surveys.

During night surveys, spotlighting targeting reptiles was incorporated into general spotlighting activities, targeting potential nocturnal reptile habitats (e.g. tree trunks, fallen logs, areas with deeper leaf litter accumulations). A total of five hours (two and a half hours per night for two nights) was spent undertaking reptile surveys.

3.5.4 Diurnal Bird Survey

The area search method as outlined within DEC (2004a) was conducted as part of this study. Specific observations were recorded from visual and vocal identification conducted during peak morning and late

afternoon activity periods. Attention was given to observe any threatened bird species previously recorded in the locality that may be present. Bird calls not able to be identified during field surveys were recorded and played back against pre-recorded bird calls for positive identification.

3.5.5 Nocturnal Bird Survey

Call Playback, Spotlighting and Stag Watches

Nocturnal bird surveys employed a combination of call playback, spotlighting and stag watches. The primary target species were the Masked Owl (*Tyto novaehollandiae*), Powerful Owl (*Ninox strenua*), Barking Owl (*Ninox connivens*) and Bush-stone Curlew (*Burhinus grallarius*). Call playback involved the broadcasting of pre-recorded vocalisations of the using a 15 watt 'TOA' megaphone ER-1215S. An initial listening period of 10 minutes was undertaken at the call playback broadcast site followed by 10 minutes spotlighting the immediate area. Calls were then broadcast intermittently for approximately five minutes followed by a 10 minute listening period. After all calls had been broadcast, a further 15 minutes of spotlighting was undertaken within the broadcast area. Call playback was undertaken over two consecutive nights during the survey from the centre of the site and in the study area in the proposed Lot 5, DA stage 1 (refer to **Illustration 3.2** for call playback locations).

Stag watches were undertaken on three different trees on two nights (refer to **Illustration 3.2** for stag watch locations). The methodology as outlined within DEC (2004a) was adopted.

3.5.6 Mammal Survey (Excluding Microchiropteran Bats)

Mammal survey methodology employed included spotlighting, call playback, searches of tracks, scats and other traces (diggings, prints, scratches, etc), and habitat analysis. The specific methodologies adopted are detailed below. Survey methods such as wire cage trapping, ground Elliott trapping and hair tubes sampling were not undertaken due to the highly modified state of the site (hence low habitat value for target species) and conservative use of habitat evaluation.

Stag Watches

Stag watches were undertaken on three different trees on two nights (refer to **Illustration 3.2** for stag watch locations). The methodology as outlined within DEC (2004a) was adopted.

Spotlighting

Spotlighting was undertaken over two nights on foot using a 100 watt spotlight. Surveys were concentrated in the treed areas on the site and drainage lines extending to the south in the proposed Lot 5 DA stage 1(refer to **Illustration 3.2** for spotlighting locations). Target species included the Koala (*Phascolarctos cinereus*), Yellow-bellied Glider (Petaurus australis), Squirrel Glider (Petaurus *norfolcensis*), Rufous Bettong (*Aepyprymnus rufescens*) and Brush-tailed Phascogale (*Phascogale tapoatafa*). The moon phase at the time of spotlighting was waning crescent (approx. 20% of full moon), creating low light surveying conditions. All habitat components were targeted, i.e. tree canopies for arboreal mammals, logs and undergrowth for terrestrial fauna, etc. A total of four hours (two hours per night for two nights) was spent undertaking mammal spotlighting surveys.

Call playback

Call playback surveys were conducted in conjunction with spotlighting in the same areas (refer to **Illustration 3.2** for call playback locations). The primary target species were the Koala, Yellow-bellied Glider and Squirrel Glider. This involved call playback of pre-recorded mammal calls, listening for calls and spotlight searches. A total of three hours (one and a half hours per night for two nights) was spent on nocturnal surveying specifically for mammals (excluding Microchiropteran bats).

Tracks, Scats and other Traces

During surveys, opportunistic recordings of tracks, scats, scratches, diggings and other traces were observed and / or collected for further analysis and reference to Triggs (2004). A total of three hours was devoted specifically to habitat searches which included searches for scats and tracks.

3.5.7 Megachiropteran Species (Flying-foxes, Fruit Bats)

Spotlighting

Spotlighting was undertaken on foot using a 100 watt spotlight. Survey effort covered two nights, each being for a period of one and a half hours.

Vocal Detection

The Grey-headed Flying-fox (*Pteropus poliocephalus*) is known to emit audible vocal calls especially during territorial disputes when feeding (Christesen and Nelson 2000). Listening for vocal calls was undertaken during night surveys over two consecutive nights.

3.5.8 Microchiropteran Bats

Ultrasonic Echolocation Detection

Microchiropteran bats (microbats) emit high frequency echolocation calls to navigate and forage. Ultrasonic call detection and analysis is recognised as an effective way of surveying microbat species within a range of habitats (Murray *et.al.* 2002). A single Anabat SD1 CF bat detector was set on two consecutive nights for approximately 12 hours per night (24 hours in total) by the dam and centre of drainage line in the southern portion of the site (refer to **Illustration 3.2** for Anabat locations). Recorded echolocation calls were forwarded to Anna Lloyd, an Anabat echolocation call analysis specialist, for call identification.

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Source of base data: Google Earth

North

0 150

Flora Survey Transects

GeoLINK environmental management and design

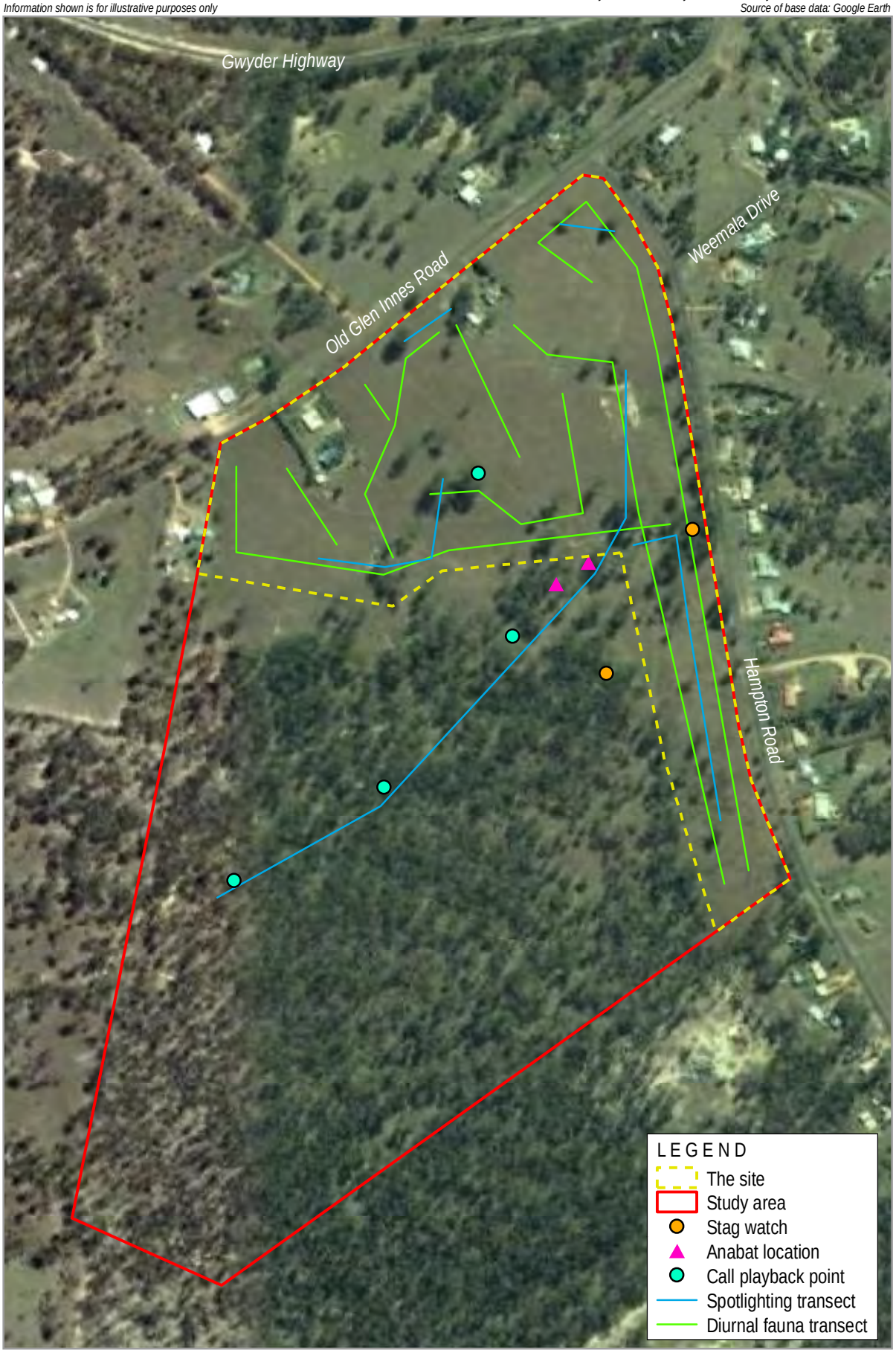
Flora and Fauna Survey and Impact Assessment: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837544

Illustration 3.1

Drawn by: DSA Checked by: RE Reviewed by: MVE Date: October 2011

Information shown is for illustrative purposes only

Source of base data: Google Earth



0 150

North

Fauna Survey Locations

Flora and Fauna Survey and Impact Assessment: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights

1837546

Illustration 3.2

3.6 Habitat Assessment

As it is recognised that not all species can be detected during a single seasonal period, habitat assessment was undertaken within the site and study area (proposed Lot 5 DA stage 1) to identify the occurrence of potential habitats and subsequently determine the suitability of these for threatened species.

3.6.1 Random Meander Surveys

The 'random meander' method, as explained within the *Threatened Species Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft November 2004* (DEC 2004a), was undertaken to assess the habitat present. The following features of fauna habitat were recorded:

- land use;
- vegetation structure;
- dominant plant species;
- level of disturbance;
- presence of scats, tracks, scratches, pock marks, diggings, signs of feeding and shelter, etc;
- tree hollows and spouts;
- connectivity;
- rocky outcrops or caves; and
- aquatic habitats.

3.7 Survey Limitations

The survey was conducted during early Spring, which is favourable for the identification of some target threatened fauna and flora species including many bird and mammal species. This time of year however is less desirable for surveying for other target species such as the Green and Golden Bell Frog (*Litoria aurea*) which breeds in Summer (OEH undated). Additionally, while some species may be present, they may have avoided detection due to their rarity, elusive nature or the sporadic utilisation of the site. Habitat evaluation and application of the precautionary principle is subsequently adopted to address these limitations.

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4

Results

4.1 Vegetation Communities

Three vegetation communities were identified on the site:

- Pastoral Grassland: Occurs across most of the site and has been cleared of native vegetation apart from isolated individual or small clusters of trees;
- Spotted Gum Forest: Occurs as the heavier patches of trees amongst the pastoral grassland, with the larger area occurring adjacent to Hampton Road and around the dam. This community also occurs across the majority of the Lot 5 stage 1 DA; and
- Aquatic Dam Vegetation: Occurs in the three dams in the eastern portion of the site.

The locations of these communities are shown in **Illustration 4.1**. Their structural and floristic compositions are detailed in **Sections 4.1.1**, **4.1.2** and **4.1.3**. All flora species detected during the survey are listed within **Appendix C**.

4.1.1 Pastoral Grassland

Structure and Floristic Composition

Emergent - Canopy – Consists of isolated trees and small clusters of trees generally between 15 to 30 m high. Tree diameter at breast height (DBH) is mostly between 0.3 and 0.5 m. Spotted Gum (mostly *Corymbia variegata* and to a lesser extent *C. henrii*) is the dominant species. Other species include Blackbutt (Eucalyptus pilularis), Grey Box (*E. moluccana*), Forest Red Gum (*E. tereticornis*), Northern Grey Ironbark (*E. siderophloia*), Red Bloodwood (*Corymbia gummifera*) and Swamp Box (*Lophostemon suaveolens*).

Emergent - Mid-storey – Predominantly absent. Some Eucalypt saplings occur in unslashed areas where livestock grassing has been reduced in recent times (e.g. southern portion of the site on DA stage 1 Lot 5).

Groundcover – Cover is generally mid-dense, with most groundcovers between 0.1 and 0.3 m tall (most of the site is subject to slashing). Supports mostly exotic pastoral grasses and herbs. Native species are less common and occur mainly occur in proximity to forested areas. Commonly occurring species include *Eragrostis sp*., *Aristida sp*., Wiry Panic (*Entolasia stricta*), Two-colour Panic (*Panicum simile*), Weeping Grass (*Microlaena stipoides*), Cobbler's Pegs (*Bidens pilosa**), Common Everlasting (*Chyrsocephalum apiculatum*), Cudweed (*Gamochaeta americana**), Fireweed (*Senecio madagascariensis**), Dandelion (*Taraxacum officinale**), Flaxleaf Fleabane (*Conyza bonariensis**), Kidney weed (*Dichondra repens*) and Twining Glycine (*Glycine clandestina*), Blue Flax-lily (*Dianella caerulea*).

Distribution and Variation of Community within the Site

This community occurs over the majority of the site, with an area of approximately 24.25 ha (refer to **Illustration 4.1** and **Plate 4.1**). Structure and floristic composition is very simple due to historic disturbances, particularly clearing and pastoralist activities. Species diversity is low to moderate.

Condition of Vegetation

This community has experienced an extensive disturbance history including clearing, livestock disturbances and pastoral improvement/maintenance works (e.g. slashing). Consequently this community

is of predominantly of low quality in terms of native flora biodiversity values.

Conservation Significance

The OEH BioMetrics Vegetation Types includes a list of native vegetation communities in the Northern Rivers Catchment Management Authority (NRCMA) area and an estimate of the percentage of each vegetation type which has been cleared. This can assist in determining the conservation status of particular vegetation communities. Under the Biometric model clearing is not allowed in vegetation communities that are more than 70 per cent cleared and are not in low condition.

The pastoral grassland in the study area does not correspond to any of the OEH BioMetrics listed vegetation types for the NRCMA. This community does not constitute any TSC Act or EPBC Act listed Endangered Ecological Communities (EECs). Overall it is of low conservation significance.

Plate 4.1 Pastoral grassland with isolated trees in the background

4.1.2 Tall Dry Spotted Gum Open Forest (Spotted Gum Forest)

Structure and Floristic Composition

Canopy – Consists of forested structured vegetation generally between 15 to 30 m high, with DHB mostly between 0.3 and 0.5 m. The vegetation community is dominated by Spotted Gum (*Corymbia variegata* and to a lesser extent *C. henrii*), with Forest Red Gum occurs as a co-dominant species, mainly in proximity to drainage lines. Other species present include Northern Grey Ironbark, Red Bloodwood and Swamp Box.

Mid-storey – Absent in slashed areas which comprises most of the site. In unslashed areas (including the majority of Lot 5 stage 1 DA), supports an open mid-storey of canopy saplings, and mostly immature Maidens Wattle (*Acacia maidenii*), Coffee Bush (*Breynia oblongifolia*) and Red Ash (*Alphitonia excelsa*). Most mid-storey trees range between 1.5 and 6 m tall.

Groundcover – On the site, generally as per the pastoral grassland. In the remainder of the study area, supports a predominantly mid-dense cover of native and exotic grasses and herbs including Blady Grass (*Imperata cylindrica*), Wiry Panic, Two-colour Panic, *Eragrostis sp*., *Aristida sp*., Weeping Grass, Rock Fern (*Cheilanthes sieberi subsp. sieberi*), Common Everlasting, Twining Glycine (*Glycine clandestina*), Blue Flax-lily (Dianella caerulea) and *Lomandra spp*.

Distribution and Variation of Community within the Site

This community occurs as the heavier patches of trees amongst the pastoral grassland (refer to **Illustration 4.1** and **Plate 4.2**). It comprises approximately 0.6 ha on the site, with approximately 44 ha occurring in the remainder of the study area on Lot 5 stage 1 DA. Vegetation structure and composition on the site has been simplified due to slashing and grazing impacts, and now comprises a pastoral woodland structure of low floristic diversity. In the remainder of the study area on Lot 5 stage 1 DA, this community has experienced a less intensive disturbance regime and comprises intact forest.

Condition of Vegetation

The stands of Spotted Gum forest on site have experienced an extensive disturbance history including under scrubbing, partial clearing/logging, livestock disturbances (grazing and trampling) and fire. This vegetation is generally in poor condition.

The Spotted Gum forest in the remainder of the study area has experienced a similar, though less intensive disturbance history. It comprises intact forest which varies in condition from moderate to good.

Conservation Significance

This community contains attributes to two BioMetrics vegetation communities:

- Type 153 – Spotted Gum dry grassy open forest of the foothills of the northern North Coast, of which 40% is estimated to have been cleared; and
- Type 145 – Spotted Gum - Blackbutt open forest of the lower Clarence Valley of the North Coast, of which 30% is estimated to have been.

Neither vegetation type is recognised under the OEH Biometrics model as 'overcleared'. This community does not constitute any TSC Act or EPBC Act listed EECs. Overall it is of no significant conservation value in terms of conservation of floristic diversity.

Plate 4.2 Typical view of Spotted Gum forest on the site

4.1.3 Aquatic dam vegetation

Structure and Floristic Composition

Canopy – Absent

Mid-storey – Absent.

Groundcover – Consists of sedgeland and rushland vegetation with a mix of predominantly native aquatic species occurring at the three constructed dams. Cover varies between very sparse in deep water in the

middle of the dams, to dense around the shallow edges, particularly in the south eastern dam. Wetland species include Azolla (*Azolla sp.*), a rush (*Juncus polyanthemus*.), Giant Waterlily (*Nymphaea gigantea*), Common Spike Sedge (*Eleocharis acuta*), River Buttercup (*Ranunculus inundates*), Nardoo (*Marsilea mutica*), Frogsmouth (*Phyilydrum lanuginosum*), and Bog Bulrush (*Schoenoplectrus mucronatus*).

Distribution and Variation of Community within the Study Area

Occurs primarily within three constructed dams (refer to **Illustration 4.1**). Isolated aquatic elements also occur in parts along the drainage lines. This community has a total area of approximately 0.15 ha. Species occurrence and dominance varies with water availability and depth.

Condition of Vegetation

The dams are an artificial habitat component. The quality of this community is degraded to varying degrees due to historic clearing, livestock disturbances (e.g. trampling and grazing in the drainage line) and water quality impacts associated with direct livestock access (refer to **Plate 4.3** and **4.4**). Vegetation in the south-east dam is in good condition and has retained structural integrity and native floristic diversity. The north-eastern dams show evidence of greater stock access and are in poor condition.

Conservation Significance

The aquatic dam vegetation community does not correlate with any OEH BioMetrics vegetation types. It does not constitute any TSC Act or EPBC Act listed EECs; and is of low significance in terms of conservation of floristic diversity.

Plate 4.3 Aquatic vegetation in the south-eastern dam

Plate 4.4 Aquatic vegetation in the larger north-eastern dam

4.1.4 Noxious Weeds

Three weed species listed under the *Noxious Weeds Act 1993* (NW Act) for the CVC LGA were recorded in the study area, outside of the site. These are:

- Mother-of-Millions (*Bryophyllum sp.**): Class 3 Noxious Weed. Uncommon occurrence in the study area. Legal requirements under the NW Act: '*The plant must be fully and continuously suppressed and destroyed and the plant must not be sold propagated or knowingly distributed*'.
- Camphor Laurel*: Class 4 Noxious Weed. Uncommon occurrence in the study area. Legal requirements under the NW Act: '*The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed*'.
- Lantana*: Class 4 Noxious Weed. Uncommon occurrence in the study area. Legal requirements under the NW Act: '*The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed*'.

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Drawn by: DSA Checked by: RE Reviewed by: MVE Date: October 2011
Source of base data: Google Earth

North

0 150

Vegetation Communities

GeoLINK environmental management and design

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1837551

Illustration 4.1

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4.2 Threatened Flora

4.2.1 Survey Results

No threatened flora species were recorded during the survey.

4.2.2 Database Results

Records of threatened flora species, populations or ecological communities known to occur within a 20 km by 20 km area around the site were obtained from the OEH Atlas of NSW Wildlife (19/09/2011). Thirty-eight records of seven threatened flora species were identified in the search area. Records of threatened flora species, communities or species habitat likely to occur within a 10 km radius of the site were also obtained from the EPBC Protected Matters Search Tool (17/09/2011). The EPBC database listed 11 threatened flora species as '*Species or species habitat likely to occur within area*'; three threatened flora species as 'Species or species habitat known to occur within *area,'* and one threatened Ecological Community as *'Community likely to occur within area'*.

The suitability of the habitat on the site and therefore the potential occurrence of these threatened flora species is provided in **Appendix D**. No threatened flora species are considered likely occurrences on the site which has experienced an extensive disturbance history. Consequently threatened flora are not considered further in this assessment as no threatened flora are considered likely to be affected by the Proposal.

4.3 Endangered Ecological Communities

No EECs listed under the TSC Act 1995 and/or EPBC Act 1999 occur in the study area.

4.4 Fauna Results

4.4.1 Survey Results

Fauna recorded during the survey are listed in **Appendix C**). The Grey-headed Flying-fox (*Pteropus poliocephalus*) and the Little Bent-wing Bat (*Miniopterus australis*) were the only threatened fauna species recorded during the survey. Both species are listed as Vulnerable under the TSC Act. The Grey-headed Flying-fox is also listed as Vulnerable under the EPBC Act. The habitat value of the site for these species is detailed in the introduction to the Seven-part Test in **Appendix E**.

No EPBC Act listed migratory species were recorded during the survey, though several are considered potential occurrences (refer to **Section 4.6**).

4.4.2 Habitat Assessment

The site and study area habitats were assessed to determine their value for native fauna species. Assessments were completed in conjunction with the flora surveys and focused on identifying habitat features known to be associated with threatened species and other native fauna groups. Observations made in respect of these habitat features are listed in **Table 4.2**. These features are components of the environment that, if present, will support fauna communities or indicate that fauna may be present. Habitat assessment is used to help determine the occurrence potential of threatened fauna species later in the report.

Overall, the site has experienced an extensive disturbance history including clearing and grazing. Despite these impacts the site still supports a variety of habitat types, including potential habitats for a variety of locally recorded threatened fauna species (refer to **Section 4.5**) capable of inhabiting habitats on the agricultural/urban interface.

Better quality habitat occurs in the forested areas in the remainder of the study area on Lot 5 DA stage 1 which is not expected to be directly impacted by the proposal.

