

2017

Moama & District Rural Residential Strategy



murray river
council

Prepared by Zenith Town Planning

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TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	Aims	1
1.2	Context	2
1.3	The study area	3
1.4	Considerations	6
1.5	Format and methodology	6
1.6	Community engagement	8
2.	THE STATUTORY AND PLANNING FRAMEWORK	11
2.1	Environmental Planning and Assessment Act 1979	11
2.2	State Environmental Planning Policies	12
2.3	Murray Regional Environmental Plan No 2 – Riverine Land	15
2.4	Riverina Murray Regional Plan	16
2.5	Murray Shire Strategic Land Use Plan 2010-2030	19
2.6	Murray Local Environmental Plan 2011	21
2.7	Murray Development Control Plan 2012	25
2.8	Moama North West Master Plan	25
2.9	Local planning directions	26
2.10	Native Vegetation Act 2003	29
2.11	Threatened Species Conservation Act 1995	30
2.12	National Parks and Wildlife Act 1974	31
2.13	Rural Fires Act 1997	32
2.14	Planning for Bushfire Protection 2006	33
2.15	Protection of the Environment Operations Act 1997	33

2.16	Environment Protection & Biodiversity Conservation Act 1999	33
2.17	NSW State Groundwater Policy Framework	34
2.18	Water Management Act 2000	35
2.19	Fisheries Management Act 1994	35
2.20	Biodiversity legislation reforms	36
3.	THE COMMUNITY AND LOCAL ECONOMY	37
3.1	The population	37
3.2	Housing	41
3.3	Industry and employment	44
3.4	Development trends	47
4.	THE LAND AND ENVIRONMENT	51
4.1	Attribute descriptions	51
4.2	Description of Area 1	59
4.3	Description of Area 2	62
4.4	Description of Area 3	65
4.5	Description of Area 4	68
4.6	Description of Area 5	71
5.	ASSESSMENT OF SUITABILITY	76
5.1	Suitability criteria	76
5.2	Assessment of potential rural residential areas	78
5.3	Forecast land supply	85
5.4	Service provision	90

6.	CONCLUSION AND RECOMMENDATIONS	99
6.1	Summary of findings	99
6.2	Recommended actions	102

REFERENCES	113
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ATTACHMENT A – STATUTORY ASSESSMENT

ATTACHMENT B – STUDY AREA MAPS

- | | | |
|-------------------------|----------------------------|---------------------------|
| - Land zoning | - Contaminated land | - Key fish habitat |
| - Murray REP No 2 | - Mineral resources | - Bushfire prone land |
| - Urban release area | - Terrestrial biodiversity | - Flood planning area |
| - Land use | - Vegetation type | - Aboriginal heritage |
| - Land capability class | - Wetlands | - Non-Aboriginal heritage |


ATTACHMENT C – RURAL RESIDENTIAL LAND MONITOR AND APPROVALS DATABASE

ATTACHMENT D – SUBMISSIONS TO AMENDMENT NO 5

ATTACHMENT E – COMMUNITY WORKSHOP PRESENTATION

ATTACHMENT F - SUBMISSIONS TO DRAFT STRATEGY

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1. INTRODUCTION

1.1 Aims

The primary aim of the *Moama & District Rural Residential Strategy* is to identify rural residential development opportunities in the vicinity of the township of Moama. This matter was deferred at the time of gazettal of *Murray Local Environmental Plan 2011*.

The former Murray Shire Council has engaged Zenith Town Planning to address this deferred matter in response to several submissions that requested application of a rural residential zone to specific parcels of land and that focussed on the need for rural residential development generally. It is an aim of the strategy to make recommendations concerning the future zoning of rural residential land and the details of an amendment to *Murray LEP 2011*.

It is also an aim of the strategy to identify short, medium and long term rural residential land releases to assist Council to co-ordinate the orderly and economic use and development of land surrounding Moama.

The current Murray River local government area was proclaimed in June 2016 and is an amalgamation of the former Murray Shire and Wakool Shire. Where possible data has been sourced for the new Murray River LGA from the 2016 Census of Population and Housing. Comparisons are made with the town of Echuca and Campaspe Shire, as there is a synergistic relationship between Moama and Echuca with an overlap of land use activities and the economics of rural residential land. Strategic planning initiatives for Echuca are considered in this strategy.

1.2 Context

Local Government is obligated to ensure that natural, social and economic resources are managed in a sustainable manner. The principles of sustainability are enshrined in the *Local Government Act 1993*. It is part of council's charter *to properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development.*

This strategy has been drafted within the context of sustainability and its recommendations are framed within Murray River Council's responsibilities to exercise caution in decision-making, retain the quality of the environment, conserve biodiversity and ecosystems, and ensure that resources are managed equitably. The four principles of sustainability are given below.

The precautionary principle - *where there are threats of serious or irreversible damage to the community's ecological, social or economic systems, a lack of complete scientific evidence should not be used as a reason for postponing measures to prevent environmental degradation. In some circumstances this will mean actions will need to be taken to prevent damage even when it is not certain that damage will occur.*

The principle of intergenerational equity - *the present generation must ensure that the health, integrity, ecological diversity, and productivity of the environment is at least maintained or preferably enhanced for the benefit of future generations.*

The principle of conserving biological diversity and ecological integrity - *aims to protect, restore and conserve the native biological diversity and enhance or repair ecological processes and systems.*

The principle of improving the valuation and pricing of social and ecological resources - *the users of goods and services should pay prices based on the full life cycle costs (including the use of natural resources at their replacement value, the ultimate disposal of any wastes and the repair of any consequent damage).*

This strategy also aims to contribute to realising the *Sustainable Development Goals* of the *UN 2030 Agenda for Sustainable Development*. These goals will build an inclusive, sustainable and resilient future for people and the planet through economic growth, social inclusion and environmental protection.

1.3 The study area

The study area is indicated by a solid red line in Figure 1.1 below.

