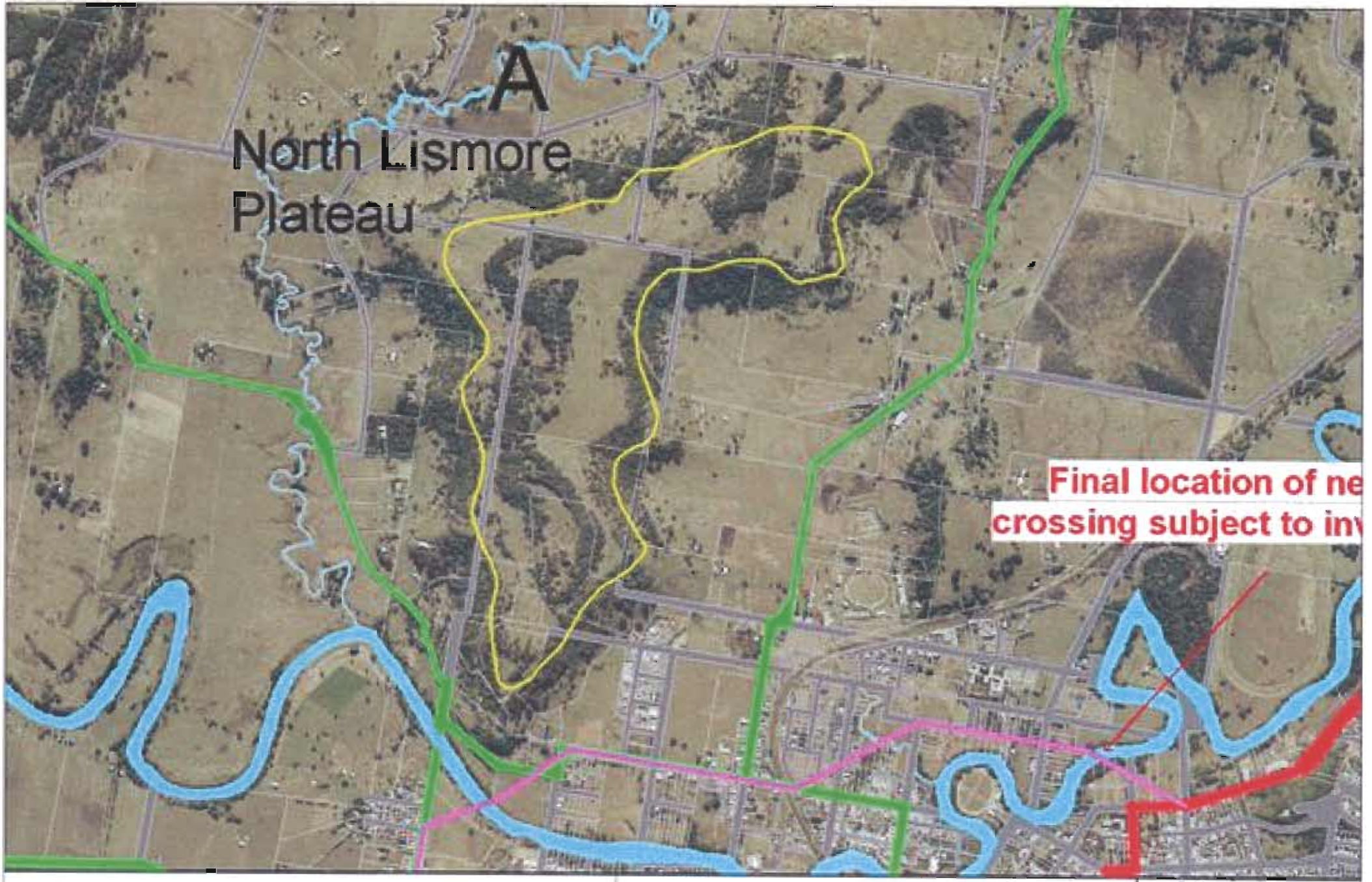
Attachment A



LISMORE CITY COUNCIL

GDA

North Lismore Plateau

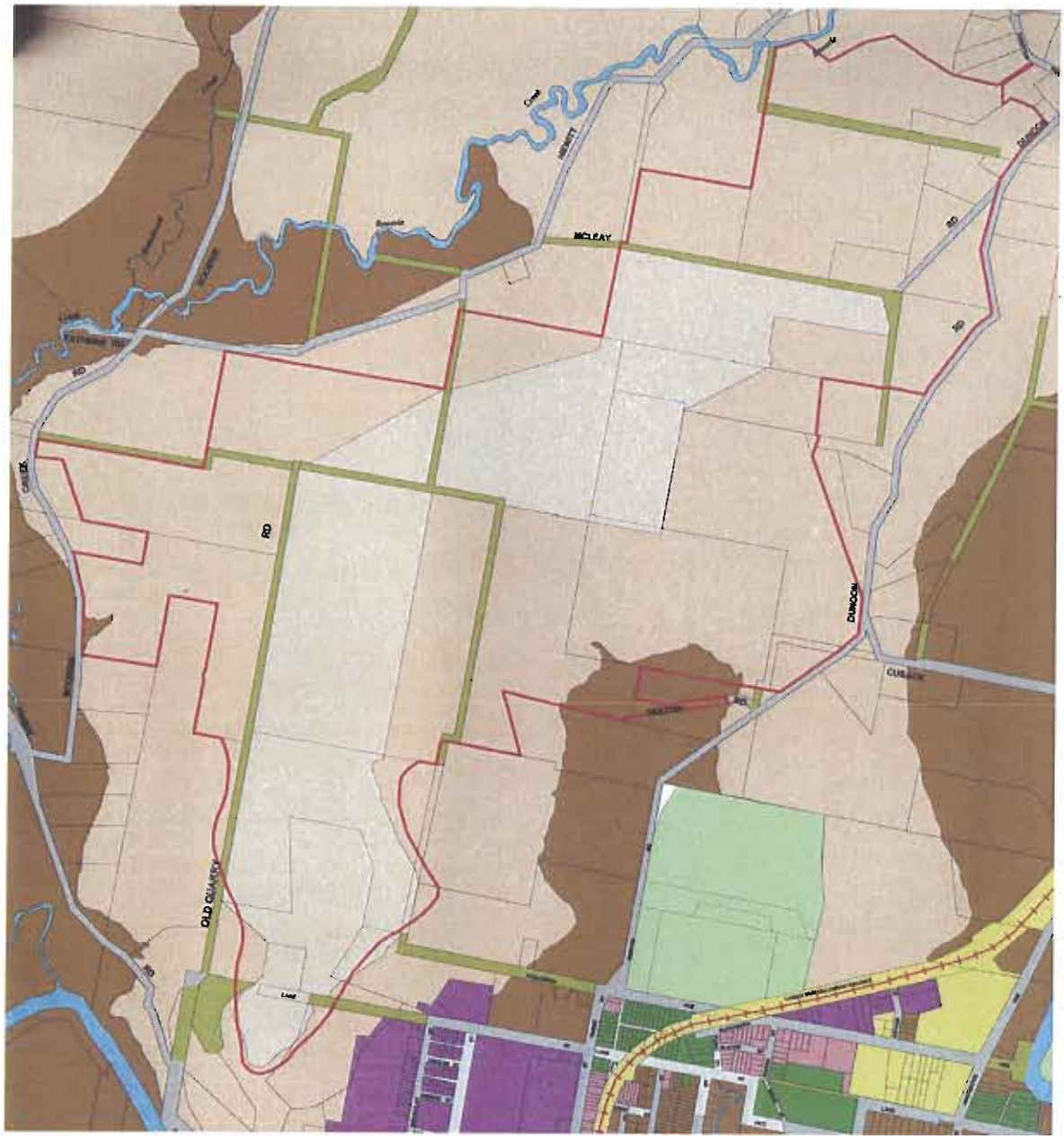
Scale
1 : 12,170

Printed
01/10/2009

NORTH

Attachment B

North Lismore Plateau Zoning – Lismore LEP 2000



1 (a) - General Rural Zone
1 (b) - Agricultural Zone
1 (c) - Rural Residential Zone
1 (d) - Investigation Zone
1 (f) -Forestry Zone
1 (r) - Riverlands Zone
2 (a) - Residential Zone
2 (f) - Residential Zone (flood liable)
2 (v) - Village Zone
3 (a) - Business Zone
3 (b) - Neighbourhood Business
3 (f) - Services Business (flood liable)
4(a) - Industrial Zone
5 - Special Uses Zone
5 Railway
5(b) - Special Uses Zone: Technology Perk
6 (a) - Recreation Zone
6 (b) - Private Recreation
7 (a) - Enviroment Protection Natural Vegetation & Wetlands Zone
7(b) - Enviroment Protection (Habitat) Zone
8 - National Parks at Nature Reserves
Main Roads
Water Catchment
Dam Inundation Area (Clause 45)
North Lismore Plateau (Updated)

N

Attachment C

North Lismore Plateau

Planning Proposal

January, 2011

Prepared by:

RPS

Suite 9, 240 Varsity Parade

Varsity Lakes, QLD 4227

T: +61 5657 5123
F: +61 5657 5130
E: William.owen@rpsgroup.com.au
W: rpsgroup.com.au

Report No: 101221
Version/Date: 31 January,2011

Prepared for:

Winten Property Group

C/o Project Plan Pty Ltd
PO Box 16
Nelson Bay NSW 2315

Contents

INTRODUCTION 4

PART 1 OBJECTIVE OR INTENDED OUTCOMES 5

PART 2 EXPLANATION OF PROVISIONS 6

PART 3 JUSTIFICATION 7

Section A - Need for the Planning Proposal 7

Section B - Relationship to Strategic Planning Framework 10

Section C - Environmental, Social and Economic Impact 13

Section D - State and Commonwealth Interests 15

PART 4 COMMUNITY CONSULTATION 16

ASSUMPTIONS 17

APPENDIX A – NORTH LISMORE IN THE LOCAL AND REGIONAL CONTEXT 18

A.1 HISTORY OF THE NORTH LISMORE PLATEAU 19

1.1 A.2 REGIONAL CONTEXT 20

A.2.1 Self Containment 22

A.3 SITE ASSESSMENT AND SUITABILITY 22

A.4 IMPLICATIONS 23

APPENDIX B – REVIEW OF PLANNING DOCUMENTS 25

B.1 INTRODUCTION 26

B.2 ENHANCING AND EMPHASISING THE FUNCTION OF LISMORE CITY 26

1.1.1 B.2.1 Far North Coast Regional Strategy 26

B.2.2 Lismore Regional City Plan 28

B.2.3 Lismore Urban Strategy 28

B.2.4 Lismore Local Environment Plan 2000 31

B.2.4.1 Draft Lismore Local Environment Plan 2010 32

B.3 RESIDENTIAL SUPPLY 33

B.3.1 Far North Coast Region Residential Submarket Analysis 33

B.3.2 PWC Supply Demand Assessment 35

B.4 NORTH LISMORE PLATEAU 37

B.4.1 DUNOON ROAD PLANNING STUDY 37

B.5 CONCLUSION 39

APPENDIX C – DETAILED DISCUSSION 41

C.1 Introduction 42

C.2 Lismore as a Major Regional Centre 42

C.3 Current Supply Limits Potential for Population Growth 43

C.4 Current and Future Demand For Residential Land 44

C.5 Location of the North Lismore Plateau 44

C.6 Traffic and River Crossing Capacity 45

C.7 Showground 46
C.8 Water Supply 46
C.9 Sewer 47
C.9 Design Workshop – Lismore City Council 48
C.10 Conclusion 49
APPENDIX D – NORTH LISMORE PLATEAU PLANNING STUDY AREA 50
D.1 Introduction 51
APPENDIX E – STATE ENVIRONMENTAL PLANNING POLICIES 53
APPENDIX F – SECTION 117 DIRECTIONS 55
APPENDIX G – TRAFFIC REPORT 58
APPENDIX H – WATER REPORT 59
APPENDIX I – SEWER REPORT 60
APPENDIX J – DRAFT STRUCTURE PLAN 61
APPENDIX K – NORTH LISMORE PLATEAU DESIGN WORKSHOP 62
K.1 Introduction 63

Introduction

This Planning Proposal has been prepared on behalf of the Winten Property Group and Riordans Consulting Surveyors in respect of various properties in North Lismore. The collective area of the holdings is referred to as the 'North Lismore Plateau' (NLP).

In December 2010 Lismore City Council, in conjunction with consultants for the Winten Property Group and Riordans Consulting Surveyors held a two day strategic design workshop aimed at preparing a draft master plan for the North Lismore Plateau development. A resolution of the workshop was to have a Planning Proposal prepared for consideration by Council. An overview of Council's design workshop is provided in Appendix K.

The Planning Proposal aims to result in a Local Environment Plan (LEP) which alters the zoning of the North Lismore Plateau site to allow for urban residential and related uses.

The Site is located within the Lismore Local Government Area.

The real property description of the North Lismore Plateau lands includes Lots 113, 213 and 35 in DP755729, Lots 1, 2 and 3 in DP772626, Lot 1 in DP 184196, Lot 2 in DP576450, Lot 2 in DP 1040479, Lot 23 in DP710682, Lot 1 in DP118555, Lot 1 in DP772627, Lot 12 in DP844585, Lot 2 in DP1044983, Lots 20 & 21in DP1148069, Lot 1 DP 176337, Lots 1 & 2 DP 596437, Lot.2 DP925006, Lot 11 DP582143, Lot 1 & 2 DP570029, Lot 3 DP623619 and Lot 3 in DP 808657. The total site area is approximately 335 Ha. The area is shown in Appendix D.

The plateau area has been identified in the New South Wales Department of Planning's Far North Coast Regional Strategy 2006-2031, and the Lismore Urban Strategy as a potential location for urban residential uses.

This planning proposal will assess the social, economic and planning arguments for urban development on the North Lismore Plateau based on current and historical data.

This planning proposal has been completed in accordance with the Department of Planning's guide to preparing planning controls. A gateway determination under Section 56 of the Environmental Planning and Assessment Act is requested.

Part 1 Objective or Intended Outcomes

The objective of this Planning Proposal is to facilitate the rezoning of lands within the North Lismore Plateau to allow for future urban residential and related uses.

Part 2 Explanation of Provisions

The Planning Proposal seeks to implement a Local Environmental Plan in the form of a Standard Instrument LEP.

Under the existing Lismore Local Environmental Plan 2000, the majority of the North Lismore Plateau is located within the 1 (d) (Investigation Zone).

The City-Wide Draft Lismore Local Environmental Plan was released in August 2010 for Public Exhibition. The public exhibition period closed on 30 August, 2010. Over 1,000 submissions were received by Council.

Following submitter the hearings, Council workshops are to be held in early 2011 to allow Council to deliberate on the issues raised by submissions. After the workshops, staff will prepare a report on the submissions; the matters raised and proposed changes to the draft LEP. This report will be considered and determined at a formal Council meeting. This is expected to occur by May 2011.

Whilst the Draft Lismore Local Environmental Plan proposes that the North Lismore Plateau comprise of a RU1(a) (Primary Production) and RU2 (Rural Landscape) zoning, it must be noted that these proposed zonings do not reflect Council's intention not to proceed with investigations for the future urban development of the site, but rather are a consequence of the lack of an 'investigation zone' category in the new LEP model provisions.

Part 3 Justification

This section answers the justification questions as outlined in the New South Wales Department of Planning's *A Guide to Preparing a Planning Proposal.*

Section A - Need for the Planning Proposal

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

The North Lismore Plateau was first officially identified as a potential location for higher order development under the **Lismore Local Environment Plan (1992)** when it was designated as a 1(d) investigation zone. The designation allowed for the site to be considered for higher order uses such as rural and urban residential development. This was followed soon after by the **Dunoon Road Planning Study (1994)**, which was undertaken on behalf the Lismore City Council to investigate the physical attributes of the NLP prior to rezoning the land. The study concluded that 'the urban residential development is the most appropriate future development of the site'.

The 2000 Lismore Local Environment Plan continued the designation of the North Lismore Plateau Study Area as a 1(d) investigation zone.

The Lismore Urban Strategy of 2003 (amended in 2005) identified the North Lismore Plateau as one of six potential locations for urban residential development over the short term, to 2011.

The New South Wales Department of Planning also acknowledged the North Lismore Plateau as having potential for urban residential development when it was identified as a Proposed Urban Release Area under the Far North Coast Regional Strategy 2006-2031.

The Dunoon Road Planning Study was prepared by Northern Rivers Engineers Planners and Scientists in 1994 for Lismore City Council. The report investigated the potential for the North Lismore Plateau to be utilised for urban residential and rural residential development and recommended urban residential development as the most appropriate use for the Study Area, with rural residential to be discounted as a viable option.

The following positive aspects for urban residential development within the Study Area are identified in the Planning Study:

- Economical and logical use of the land compared to other uses;
- Proposal would assist in maintaining the centrality of the Central Business District by encouraging development west of the city centre;
- Attractive land of high amenity with opportunities for views and creative use of bushland regeneration areas, access to breezes and good microclimate;
- Planned urban development can provide a diversity in residential product available to the Lismore market, including affordable housing;

- The development will enable a more efficient and affordable use of existing infrastructure;
- Easy accessibility to the Lismore Central Business District and existing local and regional facilities (within 3 Kms); and
- Minimal impact on agricultural land uses and other conflicting land uses.[1]

A detailed overview of the Dunoon Road Planning Study is located in Appendix B.4.

The Dunoon Road Planning Study identified the North Lismore Plateau as a viable option for large scale residential development, and the site has been historically recognised as having urban potential having been designated within the 1(d) investigation zone under the previous and current LEP. (A detailed history of the North Lismore Plateau in the planning process is located in Appendix A.)

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

It is considered that a planning proposal under the Gateway process for the preparation of a site specific Local Environmental Plan for the North Lismore Plateau as a future residential area is the best means of achieving the intended outcome. Council has already drafted and exhibited it's comprehensive LEP under the State's direction.

The Dunoon Road Planning Study, in addition to other studies (which are identified and discussed in the literary overview in Appendix B), have provided detailed investigations of the potential for residential development on the site, and it is considered that a planning proposal submitted through the gateway process will allow Lismore City Council and the New South Wales Department of Planning to advise which additional studies must be undertaken to satisfy the requirements of current legislation.

Is there a net community benefit?

The planning proposal is for the North Lismore Plateau site, which is located in North Lismore, approximately two to four kilometres north west of the Lismore City Centre. The site is currently designated as an urban investigation zone under the Lismore LEP 2000.

The identification of the North Lismore Plateau site as an urban expansion area with the intent of residential development will have a number of benefits for the wider Lismore community. These include:

- The current function of Lismore as a **Major Regional Centre** supports and requires a larger population base
- The lack of residential land **supply** in relation to the current and future **demand** for residential land will limit the potential for Lismore to accommodate higher levels of population growth
- The **location** of the North Lismore Plateau in relation to the Lismore City Centre will enhance the centrality of the Lismore City Centre and will also limit the need for additional services and facilities to be developed onsite to meet the needs of the resident population.
- An opportunity to provide a diversity of residential product not currently available within the Lismore LGA, (viz. affordable housing, a greater range of lot and housing type)
- The growth in Lismore has been dominated by development along the Lismore-Ballina corridor – the NLP will provide a geographical diversity for housing choice and a subsequent balance for the provision

[1] Dunoon Road Planning Study - Page 83

of services and infrastructure.

Lismore is designated as a Major Regional Centre under the Far North Coast Regional Strategy (FNCRS), and as such it provides a high level of social and economic infrastructure which supports the current population base. The high provision of social and economic infrastructure, with medical and educational facilities in particular, enhances the function of Lismore as a major centre of activity within the Far North Coast Region and the centre should therefore be experiencing high levels of population growth instead of the fluctuating population growth levels which it has experienced over the preceding ten years (as outlined in Appendix A). The identification of North Lismore Plateau as an urban expansion area will allow for the large scale residential development, which will have a positive impact on population growth levels over the medium term. The increase in population provided by the development of the North Lismore Plateau will provide population growth as allocated under the FNCRS, allow for a more effective utilisation of existing infrastructure provided in Lismore, and also result in a larger working population. Higher levels of population growth and an increasing population base will provide a larger and more diverse range of employment opportunities within Lismore and the local economy is required to meet the employment demands of a growing population.

Previous residential supply and demand assessments (which are detailed in Appendix B) include the Pricewaterhouse Coopers Supply and Demand Assessment, the Dunoon Road Planning Study, and MacroPlan Far North Coast Regional Residential Submarket Analysis provide a general consensus that the current supply of residential land in Lismore is not sufficient to meet current and future levels of demand. Whilst there is a high provision of residential zoned land under the Lismore Planning Scheme, the Pricewaterhouse Coopers report identifies that the majority of this land is constrained and therefore not considered developable or appropriate for development. Lismore is therefore a supply constrained market, which still has a high level of demand associated with the existing resident population. The lack of residential supply has also adversely affected residential prices with significant price increases in an area which requires lower house prices as a means of attracting residents away from the coastal areas. As a means of encouraging population growth Lismore will require a higher level of residential supply in order to accommodate future residents. The North Lismore Plateau site will provide approximately 335 Ha of land to be utilised for urban purposes.

The allocation of a residential zoning to this area will increase the supply of residential land within the Lismore area, thereby meeting current and future levels of demand. It will allow for more affordable housing options as the area is not an established and recognised residential precinct. It will also provide a mix of residential types and densities not currently available to the Lismore housing market.

From a planning perspective, the North Lismore Plateau is well located for large scale residential development as residential development on the site will not only benefit the Lismore City Centre but also provides a good location for residential uses from the purchasers' and residents' perspective. Large scale residential development, which is the intended purpose of the NLP, will enhance the centrality of the Lismore City Centre by naturally expanding the urban area of Lismore to the north. Given the proximity of the City Centre from the NLP it is not necessary for higher order retail and professional services to be located within the development, which will further emphasise the centrality and function of the Lismore City Centre. Therefore, a significant amount of population growth will occur on the NLP which will support and maximise the value of the existing centre and facilities and infrastructure rather than require additional facilities to be developed.

Appendix C provides a more detailed evaluation of the benefits of residential development at the North Lismore Plateau to the wider Lismore community.

The introduction of urban residential development in North Lismore would not have a detrimental impact on the surrounding area, existing residential areas, or on the Lismore CBD. Moreover, it is considered that the development of large scale residential uses on the North Lismore Plateau site would have a positive impact on the economic vitality of the Lismore CBD.

Section B - Relationship to Strategic Planning Framework

Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies?

The Far North Coast Regional Strategy (FNCRS) 2006-2031 was prepared by the New South Wales Department of Planning and pertains to the LGAs of Ballina, Byron, Kyogle, Lismore, Richmond Valley and Tweed. Key plans and components of the FNCRS include:

- A projected population growth of 60,400 people (26%) between 2006 and 2031.
- Plans for 51,000 new homes to be built by 2031 to accommodate population growth projections.
- Allocation of 35% of future housing to the regional centres of Tweed, Lismore and Ballina
- Encourage growth of non coastal centres.

Lismore is identified as a Major Regional Centre under the FNCRS. The FNCRS states that "Lismore will continue as a regional hub for creative industry and cultural activities, education, health, employment and retail[2]." Tweed is identified as the only other Major Regional Centre and Ballina is identified as a Developing Major Regional Centre. The FNCRS allocates 8,000 dwellings in Lismore between 2006 and 2031, which equates to 363 additional dwellings per year. Based on regional population growth projections of 60,400 people and a dwellings target of 51,000, there is a planned rate of provision of 1.1 people per dwelling. Therefore, the provision of 8,000 additional dwellings within Lismore will accommodate population growth of approximately 9,500 people.

A primary aim of the FNCRS is to limit further development of coastal centres and encourage development within the non-coastal centre so as to "protect fragile and vulnerable areas and ecosystems... [T]his policy will [also] help sustain and invigorate non coastal centres."[3] The strategy ensures that there is sufficient land available within the non-coastal areas of the Far North Coast, which is appropriately located to accommodate the projected housing employment needs of the Region's future population.

The FNCRS identifies Proposed Urban Release Areas throughout the region which are appropriate for urban residential development. The Proposed Urban Release Area located north of Lismore is in line with the Study Area identified in the Dunoon Road Planning Study of 1994 and covers a significant proportion of the North Lismore Plateau boundary currently proposed for residential development.

It is considered that the planning proposal is consistent with the aims of the Far North Coast Regional Strategy. With a total area of approximately 335 Ha it is considered that the North Lismore Plateau would

[2] FNCRS - Page 13.
[3] FNCRS page 28

have the capacity to provide between 1,200 and 1,500 residential dwellings, which equates to a significant proportion of the dwellings required within Lismore under the FNCRS. The planning proposal is also consistent with the primary aim of encouraging residential development away from the coastal areas and enhancing the function of Lismore as a Major Regional Centre.

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

The Planning Proposal is consistent with Lismore Regional City Plan 2005 and objectives of the Lismore Urban Strategy.

Lismore Regional City Plan 2005

The Lismore Regional City Plan 2005 was prepared by the Lismore City Council and provides an overview of short, medium and long term priorities for further developing Lismore as a Regional Centre. The Regional City Plan outlines land which can be development to meet future demand for residential, commercial, industrial and recreational uses.

The Lismore Regional City Plan provides a range of development opportunities and steps which should be undertaken to enhance the regional role and function of Lismore City, by increasing the ability of the City to meet demand for residential, commercial, industrial and recreation uses within Lismore City. The City Plan further emphasises the ability of the North Lismore Plateau to accommodate a significant residential population of approximately 2,500 people.

The planning proposal is consistent with the aims and objectives of the Lismore Regional City Plan 2005 as the plan identifies the potential for the North Lismore Plateau site to be utilised for residential purposes. The plan also, however, identifies a list of actions and studies to be undertaken, which will be required following the preliminary approval of the planning proposal under the gateway process.

A detailed overview of the Lismore Regional City Plan 2005 is located in Appendix B.2.

Lismore Urban Strategy

The principle objective of the Lismore Urban Strategy 2005 (LUS) is to "reinforce Lismore's regional role and status by facilitating the City's growth through the identification of appropriate areas for new residential, commercial and industrial development... [The] strategy seeks to ensure that there is sufficient land identified for residential development in Lismore to satisfy current and future needs."[4]

The LUS identifies three key capability and suitability criteria required for land to be identified for potential future residential uses:

- Land must be physically unconstrained
- Land must exhibit attributes that will make it desirable to homebuilders in the current marketplace, and
- Land must be capable of being developed and serviced in a cost effective manner.

[4] LUS 2003 (amended 2005) - Executive Summary.

The LUS identifies six areas for potential future residential uses:

- North Lismore Plateau
- Trinity Drive
- Pineapple Road
- Tucki Creek
- Invercauld Drive
- Monaltrie

The LUS contains the following comments and statements regarding the North Lismore Plateau:

- "Reasonably level and enjoys high quality views and aspect"[5]
- "Although servicing and access costs are likely to be high, this would be offset to some extent by the high lot yield that would be achievable for the entire plateau areas and the fact that blocks should attract premium prices given the characteristics of the site."[6]
- "In some respects the area has advantages over Trinity Drive in that it is closer to the CBD and the attributes of the site would lend itself to innovative subdivision practice that could potentially provide an environment of high quality and amenity for future residents"[7] (800+ lots).
- "The level of existing noise form the Speedway operations was excessive at all locations under consideration for future residential development in the area."[8]

It is considered that this planning proposal is consistent with the objectives of the LUS and that the North Lismore Plateau is a viable residential development site. The Dunoon Road Planning Study (as outlined in Appendix B.4) identifies the potential constraints associated with residential development on the site. These constraints have, however, been mitigated or will be addressed in further detailed reports. Mitigated constraints associated with the site include the following:

The quarry bordering the Dunoon Road Study Area to the south is no longer licensed to operate, and has not been operating for a number of years. Council passed a resolution in 1998 to remediate the quarry, however, the remediation work has yet to be undertaken.

The costs of providing all necessary infrastructure to service a large scale residential community on the North Lismore Plateau site have been recently analysed by independent consultants and found to be within economic viability limitations

The constraints relating to noise, flooding, and traffic have been investigated in previous studies, as identified and discussed within this report. Critical aspects have been further examined and dealt with at Council's design workshop where agreement was reached that the constraints could be satisfactorily addressed with further analysis and design following the initial gateway determination.

[5] LUS Planning Assessment - Page 19
[6] LUS Planning Assessment - Page 19
[7] LUS Planning Assessment - Page 19
[8] LUS Planning Assessment - Page 20

Is the planning proposal consistent with applicable state environmental planning policies?

The planning proposal is consistent with applicable State Environmental Planning Policies (refer to Appendix E).

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

The planning proposal is consistent with Ministerial Directions under Section 117 of the Environmental Planning and Assessment Act (refer to Appendix F).

Planning Direction 5.3 relates to farmland of state and regional significance on the NSW Far North Coast. The direction specifies that 'a planning proposal must not:

(a) rezone land identified as "State Significant Farmland" for urban or rural residential purposes.

(b) rezone land identified as "Regionally Significant Farmland" for urban or rural residential purposes.

(c) rezone land identified as "significant non-contiguous farmland" for urban or rural residential Purposes

The Direction provides that a planning proposal may be inconsistent with the terms of this direction only if council can satisfy the Director-General of the Department of Planning or (an officer of the Department nominated by the Director-General) that the planning proposal is consistent with:

(a) the Far North Coast Regional Strategy, and

(b) Section 4 of the report titled Northern Rivers Farmland Protection Project – Final Recommendations, February 2005, held by the Department of Planning.

Sections of the study area are mapped as regionally significant farmland. As the plateau area is identified for future urban development under the Far North Coast Regional Strategy the proposal to rezone regionally significant farmland is consistent with the Direction. As identified above the planned rezoning is consistent with all relevant objectives and provisions of the Far North Coasty Regional Strategy including projected population growth predictions, servicing and sustainability criteria.

Section C - Environmental, Social and Economic Impact

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

The Dunoon Road Planning Study 1994 comprised a concise assessment of vegetation and habitat within the North Lismore Study Area undertaken by James Warren, Biological and Environmental Consultant. The assessment found that the following species were considered as possible occurrences on or near the site or to have some reliance on habitats contained within the study area:

- Planigale maculate (Common Planigale)
- Pteropus alecto (Black Flying Fox)
- Miniopteris spp. (Little Bent-Wing Bay)
- Nytciceius rueppellii (Greater Broad-Nosed Bat)
- Nyctophilus bifax (Northern Long-Eared Bat)

- Chalinolobus nigrogriseus (Hoary Bat)

Overall, the assessment found that residential development on the North Lismore Plateau, as proposed in 1994, would have no significant impact on flora and fauna in terms of Section 5A of the Environmental Planning and Assessment Act, 1979. Development of the site would have to, however, take into consideration vegetation communities identified by James Warren as being of medium value.

However, the significance of habitat and species within a proposed development area need to assessed in accordance with Section 5A of the Environmental Planning and Assessment Act. Therefore an assessment of any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of large scale residential development on the North Lismore Plateau will need to be re-assessed in line with current requirements. Further investigation of environmental impacts of the planning proposal will be undertaken following the initial determination within the gateway process. This will include investigation of vegetation, habitat, bushfire and landslip.

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

It is considered unlikely that the planning proposal would have any other environmental effects. Any additional environmental effects resulting from the planning proposal as identified by the Department of Planning through the gateway process will be investigated in further detailed reports to follow.

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

The intended development of an urban residential community on the North Lismore Plateau is anticipated to have a positive effect on the local community and economy.

The planning proposal estimates that between 1200 and 1500 residential dwellings will be located on the North Lismore Plateau site, which will generate significant short term employment over the construction phase of the development. It is generally accepted that for every $1million in construction expenditure, twenty seven jobs are created throughout the broader economy.

The community development on the site will also generate a significant resident population which will enhance the current role and function of the Lismore CBD.

The Dunoon Road Planning Study identifies that the Study Area has no Aboriginal heritage issues, however the dry stone wall located to the northwest of the Study Area does have some significant heritage value and Pioneer Memorial Park should also be considered for heritage value, pending increased visitation to the area. The location of these heritage sites in relation to the current boundaries of the North Lismore Plateau Site need to be assessed in additional technical studies that will be undertaken following the initial gateway determination.

Section D - State and Commonwealth Interests

Is there adequate public infrastructure for the planning proposal?

In terms of utility service infrastructure there will be a need to extend and upgrade existing facilities to provide adequate services to the proposed development.

Based on analysis conducted to date, the costs of providing all necessary infrastructure to service a residential community on the site have been recently analysed by independent consultants and found to be within economic viability limitations.

Further consultation with public authorities responsible for the provision of public infrastructure to the North Lismore Plateau site is required, and the relevant public authorities to be consulted will be identified in the initial gateway determination.

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

The gateway determination provides a means whereby proposals such as the North Lismore Plateau can be assessed in terms of their objectives and justification, to ascertain proposal viability at an early stage.

The studies and investigations already completed for this site have included communications with relevant authorities and their views and requirements have been noted in the various reports. In particular, initial meetings with the Regional Office of the Department of Planning have indicated in principle support for the North Lismore Plateau proposal.

In reviewing the Planning Proposal the Minister for Planning will determine any further input that may be required from other Statutory Authorities.

Part 4 Community Consultation

It is considered that community consultation for the planning proposal should comprise an exhibition period of 28 days. Community consultation will be commenced by giving notice of the public exhibition of the planning proposal:

- in a newspaper that circulates in the area affected by the planning proposal;
- on the web-site of the Lismore City Council and the Department of Planning; and
- in writing to adjoining landowners

The written notice will:

- Give a brief description of the objectives or intended outcomes of the planning proposal;
- Indicate the land affected by the planning proposal;
- State where and when the planning proposal can be inspected;
- Give the name and address of the RPA for the receipt of submissions; and
- Indicate the closing date for submissions.

During the exhibition period, the following material must be made available for inspection:

- The planning proposal, in the form approved for community consultation by the Director General of Planning;
- The gateway determination; and
- Any studies relied upon by the planning proposal.

The initial gateway determination will confirm the public consultation that must be undertaken in relation to the planning proposal. If the gateway determination specifies different consultation requirement this part of the proposal will be revised to reflect the terms of the gateway determination.

Assumptions

This report has been prepared on the instructions of the stated parties and is intended to address the issues as defined in the methodology. The data, analysis and findings contained in this report are, therefore, not appropriate for use in any other circumstance. The report contains a series of projections and forecasts, which have been prepared on the basis of the best available information. Due to the dynamic nature of many of these issues and the number of variables involved, RPS can give no guarantee that these projections and forecasts will be realised.

Documents issued electronically are susceptible to being altered. Therefore, only versions held and issued by RPS can be used as an acceptable reference or source of information.

Appendix A – North Lismore in the Local and Regional Context

A.1 HISTORY OF THE NORTH LISMORE PLATEAU

The North Lismore Plateau (NLP) is located in North Lismore approximately four kilometres out of the Lismore City Centre. The area has been considered for urban development for almost 20 years due to its physical characteristics, scale and proximity to the Lismore City Centre. Planning documents (which are overviewed in Section 2) have identified the area as suitable for potential urban development since 1992. Proposals for residential land use were prepared as early as 1982, pre-empting the future rezoning of the site.

The North Lismore Plateau was first officially identified as a potential location for higher order development under the Lismore Local Environment Plan (1992) when it was designated as a 1(d) investigation zone. The designation allowed for the site to be considered for higher order uses such as rural and urban residential development. This was followed soon after by the Dunoon Road Planning Study (1994), which was undertaken by the Lismore City Council to investigate the physical attributes of the NLP prior to rezoning the land. The study concluded that ' urban residential development is the most appropriate future development of the site'.

Following the recommendation for the NLP to be utilised for urban residential development in the 1994 Planning Study, no further initiatives were undertaken by the Lismore City Council to ensure the development of the site. The 2000 Lismore Local Environment Plan continued the designation of the North Lismore Plateau Study Area as a 1(d) investigation zone. The Lismore Urban Strategy of 2003 (amended in 2005) identified the North Lismore Plateau as one of six potential locations for urban residential development over the short term, to 2011. Whilst the NLP was acknowledged as a potential location for urban residential development, it was not allocated as one of the development sites to receive a residential zoning to allow for development over the short term. The New South Wales Department of Planning also acknowledged the North Lismore Plateau - identifying it as a Proposed Urban Release Area under the Far North Coast Regional Strategy 2006-2031.

The City-Wide Draft Lismore Local Environmental Plan was released in August 2010 for Public Exhibition. The public exhibition period closed on 30 August, 2010. Over 1,000 submissions were received by Council.

Following submitter the hearings, Council workshops are to be held in early 2011 to allow Council to deliberate on the issues raised by submissions. After the workshops, staff will prepare a report on the submissions; the matters raised and proposed changes to the draft LEP. This report will be considered and determined at a formal Council meeting. This is expected to occur by May 2011.

Whilst the Draft Lismore Local Environmental Plan proposes that the North Lismore Plateau comprise of a RU1(a) (Primary Production) and RU2 (Rural Landscape) zoning, it must be noted that these proposed zonings do not reflect Council's intention not to proceed with investigations for the future urban development of the site, but rather are a consequence of the lack of an 'investigation zone' category in the new LEP model provisions.

Due to the complexities and size of the North Lismore Plateau proposal, Council has taken the initiative to consider this proposal as a site specific LEP under the gateway process. Council's design workshop in December 2010 was the first step in that process.

1.1 A.2 REGIONAL CONTEXT

The Lismore Local Government Area (LGA) is located within the Far North Coast region of New South Wales, and is governed by the Lismore City Council. The Lismore City Centre is located approximately 32 kilometres west of Ballina and 45 km southwest of Byron Bay. The Bruxner Highway, an east-west link from the Northern Rivers to Tenterfield, runs through the city centre and connects the city to Ballina in the east and to Casino in the west.

The Far North Coast of NSW comprises the LGAs of Ballina, Byron, Kyogle, Lismore, Richmond Valley and Tweed. As highlighted in Section B.1, Lismore is identified by the NSW Department of Planning as a Major Regional Centre within the Far North Coast region due to the high provision of employment opportunities, and social and economic infrastructure within the City.

Tweed is also identified as a Major Regional Centre and Ballina is identified as a Developing Major Regional Centre. Table A.1 provides an overview of the population numbers for the Lismore LGA from 1996 to 2006 in comparison to Ballina and Tweed.

Table A.1
Population Growth 1996 to 2006

	1996	2001	2006	1996-2006 Growth #	%	Annual Growth
Lismore	42,537	41,031	42,210	-327	-0.8%	-0.1%
Ballina	33,887	36,134	38,461	4,574	13%	1%
Tweed	63,607	70,905	79,319	15,712	25%	2%
Total	140,031	148,070	159,990	19,959	14%	1%

Source: ABS Census, RPS

As illustrated in Table A,1, the population of Lismore has decreased by a total of -0.8% between 1996 and 2006, with an annual population decrease of approximately -0.1%. Between 2001 and 2006, however, there was an increase in population following a decrease of 1,506 people in the five years to 2001 (population growth of -4%). The population growth characteristics of Lismore over the ten year period remained somewhat stable considering the increase from 2001 to 2006 regained a majority of the population which was lost over the preceding five years. This is in comparison to significantly higher levels of growth which occurred in Ballina (1% per annum) and Tweed (2% per annum) over the same period.

Table A.2 below provides an overview of the industry of employment characteristics of the Lismore, Ballina and Tweed resident population from the 1996 to 2006 censuses.

Table A.2
Industry of Employment Data by Resident Population

	Lismore				Ballina				Tweed			
	1996	2001	2006	96-06	1996	2001	2006	96-06	1996	2001	2006	96-06
Agriculture, forestry & fishing	1,292	1,178	1,110	-14%	1,018	983	847	-17%	1,427	1,271	939	-34%
Mining	25	12	32	28%	46	23	34	-26%	55	55	90	64%
Manufacturing	1,389	1,274	1,302	-6%	980	1,044	1,023	4%	1,533	1,751	1,981	29%
Electricity, gas, water & waste services	142	111	140	-1%	77	90	120	56%	164	185	234	43%
Construction	950	858	1,134	19%	982	989	1,478	51%	1,825	2,152	3,566	95%
Wholesale trade	690	667	606	-12%	483	542	560	16%	791	850	831	5%
Retail trade	2,026	2,155	2,682	32%	1,683	1,892	2,312	37%	2,575	3,306	4,141	61%
Accommodation & food services	1,114	1,078	1,206	8%	1,036	1,197	1,355	31%	2,336	2,555	2,967	27%
Transport, postal & warehousing	500	491	580	16%	353	443	451	28%	881	979	1,178	34%
Information media & telecommunications	500	393	388	-22%	367	237	231	-37%	328	303	344	5%
Financial & insurance services	429	355	411	-4%	338	344	398	18%	475	450	534	12%
Rental, hiring & real estate services	209	216	251	20%	263	293	325	24%	509	577	687	35%
Professional, scientific & technical services	548	659	753	37%	433	642	805	86%	764	884	1,177	54%
Administrative & support services	440	447	412	-6%	332	415	428	29%	593	784	920	55%
Public administration & safety	646	663	857	33%	433	653	894	106%	901	1,151	1,572	74%
Education & training	1,664	1,724	1,888	13%	1,146	1,419	1,641	43%	1,437	1,678	2,096	46%
Health care & social assistance	2,305	2,282	2,753	19%	1,423	1,636	2,168	52%	2,080	2,620	3,611	74%
Arts & recreation services	125	165	192	54%	139	161	228	64%	314	403	499	59%
Other services	873	717	791	-9%	558	580	578	4%	912	931	1,110	22%
Inadequately described/Not stated	433	305	349	-19%	365	293	342	-6%	679	613	783	15%
Total	**16,300**	**15,750**	**17,837**	**9%**	**12,455**	**13,876**	**16,218**	**30%**	**20,579**	**23,498**	**29,260**	**42%**

Source: ABS Census, RPS

Despite population fluctuations between 1996 and 2006, there has been a 9% increase in the number of Lismore residents who are working. There have been, however, some decreases in the level of employment within some industries, with Information, medical and telecommunications (-22%), agriculture, forestry and fishing (-14%), and wholesale trade (-12%) in particular. In comparison to Lismore, Ballina and Tweed experienced significantly higher increases in employment levels, with minimal decreases in employment per industry. Within Tweed LGA the only decrease in employment numbers occurred within in the agriculture, forestry and fishing industry.

Population increases in Ballina and Tweed generated a significant increase in the level of employment within population serving industries and industries directly impacted by population growth.

- Population growth levels required additional construction of residential dwellings and infrastructure and therefore construction employment increased 51% in Ballina and 95% in Tweed.
- Public administration and safety industry employment levels increased 106% in Ballina and 74% within Tweed.
- Health care and social assistance employment increases 52% in Ballina and 74% in Tweed.
- Employment levels within the Art and recreation services industry increased 64% and 59% within Tweed

The most significant increase in employment levels for Lismore occurred within the arts and recreation services (54%), professional, scientific and technical services (37%), public administration and safety (33%), and retail trade industries. Growth within these industries would mainly be offset by decreases in employment levels of other industries, but also indicate that the Lismore economy was shifting toward providing a greater provision of public administration and recreational services to the existing population.

A.2.1 Self Containment

The RPS definition of employment self containment is as follows:

Employment self containment refers to the measure of the number of jobs demanded by residents within a defined community divided by the numbers of those same residents who are employed within the same defined community.

For example, a suburb may have a total resident population of 20,000 people. If 6,800 people are employed by businesses that are located within the same suburb then the employment self containment for that suburb will be 68% (6,800 jobs ÷ 10,000 total jobs demand = 68%). The remaining 3,200 jobs (or 32% of total jobs demand) will be accommodated in employment precincts located outside of the defined suburb.

Of the 17,800 Lismore residents that were employed approximately 13,330 were also employed with the LGA. Therefore the Lismore LGA, comprised of Lismore City - Part A Statistical Local Area (SLA) and Lismore City - Part B SLA, had an employment self containment rate of 75%. This rate of employment self containment is considered to be quite high and is reflective of a regional economy. A regional based community that is not located near a significant economic and employment centre such as a Capital City is likely to gain much less in terms of economic benefits or value from outside areas. Therefore a regional based community is expected to have a much higher level of economic sustainability for it to be considered reasonable.

The 2006 ABS Journey to Work data also shows that there were approximately 18,900 people employed within Lismore, of which 5,555 employees live outside of the LGA. Residents of other areas therefore account for 29% of the Lismore LGA working population. There is a significant level of employment inflow occurring from Ballina, which accounts for approximately 14% of total employee numbers with Lismore.

A.3 SITE ASSESSMENT AND SUITABILITY

The site is located off Dunoon Road in North Lismore and is located approximately 4 kilometres north of the Lismore City Centre, with access provided to the site by Dunoon Road via Woodlark Street crossing over the Wilson River.

The site is generally bounded by Dunoon Road to the east, Hewitt Road and the rural residential precinct of Tullera to the North, and Booerie Creek Road to the west. The real property descriptions of the North Lismore Plateau in its current form include Lots 113, 213 and 35 in DP755729, Lots 1, 2 and 3 in DP772626, Lot 1 in DP 184196, Lot 2 in DP576450, Lot 2 in DP 1040479, Lot 23 in DP710682, Lot 1 in DP118555, Lot 1 in DP772627, Lot 12 in DP844585, Lot 2 in DP1044983, Lots 20 & 21 in DP1148069, Lot 1 DP 176337, Lots 1 & 2 DP 596437, Lot 2 DP925006, Lot 11 DP582143, Lot 1 & 2 DP570029, Lot 3 DP623619 and Lot 3 in DP 808657. The total site area is approximately 335 Ha.

North Lismore can be characterised as a rural residential area. The current provision of community infrastructure within North Lismore is limited to the Richmond River High School (Lake Street), the Italo-Australian Club (Crane Street), Lismore Showground and Speedway (located along Dunoon Road on the opposite side of the road to the southeast of the NLP), and the Lismore Racecourse (Woodlawn Road). Low impact industrial uses are also located within North Lismore along and surrounding Terania Street.

Approximately 8 Ha of land has recently been rezoned for light industrial use immediately south of the saleyards fronting Lake Street. Development has yet to commence on this site.

The Lismore City Centre serves the retail, commercial, and administrative needs of the surrounding Lismore LGA. The majority of residential development within Lismore City is located in close proximity to the city centre and generally extends eastwards towards Goonellabah along Ballina Road and Bruxner Highway. The proposed development at the North Lismore Plateau would expand medium density residential uses further north than currently exists, but would enhance the centrality of the Lismore City Centre. The direct travelling time between the NLP and the Lismore City Centre is approximately seven to eight minutes, compared to a direct journey of approximately fifteen to twenty minutes from the eastern and southern ends of Goonellabah.