Table 4.2 Fauna Habitat Features

Habitat Feature	*Indicator*	*Site Score*	*Comment*
Claw Marks on Trees	Claw marks on trees indicate the presence of arboreal mammals such as Possums, Gliders and Koalas and reptiles such as the Lace Monitor	1	Evidence of arboreal fauna activity was indicated by claw marks on smoothed barked trees. Koala (*Phascolarctos cinereus*) pock and scratch marks were observed on the site and study area on Forest Red Gum (refer to **Plate 4.5**) and occasionally on Spotted Gum. Scratch marks of the Common Brushtail Possums (*Trichosurus vulpecular*) were also present (confident) on smoothed barked trees.
Scats	A range of animal faeces may be recorded indicating the presence of certain animals	2	Koala scats (refer to **Plate 4.6**) were detected below seven trees on the site, as well as a number of trees in the remainder of the study area (refer to **Section 5**). They were mainly found below Forest Red Gums, but also some Grey Box, Northern Grey Ironbark and Spotted Gum generally in proximity to Forest Red Gums. Scats of the Eastern Grey Kangaroo (*Macropus giganteus*) were common. Common Brushtail Possum scats were also encountered occasionally. No carnivorous fauna scats were detected.
Allocasuarina sp.	*Allocasuarina spp.* provide key foraging sources for the Glossy Black Cockatoo (DEC 2004b)	0	No *Allocasuarina spp.* Occur on the site. Hence the site is of negligible foraging habitat value for the threatened Glossy Black Cockatoo (*Calyptorhynchus lathami*).
Tracks	A range of animal tracks at ground level may be recorded indicating the presence of certain animals	1	Runway tracks made by ground-dwelling mammals were observed through Blady Grass dominant areas in the study areas outside of the site (refer to **Plate 4.7**).
Tree Hollows and stags	Tree hollows and stags provide shelter and roosting areas for a variety of birds, reptiles and arboreal mammals	1	Three trees on the site contained well formed hollows, all with opening =/>10 cm diameter that were discernable to an on-ground observer (refer to **Plate 4.8** and **Illustration 4.2** – these trees were flagged with yellow tape in the field). These trees provide denning/roosting/nesting opportunities for a number of hollow obligate fauna capable of inhabiting modified habitats (e.g. microchiropteran bats, lorikeets, Brushtail Possums, etc). Several other trees contained small hollows/cavities that were not well formed, though may provide minor roosting opportunities for

Habitat Feature	Indicator	Site Score	Comment
			microchiropteran bats. No fauna were observed using the hollows on the site. A number of hollow-obligate fauna were however observed during the survey including Rainbow Lorikeet (*Trichoglossus haematodus*), Common Brushtail Possum (*Trichosurus vulpecular*) and Galah (*Cacatua roseicapilla*). Factors including the disturbance history of the site substantially reduce the potential for the tree hollows on the site to be utilised by threatened hollow-obligate species. In addition to actual hollow-bearing trees, several trees on the site contained small crevices, broken limbs and/or notches that were considered likely to form future hollows in the next 10 to 30 years (potential hollows). General observations elsewhere in the study area noted that hollow-bearing trees were uncommon.
Rocky Outcrops	Rocky outcrops are preferred by certain fauna	0	No major rocky outcrops were prevalent on the site. Some minor exposed rocks were evident in the drainage line of the proposed Lot 5 DA stage 1 in the remainder of the study area, particularly where soil erosion was active (refer to **Plate 4.9**).
Animal Diggings	A range of animal diggings in the soil may be recorded indicating the presence of certain animals	1	No fauna diggings were detected on the site though some Bandicoot diggings were detected in proposed Lot 5 DA stage 1, in the remainder of the study area. The culprit species was not discernable (refer to **Plate 4.10**).
Burrows	Fauna can be identified by the types of burrows present	1	No burrows were detected on site. Some minor burrows occurred under fallen timber in the proposed Lot 5 DA stage 1 in the remainder of the study area.
Leaf Litter	Large amounts of leaf litter often indicates ample invertebrate activity and shelter for small animals	1	Leaf litter accumulations were generally low on site and restricted to the drip line of trees. Moderate accumulations around were present in the heavier forested areas of proposed Lot 5 DA stage 1 in the remainder of the study area.
Bones	Bones can be used to identify fauna	0	No bones were detected on the site.
Aquatic Habitat	Fauna are often attracted to water	2	Aquatic habitat on the site includes: ▪ three dams - aquatic vegetation generally covered the

Habitat Feature	Indicator	Site Score	Comment
	bodies to drink, spawn or forage		shallow water around the dam edges grading to less dense cover as water depth increases; and ▪ ephemeral drainage lines. On site a drainage line occurs in the east between the two larger dams (refer to **Appendix A**). It is in a highly degraded condition and provides limited aquatic habitat values, likely only to be used by common species. In the remainder of the study area, the drainage lines are generally of better habitat quality for species that inhabit dry forest communities (eg. *Litoria peronii*). Open semi-permanent pools may also provide potential foraging habitat for the Large-footed Myotis (*Myotis macropus*). The dams provides habitat for a number of common waterfowl (e.g. Pacific Black Duck *Anas superciliosa*), though are unlikely to attract any relevant threatened species. They also provide habitat for common frogs, though the potential for any threatened frogs to occur is low due to presence of only marginal habitat mainly due to the study areas extensive disturbance history which includes historic clearing, livestock disturbances, etc. The dams may also provide potential foraging habitat for the Large-footed Myotis.
Fallen Timber and Hollow Logs	Fallen timber and hollow logs often provide shelter for a variety of fauna, as well as provide prey (including invertebrate prey) habitat	1	No significant fallen timber or logs were present on the site. Tree stumps, hollow logs, and fallen and felled timber were however common in the remainder of the study area in the forested area of proposed Lot 5 DA stage 1 (refer to **Plate 4.11**).
Extent of Well Developed Vegetation Structure	An area with a large extent of well developed vegetation structure will encourage fauna	1	The site comprises of a mostly cleared area used for grazing. Habitat features on the site are restricted to scattered trees and small pockets of forest, as well as the dams and associated drainage line. In general the site habitat lacks structural integrity and an abundance of habitat features. The Spotted Gum open forest on the remainder of the study area (outside of the site) on proposed Lot 5 DA stage 1 however is intact, is a reasonable size, and supports habitat features suitable for a suite of dry open forest dependant fauna.
Sap Sources	Specific Angophoras, Eucalypt and Corymbia species may provide	1	The main species which provide potential sap sources for *Petaurus spp.* include Red Bloodwood, Spotted Gum and Forest Red Gum. No incisions indicative of *Petaurus spp.* foraging was detected.

Habitat Feature	Indicator	Site Score	Comment
	potential sap sources for *Petaurus spp.* (Van Dyck and Strahan 2008)		
Diversity of Flora Species	A broad flora species diversity provides a large range of food sources and habitat available for fauna	1	The site has a relatively low floristic diversity, with limited canopy tree species, no definitive mid-storey, and a mostly slashed groundcover. The diversity of canopy species present provide an almost year round seasonal nectar and pollen sources for nectivorous birds, arboreal mammals and megachiropteran bats. The fragmented distribution of this habitat and limited numbers of some species however reduce the overall value of this component to more mobile or habitat generalist species. The Spotted Gum forest habitat on proposed Lot 5 DA stage 1 in the remainder of the study area has slightly higher diversity of native species. The structural integrity and size of this habitat increases the overall values of this habitat.
Understorey, Shrub Layer and Ground Cover	Dense understorey or ground cover such as thick grass provides shelter for small ground dwelling fauna	1	The site lacks any significant structured understorey and groundcover habitats. The main value of this component is as foraging habitat for common species such as macropods. This habitat component in the Spotted Gum forest habitat on proposed Lot 5 DA stage 1 in the remainder of the study area is of higher habitat values. It includes areas with a well developed grassy groundcover, providing good shelter substrate for ground-dwelling, dry open forest inhabiting species. The disturbance history of the study area however reduces the potential for threatened species dependant on a dense continuous groundcover to occur (e.g. Common Planigale *Planigale maculata*).
Connectivity and Corridors	Areas that are connected to other areas of vegetation provide a corridor for movement and can accommodate large numbers of fauna	2	The study area forms part of a larger agricultural / small holdings area located on the foothills of the Clarence River Floodplain. It comprises a mosaic of cleared grazing land, small holding developments and patches of forest/woodland (many of which have been subject to disturbances such as grazing and or logging). The main local links associated with the site and study area include: ▪ scattered trees and small patches of Spotted Gum forest in the east near the southern dam forms part of a link between a local patch of forest around Weemala Drive (east) and the Spotted Gum forest and interconnected habitat in the south-western portion of the study area. This may support the movement of forest dwelling species such as Phascogales and Koalas; and ▪ Spotted Gum forest in the south-western portion of the study area is continuous with the forest/woodland vegetation to the west and south. For habitat

Habitat Feature	Indicator	Site Score	Comment
			generalist capable of crossing modified landscapes, these habitats may be interconnected with large areas of habitat to the far west and south; and ▪ connectivity between the habitats on site and to the north is poor, primarily as the northern portion of the site comprises mostly clearing grazing land. Only highly modified habitat generalist capable of crossing cleared grassland areas (e.g. Koalas, macropods) may potentially disperse in this direction across the site. Threatened fauna species that may exist in the study area would be expected to preferentially use the relatively intact forest area to the south-west, off-site. Part of this vegetation has been mapped as a Key Habitat area by the OEH Key Habitats and Corridors project (refer to **Illustration 4.3**). The study area does not form part of any OEH mapped Regional Corridors (refer to **Illustration 4.3**), or *CVC Biodiversity Management Strategy* (2010) corridors or 'Conserve' and 'Repair' priority areas.
Koala browse species	Refer to SEPP 44 Koala Habitat Assessment in **Section 5**	2	Refer to SEPP 44 Koala Habitat assessment in **Section 5**.
Raptor roost and/or nest trees	Most raptors are very selective in choosing both the type of tree and the location used for roosting or building of nests.	1	Due to the open structure of the habitat on the site and dimensions of the tree hollows present, the site has limited potential to support roosting or nesting of any threatened forest owls such as the Powerful Owl (*Ninox strenua*). No large stick nests indicative of potential roosting of locally recorded threatened raptors were present. The Spotted Gum forest may provide potential nesting sites for raptors that utilise stick nests in living trees. During the survey a single Brown Falcon (*Falco berigora*) was observed arriving and departing from a stick nest constructed in a large Spotted Gum located in the proposed Lot 5 DA stage 1 south of the site, in the remainder of the study area.

0 *Nil*
1 *Low Occurrence*
2 *Medium Occurrence*
3 *High Occurrence*

Plate 4.5 Koala pock and scratch marks on a Forest Red Gum

Plate 4.6 Koala scats

Plate 4.7 Small mammal runway through Blady Grass in the study area (off-site)

Plate 4.8 Tree hollow in a Spotted Gum in the south-east of the site

Plate 4.9 Diverse fauna habitat in riparian zone of study area (off-site)

Plate 4.10 Small mammal diggings in Blady Grass in the study area

Plate 4.11 Fallen logs and potential fauna burrows in riparian zone of study area (off-site)

Information shown is for illustrative purposes only

Drawn by: DSA Checked by: RE Reviewed by: MVE Date: October 2011
Source of base data: Google Earth

North

0 150

Key Hollow-bearing Trees on The Site

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1837567

Illustration 4.2

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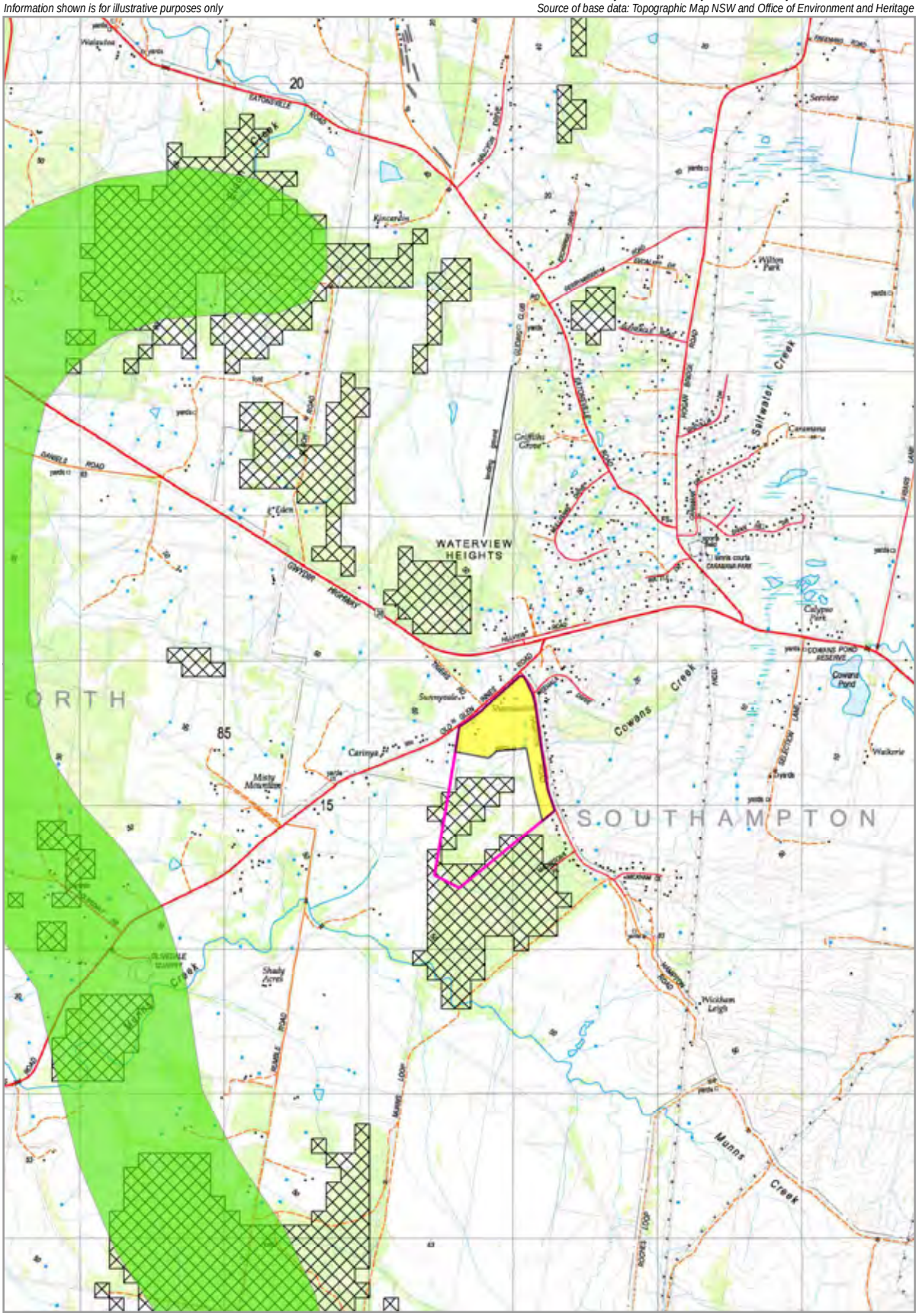
Source of base data: Topographic Map NSW and Office of Environment and Heritage



LEGEND

- The site
- Study area
- Sub-regional corridor
- OEH key habitat

0 800

North

OEH Key Habitat, Regional and Sub-regional Corridors

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Illustration 4.3

4.5 Threatened Fauna

4.5.1 Survey Results

Three threatened species were recorded during the survey:

- Little Bent-wing Bat (*Miniopterus australis*): The study area provides a small area of aerial foraging and potential non-breeding roosting habitat (e.g. tree hollows). It forming a fraction of similar potential habitat in the locality for this species;
- Koala (*Phascolarctos cinereus*): Refer to **Section 5** for study area values; and
- Grey-headed Flying-fox (*Pteropus poliocephalus*): The study area provides opportunistic foraging habitat for the Grey-headed Flying-fox population. No known or potential roosting habitat occurs in the study area.

4.5.2 Database Results

Records of threatened fauna species and populations known to occur within a 20 km by 20 km area around the site were obtained from the OEH Atlas of NSW Wildlife (19/09/2011). One thousand, five hundred and sixty-eight records of 45 threatened fauna species were identified in the search area. Records of threatened flora species, communities or species habitat likely to occur within a 10 km radius of the site were also obtained from the EPBC Protected Matters Search Tool (17/09/2011). The EPBC database listed 14 threatened fauna species as '*Species or species habitat likely to occur within area*'.

The suitability of the habitat on the site and therefore the potential occurrence of these threatened fauna species is provided in **Appendix D**. This assessment is based on the field survey results, habitat evaluation and knowledge of the ecological requirements of threatened fauna species known from the locality.

In addition to the recorded threatened species, the following species are variability considered potential occurrences at some stage on the site (refer to **Appendix D**):

- Little Lorikeet (*Glossopsitta pusilla*);
- Little Eagle (*Hieraaetus morphnoides*);
- Square-tailed Kite (*Lophoictinia isura*);
- Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*);
- Scarlet Robin (*Petroica boodang*);
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*);
- Speckled Warbler (*Pyrrholaemus saggitatus*);
- Diamond Firetail (*Stagonopleura guttata*);
- Rufous Bettong (*Aepyprymnus rufescens*);
- Hoary Wattled Bat (*Chalinolobus nigrogriseus*);
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Large-footed Myotis (*Myotis macropus*);
- Squirrel Glider (*Petaurus norfolcensis*);
- Brush-tailed Phascogale (*Phascogale tapoatafa*); and
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*).

The habitat value of the site and study area for these species is provided in the introduction to the Part 5A EP&A Act Assessments (**Appendix E**).

4.6 EPBC Act Listed Migratory Species

Searches on the EPBC Act Protected Matters Search Tool identified potential habitat for 15 migratory listed species within a 10 km of the study area. Based on the habitats present, the survey results and

local knowledge; the following migratory species listed by the database search are considered potential occurrences at some stage in the study area:

- Black-faced Monarch (*Monarcha melanopsis*);
- Rainbow Bee-eater (*Merops ornatus*);
- Satin Flycatcher (*Myiagra cyanoleuca*);
- Rufous Fantail (*Rhipidura rufifrons*);
- White-throated Needletail (*Hirundapus caudacutus*);
- Great Egret (*Ardea alba*);
- Cattle Egret (*Ardea ibis*); and
- Fork-tailed Swift (*Apus pacificus*).

5

SEPP 44 Koala Habitat Assessment

5.1 Potential Koala Habitat Assessment

5.1.1 Introduction

SEPP 44 applies to all LGAs listed under Schedule 1, which includes the Nymboida LGA (part of the current CVC LGA). Potential Koala habitat is defined in SEPP 44 as:

> *areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.*

The policy applies to areas of land at least 1 ha in size and may include adjoining land under the same ownership. The identification of land as SEPP 44 potential Koala habitat may include properties with a minimum of 1 ha of habitat with sufficient Schedule 2 species to qualify as potential Koala habitat within a larger property (St Ives Bus Services v. Ku-ring-gai Council 1995 NSW LEC 189).

SEPP 44 listed Schedule 2 listed species are as follows:

- White Box (*Eucalyptus albens*);
- River Red Gum (*Eucalyptus camaldulensis*);
- Broad-leaved Scribbly Gum (*Eucalyptus haemastoma*);
- Tallowwood (*Eucalyptus microcorys*);
- Bimble Box (*Eucalyptus populnea*);
- Large-fruited Grey Gum (*Eucalyptus punctata*);
- Swamp Mahogany (*Eucalyptus robusta*);
- Scribbly Gum (*Eucalyptus signata*);
- Forest Red Gum (*Eucalyptus tereticornis*); and
- Ribbon Gum (*Eucalyptus viminalis*).

5.1.2 Methods and Results

The determination of the percentage of Schedule 2 listed species is typically undertaken by counting all tree species greater than 10 cm DBH in the upper and lower strata within a series of 20 x 20 m quadrats within each vegetation community. The percentage of Schedule 2 species within the upper and lower strata layers is subsequently calculated. If a site is not identified as potential koala habitat no further assessment under SEPP 44 is required. Conversely, if SEPP 44 potential Koala habitat is identified, further investigations under SEPP 44 are required to determine if the site supports SEPP 44 core Koala habitat.

Preliminary site inspections identified Forest Red Gum (*Eucalyptus tereticornis*) as the only Schedule 2 listed species in the study area. Of the approximately 100 trees on proposed Lots 1, 2, 3 and 4 of DA stage 1, 20 trees (approximately 20%) constituted Forest Red Gums (SEPP 44 Schedule 2 listed species) greater than 10 cm DBH. Consequently the site qualifies as SEPP 44 potential Koala habitat and assessment for core Koala habitat is required. Further tree counts were consequently not considered necessary to identify if the study area constituted potential Koala habitat. Forest Red Gum was however common in the remainder of the study area on proposed Lot 5 DA stage 1, and observed to readily comprise greater than 15% of the upper strata layer in areas 1 ha and greater in size.

5.2 Core Koala Habitat Assessment

5.2.1 Introduction

Core Koala habitat is defined by SEPP 44 as '*an area of land with a resident population of Koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population*'. To identify if the site supports a resident population, the following techniques were used:

- review of OEH Grafton 1:100,000 threatened species map sheet Koala records; and
- field survey using a variety standard of survey techniques (direct observations of Koalas, spotlighting, call playback, and scat and scratch searches).

5.2.2 Methods and Results

5.2.2.1 Desktop Assessment

OEH Records

OEH Koala records within the locality were reviewed from the Grafton 1:100,000 threatened species map sheet (obtained from OEH under a data licence agreement). Of the 27 Koala records on the southern side of the Clarence River within a 10 km radius of the site, five Koala records occur within a 2 km radius of the site to the east and north of the site. These records were obtained between 1996 and 2004. Approximately 17 Koala records occur within 5 km of the site with several other Koala records to the north, two to the south (prior to 2004), and one to the west (1986). No Koala records are shown on the site.

5.2.2.1 Field Survey

Methods

Surveying for Koalas formed part of the general fauna survey undertaken on the site. Refer to **Section 3.5.6** for specific details of the methodology undertaken. The main methods undertaken which targeted the Koala include:

- direct searches and opportunistic observations;
- spotlighting;
- call playback;
- scat and scratch detection on trees throughout the site; and
- Spot Assessment Technique (SAT) habitat analysis across the study area.

On the site all Forest Red Gum trees were targeted for scat and scratch searches. Additionally, scat and scratch searches were undertaken for other species including Spotted Gum, Grey Box and Northern Grey Ironbark. SAT analysis was undertaken in accordance with Australian Koala Foundation (AKF undated) at 10 sites (refer to **Illustration 5.1**)

Several limitations associated with the adopted surveying methodology must be considered including:

- the location of any Koalas in trees may have impaired their detection during diurnal observations and spotlighting;
- groundcover vegetation, livestock disturbances and tractor slashing of grasses may have inhibited detection of Koala scats;
- limited life span of scats remaining intact; and
- rough barked species generally do show fauna scratch marks well to enable confident detection of species.

Despite these limitations, these methods are readily used to identify Koalas and assist in the determination of SEPP 44 core Koala habitat (DEC 2004a, KSC 2011, Darkheart Eco-Consultancy 2005). Furthermore the survey was undertaken during the Koala breeding season (DECC 2008), hence Koalas are particularly active and male Koalas are more likely to respond to call playback during this period.

Results

No Koalas were observed or heard during the diurnal and nocturnal surveys.

On the site Koala scats detected below four of the 20 Forest Red Gums as well as one Grey Box, one Spotted Gum and one Northern Grey Ironbark (refer to **Illustration 5.1**). Koala scats were also detected below several Forest Red Gums located directly adjacent to the site on the remainder of the study area on proposed Lot 5 DA stage 1, in the vicinity of the south-eastern dam and associated drainage line. A number of smooth-barked trees also showed evidence of Koala scratch marks (refer to **Plate 4.5**), which was confirmed by the presences of scats.

Given the mix of tree species in the study area, landscape characteristics (i.e. floodplain foot hills) and that the study area qualifies as SEPP 44 potential Koala habitat, the study area is considered to fall into the East Coast (med-high) category (AKF undated).

Table 5.1 SAT Activity Level Classes

Area (Density)	*Low Use*	*Medium (Normal Use)*	*High Use*
East Coast (low)	<9.47%	>/= 9.47% but </= 12.59%	>12.59%
East Coast (med-high)	<22.52%	>/= 22.52% but </= 32.84%	>32.84%
Western areas (med-high)	<35.84%	>/= 35.84% but </= 46.72%	>46.72%

Source: AKF (undated)

The SAT analysis results are shown in **Table 5.2** and **Illustration 5.1**. The analysis found that Koalas were primarily using Forest Red Gums, however other species in the vicinity of Forest Red Gums also evidenced Koala usage. Koala activity level classes varied at each SAT point, with:

- two SATs evidencing high Koala activity levels;
- one SAT evidencing medium Koala activity levels;
- five SATs evidencing low Koala activity levels; and
- two SATs evidencing no Koala activity.