The locations of the properties relating to submissions are represented in Figure 1.1 by purple stars and a broken purple line. The purple stars indicate specific lots, while the broken purple line indicates specific areas to be investigated as a part of this process.

It is noted that only land that is currently zoned RU1 Primary Production is to be investigated within the study area and any land of any other zoning has been excluded.

For the purposes of this strategy and to enable close examination of opportunities and constraints, the study area has been further divided into five areas described as follows:

Area 1 - land to the east of and adjoining the Cobb Highway

Area 2 - land to the west of the Cobb Highway bound by Hillside Road, Thyra Road and Tataila Road

Area 3 - land to the west of the Cobb Highway and bounded by Tataila Road, Thyra Road, Perricoota Road and Twenty Four Lane

Area 4 – land to the south of Perricoota Road and to the east of Thyra Road, fronting the Murray River

Area 5 – land to the south of Perricoota Road and to the west of Thyra Road, fronting the Murray River

These areas and their attributes are illustrated in Figures 4.1 to 4.5 and described in Chapter 4. *The Land and Environment*.

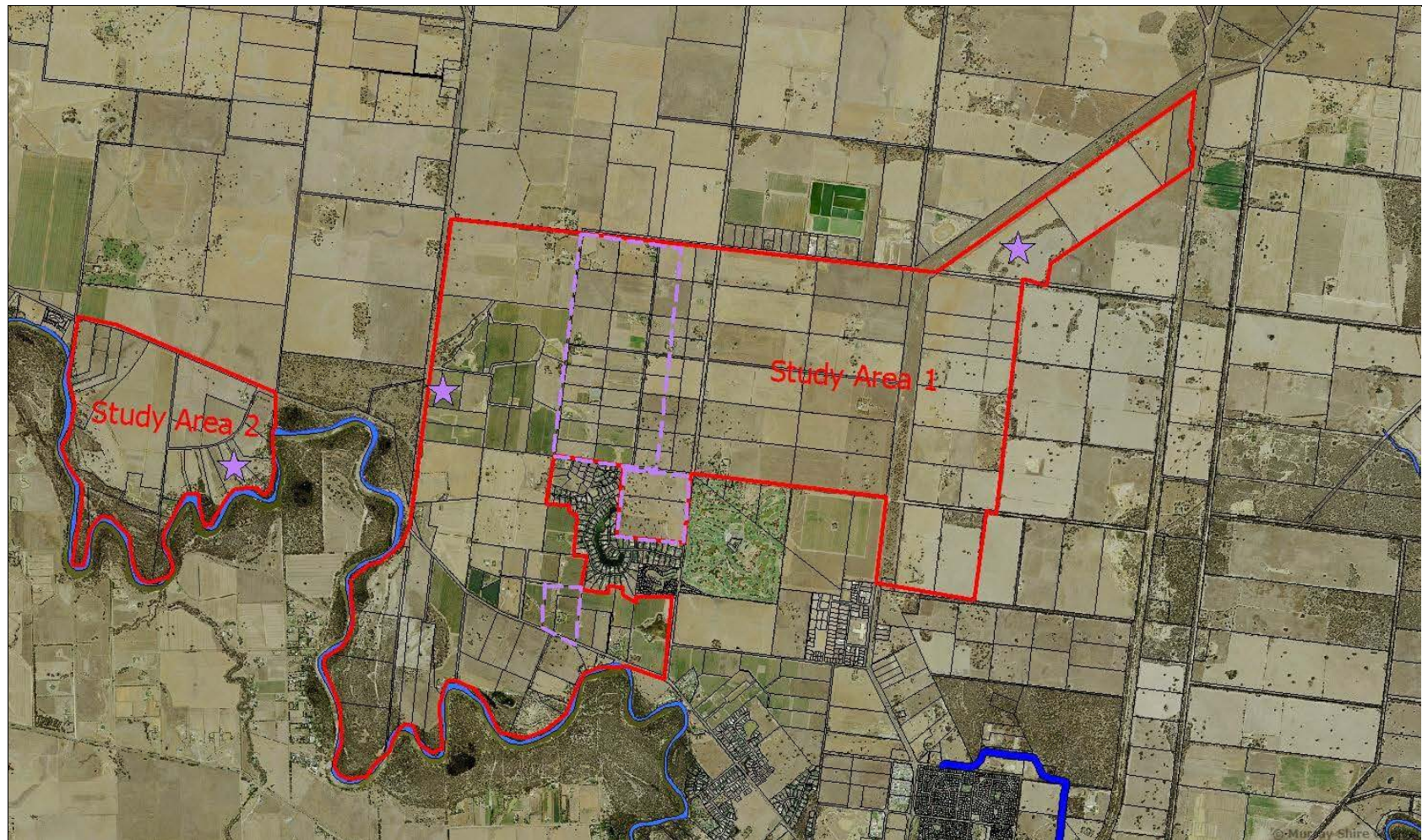


Figure 1.1: The study area and land relating to submissions to draft Murray LEP 2011

1.4 Considerations

Several submissions made to *draft Murray LEP 2011 (Amendment No 5)* during the exhibition period in 2014 requested that certain land in the vicinity of Moama be zoned for rural residential development. These properties are located within the study area and have therefore been assessed for suitability for rural residential development. Other submissions were made relating to rural residential development generally. These submissions have also been considered during preparation of this strategy. One other submission accompanied by a Local Environmental Study prepared by Advanced Environmental Systems was received in 2008.

Murray Shire Council resolved at the Ordinary Meeting of Council held on 3 March 2015 *that Council employ a suitably qualified Consultant to undertake a Rural Land Use Strategy investigating a number of RU1 zoned properties and areas to assess the justification for rezoning or minimum lot size reduction.* In response to this resolution consideration of these submissions was deferred for attention in this strategy. Details of these submissions are given in Attachment D. These details are limited to planning matters – personal details and contact names and addresses are omitted. Details of how the strategy responds to each submission is also given in Attachment D.