Significant population serving infrastructure within Lismore includes the tertiary education facilities, hospitals, airport, and retail centres. Table A.3 provides an overview of significant infrastructure within Lismore and their location in relation to the North Lismore Plateau.

Table A.3

Infrastructure in Relation to NLP

Use	Location	Distance	Time of Travel
Base Hospital	60 Uralba St, Lismore	5 km	10 minutes
St Vincent's Hospital	20 Daley Street, Lismore	6 km	12 minutes
Southern Cross University	Military Road, East Lismore	7.5 km	17 minutes
TAFE – North Coast Institute	Conway Street	4 km	8 minutes
Lismore Airport	Airport Drive, South Lismore	6 km	11 minutes
Lismore Square	MacKenzie Street, Lismore	4.5 km	9 minutes
City Centre/Main Street	Molesworth Street	4 km	7 minutes

As identified in Table A.3, the NLP is located in close proximity to major education, medical and retail infrastructure within Lismore.

A.4 IMPLICATIONS

Lismore, as of 2006, had the second largest population base within the Far North Coast region illustrating the city's role as a major regional centre. Lismore City provides a diverse range of employment opportunities and the city is heavily supported by the provision of medical and tertiary education facilities which are not currently available elsewhere in the region. Due to this current role within the region, it is considered that the Lismore population should not be decreasing. The economy and infrastructure provision should be encouraging an increase in the population base away from the coastal areas which are experiencing significant increase in population growth, therefore also increasing residential prices due to demand increases.

The current boundary of the NLP will provide approximately 335 Ha of land for residential, commercial/retail and open space uses. Previous proposals and recommendations for urban residential development at North Lismore Plateau have suggested that the site could accommodate over 1,000 dwellings. This would generate a significant onsite resident population which would require the provision of some services on site, particularly convenience retail needs. Such large scale development would provide a catalyst for increased development north and north-west of the Lismore City Centre as this population base would generate

demand for a significant increase in community facilities. Master planning of the NLP development would be required also taking into account required upgrades to existing infrastructure.

Development of this scale would become a significant economic force within Lismore, generating an increase in full time and part time employment associated with the construction of residential dwellings and infrastructure development, and an increase in business opportunities and investment potential within Lismore. In addition, the residential component would comprise the majority of the development therefore resulting in a large resident population, which would positively impact current and future population figures for the Lismore LGA.

The North Lismore Plateau is located less than ten minutes from the Lismore City Centre and the majority of higher order community facilities. The NLP is located to the north of the City Centre in an area of Lismore which has experienced minimal development to date. Mixed use development on the site would emphasise the centrality and function of the Lismore City Centre as a major regional centre within the Far North Coast region.

Appendix B – Review of Planning Documents

B.1 INTRODUCTION

This section provides an overview of relevant planning documents, such as the Far North Coast Regional Strategy, Lismore Urban Strategy, Lismore Local Environment Plan, Lismore Regional City Plan, Dunoon Road Planning Study, and North Lismore Water Servicing Strategy. Residential market assessments to be overviewed include the Far North Coast Regional Residential Submarket Analysis and the Supply and Demand Assessment for Urban Residential Development in the Lismore Local Government Area. This section also outlines which planning documents should be re-evaluated when assessing the approval of re-zoning the North Lismore Plateau for urban residential purposes.

The planning documents have been arranged based on their intent and content into three categories. These are:

- Documents which emphasise the function of Lismore
- Documents which assess the current supply and demand for residential land
- Documents which focus on the North Lismore Plateau and its capacity to meet residential demand within Lismore and the region.

B.2 ENHANCING AND EMPHASISING THE FUNCTION OF LISMORE CITY

1.1.1 B.2.1 Far North Coast Regional Strategy

The Far North Coast Regional Strategy (FNCRS) 2006-2031 was prepared by the New South Wales Department of Planning and pertains to the LGAs of Ballina, Byron, Kyogle, Lismore, Richmond Valley and Tweed. The strategy outlines the projected level of population growth anticipated in the region, and therefore the number of dwellings and employment opportunities which will be required to support such levels of population growth within the separate LGAs and within the region as a whole.

Key plans and components of the FNCRS include:

- A projected population growth of 26% between 2006 and 2031, with an additional 60,400 people expected to be living in the Region by 2031.
- Plans for 51,000 new homes to be built by 2031 to accommodate population growth projections.
- Allocation of 35% of future housing to the regional centres of Tweed, Lismore and Ballina
- Encourage growth of non coastal centres.

Lismore is identified as a Major Regional Centre under the FNCRS. The FNCRS states that "the majority of the growth will occur in and around Lismore. Lismore will continue as a regional hub for creative industry and cultural activities, education, health, employment and retail ." Tweed is identified as the only other Major Regional Centre and Ballina is identified as a Developing Major Regional Centre.

As stated above, the FNCRS plans for 60,400 additional people within the Far North Coast Region by 2031, which will require an additional 51,000 dwellings over the same period. Table 2.1 outlines dwelling targets within the separate LGAs from 2006 to 2031.

Table B.1
Far North Coast Regional Strategy Dwelling Targets

	Existing Dwellings (2006)	Additional New Dwellings to 2031
Ballina	16,720	8,400
Byron	13,090	2,600
Kyogle	4,110	3,000
Lismore	17,640	8,000
Richmond Val	8,710	9,900
Tweed	34,650	19,100
Total	94,920	51,000

Source: Far North Coast Regional Strategy

As outlined in Table B.1, the FNCRS plans for an additional 8,000 dwellings within the Lismore LGA between 2006 and 2031, which equates to 363 additional dwellings per year. Based on regional population growth assumptions (60,400) and dwellings target (51,000), there is a planned rate of provision of 1.1 people per dwelling. Therefore, the provision of 8,000 additional dwellings within Lismore will accommodate population growth of approximately 9,500 people. FNCRS states that there will be a decrease in household size across the region predominantly caused by an aging population and therefore there will be a higher proportion of one and two bedrooms across the Far North Coast. Based on the level of population growth anticipated across the region the FNCRS also states that approximately 32,500 new jobs will also be required, with approximately 23,500 of which will be service and construction related.

A primary aim of the FNCRS is to limit further development of coastal centres and encourage development within the non-coastal centre so as to "protect fragile and vulnerable areas and ecosystems... [T]his policy will [also] help sustain and invigorate non coastal centres." The strategy ensures that there is sufficient land available within the non-coastal areas of the Far North Coast, which is appropriately located to accommodate the projected housing employment needs of the Region's future population.

The FNCRS identifies Proposed Urban Release Areas throughout the region which are considered appropriate for urban residential development. The Proposed Urban Release Area located north of Lismore is in line with the Study Area identified in the Dunoon Road Planning Study of 1994 and covers a significant proportion of the North Lismore Plateau, which is currently being proposed for residential development.

Implications

The Far North Coast Regional Strategy outlines that an additional 8,000 new dwellings will be required within the Lismore LGA to meet demand generated by population growth. Based on FNCRS population projections for the region and dwelling targets it is assumed that there will be 9,500 additional people within Lismore by 2031, which equates to 430 additional people and 363 additional dwellings per year for the next 22 years.

The FNCRS also identifies the North Lismore Plateau as a Proposed Urban Release Area illustrating the State Government's previous acknowledgement of the site for consideration for residential development. The NLP covers an area of over 130 Ha and therefore has the capacity to support a significant residential population on the site. The NLP site is the largest Proposed Urban Release Area identified in the FNCRS.

The FNCRS is a three year old document which will be updated for 2011. The document allocates a high level of population growth to occur with Lismore (with 8,000 additional new dwellings required) but this allocation would have taken into consideration population decreases from 1996 to 2001.

B.2.2 Lismore Regional City Plan

The Lismore Regional City Plan 2005 was prepared by the Lismore City Council and provides a list of short, medium and long term priorities for further developing Lismore as a Regional Centre. The Regional City Plan outlines land which can be development to meet future demand for residential, commercial, industrial and recreational uses.

The Lismore Regional City Plan addresses the characteristics and required 'actions' for Lismore within six separate areas: CBD, North Lismore, South Lismore, Northern Ridges, East Lismore, and East Goonellabah.

North Lismore is identified as an area that currently comprises a mix of residential, commercial and industrial uses, with the potential of accommodating significant urban residential development in the future. Potential for the North Lismore Plateau to house 2,500 population brings about the need to provide a wide range of services and facilities, which the Regional City Plan states would be required within the NLP. Such a population, as highlighted, would also require a significant upgrade of the existing road network and the incorporation of open space and recreational space into any future development.

The Lismore Regional City Plan provides the following Actions for future development of North Lismore:

- Investigate route options for another crossing of the Wilsons River north of the CBD
- Investigate options for transport connections between North and South Lismore
- Pursue acquisitions of land for open space purposes in North Lismore
- Expand the existing business zone in North Lismore and permit retail development
- Future development on the North Lismore plateau to be designed in accordance with a village concept

Implications

The Lismore Regional City Plan provides a range of development opportunities and steps which should be undertaken to enhance the regional role and function of Lismore. The plan aims to increase the ability of the City to meet demand for residential, commercial, industrial and recreation uses. The Plan further emphasises the ability of the North Lismore Plateau to accommodate a significant residential population, and also outlines the infrastructure upgrades which would be required to accommodate such a high level of population growth within a relatively sparsely populated suburb.

The Lismore Regional City Plan is still considered to be an appropriate and relevant planning document as little has changed with regards to the function of Lismore within the regional context since the document was released in 2005.. Should significant development be planned in Lismore, the Regional City Plan should be reviewed and amended as required to ensure that the needs of the community are being considered and accommodated.

B.2.3 Lismore Urban Strategy

As stated in the Lismore Urban Strategy (LUS), the planning document's primary aim is to "reinforce Lismore's regional role and status by facilitating the City's growth through the identification of appropriate

areas for new residential, commercial and industrial development... [The] strategy seeks to ensure that there is sufficient land identified for residential development in Lismore to satisfy current and future needs."

The LUS identifies three key capability and suitability criteria required for land to be identified for potential future residential uses:

- Land must be physically unconstrained
- Land must exhibit attributes that will make it desirable to homebuilders in the current marketplace, and
- Land must be capable of being developed and serviced in a cost effective manner.

The Lismore Urban Strategy outlines population projections for the Lismore LGA to 2011. These population projections are outlined in Table B.2.

Table B.2
LUS Population Projections to 2011

	Projected Population	New Residents	Projected Urban population	New Urban Residents
2001	43,384	NA	31,478	NA
2002	43,727	340	31,754	276
2003	44,064	340	32,030	276
2004	44,404	340	32,306	276
2005	44,744	340	32,582	276
2006	45,084	340	32,858	276
2007	45,444	360	33,154	296
2008	45,804	360	33,450	296
2009	46,164	360	33,746	296
2010	46,524	360	34,042	296
2011	46,884	360	34,338	296

Source: Lismore Urban Strategy

As outlined in Table B.2, the NSW Department of Planning projected that the population of the Lismore LGA would increase by 340 people per annum to 2007 and by 360 people per annum thereafter to 2011. This population growth rate is significantly higher than the level of population growth which was experienced between 1996 and 2001, of 0.2% per annum as outlined in the LUS. The population projections outlined in the LUS therefore assumed that the previous growth rate was an anomaly and would return to previous growth levels.

The Lismore Urban Strategy states that the current real supply (as at 2006) was 279 Ha, capable of accommodating approximately 2,235 dwellings. Based on the population projections outlined in Table 2.2 the LUS states that there will be an annual residential land take up of 11 Ha (2001 to 2006) and 12 Ha (2007 to 2011), resulting in only 92 Ha of total real supply remaining by 2011.

There are six areas identified in the LUS for potential future residential uses. These areas are:

- North Lismore Plateau
- Trinity Drive
- Pineapple Road
- Tucki Creek
- Invercauld Drive
- Monaltrie

The LUS states that population growth figures "could be boosted to some extent through the release of suitable residential land on to the market" . Market demand is identified as an important factor in identifying future residential land release areas, as new supply should be provided in areas which can demonstrate demand from the market. Such areas would provide high levels of amenity, such as views, limited slope and aspect. The LUS states that market factors need to be considered given previous decreases in population in correlation with the amount of vacant land within the 2(a) zone.

Within the LUS report, the following comments and statements are made regarding the North Lismore Plateau in the Planning Assessment:

- "Reasonably level and enjoys high quality views and aspect"
- "Although servicing and access costs are likely to be high, this would be offset to some extent by the high lot yield that would be achievable for the entire plateau areas and the fact that blocks should attract premium prices given the characteristics of the site."
- "In some respects the area has advantages over Trinity Drive in that it is closer to the CBD and the attributes of the site would lend itself to innovative subdivision practice that could potentially provide an environment of high quality and amenity for future residents" (800+ lots).
- "The level of existing noise from the Speedway operations was excessive at all locations under consideration for future residential development in the area."

Of the six areas identified for potential future development, the LUS outlines a staged release programme spread over three potential release areas with the number of lots allocated on the following basis:

- Trinity Drive comprising 175 lots
- Invercauld Road comprising 65 lots
- Tucki Creek comprising 130 lots

Trinity Drive

The Trinity Drive site covers an area of approximately 35 Ha and the LUS estimates that residential development on the site will exceed the residential standard of eight dwellings per Ha, with a total of 350 lots anticipated on the site. As stated within the LUS, "[t]he Trinity Drive site is located in an area that has performed strongly in terms of land sales and the release of additional land in this area should satisfy a demonstrated demand for lots that share similar attributes to those existing in the area." The only major development issue identified within the report for residential uses along Trinity Drive is the impact that 350 lots will have on the existing road network, as the site is accessed via Trinity Drive. Trinity Drive is a small residential street which will not be capable of sustaining the significant increase in traffic movements due to residential development at the end of the street. The subdivision of the Trinity Drive site will have to take design of the road network into careful consideration.

Invercauld Road

The LUS describes the Invercauld Road site as comprising a majority of low elevation land with limited views and aspect which could potentially be developed into 550 lots. Due to the characteristics of the land, the LUS therefore states that the site is unlikely to generate strong market demand. The Planning Assessment states that the Invercauld site could potentially be developed over the medium term.

Tucki Creek

Tucki Creek is a reasonably level site with a pleasant rural outlook which is capable of accommodating approximately 250 lots. The LUS states that the site would cater to a market which is significantly different to that of the Trinity Drive site and would be capable of offering more affordable land options. However, this residential market sector is already catered for within the Lismore market with the current supply of 2(a) zoned residential land which remains undeveloped and the Planning Assessment states that development of the Tucki Creek site should not proceed unless existing 2(a) zone land is back-zoned to allow for new residential land supply to be brought to the market.

The Department of Planning's agreement to the Strategy on August 5, 2003 was conditional upon the timeframe of the strategy being limited to five years and the Greenfield areas within that timeframe being limited to the Trinity Drive area and Daniel Drive area.

Implications

The population projections utilised for assessing the future demand levels were inaccurate, with the actual level of population growth occurring being lower than what was predicted. As stated in the LUS, low population growth levels can be attributed to the characteristics of zoned residential land available, with supply not meeting market demand factors and therefore a diversified supply of residential land is required to increase population growth rates. The areas identified for future residential development in the LUS can be considered to be 'more of the same', with Invercauld in particular. Other than the North Lismore Plateau, the sites identified are in a similar geographical alignment and well removed from the Lismore CBD. The LUS therefore did not address market demand factors.

The population decrease from 1996 to 2001 was not an anomaly, whilst population growth did occur between 2001 and 2006 as identified in Section 1, the level of growth occurring is not sufficient to meet targets outlined by the FNCRS. A major regional centre such as Lismore should be capable of significant levels of population growth to attract growth away from the coastal areas. The Lismore Urban Strategy provides the framework for future lot releases and should therefore be identifying developable areas which will provide greater diversity of residential product which will catalyse population growth.

The Lismore Urban Strategy is currently being updated because the previous LUS provided a land release strategy to 2011, which will need to be re-assessed to meet the current level of demand. The updated document will be strongly influenced by the level of supply which has been released on to the market, developed and purchased since the previous LUS.

B.2.4 Lismore Local Environment Plan 2000

The Lismore Local Environmental Plan (LEP) was completed in 2000 by the Lismore City Council and the primary aim of the plan is:

"[T]o provide a flexible planning framework that allows for the maintenance and development of a prosperous, attractive and well-serviced living environment that reflects the values, needs and aspirations of the Lismore community."

In regards to residential development within the Lismore LGA, the LEP aims to provide a diverse range of residential options providing a choice in lifestyle with services provided that meet the needs of the population.

The current area of the North Lismore Plateau is located within the1 (d) (Investigation Zone) and the 1(a) (General Rural Zone) under the Lismore LEP 2000. The objectives of the 1(d) (Investigation Zone) are:

a) To identify land which is to be investigated in respect of its suitability for re-zoning, and

b) To ensure that development within the zone is compatible with the anticipated future development of the land; and

c)To ensure that development maintains the existing character of the locality and minimizes disturbance to the scenic value of the landscape through clearing, earthworks, access roads and construction of buildings, and

d) To ensure that development does not create unreasonable or uneconomic demands, or both, for the provision or extension of public amenities or services.

The NLP site was also identified as 1 (d) Investigation Zone under the previous LEP (1992). The planning objectives of the 1(d) zone under the 1992 Lismore LEP was consistent with the Environmental Plan.

The objectives of the 1(a) (General Rural Zone) are:

a) To maintain and encourage sustainable agricultural activities within the zone, and

b) To enable a range of other uses to occur on rural land providing such uses do not conflict with existing or potential agriculture and do not detract from the scenic amenity and character of the rural environment, and

c)To discourage the fragmentation of rural land, and

d) To restrict the establishment of inappropriate traffic generating uses along main road frontages, and

e) To enable the provision of rural tourist accommodation and facilities only where such facilities are compatible with the form and density of the nature of the locality.

Implications

Whilst the LEP states that future development within the 1(a) zone needs to be in-keeping with the current characteristics of the area this limits potential for large scale residential developments, with the majority of developable residential land supply already taken up. Slope and flooding within Lismore limits potential for development therefore the identification of new, large areas will be instrumental in allowing for the development of 8,000 dwellings to meet requirement of the FNCRS.

The Lismore Local Environment Plan is currently being updated. The 2010 update will assess the current residential market, update to the current residential supply and address the residential demands of the current population base. The pending updated LEP will also be required to meet the population and dwelling requirements outlined within the FNCRS.

B.2.4.1 Draft Lismore Local Environment Plan 2010

The Draft Lismore Local Environmental Plan 2010 was released for Public Exhibition in 2010. Under the Draft LEP, the NLP site has been allocated a Rural Landscape and Primary Production zoning This seems an appropriate interim zoning due to the need for up-dated investigations into the North Lismore Plateau and the lack of an 'investigation' zone under the new LEP model. This Planning Proposal has the objective of a stand-alone LEP to cover the Plateau site.

B.3 RESIDENTIAL SUPPLY

B.3.1 Far North Coast Region Residential Submarket Analysis

The Far North Coast Regional Submarket Analysis was prepared by Macroplan Australia in August 2008. The report was prepared for the New South Wales Department of Planning to provide a detailed analysis of the residential markets within the Far North Coast Region. The Residential Submarket Analysis provided an assessment of current drivers and future residential needs within Lismore, Ballina, Byron, Kyogle, Richmond Valley and Tweed.

Population, age and income

The Submarket Analysis provides a brief overview of the demographic characteristics which will influence residential demand to 2031. The report also states that the population of Lismore is not projected to undergo any significant change to 2031. Macroplan state that Lismore will follow national trends with an aging population, where the proportion of Lismore residents aged over 75 will treble by 2031, the remaining other age groups are projected to decline slightly in population. The income profile shows that the majority of residents earn a low (48%) to medium (40%) income.

The Submarket Analysis states that there will be minimal demand due to population growth as they project the population of Lismore to increase by 1,500 to 2031. This equates to an annual increase of 65 people per year.

Supply

The Submarket Analysis briefly assesses the future allocation of residential land supply within the Lismore LGA, identifying that the NSW Department of Planning has allocated approximately 3,360 dwellings to be located in the area surrounding the Lismore City Centre. The remaining residential development allocated to Lismore LGA (8,000 dwellings as outlined in the FNCRS) will be located throughout the Lismore LGA at Greenfield development sites and as infill development.

The Submarket Analysis states that there is limited supply of new residential blocks for sale within Lismore, and therefore the residential market relies on the resale of the existing housing stock. Macroplan, through discussion with local real estate agents, state that there is demand for diversified residential supply that more appropriately meets demand generated by the region's changing demographic profile.

Macroplan identifies North Lismore as a growth area which is intended to accommodate approximately 1,275 additional dwellings by 2031. Goonellabah is identified as a 'hot spot area' despite topographic and infrastructure constraints to residential development.

Demand

The number of dwelling approvals across the Lismore LGA has decreased significantly between 2002/03 and 2007/08, reaching a peak in 2004/05. Data published by Macroplan shows that the current level of dwelling approvals in Lismore is between 100-125 per year. There has been significantly higher demand for detached houses, with semi-detaching dwellings approvals consistently accounts for no more than 10% of total approvals between 2002/03 and 2007/08. The Lismore Part A SLA, which comprises the Lismore City Centre and the area surrounding it, has accounted for the majority (78%) of dwelling approvals within

Lismore. The number of dwelling approvals within Lismore Part A SLA remained stable between 2005/05 to 2007/08 whereas the remainder of Lismore LGA experienced a decrease in dwelling approvals.

Macroplan states that there is likely to be strong demand for residential development within Lismore East, Richmond Hill and Goonellabah.

The Submarket Analysis states that the "two major drivers of growth in Lismore, particularly when compared to coastal localities, are employment opportunities and housing affordability." Southern Cross University and major medical facilities within Lismore are also considered by Macroplan to increase demand for residential uses.

Residential Prices

Macroplan provide an overview of residential sales in 2006/07 and assess that the majority of the 157 residential sales within this period can be classified as being with the low price range (less than $312,000 for detached houses, and below $259,000 for other dwellings). The Submarket Analysis states that Lismore Central and Lismore Heights comprised a higher proportion of low priced sales, whereas Lismore East comprised a high proportion of high priced sales.

Recommendations / Housing Requirements

Based on the demographic profile, current supply and demand characteristics, and the current cost of residential dwellings within Lismore, the Macroplan Submarket Analysis recommends that the following be undertaken to ensure that future residential uses accommodate requirements of the Lismore population:

- "The submarket demand is primarily for affordable housing for the aging population, which will require facilities and services in close proximity to the urban areas.
- "A diversity of product is required within Lismore Central area to provide affordable rental housing for seniors and students.
- "Smaller households comprising of families without children or singles is increasing, resulting in the adaptation and diversity of housing products.
- "Higher priced housing quality should continue to be provided within Lismore East to encourage growth and diversity.
- "There is currently little housing diversity within the Lismore LGA, however affordable housing diversity, both in terms of typology and rental/ ownership, will be required to accommodate the submarket demand.
- "Additional housing will be required in order to retain affordability and provide opportunities for submarket demand."

Implications

Macroplan identify that there is need for increased supply of residential land which offers a variety of residential product, in proximity to the Lismore City Centre and community facilities, but is also affordable. The current supply of developable residential land is insufficient to meet the level of population growth which should be occurring within Lismore, as identified in the FNCRS. An increase in residential land supply is required to support demand generated by employment opportunities and to increase diversity of residential product which will appeal to more markets and enhance the affordability of residential product in Lismore. An increase in residential land supply which is appropriate for residential development will be capable of

retaining the current population of Lismore and its future generation, but will also attract migration to Lismore City.

The Submarket Analysis highlights that Lismore East is attracting high sales prices, which is an area that has been designated a high proportion of residential land supply under the LUS. Therefore, other areas need to be identified for residential uses which will not generate such high land prices. North Lismore Plateau would provide a significant level of affordable residential supply over an extended period of time. It would meet the requirement for additional residential supply, with a diversity of product appealing to separate market sectors, and would be affordable as it is not located in an established, premium location.

This document provides a clear overview of the key characteristics of the Lismore residential market, however some of the data sources are not recent and an update of residential sales, residential prices, and dwelling approvals would provide a more detailed overview of the current conditions of the market.

B.3.2 PWC Supply Demand Assessment

Pricewaterhouse Coopers (PwC) was commissioned by North Lismore Plateau landowners to undertake an assessment relating to the Demand Supply Analysis for Urban Residential Development in the Lismore Local Government Area. The aim of the report was to identify opportunities for future urban residential development within the Lismore LGA through the evaluation of current supply and demand characteristics of the residential market.

The Supply Demand Assessment argues that the current supply of residential land is significantly lower than stated by Lismore City Council within it's LUS. PwC conducted site inspections of residential land supply within Lismore and utilised 'A Critical Analysis of Lismore City Council's Urban Development Strategy' prepared by Riordans Consulting Surveyors and Stephen Fletcher & Associates Pty Ltd to assess the current supply of developable residential land supply.

The Critical Analysis, as outlined within the PwC Demand Supply Assessment found the following:

- Approximately 147.7 Ha of existing vacant residential zoned land within Lismore is constrained, compared to 31 Ha identified as constrained by Lismore Council
- Therefore the developable / unconstrained supply of residential land is 108.3 Ha, which is significantly lower than the 255 Ha identified as developable / unconstrained by Council.
- "It forecast that, without a change in the strategy, Lismore could soon reach a situation of having grossly insufficient land on the market, (especially affordable land) for urban residential development."

Having assessed that the supply of developable residential land is approximately 108 Ha, PWC states that the negative to low population growth which has previously occurred within Lismore may be caused in part to the lack of developable residential land. The limited supply of residential land has had a significant increase in demand for good quality residential land, therefore also increasing land prices. PwC state that the cost of land has increased at a Compound Annual Growth Rate of 13.2% between 2002 and 2007. Land prices are also enhanced by the role and function of the Lismore City Centre, which provides employment opportunities, community and commercial facilities which are not available elsewhere within the Far North Coast region. PwC also state that, through consultation with local real estate agents, that there is strong demand for good quality residential land within Lismore, therefore resulting in higher prices for land that is released to the market which also sells very quickly due to current lack of supply.

Increased demand for residential supply will be supported by population growth due to the role and function of Lismore as the "commercial centre of the far north coast, especially for the provision of employment, continued investment of the Lismore City Council in the local area amenities and the availability of attractive social infrastructure, including the medical and specialist facilities of the Lismore Base and St Vincent's Hospitals and the Southern Cross University." The Demand Supply Assessment also stated that the allocation of 8,000 dwellings within Lismore LGA under the FNCRS will have a significant impact on the level of demand for residential land and diversified residential product within Lismore.

PwC state that the current supply of residential zoned land will be incapable of meeting demand for residential dwellings. The Demand Supply Gap examines the trend in dwelling approvals between 2002 and 2006 within Lismore, and PwC conclude that there is an annual shortfall of 21.6 dwellings between projected demand and actual demand for dwelling approvals.

The Supply Demand Assessment identifies the North Lismore Plateau as a potential residential development site, and outlines the following benefits for rezoning as 2(a) for urban residential development:

- Efficient use of the community's resources
- Economic support for businesses and therefore employment in the Lismore CBD
- Delivering the FNCRS requirements for future lot yields
- A showcase example of new improved planning and development.
- Effective growth on the north-western side of the city
- An attractive alternative to population movement to the coast

PwC also state that urban residential development at NLP "may potentially encourage future growth and further development in areas geographically west and north of the CBD in areas that are currently undeveloped and in close proximity to the city centre. This would provide an affordable alternative to previously identified sites lying east of the city centre."

The Supply Demand Assessment also addresses the issues relating to noise from the Lismore Showground and Lismore Speedway, stating that the Section 96 Directive limits the Speedway to only 14 events per year with action to be taken against any vehicles which exceed the noise levels.

Implications

The PwC Supply Demand Analysis also highlights that the current supply of residential land is insufficient to meet demand, therefore Lismore requires additional supply of appropriate residential land to keep people from leaving Lismore and in order to attract higher levels of migration to Lismore. The Supply and Demand Analysis also highlights that affordability of residential land is significantly impacted by lack of good quality residential supply. The lack of affordable residential land supply explains the lack of high levels of population growth in Lismore, as the area is no longer seen as a significantly cheaper alternative to the coastal markets. Lismore City is a Regional Centre within the surrounding region and offers a high level of social and economic infrastructure to support the needs of its resident population, and should therefore be capable of retaining and attracting a high level of residents.

B.4 NORTH LISMORE PLATEAU

B.4.1 DUNOON ROAD PLANNING STUDY

The Dunoon Road Planning Study was prepared by Northern Rivers Engineers Planners and Scientists in 1994 after the planning study was undertaken by the Lismore City Council to investigate the potential for the North Lismore Plateau to be utilised for urban residential and rural residential development. The Study Area, as outlined in the Planning Study comprised an area of approximately 200Ha. The Study Area differs slightly from the current boundaries of the North Lismore Plateau site. This is discussed in Appendix

Supply and Demand

The Strategic Planning Assessment outlines the supply and demand argument for development of residential uses within the study area. The assessment includes population projections which anticipated the population of the Lismore LGA to increase by 14,840 people between 1991(40,580 people) to 2006 (55,420 people). Utilising these population projections, the Dunoon Road Planning Study considers that 7,867 allotments would have been required to meet population growth to 2006.

Based on the level of demand which was anticipated, the Strategic Planning Assessment concludes that the "supply of suitably zoned land is limited for both rural residential and urban residential while demand continues to increase. The availability of suitably located land close to Lismore, free of significant environmental constraints and conflicting landuses, and able to be economically serviced, will be a critical factor in Lismore's continued prosperity as a regional centre." The Study also states that the utilisation of the Study Area for urban residential uses would allow for approximately 1,500 lots which would meet 30% of residential demand to 2006.

Site Characteristics and Constraints

The Study Area is considered to be a highly desirable site for future residential development due to its location in relation to the CBD and the lack of development constraints relating to the characteristics of the site. The 1994 Planning Study clearly outlines that the NLP is flood free, close to the CBD, is not classified as good agricultural land and has no significant flora remnants or areas of animal habitat potential. The Planning Study also states that residential uses within the NLP will also maintain the centrality of the precinct Central Business District and enhance the function of the CBD as the regional centre of the Far North Coast region.

The Planning Study identifies the following potential constraints on residential development within the Study Area:

- Flooding – Flooding is not a significant constraint for development within the Study Area.
- Habitat – There are no areas of high conversation value within the Study Area, whilst a corridor network for vegetation conservation and habitat enhancement is suggested for consideration in future development.
- Heritage – the Study Area has no Aboriginal heritage issues, however the dry stone wall located to the northwest of the Study Area does have some significant heritage value. Pioneer Memorial Park should also be considered for heritage value, pending increased visitation to the area. the location of these heritage sites in relation to the NLP will have to be assessed.
- Access – The report states that "the preferred initial access point to service the proposal would be the Sexton Road extension to the central eastern part of the plateau, followed by the implementation of the

McLeay Road deviation to Dunoon Road, and finally the reconstruction and use of the quarry access road connecting to Nimbin Road, . . . The cost of major access road construction, when distributed over the total yield in stages, is considered reasonable in relation to total costs".

- Quarry – The North Lismore Quarry was located to the south of the Study Area. This is no longer an issue as the quarry has closed.
- Agriculture – Agricultural land use do not form a constraint on development within the Study Area as the Study found that there were no consolidated areas of significant grazing or crop land within the Study Area.
- Community / Recreation Services – The integration of community facilities will be included within the proposed development and will occur as required by the onsite resident population. The Planning Study also states that higher order community facilities within the wider Lismore community will need to be upgraded or expanded due to increased demand from population growth.
- Lismore Showground - The Planning Study outlines that residential development on the Study Area has the potential to cause flooding at the Lismore Showgrounds due to run-off if proper drainage systems are not utilised in the design and development process. The sale yards also represent a potential constraint to residential development due to the noise generated by cattle sales.
- Speedway – The Speedway activities at the Showground generate a high level of noise which can be heard throughout Lismore.

Servicing and Infrastructure

The development of the North Lismore Plateau site will require the extension and up-grading of utility services to provide water, sewerage, onsite waste disposal, telephone, electrical, and i road infrastructure to support residential development onsite. There were no identified contraints arising out of the general requirements for servicing and infrastructure provisioning.

Recommendations

The Dunoon Road Planning Study identifies two development options for the Study Area:

- Urban Residential – The preliminary concept plan supports the development of 1,520 lots and would accommodate a residential population of approximately 4,000 people. This option also allows for open space, community facilities and commercial facilities within the Study Area.
- Rural Residential – The Planning Study states that significant constraints exist for the development of rural residential uses within the Study Area. These include the inability to provide efficient waste disposal services to the site, that it would be uneconomic to develop rural residential when considering the cost associated with the provision of infrastructure and services, and rural residential uses would be an inefficient use of the site considering its location (in proximity to the Lismore City Centre).

The Dunoon Road Planning Study therefore recommended urban residential development as the most appropriate use within the Study Area, and recommended that rural residential be discounted as an option.

The following positive aspects for urban residential development within the Study Area are identified in the Planning Study:

- Economical and logical use of the land compared to other uses;
- Proposal would assist in maintaining the centrality of the Central Business District by encouraging west of the city centre;
- Attractive land of high amenity with opportunities for superb views and creative use of bushland

regeneration areas, access to breezes and good microclimate;

- Ready accessibility to the Lismore Central Business District and existing local and regional facilities (within 3 kms); and
- Minimal impact on agricultural landuses and other conflicting landuses.

Negative impacts include:

- Relatively high costs of providing initial road and service infrastructure;
- Multiple land owners and therefore more complex development management;
- Existence of quarry having major effect on staging; and
- Potential conflicts arising from speedway, go-car racing and saleyard activities in the valley below.

Implications

The Planning Study identifies that there are minimal critical constraints within the Study Area therefore easing development potential of the site as an entirety. The site requires service connections such as water, sewerage, electricity, and telecommunications. This therefore makes the infrastructure costs higher for the earlier stages of development, but will be mitigated over the long term due to the scale of development which could be supported within the Study Area (1,520 lots proposed within the Planning Study).

The Planning Study identifies urban residential as the most appropriate use for the site, with a small mix of rural residential lots. A medium density satellite suburb is suggested which also provides on-site convenience and amenity to address other factors of need (with retail and open space in particular). Urban residential would be the highest and best use for the study area as it would provide not only a mass of residential product, but also enhances the centrality and function of the Lismore CBD by expanding urban development to the north and west.

Dunoon Road Planning Study was prepared in 1992 and therefore the data contained within the study will need to be updated following the gateway determination to ensure overall relevance to the site.

B.5 CONCLUSION

The planning documentation, as overviewed above, provides a three-tiered argument in support of the development of the North Lismore Plateau for residential and other urban uses. Firstly, Lismore City is a designated as a Major Regional Centre under the Far North Coast Regional Strategy. Lismore City is well serviced by social and economic infrastructure and therefore has the established services and facilities required to function as a Major Regional Centre. However, what Lismore does require is a larger population base to enhance its role and function within the region, but this is not currently possible as population growth levels has recently fluctuated between negative growth and low growth levels.

Secondly, Lismore City does not currently have the level of residential land supply required to support higher population growth levels due particularly to issues of slope and flooding. The supply of developable residential land is insufficient to meet the level of demand which currently exists, and is therefore also not capable of supporting higher levels of population growth. Due to the limited supply of residential land, the land which is available and easily developable is highly priced, which further limits the potential for increases in population as Lismore is no longer considered to be a more affordable residential area within the region.

Higher levels of population growth are being experienced in the other major regional centres of the Far North Coast (Ballina and Tweed) that offer the coastal lifestyle to migrating residents as well as ensuring an adequate residential land stock.

Thirdly, the North Lismore Plateau provides a significant land holding of over 335 Ha which can be developed for a mix of residential types, including urban residential, rural residential, age care facilities and retirement homes. The location of the NLP provides easy access to the Lismore City Centre and as the area is not an established / recognised residential community it will provide lower residential sales prices for current and potential Lismore residents looking for more affordable housing options within Lismore. In addition, the significant scale of the NLP will allow for the site to accommodate a significant resident population therefore catering for a proportion of the additional people allocated to Lismore under the FNCRS.

North Lismore Plateau has consistently been identified as a potential and appropriate location for urban residential development. The NLP site offers residential land supply which differs significantly from the residential land currently available, as the current release pattern for residential land is extending the urban boundary of Lismore to the east. The expansion of Lismore to the North, by allowing for the rezoning of the North Lismore Plateau, will enhance the centrality of the CBD and provide easier access for future residents to the services and facilities provided within the city centre.

Appendix C – Detailed Discussion

C.1 Introduction

This section will identify the planning argument for the re-zoning of the North Lismore Plateau to allow urban residential and other urban development uses onsite.

The utilisation of the North Lismore Plateau for residential and other urban development is recommended for the following reasons:

- The current function of Lismore as a Major Regional Centre requires a larger population base
- The lack of residential land supply in relation to the current and future demand for residential land will limit the potential for Lismore to accommodate higher levels of population growth
- The location of the North Lismore Plateau in relation to the Lismore City Centre will enhance the centrality of the Lismore City Centre and will also limit the need for additional services and facilities to be developed onsite to meet the needs of the resident population.

C.2 Lismore as a Major Regional Centre

Lismore City is identified as a Major Regional Centre under the FNCRS and has been allocated a level of population growth equivalent to 8,000 additional households in the LGA. The FNCRS allocates a provision of 1.1 people per household, whereas the current household characteristics of Lismore indicate approximately 2.5 people per household within the LGA. Therefore the provision of 8,000 households will allow for between 9,500 and 20,000 additional people to be accommodated within the Lismore LGA. The FNCRS, through the allocation of a significant amount of additional households within Lismore, identifies that the current role and function of the Lismore City Centre will allow it to support a significantly larger population.

Lismore City Centre is the administrative centre for the Far North Coast Region, and is also currently well serviced by social and economic infrastructure facilities. The Lismore City Centre provides a range of services and facilities that has ensured that the residents of Lismore have been well-serviced by the social and economic infrastructure facilities. Based on the level and quality of medical and educational facilities provided, and its already diversified economic base, Lismore should be experiencing high levels of population growth instead of the fluctuating population growth levels which have occurred over the past ten years. In addition, there is significant potential to enhance the role and function of the Lismore regional centre, but this will require a larger population base to allow for the provision of higher order services and facilities.

Population growth within Lismore should be driven by the high provision of social and economic infrastructure provided, the rural characteristics of the surrounding area, and that Lismore provides an alternative to moving to the Coastal area. The facilities and services offered within the Lismore City Centre offer the same role and function of the other regional centre in the Far North Coast, which are located on the coast (Ballina and Tweed). The advantage of Lismore, however, is that it also offers a lower cost of living than the coastal areas. The coastal areas are experiencing significant levels of population growth as people are attracted by the amenity of coastal living. These high levels of population growth should be distributed across the region so as to limit negative impacts of population growth on the coastal centres.

The diversified economic base of the Lismore regional centre, which includes the commercial and administrative uses within the City Centre and the rural and agricultural uses within the majority of the LGA, provide a significant mix and mass of employment opportunities within Lismore. Any significant increases in the population base would only enhance the scale of the economy and continue to provide a diverse range of employment opportunities for the growing population. Significant levels of population growth, such as that which is allocated under the FNCRS, will allow for the Lismore economy to grow in scale and function in line with population requirements for employment opportunities and services provided. High levels of population growth within Lismore will therefore allow for a further diversified economic base which will increase employment opportunities, therefore also ensuring prolonged population growth over the long term.

C.3 Current Supply Limits Potential for Population Growth

The reports discussed in Appendix B provide a general consensus that the current supply of residentially zoned land in Lismore is not sufficient to meet demand. There is considered to be a lack of residential land supply due to the development potential of land which was previously zoned residential. Whilst there is a high provision of residential zoned land under the Lismore Planning Scheme, the majority of this land is actually not considered developable or appropriate for development, due to site constraints or the current characteristics of market demand. Limited supply of residential land ready for development will limit potential for population growth by reducing the capability of Lismore to meet population growth expectations and increasing land values.

The lack of developable residential land in Lismore is having a significant impact on residential land prices, making the area more costly not only for the current population base who are looking to relocate within Lismore but for those who are looking to move to Lismore from other areas. The Lismore residential market is supply constrained, and therefore any good quality residential land which does enter the market not only has a high asking price but is also bought very quickly. The supply and demand assessments contained within previous planning and assessment documents provide commentary on the impact of the current supply of residential land supply, stating that the limited supply has in part been responsible for the limited level of population growth occurring in Lismore over the past ten years. As residential land supply has been limited, potential residents that are looking to migrate and are considering a tree-change would be apprehensive given the higher land prices in comparison to other rural localities within the Far North Coast region. In addition, whilst Lismore's residential prices would be lower than those of the coastal towns, for a slightly higher price those potential residents would be provided within the added amenity of a sea-side location with associated beach lifestyle. The lack of supply therefore further increases the push – pull towards the coastal centres.

Significant residential supply is also required across the Lismore LGA to provide for the 8,000 dwellings which are allocated to the area under the FNCRS.

The North Lismore Plateau, based on preliminary planning and design outcomes, would be capable of accommodating in excess of 1,200 residential dwellings over the medium to long term. This accounts for approximately 15% of the total residential dwellings allocated to Lismore to 2031, with the potential for the NLP to accommodate even a higher number of dwellings if a higher provision of medium density residential units and aged care facilities / retirement villages are included in the master plan.

C.4 Current and Future Demand For Residential Land

The reports discussed in Appendix B provide a general consensus that there is significant demand for residential land and that the fluctuating population growth levels can be attributed to a lack of supply which is not capable of meeting internal (current Lismore residents) and external (potential Lismore residents) demand for residential product. The current supply within Lismore is not capable of meeting the current demand for residential land, and therefore significant supply needs to be identified to meet demand for residential land over the medium to long term. Previous fluctuations in population growth levels can be explained by demand for residential uses not being met and therefore people are leaving Lismore for alternative locations with mix and mass of residential uses, which are more affordable. There are limited opportunities for good residential product at reasonable prices (considering that Lismore is located away from the coast, and could be considered more isolated than other major centres) and therefore people are not locating to the area

The FNCRS outlines that the 8,000 additional dwellings will be required over the timeframe of the plan (2006-2031), and therefore over the 25 year period Lismore will require 320 additional dwellings per year. This will accommodate an additional population of between 352 and 800. Such levels of population growth are significantly higher than what has been occurring within Lismore over the past 10 years, and therefore demand for residential land will require significantly more residential land to be brought to the market every year.

The future characteristics of residential land supply will not only be shaped by the amount of land required to meet dwelling allocations, but also by the changing demographic characteristics of the Lismore population base. The demography of Lismore's population base is indicative of an ageing population, with a high proportion of lower income households. The future allocation of residential supply within Lismore will need to address demand for more affordable housing options, with a high proportion of smaller size residential product in close proximity to services and facilities (with medical services in particular). Future demand for residential land will also include those looking for a tree-change, and therefore future supply of residential land will also need to include standard and larger lot residential lots which provide the view and aspect which is a significant characteristics of the Lismore area.

The North Lismore Plateau is capable of meeting demand requirements for future residential supply in Lismore. With a site area of over 335Ha, preliminary planning of the NLP identifies potential for an excess of 1,200 dwellings to be developed on the site. The NLP is intended to be developed with a mix and mass of residential types, which would potentially include a retirement village or aged care facilities. Planning and design of the NLP will also ensure that residential product not only meets the needs of an ageing population, but also provides a range of residential densities allowing for smaller dwellings that are more affordable for the local population.

C.5 Location of the North Lismore Plateau

From a planning perspective, the North Lismore Plateau is well located for large scale residential development as residential development on the site will not only benefit the Lismore City Centre but also provides a good location for residential uses from the purchasers' and residents' perspective.

Large scale residential development, which is the intended purpose of the NLP, will enhance the centrality of the Lismore City Centre by naturally expanding the urban area of Lismore to the north. NLP will have a significant role in supporting the Lismore City Centre. The NLP will have a resident population of

approximately 2,000 people, and potentially higher. A population of this size will require a wide range of retail and professional services to support the population and such services are currently located within the City Centre. Given the proximity of the City Centre from the NLP it is not necessary for higher order retail and professional services to be located within the development, which will further emphasise the centrality and function of the Lismore City Centre. Therefore, a significant amount of population growth will occur on the NLP which will support and maximise the value of the existing centre and facilities rather than require additional facilities to be developed. It is also considered that the unprecedented development of a large scale residential area in North Lismore will act as a catalyst for more residential development north and west of the City Centre where rural land can be converted.

The North Lismore Plateau also offers potential residents with quick and easy access to the Lismore City Centre and other medical, educational, and community facilities within the surrounding area. Whilst the NLP is still located within 5 - 10 minutes of the Lismore City Centre it offers an alternative to the current residential areas, and will also offer lower priced residential land than East Lismore and Goonellabah which is where the majority of residential development has occurred over previous years. Demand for residential land in Lismore also comprises a desire for land with views and aspect. The North Lismore Plateau site provides such amenity due to its elevated position making it a desirable future residential area.

C.6 Traffic and River Crossing Capacity

Council's design workshop identified the impacts of the NLP development on the existing river crossings as an important issue to be assessed as part of the Planning Proposal considerations.

There have been a number of traffic studies completed on behalf of Lismore City Council. The most recent being the "Lismore CBD Traffic Study", reported to Council on 10 June 2008. This report has as its basis a traffic and parking study of Lismore's Commercial Business District undertaken by TTM Consulting.

The study identified future traffic requirements in the CBD in the context of traffic management and parking. One of the key findings of the study is the need for a third river crossing. Three potential crossing options were identified - option 1, the preferred option, is located just to the north of the existing Woodlark Street Bridge.

That study prioritised the intersection upgrades and gave a recommended timeline for the works to be carried out. Stage 3 (10 years and beyond) provided for a third river crossing in the vicinity of Terania Street – Orion Street.

The focus group on 'roads and traffic' issues at Council's design workshop discussed at length the under-utilization of the existing 'third' river crossing on Winterton Parade. It was agreed that this bridge showed a degree of saturation of less than 20%. This bridge provides a single lane of travel in both directions with a separate footpath on the eastern side of the road. This bridge has the capacity to cater for some 900 vehicles per hour in a single direction based on normal capacity thresholds.

The charette found that this bridge is well placed to provide access to the North Lismore Plateau- the site links well to Alexander Parade that then connects with Winterton Parade for access to the CBD. It was also

recognised that an up-graded and sign-posted intersection at Dunoon Road and Alexander Parade, together with a re-aligned Alexander Parade, would greatly enhance the use of this link to the CBD thus minimising impacts on the Woodlark Street Bridge from the development.