Table 5.2 SAT Analysis Results

SAT Number	*Number of Trees with Koala Scats*	*% Trees with Koala Scats*	*Koala Activity Level*	*Trees Species with Evidence of Koala Activity*
1	0	0	No Koala Activity	N/A
2	10	33.3	**High** Koala Activity	Forest Red Gum (7), Spotted Gum (3)
3	0	0	No Koala Activity	N/A
4	8	2.7	**Medium** Koala Activity	Forest Red Gum (7), Spotted Gum (1)
5	10	33.3	**High** Koala Activity	Forest Red Gum (4), Spotted Gum (3), Grey Box (3)
6	2	6.7	Low Koala Activity	Forest Red Gum (2)
7	2	6.7	Low Koala Activity	Forest Red Gum (1), Northern Grey Ironbark (1)
8	4	13.3	Low Koala Activity	Forest Red Gum (3), Spotted Gum (1)
9	2	6.7	Low Koala Activity	Forest Red Gum (2)
10	2	6.7	Low Koala Activity	Forest Red Gum (2)

Areas with medium and high levels of Koala usage were typically in proximity to main drainage line; and in an elevated portion of the site near Hampton Road in the south-east of the proposed Lot 5 DA stage 1. The age of the scats ranged from old to fresh.

5.2.3 Discussion and Conclusion

Attributes stated within SEPP 44 as defining core Koala habitat are provided as examples only, hence other attributes (e.g. presence of areas of major Koala activity) may be used to identify the presence of core Koala habitat with or without the example attributes provided in the SEPP 44 definition.

This assessment failed to identify the SEPP 44 example attributes of core Koala habitat detailed as follows:

1) "*Breeding females (that is, females with young)"*. No Koalas were directly recorded during the survey.

2) "*Recent sightings and historical records of a Koala population*". No Koalas were directly recorded during the survey and there are no known records of Koalas in the study area. Local OEH records however suggest long-term Koala activity in the general Waterview Heights area, including records of Koalas in habitats that are interconnected to the study area.

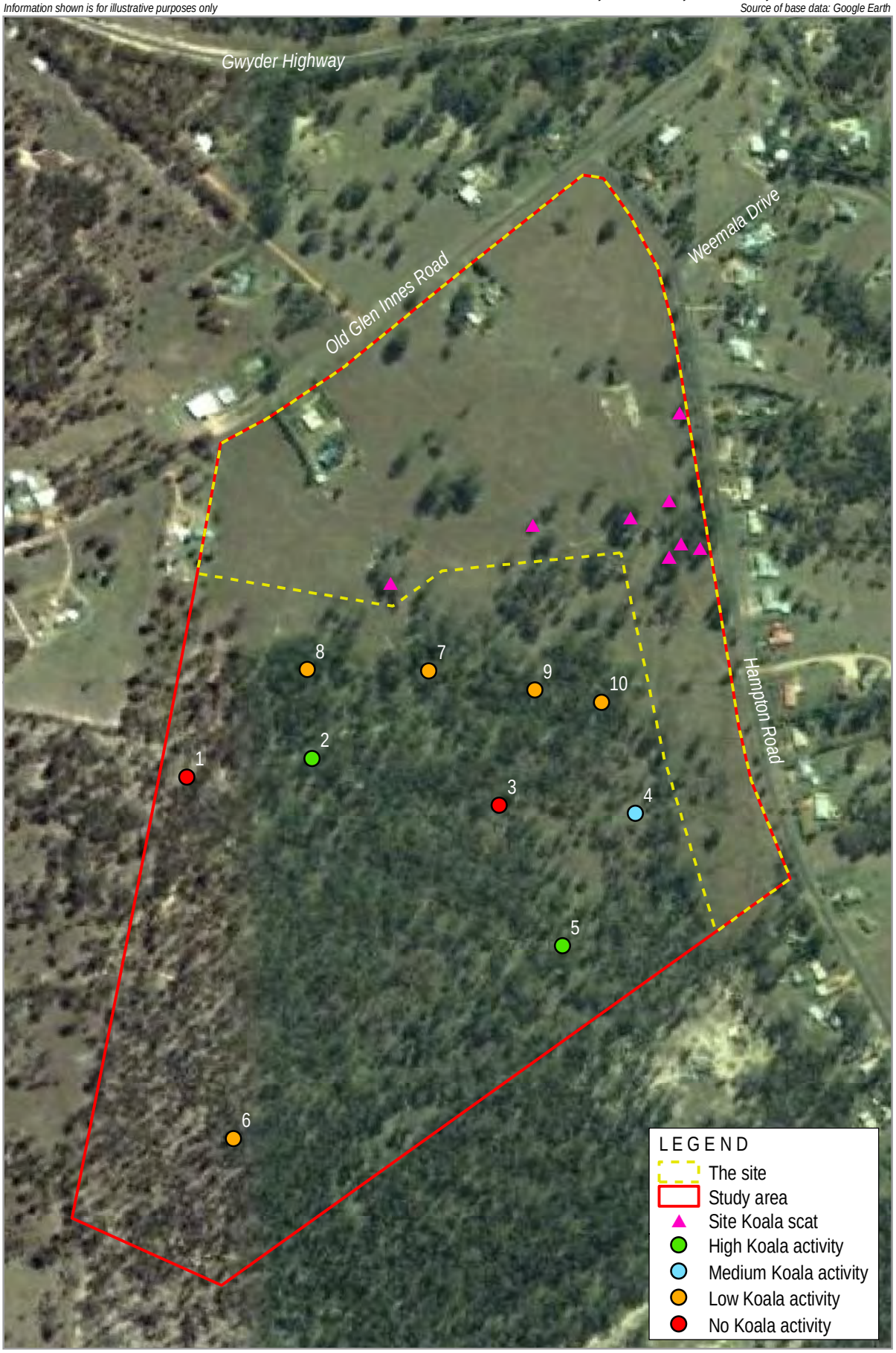
The SAT results however identified areas of medium and high levels of Koala activity, which are indicative of sedentary ranging Koala patterns and thus an area of major Koala activity (AKF undated). Given the size of the study area, vegetation composition and levels of Koala activity detected, at least a member (possibly even members) of this local Koala aggregate includes the study area as a core part of their range (as indicated by the presence of areas of major activity). Additionally as the study area is interconnected to other forest /woodland areas where Koalas have previously been recorded, it may provide additional functions such as a local linkage.

The SAT results however identified areas of medium and high levels of Koala activity, which are indicative of sedentary ranging Koala patterns and thus an area of major Koala activity (AKF undated). Given the size of the study area, vegetation composition and levels of Koala activity detected, at least a member (possibly even members) of this local Koala aggregate includes the study area as a core part of their range (as indicated by the presence of areas of major activity). Additionally as the study area is interconnected to other forest / woodland areas where Koalas have previously been recorded, it may provide additional functions for the local Koala population such as forming part of a local linkage.

SEPP 44 does not distinguish between a site that contains all of a population, or part of it. However core Koala habitat must be considered to include all areas of habitat required to meet a Koala population's needs i.e. foraging habitat, refugia and habitat linkages. Overall the study area constitutes the SEPP 44 definition of core Koala habitat, and a Koala Plan of Management (KPoM) is required to accompany the DAs.

Information shown is for illustrative purposes only

Drawn by: DSA Checked by: RE Reviewed by: MVE Date: October 2011
Source of base data: Google Earth



North

0 150

SAT and Site Koala Scat Locations

GeoLINK environmental management and design

Flora and Fauna Survey and Impact Assessment: Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837560

Illustration 5.1

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6.1 Potential Impacts

The impacts associated with the proposed two stage subdivision are detailed in **Table 6.1**, along with mitigation measures. Unless otherwise noted, potential impacts apply to both DA stage 1 (subdivision of study area into five lots) and DA stage 2 (subdivision of DA stage 1 proposed Lot 4 into 27 Lots).

Table 6.1 Potential Impacts and their Management

Potential Impact	*Management Measures*
Direct habitat loss	
The proposed development would result in the direct loss/modification of the pastoral grassland with isolated trees and small patches Spotted Gum forest on the site. DA stage 1 would have minimal vegetation/habitat loss, as: ▪ proposed Lots 1 and 3 support existing dwellings; ▪ proposed Lot 2 does not have a dwelling entitlement and would continue to be managed as rural land post development; ▪ proposed Lot 4 would be subdivided at DA stage 2 (impacts are detailed below); and ▪ proposed Lot 5 supports mostly cleared grassland areas along the eastern boundary which would be able to support a future building envelope and driveway, etc without the removal of any canopy trees (only minor regrowth clearing may be required). New boundary fences as part of DA stage 1 would follow existing fence lines and/or traverse cleared land. The exception to this is in the south-east corner of proposed Lot 4 / north-east corner of proposed Lot 5. Safeguards are available to ensure vegetation removal is minimised. DA stage 2 has potential to result in the removal of isolated pastoral grassland trees and reduction/removal of small patches of Spotted Gum forest, particularly on proposed DA stage 2 Lot 4, 11, 22, 25, 26 and 27 to allow for sufficient room for future dwelling establishment. However the proposal has been designed to allow for retention of some of the isolated grassland trees and the main area of Spotted Gum forest on site located on proposed DA	▪ Trees are to be retained to the maximum extent possible. Priority is to be given to Koala browse species (flagged with pink tape) and hollow-bearing trees (flagged with yellow tape), these trees are not to be cleared. No trees evidencing Koala usage (refer to **Illustration 5.1**) would be removed. Priority is also given to winter flowering species where possible and trees in the south-east of the proposed Lot 4 DA stage 1 which form part of a local link to habitat to the east. ▪ No removal of Spotted Gum forest or mature grassland trees on DA stage 1 Lot 5 is permitted. This area includes all moderate and high level Koala usage areas and would be managed for environmental conservation purposes. ▪ All new or upgraded fencing is to be aligned / designed to allow for retention and avoid damage to all trees => 20 cm DBH. ▪ All personnel involved in the clearing works are to be informed of the relevant ecological management measures during the site induction. This includes mapped and flagged trees to be selectively retained. The relevance of other marked items including clearing boundaries and subsequent requirements must be communicated to all contractors. ▪ Should any Forest Red Gum require removal, they would be compensated for at a tree plantings ratio of 10:1 with Forest Red Gum (i.e. 10 Forest Red Gums planted for any Forest Red Gum removed). Compensatory planting would be located in areas where they do not pose a hazard to future dwellings, preferably: – on the site along the drainage line between the two larger dams in the east; – in the south-east corner of DA stage 1 Lot 4 / north-east corner of DA stage 1 Lot 5 to maximise east-west habitat connectivity; and – within the more open areas on DA stage 1 Lot 5.

Potential Impact	*Management Measures*
stage 2 Lot 11. This assessment will assume the worst case-scenario in that all trees and patches of Spotted Gum forest within the footprint of DA stage 2 (i.e. on DA stage 1 Lot 4) require removal, excluding the Spotted Gum forest and trees in the southern half of DA stage 2 Lot 11. This comprises removal of approximately 60 trees, including: ▪ small patches of Spotted Gum forest with a total area of approximately 0.24 ha; and ▪ three trees with well formed hollows, as well as a number of other trees that contained small poorly formed hollows/cavities and potential hollow-bearing tree recruits. The removal of these trees contributes to the TSC Act listed Key Threatening Process (KTP): *Loss of hollow-bearing trees*, which attributed to the decline of many locally recorded hollow obligated threatened species. No tree removal would be required for construction of the proposed road off Glen Innes Drive, as part of DA stage 2. The two larger main dams on the proposed Lot 4 DA stage 1 are expected to be retained, though potentially directly affect through boundary fence construction. The smaller dam on proposed lot 3 DA stage 2 may be removed/modified, however it is of low conservation value. The approximately 44 ha of Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would not be affected by the proposal.	All plantings should be sourced from endemic seed stock. ▪ It would be desirable if endemic native species suited to the site were planted as part of ornamental/landscaping plantings, to help compensate for the habitat loss/modification associated with the proposal (e.g. provide foraging sources for the Grey-headed Flying-fox and Koala). To help achieve this, a brochure or website address could be provided to all new residents in the area on sustainable rural residential living. An example brochure/website includes the free publication "A Guide to Rural Residential Living" accessible from the website - http://www.ruralresidentialliving.com.au.
Direct injury/mortality	
Fauna may be killed or injured during vegetation clearing. This is a particular risk for arboreal fauna and fauna utilising tree hollows as nesting/roosting/denning sites.	▪ All trees must be visually inspected prior to clearing. If arboreal fauna are detected, a 10 m clearing buffer area is to be established around trees with non-threatened fauna, while a 30 m clearing buffer area is to be established around significant fauna until the specimen voluntarily moves on. ▪ Removal of hollow-bearing trees would be undertaken in accordance with the following procedure: o Ideally a suitably licenced and experienced ecologist or wildlife carer would be present during removal of hollow-bearing trees, to capture and relocate any hollow-obligated fauna. o All trees (including potential hollow-bearing trees which may contain hollows which are not visible to an onground observer) are to be cleared using the

Potential Impact	*Management Measures*
	following procedures where possible and inaccordance with Occupational Health and Safety requirements: – The subject tree would be gently "bumped" three times over a minimum 5 minute period (minimum 1 minute pause between each bump). The aim of this procedure is to encourage nesting/denning/roosting hollow dependant fauna to disperse. If fauna are identified dispercing this would continue until a minimum 5 minute period where no fauna are detected evacuating the tree is experiened. – At least 1 minute after the final bump, the subject tree may be felled. The tree would be felled slowly (e.g. using an excavator to dig around the roots than gently push the tree over). o Once fallen all hollows would be inspected for fauna. Detected un-injured fauna fauna would be capture and appropriately relocated by suitabily licensed personel. Should injured fauna be found on the site, local wildlife care groups and/or local veterinarians are to be contacted immediately and arrangements made for the immediate welfare of the animal. The phone number of the local Clarence Valley WIRES wildlife care group (Ph: 02 6642 4055) would be known to the clearing contractors. o If hollows are unable to be clearly inspected or confidently confirmed to be free of fauna, the trees are unable to be left at the felled site for at least 48 hours before removal and disposal.
Habitat fragmentation	
The vegetation removal required as part of the proposal as well as the modification of the site into a small holdings rural-residential environment may reduce current potential fauna movements across this area for fauna such as the Koalas. However this habitat is currently highly modified (i.e. mostly cleared grassland with scattered paddock trees/small patches of forest). The main areas of habitat in the study area would be maintained, and the proposal aims to maintain the local link to trees and forest areas east of Hampton Road through retention of the vegetation in the southern half of DA Stage 2 Lot 11. Connectivity to habitat to the south and west would also not be affected. New / upgraded fences would be expected to be mostly post and wire, similar to those on adjacent rural-residential land. Such fences may present a barrier to the movement of non-flying terrestrial species, depending on the design.	▪ The proposal design allows for retention of all vegetation on DA stage 1 Lot 5, as well as maintenance of an east-west link by retaining trees in the southern portion of DA stage 2 Lot 11. ▪ Any new fences would be of a design and contain materials that allow for Koala movement and minimise the risk of fauna entanglement (e.g. no barbed wire). The exception to this is internal pool or dog yard fences.

Potential Impact	*Management Measures*
Increased introduction and establishment of weeds on the site	
Establishment of lawns and gardens on the site would increase the occurrence of exotic species and potentially weeds on the site. The proposal will also increase the potential for weeds to be introduced and established in adjacent vegetation and habitats due to garden escapes, changes in drainage and nutrient cycling, etc. This is not considered likely to be a significant impact given the abundance of exotic species and weeds locally (e.g. in pastoral areas and adjacent rural-residential gardens) and the highly modified state of the general area.	▪ Future owners should be encouraged to plant local endemic species in any future established gardens. ▪ During the clearing/construction stages of the proposal care would be taken to minimise the spread of weeds into or throughout the site or surrounding area by regularly carefully cleaning and maintaining equipment. Instruction would be given to machinery operators on this matter during the site induction.
Water quality degradation and hydrological modification	
Potential water quality degradation associated with the proposal includes erosion and sedimentation impacts during the construction stage of the proposal (e.g. of the road associated with DA stage 2), potential chemical spills during construction of roads and dwellings, application of gardening chemicals (e.g. pesticides and fertilisers), etc. Some changes to existing hydrological movements may also occur, particularly with DA stage 2, through vegetation removal, establishment of hard surfaces, etc. Water quality degradation and hydrological modification can result in a number of ecological impacts including creating conditions no longer suitable for sensitive species (e.g. frogs), modification of vegetation floristic and structural composition, weed invasion, etc. Given the highly modified state of the site and existing landuse activities (grazing), this is considered a low risk. Establishment of on-site sewage treatments may alter the water quality (including within the watertable) locally.	▪ Sedimentation and erosion, water quality and hydrological safeguards described in the corresponding SEE (GeoLINK 2011) would be implemented. ▪ All on-site sewage treatment systems should be installed and maintained to Council stands. ▪ Rubbish along the drainage lines on site should be cleaned up and disposed of appropriately.
Powerline collision	
Establishment of powerlines on/adjacent to the site may incrementally (though not significantly) increase the risk of powerline electrocution for species such as the Grey-headed Flying-fox.	▪ It would be desirable if any powerlines established locally were covered conductor type (CCT) powerlines or underground.
Fauna injury or mortality through traffic collision	
The proposal would result in a new local road being established on site to provide access for 16 lots associated with DA stage 2. However the proposal will not create a significant fauna traffic collision risk on the site as the proposed road:	▪ The new road would be sign posted a maximum of 50km/hr.

Potential Impact	*Management Measures*
▪ has a short, straight alignment, allowing for good sight distances and low traffic speed; ▪ would be located in a largely cleared rural-residential landscape and does not intersect any forest or areas evidencing major Koala activity; ▪ is a cul-de-sac road, servicing only local traffic associated with the proposal. Given the levels of traffic along local roads, the incremental extent to which the proposal may increase the risk of traffic to fauna along these roads should not be substantial.	
Predation by domestic cats and dogs	
Future residents are considered likely to own domestic dogs and/or cats which will increase the risk of predation of local fauna. However the majority of the site would consist of a highly modified rural-residential landscape, located away from retained habitat areas. Considering the existing occurrence of domestic cats and dogs on rural-residential land locally, it is considered unlikely that the proposal would substantially increase the risk of domestic cat and dog predation locally.	▪ Dogs should be restricted to the building envelopes and when not in their owners direct company, kept either indoors or within an enclosure that does not encompass any primary Koala browse species or hollow-bearing trees; ▪ All non-resident dogs, cats or other vertebrate pests (e.g. foxes) should be reported to Council's rangers or Livestock Health and Pest Authority for control. ▪ Cats should be confined to enclosures or the indoors during the night. ▪ Dog enclosures must not encompass any Koala browse species or trees evidencing Koala usage. ▪ No dog will be allowed to come into contact or be found threatening a Koala or other wildlife.
Fauna collision and entanglement with fences	
Establishment of fences on site may increase the risk of collision and/or entanglement (e.g. for Grey-headed Flying-foxes). Due to the post development modified nature of the site, this is not considered likely to be a significant impact.	No additional safeguards are required.
Light spill	
Artificial lighting will be introduced on site which may disturb nocturnal species. Due to the post development modified nature of the site, and that the site currently receives light spill from adjacent residences and street lighting, this is not considered likely to be a significant impact.	▪ Future owners should be encouraged to minimise spillage of artificial lighting onto into retained trees/habitat, with all external lighting being localised, of low luminosity and directed towards the ground.
Increased human presence	
Human presence can result in a number of disturbances to native fauna including direct interference and noise. The proposal would result in increased permanent human presences on the site. Given the post development highly modified state of the site and the existing levels of human presence locally (particularly on adjacent rural-residential land) this is not considered likely to be a significant impact.	No additional safeguards are required.

Potential Impact	*Management Measures*
Clearing and construction related sedimentation and erosion	
Disturbances to soils associated with vegetation removal/modification, earthworks, etc, have potential to result in degradation of the environment and habitats on and adjacent to the site.	▪ During the construction stage of the subdivision and construction of future dwellings, sediment and erosion controls as specified in the Blue Book (Landcom 2004) are to be established and maintained. Maintenance of these controls would continue until bare soils have re-vegetated or been otherwise stabilised.
Altered fire regime	
Increased human presence associated with the proposal may increase the desire for prescription burning and/or arson locally. Conversely increased human presence may result in more rapid response to local fires. Due to the highly modified state of the site and general area, and existing high rate of human inhabitance locally, the proposal is not considered likely to increase the risk of ecological unsustainable fire regimes on local native vegetation communities.	▪ Future proponents of Lot 5 DA stage 1 which supports the large stand of Spotted Gum forest are encouraged to undertake non-burning methods to reduce fuel loads around dwellings and assets (e.g. slashing, clean up of sticks, etc) to prevent the accidental spread of fire into retained habitats on and adjacent to the study area. ▪ Any prescribed hazard reduction burning undertaken on site should be environmentally sustainable and give due consideration of the ecological values of the site. If required, a bushfire management plan which incorporates ecologically sustainable principles should be devised and implemented.
Livestock	
If continued to be maintained on site, livestock could result in habitat degradation (e.g. through direct disturbances associated with grazing and vegetation trampling; indirect impacts through changes in nutrient cycles, etc).	▪ Future owners should be discouraged from introducing livestock on site due to the small size of the lots. ▪ If maintained on DA stage 1 Lot 5, livestock would be restricted from the Spotted Gum forest.

6.2 Vegetation Communities

The proposal is largely restricted to pastoral grassland and associated small patches of Spotted Gum forest. It would require removal of approximately 60 trees, including:

- small patches of Spotted Gum forest with a total area of approximately 0.24 ha; and
- three trees with well formed hollows, as well as a number of other trees that contained small poorly formed hollows/cavities and potential hollow-bearing tree recruits.

The key habitat area (i.e. approximately 44 ha of Spotted Gum forest) would be retained on DA stage 1 Lot 5, and would not be affected by the proposal.

6.3 Threatened Flora

As detailed previously, no threatened flora species were recorded on the site or considered likely occurrences. Consequently no threatened flora species are considered likely to be directly affected by the proposal.

6.4 Endangered Ecological Communities

As mentioned previously, no EECs occur on the site.

6.5 Threatened Fauna

For the known and potentially occurring threatened species that may utilise the pastoral grassland and associated trees/small patches of Spotted Gum forest (refer to **Section 4.5**), the proposal would slightly reduce the study area's habitat values for these species. However this vegetation is generally of low habitat quality and has been substantially modified as part of historic clearing, with most retained trees being poorly connected to the local larger stands of vegetation. During vegetation clearing, the proposal would also impose a risk of mortality/injury, particularly for the subject hollow-obligated species. The proposal would also add other threats to these species including increased human presence, domestic pet predation, etc; however due to the pre-development highly modified state of the site, and already existing risk of these threats (i.e. from directly adjacent rural-residential areas), the incremental extent which the proposal may contribute to these threats should not be significant.

Seven-part tests of significance have been prepared (refer to **Appendix E**) in accordance with Section 5A of the EP&A Act for all known and potentially occurring threatened species. This assessment concluded that while the proposed development will impose some negative, incremental and cumulative effects, the proposed subdivision is not considered likely to place local populations of any listed threatened species at significant risk of extinction, especially with effective implementation of the mitigation measures detailed in this report.

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Matters of National Environmental Significance

7.1 Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, the following Matters of National Environmental Significance (MNES) are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPC).

An assessment of the proposal with regards to MNES is provided in **Table 7.1** below.