1.5 Format and methodology

The *Moama & District Rural Residential Strategy* begins with a summary in Chapter 2 of the legislative and policy framework that applies to rural residential development in Murray River LGA. The provisions of plans and policies that are of direct significance to the aims of the strategy are described.

This is followed by an analysis of the community and local economy in Chapter 3. The demographic and housing characteristics of the inhabitants of Murray River LGA and the changes that have occurred over the previous decade are described. The main drivers of the local economy in terms of employment and value of production attributable to specific industry sectors are identified. Recent residential development trends are also explored.

Echuca and Moama operate as a single property market – similar to Albury-Wodonga. Campaspe Shire Council, on the Victorian side of the Murray River, has prepared two relevant strategies - the *Shire of Campaspe Rural Living Strategy 2015* and the *Echuca South East Rural Living Precinct Final Draft Structure Plan 2014*. These strategies have been considered during preparation of this strategy and provide useful data for the analysis of the supply of and demand for rural residential land.

Chapter 4 considers data and mapping concerning the land and natural environment. Much of this information has been provided by Council and sourced from NSW state agencies such as the Office of Environment & Heritage and the Department of Primary Industries. The data has been analysed to identify opportunities and constraints to rural residential development.

In Chapter 5, a range of criteria is applied to the study area to determine its suitability for future rural residential development. These criteria relate to environmental attributes and natural hazards, land use and capability, and heritage.

The final chapter, Chapter 6, provides concluding remarks and recommendations to implement the findings of the strategy. The legal requirements and processes for preparing and lodging a planning proposal to amend *Murray LEP 2011* to rezone land found to be suitable for rural residential development are described. Recommendations are also made regarding amendments to *Murray Development Control Plan 2012* in relation to rural residential development. A suggested land release strategy is provided along with details of databases to monitor land availability and subdivision and dwelling approvals.

An assessment of statutory considerations is given in Attachment A. This is intended to assist preparation of a planning proposal to implement the recommendations of this strategy.

Maps provided by Murray River Council and prepared for this strategy using data supplied by the NSW Office of Environment & Heritage are appended as Attachment B. Template spreadsheets for a land monitor are appended as Attachment C.

1.6 Community engagement

The draft strategy was exhibited for 35 days between the 14th June 2017 and 19th July 2017. The draft strategy was advertised for public comment and notified in the Riverine Herald and the Pastoral Times newspapers. Council also displayed the draft strategy in the administration centres in Moama, Mathoura, Moulamein and Barham. The draft strategy was also provided to the following agencies and organisations for comment:

- Campaspe Shire Council,
- NSW Roads & Maritime Services,
- NSW Office of Environment & Heritage,
- NSW National Parks & Wildlife Service,
- NSW Department of Planning & Environment,
- NSW Department of Primary Industries (Agriculture, Water, Fisheries),
- NSW Department of Industry – Lands,

- Destination NSW,
- NSW Rural Fire Service,
- NSW Department of Industry - Resources and Energy,
- NSW Police,
- NSW Department of Health,
- Murray Darling Basin Authority,
- Murray Irrigation Limited,
- Various private irrigation schemes,
- NSW Murray Local Land Services,
- NSW Environment Protection Authority,
- Murray Shire Heritage Advisor,
- Moama Local Aboriginal Land Council,
- Essential Energy,
- The APA Group,
- Telstra,
- NBN Co, and
- Woodlands Pump Syndicate.

A community workshop was also held on Wednesday 5th July 2017 at Moama Sports Club. The workshop was attended by 31 members of the community and three Council planners. The forum was conducted as an interactive information session and feedback about the draft strategy was received. Presentation slides are provided as Attachment E.

Four submissions were received during the exhibition period. The contents of those submissions has been considered by Council and adjustments made to the final strategy. Similarly, comments made by state agencies and other local government authorities have been considered in the final version of the strategy. A table summarising points made in submissions and comments made by agencies and how the strategy responds to those points is provided as Attachment F.

2. THE STATUTORY AND PLANNING FRAMEWORK

The provisions of environmental planning instruments, legislation, strategies and state and local policies that are relevant to rural residential development in Murray River LGA are summarized in this chapter. These provisions would need to be considered in a planning proposal to enact the recommended amendments to *Murray LEP 2011*.

2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment (EPA) Act 1979* is the principal piece of legislation governing the use and development of land in NSW. The objects of the Act include:

- *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- *the promotion and co-ordination of the orderly and economic use and development of land,*
- *the protection, provision and co-ordination of communication and utility services,*
- *the provision of land for public purposes,*
- *the provision and co-ordination of community services and facilities,*
- *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats,*

- *ecologically sustainable development, and*
- *the provision and maintenance of affordable housing*

The *EPA Act* contains provisions governing the preparation of environmental planning instruments and development control plans that may be recommended in this strategy. The objects of the Act are intended to guide land planning and management.

2.2 State Environmental Planning Policies

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

SEPP No 44 – Koala Habitat Protection aims to conserve and manage areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. Murray LGA is listed in Schedule 1 to *SEPP 44* as land to which the policy applies. An assessment of the significance of land rezoned for rural residential development on which a development application is lodged will need to be carried out if the land contains any of the tree species listed in Schedule 2 of *SEPP 44*, any areas of land with a resident population of koalas evidenced by the presence of breeding females, recent sightings or historical records, or if the land constitutes potential koala habitat or core koala habitat as defined in the policy.

2.2.2 State Environmental Planning Policy No. 30 – Intensive Agriculture

The aim of *SEPP No 30* is to require development consent for cattle feedlots having a capacity to accommodate 50 or more head of cattle, and piggeries having a capacity to accommodate 200 or more pigs or 20 or more breeding sows. The policy also aims to provide for public participation and sets considerations for the consent authority when assessing a DA for cattle feedlots or piggeries. Intensive livestock

agriculture is permitted in zone RU1 Primary Production but all forms of agriculture are prohibited in zone R5 Large Lot Residential. This policy may apply to zone RU4 Primary Production Small Lots if intensive agriculture is permitted with or without consent in that zone.