To specifically analyse the likely traffic impacts of these up-grades on the existing bridge crossings, Better Transport Futures (Mark Waugh Pty Ltd) has been engaged by Winten and their report is annexed to this Planning Proposal (Appendix G).

C.7 Showground

The noise associated with some of the showground uses is a consideration for the design and development of urban uses on the NLP. It is understood that Council have resolved to put in place a noise management plan that will set emission levels, monitoring programs and use schedules.

C.8 Water Supply

The North Lismore Plateau has the ability to be serviced with reticulated town water.

The water supply can be staged utilizing existing facilities to allow initial staged development with ultimate supply dependent upon additional new infrastructure provided by the proponents.

The 1994 North Lismore Planning Study prepared for Lismore City Council by Northern Rivers Engineers Planners and Scientists considered the provision of water supply to the North Lismore Plateau. The preferred option was to supply water from the Tullera Reservoir.

In September 2006 and June 2010 ACM Landmark Pty ltd undertook water investigation reports to determine the following:-

- Determine to what extent Tullera Reservoir has additional capacity to provide for some first stage development of the plateau.
- Determine what level within the plateau can be developed with and without a booster pump and storage.
- Determine the size of trunk main from Tullera Reservoir to service both the first stage and ultimate stages of development.
- Determine the trunk main upgrade requirements from Howard Grass to Tullera Reservoir.

Investigations into the feasibility and costs associated with the water supply provision for both a first stage and ultimate development are included within the full report shown in Appendix H. This report shows the possible reticulation routes for carrier mains to the North Lismore Plateau.

The investigation revealed that an initial stage of approximately 200 lots within the plateau can be serviced by the existing Tullera Reservoir.

The Tullera Reservoir is operating at generally half of its capacity.

The first stage lots can occur in numerous locations on the plateau with the appropriate sizing of internal watermains.

The provision of a 300mm trunk main from Tullera Reservoir to the site approximately 1840m will serve both the first stage and ultimate development of the plateau.

Beyond 200 first stage lots a new 2.5ML reservoir adjacent to the Tullera Reservoir would be required together with the upgrading of the carrier main from Howards Grass to the new Tullera Reservoir via a 250mm trunk main 2620m in length.

For the first stage development a booster pump station at McLeay Road will be provided to ensure sufficient pressure. Further assessment has disclosed that an elevated reservoir or standpipe is impractical due to excessive height and adverse viability.

The booster pump station whilst not being the most favoured option by Council will ensure that a continual pressure to the plateau was available to meet Councils static head requirements. The plateau can be serviced by gravity from the proposed Tullera Reservoir to the highest points in the subdivision in times of emergency.

Some booster pumping of the system is inevitable and this would either need to be at the reservoir or as proposed at McLeay Road location.

Accordingly the site can be sufficiently serviced.

The North Lismore plateau can be provided with water supply to allow development immediately for 200 lots utilizing predominantly existing infrastructure. The remainder of the plateau beyond 200 lots can be provided with water supply with the provision of additional infrastructure comprising reservoir and carrier mains funded by the proponents.

C.9 Sewer

The Plateau area proposed for redevelopment has the capability to be served by reticulated sewer.

The reticulated sewer can comprise of standard gravity reticulation with local pump stations transporting sewage to the existing South Lismore Sewer Treatment Works or the possibility of a package on-site treatment system. Current investigations have shown the standard gravity transport system to be the most effective to service the plateau, however further consideration of alternative systems may be given by Council.

The 1994 Dunoon Road planning study prepared for Lismore City Council by Northern Rivers Engineering Planners and Scientists disclosed that the future provision of sewer services to the site is dependant on

transporting the sewage to South Lismore Treatment Works with the possible upgrade of the South Lismore Treatment Works to accept capacity of the plateau.

An assessment of the possible route of the sewer connection to the site together with an agreement of the available capacity of the South Lismore Treatment Works was undertaken in 2010 by ACM Landmark Pty Ltd. The route of the sewer connection comprising of gravity and rising main and pump station and the assessment of treatment works capacity can be seen in full in the report titled "Brief Assessment of South Lismore Sewer Treatment Works Capacity" as Appendix I.

In summary, it was found that the South Lismore Treatment Works has capacity to accept at least 600 ET (equivalent and tenements). A further review of the ACM Landmark report was undertaken by RPS to verify the voracity of the ACM report. That report concluded that the 600 ET was conservative and that there could be up to 2290 ET capacity based upon average dry weather flows (ADWF). However the report also advises a conservative approach for wastewater treatment.

Accordingly there is determined to be a minimum capacity of 600 ET and a maximum capacity of possibly greater than 2000 ET. This capacity provides the ability for the entire plateau to be serviced within the South Lismore Treatment plant together with capacity within the existing catchment for future commercial/ light industrial expansion.

The benefits of a common localised treatment plant at South Lismore provides the opportunity to provide recycled water to proximate existing industrial and commercial precincts together with proposed industrial expansion in the Dunoon Road area.

It is understood that Lismore Council is in the process of briefing a consultant to undertake a review of the upgrading requirements for the South Lismore Sewer Treatment Works. That upgrade has been necessitated as a result of the current standard of the treatment works rather than specifically a capacity investigation.

The South Lismore Treatment works has been determined to have available capacity to accept the development of the North Lismore plateau from at least 600 ET to 2000 ET. Clearly therefore the provision of sewer to the North Lismore Plateau is not an impediment to the rezoning or development of the land.

C.9 Design Workshop – Lismore City Council

The Council design workshop supported in principle the urban development of the NLP in the form of a master planned residential community. Key findings from the workshop included:

- The 1,500 households on the NLP are proximate to the Lismore CBD and their patronage and expenditure would help revitalise this precinct that presently has an estimated 10% vacancy rate of retail floorspace.
- The establishment of the NLP community would create significant employment opportunities for the local construction industry.
- The NLP community will benefit from advanced communication technology that will make the area

attractive for people wishing to work from/at home.

- 1,500 new homes on the NLP will help move the urban centre of gravity back towards the Lismore CBD.
- The establishment of a new community of this scale provides the opportunity to explore new technologies and techniques for the provision of services (water, power, sewer) and urban design.
- The NLP provides the opportunity to provide a range of housing options that is a match for the needs of the Lismore community including affordable housing and seniors living.
- A high level of connectivity is desired with pedestrian, cycle and green links.

C.10 Conclusion

There is an intrinsic link between residential supply, residential demand and the limited population growth of Lismore. There is a need for additional residential supply required to meet current demand and significant levels of supply required over the long term to meet dwelling targets outlined by the FNCRS.

Lismore is a regional centre for the Far North Coast region, which is well serviced by social and economic infrastructure. Based on the amenity of the area, and the current high provision of medical, educational, and retail services, Lismore should be experiencing high levels of population growth. Demand for residential land, both from internal and external sources, exists however the current level of residential land supply is not meeting this level of demand. With a dwelling target of 320 dwellings required per annum to 2031, Lismore requires significantly more areas to be re-zoned for residential development. The North Lismore Plateau, with an area of over 335 Ha, would not only be capable of meeting a large proportion of the residential dwellings required, but would also provide a diverse range of residential product in immediate proximity to the established central business district.

These points were expanded in Councils design workshop, which produced a draft structure plan for the NLP. The design and output from the design workshop have been used as a key input for the Draft Structure Plan included in Appendix J. This plan represents a possible option and will be refined on the basis of further inputs from the detailed planning studies and other related work that will be completed after the initial gateway process determination.

Appendix D – North Lismore Plateau Planning Study Area

D.1 Introduction

The North Lismore Plateau study area boundary was initially based on the area defined as Proposed Future Urban Release area in the Far North Coast Regional Strategy. This Planning proposal is based on a revised area that was defined during the Design Workshop hosted in December by Lismore City Council. The two day workshop considered a number of issues in detail including:

- landform and slope
- vegetation, topography, creeks and drainage
- connectivity to the existing urban areas of Lismore, including the CBD (traffic, pedestrian, cycle)
- water, stormwater and sewerage
- community building and engagement

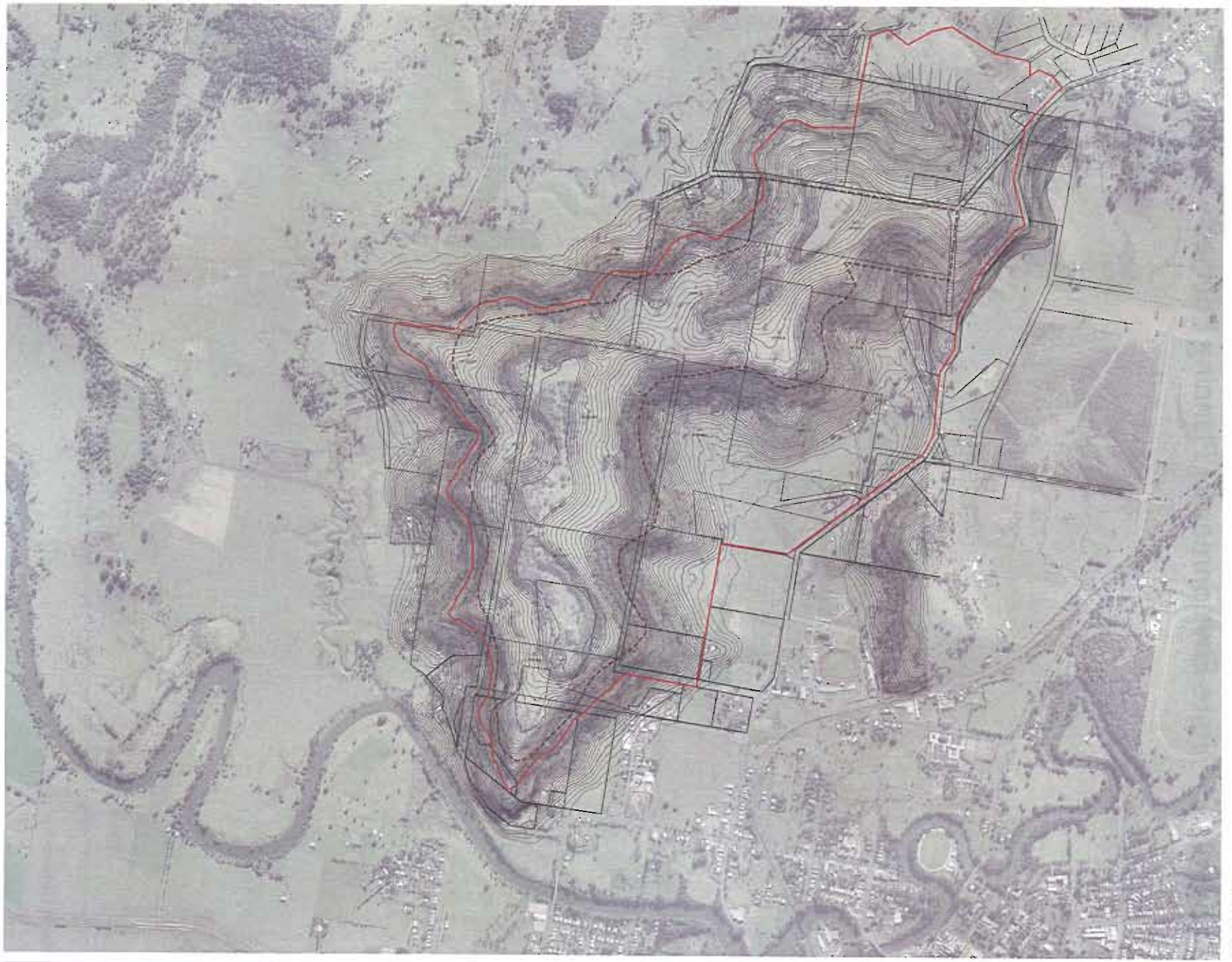
This provided a detailed justification for the study area boundary that is defined by topographic features and cadastral boundaries.

The proposed study area boundary is detailed in Figure D.1 with the boundary of the Proposed Urban Release area in the Far North Coast Regional Strategy provided for reference.

The justification for this boundary is as follows:

- The study area boundary is the 70m contour for the western, north western and part of the south eastern boundaries. This contour line generally defines the shoulder of the escarpment below which urban development is inappropriate.
- At the north of the study area the boundary is based on property boundaries as these abut the R5 zoning to the north. This will create a contiguous urban area.
- The north portion of the eastern boundary generally follows Dunoon Road.
- The southern potion of the eastern boundary is based on property boundaries and includes land at the foot of the escarpment. This land will be used for stormwater features that can not be accommodated on the plateau.

Figure D.1 North Lismore Plateau Study Area



LEGEND

- Future Urban Release Area
- FNCRS Boundary by Department of Planning

Disclaimer:

All areas shown on this plan is preliminary for discussion purposes only and is subject to detail design, engineering advice and all relevant consultant input, planning and Local Authority approvals.

Constraint information sourced from Lismore Local Planning Study by Lismore City Council 2006 - Northern Rivers Engineers, Planners & Surveyors, Rordon Consulting Surveyors and reported ground drilling.

Assumed approximately 12.8% compact extent of flooding, to be investigated & ground-truthed.

North Lismore Investigation Area
Proposed Urban Boundary and North Lismore Plateau Boundary

RPS

Appendix E – State Environmental Planning Policies

Table E.1
Consideration of State Environmental Planning Policies (SEPPs)

Title of SEPP	Applicable	Consistent	Reasoning
SEPP No. 1 - Development Standards	No	n/a	
SEPP No. 4 - Development without consent and miscellaneous complying development	No	n/a	
SEPP No. 6 - Number of storeys in a building	No	n/a	
SEPP No. 19 - Bushland in urban areas	No	n/a	
SEPP No. 21 - Movable Dwellings	No	n/a	
SEPP No. 21 - Caravan Parks	No	n/a	
SEPP No. 22 - Shops and commercial premises	No	n/a	
SEPP No. 30 - Intensive Agriculture	No	n/a	
SEPP No. 32 - Urban consolidation (re development of urban land)	No	n/a	
SEPP No. 33 - Offensive and hazardous development	No	n/a	
SEPP No. 36 - Manufactures Home Estates	No	n/a	
SEPP No. 41 - Casino / Entertainment Complex	No	n/a	
SEPP No. 44 - Koala Habitat Protection	Yes	-	Pending the initial gateway process determination, consultation with public authorities and further planning is required in accordance with planning requirements.
SEPP No. 49 - Tourism Accommodation in Private Homes	No	n/a	
SEPP No. 55 - Remediation of Land	Yes	-	Pending the initial gateway process determination, consultation with public authorities and further planning is required in accordance with planning requirements.
SEPP No. 60 - Exempt and complying development	No	n/a	
SEPP No. 62 - Sustainable Aquaculture	No	n/a	
SEPP No. 64 - Advertising and signage	No	n/a	
SEPP No. 65 - Design quality of residential flat development	No	n/a	
SEPP No. 72 - Linear Telecommunications Development - Broadband	No	n/a	
SEPP (Housing Sustainability Index: BASIX) 2004	Yes	-	BASIX is applicable to the planning proposal, pending the initial gateway process determination, consultation with public authorities and further planning of the community.
SEPP (Housing for Seniors or People with a Disability) 2004 - formerly Seniors Living			
SEPP (Major Development) 2005 - formerly Major Projects & State Significant Development	No	n/a	
SEPP (Infrastructure) 2007	Yes	-	Pending the initial gateway process determination, consultation with public authorities and further planning is required in accordance with planning requirements.
SEPP (Temporary Structures and Places of Public Entertainment) 2007	No	n/a	
SEPP (Affordable Rental Housing) 2009	No	n/a	
SEPP (Mining, Petroleum production and Extractive Industries) 2007	No	n/a	
SEPP (Temporary Structures) 2007	No	n/a	
SEPP (Rural Lands) 2008	Yes	-	The planning proposal will limit the rural potential of the site, however the intended use of the site will have a greater economic and social benefit to the community than the limited rural uses on the site.
SEPP (Exempt and Complying Development Codes) 2008	No	n/a	

Source: RPS

Appendix F – Section 117 Directions

Table F.1
Consistency with Section 117 Directions

Direction	Applicable	Consistent	Reason for Consistency
1. Employment and Resources			
1.1 Business and Industrial Zones	No	n/a	
1.2 Rural Zones			
protect the agricultural prodcution value of rural land.	Yes	Yes	The planning proposal will not adversely effect agrcicultural production as the site is not utilised for agricultural uses.
1.3 Mining, Petroleum Production and Extractive Industries	No	n/a	
1.4 Oyster Aquaculture	No	n/a	
1.5 Rural Lands			
protect the agricultural production value of rural land	Yes	Yes	The planning proposal will not adversely effect agrcicultural production as the site is not utilised for agricultural uses.
facilitate the orderly and economic development of rural lands for rural and related purposes	Yes	Yes	
2. Environment and Heritage			
2.1 Environment Protection Zones	No	n/a	
2.2 Coastal Protection	No	n/a	
2.3 Heritage Conservation			
planes of environmental heritage significance and indigenous heritage significance.	Yes	Yes	heriatge significance will not be effected. This needs to be re-addressed following the initial gateway process determination.
2.4 Recreation Vehicle Areas	No	n/a	
3. Housing, Infrastructure and Urban Development			
3.1 Residential Zones			
to encourage a variety and choice of housing types to provide for existing and future housing needs;	Yes	Yes	The planning proposal proposes to provide a range of residential types and densities within the 130 Ha site, offering a mix and mass of residential options.
to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services; and	Yes	Pending	The planning proposal will ensure that the site will be efficiently serviced by infrastructure and services. The provision of infrastructure to the site needs to be re-addressed through consultation with public authorities following the initial gateway process determination.
to minimise the impact of residential development on the environment and resource lands.	Yes	Yes	The planning proposal will have minimal impact on the surrounding environment and resource lands.
3.2 Caravan Parks and Manufactures Home Estates	No	n/a	
3.3 Home Occupations	No	n/a	
3.4 Integrated Land Use and Transport	No	n/a	
improving access to housing, jobs and services by walking, cycling and public transport, and	Yes	Pending	This will need to be addressed following the initial gateway process determination.
increasing the choice of available transport and reducing dependence on	Yes	Pending	This will need to be addressed following the initial gateway process determination.
reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and	Yes	Pending	This will need to be addressed following the initial gateway process determination.
supporting the efficient and viable operation of public transport services,	Yes	Pending	This will need to be addressed following the initial gateway process determination.
providing for the efficient movement of freight.	Yes	Pending	This will need to be addressed following the initial gateway process determination.
3.5 Development near License Aerodromes	No	n/a	

Table F.1 (cont.)
Consistency with Section 117 Directions

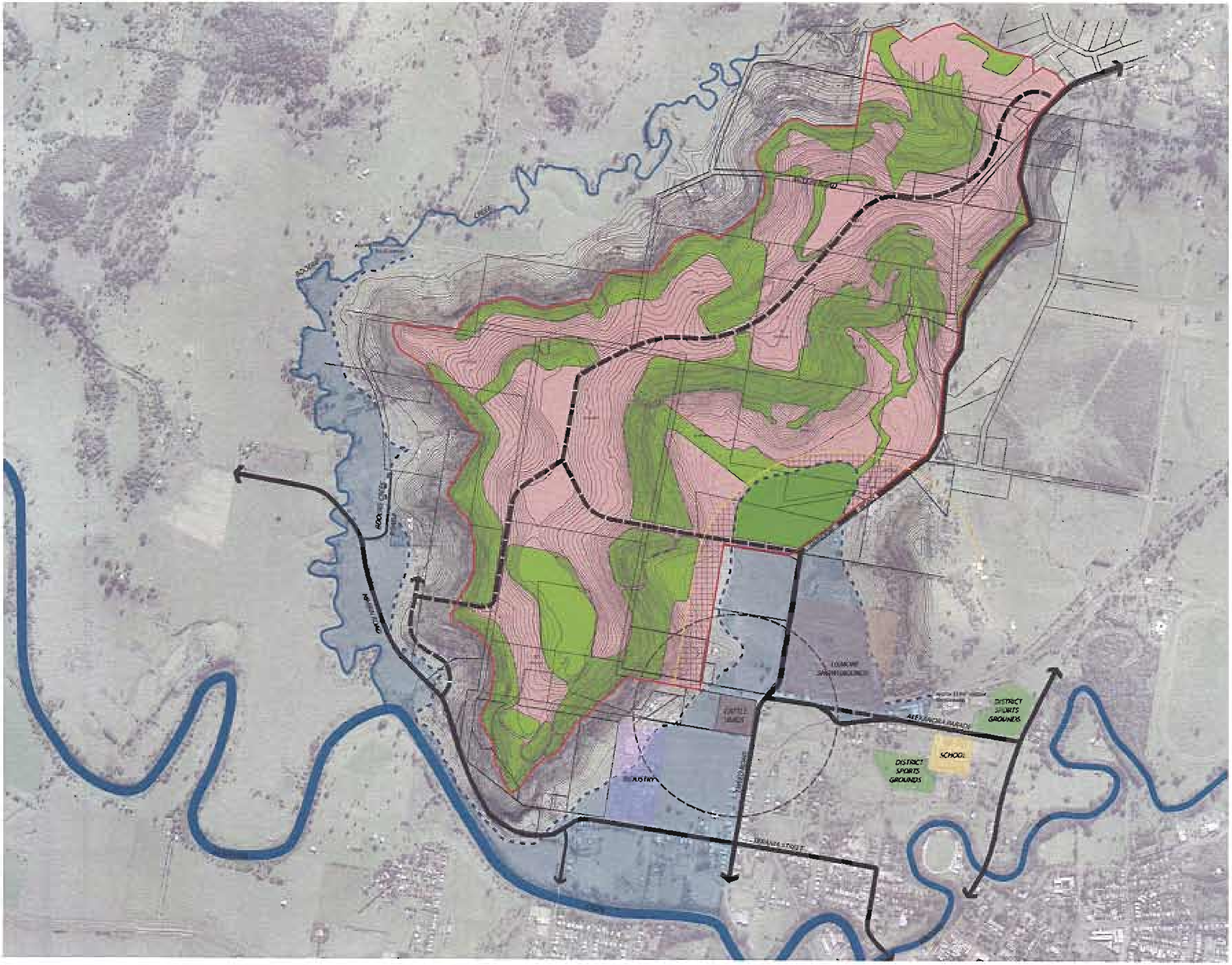
Direction	Applicable	Consistent	Reason for Consistency
4. Hazard and Risk			
4.1 Acid Sulfate Soils	No	n/a	
4.2 Mine Subsidence and Unstable Land	No	n/a	
4.3 Flood Prone Land	No	n/a	
4.4 Planning for Bushfire Protection to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and	Yes	Pending	This will need to be addressed following the initial gateway process determination, with consultation to occur between the RPA and the Commissioner of the NSW Rural Fire Service. The Final Planning Proposal will require an Asset Protection Zone.
to encourage sound management of bush fire prone areas.	Yes	Pending	This will need to be addressed following the initial gateway process determination, with consultation to occur between the RPA and the Commissioner of the NSW Rural Fire Service. The Final Planning Proposal will require an Asset Protection Zone.
5. Regional Planning			
5.1 Implementation of Regional Strategies give legal effect to the vision, land use strategy, policies, outcomes and actions contained in regional strategies.	Yes	Yes	The planning proposal is in keeping with the vision, land use strategies, policies, outcomes and actions contained within the Far North Coast Regional Strategy
5.2 Sydney Drinking Water Catchments	No	n/a	
5.3 Farmland of State and Regional Significnat on the NSW Far North Coast	Yes	Yes	Sections of the study area are mapped as regionally significant farmland. As the plateau area is identified for future urban development under the Far North Coast Regional Strategy the proposal to rezone regionally significant farmland is consistent with the Direction. As identified above the planned rezoning is consistent with all relevant objectives and provisions of the Far North Coasty Regional Strategy including projected population growth predictions, servicing and sustainability criteria.
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	No	n/a	
5.5 Developent in the vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	No	n/a	
5.6 Sydney to Canberra Corridor	No	n/a	
5.7 Central Coast	No	n/a	
5.8 Second Sydney Airport:Badgerys Creek	No	n/a	
6. Local Plan Making			
6.1 Approval and Referral Requirements to ensure that LEP provisions encourage the efficient and appropriate assessment of development.	Yes	Yes	The planning proposal does not alter provision relating to approval and referral requirements.
6.2 Reserving Land for Public Purposes	No	n/a	
6.3 Site Specific Provisions to discourage unnecessarily restrictive site specific planning controls.	Yes	Yes	The planning proposal is not unneccessarily restrictive at ot proposes meeting the development potential of the site.
7. Metropolitan Planning			
7.1 Implementation of the Metropolitan Strategy	No	n/a	

Appendix G – Traffic Report

Appendix H – Water Report

Appendix I – Sewer Report

Appendix J – Draft Structure Plan



LEGEND

- Investigation Subject Area - 345ha
- Potential Residential - 195ha
- Topographical / Environmental Features - 150 ha
- Proposed Major Roads
- Speedway Noise Impacts
- 400m Cattle Yard Buffer
- Approximate Flood Impacted Land

Note: These estimated areas, impact zones and the final location of internal roads are subject to further detailed site and environmental assessments

The Subject Area will cater for range of possible land-uses including, but not limited to, the following:

A Range of Housing Types, including:

- Standard Residential
- Medium Density Residential
- Affordable Housing
- Retirement and Aged Living

Mixed Use Sites:

- Community Centres
- Commercial and Retail Facilities
- Childcare Centres
- Educational Facilities

Open Space:

- Active and Passive Recreational Areas
- Neighbourhood Parks
- Conservation Areas
- Drainage and Infrastructure Facilities

Disclaimer:
All information shown on this plan is preliminary for discussion purposes only [illegible]

Constraint information [illegible]

Assumed approximate 12.5m contour [illegible] flooding, to be investigated & ground-truthed

North Lismore Plateau
Draft Concept Plan

PRELIMINARY FOR DISCUSSION PURPOSES ONLY

RPS

Appendix K – North Lismore Plateau Design Workshop

K.1 Introduction

The North Lismore Plateau design workshop was organised by Lismore City Council and held on the 16 and 17 of December 2010. The workshop was attended by approximately 20 council officers and landholder representatives. The agenda (including attendees) is attached for reference.

The workshop considered in detail the range of relevant social, infrastructure, environmental and urban design issues that will need to be addressed by the urban development of the NLP. This process was professionally facilitated by an experienced urban design professional from New Zealand (Mr Kobus Mentz).

The workshop proceeded in accordance with the agenda with a key resolution being to prepare a Planning Proposal for consideration by Council. The workshop also produced a detailed timeline for the submission and assessment of the Planning Proposal. This timeline is attached for reference.

Agenda

2 day design workshop - North Lismore Plateau

16 and 17 December 2010
Lismore City Council Corporate Centre, 43 Oliver Ave, Goonellabah

Agenda for DAY 1 - Thursday 16 December

8.00am **SITE VISIT – meet at Bounty Motel, 241 Keen St, Lismore**
Kobus Mentz, Jim Punch, Tony Riordan, Brent McAllister, Steve Denize only
(other workshop participants will have visited the site previously)

9.30am **WORKSHOP START**
Welcome
Objectives for the day:
- **Briefing/ sharing of technical information**
- **Address the 3 key issues (roading, speedway, sewerage treatment)**
- **Prepare masterplan (Day 2)**
- **Ensure Council's senior management and elected members are fully aware of the agreed way forward for the key issues associated with NLP**

Brent McAllister

9.35am **The day's agenda**
Kobus Mentz

9.45am **Landholder introductions** (10 mins each)
- **Winten Property Group**
  Jim Punch (Project Manager, Winten Property Group)
- **Riordans Consulting Surveyors**
  Tony Riordan

9.45am **Council staff briefing presentations** (5mins each)
- **Social context**
  Christine Minkov (Social Planner)
- **Planning context**
  Paula Newman (Coordinator Strategic Planning)
- **Lismore speedway**
  Matt Kelly (Environmental Health Compliance Coordinator)
- **Environmental context**
  Nick Stephens / Vanessa Tallon (Environmental Strategy Officers)
- **Economic development**
  Steve Denize (Manager Integrated Planning)
  Mark Batten (Business Facilitator)
- **Roads**
  Mike Perkins (Development Engineers)
- **Water & sewer**
  Rod Haig (Strategic Engineer – Water & Sewer)

10.40am **Design workshop**
Facilitated by Kobus Mentz

12.30pm **Lunch break**

1.00pm **Key issues & design options workshop**
Facilitated by Kobus Mentz

3.30pm
- **Gain consensus**
- **Summary of progress so far**

- **Where to from here?**

Kobus Mentz

4.00pm to 5.00pm **Briefing for Council General Manager, Executive Managers, elected Councillors, Staff and Landowners**
Kobus Mentz

Agenda for DAY 2 - Friday 17 December

9.30am **Worksop Start**
Objectives for the day
- **Prepare masterplan**

Brent McAllister

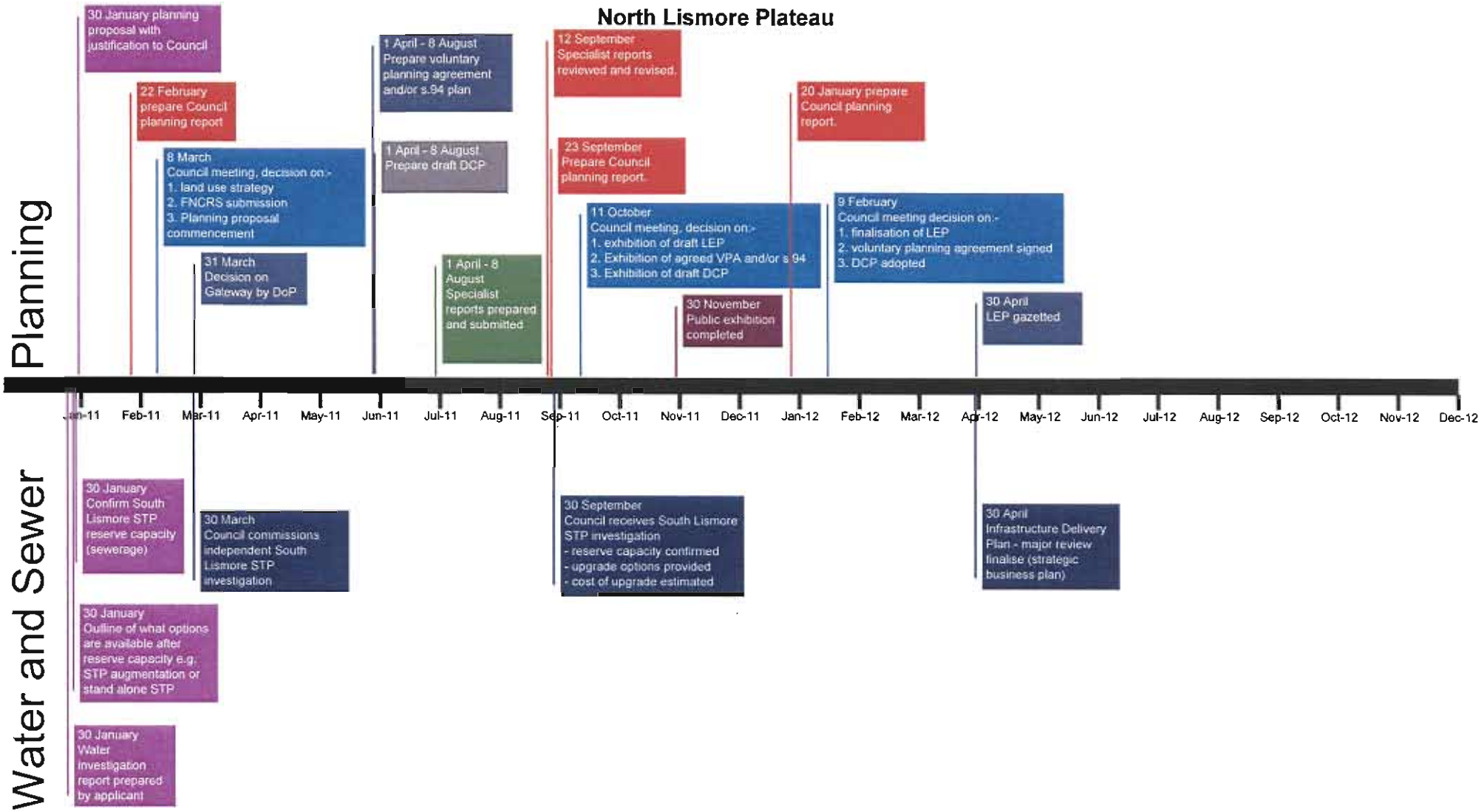
9.35am **Masterplan design workshop**
Facilitated by Kobus Mentz

12.30pm to **Lunch break**

1.00pm **Masterplan design workshop continues**
Facilitated by Kobus Mentz

3.00pm **Overview & where to from here?**
Kobus Mentz

4.00pm to 5.00pm **Briefing for Council General Manager, Executive Managers, elected Councillors, Staff and Landowners**
Kobus Mentz


North Lismore Plateau
Planning
30 January planning proposal with justification to Council
22 February prepare Council planning report
8 March
Council meeting, decision on:-
1. land use strategy
2. FNCRS submission
3. Planning proposal commencement
31 March
Decision on Gateway by DoP
1 April - 8 August
Prepare voluntary planning agreement and/or s.94 plan
1 April - 8 August
Prepare draft DCP
1 April - 8 August
Specialist reports prepared and submitted
12 September
Specialist reports reviewed and revised.
23 September
Prepare Council planning report.
11 October
Council meeting, decision on:-
1. exhibition of draft LEP
2. Exhibition of agreed VPA and/or s 94
3. Exhibition of draft DCP
30 November
Public exhibition completed
20 January prepare Council planning report.
9 February
Council meeting decision on:-
1. finalisation of LEP
2. voluntary planning agreement signed
3. DCP adopted
30 April
LEP gazetted
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Water and Sewer
30 January
Confirm South Lismore STP reserve capacity (sewerage)
30 January
Outline of what options are available after reserve capacity e.g. STP augmentation or stand alone STP
30 January
Water investigation report prepared by applicant
30 March
Council commissions independent South Lismore STP investigation
30 September
Council receives South Lismore STP investigation
- reserve capacity confirmed
- upgrade options provided
- cost of upgrade estimated
30 April
Infrastructure Delivery Plan - major review finalise (strategic business plan)

Attachment D

NORTH LISMORE PLATEAU STUDY AREA

FNCRS Boundary by Department of Planning

Proposed North Lismore Plateau Study Area (Approximately 285 Ha)

MGA

0 100 200 300

CIVIL DESIGN
SERVICES PTY LTD

NORTH LISMORE PLATEAU DEVELOPMENT
WATER SUPPLY INVESTIGATION

REPORT FOR ACM LANDMARK PTY LTD

June 2010

NORTH LISMORE PLATEAU DEVELOPMENT
WATER INVESTIGATION REPORT
FOR ACM LANDMARK PTY LTD

CONTENTS

1. INTRODUCTION 1

2. EXECUTIVE SUMMARY 1

3. INVESTIGATION APPROACH 2

4. DESIGN ASSUMPTIONS 3

5. ALTERNATIVE METHODS OF SUPPLYING
BOTH STAGE 1 AND FINAL DEVELOPMENT 5

6. NETWORK ANALYSIS 7

7. COST ESTIMATES 10

APPENDICES 15

APPENDIX A – NETWORK AND PRESSURE DIAGRAMS

APPENDIX B – CORRESPONDENCE SUPPLIED BY DAVID STEWART CONSULTING

APPENDIX C - COSTING INFORMATION PREPARED BY DAVID STEWART CONSULTING

NORTH LISMORE PLATEAU DEVELOPMENT
WATER INVESTIGATION REPORT
FOR ACM LANDMARK PTY LTD

---

1. INTRODUCTION

The proposed North Lismore Plateau Development is located on an area of approximately 100 hectares of land along the ridge above Dunoon Road, North Lismore. It is ultimately proposed to develop approximately 1000 lots on the site.

A water investigation report for the development was prepared for ACM Landmark Pty Ltd in September 2006 by Civil Design Services Pty Ltd. At that time the purpose of the report was to clarify previous costings that had been prepared by Lismore City Council for servicing the development as well as investigate various proposals for providing water supply to both the full development and the first stage of the project.

When commissioning the 2006 Report ACM Landmark requested that the following matters be investigated:

1. Determine to what extent Tullera Reservoir has additional capacity to provide for some first stage development of the Plateau.
2. Determine what level within the Plateau can be developed without a booster pump or the provision of alternative reservoirs.
3. Determine what level can be adequately serviced with the provision of a pumping station and/or storage.
4. Determine the size of the trunk main required to be constructed from Tullera Reservoir to service the proposed first stage development and ultimate development. Also determine the most appropriate route for such a trunk main.
5. Determine the cost of the above trunk main and any other associated works.
6. Give consideration to providing a connection to the existing 100 mm main in Dunoon Road.
7. Examine other water supply options/solutions should the Council subsequently advise that they consider that Tullera Reservoir no longer has the capacity to service a first stage development.

Various recommendations were made in the 2006 Report regarding the most suitable methods of servicing the development.

These recommendations have been revisited in the current report with costs being updated to June 2010.

2. EXECUTIVE SUMMARY

Investigations into the feasibility and costs associated with the provision of water supply to a proposed initial stage and the projected full development of a subdivision of North Lismore Plateau have concluded that it is possible to provide a practical and reasonably economical water supply to serve the development.

On review of the various alternative recommendations from past investigation reports it was decided that the most appropriate method of servicing Stage 1 of the North Lismore Plateau would be via the existing 1 Ml Tullera Reservoir which is located off Dunoon Road, approximately 3 km north-east of the proposed development. This reservoir is currently supplied via a 150 mm main connected to the Lismore bulk water supply main at Howards Grass. The reservoir is currently operating at slightly more than half its capacity, and is capable of meeting requirements of Stage 1 development without further amplification.

It is recommended that the full development of the North Lismore Plateau be served by adopting the same supply route as used for Stage 1. This would require the construction of a new 2.5 Ml reservoir adjacent to the existing reservoir and the amplification of the Rous Water trunk main to the reservoir.

The difficulty of providing the stipulated 30 m minimum head within the higher parts of the North Lismore Plateau can be overcome by the provision of variable speed booster pumps located in a pumping station constructed at the intersection of Dunoon and McLeay Roads.

3. INVESTIGATION APPROACH

The report prepared for ACM Landmark Pty. Ltd. in September 2006 reviewed the work previously undertaken in two previous investigations, namely

a) Northern Rivers Engineers, Planners & Scientists Report, August 1994
b) Cardno CCS Pty Ltd Report, February 2003

In addition, a summary of all water supply information that had previously been supplied from Lismore City Council and Rous Water was compiled and additional minimum information requirements determined. Approaches were made to Lismore City Council and Rous Water for the additional information required for accurate hydraulic modelling. This was later followed with a visit to the offices of both authorities for direct discussions with the appropriate engineering staff.

Subsequently additional information became available which is summarised below.

1) From Lismore City Council – Specification for the Design & Construction of Water Reticulation Pipework, July 1999

a) Static head to each lot should be between 30 m and 60 m with a minimum static head of 20 m under peak instantaneous demand at the property boundary.
b) The desirable maximum design head is to be 70 m.

2) From Rous Water (letter dated 7 July 2006)

a) Tullera Reservoir is serviced by a 150 mm gravity main connected to the trunk main at Howards Grass. Howards Grass Pumping Station is decommissioned and does not pump to Tullera Reservoir.

b) *Rous Water expects that there would be no need to provide additional chlorination at Tullera Reservoir as the increased demand would reduce the storage time in the reservoir.*
c) *Rous Water will supply the peak day demand nominated by Lismore City Council to Tullera Reservoir over 22 hours.*

3) From Rous Water (letter dated 15 August 2006)

a) *The existing trunk main at Howards Grass presently operates in the range of 176 m static to 115 m. The system at Howards Grass operates via pressure reducing and pressure sustaining valves which limit the pressure in the bulk main. These valves have been set up to operate under the existing demand conditions and will be adjusted as demand grows.*
b) *Rous Water is presently decommissioning the old 450 mm trunk main and it is anticipated that new pressure settings will be required during the upcoming summer demand period.*

4) Visit to Lismore Council and Rous Water by David Stewart, 31 August 2006

a) *Rous Water estimates it can supply approximately 1 Megalitre of water to Tullera Reservoir over a 24 hour period.*
b) *Flow into Tullera Reservoir is controlled by an altitude valve set to Lismore City Council.*

With the aid of the information that could be obtained, various alternative water supply systems for both the initial stage of the subdivision and the ultimate subdivision were assessed. These alternative designs were analysed using a water modelling program (EPANET 2.0).

Estimates of cost were determined for the designs chosen.

4. DESIGN ASSUMPTIONS

Due to the fact that information which could be obtained from both Lismore Water and Rous Water was not as complete as required at the time when the 2006 Report was prepared, it was necessary to make a number of assumptions to enable the water analysis to proceed.

The design standards adopted by Lismore Water and Rous Water for peak day flow at the time the 2006 Report was prepared were based on 2500 l/day/ET. These peak day flows were considered somewhat high in comparison to the standards which had then been adopted by other Australian Water Authorities. It was considered that, as the Lismore Plateau development would be self-contained and the houses in the development would be designed with water saving criteria in mind (BASIX design requirements), it would not be unreasonable to anticipate some lowering in average and peak demands. Reductions in the order of 10% would be considered conservative under the circumstances.

It was understood at the time that if water saving measures were adopted for the development, some reduction from the standard demand figure may be accepted by Lismore City Council.

To allow for peaking of demand throughout the day, the demand pattern adopted by Hunter Water was adopted and imposed on the peak day flow. Because of the overall final size of the development, no additional peaking factors were considered necessary.

It was only possible to obtain limited information regarding the head available in Rous Water's 450mm trunk main at Howards Grass. This information was a necessary modelling input as it determined the rate that Tullera Reservoir can be fed from the bulk supply, particularly in the initial stages of the North Lismore Plateau development. However, as Rous Water had stated that it estimated it could provide a day's supply of one Megalitre of water to Tullera Reservoir (during a 22 hour period), this information was used to estimate the average head required to be inserted into the network model at the Howards Grass model node.

To gain an accurate picture of the available head at Howards Grass it would be necessary to monitor the pressures in the main with a suitable pressure recorder over a reasonable period of time.

For the purposes of assessing Stage 1 requirements, the requirements for head at Howards Grass were assessed on the basis of full utilisation of the Tullera Reservoir. Accordingly, the head losses in the 150 mm reservoir feed have been assessed for the situation where Tullera Reservoir was required to be filled over a 22 hour period. This would require an average flow rate of 12.6 l/s.

Friction head losses in the 150 mm x 3420 m supply main would be approximately 17m. If the RL of the reservoir top feed inlet is RL 147, the required head in the trunk main would be RL 147 + 17 = RL 164. This is 12 m below the static head available.

A sensitivity analysis was performed with the network model to ascertain the minimum head required to maintain a stable supply to Tullera Reservoir once Stage 1 development was connected. It was concluded that a stable supply could be maintained to the reservoir if the average head at Howards Grass was maintained at RL 161 (flow rate 10.6 l/s). Once the average head fell to RL 159 it became evident that it would be difficult to sustain minimum levels in the reservoir (50% capacity).

Therefore, for modelling purposes it was assumed that a minimum average head of RL 161 could be reasonably be expected to be available at Howards Grass. If this assumption is contradicted by subsequent data from Rous Water then it will be necessary to downgrade the level of demand that can be supplied from the reservoir.

Regarding fire flows, the performance of supply system was checked at critical nodes using a flow rate of 25 l/s applied for one hour to coincide with the peak hourly flow.

5. ALTERNATIVE METHODS OF SUPPLYING BOTH STAGE 1 AND FINAL DEVELOPMENT

a) Stage 1

It is considered possible to service an additional 150 to 200 additional lots from the existing Tullera Reservoir, based on information supplied by Rous Water. The potential size of a Stage 1 release (up to 163 lots) would fall within this available range.

The existing 150 mm supply main to the reservoir should also be adequate to service Stage 1 requirements, subject to assumption set out above.

An "internal" trunk main would need to be laid from Tullera Reservoir to the central part of Stage 1. This would initially be laid from the reservoir, along Dunoon Road to the intersection of Dunoon Road and McLeay Road.

As adequate pressures cannot be achieved in the higher parts of the Stage 1 development, it is proposed that a booster pumping station be located at the intersection of Dunoon Road and McLeay Road to boost residual pressures to acceptable levels. This is in accordance with the recommendations of the 1994 Report by Northern Rivers Engineers, Planners & Scientists and is still considered the most satisfactory site for this station.

As considered in the 1994 Report there are two alternative routes for this main after the booster station.

The first alternative, and the one still considered most suitable, is to lay the main along the ridge contour through land that will be developed at a later stage. This will necessitate conforming to the road layout for these later stages. This is not considered unreasonable, as the location of the subdivision ring road will follow contours and is unlikely to be changed greatly from its present designated position at a later date. However, the final location of the trunk main through the intervening land to the first stage of the subdivision would need to be reviewed as planning progresses and designs evolve.

A second alternative supply route could be provided by laying the main all the way along Dunoon Road from the reservoir and along the access road to Stage 1. However this route has many practical difficulties from a construction point of view as the road reserve is narrow and has a steep cross slope with limited shoulders.

Although this route would avoid the complications associated with determining its location in relation to future roadways, its route along the valley floor would lead to excessive pressures in part of the main (up to 130 metres head). This drawback is avoided with the first alternative, which is why it has been preferred.

No additional high level storage was considered necessary in the first stage development. This was deemed unnecessary on the basis of perceived risks to supply. In the event of a pump or power supply failure there would still be sufficient hydraulic head available from Tullera Reservoir to maintain an adequate supply of water to the higher lots in Stage 1.

b) Final Development

Depending on the actual demand generated from full development of Stage 1, subsequent development beyond Stage 1 of Lismore Plateau would, at some point, require the construction of additional storage to supply demand and guarantee security of supply.

It was considered that a best alternative would be to construct an additional reservoir alongside the existing Tullera Reservoir and supply the development via the same pipeline route as used for Stage 1. There appears to be no physical impediments to siting another reservoir alongside the existing reservoir although additional land may need to be acquired to accommodate the reservoir.

Calculations have revealed that it would be possible to utilise the Stage 1 trunk main from Tullera Reservoir to the development as the final trunk main, thereby avoiding the need for future amplification works.

For the final stages of the development it would be necessary to lay an additional length of 3420 m of trunk main from Howards Grass to the site of the new Tullera Reservoir. The provision of this additional trunk main would be the responsibility of Rous Water and its cost would be covered under current Rous Water headworks charges.