Table 7.1 Assessment of Matters of National Environmental Significance

	Factor	*Impact*
a	**Any Environmental Impact on a World Heritage Property?**	
	No World Heritage Properties were listed by the Protected Matters Search Tool within 10 km of the site. Consequently the proposed development is not likely to have a significant impact on any World Heritage Property.	Nil
b	**Any Environmental Impact on National Heritage Places?**	
	No National Heritage Places were listed by the Protected Matters Search Tool within 10 km of the site. Consequently the proposed development is not likely to have a significant impact on any National Heritage Places.	Nil
c	**Any Environmental Impact on Wetlands of International Importance?**	
	No Wetlands of International Significance (Ramsar Sites) were listed by the Protected Matters Search Tool within 10 km of the site. Consequently the proposed development is not likely to have a significant impact on any Wetlands of International Significance.	Nil
d	**Any Environmental Impact on Commonwealth Listed Threatened Species or Ecological Communities?**	
	The Critically Endangered White Box-Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed under the EPBC Act as an Ecological Community likely to occur within a 10 km radius of the site. This community does not occur on or directly adjacent to the site. A total of 25 threatened species listed by the EPBC Act, comprising 11 flora and 14 fauna species, were identified by the Protected Matters Search Tool as species or species habitats that are likely, known or may occur within a 10 km radius of the site. The Grey-headed Flying-fox was the only threatened species recorded or considered a potential occurrence on the site. An assessment of significance in accordance with the Administrative Guidelines of Significance for EPBC listed species concluded that the proposal is unlikely to result in a significant impact on this species (refer to **Appendix F**). Overall the proposal is not considered likely to result in a significant impact on any EPBC Act listed threatened species or ecological communities.	Negligible.
e	**Any Environmental Impact on Commonwealth Listed Migratory Species?**	

	Factor	*Impact*
	A total of 15 listed migratory species were identified by the Protected Matters Search Tool, as species or species habitats that are likely, known or may occur within a 10 km radius of the site. The potential impact of the proposal on the migratory species considered to potentially occur within the study area has been assessed under the Administrative Guidelines (refer to **Appendix F**) for significant impact. The assessment concluded that the proposal is unlikely to result in a significant impact on any listed migratory species.	Negligible.
f	**Does Any Part of the Proposal Involve a Nuclear Action?**	
	The proposal does not involve a nuclear action.	Nil
g	**Any Environmental Impact on a Commonwealth Marine Area?**	
	No Commonwealth Marine Areas were listed by the Protected Matters Search Tool within 10 km of the site. Consequently the proposed development is not likely to have a significant impact on any Commonwealth Marine Areas.	Nil
h	**Any Environmental Impact on Commonwealth Land?**	Nil
	Four areas of Commonwealth Lands are listed by the Protected Matters Search Tool as occurring within 10 km of the site. The Proposal is not in close proximity to any Commonwealth Land, and therefore would have no significant impact on such lands.	
i	**Any Environmental Impact to the Great Barrier Reef Marine Park**	
	The study area is not located in proximity to any parts of the Great Barrier Reef Marine Park and therefore would have no impact on this protected matter.	Nil

8 Recommendations

8.1 Primary Mitigation Measures

The following mitigation measures would be implemented to ameliorate potential ecological impacts. Unless otherwise noted, mitigation measures apply to both DA stage 1 (subdivision of site into five lots) and DA stage 2 (subdivision of the proposed DA stage 1 Lot 4 into 27 lots). The conclusion of this report is based on these primary mitigation measures being adopted and effectively implemented.

8.1.1 Tree and Habitat Retention

- Trees are to be retained on the site to the maximum extent possible, prioritising:
  - trees evidencing Koala usage - must retain;
  - primary Koala browse trees (Forest Red Gum) with no evidence of Koala usage - retain to maximum extent possible;
  - hollow-bearing trees – retain to maximum extent possible;
  - winter flowering species - retain where possible; and
  - trees in the south-east portion of DA stage 1 Lot 4 which form part of an east-west link. Trees in the southern half of DA stage 2 Lot 11 must be retained. Other trees in this general area should be retained to the maximum extent possible.

  Refer to **Illustration 8.1** for the location of key priority trees for retention. Forest Red Gums on the site have particular conservation value as both winter flowering and as a primary Koala feed trees.
- No removal of Spotted Gum forest or mature grassland trees on DA stage 1 Lot 5 is permitted. This area includes all areas of major Koala activity.
- If required, a suitably qualified arborist should inspect trees near future dwelling envelopes of the proposed residential Lots to identify whether the trees are suitable for retention, and if so, any maintenance to maximise the longevity of the trees.
- All personnel involved in the clearing stage of the proposal would be informed of the relevant ecological management measures during the site induction. The relevance of marked items including clearing boundaries and subsequent requirements must be communicated to all contractors.
- All new or upgraded fencing is to be aligned / designed to allow for retention and avoid damage to all trees => 20 cm DBH.

8.1.2 Compensatory Plantings

- Should any Forest Red Gums not evidencing Koala usage require removal, they would be compensated for at a rate of 10:1 tree plantings with Forest Red Gum (i.e. 10 Forest Red Gums planted for any Forest Red Gum not evidencing Koala usage removed). Compensatory planting would be located in areas where they do not pose a hazard to future dwellings, preferably:
  - on the site along the drainage line between the two larger dams in the east;
  - in the south-east corner of DA stage 1 Lot 4 / north-east corner of DA stage 1 Lot 5 to maximise east-west habitat connectivity; and
  - within the more open areas on DA stage 1 Lot 5.

  All plantings should be sourced from endemic seed stock.

8.1.3 Habitat Protection

- The 44 ha of Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would be retained and

managed for conservation purposes under the corresponding Koala Plan of Management. This area contains the areas of major Koala activity, as well as providing a reasonable sized, intact stand of native vegetation which provides potential habitat for a number of other threatened fauna species. Restrictions of the use of this land would include:

- no native vegetation removal is permitted (including clearing for fence lines, firewood collection, logging, etc);
- livestock would be excluded from this area;
- only low impacts passive uses (e.g. bushwalking) or practices undertaken for habitat conservation, improvement or maintenance purposes are permitted (e.g. drainage line erosion protection works, weed control, pest fauna control, etc); and
- only ecologically sustainable bushfire regimes are permitted.

8.1.3 Vegetation Clearing

- All trees must be visually inspected prior to clearing. If arboreal fauna are detected, a 10 m clearing buffer area is to be established around trees with non-threatened fauna, while a 30 m clearing buffer area is to be established around significant fauna until the specimen voluntarily moves on.
- Removal of hollow-bearing trees would be undertaken in accordance with the following procedure:
  - Ideally a suitably licenced and experienced ecologist or wildlife carer would be present during removal of hollow-bearing trees, to capture and relocate any hollow-obligated fauna.
  - All trees (including potential hollow-bearing trees which may contain hollows which are not visible to an onground observer) are to be cleared using the following procedures where possible and inaccordance with Occupational Health and Safety requirements:
    - The subject tree would be gently "bumped" three times over a minimum 5 minute period (minimum 1 minute pause between each bump). The aim of this procedure is to encourage nesting/denning/roosting hollow dependant fauna to disperse. If fauna are identified dispercing this would continue until a minimum 5 minute period where no fauna are detected evacuating the tree is experienced.
    - At least 1 minute after the final bump, the subject tree may be felled. The tree would be felled slowly (e.g. using an excavator to dig around the roots than gently push the tree over).
  - Once fallen all hollows would be inspected for fauna. Detected un-injured fauna fauna would be capture and appropriately relocated. Should injured fauna be found on the site, local wildlife care groups and/or local veterinarians are to be contacted immediately and arrangements made for the immediate welfare of the animal. The phone number of the local Clarence Valley WIRES wildlife care group (Ph 02 6642 4055) would be known to the clearing contractors.
- If hollows are unable to be clearly inspected or confidently confirmed to be free of fauna, the trees are unable to be left at the felled site for at least 48 hours before removal and disposal.
- All non-usable fallen trees would not be burnt, but disposed of via wood chipping.

8.1.4 General/Other

- The proposal design allows for retention of all vegetation on DA stage 1 Lot 5, as well as maintenance of the east-west link (to habitat east of Hampton Road) by retaining trees in the southern portion of DA stage 2 Lot 11.
- Any new fences would be of a design and contain materials that allow for Koala movement and minimise the risk of fauna entanglement (e.g. no barbed wire). The exception to this is internal pool or dog yard fences which should be design/of material which exclude Koalas.
- During the construction stage of the proposal care would be taken to minimise the spread of weeds into or throughout the site or surrounding area by regularly carefully cleaning and maintaining equipment.
- Sedimentation and erosion, water quality and hydrological safeguards described in the corresponding SEE (GeoLINK 2011) would be implemented. No further safeguards are required.
- All on-site sewage treatment systems should be installed and maintained to Council stands.

- The new road would be sign posted a maximum speed of 50km/hr.
- Dogs should be restricted to the building envelopes and when not in their owner's direct company, kept either indoors or within an enclosure that does not encompass any primary Koala browse species or hollow-bearing trees.
- All non-resident dogs, cats or other vertebrate pests (e.g. foxes) should be reported to Council's rangers or Livestock Health and Pest Authority for control.
- Cats should be confined to enclosures or the indoors during the night.
- No dog will be allowed to come into contact or be found threatening a Koala or other wildlife.
- During the construction stage of the subdivision and construction of future dwellings, sediment and erosion controls as specified in the Blue Book (Landcom 2004) are to be established and maintained. Maintenance of these controls would continue until bare soils have re-vegetated or been otherwise stabilised.
- As part of DA Stage 2, future owners should be discouraged from introducing livestock on site due to the small size of the lots.
- Future proponents of Lot 5 DA stage 1 which supports the large stand of Spotted Gum forest are encouraged to undertake non-burning methods to reduce fuel loads around dwellings and assets (e.g. slashing, clean up of sticks, etc) to prevent the accidental spread of fire into retained habitats on and adjacent to the study area.
- Any prescribed hazard reduction burning undertaken on site should be environmentally sustainable and give due consideration of the ecological values of the site. If required, a bushfire management plan which incorporates ecologically sustainable principles should be devised and implemented.

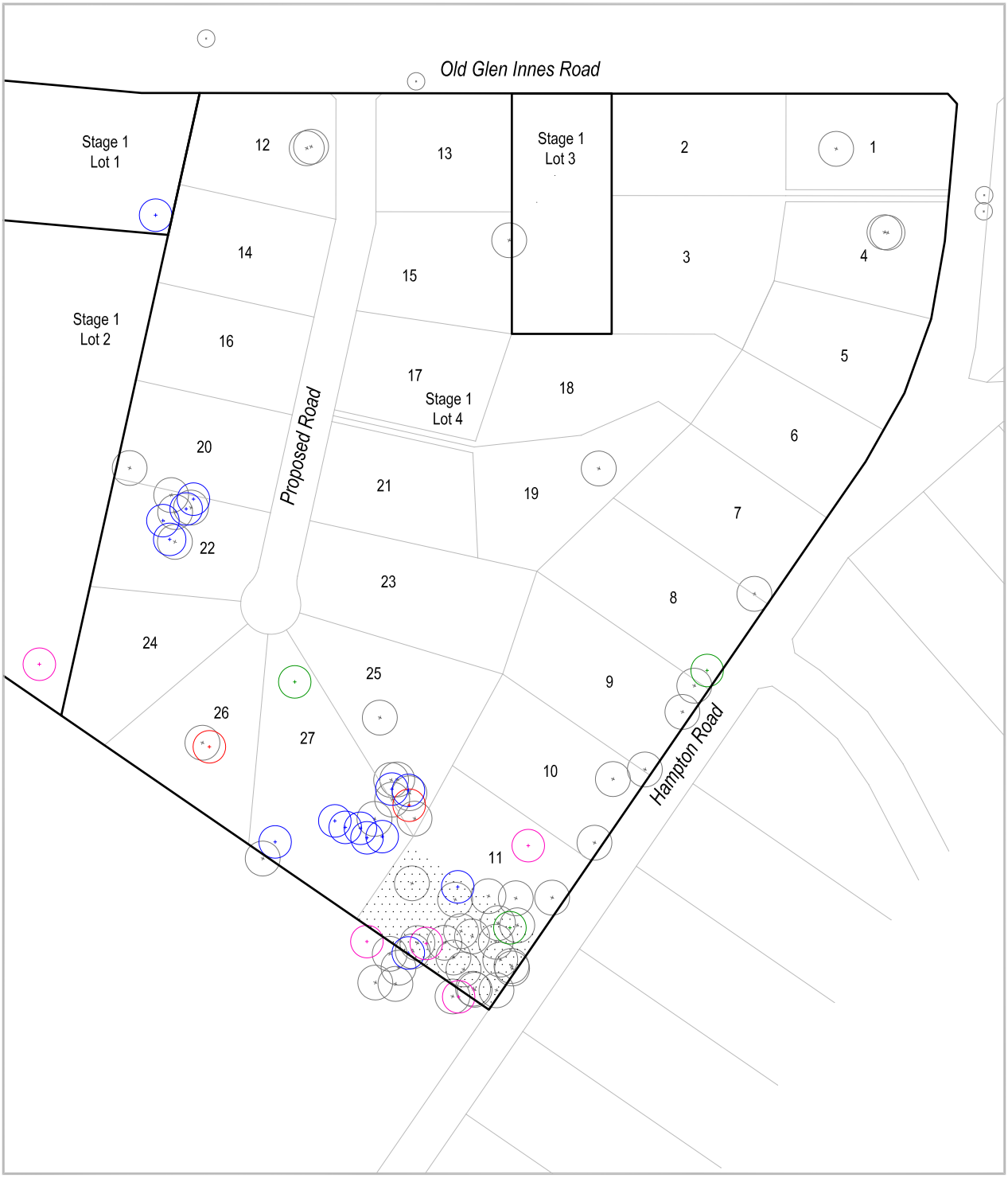
8.2 Secondary Mitigation Measures

The following mitigation measures are provided to help maintain the biodiversity values of the site and general area. It is not assumed that these mitigations measures will be implemented in the conclusion of this assessment. The adoption of these mitigation measures will be at Councils' and/or the development applicant's discretion:

- Endemic native species in a composition similar to that near the drainage line in the Spotted Gum forest on DA stage 1 Lot 5 were planted as part of compensatory/regeneration works along the erosion section of drainage line between the larger dams in the eastern portion of the site.
- Active erosion regeneration/stabilization and clean rubbish cleanup works should be undertaken along the eroded drainage line throughout the study area.
- Street plantings and future owners are encouraged to plant local endemic species in any future established gardens. To help achieve this, a brochure or website address could be provided to all new residents in the area on sustainable rural residential living. An example brochure/website includes the free publication "A Guide to Rural Residential Living" accessible from the website - http://www.ruralresidentialliving.com.au
- It would be desirable if any powerlines established locally were covered conductor type (CCT) powerlines or underground.
- Future owners should be encouraged to minimise spillage of artificial lighting onto into retained trees/habitat, with all external lighting being localised, of low luminosity and directed towards the ground.

Drawn by: RE Checked by: MVE Reviewed by: DSA Date: October 2011
Source of base data: Bothamley and O'donohue Pty Ltd

Information shown is for illustrative purposes only



LEGEND

- Primary Koala browse tree (Forest Red Gum) evidencing Koala usage
- Other species evidencing Koala usage
- Primary Koala browse tree (Forest Red Gum) not evidencing Koala usage
- Hollow bearing tree
- Tree
- Linkage vegetation to be retained

0 60

North

Priority Trees for Retention

GeoLINK environmental management and design

Flora and Fauna Survey and Impact Assessment:
Proposed Subdivision of Lot 2411 DP 709698 and Lot 9 DP 820604, Waterview Heights
1837542

Illustration 8.1

9 Conclusions

The study area and surrounding properties have experienced an extensive disturbance history due to agricultural and rural-residential development. The local landscape now comprises a mosaic of cleared grazing land, rural-residential development and forest/woodland.

Three vegetation communities were identified on the site: Pastoral Grassland, Spotted Gum Forest and Aquatic Dam Vegetation. No threatened flora species or EECs listed under the TSC Act or EPBC Act were recorded or considered likely occurrences on or directly adjacent to the site.

Three threatened fauna species were recorded during the survey: the Koala, Grey-headed Flying-fox and the Little Bent-wing bat. Fifteen other threatened fauna species listed under the TSC Act were variably considered potential occurrences.

The SEPP 44 Koala Habitat Assessment identified the site as SEPP 44 Potential Koala Habitat. A subsequent Core Koala Habitat assessment was undertaken. Review of local records found scattered Koala records in the Waterview Heights area. While no Koalas were directly recorded during the survey, Koala scats (and scratches) were detected across the study area at varying intensities indicating variable levels of Koala activities from low and no activity, to medium and high levels of activity. The areas indicating medium and high levels of Koala activity were located off-site on DA stage 1 Lot 5 (residual Lot) in the large stand of Spotted Gum forest. Overall it was found that the study area supports a core part of local Koala/s range, and constitutes core Koala habitat as defined under SEPP 44. A Koala Plan of Management therefore needs to be prepared to accompany the DAs.

The site itself comprises mostly cleared grazing land, with the main area of habitat in the study area being retained on DA stage 1 Lot 5 (residual Lot). Despite an extensive disturbance history, the site still retained some ecological values for the Koala and mobile and somewhat habitat generalist threatened fauna. Key habitat features on the site include Koala browse species and three hollow-bearing trees. The grassland trees and small patches of Spotted Gum forest in the south-east of the site (DA stage 1 Lot 4) also formed part of a local east-west link between the forested areas of the study area and habitat east of Hampton Road.

The main ecological impacts of the proposal are generally associated with removal of scattered pastoral grassland trees and associated small patches of forest, primarily associated with DA stage 2 (DA 1 would likely cause minimal loss of vegetation and habitat). The other main potential impacts of the proposal are generally low risks, existing threats which would not be significantly increased (e.g. traffic collision), minor in nature (e.g. erosion and sedimentation impact) and/or can be readily mitigated against (e.g. domestic pet predation). A range of mitigation measures are provided to minimise the impacts of the proposal on local biodiversity. The approximately 44 ha of Spotted Gum forest in the remainder of the study area on DA stage 1 Lot 5, would be retained and would not be directly affected by the Proposal.

The proposal is considered unlikely to have a significant impact on any Matters of National Environmental Significance listed under the EPBC Act. Consequently referral to the Minister is not required in relation to these protected matters.

An impact assessment and seven-part tests of significance undertaken in accordance with Section 5A of the *EP&A Act 1979* have been prepared (refer to **Appendix E**) for the 18 threatened fauna species known or potential occurrences on the site. These assessments concluded that while the proposed subdivision would impose some negative incremental and cumulative effects and contribute to key threatening processes, the proposal is not considered likely to place the subject threatened species at significant risk

of local extinction, especially with effective implementation of the primary mitigation measures of this report. Thus preparation of Species Impact Statements (SIS) would not be required for the proposal.

Project Team

The project team members included:

David Andrighetto
Ecologist

Michael Hallinan
Ecologist

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A

Subdivision Layout

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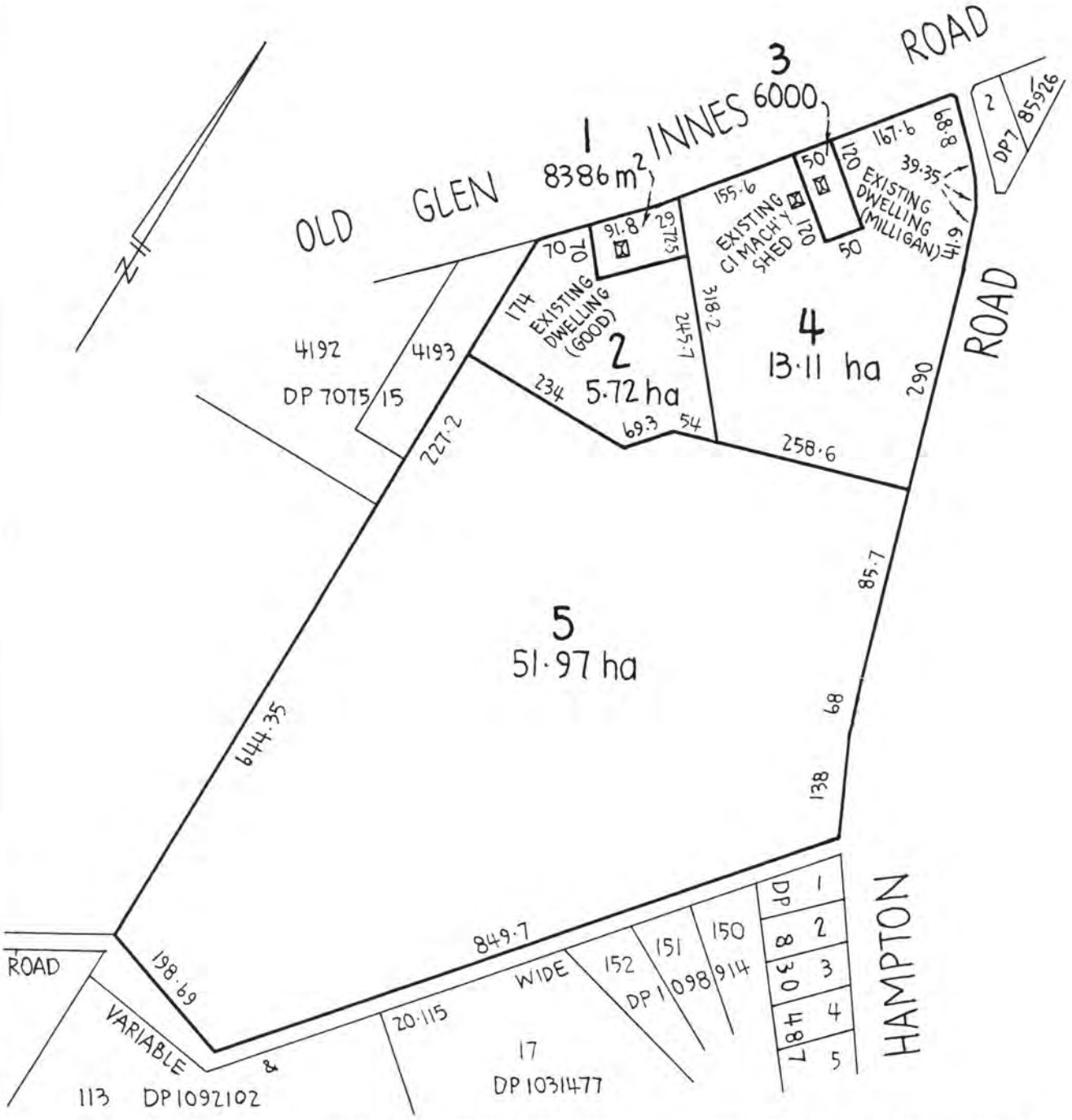
PLAN OF THE PROPOSED SUBDIVISION OF LOT 2411 IN DP709698 & LOT 9 IN DP820604

LOCALITY:	WATERVIEW HEIGHTS.	REFERENCE NO.:	9689
LGA.:	CLARENCE VALLEY.	DATE:	22ND JANUARY, 2007.
PARISH:	RUSHFORTH.	REDUCTION RATIO:	1 : 8,000.
COUNTY:	CLARENCE.	DATUM:	N/A
CLIENT:	MILLIGAN & GOOD.	SURVEYOR:	J. P. O'DONOHUE



NB. ALL MEASUREMENTS & AREAS ARE SUBJECT TO FINAL SURVEYS & MAY DEPEND UPON THE NATURAL & BUILT FEATURES OF THE LAND.