2.2.3 State Environmental Planning Policy No. 52 – Farm Dams and Other Works in Land and Water Management Plan Areas

This Policy requires that development consent be obtained for the development of an artificial waterbody on land subject to a land and water management plan unless it has a storage capacity that is less than 15 megalitres or not within 40 metres of a public road, watercourse or wetland, or of any tree clearing operations. Development of an artificial waterbody in an environmentally sensitive area with a storage capacity of 100 megalitres or more, or a storage capacity of 800 megalitres or more in other areas is designated development. Murray Shire is listed in Schedule 2 as an area to which a land and water management plan applies.

2.2.4 State Environmental Planning Policy No. 55 - Remediation of Land

SEPP 55 aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. It specifies when consent is required for remediation work, considerations that are relevant in rezoning land and in determining development applications, and that a remediation work meet certain standards and notification requirements. It applies to the whole of NSW.

If the land is potentially contaminated due to a former use or is within an investigation area then a preliminary assessment must be carried out in accordance with the contaminated land planning guidelines that takes into account the extent to which it is proposed to carry out development on that land for residential, educational, recreational or child care purposes.

Any future development application lodged on rural residential land that is known or likely to be contaminated will require further assessment to determine the suitability of that land for the proposed use and the measures required to remediate that land. Potential land contamination is identified and considered as part of the assessment of suitability for rural residential development in Chapter 5.

2.2.5 State Environmental Planning Policy (Infrastructure) 2007

The aims of *SEPP (Infrastructure) 2007* are to ensure a consistent and flexible planning system to facilitate the delivery of services. The policy identifies environmental assessment categories for types of infrastructure, matters to consider when assessing development adjacent to infrastructure and provides for consultation with relevant public authorities. The policy applies to the whole of NSW.

SEPP (Infrastructure) contains provisions relating to approval processes and assessment requirements for infrastructure proposals according to the type or sector of infrastructure. It outlines land use zones where types of infrastructure are permissible with or without consent and identifies certain works as exempt and complying development.

The effect of this policy is noted where infrastructure augmentation is recommended to service any additional rural residential zoned land.

2.2.6 State Environmental Planning Policy (Rural Lands) 2008

SEPP (Rural Lands) 2008 was gazetted on 9 May 2008 and applies to all rural LGAs including Murray River. Relevantly, this policy sets out *Rural Planning Principles* and *Rural Subdivision Principles*, to implement measures that are intended to reduce land use conflicts and to identify State significant agricultural land. The *Rural Planning Principles* and *Rural Subdivision Principles* are of direct relevance to this strategy and in

planning for the protection of agricultural land. These principles underpin the directions and actions of this strategy. An assessment of the recommendations made in this strategy against these principles is given in Attachment A.

2.3 Murray Regional Environmental Plan No 2 – Riverine Land

The *Murray Regional Environmental Plan No 2 – Riverine Land* came into force in 1994 and is now a deemed State Environmental Planning Policy. It applies to riverine land of the River Murray within Murray and Wakool Shires.

The objectives of this plan are:

- (a) *to ensure that appropriate consideration is given to development with the potential to adversely affect the riverine environment of the River Murray, and*
- (b) *to establish a consistent and co-ordinated approach to environmental planning and assessment along the River Murray, and*
- (c) *to conserve and promote the better management of the natural and cultural heritage values of the riverine environment of the River Murray.*

It contains principles that apply when Council prepares a local environmental plan that address access to riverine land, bank disturbance, flooding, land degradation, landscape, river related uses, settlement, water quality and wetlands. Relevantly, the REP requires that the degree to which access to the river and foreshore is affected, the impacts of uncontrolled access, and disturbance to banks and riparian vegetation are

to be taken into account. Any development that intensifies the use of riverside land should provide public access to the foreshore and include measures to protect and enhance vegetation.

On land that is subject to flooding, Council is to consider such matters as hazard risks, pollution threat, redistribution of floodwaters, the availability of other suitable land that is not flood-prone, and flood-free access to essential services.

In relation to the expansion of settlements, including for rural residential development, the land should be flood-free, located close to existing services and facilities, and not compromise the potential of prime crop and pasture land to produce food or fibre.

A map that indicates the land that is subject to *Murray REP No 2* in the vicinity of Moama includes all of the study area other than land east of the Cobb Highway. This map is included in *Attachment B*. The principles of this plan are applied to the findings of this strategy in *Attachment A - Statutory Assessment*.

2.4 Riverina Murray Regional Plan

The *Riverina Murray Regional Plan 2036* was released in March 2017 to replace the *Draft Murray Regional Strategy*. It establishes a framework for growth over the next 20 years. The plan supports the protection of high-value environmental assets and aims to develop a strong and diverse economy. A series of directions and actions are to guide land use planning priorities and decisions. The directions and actions of direct relevance to this strategy are given below.

Direction 1: Protect the region's diverse and productive agricultural lands and Direction 2: Promote and grow the agribusiness sector. It is recognised in the plan that the Riverina Murray is one of the most productive and diverse agricultural regions in Australia due to the Murrumbidgee and Murray river systems which enable irrigation schemes and support farming in a range of climate zones. There are growing opportunities, particularly in Asia, to target high-end food markets by exporting products known for safety, integrity and quality. Identifying and protecting important agricultural land is fundamental to the future of agricultural production. Opportunities to value add to produce will rise as agricultural output increases.

Direction 14: Manage land uses along key river corridors and Direction 15: Protect and manage the region's many environmental assets. It is of national importance to manage settlements along the Murray River corridor to enhance environmental values. Ribbon development along the Murray is to be limited and riverfront setback provisions maintained. Mapping of environmental values and native vegetation communities prepared by the Office of Environment & Heritage should be used at the strategic planning stage. High environmental values criteria includes threatened species, endangered ecological communities, wetlands and high conservation value native vegetation including over-cleared types and landscapes.