The major advantage of this proposal is that the new reservoir will be able to utilise the additional elevation afforded by the present reservoir site. This would allow the entire development to be supplied under gravity head (admittedly at lower than normal pressures).

It is further considered that the new Tullera Reservoir and trunk main feed should be sized to serve the full Lismore Plateau on its own without making use of any current spare capacity in the existing reservoir in the long term. This will allow the present reservoir and trunk main to be dedicated to serving the existing development in the area, along with any future growth in the surrounding villages.

The Lismore Plateau consists of two natural high parts of the ridge (north and south) with an elevation of RL 130. They are separated by a shallow depression with a level which varies from RL 105 to RL110.

This has created the opportunity to create two separate hydraulic zones within the Lismore Plateau development, namely, a "northern" and a "southern" zone. Each can be separately serviced from the proposed pumping station at the intersection of Dunoon Road and McLeay Road by direct boosting of pressure.

The advantages of such a system is that it will allow the use of smaller internal trunk mains (now only required to serve part of the development), and permit better control of pressures within each zone.

It would be relatively straightforward to link both zones so that one could be supplied from the other in the event of a part system failure.

6. NETWORK ANALYSIS

EPANET 2.0 was the hydraulic network program used to analyse the performance of the various supply alternatives considered.

EPANET 2.0 is a Windows based program developed by the Water Supply and Water Resources Division of the U.S. Environmental Protection Agency that performs extended period simulations of hydraulic and water-quality behaviour within pressurized pipe networks. It is public domain software (refer to website www.epa.gov for a full description of the capabilities of the program).

EPANET was specifically developed to help water utilities maintain and improve the quality of water delivered through their distribution systems. It provides a fully-equipped, extended period hydraulic analysis package which can handle systems of any size and perform a wide variety of modelling functions. Various data reporting and visualization tools are used to assist in interpreting the results of a network analysis. These include graphical views, tabular views and special reports.

Network analyses were performed to cover the performance of the options considered.

These are listed as follows with individual file names:

1. Stage 1 development with boosted flows (Lismore Plateau trial 3.NET)
2. Stage 1 development fed entirely from Tullera Reservoir without boosting (Lismore Plateau trial 5.NET)
3. Stage 1 development with boosted flows and fire flow of 25l/s applied at Node 14 (Lismore Plateau trial 3F.NET)
4. Stage 1 development fed entirely from Tullera Reservoir and fire flow of 25 l/s applied at Node 14 (Lismore Plateau trial 5F.NET)
5. Full development with boosted flows (Lismore Plateau Full Stg Trial A.NET)
6. Full development fed entirely from Tullera Reservoir without boosting (Lismore Plateau Full Stg Trial B.NET)
7. Full development with boosted flows and fire flows of 25l/s in each zone (Lismore Plateau Full Stg Fire Trial A.NET)
8. Full development fed entirely from Tullera Reservoir without boosting and fire flow of 25 l/s in each zone (Lismore Plateau Full Stg Fire Trial B.NET)

The network diagrams for each of the above simulations have been included in Appendix A of the report.

All network simulations were run over a 72 hour time frame and the results noted.

Bearing in mind the noted assumptions regarding the pressures in the Rous Water bulk supply main at Howards Grass, the results of the various network analyses were as follows:

1) Stage 1 - General

The trunk main from Tullera Reservoir to the booster pumping station was sized at 300mm and the trunk main from the pumping station to Stage 1 development was sized at 250 mm. The sizes selected were selected to suit the ultimate development.

An allowance was made for demand from existing development with a demand node created just downstream of the reservoir.

A pressure reducing valve was installed on the Stage 1 access road to control high heads in the lower blocks near Dunoon Road.

The booster pump was sized to deliver 10 l/s @ 15 m head. The operation of the pump was controlled by the pressure at Node 13 (RL 130). In practice, variable speed pumps would be employed so that the output of the pumps can match demand, allowing better control over pressures.

2) Stage 1 Results

With boosted flows, the level of Tullera Reservoir varied over a 2 m range over a 24 hour period. The variation of pressure at Node 13 (RL 130) varied from 35 m to 30 m over the same period. Pumping of the booster pump was continuous.

With non-boosted supply direct from Tullera Reservoir, the pressure head at Node 13 varied from 17m to 14.6 m head.

When fire flows of 25 l/s were imposed at Node 14 (RL 130) the residual heads obtained were:

1) Boosted flows – 7m
2) Non-assisted flow – 7 m

3) Stage 1 Observations

With boosting of flows, it was possible to maintain a minimum of 30 m head at the highest parts of Stage 1 over a 24 hour period.

If only the head from the current Tullera reservoir was available then it would be possible to maintain pressures in the range 14.6 m to 17 m. These pressures would be acceptable under emergency conditions.

If development was to be restricted to those parts of the subdivision where a minimum of 30 m head could be supplied from Tullera Reservoir without pumped assistance, then the maximum level of blocks would need to be kept below RL 115. This would severely impact on the design and viability of the subdivision.

Under all conditions it would be possible to maintain a fire flow of 25 l/s with sufficient residual pressure (7 metres minimum).

4) Conclusions

Based on initial analysis there appears to be no reason why Stage 1 of the Lismore Plateau Development could not be serviced by the spare capacity available in the Tullera Reservoir.

To provide the minimum head requirements of 30 metres stipulated by Lismore City Council, boosting of flows would be required. Variable speed pumps would be used to give better control over pressure as demand varies throughout the day and night.

As there will still be adequate pressure available in the system should the booster pumps be unable to operate, there is little risk to supply in adopting this option.

1) Full Development - General

To cater for the full development of Lismore Plateau it will be necessary to construct additional reservoir storage.

To service the development it is proposed that an additional 2.5 Ml reservoir be constructed alongside the existing Tullera Reservoir (20 m dia x 8 m water depth). This reservoir would be devoted solely to serving the subdivision, with the existing reservoir returning to its original function of serving the surrounding villages and properties.

To supply the new reservoir a new 250mm x 3420 m long trunk main would need to constructed parallel to the existing 150 mm main which supplies the existing Tullera Reservoir from the Lismore bulk water supply main at Howards Grass.

There would be no change in the trunk main from Tullera Reservoir to the pumping station or the trunk main from the pumping station to Stage 1 ("Southern" zone) as these pipes would be initially sized to suit the ultimate development.

A 200 mm trunk main would be laid from the pumping station to service the northern pressure zone of the development.

The booster pumps for the southern zone would need to be sized to deliver 35 l/s @ 19 m head, while the booster pumps for the northern zone would need to be sized to deliver 18 l/s at 17 m head. The operation of the pumps would be controlled by pressure sensors located at high points in both zones.

2) Full Development Results

A sensitivity analysis on the effects of varying the available pressure head in the bulk supply main at Howards Grass indicated that pressure heads could drop to RL 152 before supply problems were experienced at the new Tullera Reservoir. This was the

result of the lower friction head losses in the proposed 250 mm pipeline when compared with the present 150 mm pipeline. However, the pressure head of RL 161 m adopted for the Stage 1 network analysis was maintained for the full stage analysis.

With boosted flows, the level of Tullera Reservoir varied little from full level over a 24 hour period. The variation of pressure at Node 48 (same as Node 13 in Stage 1) in the southern zone varied from 43 m to 29 m over the same period. The variation of pressure at Node 23 (RL129) in the northern zone varied from 40 m to 31 m. Operation of the booster pumps was continuous. In practice these variations in pressure would be controlled by variable speed pumping.

With unassisted supply direct from Tullera Reservoir, the pressure head at Node 48 in the southern zone varied from 18m to 9 m head, while the pressure head at Node 23 in the northern zone varied from 18m to 13 m head.

When fire flows of 25 l/s were imposed the following results were obtained at Nodes 48 and 23:

Scenario	**Southern Zone**	**Northern Zone**
Boosted Flows	4.5 m residual	7.9 m residual
Tullera Res head only	-3.5 m residual	2.6 m residual

3) Full Development Observations

With boosting of flows, it was possible to maintain a minimum of 30 m head at the highest parts of both zones over a 24 hour period.

In the event of pump failure, the head available from the Tullera Reservoir would be capable of maintaining pressures at the highest points in the subdivision in the range 8 m to 17 m. These pressures would be acceptable under emergency conditions.

4) Conclusions

Based on initial analysis it would be feasible to serve the full development of Lismore Plateau with the provision of additional storage adjacent to the present Tullera Reservoir.

To provide the minimum head requirements of 30 metres stipulated by Lismore City Council boosting of flows would be required. In practice variable speed pumps would be used to give better control over pressure as demand varies throughout the day and night.

As there will still be adequate pressure available in the system should the booster pumps be unable to operate, there is little risk to supply in adopting pressure boosting without high level storage.

7. COST ESTIMATES

Preliminary cost estimates were prepared in the 2006 Report by David Stewart Consulting for both the proposed initial stage of the development comprising approximately 163 lots and the fully developed subdivision. These have been updated to June 2010 by applying CPI increases which have taken place since June 2006. All costs have accordingly been increased by 11%.

In the 2006 Report costs and unit rates were based on cost rates from several similar recent constructed works along the NSW East Coast. A comparison was also made with Hunter Water Corporation costing data, indexed for CPI increases. Watermain costs have been based on "greenfield" rates with an allowance in excavation rates for 20% rock. An additional factor of 5% was applied to cover expected differences in construction costs between the Newcastle Region and Lismore.

A summary of the adopted unit rates and costings as recommended by David Stewart Consulting is included in Appendix C.

No allowance was made for the provision of power to the site of the proposed booster station. It was noted however that there is an 11 kV supply available at the site of the reservoir and the booster pumping station.

Costs that may be involved in the acquisition of land and easements have been excluded.

Except where noted, the allowances of 15% that have used in previous investigations for both survey, investigation and design (SID) costs and contingencies have been increased in the current investigation to 16% for SID and 20% for contingencies.

The approach taken to determining the costs that would need to apportioned to both Stage 1 and the final development is as follows:

1. Rous Water Charges

Each stage would be subject to the major works amplification charges set by Rous Water. In 2006 these charges were $3275/ET (these charges may have increased since 2006).

It has been ascertained from Rous Water that the proposed amplified trunk main from Howards Grass to the new 2.5 Ml reservoir would be Rous Water's responsibility and its cost would be covered by the current $3275/ET amplification charge. Although the model has been based on a separate 250 mm trunk main, with the existing 150 mm trunk main continuing to serve the present reservoir, it is anticipated that Rous Water would install a single trunk main to serve both reservoirs.

2. Lismore Water Charges

Although the existing Tullera reservoir is currently controlled by Rous Water, it is understood that the new reservoir would fall under the control of Lismore Water. Therefore Lismore Water could recover the cost of the new reservoir as part of its subdivision amplification charges or alternatively the developer could construct the reservoir as works in kind to be offset against Water Headwork contributions.

The cost of constructing a new 2.5 Ml reservoir alongside the existing Tullera Reservoir, including overheads, is now estimated to be $1,309,000

Based on a final anticipated development of approximately 1000 ET, the amplification charge per ET for the new reservoir would be $1309/ET.

Major works, such as "internal" trunk mains and pumping stations, located downstream of the new Tullera Reservoir would fall under the control of Lismore Water. As it is anticipated that Lismore Water would expect developers to initially outlay all the funds necessary to construct the major works that are required to service the first stage development, the charges set out below are presented for comparative purposes only.

As stated earlier in this report it has been proposed that the overall development be separated into two supply zones, with each supply zone having its supply boosted by pumping so as to maintain a minimum pressure of 30m head as required by Lismore Water.

Under such a proposal the following major works would be required:

1840 m of 300 mm pipe to Booster Station
2620 m of 250 mm pipe, 813 m of 200 mm pipe for "internal" trunk mains

Cost of pipework, including overheads - $1,798,000

Booster Pumping Station (four variable speed pumps – two for each pressure zone)

Estimated cost, including overheads - $468,000 (excludes land and power costs)

Cost of trunk main and pumping works falling under control of Lismore Water =
$1,798,000 + $468,000 = $2,266,000

Total ET served (full development) – 1000

Charge for trunk main and pumping station works - $2266/ET

Total major works costs for works falling within the control of Lismore Water =
$1,309,000 + $2,266,000 = $3,575,000

3. Water Reticulation Costs (to be borne by Developers)

(a) Stage 1 Development (163 lots)

It is assumed that all costs for trunk and reticulation works downstream of Tullera Reservoir will initially be borne by the Stage 1 developer. Any recovery of part of these costs from subsequent developments utilising these works is outside the scope of this report. However as a general rule these costs are shared by benefiting developments.

It is assumed that Lismore Water will apply an amplification charge of $1309 to cover the future cost of the new 2.5 Ml Tullera Reservoir.

In addition it is assumed that Rous Water will apply amplification charges of $3275/ET for bulk water amplification which would include the future trunk main amplification from Howards Grass to Tullera Reservoir.

1. Internal Reticulation

i). 3931 m of 150mm reticulation @ $166.50/m		$654,500
ii) 1916 m of 100 mm reticulation @ $138.75/m		$265,800
		$920,300
Cost before overheads	Say	**$921,000**
SID, 16%		$147,400
Contingencies, 20%		$184,200
Cost with overheads		$1,252,600
	Say	**$1,253,000**

2. Trunk Main and Pumping Station Costs Downstream of Tullera Reservoir

i) 1840 m of 300mm main @ $311/m		$571,900
ii) 2620 m of 250mm main @ $228/m		$596,200
		$1,168,100
Cost before overheads	Say	**$1,168,000**
SID, 16%		$186,900
Contingencies, 20%		$233,600
Cost with overheads		$1,588,500
	Say	**$1,589,000**

iii) Booster Pumping Station		$222,000
SID, 16%		$35,500
Contingencies, 20%		$44,400
Cost with overheads		$301,900
	Say	**$302,000**

Total for Item 2 (= $1,589,000 + $302,000) **$1,891,000**

3. Lismore Water Amplification Charges for Future Reservoir

163 lots @ $1309/ET	$213,400

3. Rous Water System Amplification Charges

163 lots @ $3275/ET (current rate to be confirmed)	$533,825
Total Subdivider's Costs for Stage 1 Water (rounded to '000's)	**$3,901,000**
Cost per lot	**$23,930**

Note: Trnnk Main and Pumping Station may be considered for offset against Water Headworks as works in kind (total $747,200)

(b) Fnll Subdivisional Development (Equivalent ET = 956)

1. Internal Reticulation

i) 13210 m of 150 mm reticulation @ $166.50/m		$2,199,500
ii) 9120 m of 100 mm reticulation @ $138.75/m		$1,265,400
		$3,464,900
Costs before overheads	Say	**$3,465,000**
SID, 16%		$554,400
Contingencies, 20%		$693,000
Cost with overheads		$4,712,400
	Say	**$4,713,000**

2. Trunk Main and Pumping Station Costs Downstream of Tullera Reservoir

i) 1840 m of 300mm main @ $311/m		$571,900
ii) 2620 m of 250mm main @ $228/m		$596,200
iii) 813 m of 200mm main @ $189/m		$153,400
		$1,321,500
	Say	**$1,322,000**
SID, 16%		$211,500
Contingencies, 20%		$264,400
Cost with overheads		$1,797,900
	Say	**$1,798,000**
iv) Booster Pumping Station		$344,100
SID, 16%		$55,100
Contingencies, 20%		$68,800
Cost with overheads		$468,000
	Say	**$468,000**
Total for Item 2 (= $1,798,000 + $468,000)		**$2,266,000**

3. Lismore Water – Reservoir Charges

1000 ET @ $1370/ET	**$1,370,000**

4. Rous Water System Amplification Charges

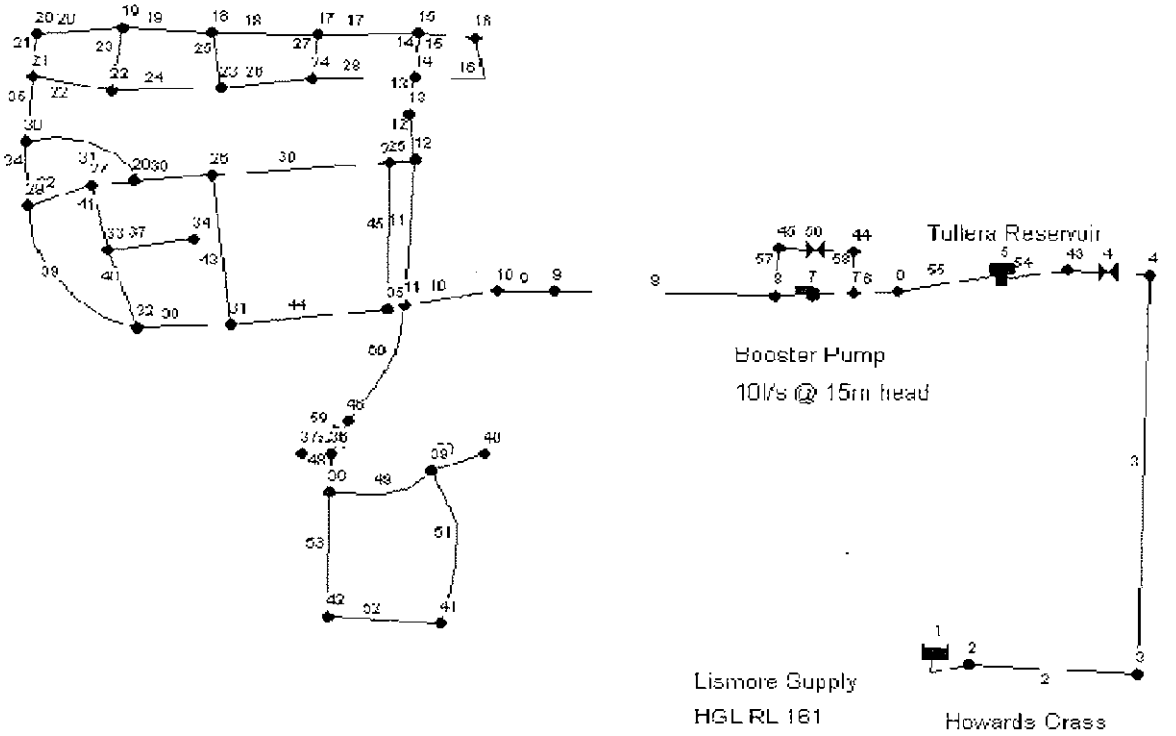
1000 ET @ $3275/ET (rate to be confirmed)	**$3,275,000**
Total Cost to Subdividers for Full Development	**$11,420,000**
Cost per ET	**$11,946**

Note: Trunk Main and Pumping Station may be considered for offset against Water Headworks as works in kind (total $4,645,000)

APPENDICES

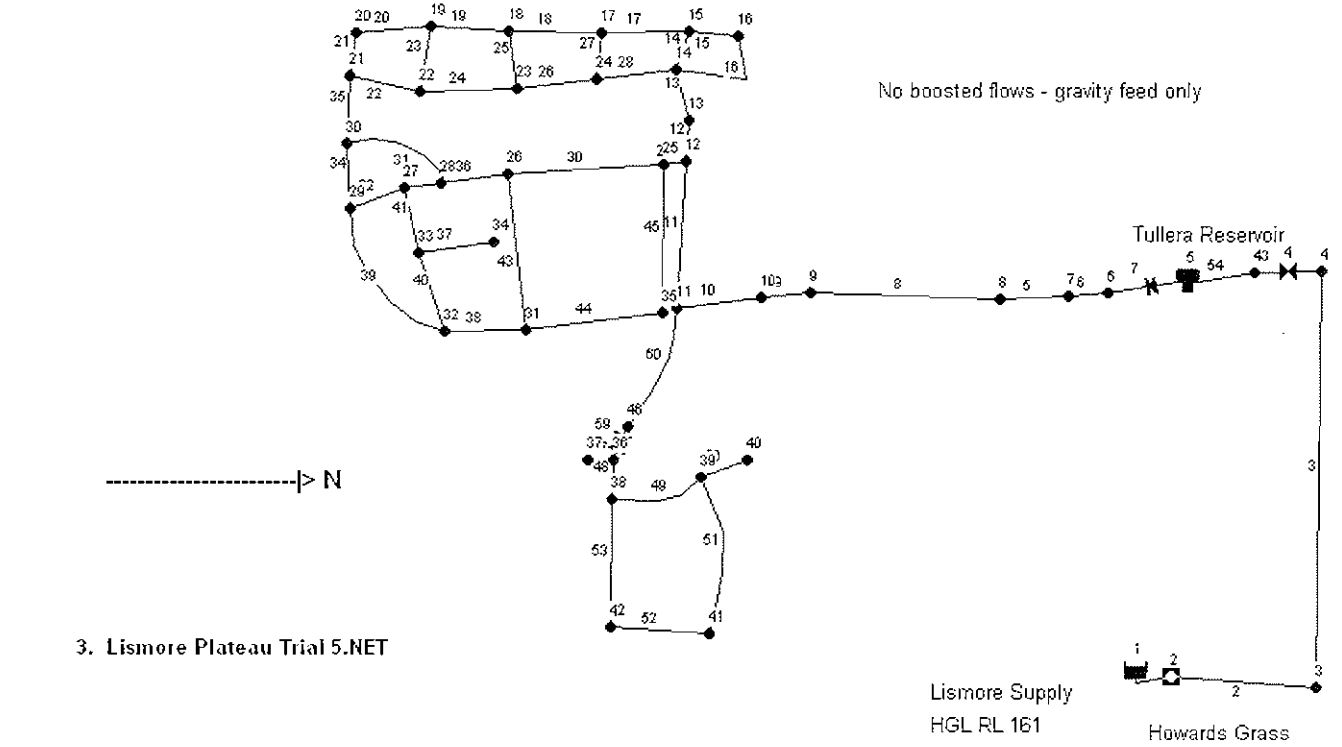
APPENDIX A
NETWORK AND PRESSURE DIAGRAMS

NORTH LISMORE PLATEAU STAGE 1 DEVELOPMENT



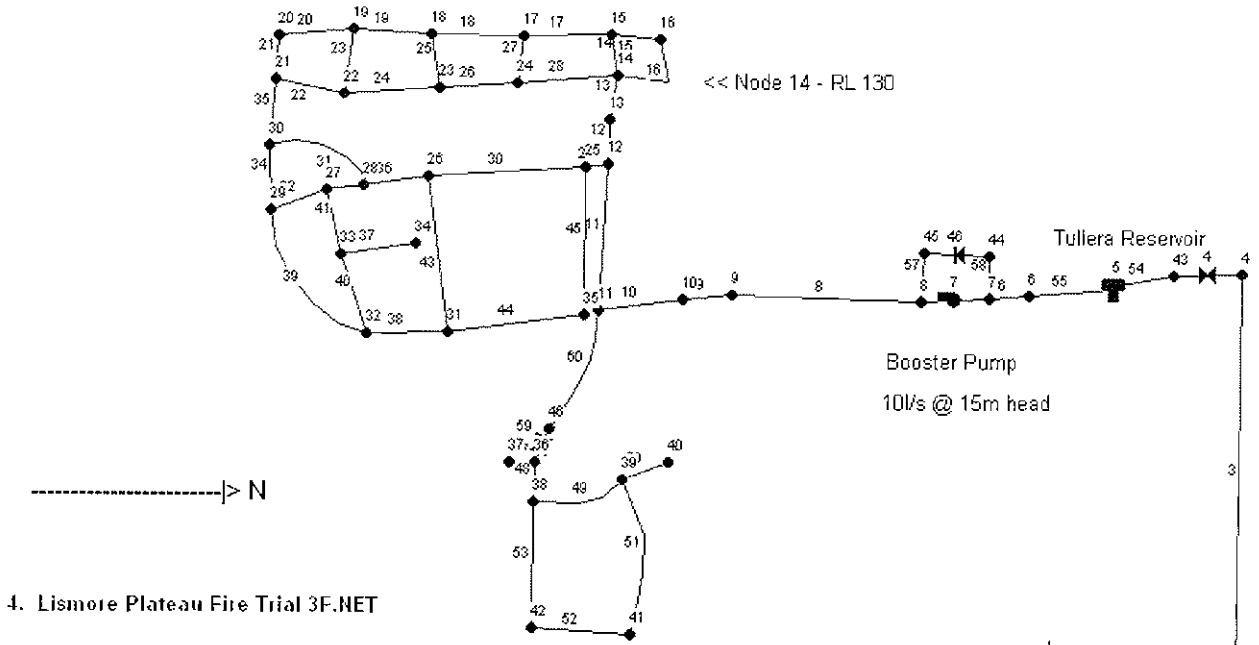
Lismore Plateau trial 3.NET

NORTH LISMORE PLATEAU STAGE 1 DEVELOPMENT



3. Lismore Plateau Trial 5.NET

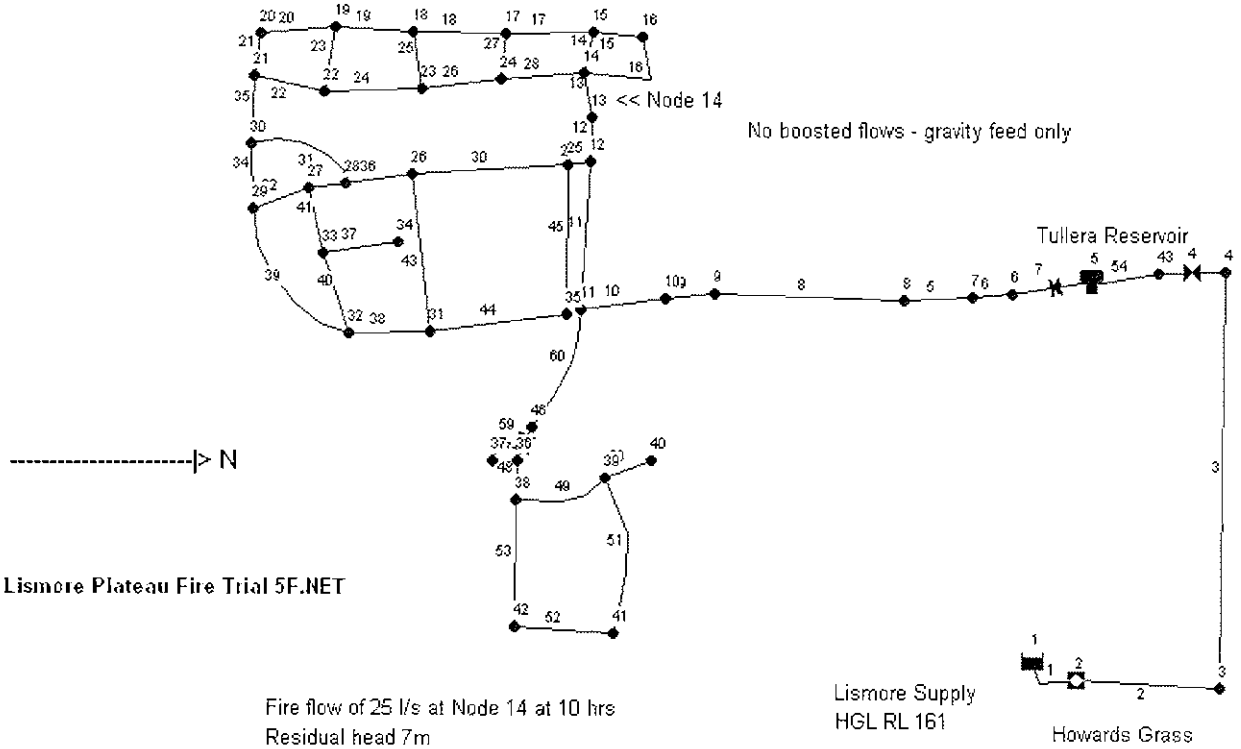
NORTH LISMORE PLATEAU STAGE 1 DEVELOPMENT



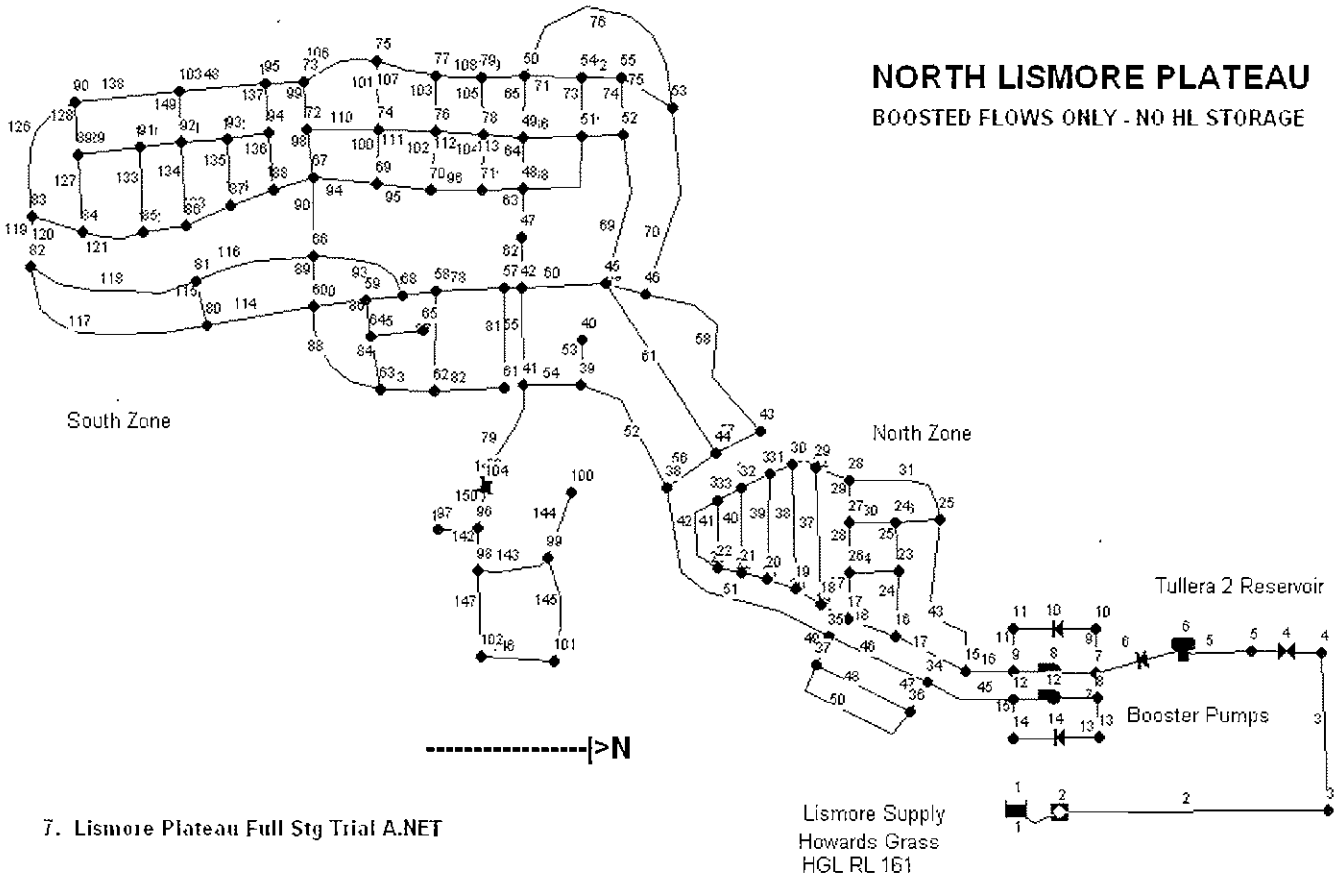
4. Lismore Plateau Fire Trial 3F.NET

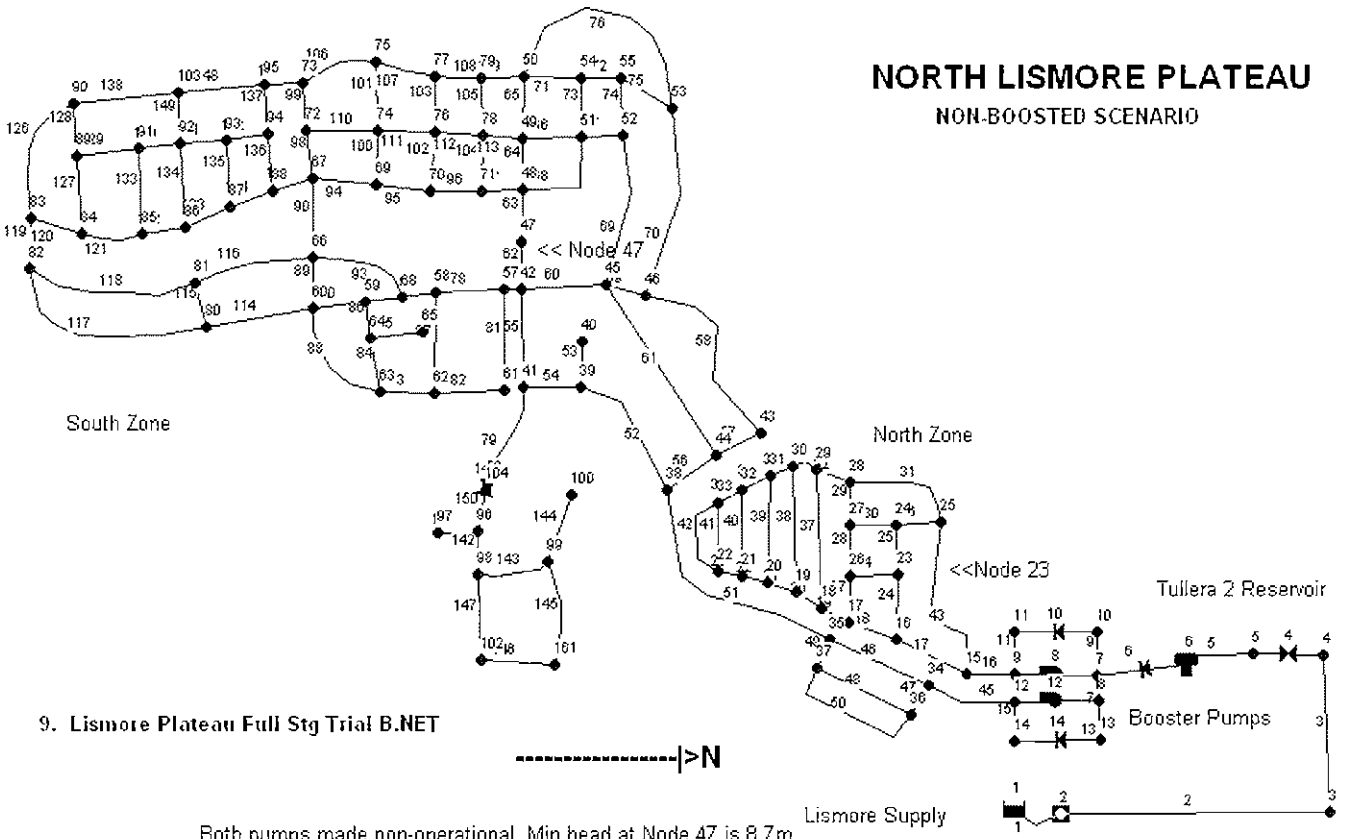
Fire flow of 25l/s applied at Node 14 at 10hrs
Residual head 7m.

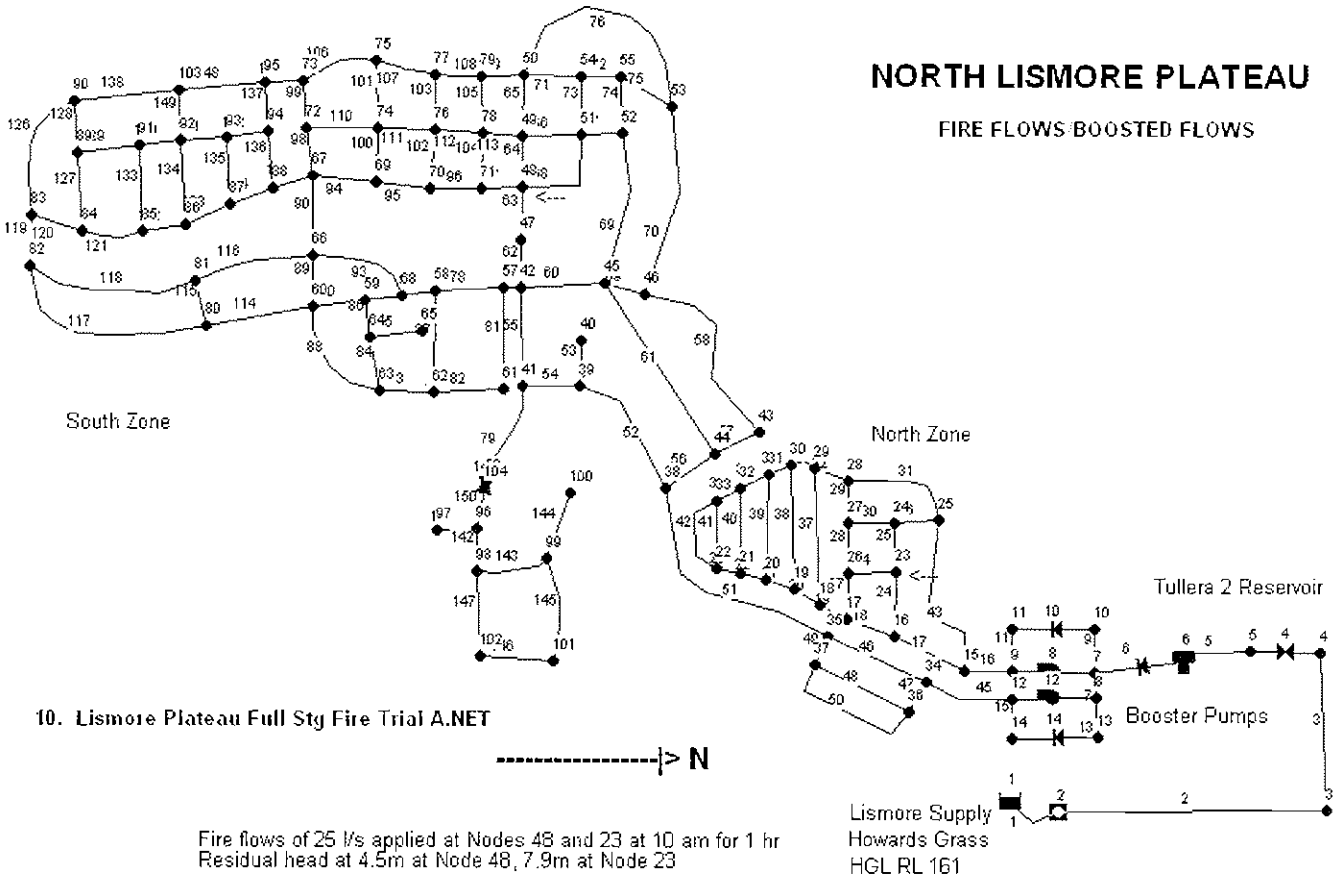
NORTH LISMORE PLATEAU STAGE 1 DEVELOPMENT

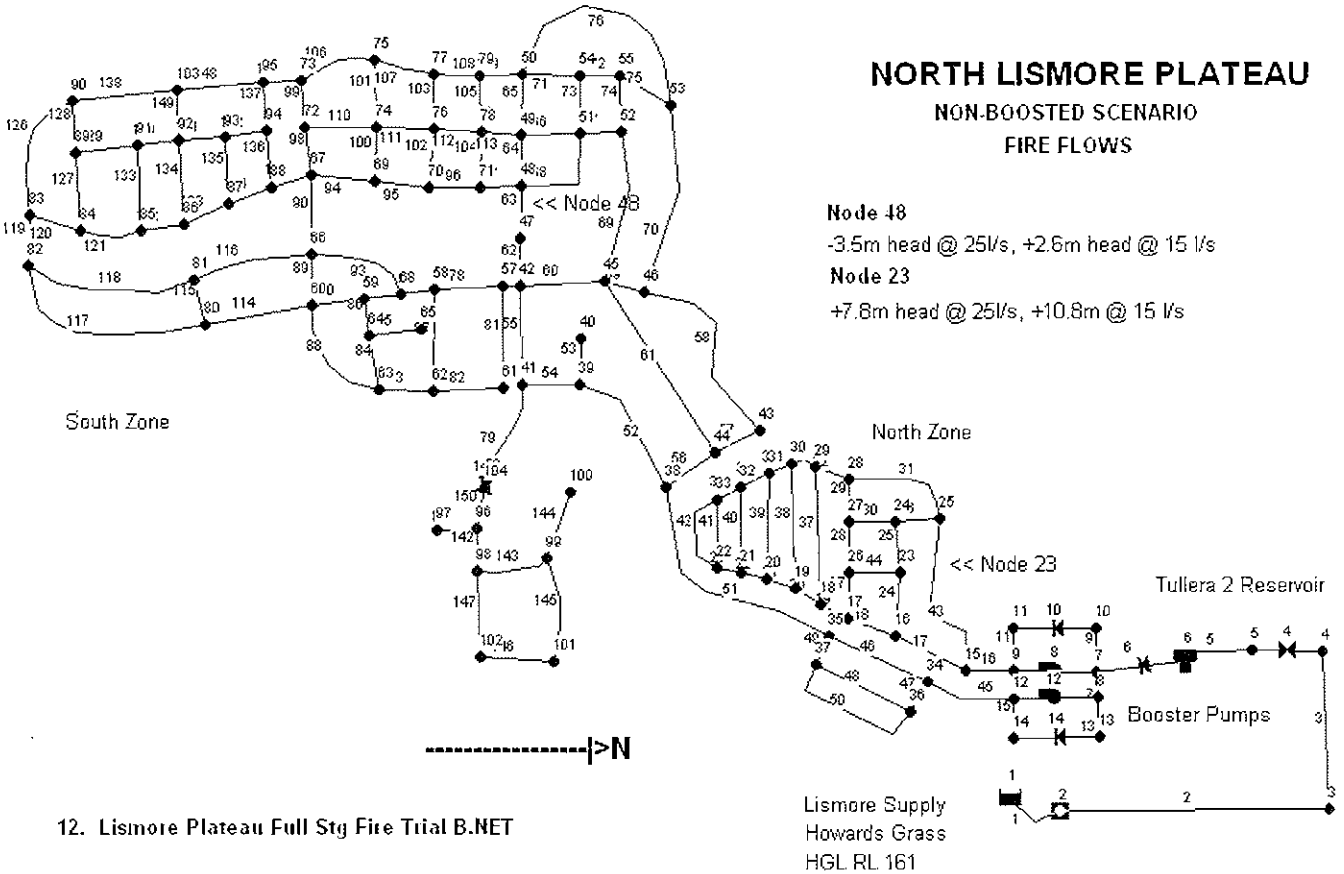


6. Lismore Plateau Fire Trial 5F.NET

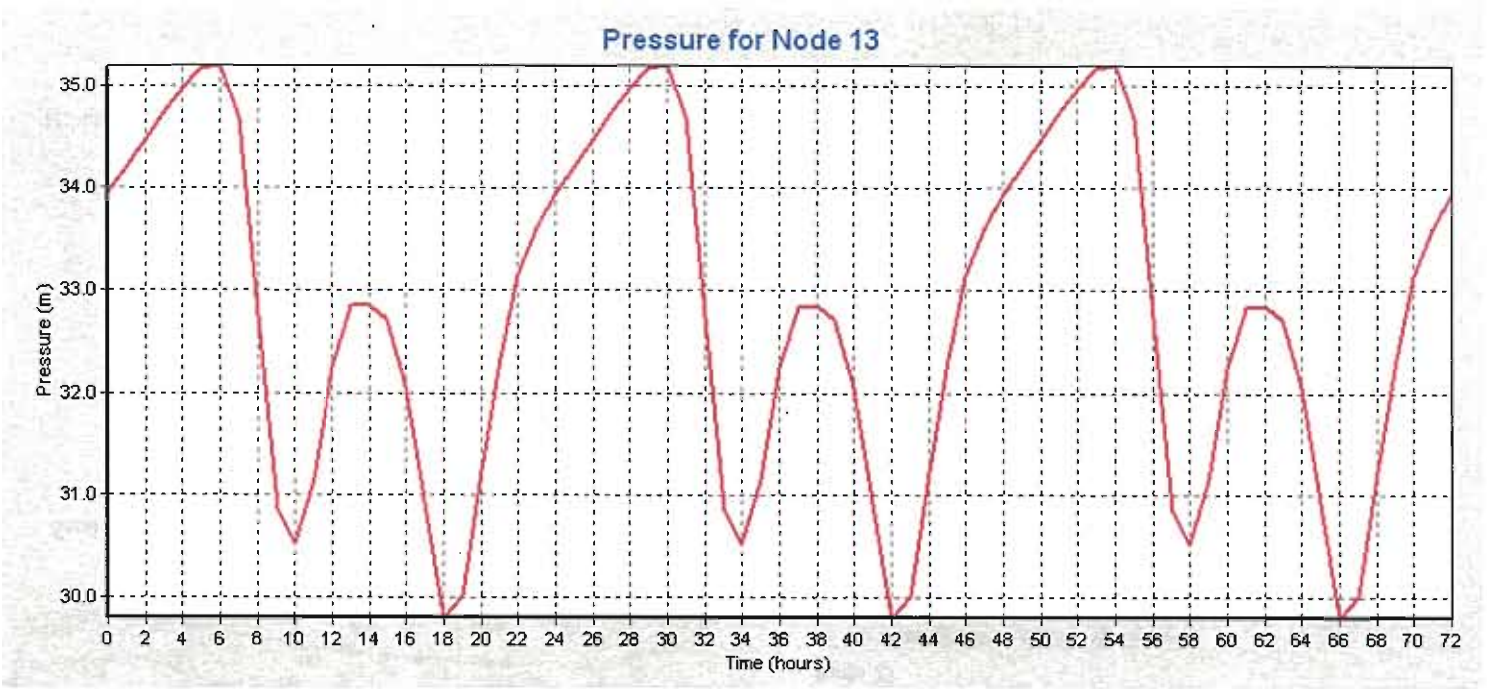

NORTH LISMORE PLATEAU
BOOSTED FLOWS ONLY - NO HL STORAGE
South Zone
North Zone
Tullera 2 Reservoir
Booster Pumps
----------|>N
Lismore Supply
Howards Grass
HGL RL 161
7. Lismore Plateau Full Stg Trial A.NET


NORTH LISMORE PLATEAU
NON-BOOSTED SCENARIO
<< Node 47
South Zone
North Zone
<<Node 23
Tullera 2 Reservoir
Booster Pumps
Lismore Supply
Howards Grass
9. Lismore Plateau Full Stg Trial B.NET
----------|>N
Both pumps made non-operational. Min head at Node 47 is 8.7m
Min head at Node 23 is 12.8m.