BOTHAMLEY AND O'DONOHUE PTY. LIMITED

ABN. 17 002 718 185

LAND AND ENGINEERING SURVEYORS, DEVELOPMENT CONSULTANTS

THE PROPERTY CENTRE,
12 PRINCE STREET,
PO BOX 1034, GRAFTON, NSW, 2460.
Tel: (02) 6642 3287 (bh)
(02)6643 1066 (ah)
Fax: (02)6642 7808
email: bodsurvey@exemail.com.au

J. P. O'DONOHUE (B.SURV.) MIS. NSW.
REGISTERED SURVEYOR

GRID NORTH - MGA

OLD GLEN INNES ROAD

TIGERS ROAD

WEEMALA DRIVE

HAMPTON ROAD

PROPOSED ROAD 20 WIDE

(ROAD 20 WIDE)

4913
DP707515

2
5.727ha

5
51.97ha

4
13.12ha

3
6000m²

8382m²
BRICK COTTAGE
& TILE ROAD

TWO STORY
BRICK COTTAGE
& TILE ROOF
'SHANNONDOR'

OLD CI
SHED

LARGE METAL SHED

DAM

EXISTING DRIVEWAYS

EXISTING DRIVEWAY

TELSTRA PITS & POLE

TELSTRA PITS & ELEC POLE

TELSTRA PIT

TELSTRA PITS

TELSTRA POLE

ELEC POLE

ELEC POLE & TRANSFORMER

STAY WIRE

STAY POLE

SIGN

MAILBOX

OUTLET INVERT RL63.25
DIA 600 RCP
& RC HEADWALL
INLET INVERT RL63.49

OUTLET INVERT RL64.44
DIA 600 RCP
& RC HEADWALLS
INLET INVERT RL64.61

OUTLET INVERT RL66.08
DIA 375 RCP
& RC HEADWALL
INLET INVERT RL66.14

INLET INVERT RL65.63
DIA 375 RCP
& RC HEADWALL
OUTLET INVERT RL65.57

DIA 750 RCP
& RC HEADWALL
OUTLET INVERT RL63.43

INLET INVERT RL63.67

DIA 450 RCP
& RC HEADWALL
OUTLET INVERT RL57.57

INLET INVERT RL57.6

ELECTRICITY
& TELSTRA PITS

HYDRANT
ELECTRICTY PIT

TELSTRA PIT
STOP VALVE

STOP VALVES

HYDRANT

ELEC POLE & TRANSFORMER

1 DP785926

2 DP785926

36 DP842468

5 DP811071

6 DP811071

7 DP811071

8 DP811071

9 DP811071

10 DP811071

11 DP811071

12 DP811071

13 DP811071

14 DP811071

LEGEND & NOTES:-

- OVERHEAD ELECTRICITY &/OR TELEPHONE CABLES
- UNDERGROUND TELEPHONE CABLES
- WATER SUPPLY MAINS
- EDGE OF BITUMEN SURFACE/LANE
- EDGE OF GRAVEL FORMATION
- FENCE
- HYDRANT
- STOP VALVE
- ELECTRICITY POLE
- ELECTRICITY POLE WITH STREET LIGHT
- TELSTRA PIT
- CABLE MARKER
- SIGN/SIGN END
- GATE
- TREE(APPROX SPREAD)

ALL SERVICES ARE SHOWN AS A RESULT OF FIELD SURVEYS & ENQUIRIES TO THE RELEVANT AUTHORITIES INCLUDING 'DIAL BEFORE YOU DIG'. THE LOCATION & LEVEL OF ALL SERVICES MUST BE VERIFIED BY THE RELEVANT AUTHORITY PRIOR TO ANY EXCAVATION OR CONSTRUCTION

ALL MEASUREMENTS & AREAS ARE SUBJECT TO SURVEY & MAY DEPEND UPON THE NATURAL & BUILT FEATURES OF THE LAND

RIGHTS OF CARRIAGEWAY & EASEMENTS NOT SHOWN

MINIMUM AREA LOTS 6 TO 27 = 4,000m² (DRAFT CLARENCE VALLEY LEP 2010)

SCALE 1 : 250 0 2.5 5 7.5 10 12.5

SURVEYED: BT
DRAWN: JOD
DWG No.:DWG9689B

DATUM: AHD
CONTOUR INTERVAL: 0.5
REFERENCE No.: 9689

ISSUE	DETAILS	DATE
5		
4		
3		
2		
1	FIRST ISSUE	07/07/11

PROPOSED SUBDIVISION & DEVELOPMENT OF LOT 2411 IN DP709698 & LOT 9 IN DP820604 OLD GLEN INNES & HAMPTON ROADS, WATERVIEW HEIGHTS

DTM & DETAIL PLAN - LOT & ROAD LAYOUT

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CLIENT: BOTHAMLEY & O'DONOHUE PTY LTD
McLENNAN EARTHMOVING PTY LTD

SHEET 1 OF 1

B

Meteorological Data

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Table B.1 Meteorological Data September 2011 – Grafton

Date	*Min temp (°C)*	*Max temp (°C)*	*Rainfall (mm)*	*Direction of maximum wind gust*	*Speed of maximum wind gust (km/h)*	*9am Temperature (°C)*	*3pm Temperature (°C)*
21/09/11	11.7	24.5	0	SSE	44	19.4	23.2
22/09/11	8.0	25.2	0	ENE	28	16.8	25.0
23/09/11	9.7	29.6	0.2	ENE	30	16.5	28.4

Source: http://www.bom.gov.au/climate/dwo/IDCJDW2050.latest.shtml

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C

Floristic Data

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Table C.1 Floristic Data

Family	*Species*	*Common Name*
Adiantaceae	*Cheilanthes sieberi subsp. sieberi*	Rock Fern
Anthericaceae	*Laxmannia gracilis*	Slender Wire Lily
Apiaceae	*Centella asiatica*	Pennywort
Apocynaceae	*Parsonsia straminea*	Common Silkpod
Asteraceae	*Bidens pilosa**	Cobbler's Pegs
Asteraceae	*Chyrsocephalum apiculatum,*	Common Everlasting
Asteraceae	*Cirsium vulgare**	Spear Thistle
Asteraceae	*Conyza bonariensis**	Flaxleaf Fleabane
Asteraceae	*Euchiton sphaericus*	-
Asteraceae	*Gamochaeta americana**	Cudweed
Asteraceae	*Glossocardia bidens*	Native Cobblers Pegs
Asteraceae	*Senecio madagascariensis**	Fireweed
Asteraceae	*Taraxacum officinale**	Dandelion
Azollaceae	*Azolla sp.*	Azolla
Convolvulaceae	*Dichondra repens*	Kidney weed
Convolvulaceae	*Polymeria calycina*	Slender Bindweed
Crassulaceae	*Bryophyllum sp.*	Mother-of-Millions
Cyperaceae	*Cyperus sp.*	-
Cyperaceae	*Eleocharis acuta*	Common Spike Sedge
Cyperaceae	*Eleocharis philippinensis*	-
Cyperaceae	*Scleria sp.*	-
Cyperaceae	*Schoenoplectrus mucronatus*	Bog Bulrush
Euphorbiaceae	*Breynia oblongifolia*	Coffee Bush
Euphorbiaceae	*Glochidion ferdinandi*	Cheese Tree
Fabaceae (Faboideae)	*Daviesia sp.*	-
Fabaceae (Faboideae)	*Glycine clandestina*	Twining Glycine
Fabaceae (Faboideae)	*Trifolium repens**	White Clover
Fabaceae (Mimosoideae)	*Acacia maidenii*	Maidens Wattle
Goodeniaceae	*Goodenia hederacea*	Ivy Goodenia
Juncaginaceae	*Juncus polyanthemus*	-
Lauraceae	*Cinnamomum camphora**	Camphor Laurel
Lobeliaceae	*Pratia purpurascens*	Whiteroot
Lomandraceae	*Lomandra filiformis*	Wattle Mat-rush
Lomandraceae	*Lomandra longifolia*	Spiny headed Mat-rush
Lomandraceae	*Lomandra multiflora subsp. multiflora*	Many-flowered Mat-rush
Loranthaceae	*Amyema sp.*	Mistletoe
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry
Marsileaceae	*Marsilea mutica*	Nardoo
Myrtaceae	*Corymbia gummifera*	Red Bloodwood
Myrtaceae	*Corymbia henryi*	Large-leaved Spotted Gum
Myrtaceae	*Corymbia variegata*	Spotted Gum
Myrtaceae	*Eucalyptus moluccana*	Grey Box
Myrtaceae	*Eucalyptus pilularis*	Blackbutt
Myrtaceae	*Eucalyptus siderophloia*	Northern Grey Ironbark
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum
Myrtaceae	*Kunzea opposita*	-
Myrtaceae	*Lophostemon suaveolens*	Swamp Box
Myrtaceae	*Melaleuca alternifolia*	Tea Tree
Nymphaeaceae	*Nymphaea gigantea*	Giant Waterlily
Oleaceae	*Notelaea longifolia f. intermedia*	Large-leaved Olive
Philydraceae	*Phyilydrum lanuginosum*	Frogsmouth
Phormiaceae	*Dianella caerulea*	Blue Flax-lily
Poaceae	*Andropogon virginicus**	Whisky Grass
Poaceae	*Aristida vagans*	Threeawn Speargrass
Poaceae	*Echinopogon caespitosus*	Bushy Hedgehog-grass
Poaceae	*Entolasia stricta*	Wiry Panic

Family	*Species*	*Common Name*
Poaceae	*Eragrostis sp.*	A Lovegrass
Poaceae	*Heteropogon contortus*	Bunch Speargrass, Black Speargrass
Poaceae	*Imperata cylindrica var. major*	Blady Grass
Poaceae	*Microlaena stipoides*	Weeping Grass
Poaceae	*Panicum simile*	Two-colour Panic
Ranunculaceae	*Ranunculus inundatus*	River Buttercup
Rhamnaceae	*Alphitonia excelsa*	Red Ash
Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower
Verbenaceae	*Lantana camara**	Lantana
Xanthorrhoeaceae	*Xanthorrhoea latifolia subsp. latifolia*	A Grass Tree

Key
* Exotic species

Table C.2 Fauna Survey Results

Common Name	*Scientific Name*	*Recording Type*
	Aves	
Pacific Black Duck	*Anas superciliosa*	Observed
Sulphur-crested Cockatoo	*Cacatua galerita*	Observed and call identification
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*	Observed and call identification
Galah	*Eolophus roseicapillus*	Observed
Brown Falcon	*Falco berigora*	Observed – nesting @ 0486870E; 6715275N
Australian Raven/Crow	*Corvus coronoides*	Observed and call identification
Laughing Kookaburra	*Dacelo novaeguineae*	Observed and call identification
White-faced Heron	*Egretta novaehollandiae*	Observed
Blue-faced Honeyeater	*Entomyzon cyanotis*	Observed and call identification
Galah	*Eolophus roseicapillus*	Observed
Magpie Lark	*Grallina cyanoleuca*	Observed and call identification
Welcome Swallow	*Hirundo neoxena*	Observed
Superb Fairy-wren	*Malurus cyaneus*	Observed and call identification
Red-backed Fairy-wren	*Malurus melanocephalus*	Observed and call identification
Noisy Minor	*Manorina melanocephala*	Observed and call identification
White-throated Honeyeater	*Melithreptus albogularis*	Observed
Rufous Whistler	*Pachycephala rufiventris*	Observed and call identification
Noisy Friarbird	*Philemon corniculatus*	Observed and call identification
Grey Fantail	*Rhipidura albiscapa*	Observed and call identification
Willie Wagtail	*Rhipidura leucophrys*	Observed
Pied Currawong	*Strepera graculina*	Observed
Rainbow Lorikeet	*Trichoglossus haematodus*	Observed and call identification
Masked Lapwing	*Vanellus miles*	Observed and call identification
	Mammals	
Domestic Dog	*Canis lupus familiaris**	Observed
Eastern Grey Kangaroo	*Macropus giganteus*	Observed and scats
Koala	*Phascolarctos cinereus* [v]	Scats and scratch marks on tree trunks
Grey-headed Flying-fox	***Pteropus poliocephalus*** [v]	Observed and heard during spotlighting
Common Brushtail Possum	*Trichosurus vulpecula*	Observed during spotlighting
Gould's Wattled bat	*Chalinolobus gouldii*	"*Definite*" Anabat recording
Chocolate Wattled Bat	*Chalinolobus morio*	"*Probable*" Anabat recording
Little Bent-wing Bat	*Miniopterus australis* [v]	"*Definite*" Anabat recording
A Freetail Bat	*Mormopterus sp.2*	"*Definite*" Anabat recording
A Long-eared Bat	*Nyctophilus spp.*	"*Definite*" Anabat recording
Eastern Broad-nosed Bat	*Scotorepens orion*	"*Probable*" Anabat recording
A Broad-nosed Bat	*Scotorepens sp.*	"*Definite*" Anabat recording
	Amphibians	
Common Eastern Froglet	*Crinia signifera*	Heard
Striped Marsh Frog	*Limnodynastes peronii*	Heard
Eastern Dwarf Tree Frog	*Litoria fallax*	Seen and heard
	Reptilia	
Wall Lizard	*Cryptoblepharus virgatus*	Observed
Garden Sun-skink	*Lampropholis delicata*	Observed

Key:
* - Feral species
[v] - TSC Act listed Vulnerable species
Bold denotes EPBC Act listed Vulnerable species

D

Threatened Species Potential Occurrence Potential

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Table D.1 Threatened Flora Potential Occurrence Assessment

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source: OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence*
		TSC Act	*EPBC Act*			
Allocasuarina defungens	Dwarf Heath Casuarina	E	E	Tall heath on sand, also on clay and sandstone.	No suitable habitat	Unlikely
Ancistrachne maidenii	-	V	-	Restricted to northern Sydney, around St Albans - Mt White - Maroota - Berowra areas and to the Shannon Creek area south-west of Grafton. Grows in dry sclerophyll forest on sandstone-derived soils.	Low	Low and not recorded during targeted searches.
Angophora robur	Sandstone Rough-barked Apple	V	V	Dry open forest in sandy or skeletal soils on sandstone, or occasionally granite, with frequent outcrops of rock.	Low	Low and not recorded during targeted searches.
Arthraxon hispidus	Hairy-joint Grass	V	V	Moist shady places in or on the edges of rainforest and wet eucalypt forest, often near creeks or swamps.	No suitable habitat	Unlikely
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	Does not have well defined habitat and is known from a range of communities, including swamp-heath and woodland.	Marginally suitable however no records in locality	Low
Eucalyptus tetraplura	Square-fruited Ironbark	V	V	Dry or moist eucalypt forest on moderately fertile soil, often in low areas with poor drainage.	Low	Low and not recorded during targeted searches.

Scientific Name	Common Name	Status		Habitat Requirement (Source: OEH undated)	Suitability of Habitat on the Site	Potential Occurrence
		TSC Act	EPBC Act			
Macrozamia johnsonii	Johnson's Cycad	E	-	Colonies in sheltered ridges and steep southerly and easterly slopes in wet and dry eucalypt forest on shallow rocky soils. In other States the species is found in a range of near-coastal habitats, including sand dunes, sand spits, shrubland and forest/woodland. In NSW, mainly known from south of Sydney, with an outlying record near Byabarra on the north coast. Commonly occurs at the interface of dry eucalypt forest and gully communities.	Low	Low and not recorded during targeted searches.
Marsdenia longiloba	Clear Milkvine	E	V	Subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops.	Low	Unlikely
Melichrus hirsutus	Hairy Melichrus	E	E	Low-altitude eucalypt forest with shrubby understorey on sandy infertile soil with rocky outcrops.	Low	Unlikely
Niemeyera whitei (formerly *Amorphospermum whitei)*	Rusty Plum	V	-	Rainforest and adjoining moist eucalypt forest.	No suitable habitat	Unlikely
Phyllanthus microcladus	Brush Sauropus	E	-	Banks of creeks and rivers in streamside rainforest.	No suitable habitat	Unlikely
Prostanthera spinosa	Spiny Mint-bush	V	-	Skeletal sandy soils of rocky areas.	Low	Low and not recorded during targeted searches.
Taeniophyllum muelleri	Minute Orchid	-	V	Grows on outer branches and branchlets of rainforest trees; coast and coastal ranges, from sea level to 250 m alt., north from the Bellinger River.	Low	Low

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source: OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence*
		TSC Act	*EPBC Act*			
Triplarina imbricata	Creek Triplarina	E	E	Found only in a few locations in the ranges south-west of Glenreagh and near Tabulam in north-east NSW. Occurs along watercourses in low open forest with Water Gum (*Tristaniopsis laurina*).	Low	Unlikely
Tylophora woollsii	Cryptic Forest Twiner	E	E	Moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins.	Low	Low

E = Endangered; V = Vulnerable

Table D.2 Threatened Fauna Potential Occurrence Assessment

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence on the Site*
		TSC Act	*EPBC Act*			
Aves						
Anseranas semipalmata	Magpie Goose	V	-	Shallow wetlands (<1 m deep), large swamps and dams with dense growth of rushes or sedge	Low	Low
Anthochaera phrygia (formerly Xanthomyza phrygia)	Regent Honeyeater	CE	E	Dry open forest and woodland with an abundance of nectar-producing eucalypts, particularly box-ironbark woodland, swamp mahogany forests, and riverine sheoak woodlands.	Low – possibly only as rare transient forager.	Low
Botaurus poiciloptilus	Australasian Bittern	E	E	Permanent freshwater wetlands with tall dense vegetation, particularly bullrushes and spikerushes.	Low	Low
Burhinus grallarius	Bush Stone-curlew	E	-	Lightly timbered open forest and forest/woodland, and partly cleared farmland with forest/woodland remnants, preferring areas with dry leaf-litter, fallen timber and sparse ground cover	Low to marginally suitable in broad habitat terms in treed areas of the site. Not recorded during survey and few records in locality. Better quality potential habitat occurs in forested portions of study area off-site.	Low on site not recorded during survey (e.g. call playback), no records within close proximity of site (OEH 1:100,000 Grafton threatened species map sheet), and local occurrence potential unlikely to be affected by Proposal.
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	Sheoaks in coastal forests and forest/woodlands, timbered watercourses, and moist and dry eucalypt forests of the coast and the Great Divide up to 1000 m	Low - no preferred foraging sources on site.	Low
Climacteris picumnus	Brown Treecreeper	V	-	Eucalypt forests and forest/woodlands of inland plains and slopes of the Great Dividing Range, and less commonly on coastal plains and ranges. Fallen timber is an important habitat component for foraging. Hollows in standing dead or live trees and tree stumps are essential for nesting	Low on site. Better quality potential habitat occurs in forested portions of study area off-site.	Low on site given marginal habitat and no records within close proximity of site (OEH 1:100,000 Grafton threatened species map sheet). Local occurrence potential unlikely to be affected by Proposal.

Scientific Name	Common Name	Status		Habitat Requirement (Source OEH undated)	Suitability of Habitat on the Site	Potential Occurrence on the Site
		TSC Act	EPBC Act			
Daphoenositta chrysoptera	Varied Sittella	V	-	Inhabits eucalypt forests and forest/woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia forest/woodland. Adversely affected by presence of Noisy Miners	Low on site. Better quality potential habitat occurs in forested portions of study area off-site.	Low on site given marginal habitat and no records within close proximity of site (OEH 1:100,000 Grafton threatened species map sheet). Local occurrence potential unlikely to be affected by Proposal.
Ephippoorhynchus asiaticus	Black-necked Stork	E	-	Swamps, mangroves, mudflats, dry floodplains	Low	Low and local occurrence potential unlikely to be affected by Proposal.
Erythrotriorchis radiatus	Red Goshawk	CE	V	Along or near watercourses, swamp forest and forest/woodlands on the coastal plain. It favours patches of dense forest interspersed with open forest/woodland or cleared land	Possible with study area forming fraction of larger area of habitat. Rare species with only two records in locality.	Low on site and local occurrence potential unlikely to be affected by Proposal
Glossopsitta pusilla	**Little Lorikeet**	V	-	Forages primarily in the canopy of Eucalyptus forest and forest/woodland, riparian areas favoured, nests in hollows of smooth-barked Eucalypts.	Possible as small area of opportunistic foraging habitat for local population. Minimal hollows available for nesting	**Possible**
Grus rubicunda	Brolga	V	-	Shallow swamps, floodplains, grasslands and pastoral lands, usually in pairs or parties	Low	Low
Gygis alba	White Tern	V	-	Marine environments, coastal tall open forest up to 1 km inland	No suitable habitat	Unlikely
Haematopus longirostris	Pied Oystercatcher	E	-	Open beaches, intertidal flats, sandbanks and occasionally rocky headlands	No suitable habitat	Unlikely
Hieraaetus morphnoides	**Little Eagle**	V	-	Occupies open eucalypt forest, forest/woodland or open forest/woodland, nests in tall living trees within a remnant patch	Marginally suitable	**Possible**
Irediparra gallinacea	Comb-crested Jacana	V	-	Among vegetation floating on slow-moving rivers and permanent lagoons, swamps, lakes and dams	Low	Low

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence on the Site*
		TSC Act	*EPBC Act*			
Lathamus discolor	Swift Parrot	E	E	Forests, woodlands, plantations, and banksias.	Possible as minor fraction of migratory foraging range. Spotted Gum forest in the remainder of the study area provides better quality potential habitat. Not recorded in locality.	Low as rare transient forager. Local occurrence potential unlikely to be affected by the Proposal.
Lophoictinia isura	**Square-tailed Kite**	V	-	Dry forest/woodland and open forest, particularly along major rivers and belts of trees in urban or semi-urban areas. Home range can extend over at least 100 km^2	Marginally suitable	**Possible**
Melithreptus gularis gularis	**Black-chinned Honeyeater (eastern subspecies)**	**V**	-	Drier open forests or forest/woodlands dominated by box and ironbark eucalypts, and open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees	Marginally suitable	**Possible**
Ninox strenua	Powerful Owl	V	-	Forest/woodland and open forest to tall moist forest and rainforest, common along drainage lines	Marginally suitable as a small area of low quality foraging habitat forming fraction of broader foraging range. Better quality potential habitat occurs in forested portions of study area off-site.	Low on site, no records (OEH 1:100 000 Grafton threatened species map sheet) within close proximity of site, and local occurrence potential unlikely to be affected by Proposal
Pandion cristatus (formerly *Pandion haliaetus)*	Eastern Osprey	V	-	Forage for fish in fresh, brackish or saline waters of rivers, lakes, estuaries with suitable nesting sites nearby	No suitable habitat	Unlikely
Petroica boodang	**Scarlet Robin**	V	-	Lives in dry eucalypt forests and forest/woodlands. The understorey is usually open and grassy with few scattered shrubs. Habitat usually contains abundant logs and fallen timber	Marginally suitable	**Possible**
Petroica phoenicea	Flame Robin	V	-	Breeds in upland tall moist eucalypt forests and forest/woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys	Low. Better potential quality habitat in forested portions of study area off site.	Low and local occurrence potential unlikely to be affected by Proposal

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence on the Site*
		TSC Act	*EPBC Act*			
Pomatostomus temporalis temporalis	**Grey-crowned Babbler**	V	-	Box-Gum Forest/woodlands on the slopes, and Box-Cypress-pine and open Box Forest/woodlands on alluvial plains. Birds are generally unable to cross large open areas. Feed on invertebrates, either by foraging on tree trunks and or on the ground, digging and probing amongst litter and tussock grasses	Marginally suitable	**Possible**
Pyrrholaemus saggitatus	**Speckled Warbler**	V	-	Eucalyptus dominated communities with sparse shrubs and grassy understorey, often on rocky ridges or in gullies. Large, relatively undisturbed remnants are required for the species to persist in an area	Marginally suitable	**Possible**
Rostratula benghalensis australis	Australian Painted Snipe	E	V	Well-vegetated shallows and margins of wetlands, dams, sewage ponds, wet pastures, marshy areas, irrigation systems, lignum, tea-tree scrub, and open timber.	Low	Low
Stagonopleura guttata	**Diamond Firetail**	V	-	Grassy eucalypt forest/woodlands, open forest, mallee, temperate grassland, and secondary grassland derived from other communities, riparian areas, and sometimes in lightly wooded farmland	Marginally suitable	**Possible**
Sterna fuscata	Sooty Tern	V	-	Breeds in large colonies in sand or coral scrapes on offshore islands and cays including Lord Howe and Norfolk Islands	No suitable habitat	Unlikely
Stictonetta naevosa	Freckled Duck	V	-	Permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. In drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds	Low	Low
Turnix melanogaster	Black-breasted Button-quail	E	V	Drier rainforests and viney scrubs, often in association with Hoop Pine and a deep moist leaf litter layer. During drought it may move to adjacent wetter rainforests.	No suitable habitat	Unlikely