Direction 27 Manage rural residential development aims to direct such development to locations that are efficient and sustainable. Three actions are provided that will form the basis of criteria to be used to evaluate the suitability of land for rural residential development. These actions are:

27.1 Enable new rural residential development only where it has been identified in a local housing strategy prepared by council and approved by the Department of Planning and Environment.

27.2 *Locate new rural residential areas:*

- *in close proximity to existing urban settlements to maximise the efficient use of existing infrastructure and services, including roads, water, sewerage and waste services and social and community infrastructure;*
- *to avoid or minimise the potential for land use conflicts with productive, zoned agricultural land and natural resources; and*
- *to avoid areas of high environmental, cultural and heritage significance, important agricultural land or areas affected by natural hazards.*

27.3 *Manage land use conflict that can result from cumulative impacts of successive development decisions.*

Direction 24: Create a connected and competitive environment for cross-border communities. The commercial and institutional benefits of proximity of small towns to regional cities in Victoria is identified and the relationship between the demand and supply of land and housing for towns on either side of the Murray River is recognised as they both operate in the same housing market. This highlights the need for regional land use and infrastructure planning to deliver services and to support future economic opportunities. An action to support consistent and complementary approaches is to develop a cross-border land and housing monitor.

Direction 29: Protect the region's Aboriginal and historic heritage. The contribution of heritage to community well-being and the tourism industry is acknowledged and the need to make early investment in the protection of indigenous and non-indigenous heritage values at the strategic planning stage will provide certainty to stakeholders in the planning and development community.

These directions provide guidance and inform the approach taken in preparing this rural residential strategy. In particular, an assessment of the findings of this strategy against the actions of *Direction 27 Manage rural residential development* is provided in *Attachment A*.

2.5 Murray Shire Strategic Land Use Plan 2010-2030

The *Murray Shire Strategic Land Use Plan 2010-2030* was prepared primarily to inform the preparation of *Murray LEP 2011*. It also aims to provide certainty to the community, maintain productive agricultural land, protect the riverine environment, separate incompatible land uses, reduce speculation, consider tourism proposals and to discourage development on flood prone land.

It is noted in the strategy that the population of Murray Shire was 7,076 persons in 2008 and that this is expected to increase to 9,300 by 2036 due mostly to in-migration to the LGA. The population of Moama is expected to approach 10,000 over the twenty year period of the plan.

With an ageing population it is recognised that Council needs to plan to provide a wide range of housing types including dwellings on rural residential lots. The plan proposes to isolate most rural residential development west of Twenty-four Lane and to preserve land closer to the town centre for urban development. Demand for larger residential lots has been met by lots within the range 1,000m² to 1,500m² rather than lots greater than 4,000m² in area which are considered traditional rural residential.

The supply of land zoned rural residential (R5 Large Lot Residential) in Moama is limited to areas with minimum lot sizes of 4,000 m², 5,000 m² and 8,000m². These R5 zoned areas are in Tatalia Lane (MLS of 4,000m² and 8,000m²), land to the east of the Cobb Highway (MLS of 4000m²) and land west of Lignum Road (MLS of 4000m²). Land within Maiden Smith Drive is also zoned R5 with a minimum lot size of 5,000m², however, this is currently subject to a Planning Proposal which seeks to amend the zoning and reduce the minimum lot size.

Below is an extract from the *Moama Strategic Land Use Plan* that shows the preferred site for rural residential development. It is noted in the plan that no urban expansion or intensification of development should take place on land that is located east of the Cobb Highway and subject

to a 1:100 year flood event and not protected by the town flood levee. All urban expansion, including rural residential development, should therefore be to the west of town.