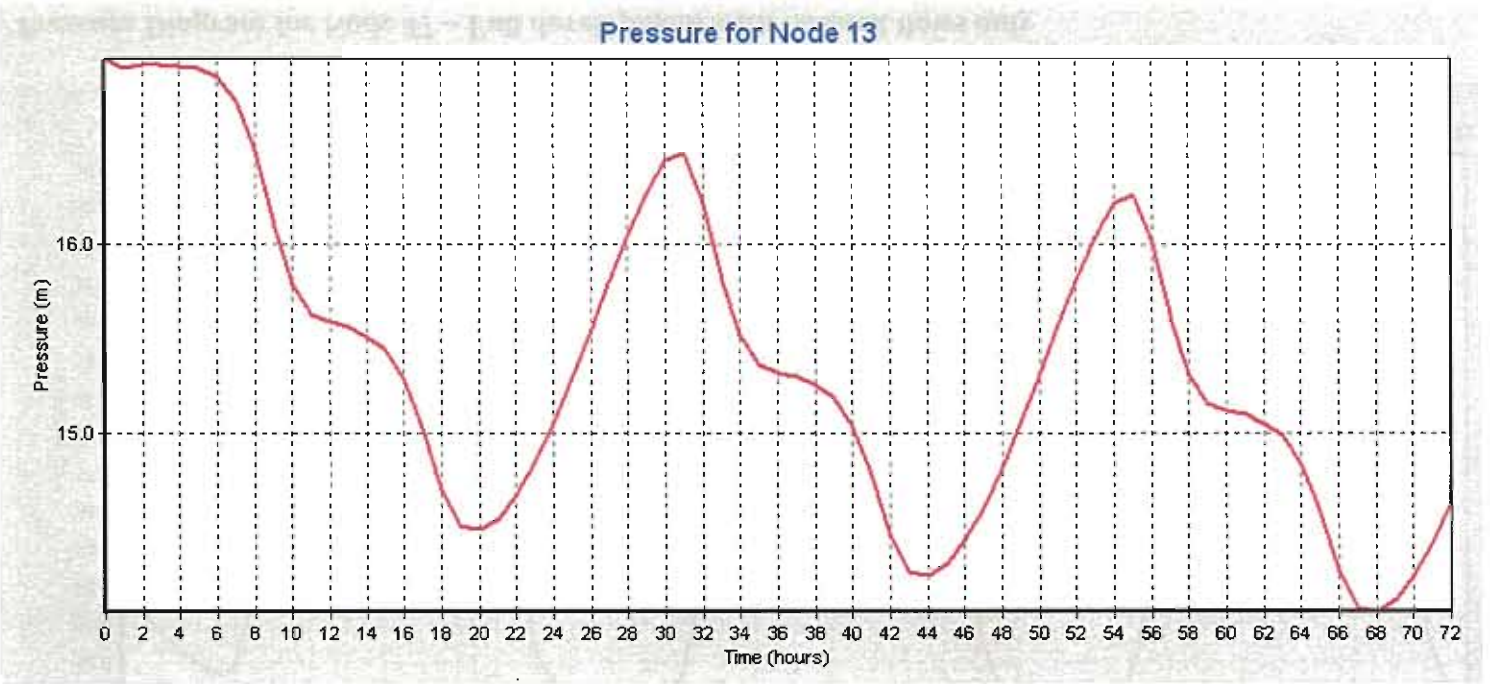

NORTH LISMORE PLATEAU
FIRE FLOWS BOOSTED FLOWS
South Zone
North Zone
Tullera 2 Reservoir
Booster Pumps
Lismore Supply
Howards Grass
HGL RL 161
10. Lismore Plateau Full Stg Fire Trial A.NET
N
Fire flows of 25 l/s applied at Nodes 48 and 23 at 10 am for 1 hr
Residual head at 4.5m at Node 48, 7.9m at Node 23



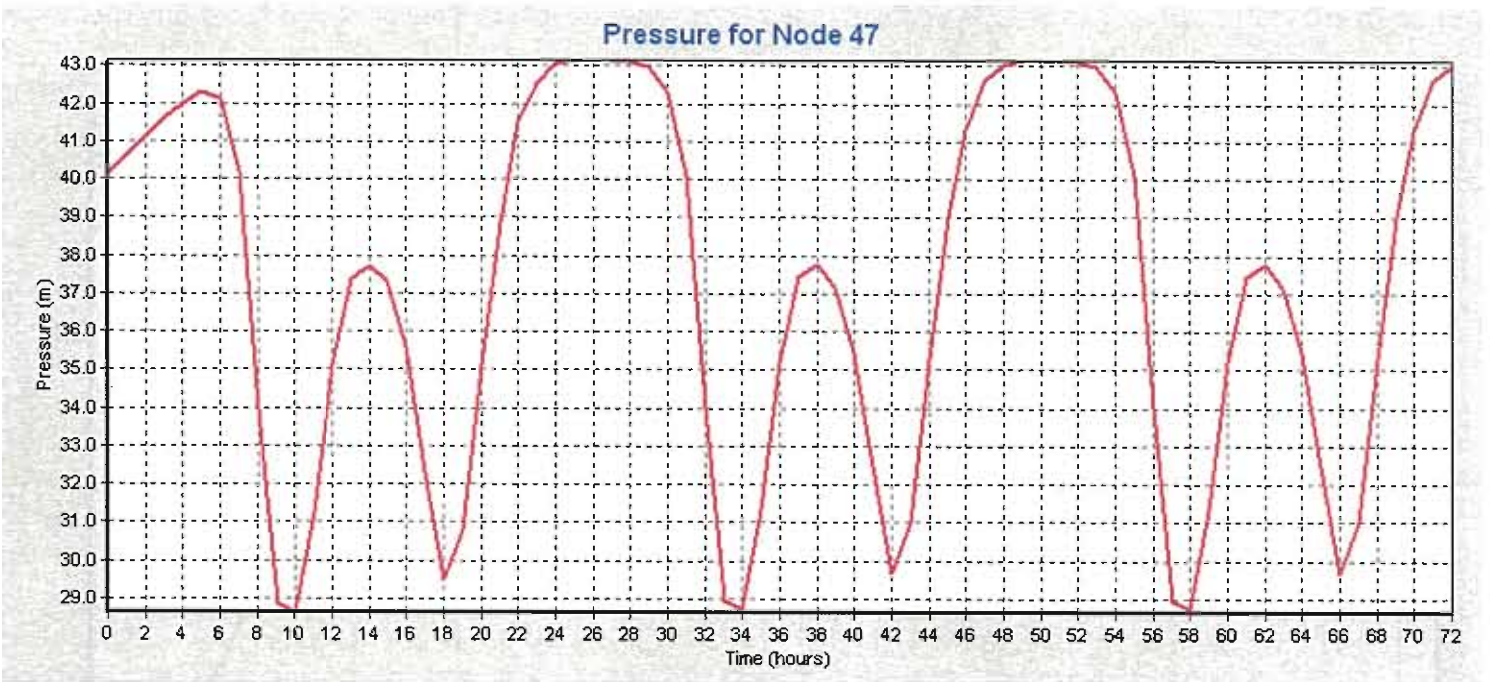
12. Lismore Plateau Full Stg Fire Trial B.NET



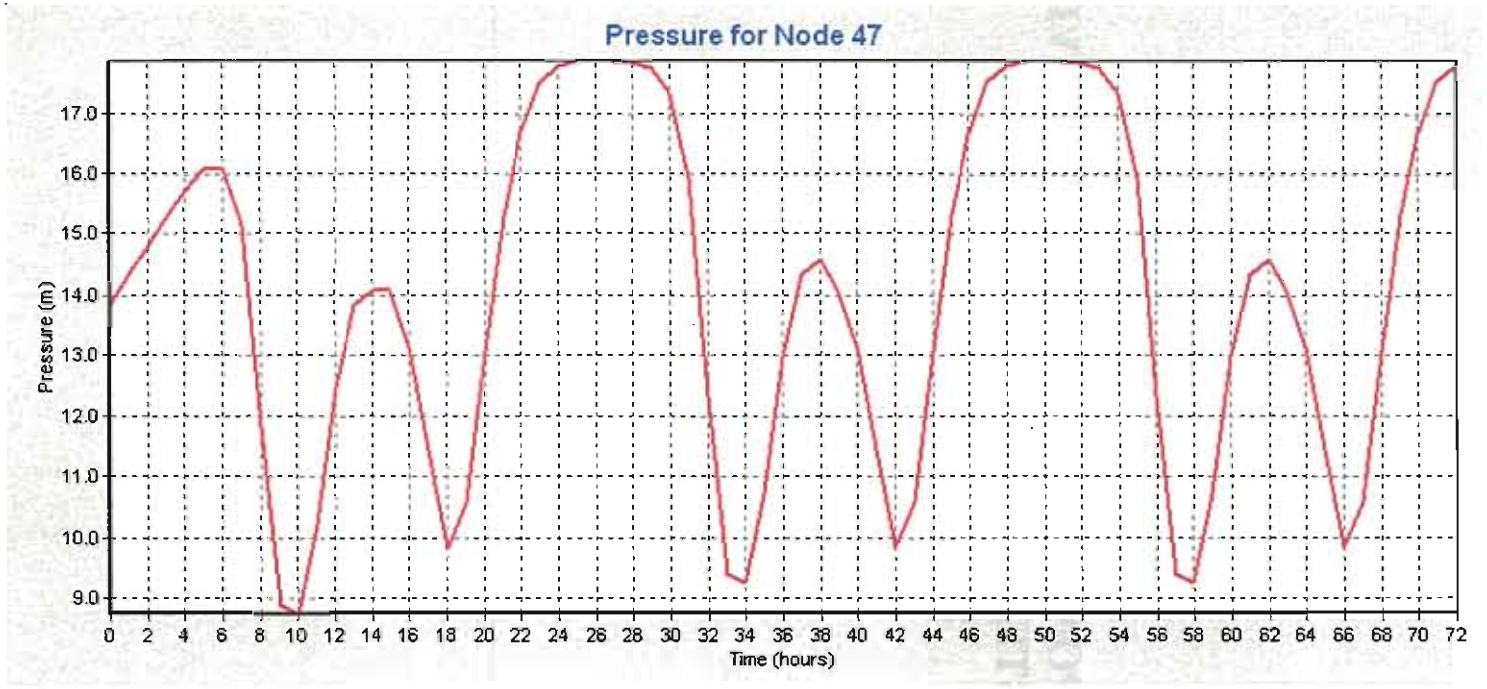
Pressure Diagram for Node 13 – Stage 1 development with boosted flows only
Refer to Network Diagram 1



Pressure Diagram for Node 13 – Stage 1 development fed entirely from Tullera Reservoir
Refer to Network Diagram 3



Pressure Diagram for Node 47 – Full development with boosted flows only
Refer to Network Diagram 7 (note pressure range would be reduced by variable speed pumping – not modelled)



Pressure Diagram for Node 47 – Full development fed entirely from Tullera Reservoir (No 2)
Refer to Network Diagram 9

APPENDIX B
CORRESPONDENCE SUPPLIED BY DAVID STEWART CONSULTING
SEPTEMBER 2006

David Stewart Consulting
Engineering Management • Transport+Urban Systems
Newcastle East • NSW • Australia

21 September 2006

Manager, Distribution Engineering
Rous Water
PO Box 230
LISMORE NSW 2480

Attention Mr Terry Gobbe

Dear Mr Gobbe,

proposal for Development on North Lismore Plateau

Thank you for your generous time and ready information on my visit on 31st August 2006. I have attached some notes of the meeting for your confirmation and will proceed to adopt these as the basis for advice to the client for this proposed development. If you have any further information which would influence my advice I ask if you could let me know as soon as possible.

Yours faithfully

David Stewart
David Stewart Consulting

Enclosure: Notes of Meeting of 31 August 2006

CC: ACM Landmark, Cessnock NSW

PO BOX 431 • NEWCASTLE • 2300 NSW • AUSTRALIA
T: 02 4927 1585 • F: 02 4929 4505 • M: 0417 841 525
E: dstewart.consult@pacific.net.au

North Lismore Platean – Proposed Development

Informal meeting at Rous Water Offices, Lismore on 31st August 2006.

Present Mr Terry Gobbe, Rous Water,

Mr David Stewart, David Stewart Consulting

1. If any development is approved by Lismore CC in the North Lismore Plateau district Rous Water will respond to a formal request from Lismore City Council to supply water to meet development needs based on the planned ET numbers advised by LCC.

2. The issue of demand factors related to standard ETs, requirements for rain water tanks at dwellings and reductions following Basix regulations is a matter for LCC. Rous Water use a standard demand figure of 2,500 l/day per ET.

3. Rous Water do not usually own distribution reservoirs and would expect LCC to provide a new reservoir at Tullera if that is required.

4. If a new supply main is required to feed a new reservoir at Tullera for a North Lismore development then Rous Water will construct and will own this asset. The cost of this would come from the standard amplification charges of $3,275 per ET which is levied by Rous Water on all new titled lots.

5. An analysis by Rous Water indicates that the feed to the existing Tullera Reservoir can provide one mega litre per day of 22 hours.

6. Operating conditions in the supply mains which feed Tullera and North Lismore are managed by Rous Water on a daily basis to meet the supply agreements and cannot be specified in detail.

David Stewart

21 September 2006

Manager Lismore Water
Lismore Water
PO Box 23A
LISMORE NSW 2480

Attention Dr Malcolm Jones

Dear Dr Jones,

proposal for Development on North Lismore Plateau

Thank you for your generous time and ready information on my visit on 31st August 2006. I have attached some notes of the meeting for your confirmation and will proceed to adopt these as the basis for advice to the client for this proposed development. If you have any further information which would influence my advice I ask if you could let me know as soon as possible.

Yours faithfully

David Stewart
David Stewart Consulting

Enclosure: Notes of Meeting of 31 August 2006

CC: ACM Landmark, Cessnock NSW

North Lismore Plateau – Proposed Development

Informal meeting at Lismore Water Offices, Lismore on 31st August 2006.

Present Dr Malcolm Jones, Lismore Water,

Mr David Stewart, David Stewart Consulting

Water Supply Systems

7. Any development approved for North Lismore Plateau will use a supply from Rous Water through a Lismore Water Reservoir, probably near the existing Tullerra Reservoir.

8. All new developments in the Lismore Water area should expect a requirement that they be planned and designed to minimise water consumption, to maximise water device efficiency, to engage local catchment of rainwater at the dwelling, and to consider grey water re-use.

9. Grey water re-use is possibly most effective at a district or suburb level using a dual reticulation system. It would be collected at the district level in a lake, treated by UV or similar means and reticulated to dwellings and bulk users. The preferred method will also enable grey water re-use to serve community landscaping and recreation facilities.

10. If any development is approved by Lismore CC in the North Lismore Plateau district LCC will negotiate with Rous Water to supply water to meet development needs.

11. Lismore Water would consider the issue of demand factors related to standard ETs, reductions if rain water tanks are required at dwellings and reductions following Basix regulations. Some reduction from the standard demand figure may be accepted by LCC when a formal request for rezoning is submitted.

Sewerage Systems

The following comments were given by Dr Jones as information and observations and are not to be taken as policy, as directives or as guidance.

12. No new sewage treatment plant can be expected to serve a development such as the North Lismore Plateau in the City of Lismore. The area is close to the South Lismore treatment plant (SLTP) and a sewer main with possible pressure main sections could be constructed from a development at North Lismore to the SLTP.

13. The environmental planning requirements for a new sewage treatment plant are considerable and would be likely to cause long delays to any planning for a new urban development.

14. South Lismore plant could be expanded to cater for increased inflow from additional urban development in its catchment. There is not likely to be a requirement that sewage from North Lismore would be directed to the East Lismore treatment plant.

David Stewart

APPENDIX C
COSTING INFORMATION PREPARED BY DAVID STEWART CONSULTING

NORTH LISMORE PLATEAU DEVELOPMENT

STAGE 1 PROJECT COSTS - ASSUMPTIONS

Design Concept

The design costs are based on the provision of a 300 mm trunk main from Tullera Reservoir to the intersection of McLeay and Dunoon Roads. A booster pump will be located at this location. A 250 mm main will then be laid along the route of the future Plateau ring road to the central area of Stage 1. A combination of 150 mm and 100 mm watermains will service the lots in Stage 1.

Pipework

1. Costs have been based on past Hunter Water Revaluation figures, indexed for CPI increases and on contract prices from the Mid North Coast of 2000-2004 and from current suppliers quotations for materials.
2. Watermain costs have been based on "greenfield" rates
3. Hunter Water rates have been based using on Class 20 uPVC pipe. Although Class 16 pipe would be used in the Lismore Plateau Project, no reduction in material costs has been applied as it would be expected that pipe raw material cost increases would have exceeded CPI increases in recent times.
4. A factor of 5% has been allowed to compensate for costs associated with the locality.
5. No allowance has been made for connections to properties other than the provision of drilled connection points at the main.
6. Laying costs have been increased by 20% to allow for the possibility of rock excavation.

Reservoir

The existing reservoir at Tullera can serve the Stage 1 development.

Booster Station

1. Costs have been based on a 2006 quotation for pumps and controls systems from a supplier, and on past Hunter Water Revaluation figures, indexed for CPI increases.
2. It has been assumed that the booster pumps will be housed in a brick building.
3. The pump house has been sized for two pumps only and would need to be extended to accommodate an additional two pumps at a later time.
4. Allowance has been made for power and telemetry, with an 11kV supply adjacent in Dunoon road and a transformer to 415V.
5. No allowance has been made for land acquisition.

Overheads And Contingencies

1. An allowance of 16% has been made for survey, investigation and design and 20% for contingencies.

STAGE 1 COSTS

	Unit	Rate Sept 06	Quantity	Amount Sept 06	June 2010 (11% increase)
1. Pipework					
a. 300mm uPVC trunk main	m	$280.00	1,840	$515,200	$571,900
b. 250mm uPVC trunk main	m	$205.00	2,620	$537,100	$596,200
c. 200mm uPVC trunk main	m	$170.00	0		
c. 150mm uPVC reticulation	m	$150.00	3,931	$589,650	$654,500
d. 100 mm uPVC reticulation	m	$125.00	1,916	$239,500	$265,800
Cost before overheads				$1,881,450	$2,088,400
SID, 16%			16%	$301,032	$334,100
Contingencies, 20%			20%	$376,290	$417,700
Cost with overheads				$2,558,772	$2,840,200
		Allow		**$2,559,000**	**$2,841,000**
2. Booster Station					
Booster Station Pumps				$36,000	$40,000
Building& pipework				$83,000	$92,100
Electrical & telemetry				$80,000	$88,800
Cost before overheads				$199,000	$220,900
SID,16%			16%	$32,000	$35,300
Contingencies, 20%			20%	$40,000	$44,200
Cost with overheads				$272,000	$300,400
		Allow		**$272,000**	**$301,000**
		Allow		**$2,831,000**	**$3,142,000**

Note: Costs shown in the report are slightly higher than shown on this cost spreadsheet due to a difference staged approach to rounding off costs.

FULL DEVELOPMENT PROJECT COSTS - ASSUMPTIONS

Design Concept

The design costs are based on the provision of a 300 mm trunk main from Tullera Reservoir to the intersection of McLeay and Dunoon Roads. A booster pump will be located at this location. This station will contain two sets of pumps. One set of pumps will boost pressure to the northern zone of the development (ET = 323) while the second set of pumps will boost pressure to the southern zone of the development (ET = 633). A 250 mm trunk main would carry boosted water along the route of the Plateau ring road to the centre of the northern zone while a 200 mm main would carry boosted water to the centre of the southern zone.

Reservoir

1 Costs for a reservoir have been derived from current prices for similar reservoirs on the Mid North Coast and from past Hunter Water Revaluation figures, indexed for CPI increases.
2. Adjustments of actual Mid North reservoir costs to obtain cost for a 2.5 Ml reservoir have been made using scaling factors from Hunter Water cost data.
3. Assume a steel 2.5 Ml reservoir, 20 m dia x 8 m high
4. The new Trunk Main from Existing Lismore Supply at Howards Grass to Tullera Reservoir is provided by Rous Water from their amplification works charges.

Pipework

1. Costs have been based on past Hunter Water Revaluation figures, indexed for CPI increases, on contract prices from the Mid North Coast of 2000-2004 and from current suppliers quotations for materials.
2. Watermain costs have been based on "greenfield" rates
3. Hunter Water rates have been based using on Class 20 uPVC pipe. Although Class 16 pipe would be used in the Lismore Plateau Project, no reduction in material costs has been applied as it would be expected that pipe raw material cost increases would have exceeded CPI increases in recent times.
4. A factor of 5% has been allowed to compensate for costs associated with the locality.
5. No allowance has been made for connections to properties other than the provision of drilled connection points at the main.
6. Laying costs have been increased by 20% to allow for the possibility of rock excavation.

Booster Station

1. Costs have been based on a quotation for pumps and controls systems from a supplier, and on past Hunter Water Revaluation figures, indexed for CPI increases.
2. It has been assumed that the booster pumps will be housed in separate brick buildings.
3. The pump house has been initially sized for two pumps only and would need to be extended to accommodate an additional two pumps.
4. Allowance has been made for power and telemetry, with an 11kV supply adjacent in Dunoon road and a transformer to 415V.
5. No allowance has been made for land acquisition.

Overheads And Contingencies

1. An allowance of 16% has been made for survey, investigation and design and 20% for contingencies. This is made up of 3% each for Survey and Investigations, 4% for Design and 6% for Contract Administration.

FULL Development Costs

	Unit	Rate Sept 06	Quantity	Amount Sept 06	Amount June 2010 (11% increase)
1. Pipework					
a. 300mm uPVC trunk main	m	$280.00	1,840	$515,200	$571,900
b. 250mm uPVC trunk main	m	$205.00	2,620	$537,100	$596,200
c. 200mm uPVC trunk main	m	$170.00	813	$138,210	$153,400
c. 150mm uPVC reticulation	m	$150.00	13,210	$1,981,500	$2,199,500
d. 100 mm uPVC reticulation	m	$125.00	9120	$1,140,000	$1,265,400
Cost before overheads				$4,312,010	$4,786,400
SID, 16%			16%	$689,922	$765,800
Contingencies, 20%			20%	$862,402	$957,300
Cost with overheads				$5,864,334	$6,509,500
		Allow		**$5,865,000**	**$6,510,000**
2. Booster Station					
Booster Station Pumps				$63,000	$69,900
Building& pipework				$167,000	$185,400
Electrical & telemetry				$80,000	$88,800
Cost before overheads				$310,000	$344,100
SID,16%			16%	$49,600	$55,100
Contingencies, 20%			20%	$62,000	$68,800
Cost with overheads				$421,600	$468,000
		Allow		**$422,000**	**$468,000**
3. Reservoir - Tullera No 2					
Steel 2.5 Ml, 20.0 m dia x 8.0 m high				$800,000	$888,000
Site formation				$100,000	$111,000
Cost before overheads				$900,000	$999,000
SID, 16%			16%	$144,000	$159,800
Contingencies, 15%			15%	$135,000	$149,900
Cost with overheads				$1,179,000	$1,308,700
		Allow		**$1,180,000**	**$1,309,000**
4. Total Project Costs				$7,464,934	
		Allow		**$7,465,000**	**$8,287,000**

Note: Costs shown in the report are slightly higher than shown on this cost spreadsheet due a different staged approach to rounding off costs.

CIVIL DESIGN
SERVICES PTY LTD

REPORT ON FEASIBILITY OF PROVIDING AN ELEVATED STORAGE TO SERVICE NORTH LISMORE PLATEAU RESIDENTIAL DEVELOPMENT

REPORT FOR
ACM LANDMARK

January 2011

REPORT ON FEASIBILITY OF PROVIDING AN ELEVATED STORAGE TO SERVICE NORTH LISMORE PLATEAU RESIDENTIAL DEVELOPMENT

CONTENTS

1. INTRODUCTION AND BACKGROUND..... 1

2. DESIGN PARAMETERS 1

3. ANALYSIS 2

4. SUMMARY 4

5. CONCLUSIONS 5

6. APPENDED DIAGRAMS 6

REPORT ON FEASIBILITY OF PROVIDING AN ELEVATED STORAGE TO SERVICE NORTH LISMORE PLATEAU RESIDENTIAL DEVELOPMENT

1. INTRODUCTION AND BACKGROUND

ACM Landmark Pty Ltd has requested Civil Design Services to investigate the feasibility of using an elevated reservoir to service the proposed North Lismore Plateau development beyond Stage 1 development.

Provision of water supply to the proposed North Lismore Plateau development has previously been investigated in a number of reports. The latest full report by Civil Design Services Pty Ltd was prepared in July 2010. This report updated cost estimates contained in the initial report of September 2006.

Previous reports have investigated the extent to which the existing Tullera Reservoir has additional capacity to service the first stage development of the Plateau and the overall requirements to service the ultimate development of approximately 1000 lots.

Past investigations have concluded that the most appropriate method of servicing Stage 1 of the North Lismore Plateau would be via the existing 1 Ml Tullera Reservoir which is located off Dunoon Road, approximately 3 km north-east of the proposed development. This reservoir is currently supplied via a 150 mm main connected to the Lismore bulk water supply main at Howards Grass. The reservoir is currently operating at slightly more than half its capacity, and is capable of meeting requirements of Stage 1 development without further amplification.

It has been recommended that the full development of the North Lismore Plateau be served by adopting the same supply route as used for Stage 1. This would require the construction of a new 2.5 Ml reservoir adjacent to the existing reservoir and the amplification of the Rous Water trunk main to the reservoir.

It was proposed that the difficulty of providing minimum stipulated pressures within the higher parts of the North Lismore Plateau be overcome by the provision of variable speed booster pumps located in a pumping station constructed at the intersection of Dunoon and McLeay Roads.

This latest report will examine the feasibility of dispensing with the booster pumping station beyond the first stage of the development and instead maintaining supply to the development by gravity feed. This would require the construction of elevated storages either within or external to the boundaries of the development.

2. DESIGN PARAMETERS

These are the design parameters that have been used in previous investigation reports:

1) From Lismore City Council – Specification for the Design & Construction of Water Reticulation Pipework, July 1999:

a) *Static head to each lot should be between 30 m and 60 m with a minimum static head of 20 m under peak instantaneous demand at the property boundary.*
b) *The desirable maximum design head is to be 70 m.*

2) From Rous Water (letter dated 7 July 2006)

a) *Tullera Reservoir is serviced by a 150 mm gravity main connected to the trunk main at Howards Grass. Howards Grass Pumping Station is decommissioned and does not pump to Tullera Reservoir.*
b) *Rous Water expects that there would be no need to provide additional chlorination at Tullera Reservoir as the increased demand would reduce the storage time in the reservoir.*
c) *Rous Water will supply the peak day demand nominated by Lismore City Council to Tullera Reservoir over 22 hours.*

3) From Rous Water (letter dated 15 August 2006)

a) *The existing trunk main at Howards Grass presently operates in the range of 176 m static to 115 m. The system at Howards Grass operates via pressure reducing and pressure sustaining valves which limit the pressure in the bulk main. These valves have been set up to operate under the existing demand conditions and will be adjusted as demand grows.*
b) *Rous Water is presently decommissioning the old 450 mm trunk main and it is anticipated that new pressure settings will be required during the upcoming summer demand period.*

4) From discussions between Lismore Council and Rous Water and consultant David Stewart, 31 August 2006

a) *Rous Water estimates it can supply approximately 1 Megalitre of water to Tullera Reservoir over a 24 hour period.*
b) *Flow into Tullera Reservoir is controlled by an altitude valve set to Lismore City Council.*

Various alternative water supply systems for both the initial stage of the subdivision and the ultimate subdivision have been assessed and alternative designs have been analysed using a water modelling program (EPANET 2.0).

3. ANALYSIS

The Lismore Plateau consists of two natural high parts of the ridge (north and south), each with an elevation of RL 130. They are separated by a shallow depression with a level which varies from RL 105 to RL110.

It has previously been recommended that two separate hydraulic zones be created within the Lismore Plateau development, namely, a "northern" and a "southern" zone. It was proposed to separately service each zone from a proposed booster pumping station at the intersection of Dunoon Road and McLeay Road.

For the later stages of the development, water supplying the booster station would come from a new 2.5 Ml reservoir to be constructed adjacent to the existing 1 Ml Tullera reservoir. The reservoir site has an elevation of RL139. The existing reservoir has a top water level of RL 147 and it was proposed that the new reservoir also have the same top water level. The dimensions proposed for the new reservoir were 20 m diameter x 8 m water depth.

Based on friction head losses at maximum flow rates, the approximate pipeline losses that would occur in the 4.4 km of pipeline between the reservoir and the highest node in the "southern" zone would be in the order of 4 metres.

If an operating range in the reservoir was assumed to vary between 4 metres depth and 8 metres depth, then the TWL required for the reservoir to provide a minimum static head of 30 metres at the highest property in the development would be as follows:

RL of highest property = 130 m
Minimum head required at highest property = 30 m. This will be capable of being supplied at the minimum normal operating point of the reservoir (assumed 4m below TWL).
Hydraulic gradient required at highest property under static head conditions
= 130 + 30 = 160 m
Pipeline friction losses under peak flow conditions = 4 m.
Minimum allowable head at peak instantaneous demand = 20 m. Therefore static head of 30 m is governing criteria (20 m + 4 m friction loss < 30 m).
Minimum operating depth of reservoir = 4 m
Maximum operating depth of reservoir = 8m
Required TWL of reservoir = 160 m + 4 m = 164 m

To supply the North Lismore Plateau solely by gravity would necessitate the construction of a storage 164 -139 = 25 m in height. Obviously this is impractical for a full size reservoir. Additional pumping would also be required to boost the supply to the reservoir from the existing trunk main system at Howards Grass as there would be insufficient head in the trunk main to supply a reservoir at this level.

The practicality of finding a more elevated reservoir site was considered. There are no suitable nearby elevated sites that would meet the criteria required (minimum elevation required approximately RL 156).

Consideration was then given to constructing a standpipe adjacent to the Tullera reservoir. A pumping station would be required to be constructed adjacent to the reservoir to pump water from the reservoir into the standpipe to provide the required head.

The operating range for a standpipe would be in the order of 4 metres.

The TWL required to provide a minimum head of 30 m at the highest property would be in the order of:

160 m + 4 m = 164 m

This would involve the construction of a standpipe in the order of 25 m in height. By comparison the Hunter Water "Shuttlecock" elevated water tower at Madison Drive, Charlestown is about 20 m high overall (3.6 m operating depth).

A standpipe of these dimensions would be very expensive to construct and maintain and would be visually most intrusive on the ridgeline. It should be noted that it would still be necessary to construct a reservoir of 2.5 Ml capacity in addition to the standpipe in order to satisfy minimum storage requirement (1 day's storage at peak demand).

Because of the limited storage capacity available in the top storage section of the standpipe frequent pumping operations would be required at full development to maintain storage levels. This would not be acceptable from an operational viewpoint. In the event of power failure the limited storage in the standpipe would quickly deplete and pressure in the reticulation system would drop to a level that could be supplied from the adjacent reservoir.

Internal elevated tanks (one in each of the "southern" and "northern" pressure zones) were considered as part of the initial 2006 investigations. These were to be 25 m high overall (storage 6 m dia x 5 m high, TWL 154.5). Although minimum operating pressures greater than 20 m could be achieved, the criteria for 30 m minimum static head could not be satisfied. The high level tank alternative was rejected at the time because of the resultant unacceptable visual impact on the ridgeline.

4. SUMMARY

It is concluded that the suggested use of elevated storages to allow for a gravity fed reticulation system within the final development of the North Lismore Plateau development has a number of serious drawbacks.

To meet the Lismore City Council's criteria for a minimum static head of 30 metres would require the construction of excessively high and, therefore expensive, storages.

If the reservoir required to service the final development (2.5 Ml capacity) were to be elevated to provide a minimum static head of 30 m in the highest parts of the development it would need to be 25 m high, which is clearly impractical.

A standpipe adjacent to the storage reservoir was next considered. It too would need to be some 25 m in height. A pumping station would need to be constructed to supply the elevated storage from the adjacent reservoir. Frequent pumping cycles would be needed to maintain storage levels in the standpipe at full development because of the limited effective storage available.

High level tanks, 25 m high, located within each pressure zone of the development, have previously been investigated as a means of maintaining pressures within the two proposed pressure zones. Although these tanks would be able to maintain peak flow pressures greater than 20 m, they could not meet the criteria of 30 m minimum static head.

Because of their height, elevated storages were also considered undesirable because of their prominent visual impact on the ridgeline.

5. CONCLUSIONS

It has been demonstrated that elevated storages do not represent a better alternative to the method of supply recommended in our previous reports.

Our past recommendations, as set out in our latest report of July 2010, are summarized as follows:

It was recommended that the most suitable method of supplying the ultimate development of the North Lismore Plateau would be to construct a 2.5 Ml reservoir adjacent to the site of the existing 1 Ml Tullera reservoir. With a top water level of RL 147 this reservoir would be capable of supplying the entire development by gravity. However, to maintain the minimum pressures stipulated by the Lismore City council it would be necessary to provide pressure boosting. Pressure boosting would be provided by a proposed booster pumping station at the intersection of Dunoon Road and McLeay Road.

In practice variable speed pumps would be used to give better control over pressure as demand varies throughout the day and night. Variable speed pumps would also be far more economical to run than single speed booster pumps.

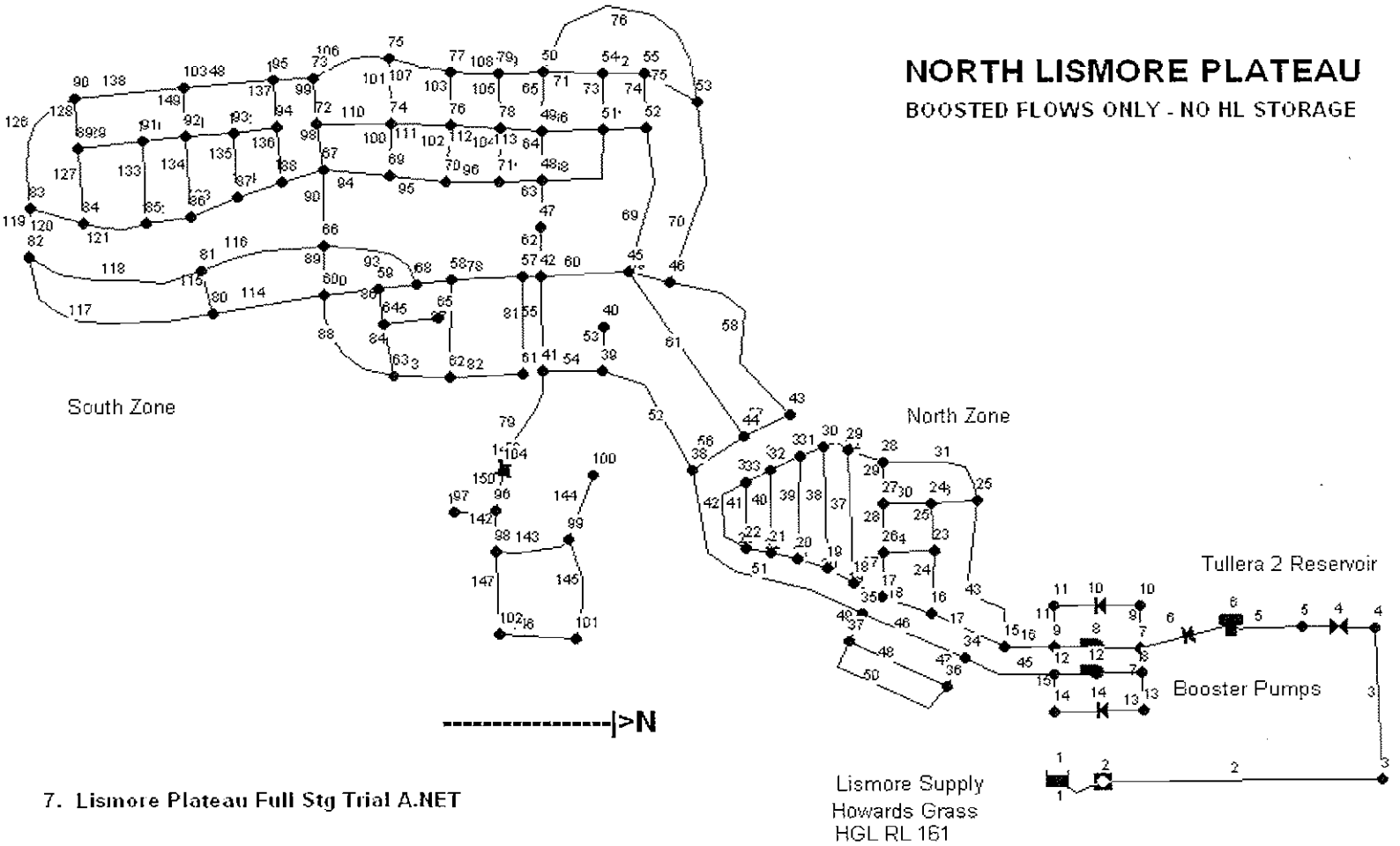
Thus far, modelling work has only been carried out using fixed speed pumps. However, the modelling program used (EPANET 2.0) is capable of modelling variable speed pumps. This could be a worthwhile exercise to demonstrate the efficiencies that could be achieved over fixed speed pumps.

As there will still be adequate pressure available in the system should the booster pumps be unable to operate because of power failure, there is little risk to supply in adopting pressure boosting without high level storage.

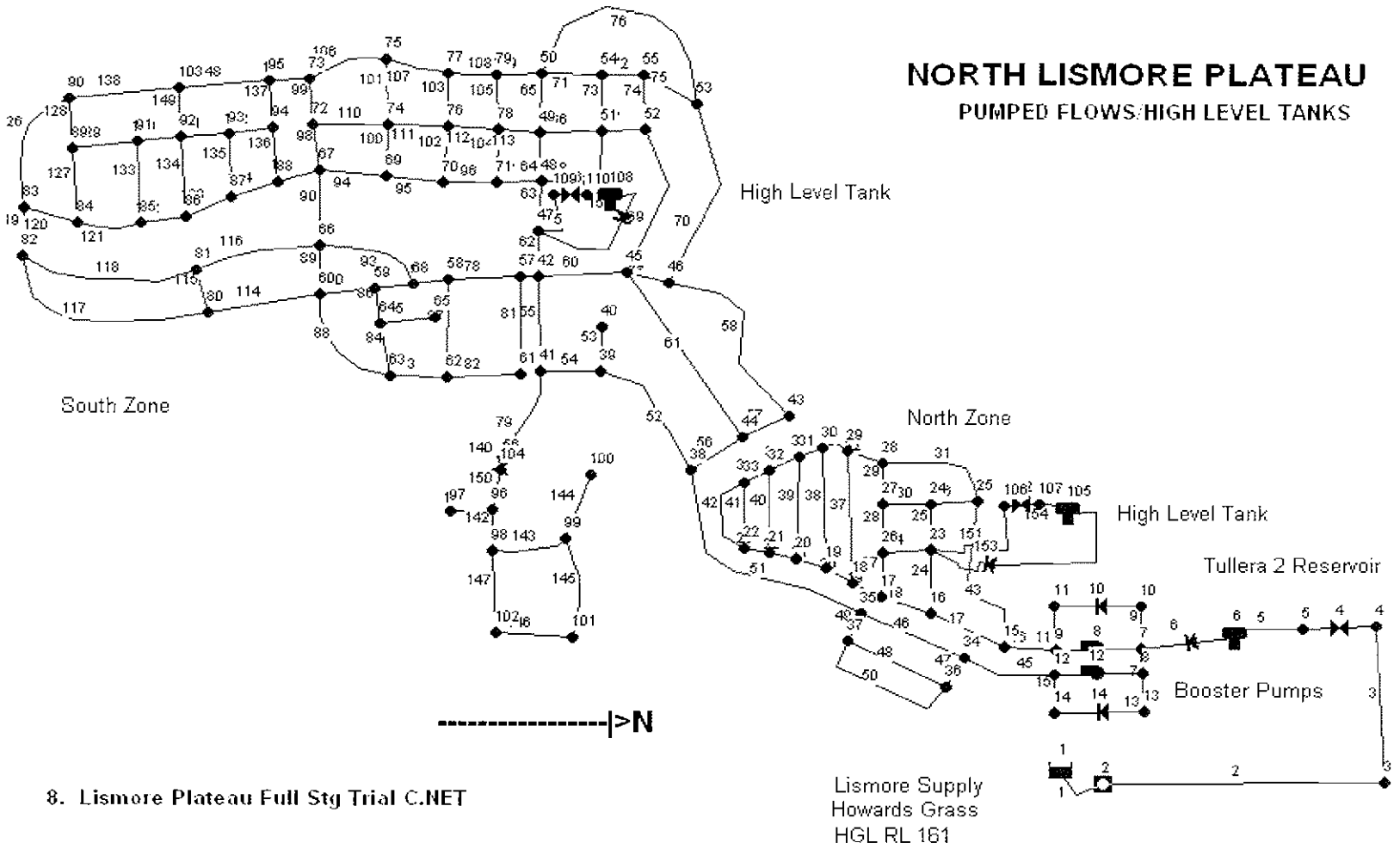
In the event of pump failure, the head available from the Tullera Reservoir would be capable of maintaining pressures at the highest points in the subdivision in the range 8 m to 17 m. These pressures would be acceptable under emergency conditions.

Overall, it would be far cheaper to provide pressure boosting than incur the additional construction, operational and maintenance costs associated with the provision of some form of elevated storage to provide a gravity fed supply within the North Lismore Plateau development.

APPENDED DIAGRAMS



7. Lismore Plateau Full Stg Trial A.NET



8. Lismore Plateau Full Stg Trial C.NET

Water Availability

North Lismore Plateau

acm
LANDMARK
LAND DEVELOPMENT
CONSULTANTS

Suite 3, Unit 5 Edward Street
PO Box 627, CESSNOCK NSW 2325
P (02) 4991 7171
F (02) 4991 7272
E admin@acmlandmark.com.au
www.acmlandmark.com.au

CONTENTS

1	INTRODUCTION	1
2	SITE	1
3	PROPOSAL	1
4	BACKGROUND	1
5	ASSESSMENT	2
6	CONCLUSION	3

APPENDICES

A. STUDY AREA
B. CONCEPT WATER SUPPLY PLAN
C. WATER SUPPLY INVESTIGATION JUNE 2010
D. WATER SUPPLY INVESTIGATION JANUARY 2011

1 INTRODUCTION

ACM landmark were engaged to undertake an assessment of the provision of water to the North Lismore plateau. The assessment was requested to determine a water servicing methodology including short term and long term storage requirements. The assessment also determined a short term servicing arrangement.

The information was required to be provided for the planning charrette in December 2010 with Lismore City Council.

2 SITE

The land is known as the North Lismore Plateau, a site approximately four (4) kilometers to the south west of the Central Business District of Lismore. The land comprises elevated plateau slopes rising to approximately 126m AHD and is located to the south of Dunoon Road and north of Nimbin Road. The area of the plateau is approximately 285ha and is expected to provide for approximately 1200 to 1600 residential lots. A plan of the study area can be seen as Appendix A.

3 PROPOSAL

It is proposed to zone the land from its current investigation zone of 1(b) to a residential RU2 zone. The residential development of the land would require the provision of services such as water supply.

Investigations into the provision of water supply to the plateau have identified the ability of water to be provided to the future urban development both in the short and long term.

4 BACKGROUND

The 1994 study titled 'The Dunoon Road Planning Study' undertaken by Northern Rivers Engineers, Planners and Scientists in 1994 for Lismore City Council described a feasible method to service the plateau with water. The current proposal further investigates that scheme proposed and contained within the 1994 report in terms of connection of the plateau to the reticulated water supply from Tullera Reservoir and Howards Grass. Costs for the provision of water supply were originally prepared with the 1994 study however the current reports have independently costed those water supply works to current costs.

5 ASSESSMENT

The attached plan shown as Appendix B gives a pictorial representation of a proposed water supply connection route and scheme from the Tullera Reservoir. The plan demonstrates both the short term supply and the long term supply utilizing a new reservoir adjacent to the existing Tullera Reservoir.

The 1994 North Lismore Planning Study prepared for Lismore City Council by Northern Rivers Engineers Planners and Scientists considered the provision of water supply to the North Lismore Plateau. The preferred option was to supply water from the Tullera Reservoir.

In September 2006 and June 2010 ACM Landmark Pty ltd undertook water investigation reports to determine the following:-

- Determine to what extent Tullera Reservoir has additional capacity to provide for some first stage development of the plateau.
- Determine what level within the plateau can be developed with and without a booster pump and storage.
- Determine the size of trunk main from Tullera Reservoir to service both the first stage and ultimate stages of development.
- Determine the trunk main upgrade requirements from Howard Grass to Tullera Reservoir.

Investigations into the feasibility and costs associated with the water supply provision for both a first stage and ultimate development are included within the full report shown in Appendix C.

The investigation revealed that an initial stage of approximately 200 lots within the plateau can be serviced by the existing Tullera Reservoir with the provision of a new 300mm carrier main from the reservoir to the plateau area.

The Tullera Reservoir is operating at generally half of its capacity.

The first stage lots can occur in numerous locations on the plateau with the appropriate sizing of internal watermains.

The provision of a 300mm trunk main from Tullera Reservoir to the site approximately 1840m will serve both the first stage and ultimate development of the plateau.

Beyond 200 first stage lots a new 2.5ML reservoir adjacent to the Tullera Reservoir would be required together with the upgrading of the carrier main from Howards Grass to the new Tullera Reservoir via a 250mm trunk main 2620m in length.

For the first stage development a booster pump station at McLeay Road will be provided to ensure sufficient pressure. Further assessment has disclosed that an elevated reservoir or standpipe is impractical due to excessive height and adverse visability. This report can be seen as Appendix D.

The booster pump station whilst not being the most favoured option by Council will ensure that a continual pressure to the plateau was available to meet Councils static head requirements. The plateau can be serviced by gravity from the proposed Tullera Reservoir to the highest points in the subdivision in times of emergency without the operation of the pump station. However the operation of the booster pump station provides greater static head to the elevated areas of the plateau.

Some booster pumping of the system is inevitable and this would either need to be at the reservoir or as proposed at McLeay Road location.

The external scheme components would be funded by the developers of the plateau and could be offset against water headworks contributions. Internal water reticulation would also be provided by the developers within the subdivision of each stage of the residential development.

Rous Water have also confirmed the provision of bulk supply to the North Lismore Plateau and that the distribution of this supply would be carried out to the satisfaction of Lismore Water.

6 CONCLUSION

The North Lismore Plateau area proposed for rezoning has the capability to be serviced by water supply from the Tullera Reservoir. Lismore City Council however favours the provision of gravity supply system to the land. However assessment has shown that an elevated reservoir at Tullera, adjacent to the existing reservoir is not feasible.