Scientific Name	Common Name	Status		Habitat Requirement (Source OEH undated)	Suitability of Habitat on the Site	Potential Occurrence on the Site
		TSC Act	EPBC Act			
Tyto novaehollandiae	Masked Owl	V	-	Dry eucalypt forest and forest/woodlands. Use large tree hollows or sometimes caves for nesting	Marginally suitable as a small area of low quality foraging habitat forming fraction of broader foraging range. Better quality potential habitat occurs in forested portions of study area off-site.	Low on site, no records (OEH 1:100 000 Grafton threatened species map sheet) within close proximity of site, and local occurrence potential unlikely to be affected by Proposal
Mammalia						
Aepyprymnus rufescens	**Rufous Bettong**	V	-	Tall moist eucalypt forest to open forest/woodland with tussock grass understorey. Feeds on grasses, herbs, seeds, flowers, roots, tubers, fungi, and occasionally insects	Low to moderate as a small area of foraging habitat. Better quality potential habitat occurs in forested portions of study area off site. Local records (OEH 1:100 000 Grafton threatened species map sheet) nearby to south-west and east.	**Possible**
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Near cave entrances and crevices in cliffs. Frequents dry open forest and forest/woodland close to these features	Low	Low
Chalinolobus nigrogriseus	**Hoary Wattled Bat**	V	-	Dry open eucalypt forest dominated by spotted gum, boxes and ironbarks. Also healthy coastal forests where Red Bloodwood and Scribbly Gum are common. Naturally sparse understorey is favourable	Low to marginally suitable.	**Possible**
Dasyurus maculatus maculatus	Spotted-tailed Quoll	V	E	Dry and moist eucalypt forests and rainforests, fallen hollow logs, large rocky outcrops	Low on site. Forested off-site portions of study area are moderate.	Low on site and local occurrence potential unlikely to be affected by the Proposal.
Miniopterus australis	**Little Bent-wing bat**	V	-	Moist eucalypt forest, rainforest and dense coastal scrub. Roost in caves, tunnels and sometimes tree hollows	Moderate	**Possible**
Miniopterus schreibersii oceanensis	**Eastern Bentwing-bat**	V	-	Forest or forest/woodland, roost in caves, old mines and stormwater channels	Moderate	**Possible**

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence on the Site*
		TSC Act	*EPBC Act*			
Myotis macropus	**Southern or Large-footed Myotis**	V	-	Bodies of water, rainforest streams, large lakes, reservoirs. Roost in caves, mines tunnels, tree hollows, disused birds nests, and under bridges and buildings	Marginally suitable	**Possible**
Petaurus australis	Yellow-bellied Glider	V	-	Tall mature eucalypt forests. Nest in tree hollows and feed on a range of sources	Low	Low
Petaurus norfolcensis	**Squirrel Glider**	V	-	Dry eucalypt forests and forest/woodland including Blackbutt, Bloodwood and Ironbark eucalypt forest with heath understorey in coastal areas, and box-ironbark forest/woodlands and River Red Gum forest inland. Require abundant tree hollows for refuge and nest sites. More common in old-growth forest and mixed forests with winter flowering food supplies	Forest on site and trees within gliding distance are structurally suitable, though support few hollows.	**Marginally possible**
Petrogale penicillata	Brush-tailed Rock Wallaby	V	V	North-facing cliffs and dry eucalypt forest and woodland, inhabiting rock crevices, caves, overhangs during the day, and foraging in grassy areas nearby at night.	No suitable habitat	Unlikely
Phascogale tapoatafa	**Brush-tailed Phascogale**	V	-	Drier forests and forest/woodlands with hollow-bearing trees and sparse ground cover	Marginally suitable	**Marginally possible**
Phascolarctos cinereus	**Koala**	V	-	Appropriate food trees in forests and forest/woodlands, and treed urban areas	Moderate - refer to **Section 5**	**Recorded**
Planigale maculata	Common Planigale	V	-	Rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas with surface cover and usually close to water. Shelter in crevices, hollow logs, beneath bark or under rocks	Low	Low
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V	Cool temperate rainforest, moist and dry forests, and wet heathland, inhabiting dense layers of grass, ferns, vines and shrubs.	Low	Low
Pseudomys novaehollandiae	New Holland Mouse	-	V	Occurs in open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	Low	Low

Scientific Name	*Common Name*	*Status*		*Habitat Requirement (Source OEH undated)*	*Suitability of Habitat on the Site*	*Potential Occurrence on the Site*
		TSC Act	*EPBC Act*			
Pteropus poliocephalus	**Grey-headed Flying-fox**	V	V	Forage in subtropical and temperate rainforests, tall sclerophyll forests and forest/woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops	High as seasonal foraging habitat	**Recorded**
Saccolaimus flaviventris	**Yellow-bellied Sheathtail-bat**	V	-	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows	Moderate	**Possible**
Amphibia						
Mixophyes balbus	Stuttering Frog	V	V	Cool rainforest, moist eucalypt forest and occasionally along creeks in dry eucalypt forest.	No suitable habitat	Unlikely
Mixophyes iteratus	Giant Barred Frog	E	E	Deep, damp leaf litter in rainforests, moist eucalypt forest and near dry eucalypt forest	No suitable habitat	Unlikely
Reptilia						
Cacophis harriettae	White-crowned Snake	V	-	Low to mid-elevation dry eucalypt forest and forest/woodland with well developed litter layer where their prey of small lizards may be more abundant	Low	Low
Hoplocephalus bitorquatus	Pale-headed Snake	V	-	Dry eucalypt forests and forest/woodlands, cypress forest/woodland and occasionally in rainforest or moist eucalypt forest. Favours streamside areas, particularly in drier habitats	Low	Low
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	V	V	Rainforest and occasionally moist eucalypt forest, on loamy or sandy soils	Low	Low

E = Endangered; V = Vulnerable;

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Part 5A Assessment of Significance

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Seven-part Test of Significance for: Threatened Fauna

From **Section 4.5**, the following threatened species required assessment under the Seven-part tests of significance in accordance with Section 5A of the EP&A Act

- Little Lorikeet (*Glossopsitta pusilla*);
- Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*);
- Scarlet Robin (*Petroica boodang*);
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*);
- Speckled Warbler (*Pyrrholaemus saggitatus*);
- Diamond Firetail (*Stagonopleura guttata*);
- Little Eagle (*Hieraaetus morphnoides*);
- Square-tailed Kite (*Lophoictinia isura*);
- Hoary Wattled Bat (*Chalinolobus nigrogriseus*);
- Little Bent-wing Bat (*Miniopterus australis*);
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Large-footed Myotis (*Myotis macropus*);
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*);
- Rufous Bettong (*Aepyprymnus rufescens*);
- Squirrel Glider (*Petaurus norfolcensis*);
- Brush-tailed Phascogale (*Phascogale tapoatafa*);
- Koala (*Phascolarctos cinereus*); and
- Grey-headed Flying-fox (*Pteropus poliocephalus*).

The study area habitat values and extent of local population per species/species group are detailed below. To minimise repetition, the responses to the seven-part tests are structured as follows:

- Part **(a)**, **(d)**, **(f)** and **(g)** are answered per species or as a collective group of species depending on the nature of impacts.
- Part **(b)** deals specifically with Endangered Populations and is not relevant to the subject threatened species listings.
- Part **(c)** deals specifically with EECs, hence is not relevant to this threatened fauna species assessment.
- Part **(e)** deals with Critical Habitat which is not relevant to the subject species/ proposed works.

Hoary Wattled Bat, Little Bent-wing Bat, Eastern Bent-wing Bat, Large-footed Myotis and Yellow-bellied Sheathtail-bat

Habitat Value of The Site/Study Area and Local Population Range

The Little Bent-wing Bat was a '*definite*' recording during the survey. While none of the other subject species were recorded, they are considered potential occurrences given local records and the presence of potential habitat.

The site (particularly in and amongst the heavier treed areas) provides a small area of aerial foraging habitat for all of the subject species. The dams (particularly the larger dams along the drainage line in the east) also provide potential aquatic foraging habitat for the Large-footed Myotis. Tree hollows on site provide potential roosting habitat for all of the subject species, though only potential seasonal non-breeding roost sites for the Little Bentwing-bat and Eastern Bentwing-bat. Trees with minor cavities/crevices and decorticating bark from *Eucalyptus spp.* and *Corymbia spp.* may also provide temporary non-breeding roost sites.

The study area and locality offer better quality and larger areas of potential foraging habitat including large stand of Spotted Gum forest on proposed Lot 5 of DA stage 1, and privately owned land to the west, north

west and south west. Given the high mobility of these species, individuals from the locality and any individuals utilising the site would be expected to be able to interbreed and hence collectively form local populations. Local populations of the subject species are considered to consist of those individuals/colonies that may utilise the locality as foraging and/or roosting habitat. The range of the local populations of these highly mobile species would thus extend well beyond the study area.

Grey-headed Flying-fox

Habitat Value of The Site/Study Area and Local Population Range

The Grey-headed Flying-fox was recorded feeding on flowering Forest Red Gums (*E. tereticornis*) and flying over the site during the survey. The study area (including the site) provides a small area of potential foraging habitat during flowering incidences, particularly of canopy *Eucalyptus spp.* and *Corymbia spp*. It has potential to form a fraction of the local Grey-headed Flying-fox populations wider foraging range which would extend beyond the locality.

The study area is not known or considered potential roosting habitat for this species. For this assessment, the local population is considered to consist of all individual who roost in the locality, including the Susan Island roost site to the east, or may utilise the locality to satisfy their foraging requirements.

Koala

Habitat Value of The Site/Study Area and Local Population Range

Refer to SEPP 44 Koala Habitat Assessment in **Section 5** of the report for details of the habitat potential of this species. In summary, while no Koalas were directly observed during the survey, evidence of Koala occurrence was detected across the study area (including seven trees on the site). The SAT results suggest that at least a member (possibly even members) of this local Koala aggregate includes the study area as a core part of their range (as indicated by the presence of areas of major activity). Koala activity levels on the site were low. The areas of major Koala activity were within the found in the larger stand of Spotted Gum forest in the remainder of the study area (off site) typically in proximity to main drainage line; and in an elevated portion of the site near Hampton Road in the south-east of the proposed Lot 5 DA stage 1.

The local Koala population is considered to comprise of all individuals based in forest/woodland habitat within the Waterview Heights locality.

Square-tailed Kite and Little Eagle

Habitat Value of The Site/Study Area and Local Population Range

Neither of the subject species nor evidence of their occurrence (i.e. large stick nests), were recorded during the survey in the study area. The study area (including the site) is considered structurally suitable foraging habitat for these species, forming a fraction of the local population's extensive foraging range. Larger eucalypts have potential to provide possible nesting opportunities, though the site offers only a fraction of the habitat of similar and better quality potential nesting habitat throughout the study area and broader locality. For this assessment, the local population of the subject species would comprise any individuals/breeding pairs which utilise the locality as part of their regular foraging territory. The range of local populations would extend well beyond the study area.

Little Lorikeet, Babbler Black-chinned Honeyeater, Scarlet Robin, Grey-crowned Babbler, Speckled Warbler and Diamond Firetail

Habitat Value of The Site/Study Area and Local Population Range

The site provides a relatively small area of foraging habitat for these species. It is typically of low habitat value, however may form part of the larger range of the local population of these species given the proximity to more substantial areas of forest locally (including the Spotted Gum forest in the study area on proposed Lot 5 DA stage 1). Potential site usage would mainly be from individuals/groups whose sedentary home ranges overlap the study area. Key foraging resources include:

- seasonal nectar and pollen foraging resources of *Eucalypts spp*. and *Corymbia spp*, particularly for the Little Lorikeet and Black-chinned Honeyeater;
- invertebrate prey, particularly for the Scarlet Robin, Grey-crowned Babbler and Speckled Warbler; and

- grass and herb seeds, particularly for the diamond Firetail.

Potential nesting site for the Little Lorikeet are provided by the limited tree hollow resources. The actual potential for this species to nest on the site however is reduce by the high density of aggressive birds (e.g. Galahs, Rainbow Lorikeet, etc) as well as potential predators (e.g. Brushtail Possums, etc) locally.

The trees/forest vegetation in the study area (including the site) provides potential nesting habitat for the other species which utilise constructed nests, though the site offers only a fraction of the habitat of similar and better quality potential nesting habitat throughout the study area and broader locality.

The study area has potential to support a number of pairs or groups of these species (at least as seasonal foraging habitat). Given the size of the site, high mobility of this species and the extent of other known/potential forest and forest/woodland habitat available within the locality, the local population would include pairs/groups occupying interconnecting habitat throughout the locality.

Brush-tailed Phascogale and Squirrel Glider

Habitat Value of The Site/Study Area and Local Population Range

The large stand of Spotted Gum forest on proposed Lot 5 DA stage 1 (residual lot) and directly adjacent grassland trees / small patches of Spotted Gum forest on the site provide potential foraging habitat for the Brush-tailed Phascogale and Squirrel Glider. Potential denning habitat is provided by hollow-bearing trees (though such resources are limited), as well as hollow-logs in the large stand of Spotted Gum forest on proposed Lot 5 DA stage 1 for the Brush-tailed Phascogale. The site itself offers only a small fraction of the habitat available to local population of these species. For this assessment the local population of the subject species would include all individuals/ family groups within known/interconnected potential forest/woodland habitats all direction from the site in the Waterview Heights locality.

Rufous Bettong

Habitat Value of The Site/Study Area and Local Population Range

The Rufous Bettong was not recorded during the survey. The main potential habitat for this species in the study area is provided by the large stand of Spotted Gum forest on proposed Lot 5 DA stage 1 (residual lot). The site itself is generally of low habitat value and lack of dense cover/shelter resources. It provides only the minor potential foraging on the edge of better quality Spotted Gum forest. The local population for this assessment would comprise of all individuals based in forest/woodland areas in the Waterview Heights area.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

General Introduction of the Proposal

The proposal is two part subdivision: DA stage 1: subdivide the study area into five Lots; and DA stage 2 subdivide the proposed 13.11 ha DA stage 1 Lot 4 into 27 Lots). A description of the proposal is provided in **Section 2**.

The proposed development would result in the direct loss/modification of the pastoral grassland with isolated trees and small patches Spotted Gum forest on the site. This assessment will assume the worst case-scenario in that all trees and patches of Spotted Gum forest within the footprint of DA stage 2 (i.e. on DA stage 1 Lot 4) require removal, excluding the Spotted Gum forest and trees in the southern half of DA stage 2 Lot 11. This comprises removal of approximately 60 trees, including:

- small patches of Spotted Gum forest with a total area of approximately 0.24 ha; and
- three trees with well formed hollows, as well as a number of other trees that contained small poorly formed hollows/cavities and potential hollow-bearing tree recruits.

The two larger main dams on the proposed Lot 4 DA stage 1 are expected to be retained, though potentially directly affect through boundary fence construction. The smaller dam on proposed lot 3 DA

stage 2 may be removed/modified, however it is of low conservation value.

The approximately 44 ha stand of Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would not be affected by the proposal.

Hoary Wattled Bat, Little Bent-wing Bat, Eastern Bent-wing Bat, Large-footed Myotis and Yellow-bellied Sheathtail-bat

For the subject microchiropteran bats, the habitat loss/modification required as part of the proposal would reduce the site's current foraging and potential roosting/ breeding values. During the vegetation clearing stage of the proposal, there is also a risk of direct mortality/injury of individuals potentially roosting on the site at the time of the clearing. While this is a negative effect and would result in incremental and cumulative habitat loss of these species locally, the local population of the subject species are unlikely to be significantly affected given:

- the limited extent of the site, which has potential only to support a small portion of aggregates of the local population;
- the remainder of the study area and locality supports substantial areas of similar and better quality habitat for the local population of these species which would not be affected by the proposal;
- all of the subject species are highly mobile and the proposal would not create any barriers to their local movements; and
- effective implementation of the mitigation measures provided in **Section 8** would minimise the risk of direct mortality during vegetation clearing.

The proposal is considered unlikely to significantly contribute to indirect impacts which threaten the subject species (e.g. application of pesticides in or adjacent to foraging areas - OEH undated), given:

- the current modified state of the site and general locality, and associated land use practices (e.g. livestock grazing);
- the nature of the proposal, which is largely restricted to highly modified portions of the study area; and
- mitigation measures provided in **Section 8** aim to minimise the risk of indirect impacts such as sedimentation and erosion impacts and water quality impacts on lower catchment habitats.

Overall the proposal may potentially affect individuals/small colonies of the subject species (potentially including low quality breeding habitat for all of the subject species except the subject Bent-wing Bat), given the extent of foraging and breeding habitat available to the local population of these species in the locality, it is considered unlikely that the proposal would have an adverse affect on the life cycle of any of the subject species such that the local population is likely to be placed at significant risk of extinction.

Grey-headed Flying-fox

The proposed development would reduce the site's value as foraging habitat for the Grey-headed Flying-fox. While this is a negative (incremental and cumulative effect), the local population is unlikely to be significantly affected as:

- the site is not known or likely potential roosting habitat;
- the site has potential only to form a minute fraction of the local population foraging range;
- the majority of habitat in the study area is on proposed Lot 5 DA stage 1 and would not be affected by the proposal, and the locality include relatively extensive areas of potential foraging habitat;
- no barriers to the local movement of this highly mobile species would be created; and
- the extent to which the proposal may contribute to other threats would be negligible (e.g. powerlines are abundant throughout the general locality, hence if above powerlines are established, the risk of powerline collision/electrocution locally would only be minutely increased).

Overall, while the proposal would reduce the site's value for this species, it is unlikely that the proposed development would have an adverse effect on the life cycle of the Grey-headed Flying-fox such that a

viable local population is likely to be placed at significant risk of extinction.

Koala
The proposed development would reduce the site's value for the Koala through vegetation and transformed of existing grassland with paddock trees and associated small patches of Spotted Gum forest into a rural-residential environment. Other threats to the Koala would also be introduced to the site and/or incrementally (though not significantly) increased locally such as reduced habitat connectivity, traffic collision and predation via domestic pets (refer to **Section 6**).

However the direct footprint of the proposal is restricted to existing modified areas which currently evidence low Koala usage. The main area of habitat, encompassing the high and medium use Koala usage areas, occurs in the 44 ha of Spotted Gum forest on proposed Lot 5 DA stage 1, and would not be directly affected by the Proposal. A Koala Plan of Management would also be prepared for the study area, with the aim of maintaining or enhancing the current overall Koala values.

Additionally the site is located on the interface between a cleared agricultural environment and existing rural-residential areas. Hence threats such as traffic collision, and cats and dogs (domestic and feral) are already present. Considering this and the nature of the proposal, the extent to which the proposal may contribute to key threats to the local Koala population such as predation, traffic collision and habitat fragmentation would be minimal.

Overall it is considered unlikely that the proposed development would have an adverse effect on the life cycle of the Koala such that a viable local population is likely to be placed at significant risk of extinction.

Square-tailed Kite and Little Eagle
For the Square-tailed Kite and Little Eagle, the proposed development would result in the direct loss/modification of a small area of potential foraging habitat. However this is considered unlikely to significantly affect any potentially occurring local population as:

- no nesting sites would affected;
- the site has potential only to form a minor fraction of these species extensive territory and the locality includes relatively extensive areas of habitat of similar and better habitat values, including the Spotted Gum forest Lot 5 DA stage 1 (residual lot) which will not be directly impacted by the proposal, and privately owned forested land to the west, north west and south west;
- no barriers to the local potential movements of these highly mobile species would be created; and
- the extent to which the proposal may contribute to other threats would be negligible, e.g. the locality currently supports a reasonable human population, hence threats such as collection of eggs would not be substantially increased by the increase in human presence imposed by the proposal.

Overall the proposal is considered unlikely to have an adverse effect on the life cycle of either of the subject species such that a viable local population is likely to be placed at significant risk of extinction.

Little Lorikeet, Babbler Black-chinned Honeyeater, Scarlet Robin, Grey-crowned Babbler, Speckled Warbler and Diamond Firetail
The habitat loss/modification required as part of the proposal would reduce the site's current foraging and potentially nesting/breeding values for the subject species. During the vegetation clearing stage of the proposal, there is also a risk of direct mortality/injury of individuals potentially nesting on the site at the time of the survey. While this is a negative effect and would result in incremental and cumulative habitat loss of these species locally, any potentially occurring local populations of these species are unlikely to be significantly affected given:

- the limited extent/habitat value of the site, which provides a fraction of the habitat available for the subject species locally;
- the locality supports substantial areas of similar and better quality habitat for potentially occurring local populations of the subject species, including the approximately 44 ha Spotted Gum forest on the residual lot (DA stage 1 Lot 5) which would not be affected by the proposal;

- the subject species are highly mobile and the proposal would not create any barriers to its potential local movements; and
- effective implementation of the mitigation measures provided in **Section 8** would minimise the risk of threats such as direct mortality during vegetation clearing.

The proposal is considered unlikely to significantly contribute to indirect impacts which threaten the subject species such as traffic collision, window collision, predation by domestic cats, etc; given:

- the current modified state of the site and general locality, and associated land use practices and threats (e.g. the site is located next to an existing rural-residential areas with domestic cats, hence the local domestic cat population (and associated risk of predation) would not be significantly increased by the proposal); and
- the proposal is largely restricted to a highly modified pastoral area, which would be of low value for the subject species post development.

Overall it is considered unlikely that the proposal would have an adverse affect on the life cycle of the subject species such that a viable local population is likely to be placed at significant risk of extinction.

Brush-tailed Phascogale and Squirrel Glider

The Proposal would require the removal of potential foraging resources (i.e. nectar and pollen, gums and sap sources) and/or prey foraging habitat for the subject species, by requiring the removal paddock trees and small patches of Spotted Gum forest adjacent to a large stand (approximately 44 ha) of Spotted Gum forest. Three trees with small hollows that provide potential den sites for the subject species may also require removal. During the potential removal of these trees, the Proposal would also impose a risk of injury or mortality to potentially denning individuals.

Overall the Proposal would impose some negative (incremental and cumulative) effects, it is considered unlikely to significantly affect any the local population of the subject species as:

- only a limited area of potential habitat would be directly affected;
- the locality includes relatively large area of similar and better quality potential habitat (including denning habitat) for the these species which would not be directly or substantially indirectly affected by the Proposal. This includes the approximately 44 ha of Spotted Gum forest on the residual lot (DA stage 1 Lot 5);
- both the Squirrel Glider and Brush-tailed Phascogale display moderate to high mobility and would continue to be able to move between local habitats post establishment of the proposal. This includes utilising retained vegetation in the southern half of DA Stage 2 Lot 11, which forms part of an east-west link to vegetation east of Hampton Road (mainly only suitable for dispersing Brush-tailed Phascogales);
- the Proposal would be undertaken following the mitigations measures detailed in **Section 8** of this report which would ensure the risk of injury/mortality during tree felling, domestic pet predation risk, and indirect impacts (e.g. erosion and sedimentation) on adjacent habitats are minimal and/or not substantially increased.

Overall it is considered unlikely that the proposal would have an adverse effect on the life cycle of the Brush-tailed Phascogale or Squirrel Glider such that a viable local population is likely to be placed at significant risk of extinction.

Rufous Bettong

The proposal would only result in the loss/modification in a minor marginal area of foraging habitat for the Rufous Bettong. Key habitats associated with the study area which includes key habitat features such as potential shelter and breeding habitat (tall grasses, logs, etc) would be retained in the off-site portions of the study area (i.e. the residual lot, DA stage 1 Lot 5). Other threats to this species such as predation and in appropriate fire regimes are unlikely to be significantly increased as a result of the proposal (refer to **Section 6**), and existing potential local movement patterns would not be adversely affected (ie the

footprint of the proposal is largely restricted to modified grazing land in the northern portion of the study area). Overall the proposal would not have an adverse affect on the life cycle of the Rufous Bettong such that a viable local population is likely to be placed at significant risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

All Subject Species

The proposal is two part subdivision would collectively result in the direct loss/modification of the pastoral grassland with isolated trees and small patches Spotted Gum forest on the site. This assessment will assume the worst case-scenario in that all trees and patches of Spotted Gum forest within the footprint of DA stage 2 (i.e. on DA stage 1 Lot 4) require removal, excluding the Spotted Gum forest and trees in the southern half of DA stage 2 Lot 11. This comprises removal of approximately 60 trees, including:

- small patches of Spotted Gum forest with a total area of approximately 0.24 ha; and
- three trees with well formed hollows, as well as a number of other trees that contained small poorly formed hollows/cavities and potential hollow-bearing tree recruits.