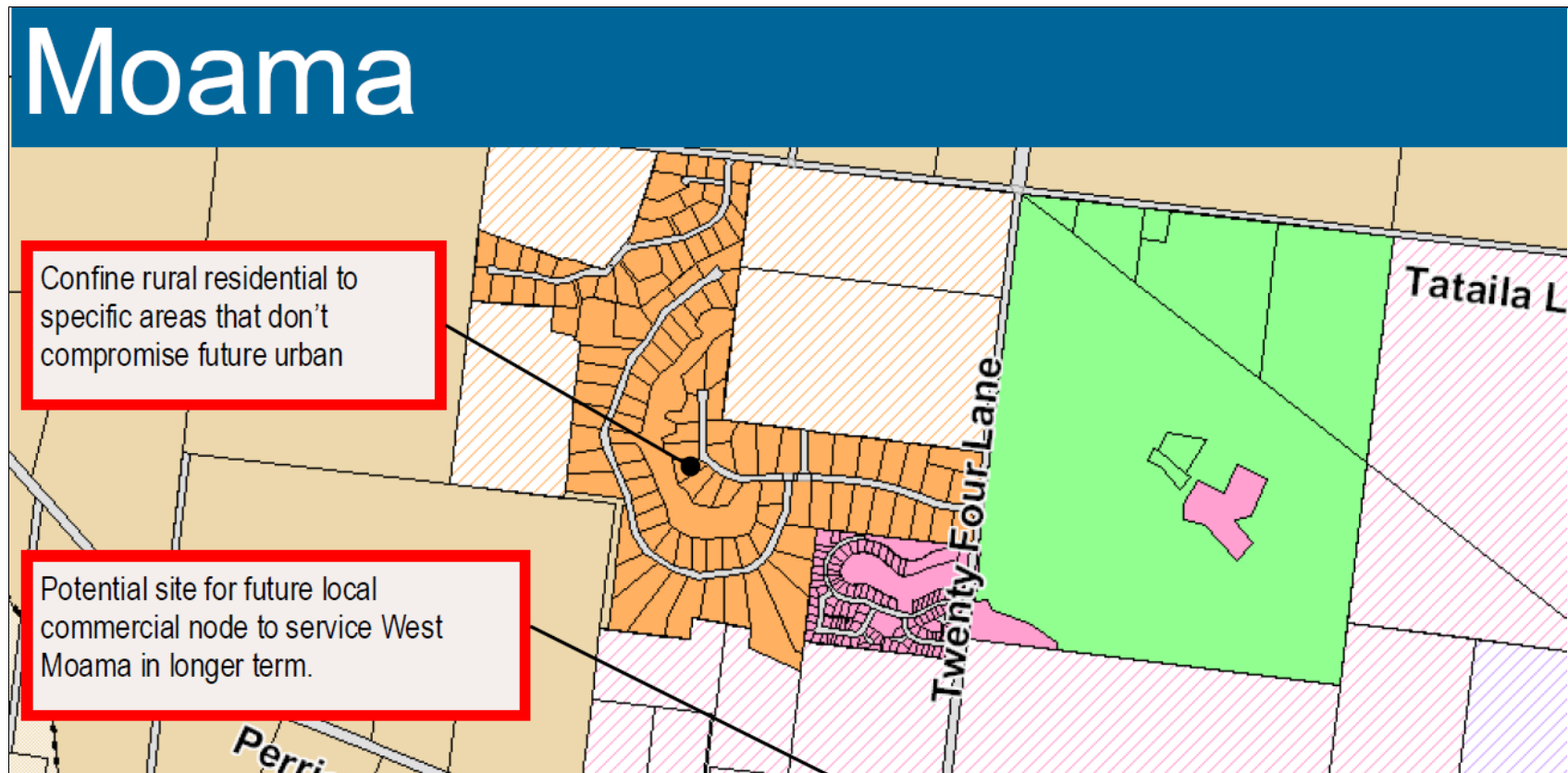


Figure 2.2 Extract from Moama Strategic Land Use Plan

The *Murray Shire Strategic Land Use Plan* identifies key planning issues for rural areas and the environment. Information contained in the plan is used elsewhere in this strategy in particular to describe the characteristics of farming in Moama and significant natural environmental attributes. Importantly, the plan acknowledges that opportunities for rural living within rural zones are very limited and emphasises the threat to agriculture that rural residential development can pose through land use conflict and the loss of agricultural land to residential use.

2.6 Murray Local Environmental Plan 2011

Murray LEP 2011 was prepared in accordance with the *Standard Instrument (LEPs) Order 2006* to comply with state agency directives and the statutory requirements of the *Environmental Planning and Assessment Act 1979*.

Land within the study area is predominantly zoned RU1 Primary Production under *Murray LEP 2011*. However, there are areas zoned E3 Environmental Management, SP2 Infrastructure, SP3 Tourist and IN1 General Industrial. Riparian land fronting the Murray River is zoned W2 Recreational Waterway.

A map of the land zoning of the study area and other maps accompanying the LEP are appended in Attachment B.

Clause 4.2 *Rural subdivision of Murray LEP 2011* applies a minimum lot size to all land within the study area of 120 hectares for the purposes of subdivision for a dwelling. Land may be subdivided to a lot size less than 120 hectares for the purpose of primary production but a dwelling is not permitted on such a lot. Clause 4.2A *Erection of dwelling houses in certain rural and environmental protection zones* applies to zones RU1 and E3. It aims to minimise unplanned rural residential development by restricting the erection of a dwelling to land that is at least the applicable minimum lot size or where a dwelling was permitted prior to the plan taking effect.

Clause 4.2C and 4.2D have been inserted into *Murray LEP 2011* by way of a recent amendment to the principal planning instrument. Clause *4.2C Exceptions to minimum lot sizes for certain rural subdivisions* applies to land zoned RU1 Primary Production enables subdivision to a lot size less than shown on the Lot Size Map so long as the use of the land remains the same as under existing development consent. Clause *4.2D Boundary adjustments in Zones RU1 and E3* is to facilitate boundary adjustments where the resultants lots do not comply with the Lot Size Map where, relevantly, no new lots are created and the number of dwellings or opportunities for dwellings remains the same.

Development standards governing the height of buildings and floor space ratios are not included in *Murray LEP 2011*. Other relevant clauses of Murray LEP 2011 are described below.

5.10 Heritage conservation

Clause 5.10 aims to conserve the environmental heritage, the significance of heritage items and heritage conservation areas, including associated fabric, settings and views, archaeological sites, and Aboriginal objects and places of heritage significance. This clause establishes where development consent is required and circumstances where the provision of heritage management documents may be required.

Heritage items are listed in *Schedule 5 Environmental heritage of Murray LEP 2011* and are shown on the Heritage Map.

7.1 Essential Services

Clause 7.1 requires Council to be satisfied that services that are essential for proposed development are available. Alternatively, adequate arrangements must be made to make them available when required. Essential services are listed as the supply of water and electricity, the disposal and management of sewerage, stormwater drainage or on-site conservation, and suitable road access.

7.2 Earthworks

Clause 7.2 Earthworks requires consent for earthworks except where exempt development, ancillary to other development requiring consent or of a minor nature. Where consent is required, i.e. for stand-alone earthworks that are significant in scale, a range of matters are listed for Council to consider with the objective to prevent adverse impacts on environmental functions and processes, neighbouring land uses, cultural or heritage items, or on the features of surrounding land.

7.3 Biodiversity protection

This clause aims to protect native flora and fauna, ecological processes, and the conservation and recovery of native flora and fauna and their habitats through design, siting and managing new development to avoid, minimise and mitigate adverse environmental impacts. This clause applies to land identified as 'key fish habitat' or 'terrestrial biodiversity' on the Biodiversity Map.

7.4 Development on river front areas,

Clause 7.7 aims to protect riverine processes, water quality, bed and bank stability, amenity, scenic and landscape and heritage values, and riparian corridors. Residential development in river front areas is restricted by this clause to alterations and additions to existing buildings. A river front area is defined in the RU1 Primary Production zone as land within 100 metres of the top of the bank of the Murray River.