Supply can be guaranteed to the plateau both in the interim and full development with some booster pumping to achieve Councils static head requirements in the more elevated lots on the plateau.

Upgrading of the carrier mains from Howards Grass to Tullera Reservoir will be required to provide increased capacity for the latter stages of the plateau development beyond 200 lots.

The provision of a new reservoir, augmentation of the carrier mains from Howards Grass to Tullera Reservoir and the provision of an ultimate sized main from Tullera Reservoir to the plateau will ensure that the North Lismore Plateau can be adequately services with reticulated water.

It can be seen therefore that the rezoning of the North Lismore Plateau would not be limited by the provision of sewer to enable future development.

APPENDIX A

STUDY AREA

APPENDIX B

Concept Water Plan

APPENDIX C

Water Supply Investigation June 2010

APPENDIX D

Water Supply Investigation January 2011

Attachment E

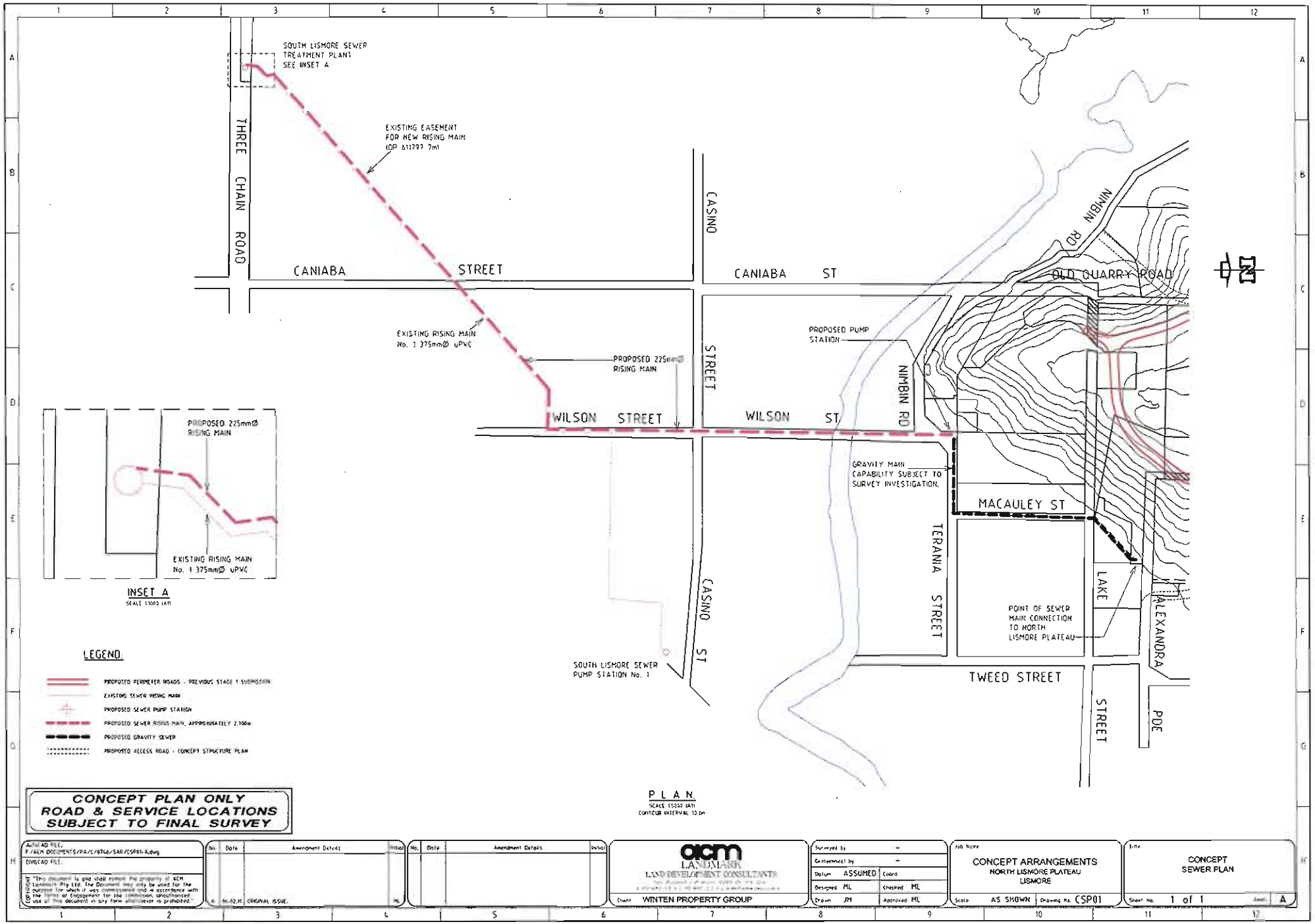
NORTH LISMORE PLATEAU STUDY AREA

FNCRS Boundary by Department of Planning

Proposed North Lismore Plateau Study Area (Approximately 285 Ha)

MGA

0 100 200 300


SOUTH LISMORE SEWER TREATMENT PLANT SEE INSET A
EXISTING EASEMENT FOR NEW RISING MAIN (DP 611797 7m)
THREE CHAIN ROAD
CANIABA STREET
CASINO STREET
CANIABA ST
NIMBIN RD
OLD QUARRY ROAD
EXISTING RISING MAIN No. 1 375mmØ uPVC
PROPOSED 225mmØ RISING MAIN
PROPOSED PUMP STATION
WILSON STREET
WILSON ST
GRAVITY MAIN CAPABILITY SUBJECT TO SURVEY INVESTIGATION.
MACAULEY ST
TERANIA STREET
LAKE
ALEXANDRA
POINT OF SEWER MAIN CONNECTION TO NORTH LISMORE PLATEAU
SOUTH LISMORE SEWER PUMP STATION No. 1
CASINO ST
TWEED STREET
PDE
INSET A
SCALE 1:1000 (A1)
LEGEND:
PROPOSED PERIMETER ROADS - PREVIOUS STAGE 1 SUBMISSION
EXISTING SEWER RISING MAIN
PROPOSED SEWER PUMP STATION
PROPOSED SEWER RISING MAIN, APPROXIMATELY 2,700m
PROPOSED GRAVITY SEWER
PROPOSED ACCESS ROAD - CONCEPT STRUCTURE PLAN
CONCEPT PLAN ONLY
ROAD & SERVICE LOCATIONS
SUBJECT TO FINAL SURVEY
PLAN
SCALE 1:5000 (A1)
CONTOUR INTERVAL 10.0m
acm
LANDMARK
LAND DEVELOPMENT CONSULTANTS
WINTEN PROPERTY GROUP
CONCEPT ARRANGEMENTS
NORTH LISMORE PLATEAU
LISMORE
CONCEPT SEWER PLAN
AS SHOWN
CSP01
1 of 1
A

ACM LANDMARK PTY LTD

BRIEF ASSESSMENT OF SOUTH LISMORE SEWER TREATMENT WORKS CAPACITY

REPORT FOR WINTEN PROPERTY GROUP
PROJECT 744 LISMORE

August 2010

BRIEF ASSESSMENT OF SOUTH LISMORE SEWER TREATMENT WORKS CAPACITY

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	1
3.	BACKGROUND	2
4.	CONCLUSION	4

LIST OF TABLES

TABLE 1	PROJECTED ORGANIC LOADING	3
TABLE 2	LOAD BASED DATA	3
TABLE 3	ORGANIC LOADING	4

APPENDICES

A	FLOW SHEETS	

NORTH LISMORE PLATEAU DEVELOPMENT
WATER INVESTIGATION REPORT

1. INTRODUCTION

This assessment has utilized available data to consider the possibility of spare capacity within the South Lismore Sewer Treatment Works to accept staged development from the North Lismore Plateau.

The existing data included:-

- South Lismore Treatment Works Augmentation - Concept Design Report CMPS&F Pty Ltd July 1995.
- Flow data from the South Lismore Treatment works for 2007, 2008 and 2009.

Both the report and flow data documentation was kindly provided by Lismore City Council.

The report was a concise concept design for the upgrading South Lismore Sewer Treatment Works in 1995.

The report considered the existing conditions and proposed upgrading of the Sewerage Treatment Works (STW) to a projected ultimate loading of approximately 22,000 Equivalent Persons (EP). This comprised approximately 8800 Residential EP and approximately 13,200 Industrial/Commercial EP.

Flow Data provided by Lismore City Council from the South Lismore Treatment Works which incorporated spread sheets for 'Flows' through the inlet works for the years 2007, 2008 and 2009 were assessed. The flow sheets incorporated inflow and bypass flows in megalitres/year and can be seen as Appendix A within this report.

These recent inflows were assessed against the 1995 upgrade parameters to determine if available capacity existed within the treatment works to accept additional development flows.

2. SUMMARY

The coarse assessment of the data simply reviews the previous design parameters for the South Lismore Treatment Works upgrade against current inflow data from the plant in order to assess the likely capacity, if any, for the treatment works to accept additional development flows.

Based upon the available data the treatment works appears to have capacity of approximately 1900 EP or approximately 475 ET when compared to the design upgrade data.

This assessment however does not include 2010 inflow data from the treatment works which was unavailable at the time.

Organic loads treated within the treatment works are well below design parameters and also below Agreed Licensing Limits.

Whilst there may be some limitations to the available inflow there appears to be significant capacity within organic load limits to cater for additional increase in flow treatment within the treatment works.

There is also considered to be capacity within the South Lismore Sewer Treatment works site to cater for further upgrading beyond 1800 EP or 450 lots.

Capacity of pump stations and rising/gravity mains conveying flows to the treatment works has not been assessed.

3. BACKGROUND

The 1995 augmentation design report determined that South Lismore Sewage Treatment Works had a nominal 18,000 EP capacity and a theoretical loading of 21,000 EP prior to the upgrading. The upgrade budget of approximately $3 million included augmentation to treat increased loads and to meet environmental objectives. The catchment of the South Lismore STW includes the Central Business District (CBD) of Lismore, South Lismore and North Lismore including the North Lismore Plateau.

Upgrading was proposed to a nominal 22,000 EP made up of 8,800 EP residential and approximately 13,200 EP industrial

Residential 1 ET = 3 EP
Industrial/Commercial 1 ET = 4 EP

Actual Average Dry Weather Flow was determined at 228L/EP/day using 1988 flow data from the report.

The standard Public Works (PW) design flow allowance of 240L/EP was adopted within the upgrade documentation. Therefore it can be seen that the design parameters actually exceeded flows through the treatment works prior to augmentation.

The projected organic loads for the treatment works were:-

Table 1. Projected Organic Loading in kg/day

	2010	Ultimate
BOD	1512	1533
NFR	1512	1533
TOTAL P	52	53
TKN	259	263

The report concluded that as the 2010 and ultimate organic loads are similar the STW augmentation was assumed to provide capacity for the ultimate requirements.

Various components within the existing facility were found to be of sufficient capacity for the proposed upgrade these were:-

> Sludge stabilization (digestion), lagoon storage, sludge drying capacities (which has a total theoretical rating of 27,000 EP).

From the data provided by Lismore City Council comprising load based flows for the years 2007, 2008 and 2009 the following is shown:-

Table 2. Load Based Data 2007, 2008 & 2009

2007	Total Annual Inflow	1,432.70	ML/year
	Bypass Flow (wet weather)	.01	ML/year
	Total	1,432.71	ML/year
2008	Total Annual Inflow	1,760.14	ML/year
	Bypass Flow (wet weather)	8.36	ML/year
	Total	1,768.50	ML/year
2009	Total Annual Inflow	1,596.80	ML/year
	Bypass Flow (wet weather)	1,521.71	ML/year
	Total	3,118.51	ML/year

Bypass wet weather flows for 2009 show high flood flow bypass into the system, particularly in the months of April and June.

In considering the annual inflow rates only from 2007, 2008 and 2009 to corresponding EP the following is revealed.

2007 - 1,433 ML/day or approximately 16,360 EP
2008 - 1,760 ML/day or approximately 20,091 EP
2009 - 1,597 ML/day or approximately 18,230 EP

On this basis the South Lismore Treatment Works having been upgraded in 1998 to 22,000 EP shows that there could be a theoretical capacity of approximately 1,900 EP or approximately 475 ET (dwellings). However in using average bypass flows this reduces to 1,800 EP or 450 ET.

It should be noted that 2010 figures were not available at the time of this report and that if the abnormal bypass inflows of 2009 were considered then the treatment plant could be at capacity.

When assessing the projected organic loading within the design report against the organic loading within the three (3) year Sewer Treatment Works data the following is shown:-

Table 3. Organic Loading

Design Load	Year 2007	Year 2008	Year 2009	Agreed Licensing load
BOD 1533kg/d	8.25	9.01	6.11	57.53
Total P 53kg/d	2.6	3.44	4.27	6.65
TKN 263kg/d	18.6	18.36	21.26	57.53

The organic loads from the Sewer Treatment Works are well within capacity and licensing limits. Therefore whilst the South Lismore Sewer Treatment Works may have a more limited capacity of 1,800 EP in terms of inflow it would appear that greater operational capacity maybe available before organic load targets are reached.

4. CONCLUSION

Given the brief assessment of the available information from the treatment works including inflow and bypass flows and the review of the organic loads against upgrading design and licensing limits the South Lismore Sewer Treatment Works appears to have capacity to accept additional development of approximately 1,800 EP (450 lots).

It is also concluded that there is capacity for future upgrading of the Sewer Treatment Works beyond the 450 lots to service the North Lismore Plateau.

It is recommended that a more detailed investigation be undertaken of the Sewer Treatment Works including contributing pump stations, rising/gravity mains to fully determine the actual available capacity of the Sewer Treatment Works to accept proposed development from the North Lismore Plateau and consider the available 2010 inflow data to more accurately determine available capacity.

APPENDIX A
FLOW SHEETS

2007

Date	flow	TSS	Wt TSS	BOD	Wt BOD	TOG	Wt TOG	T.P.	Wt TP	T.N.	Wt TN
6-Dec	1.506	1	1505.9	1.2	1807.1	2	3011.9	0.35	527.1	3.34	5029.8
13-Dec	2.254	0.5	1127.0	1.5	3380.9	0.5	1127.0	0.26	586.0	1.09	2456.8
20-Dec	3.672	1.5	5508.0	1.8	6609.6	1.3	4773.6	0.57	2093.0	5.15	18910.8
27-Dec	3.044	0.7	2130.8	0.9	2739.6	4.7	14306.8	0.38	1156.7	3.49	10623.6
3-Jan	4.855	1.5	6982.5	1.1	5120.5	3.6	16758.0	0.55	2560.3	3.9	18154.5
10-Jan	4.142	1.5	6213.0	1.6	6627.2	0.5	2071.0	0.69	2858.0	3.69	15284.0
17-Jan	3.428	3	10284.0	1	3428.0	3	10284.0	0.53	1816.8	1.86	6376.1
24-Jan	3.067	0.5	1533.5	1.8	5520.6	0.7	2146.9	1.05	3220.4	2.75	8434.3
31-Jan	3.212	2.5	8028.8	2.4	7707.6	2.8	8992.2	0.51	1637.9	2.14	6872.6
7-Feb	-0.012	2	-24.0	0.9	-10.8	0.5	-6.0	0.76	-9.1	1.83	-22.0
14-Feb	6.810	5.5	37455.0	6	40860.0	2.6	17706.0	2.17	14777.7	2.44	16616.4
21-Feb	3.589	5	17945.0	3.2	11484.8	0.7	2512.3	1.55	5563.0	2.62	9403.2
28-Feb	0.133	52	6916.0	4	532.0	0.6	79.8	0.42	55.9	1.49	198.2
7-Mar	1.149	12	13788.0	4.6	5285.4	0.5	574.5	0.69	792.8	3.73	4285.8
14-Mar	2.173	1	2173.0	2.2	4780.6	0.5	1086.5	0.821	1784.0	1.6	3476.8
21-Mar	3.305	17.5	57837.5	3.9	12889.5	1.2	3966.0	0.53	1751.7	1.97	6510.9
28-Mar	0.420	6.5	2730.0	1.8	756.0	0.5	210.0	0.32	134.4	1.83	768.6
4-Apr	3.233	10	32330.0	2.5	8082.5	1.9	6142.7	0.29	937.6	4.97	16068.0
11-Apr	2.287	1.5	3430.5	0.5	1143.5	0.5	1143.5	0.22	503.1	1.09	2492.8
18-Apr	1.802	3.5	6307.0	1	1802.0	6.8	12253.6	0.19	342.4	1.51	2721.0
25-Apr	0.070	0.5	35.0	3.5	245.0	0.5	35.0	0.31	21.7	0.88	61.6
2-May	-0.312	4	-1248.0	0.5	-156.0	2.6	-811.2	0.38	-118.6	0.9	-280.8
9-May	2.984	2.5	7410.0	0.5	1482.0	0.6	1778.4	0.48	1422.7	0.82	2430.5
16-May	3.144	3.5	11004.0	0.5	1572.0	0.5	1572.0	0.31	974.6	3.16	9935.0
23-May	0.218	0.5	109.0	0.5	109.0	1.3	283.4	0.18	39.2	1.39	303.0
30-May	0.729	12	8748.0	0.5	364.5	0.5	364.5	0.35	255.2	2.65	1931.9
6-Jun	2.302	11	25322.0	9.7	22329.4	0.5	1151.0	0.91	2094.8	5.85	13466.7
3-Jun	2.934	2	5868.0	0.6	1760.4	0.5	1467.0	0.34	997.6	6.87	20156.6
0-Jun	2.915	2.5	7287.5	0.5	1457.5	0.5	1457.5	0.24	699.6	6.87	20026.1
27-Jun	8.299	3.5	29046.5	3.7	30708.3	0.6	4979.4	0.86	7137.1	9.64	80002.4
4-Jul	2.989	4	11956.0	3.2	9564.8	0.5	1494.5	0.66	1972.7	10.84	32400.8
11-Jul	2.699	6	16194.0	5.4	14574.6	0.5	1349.5	0.91	2456.1	11.86	32010.1
18-Jul	2.781	19	52839.0	10.8	30034.8	0.5	1390.5	1.21	3365.0	13.05	36292.1
25-Jul	2.777	4	11108.0	3.5	9719.5	0.8	2221.6	0.77	2138.3	9.41	26131.8
1-Aug	24.152	8	193216.0	2.1	50719.2	5.1	123175.2	0.668	16133.5	5.339	128947.5
8-Aug	0.088	0.5	44.0	0.7	61.6	1	88.0	0.558	49.1	2.884	253.8
15-Aug	0.498	3.5	1743.0	1.4	697.2	0.9	448.2	0.59	293.8	1.22	607.6
22-Aug	19.155	2	38310.0	1.6	30648.0	4.5	86197.5	0.72	13791.6	12.09	231584.0
29-Aug	3.883	6	23298.0	1.7	6601.1	5.7	22133.1	0.56	2174.5	5.56	21589.5
5-Sep	4.468	8	35744.0	3.2	14297.6	1.3	5808.4	0.93	4155.2	7.01	31320.7
12-Sep	5.416	2	10832.0	1.6	8665.6	3.7	20039.2	0.52	2816.3	3.81	20635.0
18-Sep	6.268	2.5	15645.0	1.1	6883.8	0.5	3129.0	0.74	4630.9	4.89	30601.6
26-Sep	3.258	0.5	1629.0	3	9774.0	0.5	1629.0	0.56	1824.5	5.23	17039.3
3-Oct	3.328	3.5	11648.0	1.7	5657.6	0.5	1664.0	0.44	1464.3	3.43	11415.0
10-Oct	7.868	2	15736.0	5.7	44847.6	2.3	18096.4	1.24	9756.3	6.01	47286.7
17-Oct	3.288	2.5	8220.0	0.5	1644.0	0.5	1644.0	0.61	2005.7	2.38	7825.4
24-Oct	3.100	3	9300.0	0.5	1550.0	0.5	1550.0	0.48	1488.0	2.65	8215.0
31-Oct	5.233	10	52330.0	1.7	8896.1	1.1	5756.3	1.12	5861.0	5.44	28467.5
7-Nov	4.172	1.5	6258.0	1	4172.0	1.6	6675.2	1	4172.0	3.41	14226.5
14-Nov	7.462	0.5	3731.0	0.5	3731.0	1.2	8954.4	0.456	3417.6	0.713	5320.4
21-Nov	3.587	1.5	5380.5	1.5	5380.5	1.5	5380.5	0.371	1330.8	0.788	2826.6
28-Nov	3.760	0.5	1880.0	1.5	5640.0	0.5	1880.0	1	3760.0	1.68	6318.8

al	197.3513667	Ml	844824.95	grams	464177.32	grams	442121.7333	grams	145670.8103	grams	1044008.327	grams
load/ML			4280.82	g/ML	2352.03	g/ML	2240.28	g/ML	738.13	g/ML	5290.10	g/ML

Inflow	1432.70	Ml/yr
Reuse	151.61	Ml/yr
Bypass	0.01	Ml/yr
Outflow	1281.10	Ml/yr

LOAD BASED LICENCE CALCULATIONS

			TSS		BOD		TOG		TP		TN	
Annual Fl.	1281.10	Ml										
Annual Load	(AL)		5,484	Kg	3,013	Kg	2,870	Kg	946	Kg	6,777	Kg
Agreed Load	(AL)		37,738	Kg	21000	Kg	12579	Kg	2,430	Kg	21000	Kg
Fee rate factor			15		10		2		0.3		10	
Fee Rate	(FRT)		19216.46		12810.97		2562.19		384.33		12810.97	Kg
AL - FRT	(check)		-13732.31		-9797.79		307.82		561.29		-6033.84	
2xAL - FRT	(AL1)		n/a		n/a		3,177.83		1506.90		n/a	
Assesable Load			5,484		3,013		2,870		1,507		6,777	Kg
CF			0.28685		0.00368		0.27195		2.499		0.08453	
Pollutant Fee			TSS $1,572.03		BOD $11.09		TOG $780.60		TP $3,765.75		TN $572.87	
										TOTAL	$6,702.23	

2008

Date	flow	TSS	Wt TSS	BOD	Wt BOD	TOG	Wt TOG	T.P.	Wt TP	T.N.	Wt TN
5-Dec	3.963	18.5	73315.5	1.2	4755.6	2	7926.0	0.78	3091.1	0.95	3764.9
12-Dec	4.431	2	8862.0	1.4	6203.4	1.1	4874.1	1.01	4475.3	1.19	5272.9
19-Dec	3.410	0.5	1705.0	0.6	2046.0	1	3410.0	0.65	2216.5	0.86	2932.6
26-Dec	2.460	0.5	1225.0	4.2	10290.0	2.5	6125.0	0.952	2332.4	3.31	8109.5
2-Jan	16.793	4.5	75568.5	2.4	40303.2	0.5	8396.5	0.83	13938.2	3.13	52562.1
9-Jan	14.712	1.5	22068.0	4.3	63261.6	2.3	33837.6	0.872	12828.9	1.479	21759.0
16-Jan	5.430	0.5	2715.0	3	16290.0	1.4	7602.0	1.4	7602.0	2.81	15258.3
23-Jan	3.717	1	3717.0	1.6	5947.2	0.5	1858.5	1.3	4832.1	3.16	11745.7
30-Jan	2.898	0.5	1449.0	0.9	2608.2	0.5	1449.0	1.194	3460.2	1.488	4312.2
6-Feb	14.654	5	73270.0	2	29308.0	1.9	27842.6	1.01	14800.5	2.25	32971.5
13-Feb	8.109	0.5	4054.5	1.9	15407.1	0.5	4054.5	1.19	9649.7	2.25	18245.3
20-Feb	10.151	0.5	5075.5	0.9	9135.9	3.4	34513.4	0.66	6699.7	1.66	16850.7
27-Feb	5.033	1	5033.0	1.6	8052.8	5.7	28688.1	0.93	4680.7	1.23	6190.6
5-Mar	4.020	0.5	2010.0	0.5	2010.0	5.7	22914.0	0.51	2050.2	0.56	2251.2
12-Mar	3.630	0.5	1815.0	0.5	1815.0	3.4	12342.0	0.53	1923.9	0.57	2069.1
19-Mar	3.564	3	10692.0	0.7	2494.8	0.5	1782.0	0.83	2958.1	0.73	2601.7
26-Mar	9.377	6	56262.0	1.2	11252.4	0.5	4688.5	1.07	10033.4	1.302	12208.9
2-Apr	3.560	0.5	1780.0	2	7120.0	2.6	9256.0	1.02	3631.2	1.01	3595.6
9-Apr	15.340	1.5	23010.0	1.8	27612.0	2.6	39884.0	0.47	7209.8	9.62	147570.8
16-Apr	4.518	0.5	2259.0	0.5	2259.0	0.1	451.8	0.88	3975.8	1.4	6325.2
23-Apr	4.974	0.5	2487.0	0.5	2487.0	6.8	33823.2	0.46	2288.0	1.42	7063.1
30-Apr	3.651	0.5	1825.5	0.5	1825.5	3	10953.0	0.3	1095.3	2.34	8543.3
7-May	3.463	0.5	1726.5	0.5	1726.5	3.6	12430.8	0.29	1001.4	3.93	13570.3
14-May	3.352	0.5	1676.0	0.5	1676.0	2	6704.0	0.58	1944.2	3.06	10257.1
21-May	3.919	0.5	1959.5	0.5	1959.5	2.4	9405.6	1.62	6348.8	7.44	29157.4
28-May	7.580	0.5	3790.0	1.6	12128.0	2.7	20466.0	0.55	4169.0	3.121	23657.2
4-Jun	5.625	0.5	2812.5	1.6	9000.0	3.2	18000.0	0.54	3037.5	5.19	29193.8
11-Jun	4.248	0.5	2124.0	0.5	2124.0	1.7	7221.6	0.52	2209.0	2.52	10705.0
18-Jun	3.912	0.5	1956.0	0.5	1956.0	3.9	15256.8	0.49	1916.9	3.44	13457.3
25-Jun	3.441	2	6882.0	3.5	12043.5	2.8	9634.8	0.41	1410.8	5.33	18340.5
2-Jul	3.356	0.5	1678.0	0.5	1678.0	2.7	9061.2	0.32	1073.9	5.14	17249.8
9-Jul	3.404	0.5	1702.0	1.6	5446.4	0.5	1702.0	0.42	1429.7	6.67	22704.7
16-Jul	3.340	0.5	1670.0	2.8	9352.0	0.5	1670.0	0.42	1402.8	6.51	21743.4
23-Jul	5.576	0.5	2788.0	3.4	18958.4	5.3	29552.8	0.45	2509.2	8.03	44775.3
30-Jul	5.576	0.5	2788.0	1.1	6133.6	4	22304.0	0.3	1672.8	6.1	34013.6
6-Aug	5.591	2.6	13977.5	2.7	15095.7	2.6	14538.6	0.33	1845.0	7.49	41876.6
13-Aug	3.269	5	16445.0	3.9	12827.1	0.5	1644.5	0.37	1216.9	12.61	41474.3
20-Aug	3.334	3.5	11669.0	2	6668.0	0.7	2333.8	0.42	1400.3	9.79	32639.9
27-Aug	4.763	2	9526.0	1.2	5715.6	2.8	13336.4	0.99	4715.4	8.73	41581.0
3-Sep	5.556	1	5556.0	5	27780.0	1.1	6111.6	0.82	4555.9	4.97	27613.3
10-Sep	3.532	1	3532.0	4	14128.0	2.6	9183.2	1.05	3708.6	6.3	22251.6
17-Sep	3.208	0.5	1604.0	4.5	14436.0	3.2	10265.6	0.8	2566.4	2.95	9463.6
24-Sep	3.531	0.5	1765.5	1.8	6355.8	2.6	9180.6	0.613	2164.5	3.52	12429.1
1-Oct	3.110	0.5	1555.0	0.2	622.0	0.5	1555.0	0.37	1150.7	1.12	3483.2
8-Oct	3.059	0.5	1529.5	1.4	4282.6	2.2	6729.8	0.58	1713.0	1.6	4894.4
15-Oct	4.921	0.5	2460.5	6	29526.0	3.5	17223.5	0.72	3543.1	2.81	13828.0
22-Oct	4.026	0.5	2013.0	0.9	3623.4	7.4	29792.4	0.56	2254.6	1.03	4146.8
29-Oct	3.159	4	12636.0	0.5	1579.5	2.9	9161.1	0.23	726.6	0.965	3048.4
5-Nov	3.500	2	7000.0	0.5	1750.0	6	21000.0	0.46	1575.0	1.83	6405.0
12-Nov	4.380	2	8760.0	0.5	2190.0	3.5	15330.0	0.36	1576.8	1.34	5869.2
19-Nov	14.306	2	28612.0	1.5	21459.0	3.9	55793.4	0.62	8869.7	8.12	116164.7
26-Nov	4.301	0.5	2150.5	0.5	2150.5	3	12903.0	0.39	1677.4	1.08	4645.1

al	282.733	Ml	544542.5	grams	526855.8	grams	706161.9	grams	201158.899	grams	1072843.881	grams
/ML			1926.00	g/ML	1863.44	g/ML	2497.63	g/ML	711.48	g/ML	3794.55	g/ML

Inflow	1760.14	Ml/yr
Reuse	5.59	Ml/yr
Bypass	8.36	Ml/yr
Outflow	1762.91	Ml/yr

LOAD BASED LICENCE CALCULATIONS

			TSS		BOD		TOG		TP		TN	
Annual Fl.	1766.82	Ml										
Annual Load	(AL)		3,403	Kg	3,292	Kg	4,413	Kg	1,257	Kg	6,704	Kg
Agreed Load	(AL)		37,738	Kg	21000	Kg	12579	Kg	2,430	Kg	21000	Kg
Fee rate factor			15		10		2		0.3		10	
Fee Rate	(FRT)		26502.27		17668.18		3533.64		630.05		17668.18	Kg
AL - FRT	(check)		-23099.39		-14376.82		879.22		727.01		-10963.91	
2xAL - FRT	(AL1)		n/a		n/a		5,292.07		1984.07		n/a	
Assessable Load			3,403		3,292		4,413		1,984		6,704	Kg
CF			0.26665		0.00368		0.27195		2.499		0.08453	
Pollutant Fee			TSS $975.44		BOD $12.12		TOG $1,200.08		TP $4,958.18		TN $566.71	
										TOTAL	$7,712.52	

2009

Date	flow	TSS	Wt TSS	BOD	Wt BOD	TOG	Wt TOG	T.P.	Wt TP	T.N.	Wt TN
3-Dec	3.430	0.5	1715.0	0.7	2401.0	5	17150.0	0.42	1440.6	1.14	3910.2
10-Dec	2.925	0.5	1462.5	0.5	1462.5	2.8	8190.0	0.47	1374.8	1.14	3334.5
17-Dec	3.522	3.5	12327.0	0.7	2465.4	3.5	12327.0	0.5	1761.0	1.64	5776.1
23-Dec	3.231	1	3231.0	0.8	2584.8	3.6	11631.6	0.97	3134.1	1.06	3424.9
31-Dec	3.491	0.5	1745.5	0.5	1745.5	2.8	9774.8	0.556	1941.0	0.748	2611.3
7-Jan	3.272	0.5	1636.0	0.5	1636.0	2	6544.0	0.42	1374.2	0.66	2159.5
14-Jan	3.260	1.5	4890.0	0.5	1630.0	2.1	6846.0	0.33	1075.8	0.58	1890.8
21-Jan	3.067	0.5	1533.5	0.5	1533.5	0.8	2453.6	0.23	705.4	0.63	1932.2
28-Jan	3.185	0.5	1592.5	1.2	3822.0	0.5	1592.5	0.56	1783.6	1.94	6178.9
4-Feb	5.276	0.5	2638.0	0.5	2638.0	2	10552.0	0.46	2427.0	1.22	6436.7
11-Feb	3.305	0.5	1652.5	0.5	1652.5	4.5	14872.5	0.55	1817.8	0.812	2683.7
18-Feb	2.723	0.5	1361.6	1.5	4084.5	10.1	27502.3	0.52	1416.0	4.2	11436.6
25-Feb	3.898	1.5	5847.0	1.3	5067.4	0.5	1949.0	0.846	3305.5	0.682	2658.4
4-Mar	3.695	0.5	1847.5	1.5	5542.5	0.5	1847.5	0.82	3029.9	0.73	2697.4
11-Mar	3.573	0.5	1786.5	1	3573.0	0.5	1786.5	0.71	2536.8	1.02	3644.5
18-Mar	4.013	0.5	2006.5	0.5	2006.5	2.3	9229.9	0.42	1685.5	0.62	2488.1
25-Mar	3.590	0.5	1795.0	0.5	1795.0	2.4	8616.0	0.46	1651.4	0.65	2333.5
1-Apr	7.211	1.5	10816.5	0.5	3608.5	2.3	16585.3	0.61	4398.7	3.11	22426.2
8-Apr	7.163	0.5	3581.5	1.2	8595.6	4.8	34382.4	1.18	8452.3	2.22	15901.9
15-Apr	10.893	0.5	5446.5	0.5	5446.5	1.1	11982.3	0.83	9041.2	2.65	28866.5
22-Apr	6.700	0.5	3350.0	0.5	3350.0	1.5	10050.0	0.69	4623.0	2.14	14338.0
29-Apr	4.043	0.5	2021.5	0.5	2021.5	0.5	2021.5	0.63	2547.1	0.68	2749.2
6-May	3.747	0.5	1873.5	0.5	1873.5	0.5	1873.5	0.59	2210.7	0.7	2622.9
13-May	3.804	0.5	1802.0	0.5	1802.0	1.4	5045.6	0.33	1189.3	2.23	8036.9
20-May	4.467	0.5	2233.5	0.7	3126.9	9	40203.0	0.36	1697.5	4.92	21977.6
27-May	8.944	0.5	4472.0	0.5	4472.0	0.5	4472.0	0.45	4024.8	2.55	22807.2
3-Jun	5.347	0.5	2673.5	1.2	6416.4	1.2	6416.4	0.4	2138.8	2.3	12298.1
0-Jun	4.150	0.5	2075.0	0.5	2075.0	7.9	32785.0	0.25	1037.5	2.62	10873.0
7-Jun	3.883	0.5	1941.5	0.5	1941.5	0.5	1941.5	0.21	815.4	6.06	23531.0
24-Jun	17.913	0.5	8956.5	1.2	21495.6	0.5	8956.5	0.27	4836.5	4.13	73980.7
1-Jul	4.539	0.5	2269.5	0.5	2269.5	0.5	2269.5	0.19	862.4	2.76	12527.6
8-Jul	4.188	0.5	2094.0	0.5	2094.0	4.7	19683.6	0.29	1214.5	4.82	20186.2
15-Jul	4.491	0.5	2245.5	0.5	2245.5	2.3	10329.3	0.28	1257.5	3.46	15538.9
22-Jul	3.940	0.5	1970.0	0.6	2364.0	0.5	1970.0	0.24	945.6	4.98	19621.2
29-Jul	3.695	2	7390.0	0.5	1847.5	0.5	1847.5	0.27	997.7	5.91	21837.5
5-Aug	3.499	1	3499.0	0.5	1749.5	2.8	9797.2	0.35	1224.7	5.38	18824.6
12-Aug	3.580	0.5	1790.0	2.1	7518.0	0.5	1790.0	0.41	1467.8	6.81	24379.8
19-Aug	3.340	0.5	1670.0	0.6	2004.0	1.6	5344.0	0.35	1169.0	4.72	15764.8
26-Aug	3.274	0.5	1637.0	0.5	1637.0	0.6	1964.4	0.43	1407.8	2.11	6908.1
2-Sep	3.336	0.5	1668.0	0.5	1668.0	15.8	52708.8	0.37	1234.3	3.05	10174.8
9-Sep	3.432	0.5	1716.0	0.5	1716.0	0.5	1716.0	0.34	1166.9	4.34	14894.9
16-Sep	3.290	0.5	1645.0	0.5	1645.0	1.9	6251.0	0.34	1118.6	3.01	9902.9
23-Sep	3.226	0.5	1613.0	0.5	1613.0	0.5	1613.0	0.61	1967.9	1.41	4548.7
30-Sep	3.157	4	12628.0	0.5	1578.5	0.5	1578.5	0.39	1231.2	0.87	2746.6
7-Oct	2.865	0.5	1402.5	0.5	1402.5	2.2	6171.0	0.71	1991.6	0.93	2608.7
14-Oct	3.128	1	3128.0	0.5	1564.0	0.5	1564.0	0.61	1908.1	1	3128.0
21-Oct	2.465	16	39440.0	1.4	3451.0	1.4	3451.0	0.63	1553.0	1.28	3155.2
28-Oct	5.072	0.5	2536.0	0.5	2536.0	0.6	3043.2	0.8	4057.6	1.9	9636.8
4-Nov	3.157	0.5	1578.5	0.5	1578.5	0.5	1578.5	0.65	2052.1	0.768	2418.3
11-Nov	3.949	0.5	1974.5	0.5	1974.5	2	7898.0	0.65	2566.9	0.79	3119.7
18-Nov	3.310	0.5	1655.0	1.1	3641.0	0.5	1655.0	0.36	1191.6	2.466	8162.5
25-Nov	3.501	0.5	1750.5	0.6	2100.6	2.4	8402.4	0.35	1225.4	2	7002.0

al	225.895	Ml	197611	grams	162059.7	grams	482206.1	grams	113284.96	grams	563093.896	grams
g/ML			874.79	g/ML	717.41	g/ML	2134.65	g/ML	501.49	g/ML	2492.72	g/ML

Inflow	1598.80	Ml/yr
Reuse	5.64	Ml/yr
Bypass	1521.71	Ml/yr
Outflow	3112.87	Ml/yr

LOAD BASED LICENCE CALCULATIONS

			TSS		BOD		TOG		TP		TN	
Annual Fl.	3112.87	Ml										
Annual Load	(AL)		2,723	Kg	2,233	Kg	6,645	Kg	1,561	Kg	7,760	Kg
Agreed Load	(AL)		37,738	Kg	21000	Kg	12579	Kg	2,430	Kg	21000	Kg
	Fee rate factor		15		10		2		0.3		10	
Fee Rate	(FRT)		40693.02		31128.68		6225.74		933.66		31128.68	Kg
AL - FRT	(check)		-43969.91		-28895.47		419.14		627.22		-23369.16	
2xAL - FRT	(AL1)		n/a		n/a		7,064.01		2188.31		n/a	
	Assessable Load		2,723		2,233		7,064		2,188		7,760	Kg
	CF		0.30116		0.00386		0.28571		2.62548		0.0888	
			TSS		BOD		TOG		TP		TN	
	Pollutant Fee		$820.09		$8.62		$2,018.26		$5,745.36		$689.05	
										TOTAL	$9,281.38	

RPS

Newcastle Office
Ground Floor, 241 Denison Street, Broadmeadow, NSW Australia 2292
PO Box 428, Hamilton, NSW Australia 2303
T +61 2 4940 4200 F +61 2 4961 6794 E newcastle@rpsgroup.com.au W rpsgroup.com.au

REVIEW OF SOUTH LISMORE SEWER TREATMENT WORKS CAPACITY

Introduction

RPS has been engaged by Winten Property Group to review a report prepared by ACM Landmark assessing available capacity in the South Lismore Sewer Treatment Works. The assessment is based on data supplied by Lismore City Council including :-

- South Lismore Treatment Works Augmentation – Concept Design Report CMPS&F Pty Ltd 1995
- Flow data from the South Lismore Treatment Works for 2007, 2008, 2009.

The nominal capacity of South Lismore Treatment Works is 22,000 EP.

Review

The ACM Landmark assessment of available capacity at 1,900 EP is considered to be conservative. This available capacity has been determined using the total annual inflow for 2008 which was equivalent to 20,091 EP. The annual inflow not only includes discharge from connected properties but wet weather flows.

The inlet works have been designed to process flows of approximately 171 l/s (2.8 x ADWF), flows greater than this are directed to the wet weather bypass.

Review of average flows from August 2009 to November 2009, where no bypass flows were recorded, indicate average flows of 3,240 kl/day (37.5 l/s) this equates to 13,500 EP based on 240 l/person/day.

Review of average flows from August 2008 to October 2008, where no bypass flows were recorded, indicate average flows of 3,730 kl/day (43.2 l/s) this equates to 15,540 EP based on 240 l/person/day.

Review of average flows from January 2007 to November 2007, where no bypass flows were recorded, indicate average flows of 3,924 kl/day (45.4 l/s) this equates to 16,350 EP based on 240 l/person/day.

Using an average of the above loading figures (15,130 EP) indicates there could be 6,870 EP capacity available in the Treatment Works.

However in the area of wastewater treatment it is considered that a conservative approach should be adopted.

RPS

Conclusions

The conclusions drawn by the assessment completed by ACM Landmark are considered to be consistent with the data provided.

The South Lismore Sewer Treatment Works appears to have hydraulic and organic capacity to process flows from at least an additional 1,800 EP. This available capacity could be as high as 6,870 EP.

Information in the Concept Design Report indicates some existing components of the South Lismore Sewer Treatment Works have a theoretical rating of approximately 27,000 EP. Therefore it is not unreasonable to assume that the Treatment Works could be readily upgraded from its existing capacity of 22,000 EP to 27,000 EP.

Ian Murphy
Principal/ Water & Sewer Strategist

Sewer Availability

North Lismore Plateau

acm
LANDMARK
LAND DEVELOPMENT
CONSULTANTS

Suite 3, Unit 5 Edward Street
PO Box 627, CESSNOCK NSW 2325
P (02) 4991 7171
F (02) 4991 7272
E admin@acmlandmark.com.au
www.acmlandmark.com.au

CONTENTS

1	INTRODUCTION	1
2	SITE	1
3	PROPOSAL	1
4	BACKGROUND	1
5	ASSESSMENT	3
6	SOUTH LISMORE SEWER TREATMENT PLANT CAPACITY	3
7	CONCLUSION	4

APPENDICES

A. STUDY AREA
B. CONCEPT SEWER SUPPLY PLAN
C. BRIEF ASSESSMENT
D. REVIEW OF SEWER CAPACITY, PEER REVIEW

1 INTRODUCTION

ACM landmark were engaged to undertake a brief assessment of the provision of sewer to the North Lismore plateau. The assessment was requested to determine a sewer servicing methodology including transfer from the site of sewage to the South Lismore Sewer Treatment Plant (SLSTP). The assessment was also required to determine available capacity within the South Lismore Sewer Treatment Plant.

The information was required to be provided for the planning charrette in December 2010 with Lismore City Council.

2 SITE

The land is known as the North Lismore Plateau, a site approximately four (4) kilometers to the south west of the Central Business District of Lismore. The land comprises elevated plateau slopes rising to approximately 126m AHD and is located to the south of Dunoon Road and north of Nimbin Road. The area of the plateau is approximately 285ha and is expected to provide for approximately 1200 to 1600 residential lots. A plan of the study area can be seen as Appendix A.

3 PROPOSAL

It is proposed to zone the land from its current investigation zone of 1(b) to a residential RU2 zone. The residential development of the land would require the provision of services such as sewer.

Various possibilities to service the land with sewer have been considered including package treatment plants, standard gravity system etc. The most practical and feasible of these is the provision of a standard gravity system throughout the site comprising gravity mains, local pump stations where necessary and associated rising mains connecting to the South Lismore Sewer Treatment Plant.

4 BACKGROUND

The 1994 study titled 'The Dunoon Road Planning Study' undertaken by Northern Rivers Engineers, Planners and Scientists in 1994 for Lismore City Council described the most feasible method to service the plateau with sewer. The current proposal mirrors that contained within the 1994 report in terms of connection of the plateau to the South Lismore Sewer Treatment Plant. Costs for the provision of external gravity sewer mains, pump station and rising mains were originally prepared by Cardno in 2003. Those costs have been merely indexed as follows:-

$$\frac{\text{2003 price x 30}^{\text{th}}\text{ September 2010 quarter (173.3)}}{\text{30}^{\text{th}}\text{ December 2002 quarter (139.5)}} = 1.242$$

The sewerage costs are made up of the following:-

- New additional treatment facilities at the existing South Lismore Treatment Works.
- A new major pump station at the intersection of Terania Street and Wilson Street North Lismore.
- Rising main from the major pump station to the South Lismore Treatment Works (SLSTW).

The following sewer treatment costs were prepared by Cardno in 2003 and indexed to 2010 costs.

Gravity Main		
250mm Including Manholes Approx. 600m		$210,000.00
Land Matters		$30,000.00
		$240,000.00
SID 16%		$38,400.00
Contingencies 20% (on $210,000.00)		$42,000.00
TOTAL	Say	**$320,400.00**
Pump Station (60 L/S)		
Pump Station		$329,130.00
Land Matters		$62,323.00
Power Supply		$46,742.00
		$438,195.00
SID 16%		$70,111.00
Contingencies 20%		$87,639.00
TOTAL	Say	**$596,000.00**
Rising Main (2600m)		
2600m x 225mm @ $149/m		$447,120.00
Rail Crossing		$46,700.00
River Crossing		$62,300.00
Easement Widening allowance		$31,700
		$587,820.00
SID 16%		$94,052.00
Contingencies 20%		$117,564.00
TOTAL		**$799,436.00**
TOTAL SEWER CONNECTION SYSTEM		***$1,715,840.00***

This approximate $1,100.00 to $1,500.00 per lot for 1,200 to 1,600 lots.

The costs represent external sewer connection costs. Additional cost per lot for internal sewer will be applicable and combine normal development servicing costs.

5 ASSESSMENT

The attached plan shown as Appendix B gives a pictorial representation of a proposed connection route from the plateau to the South Lismore Sewer Treatment Plant. The transfer route comprises public road access, existing bridge access of Leycester Creek and existing easements through intervening land to the South Lismore Sewer Treatment Plant.

A proposed pump station has been located at the intersection of Wilson Street and Terania Street. A gravity main of approximate size and length of 250mm and 600m respectively will convey sewage from the plateau to the new pump station. The pump station will convey sewage thence to the South Lismore Sewer Treatment Plan via a new rising main running parallel within Wilston Street and thence to the existing ring main within the existing easement to the STP.

The approximate cost of the external scheme components has been assessed at $1,100.00 to $1,500.00 per lot.

The external components comprising gravity main, sewer pump station and ring main to the SLSTP will be provided and funded by the developers of the plateau generally to service the first stage of the residential development.

Internal gravity reticulation would also be provided by the developers within the subdivision of each stage of the residential development.

6 SOUTH LISMORE SEWER TREATMENT PLANT CAPACITY

A brief assessment of the capacity of the South Lismore Sewer Treatment Plant was undertaken in August 2010. That report considered the previous upgrading of the Sewer Treatment Plant within the 1995 major upgrade of the Sewer Treatment Plant. The upgrading in 1995 and its associated capacity were considered against current sewage inflows from 2007, 2008 and 2009. The assessment concluded that there was a possible capacity within the Sewer Treatment Plant for 600 ET (equivalent tenements). The full report can be seen as Appendix C.