The two larger main dams on the proposed Lot 4 DA stage 1 are expected to be retained, though potentially directly affect through boundary fence construction. The smaller dam on proposed lot 3 DA stage 2 may be removed/modified, however it is of low conservation value.

The approximately 44 ha stand of Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would not be affected by the proposal.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

All Subject Species

The site and surrounding properties have experienced an extensive disturbance history due to agricultural and rural-residential development. The local landscape now comprises a mosaic of cleared grazing land, rural-residential development and forest/woodland.

The main habitat loss/modification associated with the proposal is confined to existing modified land comprising grassland and associated small patches of Spotted Gum forest. All mature trees and the approximately 44 ha stand of Spotted Gum forest on DA stage 1 Lot 5, would be retained, along with the trees in the southern half of DA stage 2 Lot 11. This will maintain connectivity with adjacent habitat areas to the east, west and south of the study area.

The Hoary Wattled Bat, Little Bent-wing Bat, Eastern Bent-wing Bat, Large-footed Myotis, Yellow-bellied

Sheathtail-bat, Grey-headed Flying-fox, Square-tailed Kite, Little Eagle, Little Lorikeet, Babbler Black-chinned Honeyeater, Scarlet Robin, Grey-crowned Babbler, Speckled Warbler and Diamond Firetail, are all flying species for which barriers to their movement would not be created by the proposal.

While the existing potential direct movements of ground dwelling fauna (e.g. for the Koala) through the rural-residential area would be reduced, this area is already mostly cleared (hence offering low dispersal suitability for the Brush-tailed Phascogale and Squirrel Glider), and vegetation on adjacent land to the east and west would maintain local north-south connectivity for tree dependant species to disperse. In addition for the Koala, this highly mobile is known to disperse through urban environments. This suggests the Koala may directly be able to movement through the proposed small holding / rural-residential area post establishment of the development.

Overall the proposal is considered unlikely to result in habitat fragmentation or isolation for any of the subject species.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

Koala
While the study area is recognised as core Koala habitat, the major areas of activity were outside of the site (i.e. proposal footprint) within the Spotted Gum forest on proposed Lot 5 DA stage 1, and would not be impacted by the proposal. The site itself showed only low levels of Koala usage, and the safeguards of this report would ensure the study area values for the Koala are maintained or enhanced. Overall while the habitat removal/modification associated with the proposal is a negative (incremental and cumulative) effect, the habitat on the site is not considered critical to the long-term survival of the Koala in the locality.

All Other Subject Species
As discussed in the introduction to the Seven-part Test, the site provides only a fraction of the area available for the local population of the subject species, and is generally of low habitat value. While it may maybe of some importance to individuals/small aggregates of the local population of these species, large areas of better quality habitat occurs in the remainder of the study area (including approximately 44 ha of Spotted Gum forest) and locality. Overall the site itself is not considered critical to the long-term survival of the subject species in the locality.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the TSC Act within the study area nor are there any areas of critical habitat for the subject species listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

All Subject Species - Introduction
Part 4 of the TSC Act states "*The object of a recovery plan is to promote the recovery of the threatened species, population or ecological community to which it relates to a position of viability in nature*." Any development which adversely affects threatened species or their habitat, or contributes to relevant key threatening processes may be interpreted as being inconsistent with this general objective. However the extent to which the proposal contributes to threats of the subject species is unlikely to interfere with the recovery of any of the subject species. Specific recovery and threat abatement strategies are discussed below.

Koala
An approved recovery plan currently exists for the Koala (DECC 2008), however the specific objectives of this recovery plan are not relevant to the Proposal. The Proposal would not have a significant negative effect on any of the Priority Action Statements (PAS) actions associated with the Koala (DECCW website:

www.threatenedspecies.environment.nsw.gov.au).

Overall the Proposal is not considered significantly inconsistent with the specific objectives or actions of the relevant recovery plan or PAS.

Grey-headed Flying-fox
A draft national recovery plan currently exists for the Grey-headed Flying-fox (DECCW 2009). The specific objectives and actions of this plan are not likely to be affected by the Proposal. The Proposal would not have a significant negative effect on any of the PAS actions associated with the Grey-headed Flying-fox (DECCW website: www.threatenedspecies.environment.nsw.gov.au).

Overall the Proposal is not considered significantly inconsistent with the specific objectives or actions of the relevant recovery plan or PAS.

Other Subject Species
No draft or approved recovery plans prepared under the TSC Act currently exists for these remaining subject species. The Proposal would not have a significant negative effect on any of the PAS actions associated with any of the subject species (DECCW website: www.threatenedspecies.environment.nsw.gov.au).

Overall the Proposal is not considered significantly inconsistent with the objectives or actions of the relevant recovery plan or PAS.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the TSC Act as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of Key Threatening Processes (KTP's) under TSC Act, and whether the proposed development is recognised as a threatening process is shown in **Table E1**.

Table E.1 Key Threatening Processes

Listed Key Threatening Processes (as described in the final determination of the Scientific Committee to list the threatening processes)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	***Possible***	***Unlikely***
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change	✓		
Bush rock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition and habitat degradation by feral goats			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
High frequency fire resulting in the disruption of life cycle processes in			✓

Listed Key Threatening Processes (as described in the final determination of the Scientific Committee to list the threatening processes)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	***Possible***	***Unlikely***
plants and animals and loss of vegetation structure and composition			
Herbivory and environmental degradation caused by feral deer			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion and establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch broom (*Cytisus scoparius*)			✓
Invasion and establishment of the cane toad (*Bufo marinus*)			✓
Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata*			✓
Invasion, establishment and spread of *Lantana camara*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses		✓	
Invasion of the Yellow Crazy Ant			✓
Loss of hollow-bearing trees	✓		
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation and hybridisation of feral dogs (*Canis lupus familiaris*)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Removal of dead wood and dead trees		✓	

The main KTP's listed under the TSC Act which the proposal may contribute to include clearing of native vegetation, loss of hollow-bearing trees and anthropogenic climate change.

Clearing of native vegetation is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands (OEH undated). The proposed development would contribute to this process by requiring removal/modification of the paddock trees and small stands of Spotted Gum forest. However the extent to which the proposal contributes to this threatening process is not considered likely to place the local population of the subject threatened species at significant risk of extinction.

Anthropogenic Climate Change is evidence that modification of the environment by humans may result in future climate change. Human induced activities as a result of energy use, industrial processes, solvent and other product use, agriculture, land use change and forestry, and waste cause greenhouse gas

emissions (OEH undated). The incremental extent to which the proposal may contribute to anthropogenic climate change is unlikely to alone put the local population any of the subject species at significant risk of local extinction.

Loss of hollow-bearing would occur as three hollow-bearing trees require removal as part of the Proposal. Safeguards have been provided to minimise this impact.

The proposal is not considered likely to significantly contribute to any other KTP, especially with effective implementation of the safeguards provided in **Section 8** of this report.

Conclusion

While the proposed development will impose some negative, incremental and cumulative effects, the proposed subdivision is not considered likely to place local populations of any listed threatened species at significant risk of extinction, especially with effective implementation of the mitigation measures detailed in this report.

References

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EPBC Act Matters Of National Environmental Significance – Significant Impact Criteria Assessment for Migratory and Threatened Species

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EPBC Act Matters of National Significance: Significant Impact Criteria Assessment for Threatened Species

Vulnerable Species

The Grey-headed Flying -fox was the only EPBC Act listed threatened species considered as potentially occurring in the study area.

DEH (2006) defines an 'important population' as "*a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:*

- *key source populations either for breeding or dispersal;*
- *populations that are necessary for maintaining genetic diversity; and/or*
- *populations that are near the limit of the species range."*

The Grey-headed Flying-fox was recorded feeding on flowering Forest Red Gum (*Eucalyptus tereticornis*) trees during the survey. The study area is not known or considered potential roosting habitat for this species. It however provides a small area of potential foraging habitat during flowering incidences, particularly of canopy *Eucalypt spp.* and *Corymbia spp*. The study area has potential to form a small part of the local Grey-headed Flying-fox populations wider foraging range which would extend beyond the locality. For this assessment, the important population is considered to consist of all individuals who roost in the locality, including Susan Island to the east of the site, or may utilise the locality to satisfy their foraging requirements.

Vulnerable Species Significant Impact Criteria Assessment

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;***

The proposal is two part subdivision: DA stage 1: subdivide the study area into five Lots; and DA stage 2 subdivide the proposed 13.11 ha DA stage 1 Lot 4 into 27 Lots). A description of the proposal is provided in **Section 2**.

The proposed development would result in the direct loss/modification of the pastoral grassland with isolated trees and small patches Spotted Gum forest on the site. This assessment will assume the worst case-scenario in that all trees and patches of Spotted Gum forest within the footprint of DA stage 2 (i.e. on DA stage 1 Lot 4) require removal, excluding the Spotted Gum forest and trees in the southern half of DA stage 2 Lot 11. This comprises removal of approximately 60 trees, including:

- small patches of Spotted Gum forest with a total area of approximately 0.24 ha; and
- three trees with well formed hollows, as well as a number of other trees that contained small poorly formed hollows/cavities and potential hollow-bearing tree recruits.

The two larger main dams on the proposed Lot 4 DA stage 1 are expected to be retained, though potentially directly affect through boundary fence construction. The smaller dam on proposed lot 3 DA stage 2 may be removed/modified, however it is of low conservation value.

The approximately 44 ha stand of Spotted Gum forest on DA stage 1 Lot 5 (the residual lot) would not be affected by the proposal.

The proposed development would reduce the site's value as foraging habitat for the Grey-headed Flying-fox. While this is a negative (incremental and cumulative effect), the local population is unlikely to be significantly affected as:

- the site is not known or likely potential roosting habitat;
- the site has potential only to form a minute fraction of the local population foraging range;

- the majority of habitat in the study area is on proposed Lot 5 DA stage 1 and would not be affected by the proposal, and the locality include relatively extensive areas of potential foraging habitat;
- no barriers to the local movement of this highly mobile species would be created; and
- the extent to which the proposal may contribute to other threats would be negligible (e.g. powerlines are abundant throughout the general locality, hence if above powerlines are established, the risk of powerline collision/electrocution locally would only be minutely increased).

Overall, the proposal is unlikely to 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;***

The habitat to be affected by the proposed works is limited in extent and habitat quality. It has potential only to form a fraction of the local important Grey-headed Flying-fox populations' wider foraging range and no known or likely roosting habitat would be affected. Overall the proposal is not expected to result in a significant reduction in the area of occupancy for any important Grey-headed Flying-fox populations.

- ***fragment an existing important population into two or more populations;***

The Grey-headed Flying-fox is highly mobile flying species, and known to be to disperse across fragmented and landscapes and occur in highly modified environments (NPWS Atlas of NSW Wildlife 2010, Van Dyck and Strahan 2008, DECCW undated, personal observations). Consequently the proposal should not create any barriers to the potential local movements of these species and is not expected to result in significant habitat fragmentation or isolation.

- ***adversely affect habitat critical to the survival of a species;***

DEH (2006) states '*Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:*
• for activities such as foraging, breeding, roosting, or dispersal;
• for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
• to maintain genetic diversity and long term evolutionary development; or
• for the reintroduction of populations or recovery of the species or ecological community".

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

The proposal is not considered likely to significantly affect habitat critical to the survival of the Grey-headed Flying-fox as:

- the site does not contain habitat listed on the Register of Critical Habitat or any known recovery plans for the Grey-headed Flying-fox;
- the habitat to be directly affected has potential only to form a fraction of an important Grey-headed Flying-fox populations' wider foraging range;
- similar and better quality potential habitats are relatively extensive in the locality;
- the site is not a known or likely roost; and
- given the nature of the proposed works and modified nature of the local landscape, the current dispersal potential for the Grey-headed Flying-fox would be expected to be retained post development.

- ***disrupt the breeding cycle of an important population;***

With consideration of the previous points, particularly the limited extent and quality of habitat on site, it is

considered unlikely that the breeding cycle of any important population of the Grey-headed Flying-fox would be significantly affected by the proposal.

- ***modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;***

For the Grey-headed Flying-fox, the proposal would result in the direct loss/modification of a small area of foraging habitat provided by isolated trees and small patches of Spotted Gum forest in a pastoral grassland area. In total approximately 60 tree require removal. While this is a minor negative effect, the Grey-headed Flying-fox is considered unlikely to be significantly affected given:

- the site is not known or likely potential roosting habitat;
- the site has potential only to form a minute fraction of the local population foraging range. The study area and locality include better quality and larger areas of potential foraging habitat including the approximately 44 ha of Spotted Gum forest on proposed Lot 5 DA stage 1 which will not be directly impacted by the proposal;
- no barriers to the local movement of this highly mobile species would be created; and
- the extent to which the proposal may contribute to other threats would be negligible (e.g. powerlines are abundant throughout the general locality, hence if above powerlines are established, the risk of powerline collision/electrocution locally would only be minutely increased).

Overall, the proposal is not considered likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Grey-headed Flying-fox is likely to significantly decline.

- ***result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;***

DEH (2006) states "*an 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation*."

No invasive species for the Grey-headed Flying-fox or its habitat are considered likely to become established or dispersed as a result of the proposed works.

- ***introduce disease that may cause the species to decline; or***

No diseases that may affect the Grey-headed Flying-fox or its habitat are considered likely to become introduced or spread as a result of the proposed works.

- ***interfere substantially with the recovery of the species.***

While the proposal may impose some minor negative impacts to the Grey-headed Flying-fox and its habitat, the nature of the proposed works is such that the recovery of this species is unlikely to be substantially interfered with.

Conclusion

The proposed works are considered unlikely to result in a significant impact on any important Grey-headed Flying-fox population. Consequently referral to DEWHA and approval by the Minister is not required.

EPBC Act Matters of National Significance: Significant Impact Criteria Assessment for Migratory Species

From the EPBC Act Protected Matters Search Tool search results, the survey results and local knowledge, the following species are considered potential occurrences in the study area:

- Black-faced Monarch (*Monarcha melanopsis*);
- Rainbow Bee-eater (*Merops ornatus*);
- Satin Flycatcher (*Myiagra cyanoleuca*);
- Rufous Fantail (*Rhipidura rufifrons*);
- White-throated Needletail (*Hirundapus caudacutus*);
- Great Egret (*Ardea alba*);
- Cattle Egret (*Ardea ibis*); and
- Fork-tailed Swift (*Apus pacificus*).

DEH (2006) states that "*an area of 'important habitat' for a migratory species is:*
a) habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
b) habitat that is of critical importance to the species at particular life-cycle stages; and/or
c) habitat utilised by a migratory species which is at the limit of the species range; and/or
d) habitat within an area where the species is declining."

Migratory Species Significant Impact Criteria Assessment
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- ***substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;***

The site has potential only to form a fraction of the local ranges for any migratory species and does not contain significant potential foraging resources (e.g. extensive estuarine mudflats or the only stand of winter flowering species within the broader landscape), nesting or breeding habitat. The locality includes extensive areas of similar and better quality habitat for these species. Hence the site is not considered to support an important habitat area of habitat for any migratory species.

Consequently the proposal is not considered likely to substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.

- ***result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or***

As mentioned previously the proposal does not affect habitat that constitutes important habitat for any migratory species population. Additionally the nature of the proposal is such that no invasive species are considered likely to be introduced.

- ***seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.***

As mentioned previously, the site only provides a small area of foraging and possibly roosting and nesting habitat for a number of somewhat habitat generalist EPBC Act listed migratory species as part of an extensive area of similar and better quality habitat throughout the general locality and beyond. The site does not provide any significant foraging, roosting or nesting habitat for any migratory species populations. Consequently the proposal is not considered likely to seriously disrupt the lifecycle (breeding, feeding,

migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Conclusion

The proposal is considered unlikely to result in a significant impact on any migratory listed species. Consequently referral to DEWHA and approval by the Minister is not required.

Reference

DEH (2006). EPBC Act Policy Statement 1.1: Significant Impact Guidelines - Matters of National Environmental Significance. Australian Government Department of the Environment and Heritage.

Appendix E

Preliminary Contaminated Land Assessment

Preliminary Site Investigation

Hampton Road, Waterview Heights

PO Box 119
Lennox Head NSW 2478
T 02 6687 7666

PO Box 1446
Coffs Harbour NSW 2450
T 02 6651 7666

info@geolink.net.au

Prepared for: Waterview Heights Developments Pty Ltd

UPR	Description	Date Issued	Issued By
2440-1010	First issue	27/07/2015	Simon Waterworth

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Executive Summary

GeoLINK has been engaged by Waterview Heights Developments Pty Ltd to prepare a stage 1 preliminary site investigation (in the accordance with the Contaminated Land Planning Guidelines) to accompany a planning proposal (REZ2015/0004) for the rezoning of land in Hampton Road, Waterview Heights south west of Grafton. The proponent is seeking to rezone a portion of the site from RU2 Rural Landscape to R5 Large Lot Residential to allow for the future subdivision of the rezoned land into large lot residential allotments with one larger residue lot containing the existing vegetated land.

Previous land use has been broad scale agriculture making it a Table 1 activity as identified in the Contaminated Land Planning Guidelines. Therefore the potential exists for land contamination as a result of past agricultural activities. The environmental assessment accompanying the development application (DA) identified that confined portions of the site had previously contained deposits of waste material and rubbish. Advice from the owner of the site and a subsequent site inspection has confirmed that the waste material has since been removed and the site remediated. The landowner has advised and provided evidence that all waste material has been disposed of offsite at a licenced facility.

Assessment of the site history has identified that there is a low potential for contamination through chemicals such as pesticides (organo-chlorines), hydrocarbons, and heavy metals as a result of past and resent land use. There was no evidence of odours detected, nor was there any visual evidence of surface staining observed on the site (associated with oils and contaminants as identified).

Based on a review of the available desktop data and observations made during the site inspection, this report has determined that, as the deposits of waste material have been removed and there is a very low risk of contamination through past agricultural practices, no laboratory testing or further investigation is considered necessary and the rezoning should proceed.

1. Introduction

1.1 Summary of the Planning Proposal

GeoLINK has been engaged by Waterview Heights Developments Pty Ltd to prepare a planning proposal for the rezoning of land in Hampton Road, Waterview Heights. The proponent is seeking to rezone a portion of the site from RU2 Rural Landscape to R5 Large Lot Residential to allow for the future subdivision of the rezoned land into large lot residential allotments with one larger residue lot containing the existing vegetated land.

The site is located within the Clarence Valley Local Government Area and therefore the Clarence Valley Local Environmental Plan 2011 (CVLEP 2011) applies to the land. The site is currently zoned RU2 Rural Landscape however adjoins land zoned R5 Large Lot Residential. Clause 4.1 - minimum subdivision lot size and associated lot size maps, require that the subdivision of the subject site must result in lots that have a minimum area of 40 ha. It is proposed to undertake a subdivision of the land that involves subdivision of lots less than 40 ha and therefore an amendment to CVCLEP 2011 is required.

In assessing the Planning Proposal for gateway determination, Council has requested stage 1 preliminary site investigation (in the accordance with the Contaminated Land Planning Guidelines) be prepared to accompany the planning proposal.

1.2 Scope and Objective

The objectives of this stage 1 preliminary site investigation report is to determine the likelihood of contamination in the soils which may be disturbed by future land use as a result of the rezoning of land. This contamination investigation will determine the likelihood of contamination from past practices, identify the likely nature of any potential contamination, provide recommendations for further sampling if necessary, and potential options for remediation.

2. Site identification

2.1 The Site and Locality

Lot 5 DP 1179232 is located in Waterview Heights which is a large lot residential (rural residential) subdivision approximately seven kilometres west of Grafton. Waterview Heights is dissected by the Gwydir Highway with the majority of the large lot residential development on the northern side of the Highway. The subject site is located south of the Gwydir Highway. A locality plan of the site is shown as **Illustration 2.1** and an aerial photograph of the site is shown as **Illustration 2.2**. Photographs of the site are shown in **Plates 2.1 to 2.4**.

Plate 2.1 Site image 1

Plate 2.2 Site image 2

Plate 2.3 Site image 3

Plate 2.4 Site image 4

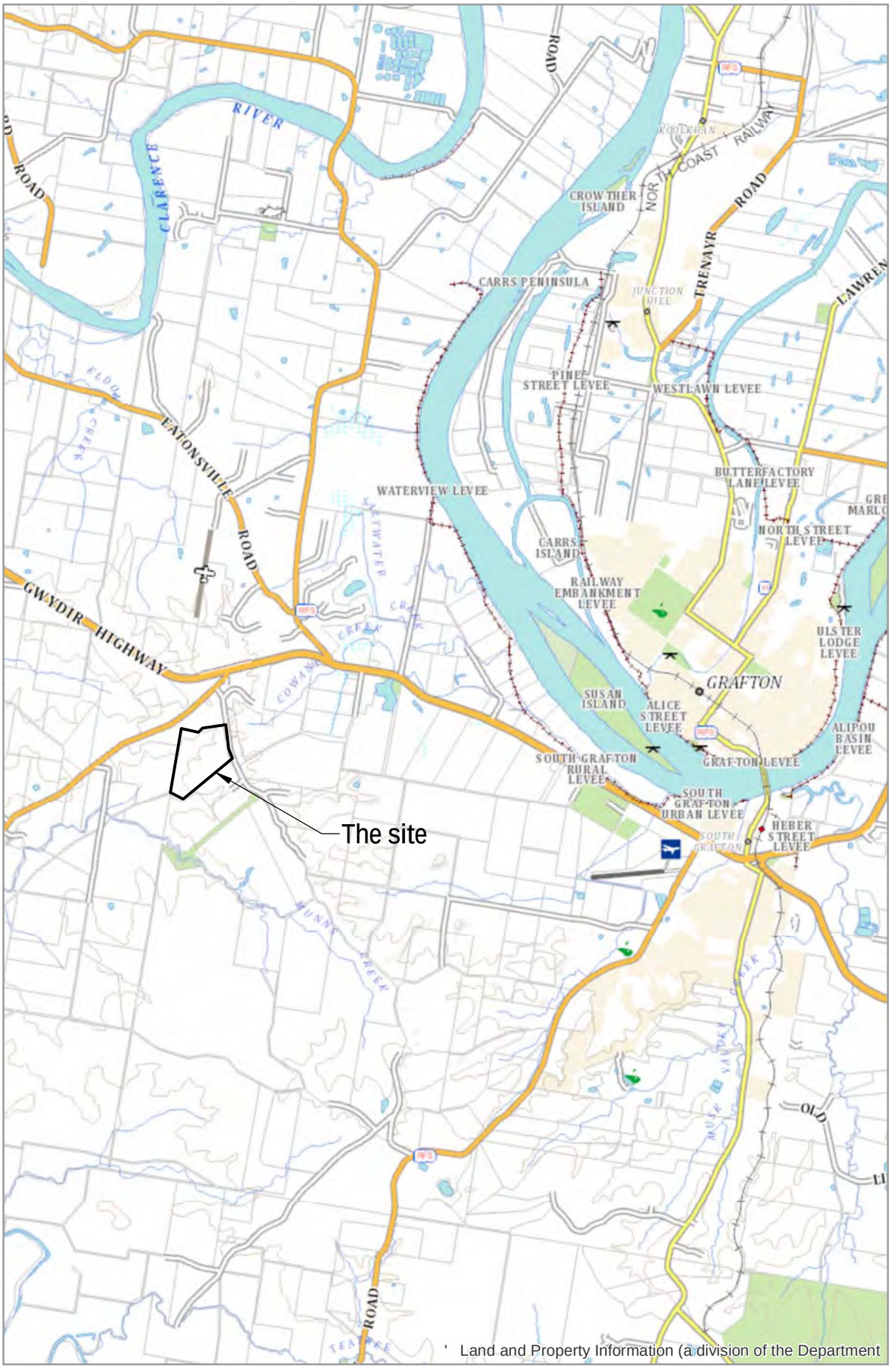
The site is 51.95 ha in area and comprises a strip of open pastoral land along Hampton Road with individual/ small clusters of trees and forested areas primarily in the west of the cleared land. The site is located adjacent to rural (pastoral and forested) land to the west with areas of large lot residential land to the east, north and south-east.