7.5 Riparian land and Murray River and other watercourses – general principles

The objectives of clause 7.5 are to protect and maintain water quality, the stability of the bed and banks of the Murray River, aquatic riparian habitats and ecological processes. It applies to land that is mapped as 'Riparian Land and Waterways' on the Watercourse Map and is situated within 40 metres of the top of the bank of the Murray River.

7.7 Wetlands

Clause 7.7 Wetlands applies to land mapped as '*Wetlands and Freshwater Lakes*' on the Wetlands Map. The objective of this clause is to preserve wetlands and protect them from the impacts of development.

7.8 Flood planning

Clause 7.8 sets considerations for the suitability of development, potential impacts on flood behaviour and measures to protect life and property. The objectives of this clause are to minimise risk to life and property, allow development on land that is compatible with the land's flood hazard having regard to climate change and to avoid significant adverse impacts on flood behaviour and the environment. This clause applies to land shown as '*flood planning area*' on the Flood Planning Map and to other land that is at or below the flood planning level.

It is the purpose of this strategy to investigate land that has been identified as potentially suitable for rural residential development and to recommend the allocation of appropriate land zones and development standards to apply to land that is found to be suitable for rural living. Findings are to have regard to the constraints identified on LEP maps. The recommendations are to be effected by a planning proposal to

amend *Murray LEP 2011*. This includes recommendations to apply zone R5 Large Lot Residential and RU4 Primary Production Small Lots along with land use tables that prescribe uses that are permitted with or without consent and uses that are prohibited in those zones.

2.7 Murray Development Control Plan 2012

Murray Development Control Plan 2012 supports *Murray LEP 2011* by setting objectives and controls for land uses that are permitted within the LGA. The DCP does not address rural residential development other than to reinforce the structure plan for Moama and by making reference to the need to confine rural residential development to specific areas that do not compromise future urban expansion.

Land within the study area and to the east of the Cobb Highway is located with flood planning areas 1 and 2. FPA 1 is land considered to be subject to inundation in a 1 in 200 year event and FPA 2 is subject to an extreme flood or Probable Maximum Flood event as defined in the *Moama Floodplain Management Study 1999*.

2.8 Moama North West Master Plan

The *Moama North West Master Plan* was prepared by MacroPlan Australia in 2009 to provide strategic direction for the use and development of 243 hectares of farmland situated to the north-west of the town of Moama. The masterplan was prepared in response to the nomination of this area for future urban development in the *Murray Shire Strategic Land Use Plan 2010-2030*.

The masterplan assesses demand and supply and provides projections of lot yields based on a range of minimum lot sizes and having taken into account environmental and servicing constraints. Parts of the area in closest proximity to Moama have been identified as an *Urban Release Area* in *Murray LEP 2011*.

2.9 Local Planning Directions

Local planning directions are environmental planning instruments made by the Minister for Planning under section 117 of the *EP&A Act* to govern the preparation of draft LEPs. The following directions are relevant to Murray River Council and any planning proposal to amend *Murray LEP 2011* must be consistent with these directions unless justified by this strategy and subject to endorsement of the strategy by the Department of Planning and Environment.

An assessment of the findings of this strategy against relevant section 117 directions is included in *Attachment A* to assist preparation of a planning proposal to rezone land for rural residential development.

2.9.1 Employment and Resources

1.2 Rural Zones – The objective of this direction is to protect the agricultural production value of rural land. A draft LEP shall not rezone rural land to a business, residential, village, industrial or tourist zone, cannot increase residential densities of rural land and must contain provisions to control access to classified roads. A draft plan can be inconsistent with this direction where a land use strategy considers this direction, identifies specific areas of rural land for increased residential densities and is endorsed by the Department of Planning & Environment.

1.5 *Rural Lands* - the objectives of this direction are:

(a) *to protect the agricultural production value of rural land, and*

(b) *to facilitate the orderly and economic development of rural lands for rural and related purposes.*

When a council prepares a draft LEP that affects land within an existing or proposed rural or environment protection zone (including the alteration of any existing rural or environment protection zone boundary), or prepares a draft LEP that changes the existing minimum lot size on land within a rural or environment protection zone, it must be consistent with the Rural Planning Principles and Rural Subdivision Principles of *SEPP (Rural Lands) 2008*.

2.9.2 Environment and Heritage

2.1 *Environment Protection Zones* - the objective of this direction is to protect and conserve environmentally sensitive areas. A planning proposal to amend *Murray LEP 2011* would need to consider provisions that facilitate the protection and conservation of environmentally sensitive areas and shall not reduce the environmental protection standards that apply to land zoned or identified for environment protection, except where there is a change to a development standard for the minimum lot size for a dwelling in accordance with direction 1.5 *Rural Lands*.

2.3 *Heritage Conservation* – the objective of this direction is to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance. A planning proposal shall contain provisions to protect items, places and the like of heritage

significance, including objects, places, landscapes and areas of significance to Aboriginal communities where identified in a local heritage study.

2.9.4 Hazard and Risk

4.3 *Flood Prone Land* – the objectives of this direction are:

- (a) *to ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and*
- (b) *to ensure that the provisions of an LEP on flood prone land is commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land.*

A planning proposal cannot intensify the use of land that is flood-prone nor permit development or a significant increase of development in flood planning areas unless a flood study has been adopted that was prepared in accordance with the *Floodplain Development Manual*.

4.4 *Planning for Bushfire Protection* – the objectives of this direction are:

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

A planning proposal that affects bushfire prone land must have regard to *Planning for Bushfire Protection 2006* and introduce controls that minimize risk.

2.10 Native Vegetation Act 2003

The *Native Vegetation Act 2003* regulates the clearing of native vegetation on all land in NSW except for National Parks and other conservation areas, State forests and reserves, and urban areas. Native vegetation is any species of vegetation that existed in NSW before European settlement including trees, saplings, shrubs, scrub, understorey, groundcover or plants in a wetland.

Clearing is defined as cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation. The clearing of native vegetation is subject to differing requirements depending on whether the vegetation is classified as remnant vegetation, protected regrowth or non-protected regrowth.