A further review of the 2010 report was undertaken independently by RPS (Newcastle) in order to test the voracity of the initial assessment by ACM Landmark Pty Ltd. This report can be seen as Appendix D.

The RPS report found that the ACM report was somewhat conservative and that the actual capacity within the South Lismore Sewer Treatment Plant was up to 2000 ET. This of course would be subject to design and consideration of the actual design flows and the bypass peak wet weather flows. However the report clearly confirms the ability of the plateau to accommodate from 600 ET to 2000 ET within the existing capacity of the South Lismore Sewer Treatment Plant. There is also sufficient capacity

within the 600 ET to 2000 ET to accommodate existing catchment growth/development within North Lismore and the Lismore CBD.

It is understood that Lismore Council is in the process of briefing a consultant to undertake a review of the upgrading requirements for the South Lismore Sewer Treatment Works. That upgrade has been necessitated as a result of the current standard of the treatment works rather than specifically a capacity investigation.

7 CONCLUSION

The North Lismore Plateau area proposed for rezoning has the capability to be serviced by sewer in a manner of forms. Lismore City Council however favours the provision of a standard or regular system of gravity sewer service to the land and transfer to the South Lismore Sewer Treatment Plant.

The connection of the plateau to the South Lismore Sewer Treatment Plant comprise gravity mains, pump station and rising mains. There have been conceptually sized and costed to give an understanding as to the overall development costs.

The South Lismore Sewer Treatment Plant has been determined within the two assessment reports to have sufficient capacity within its current operation to cater for 600 ET to 2000 ET, subject to design.

It can be seen therefore that the rezoning of the North Lismore plateau would not be limited by the provision of sewer to enable future development.

Some upgrading of the South Lismore Sewer Treatment Plant will be required to provide plant improvement and possibly the latter stages of the plateau development. The proposed investigations of any necessary upgrading are currently being proposed by council.

That upgrading will however be to improve plant efficiency rather than upgrade to provide plant capacity for the North Lismore Plateau. Clearly therefore the provision of sewer to the North Lismore Plateau is not an impediment to the rezoning or urban development of the land.

APPENDIX A

Study Area

APPENDIX B

Concept Sewer Plan

APPENDIX C

Brief Assessment Report

APPENDIX D

Review of Sewer Capacity, Peer Review

Attachment F

Better Transport Futures

Mark Waugh Pty Limited
ABN 67 106 169 180
Transport Planning & Engineering

Proposed Residential Subdivision, North Lismore NSW

Traffic Impact Assessment

February 2011

Mark Waugh Pty Ltd
ACN 106 169 180
ABN 67 106 169 180
PO Box 114,
NEW LAMBTON
NSW 2305
Telephone: +61 2 4952 5592
Facsimile: +61 2 4952 5573
E-mail: admin@markwaugh.com.au

Contents

Document History and Status ii

1. Introduction 1

2. Existing Situation 2
- 2.1 Site Description and Proposed Activity 2
- 2.2 Existing Traffic Conditions 3
- 2.3 Traffic Flows 7
- 2.4 Traffic Safety and Accident History 8
- 2.5 Parking Supply and Demand 9
- 2.6 Public Transport 9
- 2.7 Other Proposed Developments 13

3. Proposed Development 14
- 3.1 The Development 14
- 3.2 Access 14
- 3.3 Circulation 15
- 3.4 Parking 16

4. Impact of Proposed Development 17
- 4.1 Traffic Generation 17
- 4.2 Traffic Distribution and Assignments 17
- 4.3 Impact on Road Safety 18
- 4.4 Impact of Generated Traffic 19
- 4.5 Public Transport 21
- 4.6 Recommended Works 22

5. Conclusions 23

Appendix A Site Plans 25

Appendix B Accident Data 26

Appendix C Traffic Survey Results 28

Better Transport Futures

Mark Waugh Pty Limited
ABN 67 106 169 180
Transport Planning & Engineering

Document History and Status

Issue	Rev.	Issued To	Qty	Date	Approved
Draft	Rev01	Jim Punch – Project Plan	1	29th January 2011	M Waugh
Final	Rev02	Jim Punch – Project Plan	1	10th February 2011	M Waugh

Printed:	9th February 2011
Last Saved:	9th February 2011
File Name:	P783 PP North Lismore residential TIA Rev01
Author:	Sean Morgan
Name of Organisation:	Project Plan
Name of Project:	Proposed Residential development, North Lismore, NSW
Name of Document:	Traffic and Parking Impact Statement
Document Version:	Final
Project Number:	P0783

1. Introduction

Background
Better Transport Futures has been commissioned by Project Plan on behalf of the Winten Property Group to prepare a Traffic Impact Assessment for the proposed residential development to the north of Lismore, northern NSW. Due to the size of the development and its location adjacent to Dunoon Road (MR306) the Roads and Traffic Authority for NSW (RTA) will be required to review the proposal prior to formal rezoning once the detail is available for the access arrangements on the arterial road network.

Scope of Report
The scope of this report is to review the traffic and parking implications for the proposed development. The report will also provide advice on access issues, internal car park layout and issues relating to service vehicles.

Issues and Objectives of the study
The issues relevant to the proposal are:

- Assess impact on the arterial and local road network due to the additional traffic flows;
- Assess the capacity of the bridge crossing for access to the Lismore CBD;
- Review the access arrangements for the development; and
- Assess any other transport impacts associated with the development.

The objective of the report is to document the impacts of the proposed development, provide advice on any infrastructure work required as part of the development and to determine the extent of the capacity of the existing road network and in particular the capacity for additional traffic to cross the river to access the Lismore CBD.

Planning Context
As part of the development of this document, the following guides and publications were used:

- RTA Guide to Traffic Generating Developments, Version 2.2 Dated October 2002;
- Australian / New Zealand Standard – Parking Facilities Part 1 : off-street car parking (AS2890.1:2004);
- Accident Data for the locality by the RTA (Grafton office)
- Lismore City Council DCP Chapter 7 Off Street Parking dated 18/03/09.
- Lismore CBD Traffic and Parking Study, prepared by ttm consultants, final report dated December 2007.

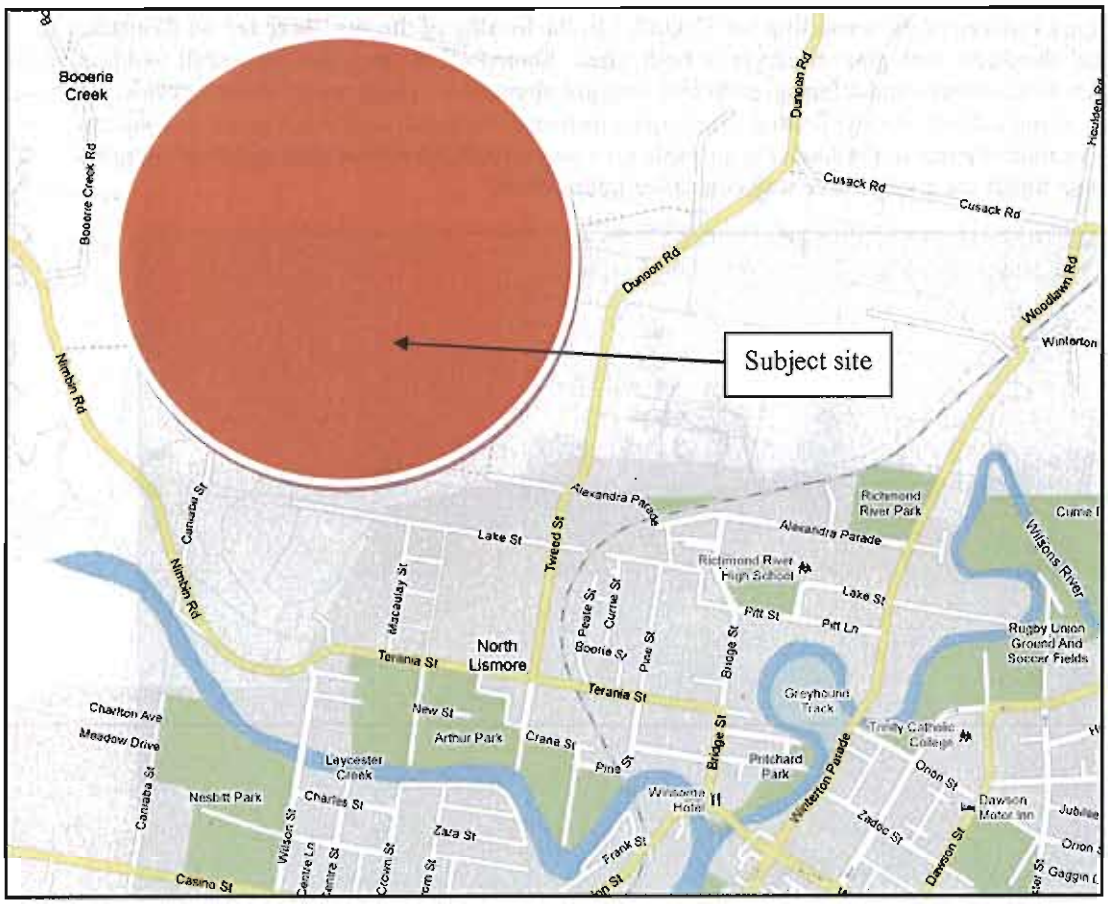
2. Existing Situation

2.1 Site Description and Proposed Activity

2.1.1 Site Location and Access

The site is bounded is bounded by Dunoon Road and Nimbin Road to the north-west of the Lismore CBD. The site currently has a number of separate access points to individual lots within the subject area. There are a number of residential lots to the immediate south of the site and the Lismore showground is located opposite the site on Dunoon Road.

The location of the site is shown below in **Figure 2.1.**



Source: Google Maps

- **Figure 2.1 - Site Location**

2.2 Existing Traffic Conditions

2.2.1 Road Hierarchy

Dunoon Road

The major road through the locality is Dunoon Road which is a local Council road providing a road link between Lismore to the south and Dunoon to the north and is a classified main road (MR306) requiring RTA concurrence for any works on or adjacent to the road. To the south of the site it connects with Tweed Street for the connection into Lismore. It also connects with Alexandra Parade for the alternative route into Lismore CBD via Winterton Parade. It provides access for local traffic with limited through traffic movements.

In the locality of the subject site, it provides a single lane of travel in both directions and operates under a posted speed limit of 80 km/h adjacent to the site. On the southern boundary of the site the speed limit reduces to the urban limit of 50 km/h. In the locality of the site, there are no footpaths or sealed shoulders with grassed verges to both sides. Dunoon Road provides an overall width in the order of 6.5 metres and offers a reasonably straight alignment. There are no street lights in the vicinity of the subject site and limited street lights further to the south within Lismore. It connects with Alexandra Parade to the south via a simple give way controlled intersection and then connects to Terania Street via another give way controlled intersection.

■ **Photo 1** View south along Dunoon Road showing typical cross section. Site is to right of photo

Nimbin Road

Nimbin Road to the south west of the site is a Council road providing local access to a number of rural lots as well as access through to Nimbin to the north and is a classified main road (MR142). It connects with Terania Street for access to the Lismore CBD. In the vicinity of the subject site it provides an overall width in the order of 6.5 metres with a single lane of travel in both directions. The intersections along its length are simple, give way controlled and the posted speed limit is 50 km/h for the majority of its length along the site frontage. It then increases to 100 km/h. There are no footpaths provided along its length until it connects with Terania Road within the built up area of Lismore.

- **Photo 2** View along Nimbin Road showing typical cross section

Alexandra Parade

Alexandra Parade is a local Council road and provides a connection between the subject site and Winterton Parade for access to the Lismore CBD. It provides a single lane of travel in both directions with an overall width in the order of 6.0 metres. There are no footpaths along its length. Alexandra Parade provides access to a number of individual residential lots and a number of light industrial users as well as at the eastern end of the road the Richmond River High School. Outside of this school zone the posted speed limit is 50 km/h.

- **Photo 3** View along Alexandra Parade showing typical cross section.

Winterton Parade

Winterton Parade provides a direct access to the Lismore CBD with a bridge over the river at its southern end. It provides an overall width in the order of 6.5 metres and provides a single lane of travel in both directions. There is a single footpath / cycleway provided along the western side of the road that continues over the river bridge. It provides access to a number of residential lots and operates under a posted speed limit of 50 km/h. It also provides the major access to the Richmond River High School with associated high usage for student drop off and pick up.

■ **Photo 4** View south over the bridge crossing on Winterton Parade. Note footpath to right hand side of photo

2.2.2 Road works

It is understood that other than routine maintenance by the road authorities there are no plans for any major road network changes in the immediate vicinity of the subject site. Given the relatively low traffic flows it can be seen that there is minimal requirements to upgrade the roads in this location.

Currently Council are completing some minor street works along Winterton Parade with resurfacing and rising of the road height being completed as part of the Council flood mitigation works.

2.2.3 Traffic Management Works

It is understood that there are no planned traffic management works in the immediate vicinity of the subject site. A traffic report for the Lismore CBD commissioned by Council has identified a number of intersection upgrades and road upgrades required over the planning of timeframe of 10 years and beyond. It provides a staging for these upgrades of within 5 years, 5-10 years and 10 years and beyond. Council have adopted the recommendations of this study and are looking to complete the road upgrade work over the coming years, dependent upon funding through S94 contributions and State funding opportunities. All of these upgrades have been identified as has the traffic impacts from the proposed development of the subject site.

2.2.4 Cycling Facilities

There are very limited cycle facilities in the immediate vicinity of the subject site as well as within Lismore despite the Lismore Cycleway Plan (November 2007) identifying the need to develop:

- Linking of existing cycleways with established cycling attractors for commuting cyclists
- Providing loops in the network for recreational cyclists
- Avoiding where possible highly trafficked roads.

There are no published plans of cycleways readily available to promote cycling within the community.

The local roads adjacent to the subject site carry very low traffic volumes and the traffic speeds are low allowing for on-road cycling to occur safely.

2.3 Traffic Flows

The proposed development is for a residential facility providing mixed density development. Access will be provided via connections to Nimbin Road and Dunoon Road. Traffic flows would be typical of residential development, with distinct peaks during the morning and afternoon periods associated with commuting trips, school trips etc.

2.3.1 Daily Traffic Flows

There is limited data available with regard to daily traffic flows in the immediate vicinity of the subject site. However, observations on site indicate that overall the traffic flows adjacent to the subject site are relatively low and well within acceptable limits for these local roads. It can be seen that Dunoon Road does not provide a direct access road to any major centres and as such only provides access for local residential and rural needs.

Peak hour surveys were completed adjacent to the site in a number of locations. Based on peak hour flows representing 10% of the daily flows, the following flows are projected:

- Dunoon Road north of Alexandra Parade – 3,300 vehicles per day.
- Dunoon Road south of Alexandra Parade – 2,700 vehicles per day
- Alexandra Parade east of Dunoon Road – 3,500 vehicles per day

Whilst peak hour flows were completed over the bridge crossing on Winterton Parade, these are not considered representative of daily flows. The Richmond River High School generates significant traffic demands during drop off and pick up times and basing the daily flows on these peak flows would not provide a representative daily value of traffic flows at this location. During the morning peak period, the two-way traffic flow on Winterton Parade over the river bridge was 705 vehicles, with the dominant flow being towards town (525 vehicles). During the afternoon, the flows between 3.15 and 4.00 were similar, although the balance was more even between town bound and out of town bound traffic. However, after 4.00 PM the traffic flows decreased noticeably with the observed flows being in the order of 344 (with the dominant flow being out of town with 210 vehicles or 61% of the flows). This shows that outside of the peak demand created by the schools at this location the flows on Winterton Parade are well within acceptable limits.

The CBD traffic study completed for Council shows slightly lower flows than this but are based on 1996 data. Allowing for background growth in data the current values predicted above would appear representative of the current daily flows.

2.3.2 Daily Traffic Flow Distribution

Based on the observed traffic movements during both the morning and afternoon peak periods, it can be seen that there is a strong desire for traffic to head towards the Lismore CBD from the outlying areas during the morning peak and then the reverse movement out of Lismore during the PM peak.

It is considered that the subject development site with residential development would show a similar bias with traffic wishing to head towards the Lismore CBD in the morning peak and the reverse outbound trip in the afternoon.

2.3.3 Vehicle Speeds

No vehicle speed measurements have been taken as part of the study work. Observations on site would indicate that the majority of traffic appears to travel within the posted speed limits, with no obvious signs of excessive speed. The road alignment on Dunoon Road adjacent to the site does not encourage high traffic speeds. Similarly, the alignment off Alexandra Parade under the railway line contains vehicle speeds.

Vehicles speeds are also constrained by the school zone on Winterton Parade and Alexandra Parade (40 km/h zone).

2.3.4 Existing Site Flows

The site is currently occupied by a number of rural lots. Existing traffic flows within the overall site area are relatively low.

2.3.5 Heavy Vehicle Flows

Minimal heavy goods vehicles were observed during the site visits. It can be seen that there are only heavy vehicles with a destination to this area with limited through traffic movements overall. It is noted that there are livestock sales yards on the corner of Alexandra Parade and Dunoon Road with the requirement for access by larger vehicles including semi trailers during sales events.

2.3.6 Current Road Network Operation

Observations on site indicate the current road network operates well with minimal delays for the majority of traffic movements. The traffic movements associated with the Richmond River High School and Woodlawn College both create high demands along Winterton Parade during the peak periods which can lead to some delays at the intersection of Winterton Parade and Orion Street.

The intersection of Alexandra Parade with Dunoon Road and with Winterton Parade both however operate very well with little if any delay for the majority of road users.

Observations within the Lismore CBD show that there is some congestion, although this was exacerbated by the road works occurring in and around the CBD. The report commissioned by Council has already acknowledged the existing road network constraints and a number of upgrades have been developed and adopted for Council to help reduce the level of congestion and delays within the Lismore CBD.

2.4 Traffic Safety and Accident History

Accident data for the locality is collected by the RTA. Data from the RTA reveals a single accident at the intersection of Winterton Parade and Orion Street and three accidents at the

intersection of Alexandra Parade and Dunoon Road, over a 5 year history. These are relatively low numbers with just a single injury. Further details are provided in **Appendix B**.

A review of the local road network indicates that the roads are typically well laid out with easy to understand intersections with good visibility splays.

Overall it is considered that the road in this location provides a safe and acceptable layout for existing road users.

2.5 Parking Supply and Demand

2.5.1 On-street Parking Provision

Currently vehicles can park on the verges on the local streets in the general vicinity of the subject site. There are limited parking controls allowing for general use of this parking as required.

2.5.2 Off-Street Parking Provision

Off-street parking in the general locality of the subject site is provided within the residential and light industrial lots. There is car parking within the Richmond River High School for teacher and parent use as required.

2.5.3 Parking Demand and Utilisation

During the site work there was minimal parking demand observed. All of the parking demand was satisfied within the site boundaries of the various lots with very little demand for on-street parking in the locality of the subject site.

It is understood that during functions at the showground there are significant parking demands along both Dunoon Road and Alexandra Parade. This parking demand is restricted by normal parking controls associated with public roads.

2.5.4 Set down or pick up areas

There are no formal set down or pick up areas in the locality of the site. The school bus drop off and pick up is completed off Lake Street with no impact directly on Winterton Parade or Alexandra Parade.

2.6 Public Transport

2.6.1 Rail Station Locations

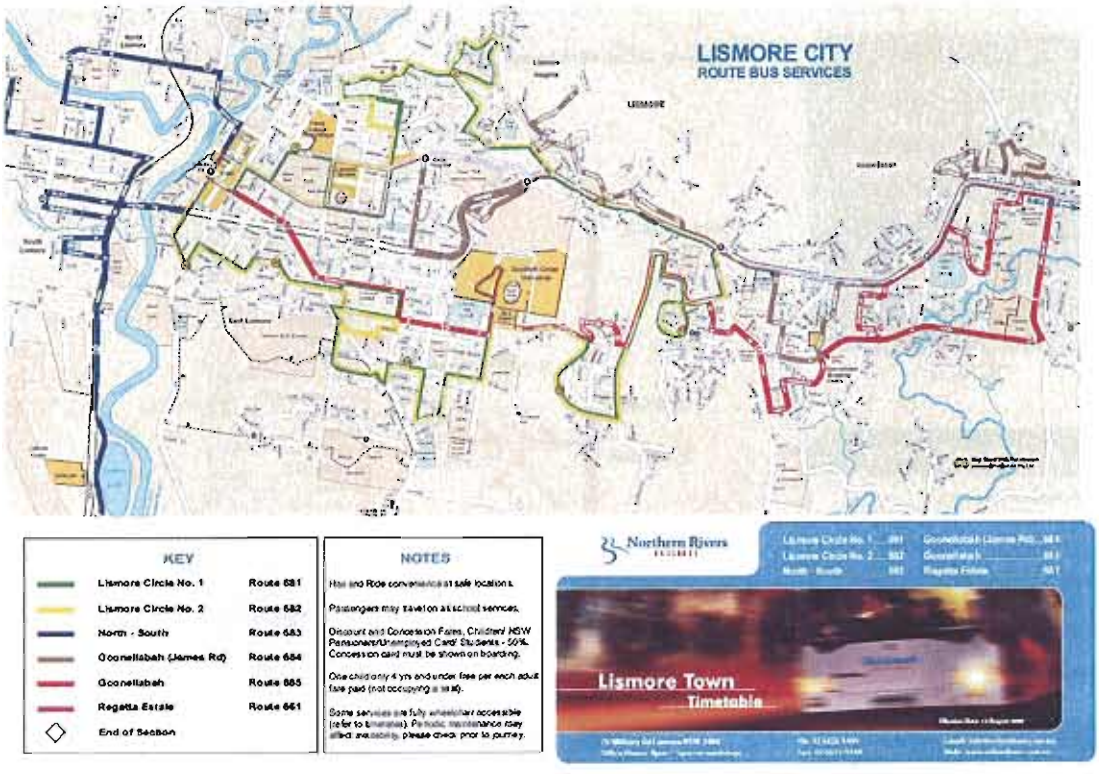
Lismore Railway Station is closed to rail travel however the station is part of the Countrylink service with rail travel to Sydney and to Brisbane via Casino available and connected to Casino from Lismore via a bus service. There is an AM and PM service to Sydney and an afternoon service to Brisbane.

■ **Figure 2-1 Countrylink North Coast Network**

2.6.2 Bus Stops and Associated Facilities

Lismore is well supported by a wide range of small bus companies servicing the surrounding townships throughout the region as well as the Countrylink Service connecting Casing to the Gold Coast via Lismore and Byron Bay.

Existing bus services within Lismore are provided by Northern Rivers Buslines however they offer no regular services within the vicinity of the site. The North-South Route 683 services the North Lismore area every two hours during the day and travels along Terania Street however returns towards Lismore at its junction with Nimbin Road. (**Figure 2-2**).



■ **Figure 2-2 Northern Rivers Buslines Lismore Bus Routes**

The site work reveals that there are a high number of school buses that service the existing demands for school students for Richmond River High school. These buses provide a service to this school from a number of local towns and centres.

The Dunoon Bus Service offers a Dunoon to Lismore route via Tullera along Dunoon Road on school days only.

Waller's Bus Company runs a number of services daily between Lismore and Nimbin and beyond to Murwillumbah. The services primarily cater for school students although plans are in place, subject to approval by NSW Transport, to offer an additional service for commuters leaving Nimbin in the morning and returning from Lismore at the end of the working day. The route from Nimbin travels along Nimbin Road, along Terania Street and travelling into the CBD via Bridge Street.

WALLER'S BUS COMPANY

Timetable

Pickup Points	Nimbin Central	Nimbin Main St.	Coffee Camp	Goolmangar School	Goolmangar Store	Blakebrook Interchange	RRHS	Lismore Transit
Nimbin - Lismore Mon - Fri	7.50	7.52	8.03	8.10	8.14	8.20	8.35	8.50
	8.55	9.00	9.10	9.15	9.18			9.35
	3.22	3.25	3.35	3.40	3.45			4.10
		4.30	4.40	4.45	4.49			5.00
Mon. & Thu. Only		12.45	12.55	1.00	1.05	1.15	1.17	
School Holidays		9.00	9.10	9.15	9.18			9.35
		3.25	3.30	3.40	3.44			4.00

Pickup Points	Lismore Transit	RRHS	Blakebrook Interchange	Goolmangar Store	Goolmangar School	Coffee Camp	Nimbin Main St.	Nimbin Central
Lismore - Nimbin Mon - Fri	7.00			7.10	7.14	7.25	7.30	4.20
	8.00			8.23	8.25	8.35	8.45	8.50
	2.35	2.40	2.45	2.48	2.55	3.00	3.10	3.15
	3.20	3.35	3.50	3.55	4.00	4.05	4.15	4.20
Mon. & Thu. Only	12.00	12.03	12.10	12.12	12.15	12.25	12.35	
School Holidays	2.35			2.48	2.55	3.00	3.10	
	3.25			3.44	3.50	3.57	4.00	

Pickup Points School days only	Gwynne Road	Mitchell Road	Oakey Creek Interchange	Blakebrook Interchange	RRHS	Trinity Bay 2 Interchange		Lismore Transit
Georgica - Lismore	7.43	7.51	8.00	8.20	8.35	8.40		8.52

Pickup Points School days only	Lismore Transit		Trinity Bay 2 Interchange	RRHS	Blakebrook Interchange	Oakey Creek Interchange	Mitchell Road	Gwynne Road
Lismore - Georgica	3.25		3.35	3.43	3.50	4.19	4.28	4.36

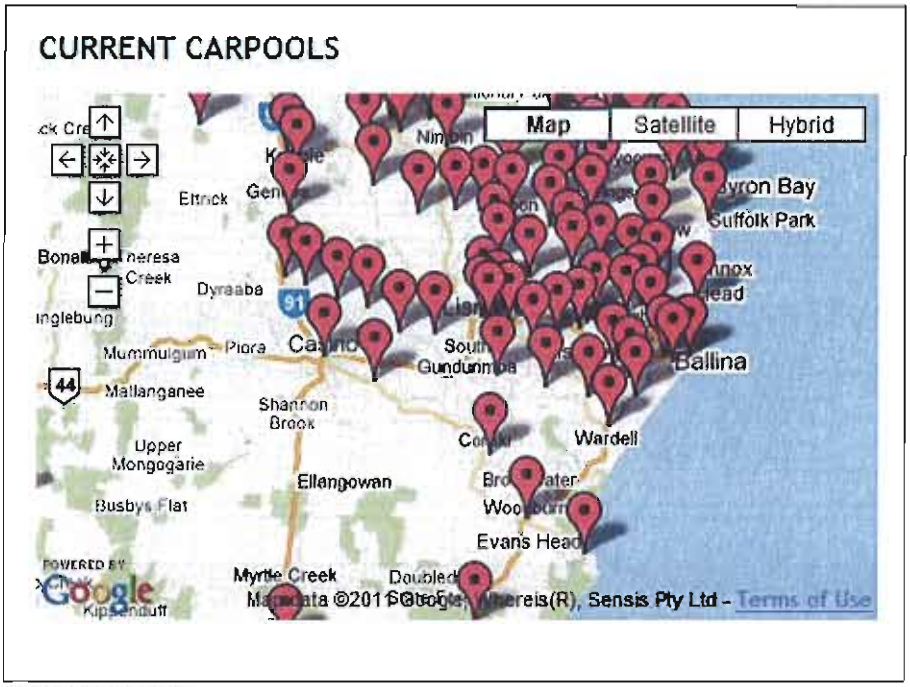
Town Service - Wheelchair access available upon request, 24 Hour notice required
School Service - Buses connect in Nimbin - Murwillumbah
No Public Holiday Services
P.O. Box 6503 SOUTH LISMORE NSW 2480 Phone: (02) 6622-6266 Mob: 0428-255-284 Fax: (02) 6622-6682

- **Figure 2-3 Waller's Bus Company Lismore to Nimbin Timetable**

2.6.3 Car Pooling

In February 2010 the first regional carpooling network was announced in Lismore. Providing an online registration the program aims to create a network of commuters across the Northern Rivers region (Tweed to Clarence) that have similar travel patterns and are prepared to share their travelling to reduce cost and travel time.

The network is supported by a series of designated roadside pick up points as well as priority parking in specific car parks. It is supported by the local councils, North Coast Institute of TAFE and the North Coast Area Health Service.



Source: www.nrcarpool.org

- **Figure 2-4 Current Carpooling in the Northern Rivers Carpooling Network**

2.6.4 Pedestrians

There are currently no pedestrian facilities in the vicinity of the site reflecting its rural nature. There is a footpath along the western side of Winterton Parade providing an important link between the Richmond River High School and the Lismore CBD. This was observed to be used by students accessing the school during the site work.

There is a footpath that connects around the south west of the Richmond River High School as well as a gravel path through Slaters Park connecting back to Alexandra Parade to the east of the railway crossing.

2.7 Other Proposed Developments

To the south of the site, there is a planned development of approximately 8 hectares of industrial land fronting Tweed Street and Terania Street. The land has been rezoned for industrial use and will be proceeding to DA stage shortly.

There are currently no other significant developments proposed in the immediate vicinity of the subject site.

3. Proposed Development

3.1 The Development

Plans for the proposed residential development have been prepared by RPS and a copy of the overall site layout is provided in **Appendix A** to this report.

3.1.1 Nature of Development

The proposal is for a residential subdivision providing some 1500 residential lots, with a variety of lot sizes. Access to the site will be via three or four potential driveway access points on Dunoon Road and a single access off Nimbin Road.

3.1.2 Access and Circulation Requirements

Access to the site will be via three or four new driveway access points on Dunoon Road. There are three access points to the north of the intersection of Alexandra Parade and Dunoon Road and potentially an access point at this intersection to create a 4-way intersection. These access points will allow for all turning movements as well as dispersement of trips. The development of the land will occur over a number of stages and there will be one or potentially two access points off Dunoon Road at the commencement of the project. As the development progresses, there will be potential for an access off Nimbin Road. There will be an internal network of residential estate roads connecting these separate access points allowing different route options.

The design and construction of these internal roads and access points will be in accordance with Council requirements.

3.2 Access

3.2.1 Driveway Location

The access points will be located in locations to suit the road alignment as well as internal topographical issues. The exact location of these access points will be discussed and agreed with Council during the design phase of the project.

3.2.2 Sight Distances

An important issue with relation to the access points is the provision of adequate sight visibility splays for traffic entering and exiting the site as well as through drivers being able to see the intersection and adjust their vehicle as required. For the posted speed limit of 80 km/h the required visibility splay is 160 metres whilst for junctions within the 50 km/h speed zone the requirement is 69 metres.

The location of the access points will need to take these requirements into consideration at the design stage of the project.

3.2.3 Service Vehicle Access

The site will allow for access for typical service vehicle requirements associated with residential subdivisions. This will include Council refuse collection vehicles as well as occasional large delivery vehicles. All service vehicles will enter and exit the site in a forward direction and allowing for normal Council requirements it is considered that the internal layout will allow for safe and appropriate access as required for service vehicles.

3.2.4 Queuing at entrance to site

Given the comparatively low traffic flows on the external road network adjacent to the subject site it is considered that there will be minimal queuing at the site entry points. It can be seen that the majority of traffic will have an origin / destination towards Lismore and for the access points on Dunoon Road this will require a left turn in and right turn out, which will mean any queue will be contained within the site. With the potential dispersement of trips due to the 4 or 5 access points it can be seen that the impact at any one access will be reduced and queues will accordingly be negligible. Thus there will be minimal impact upon the traffic movements along the external road links.

3.2.5 Comparison with existing site access

The existing site is currently served by a number of driveways providing access to individual lots. These individual access points will carry much lower flows than the proposed development access points. All redundant existing driveway access points will be removed as part of the development of the site.

3.2.6 Access to Public Transport

There are currently limited options for buses in the vicinity of the site except for school bus runs. It can be seen however that with 1500 lots (and a potential number of residents in the order of 3,750) there will be demand for public transport for access to the centre of Lismore. It is considered that the potential for a bus route to access through the site should be determined at the design stage of the process in consultation with local bus providers so that access can be permitted through the site. This could potentially require the internal access route to have an increased road width to accommodate a bus and for bus stops to be provided along this route accordingly.

This potential route through the site and the associated design requirements will need to be discussed and approved at the design stage with Council and the local bus providers.

3.3 Circulation

3.3.1 Pattern of circulation

Traffic will enter the site in a forward direction with manoeuvring available within the site on the internal roads to allow for traffic to be able to exit in a forward direction.

3.3.2 Road width

The internal roads will be designed and constructed in accordance with Council Residential Subdivision guidelines. All roads must allow for two-way traffic movements.

3.3.3 Internal Bus Movements

It is considered that there could be potential for an internal bus route through the site to provide access for future residents to access the Lismore CBD. This may require a bus route to access

through the site and will require discussion with Council and the local bus operators during the design stage of the project.

3.4 Parking

3.4.1 Proposed Supply

All parking for this proposed development will be contained within the site.

3.4.2 Authority Parking Requirements

RTA Parking Requirements

The RTA Guide to Traffic Generating Developments indicates that a single space is required per residential dwelling but that two spaces are preferable.

Lismore City Council DCP Car Parking Requirements

The Lismore City Council Development Control Plan requires two parking spaces per dwelling with one space cover e.g. garage or carport. Parking must also be available for visitors to the site.

Given the size of the development area it is considered that parking provision on site can be accommodated within the site footprint with no impacts upon the external road network. Visitor parking can be accommodated on driveways or within the internal road network with no external impacts.

3.4.3 Parking Layout

The design of the dwellings and the associated parking will be provided in accordance with Council design requirements and will be detailed during the detailed design stage of the development.

3.4.4 Parking Demand

The development will have its peak parking demand over night and the provision of parking in accordance with the Council DCP will ensure the normal peak demand can be accommodated within the development site with no impact upon the external road network.

3.4.5 Service Vehicle Parking

As a residential subdivision there is no requirement or demand for a dedicated service area. The preliminary plans for the development indicate a potential mixed use centre and child care development at the entry point off Dunoon Road which may require some service vehicle access. This will need to be reviewed during the detailed design stage of the development and will need to be in accordance with the Council DCP.

3.4.6 Bicycle Parking

Bicycle parking can be provided within the overall site footprint and will be determined as part of the detailed design of the subdivision. Typically, parking for bicycles can be satisfied within the garages provided for each dwelling.

4. Impact of Proposed Development

4.1 Traffic Generation

4.1.1 Daily and Seasonal Factors

It is considered that the residential development will have minimal daily and seasonal variation in traffic flows. Weekend flows may be slightly lower than the working week Monday to Friday but overall the flows will be reasonably consistent.

4.1.2 Pedestrian Movements

Pedestrian access and movements to the subject site is an important consideration in the development of the site. It is considered that access will be required internal to the site throughout the development and that off road paths should be provided to cater for the demands of the future residents in and around the subdivision. The use of paths connecting between residential roads or at the end of cul de sacs allows for ease of movement through the site with reduced distance for pedestrians providing a distinct benefit.

The internal design of the development will be in accordance with Council's DCP which includes requirements for pedestrians. The design of the internal roads and paths for pedestrians will be completed during the detailed design stage of the project.

It can also be seen that there will be potential pedestrian (and cyclists) desire lines for movements towards the Richmond River High School and through to the Lismore CBD. The provision of a path from the subject site to connect with Alexandra Parade and through to the existing footpath / cycleway on Winterton Parade is desirable and should be provided as part of the development of the site. This path will provide a benefit to the proposed development as well as the existing residents and development along Alexandra Parade.

The design and provision of this path will be determined during the detailed design stage of the project in consultation with Council.

4.2 Traffic Distribution and Assignments

4.2.1 Hourly Distribution of Trips

The level of traffic generated by the proposed development has been assessed in accordance with the RTA Guide to Traffic Generating Developments. This guide indicates that typically residential developments such as this generate some 0.85 trips per dwelling during the peak hours and 9 trips per day. For the proposed development of 1500 lots this gives 1275 trips during the peaks and potentially 13,500 trips per day.

Outside of the peak hours, the flows associated with the residential development would be much lower. Typically flows at night are negligible for residential developments such as this.

4.2.2 Origin / destinations assignment

It is considered that nearly all of the traffic associated with the development will desire access towards the Lismore CBD. There are a number of routes available to the traffic associated with the development but it is considered that the location of the site with primary access off Dunoon Road will have a bias towards using the route via Alexandra Parade and Winterton Parade to access

Lismore and locations beyond. Traffic may choose to continue south along Tweed Street to connect with Terania Street and Bridge Street to access the CBD but this route is not as attractive as it is slightly longer. It can also be seen from the CBD traffic report completed for Council that the use of this route creates delays for road users with a capacity constraint over the river meaning that traffic to and from the development would find it more desirable to use the route via Winterton Parade.

An important point with regard to the CBD traffic report completed for Council is that the traffic flows associated with the subject development was taken into account with the traffic modelling work completed for the study. However, it would appear that the traffic flows associated with the subject development have been assumed to travel across the two other bridges over the river (as there is no reference to the bridge on Winterton Parade) and thus the model may have overestimated the volume of traffic that will in the future be travelling over the two other bridges to the Lismore CBD. If this is the case, then the requirement to upgrade the bridge over the river as identified within the Council report may not be required in the short term i.e. two years as identified within the report.

4.3 Impact on Road Safety

The additional traffic flows associated with the development of the subject site will have an acceptable impact upon the overall traffic safety in the general vicinity of the subject site. All of the key intersections are well laid out and provide an adequate carriageway width to allow for turning movements. Visibility splays at all of these intersections are good and allow for safe traffic movements.

However, observations on site indicate that the intersection of Winterton Parade with Orion Street currently offers some safety concerns for road users, due to the restricted visibility for drivers exiting Orion Street. The view to the south (left) along Winterton Parade is restricted meaning that drivers pull out of the side road and cause northbound through movements on Winterton Parade to brake to avoid a collision.

A review of the CBD traffic report completed for Council shows that this intersection has not been considered for any upgrade works.

From the site work, the following options are put forward for consideration for upgrading this intersection to improve safety:

1. Provide a roundabout control at this location to reduce vehicle speeds and reduce visibility requirements. This will also increase the capacity of this intersection to cater for the demands associate with the development of the subject site.
2. Improve the visibility splay available for drivers exiting Orion Street. Whilst this will improve safety it will not improve the capacity of this intersection.

It is important to note that that this intersection also carries a large number of buses associated with the school drop off and pick up requirements at the Richmond River High school as well as movements associated with the Trinity Bus Interchange. Any upgrade would need to take into account the requirements of these larger vehicles and their turning requirements.

Of the two options above, it is considered that the provision of a roundabout at this location would provide the best solution from a road safety and capacity perspective.

This is an existing issue and is the responsibility of the road authority (Council) to improve this intersection. However, it can be seen that there is potential for increased risks at this intersection due to the increased traffic flows generated by the development and a contribution to the road authority to improve this intersection could be considered as part of this development.

- **Photo 5 View to left for drivers exiting Orion Street onto Winterton Parade**

Of the remaining intersections used by the development, the layout of these intersections provides a safe and acceptable layout with good visibility on all approaches. The layout of the intersection of Alexandra Parade and Dunoon Road may require an upgrade to roundabout control to accommodate the 4th leg from the development but this will not have any negative impacts upon the road safety at this location.

The review of the accident data for the locality indicates that there have been limited accidents in the general vicinity of the subject site.

Overall it is considered that there will be a minimal impact upon road safety in the locality.

4.4 Impact of Generated Traffic

4.4.1 Impact on daily Traffic Flows

The daily level of traffic generated by the proposed development has been assessed in accordance with the RTA Guide to Traffic Generating Developments. Typical peak hour flows would be in the order of 1275 vehicles whilst daily flows will be in the order of 13,500 trips per day (or 6,750 inbound and 6,750 outbound per day).

The majority of this traffic will use the route along Alexandra Parade and Winterton Parade to access the Lismore CBD. In time, there could be a switch in routes when the additional bridge crossing over the river is provided (as identified within the CBD traffic study completed for Council). The full development 1500 lots will take a number of years to develop and could take near 10 years before the full development is realised.

It can be seen that during the initial stages of the development, the daily traffic flows would be much lower. For example, if the initial stage of the development incorporates 200 lots, the daily traffic flows would be 1800 vehicles per day which would have a minor impact upon the existing road network and could be accommodated along the Alexandra / Winterton Parade route into the Lismore CBD. The impact upon the capacity of Winterton Parade would be negligible with flows spread-out over the full day.

As the development proceeds, it can be seen that the traffic impacts will increase and potentially impact upon the capacity of the route along Alexandra Parade and Winterton Parade. However, there is scope within the existing road network for the development to proceed within the current road network. Traffic dispersement will occur as and when the additional bridge crossing is provided over the river (as identified within the Council report for the CBD).

As a local collector road, Alexandra Parade can carry between 5,000 and 10,000 vehicles per day. With the current AADT being in the order of 3,500 vehicles per day there is scope for up to an additional 6500 vehicles per day to use this road. This represents nearly 50% of the total development of the subject site or 700 lots. Whilst no daily data is available for Winterton Parade, it is considered that a similar value could be accommodated on this road.

For the local roads immediately surrounding the site, it can be seen that there will be increased movements in and out of the site but that the overall flows will be acceptable upon the overall capacity of the road network. The key issue will be the impact at the intersection and the capacity of these intersections.

A review of the CBD traffic study indicates that the subject site was taken into account when the future traffic patterns were assessed and therefore no additional work will be required as part of this development within the Lismore CBD.

4.4.2 Peak Hour Impacts on Intersections

One of the critical intersections is that of Alexandra Parade and Dunoon Road. It can be seen that this intersection will carry increased traffic flows and will provide for a 4-way intersection as the development continues. Whilst there will not be a significant capacity constraint, it is considered that a give way controlled 4-way intersection is not desirable at this location and that a 4-way roundabout controlled intersection is preferred. This roundabout upgrade would help with road safety as well as contain traffic speeds. This location marks the entry point for the 50 km/h speed zone associated with Lismore and a roundabout at this location would create a gateway treatment and encourage drivers to slow down to the reduced speed within the urban limits of Lismore.

The design and construction of this upgrade will be in accordance with Council and RTA requirements and will be completed as part of the detailed design work for the project.

Of the remaining intersections potentially impacted upon by the subject development, it is considered that the existing intersections currently have adequate spare capacity to cater for the demands associated with the development. Observations on site during both the morning and afternoon peak period indicated that the intersection of Alexandra Parade and Winterton Parade operates with little if any delay and it is considered that the additional flows associated with the

development will have a minimal impact upon the operation of this intersection for a number of years into the development.

However, it is considered that as the development extends beyond approximately 500 lots, this intersection will alter in its pattern of traffic movements, with the dominant flows being the left turn into Alexandra Parade and the right turn out. It would therefore be preferable to alter the priority of this intersection to reflect this priority movement, with the northern leg being the minor road.

It can be seen that the development of 500 lots or more could take a number of years and that the extent of road works required at that time needs to be assessed in context of the possible new bridge over the river to the Lismore CBD. Whilst the route via Winterton Parade has some considerable spare capacity, upgrading of the road network elsewhere may make it more desirable for drivers to choose another route.

4.4.3 Impact of Construction Traffic

The majority of the construction work will be located on site and as such will have a minimal impact upon the adjacent road network. The works on site will require some specialist machinery e.g. cranes, as well as construction workers to access the site. Typically site construction work occurs between 7.00 AM and 4.00 AM and thus will have little impact upon the traditional peak periods.

During the construction of the new site access driveways, there will be a need to work adjacent to a traffic lane. This will require protection for workers and would involve a reduced speed zone for the duration of these works.

All works on site will be governed by the relevant EP&A rules and as stipulated within any development consent granted by Lismore City Council. This will include hours of work. As part of the development approval process, a Traffic Control Plan (TCP) will be required.

4.4.4 Other Developments

The proposed industrial development to the south of the site will not impact upon this proposed development.

4.4.5 Assessment of Traffic Noise

An assessment of traffic noise is beyond the scope of work and expertise of Better Transport Futures.

4.5 Public Transport

4.5.1 Options for improving services

It is considered that the proposed development could generate increased demands for access to the Lismore CBD via improved bus services. A regular bus service between the subject site and the Lismore CBD would provide a benefit to non car owning residents as well as reduce the dependence upon private motor vehicle use for access to the Lismore CBD. The potential for a bus route to service the site and potentially travel through the site should be discussed with Council and the local bus providers during the design stage of the project.

4.5.2 Pedestrian Access to Bus Stops

All of the internal residential roads will allow for pedestrian access in accordance with Council's residential subdivision guide. This will allow for pedestrian access to any bus stops within the site or along Dunoon Road once a new route is determined.

4.6 Recommended Works

4.6.1 Improvements to Access and Circulation

It is considered that the proposed site access and circulation will provide a safe and appropriate access arrangement for the proposal, as all access points and internal roads will be designed and constructed in accordance with Council's Residential Subdivision guidelines. Due to the low speed environment within the site, internal movements will be able to operate in a safe and appropriate manner.

4.6.2 Improvements to External Road Network

As discussed above, a number of external road upgrades will be required as part of the development. These will include:

- Upgrade the intersection of Winterton Parade and Orion Street to provide a roundabout controlled intersection. A contribution towards this upgrade is considered appropriate as this is an existing issue and the upgrade will solve the existing safety concerns at this intersection;
- Provide a 4-way roundabout controlled intersection at Alexandra Parade with Dunoon Road as part of the access to the subject site;
- Upgrade the intersection of Alexandra Parade and Winterton Parade to alter the priority to reflect the dominant flows that will occur as the development of the subject site proceeds

4.6.3 Improvements to Pedestrian Facilities

It is considered that a footpath / cycleway should be provided along Alexandra Parade to connect to the existing footpath / cycleway on Winterton Parade for access between the subject site and the Lismore CBD

4.6.4 Effect of Recommended Works on Adjacent Developments

There will be no effect on adjacent developments.

4.6.5 Effect of Recommended Works on Public Transport Services

There will be no effect on public transport services.

4.6.6 Provision of LATM Measures

There are no other LATM measures required as part of this development.

4.6.7 Funding

All works identified above will be reviewed as part of the subject development with potential for some of the works to be negotiated as part of a Voluntary Planning Agreement (VPA) as well as funding through S94 contributions.

4.6.8 Noise Attenuation

Any noise attenuation measures will be assessed by others.