The Proposal is to rezone a portion of the site from RU2 Rural Landscape to R5 Large Lot Residential to allow for the future subdivision of the rezoned land into large lot residential allotments with one larger residue lot containing the existing vegetated land. The proposed zoning amendment map is shown as **Illustration 2.3**.

Drawn by: KHO Checked by: RE Reviewed by: SJW Date: 23 July 2015

Information shown is for illustrative purposes only

Source of base data: SIXMaps



0 1.5 km

North

Locality Plan

GeoLINK environmental management and design

Preliminary Contamination Assessment - Hampton Road, Waterview Heights

2440-1011

Illustration 2.1

Information shown is for illustrative purposes only

Drawn by: KHP Checked by: RE Reviewed by: SJW 23 July 2015
Source of base data: SIXMaps, Bothamley and O'Donohue Pty. Limited

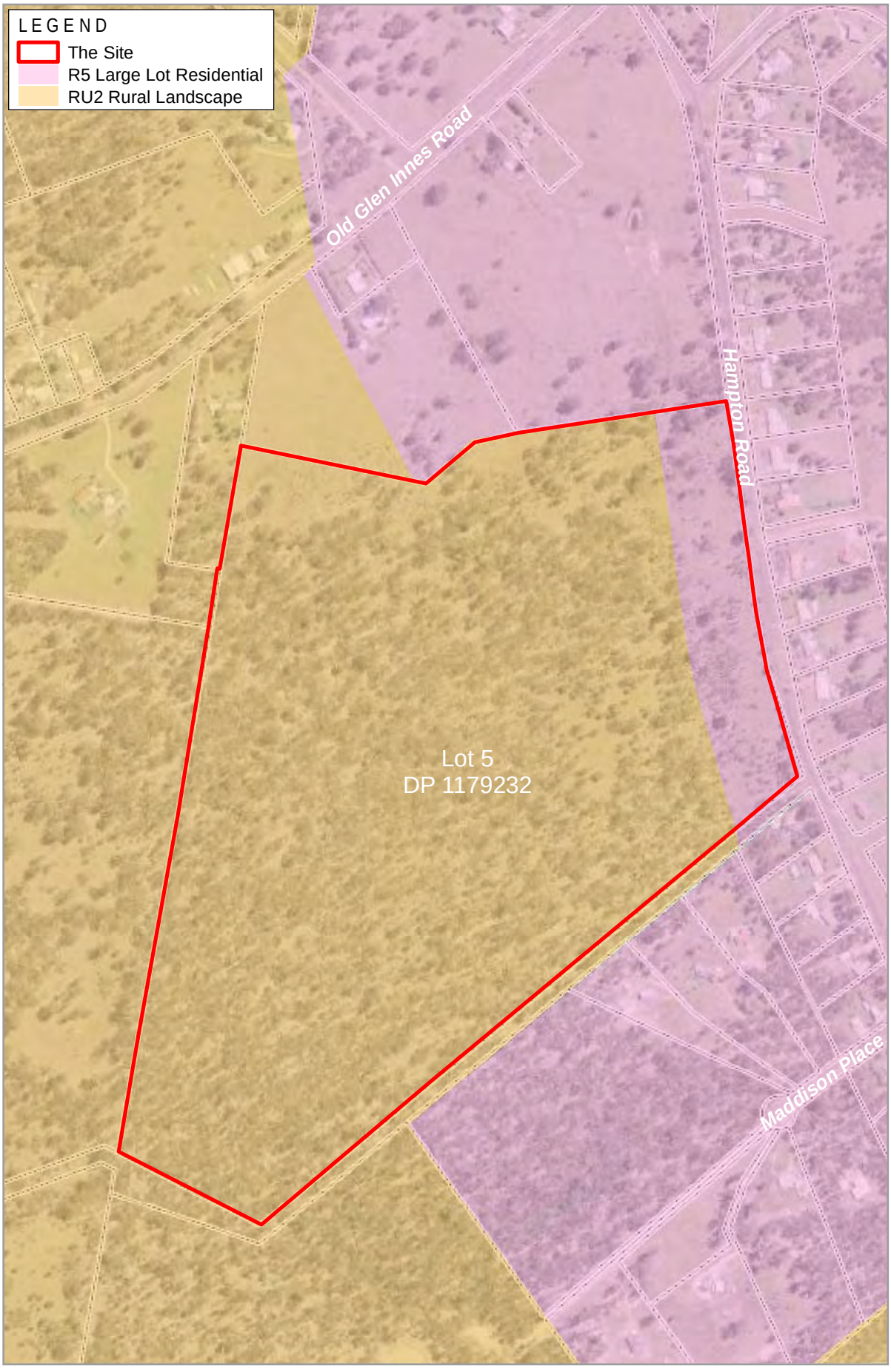
0 150

North

The Site

Information shown is for illustrative purposes only

Drawn by: KHP Checked by: RE Reviewed by: SJW Date: July 2015
Source of base data: SIXMaps



North

0 150

Proposed Amendment to Zoning Plan

3. Site Characteristics

3.1 Geology

The Geological Survey of NSW Grafton 1:250,000 Geological Series Sheet SH 56-6 First Edition (1976) indicates that the site is located on Kangaroo Creek Sandstone, which is comprised of quartz sandstone and feldspathic quartz sandstone.

3.2 Topography

Topography in the vicinity of the site is gently undulating with the area to be rezoned generally flat. The Australian height datum (AHD) indicates that the site has an approximate elevation of 60 metres to 40 metres.

3.3 Hydrogeology

An intermittent drainage channel extends from the east and traverses through the site towards the south west. This drainage system discharges into Munns Creek, approximately 1.8 kilometres south west of the subject site. An isolated farm dam is also located in the northeast corner of the site.

Based on regional topography and the location of the nearest surface water body (Munns Creek), it is considered that groundwater flow at the site is likely to be towards the south west. A search of the NSW Natural Resource Atlas conducted on 23 July 2015 identified one groundwater bore, located approximately 2.4 kilometres northeast of the subject site. No information on the drillers data log details was available on the website.

3.4 Acid Sulfate Soils

The site is not within land likely to contain acid sulfate soils. The nearest mapped acid sulfate soil material is located approximately 1.7 kilometres north east and is classed as 'low probability of occurrence'. It is noted that the site is located at an elevation of approximately 60 m AHD. The presence of acid sulfate soils is generally limited to elevations of less than 10 m AHD. Based on these, further assessment of acid sulfate soils or potential acid soils is considered not warranted.

3.5 Flood Characteristics

The site is not in proximity to the Clarence River or floodplain and no land on the site is below the 1 in 100 year or extreme flood level of the Clarence River according to the Lower Clarence River Flood Study Review 2004. The pronounced drainage line that runs through the centre of the property connects to Munns Creek to the southwest. The drainage line comprises an intermittent stream. It does not support permanent flows. It is unlikely that periodic rainfall events and/ or flooding in Munns Creek would affect the site as this area of the drainage line is within the upper limits of a tributary's catchment that flows into Munns Creek. The site would not be prone to flood risks.

4. Site History

This section of the report aims to review the site history to determine whether current or past activities may have contributed to contamination of the site. A site history was obtained by:

- A review of a selection of historical aerial photographs
- A search of NSW Office of Environment and Heritage records for contaminated sites (refer to **Appendix A**)
- A search of Department of Primary Industries (DPI) records of cattle dip sites (refer to **Appendix B**)
- A review of other relevant previous studies within the study area.

4.1 Aerial Photography

A review of a selection of historical aerial photographs was undertaken and included a review of NSW Land and Property Information '6 Maps', Google Earth history images and Historic Photographs Australia. Please note however, the historical photographs/ aerial imagery available for analysis only extended back to the year 2001, all attempts were made to source images from an earlier date, including consultation with Clarence Valley Council GIS division.

No significant changes were observed both on the subject site and the surrounding landscape from 2001 – 2015, with the exception of minor residential development and vegetation removal occurring to the north of the site. The historical aerial photography review indicates a potential for the following land contaminating activities to have occurred on the site:

- Broad-scale agricultural activities – livestock grazing.
- Residential development – construction.

Further assessment of these potential land contaminating activities is considered warranted.

4.2 Previous subdivision relating to the land

Development Consent No. SUB2011/0059 approved a five lot subdivision of Lot 2411 DP709698 and Lot 9 DP 820604 on 01 February 2012. The subject land (Lot 5 DP 1179232) is the residue parcel of this subdivision.

4.3 Regulatory Authorities

4.3.1 Department of the Environment and Heritage National Pollutant Inventory

A search of the Department of the Environment and Heritage National Pollutant Inventory revealed that no known polluted sites are in proximity to the site.

4.3.2 NSW Environment Protection Authority

A search of the NSW Office of Environment and Heritage (OEH) records revealed that no notices under the Environmentally Hazardous Chemicals Act (1985) and the Contaminated Land Management Act (maintained under Section 308 of the Protection of the Environment Operations Act 1997) have been issued within the study area or on land adjacent to the study area (refer to Error! Reference source not found.).

4.3.3 NSW Department of Primary Industries

A search of the NSW Department of Primary Industries (DPI) Cattle Dip Site Locator identified that no Cattle Dip sites have been identified in close proximity to the site (refer to **Appendix B**). These past practices of cattle dip sites are well documented to contain high levels of arsenic within the soils. Although cattle dips were commonly used within the Clarence Valley, the inspection did not identify any features of a cattle dip occurring onsite.

4.3.4 Department of the Environment and Heritage

A search of the Department of the Environment and Heritage contaminated land record indicated that there are no contaminated sites within proximity to the site.

4.4 Previous Contamination Assessment

There was no previous contamination assessments made available to GeoLINK for review at the time of preparing this report.

4.5 Chemicals of Concern

The site history indicates potential from residue contaminants associated with past agricultural practices. No other specific contaminants have been identified, however it is considered prudent that chemicals associated with fuel leakage or spills (from waste material); pesticide use and disposal of wastewaters/ bio-solids could have occurred onsite. The corresponding chemicals of concern are listed in **Table 4.1**.

Table 4.1 Chemicals of Concern

Potential for contamination	*Chemical of Concern*
Fuel leakage or spills	hydrocarbons
Pesticide use	Pesticides (organo-chlorines)
Disposal of wastewaters/ bio-solids	Heavy metals

5. Site Investigations

5.1 Site inspection

A comprehensive site inspection was undertaken on 11 March 2015. The purpose of the site inspection was to make observations of the site and adjacent site land uses to determine its potential for rezoning and to determine likely land constraints such as evidence of land contamination from previous land uses and practices.

5.2 Waste

The site inspection did not identify any waste material however it is understood that small portions of the site, particularly those affected by erosion within the intermittent drainage line, did previously contain deposits of waste material and rubbish. These include but are not limited to:

- Tyres
- Car bodies
- Metal waste
- Wire
- General scrap materials.

This has since been remediated by the landowner and all waste material has been disposed of offsite at a licenced facility (refer **Section 6** for further details).

5.3 Fill

There was no visual evidence to suggest the presence of potential filling material on the site based on the detailed observation made. The potential for localised or minor filling elsewhere on the site cannot be excluded.

5.4 Asbestos

There was no visual evidence of potential asbestos containing materials observed on the surface of the site. Therefore, a hazardous building material survey was not required to be undertaken.

5.5 Phytotoxicity

There was no visual evidence of phytotoxic impact (i.e. plant stress or dieback) observed on the site. Vegetation on adjoining properties also appeared healthy.

5.6 Odours and Staining

Emphasis of the site inspection was concentrated to the drainage channel where previous deposits of waste material and rubbish had been placed. There was no evidence of odours detected, nor was there any visual evidence of surface staining observed on the site (associated with oils and contaminants as identified in **Table 4.1**). As the waste and rubbish material had been removed and the site remediated, it is considered unlikely that contamination to underlying soils from the storage of this waste would present material risk to the surrounding environment.

5.7 Incidence and Complaints

There was no anecdotal information provided to suggest any incidents had occurred at the site or complaints had been made about the site.

5.8 Adjacent Land Uses

Land uses observed on the properties adjacent to the site are summarised in **Table 5.1**.

Table 5.1 Adjacent Land Uses

Adjacent boundary	*Land Use*
North	Large lot rural residential properties (RU5)
East	Large lot rural residential properties (RU5)
South	Rural landscape (RU2)
West	Rural landscape (RU2)

Current land use activities observed adjacent to the site did not suggest a significant potential for offsite land use activities to be affecting the site (in the context of contamination). On this basis, further assessment of potential off site sources of contamination is not warranted.

6. Previous remediation works

As identified in **Section 5**, there were small portions of the site, particularly those affected by erosion within the intermittent drainage channel, which previously contained deposits of waste material and rubbish.

To ensure the waste material was removed and that the drainage channel was appropriately remediated, the landowner employed the services of Soil Conservation Services in February 2014 to provide advice on how best to deal with these matters. Soil Conservation Services provided number of recommendations (refer **Appendix C**) including:

- Removal of waste material and rubbish
- Lining the channel base and edge with quarry rock over geotextile
- Ensuring works are done to constrict channel width
- Cover disturbed areas with open weave matting
- Planting upper bank edge with Lomandra longafolia.

As shown in **Plates 6.1 – 6.3**, it is evident that all works have been completed to the intermittent drainage channel based on the recommendations identified above. All waste material has been disposed of offsite at a licenced facility, and landfill receipts have been kept by the landowner as evidence of disposal.

Plate 6.1 Prior to Remediation

Plate 6.2 Post Remediation

Plate 6.3 Post Remediation

7. Conclusion

Based on a review of the available desktop data and observations made during the site inspection, this report has determined that the site is unlikely to have been contaminated by previous land uses and practices. No specific contaminants have been identified onsite as a result of observations made during the site inspection and the searches of the various databases related to land contamination did not reveal any potential for contamination on the site. Locations that previously contained waste material (metal, tyres, wire etc.) did not present signs of contamination. As the waste and rubbish material have been removed and the site remediated, it is considered unlikely that contamination to underlying soils from this waste would present a risk to the surrounding environment. It is therefore considered that the proposed rezoning of land can proceed without laboratory testing or further investigation.

Project Team

GeoLINK Team	*Role*
Simon Waterworth	Director / Project Manager
Tim Ruge	Environmental Engineer / Technical Review
Kale Hardie-Porter	Environmental Planner / Report Preparation

References

GeoLINK, (2011) *Ecological Assessment Old Glen Innes Road Subdivision – Stage 1 of 2*, GeoLINK Coffs Harbour

Copyright and Usage

Appendix A

NSW OEH - EPA Search Results

Healthy Environment, Healthy Community, Healthy Business

Home > Contaminated land > Record of notices

Search results

Your search for: Name (site, occupier, owner, recipient): Hampton Road Waterview Heights
LGA: Clarence Valley Council

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

22 July 2015

Connect

Feedback

Web suppo
Public con

Appendix B

NSW DPI Cattle Dip Search Results

Cattle dip site locator

This search retrieved 0 dip sites.

For more information about each dip site, click on the name below.

Dip name	Road	Town/Locality	Council

Find dip sites

Dip name	
Road	Hampton Road
Town/Locality	Grafton
Council	---select all---

Search

Appendix C

Soil Conservation Services recommendations

13 October 2014

Suite 5 Level 1 City Square
76 Harbour Drive
PO Box 530 Coffs Harbour NSW 2450
P: 02 6650 3124
M: 0439 608532

Inspection Notes – Hampton Rd Waterview Heights

The site was inspected with Mike Gorrie in February 2014.
There is evidence of erosion on the site in a number of locations along the main drainage line evident on the property. The main cause of the erosion is a dispersible B horizon within the soil profile, and flow concentration associated with dam structures. The treatment for dispersible soil is to apply fine gypsum at a rate determined by laboratory testing. However a typical rate of 1 tonne per 1000m3 of soil is recommended generally in the Coffs Harbour District SCS Technical Manual (1989). Rock lined channel is the solution for concentrated flow paths.

Please refer to photos 1 to 7 and notes attached. Please note order of photos is from most upslope dam.

Any queries please do not hesitate to contact the undersigned on 0439 608532.

Peter Corlis
Senior Environmental Officer

Photo 1

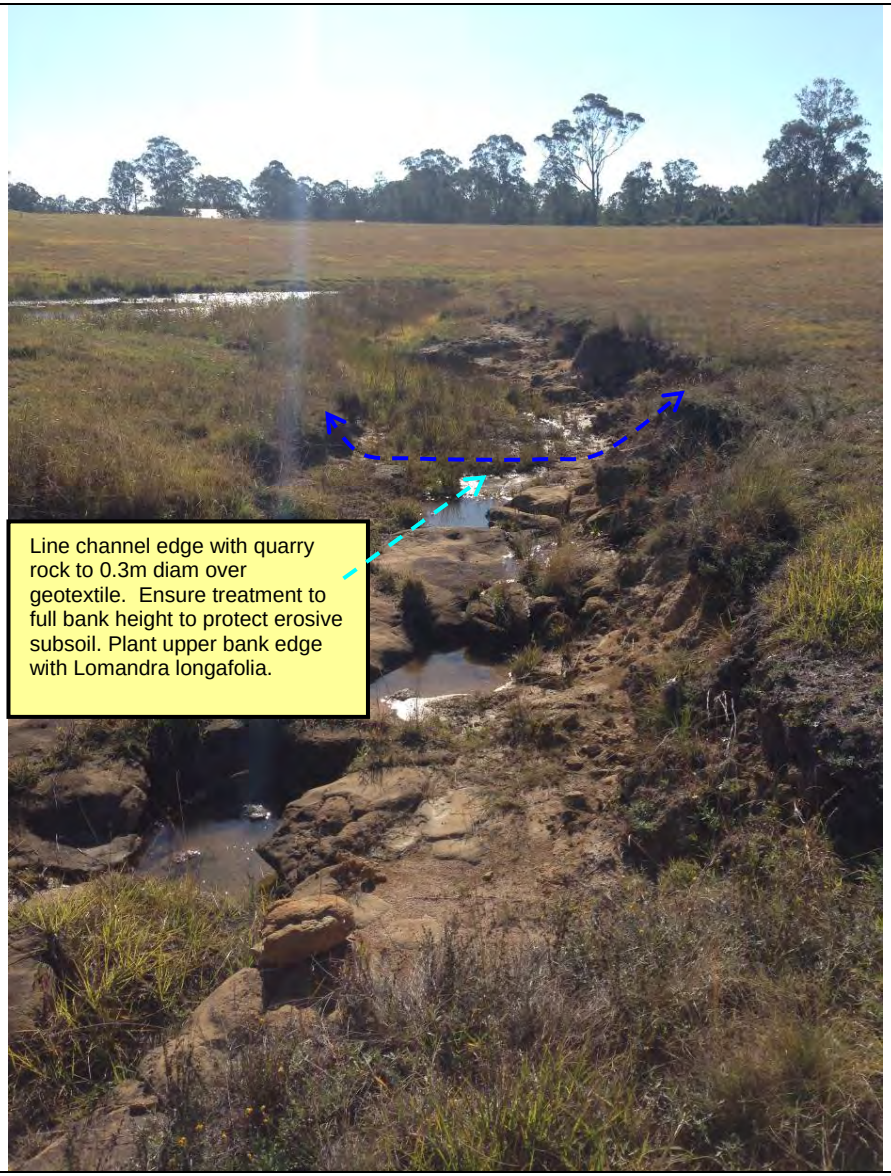


Photo 2

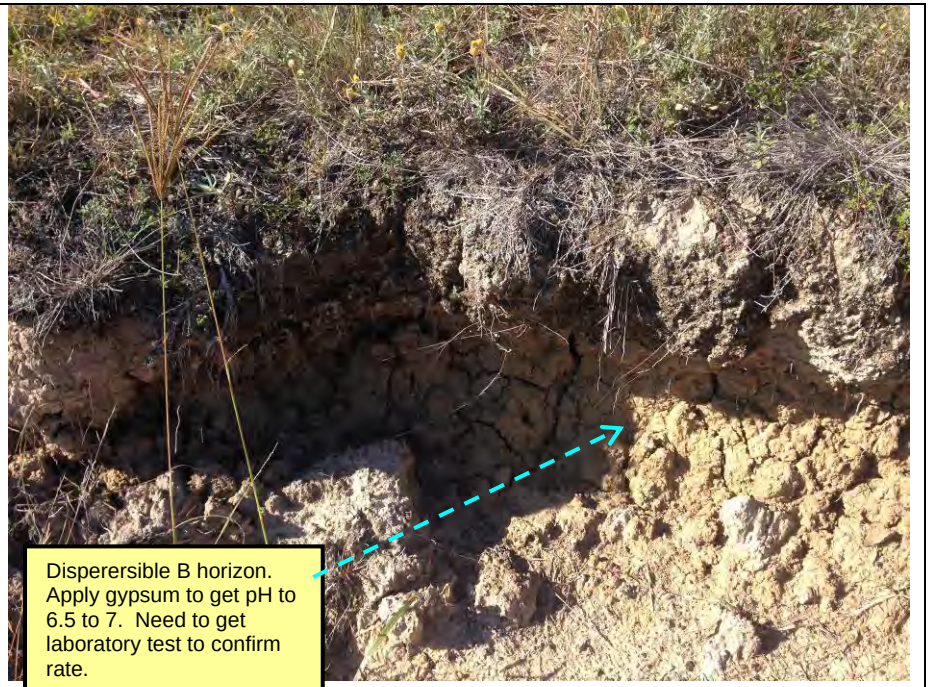


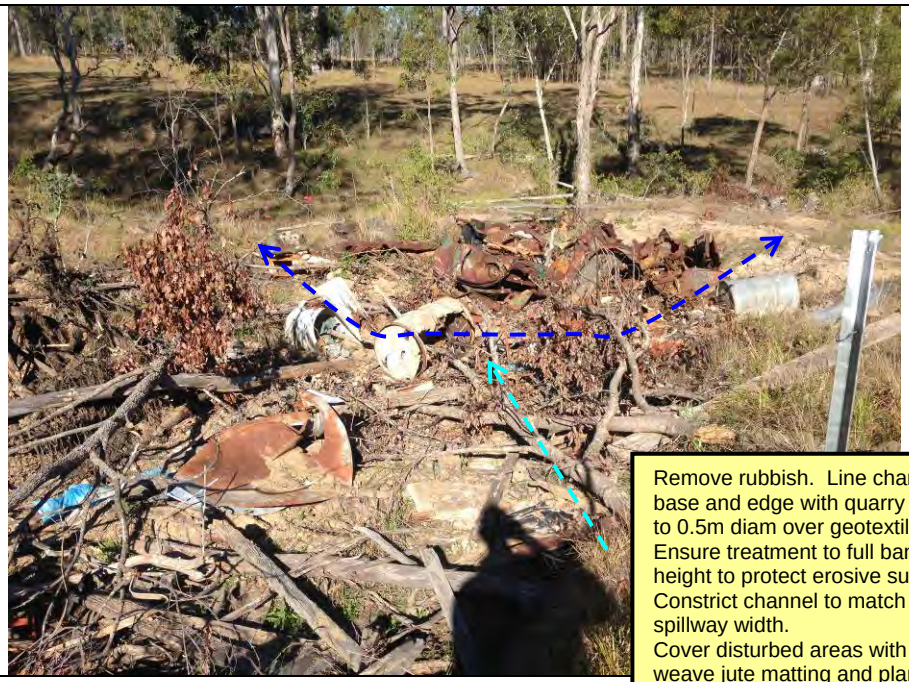
Photo 3

Photo 4

Photo 5

Photo 6

Photo 7



Remove rubbish. Line channel base and edge with quarry rock to 0.5m diam over geotextile. Ensure treatment to full bank height to protect erosive subsoil. Constrict channel to match dam spillway width.
Cover disturbed areas with open weave jute matting and plant upper bank edge with Lomandra longafolia.