5. Conclusions

The following conclusions are drawn from the investigations into the proposed residential development to the north of Lismore off Dunoon Road, NSW:

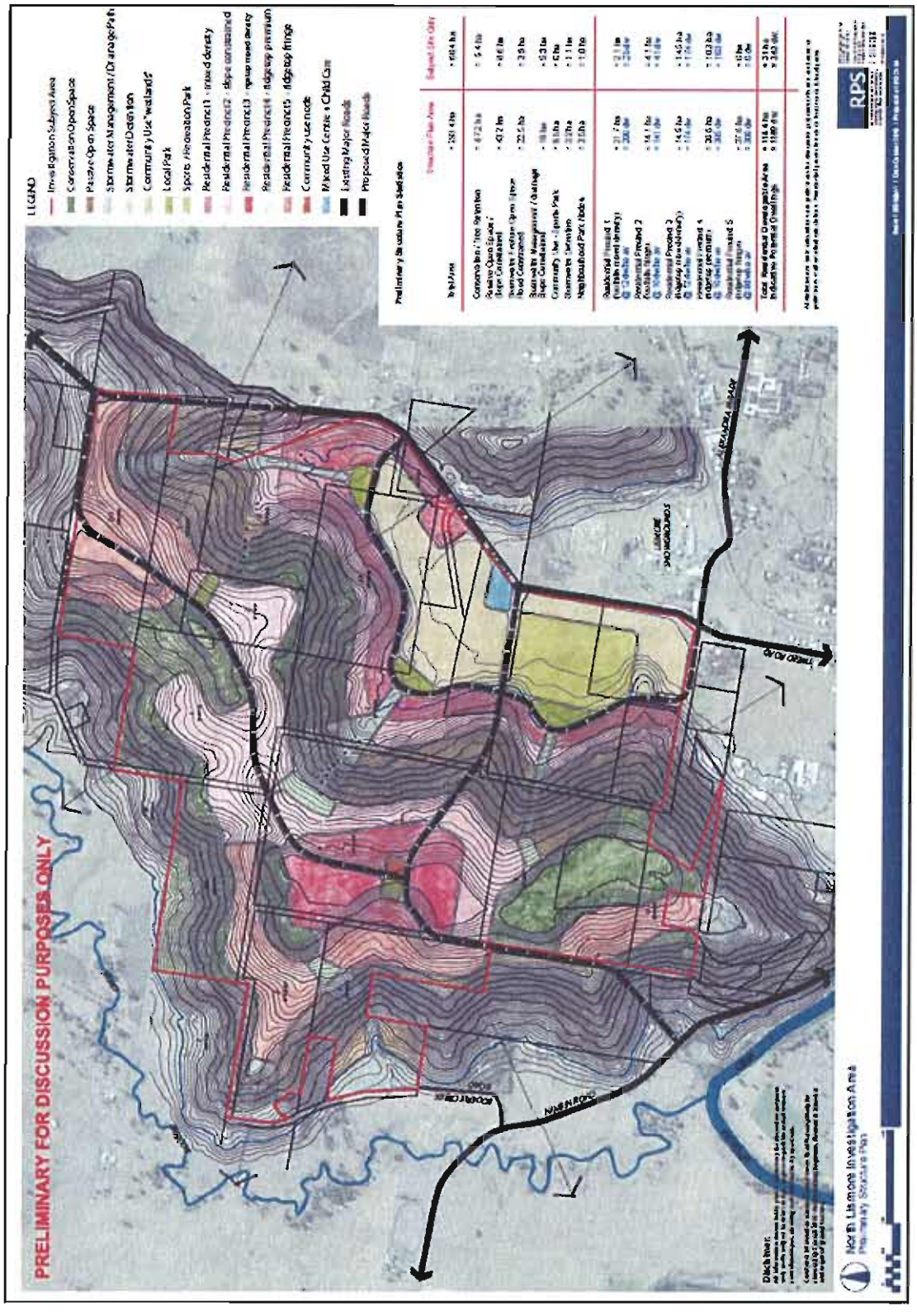
1. The proposed development is for a residential subdivision providing in the order of 1500 lots. Access will be provided via a number of access points off Dunoon Road and Nimbin Road and all parking can be contained on site.
2. The site is currently occupied by a number of rural holdings.
3. The major road though the locality providing access to the subject site is Dunoon Road. It generally provides a single lane of travel in each direction and suffers from minimal delays and congestion in the general locality of the site due to it not providing any direct through route for traffic.
4. The remaining roads in the locality of the subject site are all local Council roads providing access to the local residents. These operate under the 50 km/h speed limit within the urban limit of Lismore and generally provide a wide pavement width with no footpaths.
5. As part of the study, traffic data was collected at the key intersections that could be impacted upon by the development and the road network operations observed at these locations. The on-site observations show that the current traffic flows are low in the vicinity of the site and there is minimal delay for existing road users.
6. The observations on site showed that there is a large amount of traffic using Winterton Parade to cross the river, but the majority of this traffic is associated with school drop off and pick up. Outside of these periods the flows are very low on this section of the road network.
7. Based on advice from the RTA Guide to Traffic Generating Developments, the proposed development of 1500 lots could generate some 1275 vehicle movements during the peak periods and 13500 throughout the day. It is considered that the major attraction would be towards the Lismore CBD and that access via Alexandra Parade and Winterton Parade would be desirable for future residents of the subject site.
8. A review of the traffic report that was completed for Council for the Lismore CBD shows that the proposed development of the subject site was taken into account when the traffic modelling was completed for this project. Whilst this report indicated that there would be capacity constraints in the road network, the report and modelling did not take into account the capacity along the route via Winterton Parade.
9. The existing road network in the general vicinity of the subject site currently operates with minimal delays and congestion for the existing road users. There are minimal delays for the existing road users and it is considered that the additional traffic flow associated with development of the subject site will have a minimal impact upon the overall operation of the road network.
10. A review of the accident data provided by the RTA indicates that there have been few accidents in the general vicinity of the subject site over the last 5 years. Given the good road layout in the locality it is not considered that this will alter considerably due to the proposed development. However, observations on site show that the intersection of Winterton Parade and Orion Street suffers from some delays but also creates some safety concerns due to limited visibility at this location. The provision of a roundabout at this location will aid the safe operation of this intersection.
11. One of the main access points for the development will be a 4-way intersection of Alexandra Parade and Dunoon Road. It is considered that this intersection should be upgraded to a 4-way roundabout control, for ease of traffic movements and to act as a gate way treatment for traffic entering the urban speed limit of 50 km/h within Lismore.

12. As the development expands in stages, it is considered that the intersection of Alexandra Parade and Winterton Parade should be altered to reflect the change in priority for the dominant traffic movements.
13. It can be seen that beyond the development of approximately 500 lots, the continual use of the route via Alexandra Parade and Winterton Parade could change with the provision of the additional bridge crossing proposal supported by Council. Once this is constructed the traffic movements between the subject site and the Lismore CBD could alter considerably and should be reviewed at that stage.

The overall conclusion from the investigations is that traffic and parking arrangements for the development proposal are satisfactory and that there is no traffic or parking impediments to the development. Access between the subject site and the Lismore CBD can be gained via the route along Alexandra Parade and Winterton Parade, subject to the following works being implemented:

- Upgrade the intersection of Winterton Parade and Orion Street to provide a roundabout controlled intersection. This will solve the existing safety concerns at this intersection;
- Provide a 4-way roundabout controlled intersection at Alexandra Parade with Dunoon Road as part of the access to the subject site;
- Provide a footpath / cycleway along Alexandra Parade to connect to the existing footpath / cycleway on Winterton Parade for access between the subject site and the Lismore CBD;
- Upgrade the intersection of Alexandra Parade and Winterton Parade to alter the priority to reflect the dominant flows that will occur as the development of the subject site proceeds; and
- Review access options beyond 500 lots to reflect the road changes that will have occurred at that time, including the potential provision of another bridge crossing to the Lismore CBD.

Appendix A Site Plans



Appendix B Accident Data

RTA

Summary Crash Report

# Crash Type		
Car Crash	1	100.0%
Light Truck Crash	1	100.0%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	(0)	(0.0%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(0)	(0.0%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	0	0.0%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	1	100.0%
Non intersection	0	0.0%

* Up to 10 metres from an intersection
~ 07:30-09:30 or 14:30-17:00 on school days

Collision Type		
Single Vehicle	0	0.0%
Multi Vehicle	1	100.0%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	0	0.0%
Unclassified Road	1	100.0%

Contributing Factors		
Speeding	0	0.0%
Fatigue	0	0.0%

Weather		
Fine	1	100.0%
Rain	0	0.0%
Overcast	0	0.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	0	0.0%
Dry	1	100.0%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	1	100.0%
Dusk	0	0.0%
Darkness	0	0.0%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	1	100.0%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	0	0.0%
Out of control on straight	0	0.0%
Off road, on curve	0	0.0%
Off road on curve, hit object	0	0.0%
Out of control on curve	0	0.0%
Other crash type	0	0.0%

Speed Limit					
			~ 40km/h or less	0	0.0%
40 km/h or less	0	0.0%	80 km/h zone	0	0.0%
50 km/h zone	0	0.0%	90 km/h zone	0	0.0%
60 km/h zone	1	100.0%	100 km/h zone	0	0.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

CRASHES		1
Fatal crash	0	0.0%
Injury crash	0	0.0%
Non-casualty crash	1	100.0%

CASUALTIES		0
Killed	0	0.0%
Injured	0	0.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn. No restraint fitted to position OR No helmet worn

Time Group			% of Day
00:01 - 02:59	0	0.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	0	0.0%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	1	------	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	0	0.0%	4.2%
15:00 - 15:59	0	0.0%	4.2%
16:00 - 16:59	0	0.0%	4.2%
17:00 - 17:59	0	0.0%	4.2%
18:00 - 18:59	0	0.0%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil			% of Dark
0	of	0 in Dark	0.0%

Crashes		Casualties
1	2006	0

~ School Travel Time		
Involvement	0	0.0%

McLean Periods			% Week
A	0	0.0%	17.9%
B	0	0.0%	7.1%
C	1	100.0%	17.9%
D	0	0.0%	3.5%
E	0	0.0%	3.6%
F	0	0.0%	10.7%
G	0	0.0%	7.1%
H	0	0.0%	7.1%
I	0	0.0%	12.5%
J	0	0.0%	10.7%

Day of the Week								
Monday	0	0.0%	Thursday	1	100.0%	Sunday	0	0.0%
Tuesday	0	0.0%	Friday	0	0.0%	WEEKDAY	1	100.0%
Wednesday	0	0.0%	Saturday	0	0.0%	WEEKEND	0	0.0%

# Holiday Periods								
New Year	0	0.0%	Queen's BD	0	0.0%	Easter SH	0	0.0%
Aust. Day	0	0.0%	Labour Day	0	0.0%	June/July SH	0	0.0%
Easter	0	0.0%	Christmas	0	0.0%	Sept./Oct. SH	0	0.0%
Anzac Day	0	0.0%	January SH	0	0.0%	December SH	0	0.0%

Crashid dataset Crashes_Winterton_Orion Lismore
Note: 2005-2009

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

RepID: REG01 Office: Grafton User ID: suttonpa Page 1 of 1 Generated: 10/02/2011 14:59

RTA

Summary Crash Report

# Crash Type		
Car Crash	3	100.0%
Light Truck Crash	0	0.0%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	0	0.0%
*Heavy Truck Crash	(0)	(0.0%)
Bus Crash	0	0.0%
*Heavy Vehicle Crash	(0)	(0.0%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	0	0.0%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

* Rigid or Artic Truck * Heavy Truck or Heavy Bus
# These categories are NOT mutually exclusive

Location Type		
*Intersection	3	100.0%
Non Intersection	0	0.0%

* Up to 10 metres from an intersection
~ 07:30-09:30 or 14:30-17:00 on school days

Collision Type		
Single Vehicle	1	33.3%
Multi Vehicle	2	66.7%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	3	100.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	1	33.3%
Fatigue	0	0.0%

Weather		
Fine	2	66.7%
Rain	1	33.3%
Overcast	0	0.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	1	33.3%
Dry	2	66.7%
Snow or Ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	2	66.7%
Dusk	0	0.0%
Darkness	1	33.3%

Crash Movement		
Intersection, adjacent approaches	1	33.3%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	1	33.3%
U-turn	0	0.0%
Rear-end	0	0.0%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	1	33.3%
Off road on straight, hit object	0	0.0%
Out of control on straight	0	0.0%
Off road, on curve	0	0.0%
Off road on curve, hit object	0	0.0%
Out of control on curve	0	0.0%
Other crash type	0	0.0%

Speed Limit					
~ 40km/h or less	0	0.0%			
40 km/h or less	0	0.0%	80 km/h zone	0	0.0%
50 km/h zone	0	0.0%	90 km/h zone	0	0.0%
60 km/h zone	3	100.0%	100 km/h zone	0	0.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

CRASHES	3	
Fatal crash	0	0.0%
Injury crash	2	66.7%
Non-casualty crash	1	33.3%

* Belt fitted but not worn. No restraint fitted to position OR No helmet worn

Time Group			% of Day
00:01 - 02:59	0	0.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	0	0.0%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	0	0.0%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	0	0.0%	4.2%
15:00 - 15:59	0	0.0%	4.2%
16:00 - 16:59	1	33.3%	4.2%
17:00 - 17:59	1	33.3%	4.2%
18:00 - 18:59	0	0.0%	4.2%
19:00 - 19:59	1	33.3%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil	% of Dark
0 of 1 in Dark	0.0%

CASUALTIES	2	
Killed	0	0.0%
Injured	2	100.0%
* Unrestrained	0	0.0%

Crashes		Casualties
1	2009	1
1	2006	1
1	2005	0

~ School Travel Time		
Involvement	1	33.3%

McLean Periods			% Week
A	0	0.0%	17.9%
B	0	0.0%	7.1%
C	0	0.0%	17.9%
D	0	0.0%	3.5%
E	0	0.0%	3.6%
F	3	100.0%	10.7%
G	0	0.0%	7.1%
H	0	0.0%	7.1%
I	0	0.0%	12.5%
J	0	0.0%	10.7%

Day of the Week						# Holiday Periods		
Monday	1	33.3%	Thursday	0	0.0%	Sunday	0	0.0%
Tuesday	1	33.3%	Friday	0	0.0%	WEEKDAY	3	100.0%
Wednesday	1	33.3%	Saturday	0	0.0%	WEEKEND	0	0.0%

New Year	0	0.0%	Queen's BD	0	0.0%	Easter SH	0	0.0%
Aust. Day	0	0.0%	Labour Day	0	0.0%	June/July SH	0	0.0%
Easter	0	0.0%	Christmas	0	0.0%	Sept./Oct. SH	0	0.0%
Anzac Day	0	0.0%	January SH	0	0.0%	December SH	0	0.0%

Crashid dataset Crashes_Alexandra_Duncan Lismore
Note: 2005-2009

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Rep ID: REG01 Office: Grafton User ID: sutterpa

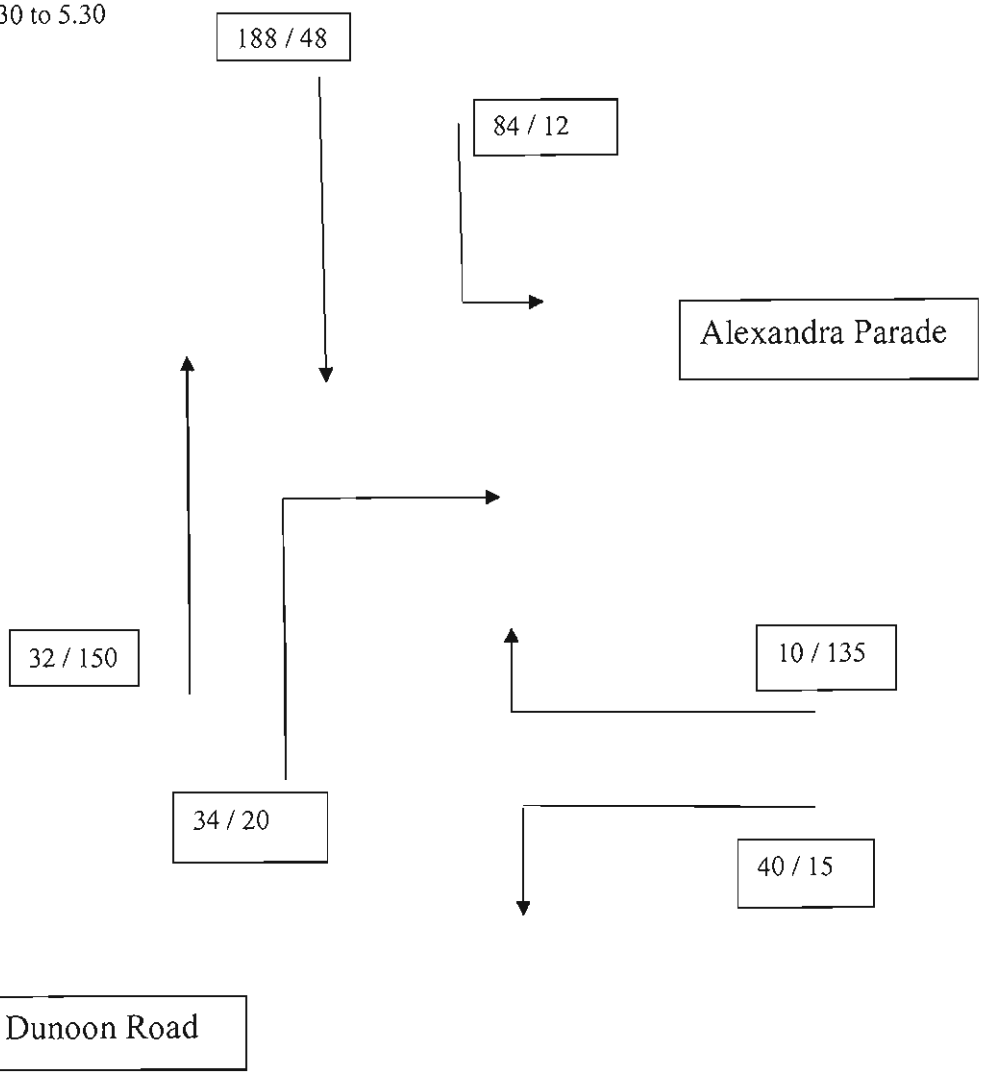
Generated: 10/02/2011 15:08

Mark Waugh Pty Limited
ABN 67 106 169 180
Transport Planning & Engineering

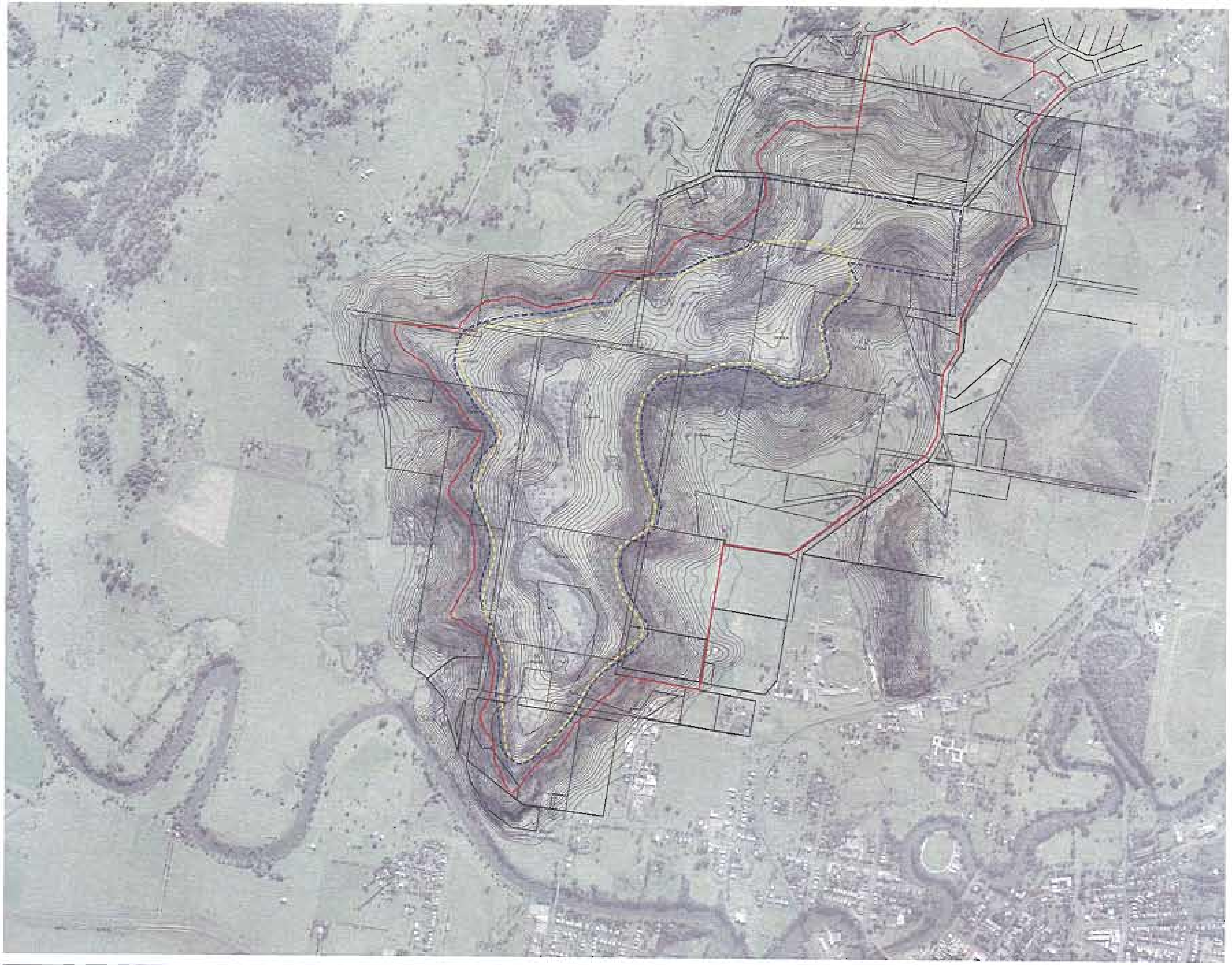
Better Transport Futures

Appendix C Traffic Survey Results

Alexandra Parade and Dunoon Road
AM peak – 7.30 to 8.30
PM peak – 4.30 to 5.30



Attachment G



LEGEND

- Investigation Subject Area - 345.39ha
- FNCRS Boundary by Department of Planning - 159.62ha
- North Lismore Plateau LUS boundary - 128.26ha

Disclaimer:

All information shown in this plan is preliminary for discussion purposes only and is subject to detail design, engineering advice and all relevant consultant input, planning and Local Authority approvals.

Rodgers Consulting Surveyors and requires ground-truthing.

Assumed approximate 12.0m contour extent of flooding, to be investigated & ground-truthed.

North Lismore Investigation Area
Proposed Urban Boundary and North Lismore Plateau Boundary

RPS

Attachment H

Appendix H Consistency with SEPP's

State Environmental Planning Policy	Consistency
SEPP No. 1 – Development Standards	N/A
SEPP No. 4 – Development Without Consent and Miscellaneous Exempt and Complying Development	N/A
SEPP No. 6 – Number of Storeys in a Building	N/A
SEPP No. 10 – Retention of Low Cost Rental Accommodation	N/A
SEPP No 14 – Coastal Wetlands	N/A
SEPP No. 15 – Rural Landsharing Communities	N/A
SEPP No. 19 – Bushland in Urban Areas	N/A
SEPP No. 21 – Caravan Parks	Consistent
SEPP No. 22 – Shops and Commercial Premises	Consistent
SEPP No. 26 – Littoral Rainforests	N/A
SEPP No. 29 – Western Sydney Recreation Area	N/A
SEPP No. 30 – Intensive Agriculture	N/A
SEPP No. 32 – Urban Consolidation (Redevelopment of Urban Land)	N/A
SEPP No. 33 – Hazardous and Offensive Development	N/A
SEPP No. 36 – Manufactured Home Estates	Consistent
SEPP No. 39 – Spit Island Bird Habitat	N/A
SEPP No. 41 – Casino Entertainment Complex	N/A
SEPP No. 44 – Koala Habitat Protection	Consistent. E. teriticornis (Forest Red Gum) is known to occur on the site and this community should be included in an environment protection zone.
SEPP No. 47 – Moore Park Showground	N/A
SEPP No. 50 – Canal Estate Development	N/A
SEPP No. 52 – Farm Dams and Other Works in Land and Water Management Plan Areas	N/A
SEPP No. 53 – Metropolitan Residential Development	N/A
SEPP No. 55 – Remediation of Land	Consistent. Potential contamination and remediation issues will be addressed in compliance with this SEPP.
SEPP No. 59 – Central Western Sydney Regional Open Space and Residential	N/A

State Environmental Planning Policy	Consistency
SEPP No. 60 – Exempt and Complying Development	N/A
SEPP No. 62 – Sustainable Aquaculture	N/A
SEPP No. 64 – Advertising and Signage	Consistent
SEPP No. 65 – Design Quality of Residential Flat Development	Consistent
SEPP No 70 – Affordable Housing (Revised Schemes)	N/A
SEPP No. 71 – Coastal Protection	N/A
SEPP (Affordable Rental Housing) 2009	Consistent
SEPP (Building Sustainability Index: BASIX) 2004	Consistent
SEPP (Exempt and Complying Development Codes) 2008	Consistent
SEPP (Housing for Seniors or People with a Disability) 2004	Consistent
SEPP (Infrastructure) 2007	Consistent
SEPP (Kosciuszko National Park – Alpine Resorts) 2007	N/A
SEPP (Major Development) 2005	N/A
SEPP (Mining, petroleum Production and Extractive Industries) 2007	N/A
SEPP (Rural Lands) 2008	Consistent
SEPP (Sydney Region Growth Centres) 2006	N/A
SEPP (Temporary Structures) 2007	N/A
SEPP (Western Sydney Employment Area) 2009	N/A
SEPP (Western Sydney Parklands) 2009	N/A

Attachment I

Appendix I Consistency with Section 117 Directions

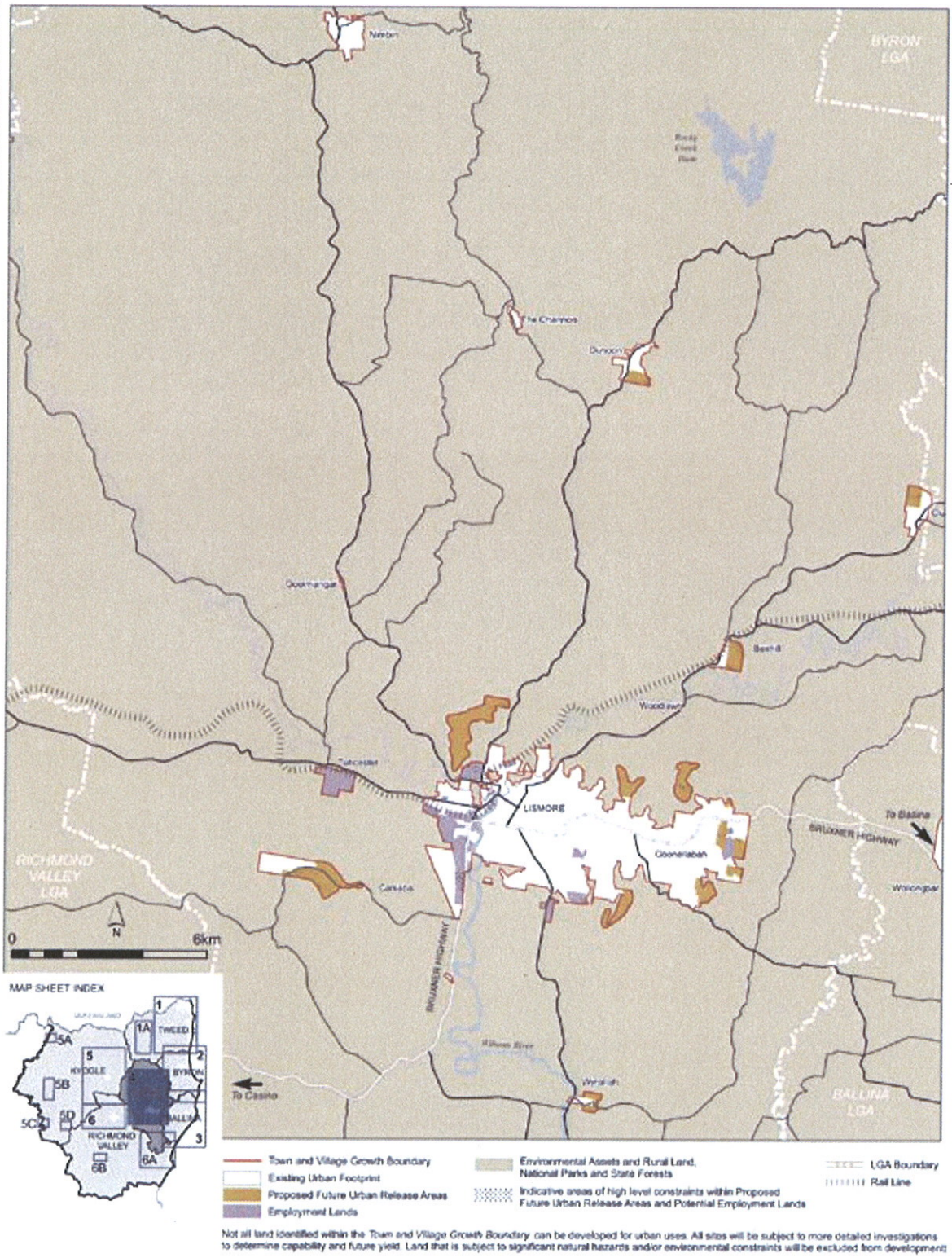
Ministerial Directions	Comment
1. Employment and Resources	
1.1 Business and Industrial Zones	N/A
1.2 Rural Zones	Consistent. The planning proposal is substantially consistent with the Lismore Urban Strategy and the Far North Coast Regional Strategy.
1.3 Mining Petroleum Production and Extractive Industries	Consistent. The extractive resources located within the planning proposal area have been exploited and it is unlikely that commercial material remains. No state or regional resources are identified.
1.4 Oyster Aquaculture	N/A
1.5 Rural Lands	Consistent. The land that is subject to this planning proposal is substantially consistent with the Lismore Urban Strategy and the Far North Coast Regional Strategy.
2. Environment and Heritage	
2.1 Environment Protection Zones	Consistent. The planning proposal is not removing any environment protection zones and will likely result in habitat areas and wildlife corridors being included in environment protection zones.
2.2 Coastal Protection	N/A
2.3 Heritage Conservation	Consistent. The planning proposal will protect any Aboriginal heritage objects or places if they are found to occur. A known heritage rock wall will be protected.
2.4 Recreation Vehicle Areas	N/A
3. Infrastructure and Urban Development	
3.1 Residential Zones	Consistent. A range of housing types and densities will be permitted in the planning proposal area. Servicing is a key consideration of the planning proposal.
3.2 Caravan Parks and Manufactured Home Estates	Consistent. There is a low probability that the residential component of the subject land will be used for a caravan park or manufactured home estate.
3.3 Home Occupations	Consistent. Home occupations will be permitted in residential areas.
3.4 Integrating Land Use and Transport	Consistent. The site has sufficient capacity to provide access to transport for residents and is well placed to access schools, sports grounds, shops and employment lands.
3.5 Development Near Licensed Aerodromes	Consistent. The subject land is not in close proximity to Lismore airport and will not create aircraft hazard issues. It is not affected by ANEF contours of 20 or greater.

Ministerial Directions	Comment
4. Hazard and Risk	
4.1 Acid Sulphate Soils	N/A
4.2 Mine Subsidence and Unstable Land	N/A
4.3 Flood Prone Land	Consistent. No residential development will be located on flood affected land. Flood affected land is limited to one small area and this will likely be used for ancillary infrastructure such as roads and stormwater detention and quality improvement.
4.4 Planning for Bushfire Protection	Consistent. Parts of the subject land will be affected by bushfire hazards and asset protection zones will be addressed in the planning proposal.
5. Regional Planning	
5.1 Implementation of Regional Strategies	Generally consistent. The subject land includes all of the land nominated in the FNCRS as a growth area. It has been expanded to include additional lands and it is recommended that the FNCRS be amended in the current round of revision to be identical to this planning proposal.
5.2 Sydney Drinking Water Catchments	N/A
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	Generally consistent. The subject land is not identified as State significant farm land. A large part of the site is Regionally significant farm land, but all of this (except approximately 45 ha) is identified in the FNCRS as a future urban growth area.
5.4 Commercial and Retail development along the Pacific Highway, North Coast	N/A
5.8 Second Sydney Airport: Badgerys Creek	N/A
6. Local Plan Making	
6.1 Approval and referral requirements	Consistent.
6.2 Reserving Land for Public Purposes	Consistent. Land reservations are not proposed at this stage.
6.3 Site Specific Provisions	Consistent. The proposal is only nominating land uses that will provide for the most appropriate use of the land and will zones that are available in the prevailing LEP.
7. Metropolitan Planning	
Implementation of the Metropolitan Strategy	N/A

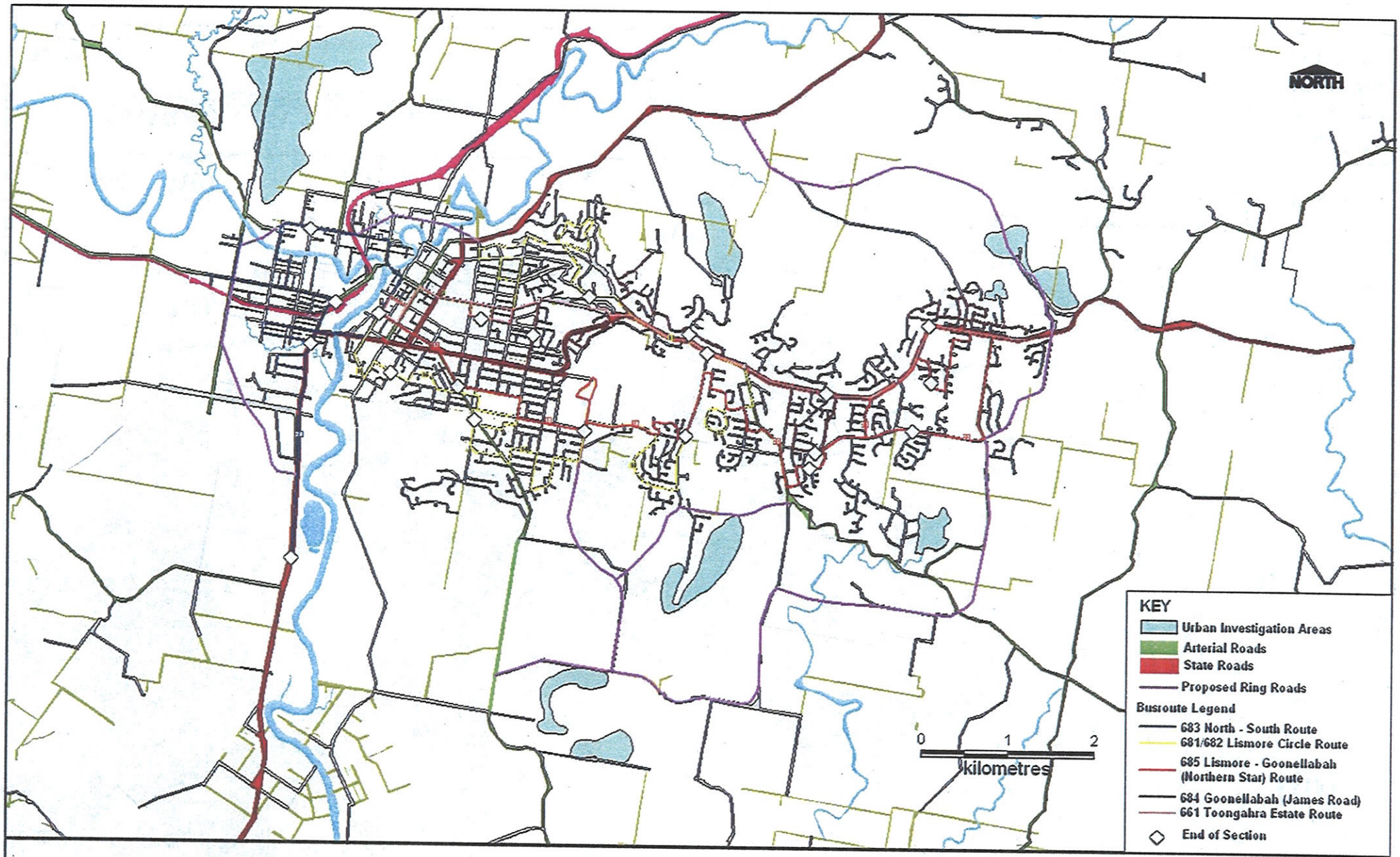
Agreed Findings

- The NLP will bring considerable economic and social benefits to Lismore.
- Does not compete with southern options, they are a given.
- NLP is the only significant growth opportunity.
- The Speedway only significantly impacts a portion of the site which could be dealt with through the following measures:
  1. Noise mitigating design measures
  2. An industry standard management regime
- Sewerage and water infra structure can be resolved without undue cost to council or at the expense of other infra structure commitments.
- Simes bridge is likely to resolve access requirements (study to confirm) and can be provided without undue cost to council, the 'third' bridge crossing may be required earlier and will be pro rata funded by the NLP development.
- This site can serve as a model for the district with best practice sustainability based design.
- A workable time table has been drafted.

TOWN AND VILLAGE GROWTH BOUNDARY MAP
SHEET 4 - LISMORE



Not all land identified within the *Town and Village Growth Boundary* can be developed for urban uses. All sites will be subject to more detailed investigations to determine capability and future yield. Land that is subject to significant natural hazards and/or environmental constraints will be excluded from development



LISMORE CITY COUNCIL

While all reasonable care has been taken the council does not guarantee the accuracy of the information contained on this map and any reliance placed on such information shall be at the sole risk of the user. All acknowledged on signed application.

Digital Cadastral Database (c) Land Information Centre

lismore

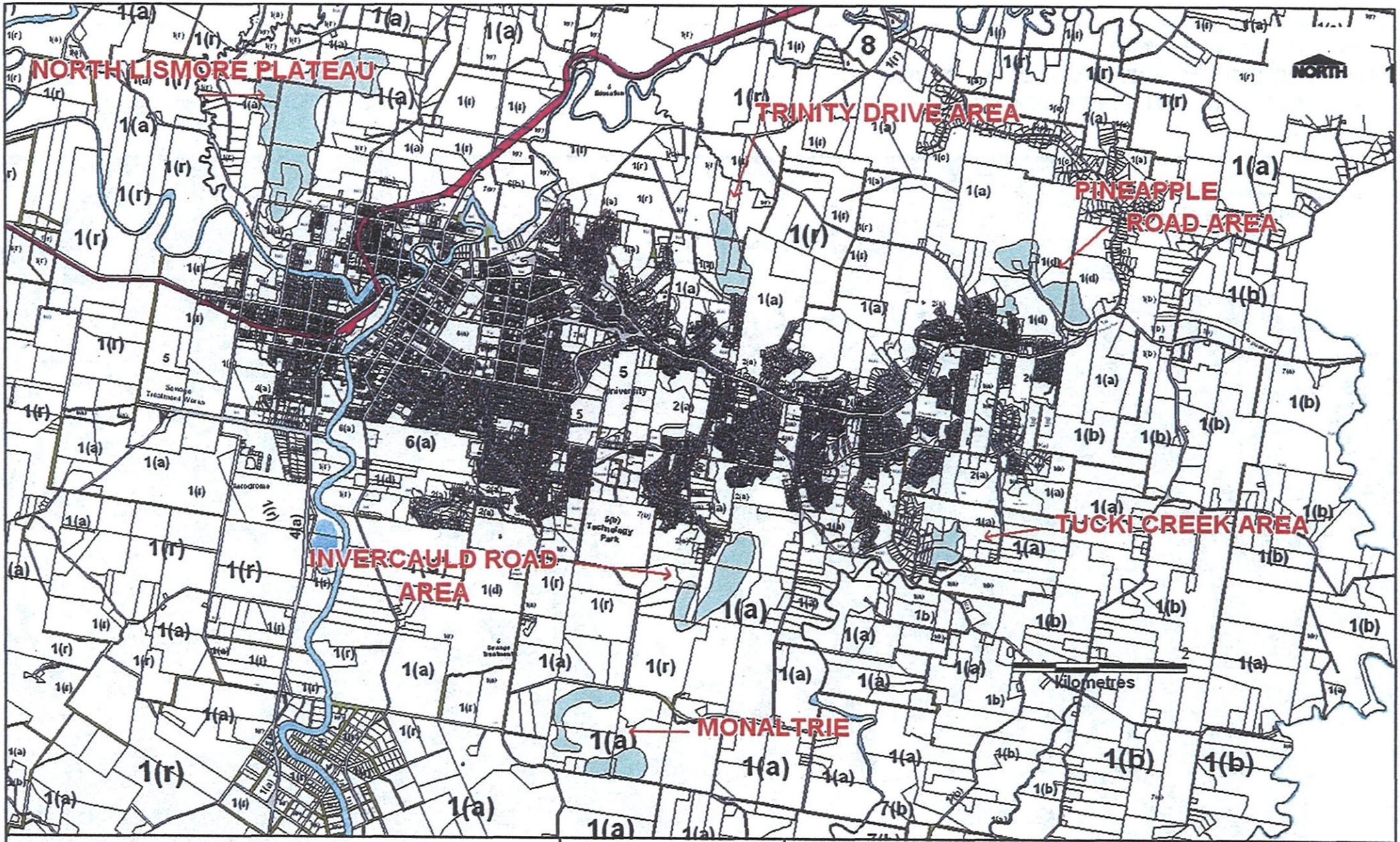
Scale 1 : 40,000

GDA

MAP 14

LOCATION OF GREENFIELD INVESTIGATION SITES IN RELATION TO PUBLIC TRANSPORT ROUTES AND ARTERIAL ROADS

LISMORE URBAN STRATEGY



LISMORE CITY COUNCIL

While all reasonable care has been taken by council does not guarantee the accuracy of the information contained on this map and any reliance placed on such information shall be at the sole risk of the user. As acknowledged on signed application. Digital Cadastral Database (c) Land Information Centre

lismore

Scale 1 : 40,000

GDA

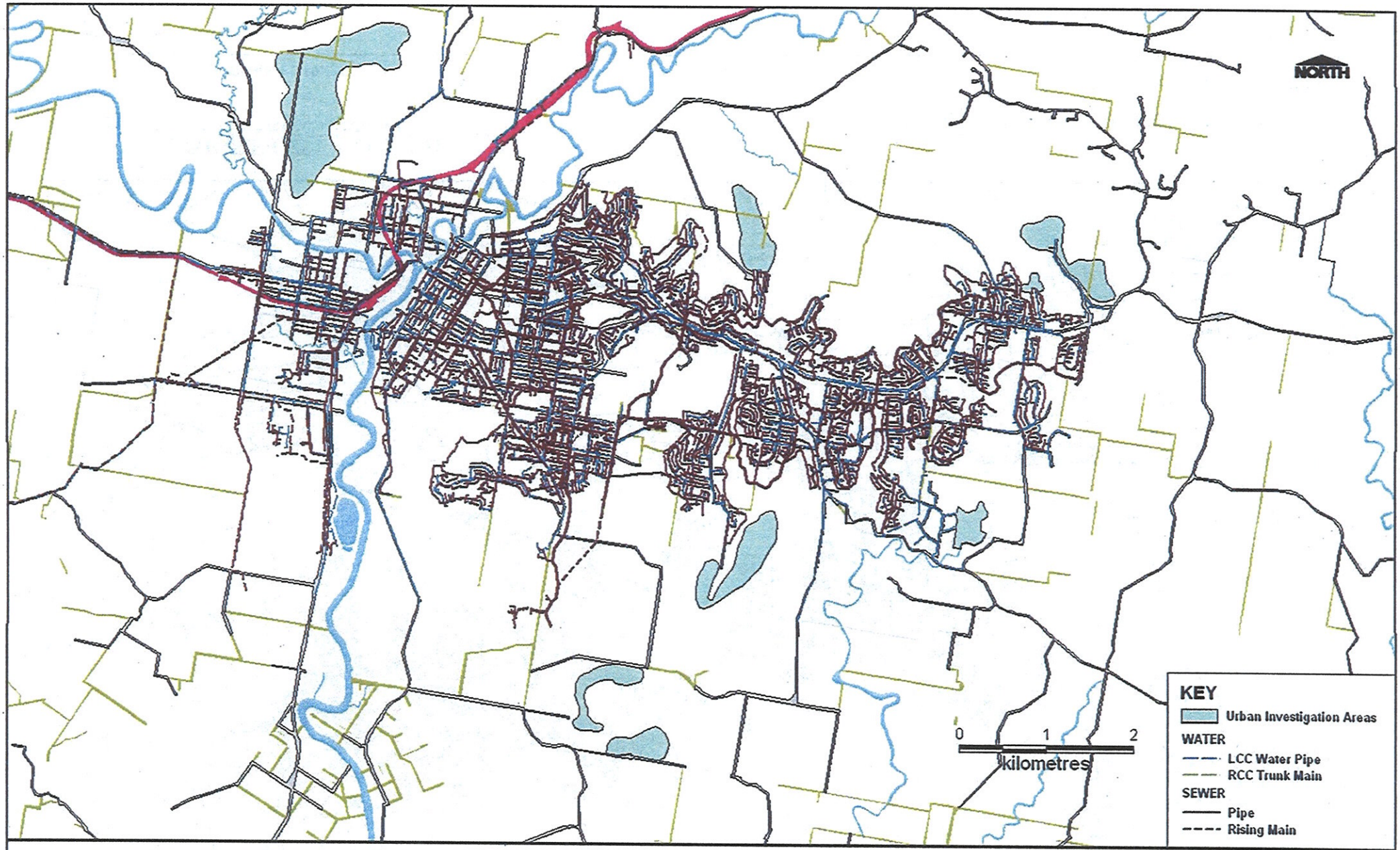
KEY

- Urban Investigation Areas
- Railway
- Rivers/Creeks

MAP 11

LOCATION OF GREENFIELD INVESTIGATION SITES

LISMORE URBAN STRATEGY



LISMORE CITY COUNCIL

While all reasonable care has been taken the council does not guarantee the accuracy of the information contained on this map and any reliance placed on such information should be at the sole risk of the user. AC acknowledged on signed application.
Digital Cadastral Database © Land Information Centre

lismore

Scale 1 : 40,000

GDA

MAP 13

LOCATION OF GREENFIELD INVESTIGATION SITES IN RELATION TO WATER AND SEWER MAINS

LISMORE URBAN STRATEGY