Landholders can clear land without approval for certain activities including sustainable farming, continued operations and for Routine Agricultural Management Activities. Other clearing may be permitted subject to a Property Vegetation Plan (PVP) that is negotiated between the land owner and the catchment management authority operating in the area. A PVP may include offsets which are actions required to be taken to compensate for the impacts of the removal of native vegetation. The provisions of the *Native Vegetation Act 2003* apply to development within a rural residential zone, including zone R5 Large Lot Residential.

The *Native Vegetation Act 2003* is to be repealed and replaced by 25 August 2017 by the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016*.

2.11 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* aims to identify and conserve the threatened species, populations and ecological communities of animals and plants in NSW. Threatened species, populations and ecological communities considered by the NSW Scientific Committee to be at risk of extinction in the immediate to medium-term future are listed under schedules in the Act.

The purpose of the Act is to:

- *conserve biological diversity and promote ecologically sustainable development,*
- *prevent the extinction and promote the recovery of threatened species, populations and ecological communities,*
- *protect the critical habitat of those species, populations and ecological communities that are endangered,*
- *eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities,*
- *ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed, and*
- *encourage the conservation of threatened species, populations and ecological communities through co-operative management.*

The *Threatened Species Conservation Act* incorporates the concepts of biodiversity certification and BioBanking. The effect of biodiversity certification is that a proposed development that is consistent with an LEP and is deemed not likely to significantly affect known threatened species, critical habitats or endangered ecological communities is not subject to provisions of the Act during assessment, such as to carry out an assessment of significance. This process relies upon provisions being included in an LEP to protect threatened species and the presence of threatened species being ground-truthed and mapped.

BioBanking provides for the creation of biodiversity credits that can be traded on the open market. Credits are generated when a landowner enters into an agreement that is attached to the title to the land to maintain or improve biodiversity values through specified management actions on the 'biobank site'. The landowner may then sell those credits to a developer who requires an offset for impacts on biodiversity values on a development site. Credits may also be purchased to secure conservation outcomes over land in perpetuity. The provisions of the *Threatened Species Conservation Act 1995* apply to development within a rural residential zone.

The *Threatened Species Conservation Act 1995* is to be repealed and replaced by 25 August 2017 by the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016*.

2.12 National Parks & Wildlife Act 1974

The *National Parks and Wildlife Act 1974* protects Aboriginal objects and Aboriginal places in NSW. Under the *NPW Act*, it is an offence to knowingly harm or desecrate an Aboriginal object. Harm includes destroy, deface or damage an Aboriginal object or Aboriginal Place, and in relation to an object, move the object from the land on which it has been situated. Aboriginal objects include sites, relics or cultural material such as scar trees, middens and ancestral remains.

The *NPW Act* can also protect areas of land that have no Aboriginal objects, that is, they may have no physical evidence of Aboriginal occupation or use. These areas can be declared 'Aboriginal places' if they have spiritual, natural resource usage, historical, social, educational or other type of significance.

Anyone who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later harm an object.

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* provides a process whereby a reasonable determination can be made as to whether or not Aboriginal objects will be harmed by an activity, whether further investigation is warranted and whether the activity requires an application for an Aboriginal Heritage Impact Permit. The due diligence process has been carried out for the land that has been investigated for suitability for rural residential development and is covered in chapter 4. *The Land and Environment*.

The *National Parks and Wildlife Act 1974* is to be repealed and replaced by 25 August 2017 by the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016*.

2.13 Rural Fires Act 1997

The *Rural Fires Act 1997* seeks to protect life and property from harm or damage in the event of a bushfire. Under section 100B of the Act a Bushfire Safety Authority is required to be issued by the Commissioner of the NSW Rural Fire Service to permit the subdivision of land for the purposes of rural residential development or the development of a *special fire protection purpose* such as a child care centre, retirement village, hospital and the like.

Future subdivisions that result from the implementation of the recommendations of this strategy to rezone land for rural residential development would require a Bushfire Safety Authority to proceed.

2.14 Planning for Bush Fire Protection 2006

Planning for Bush Fire Protection 2006 applies to all land that is mapped as being bushfire prone. Specific standards are applied to rural residential subdivision to ensure adequate asset protection zones, access roads, fire trails and services. The guideline calls up *Australian Standard 3959* to ensure construction standards of dwellings are sufficient to withstand expected bushfire attack level.

The document also provides guidance for subdivision design in bushfire prone areas. Future rural residential development that results from implementation of the recommendations of this strategy would need to comply with the standards of *Planning for Bush Fire Protection 2006*.

2.15 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* provides an integrated system of licensing for polluting activities with the objective of protecting the environment. The provisions of this Act would need to be considered for any future subdivision and development taking place on land that is determined to be suitable for rural residential zoning.

2.16 Environment Protection & Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* affords protection for seven matters of national environmental significance. These matters are world heritage properties, national heritage places, wetlands of national importance, listed threatened species and ecological communities, migratory species, commonwealth marine areas and nuclear actions including uranium mines. Actions that have,

or are likely to have, a significant impact on a matter of national environmental significance require the approval of the Australian Government Minister for the Environment and Energy.

Actions include but are not limited to construction, expansion, alteration or demolition of buildings, structures, infrastructure or facilities; storage or transport of hazardous materials; waste disposal; earthworks; impoundment, extraction and diversion of water; research activities; vegetation clearance; military exercises and use of military equipment; and sale or lease of land.

It is the responsibility of the Minister to decide whether assessment and approval is required under the *EPBC Act*. Currently there are 6 wetlands of international importance, 5 listed threatened ecological communities, 26 listed threatened species and 10 listed migratory species protected under the *EPBC Act* within the study area of Murray River LGA. The provisions of the *Environment Protection and Biodiversity Conservation Act 1999* may apply to development within a rural residential zone.

2.17 NSW State Groundwater Policy Framework

The *NSW State Groundwater Policy Framework* provides policy direction on the sustainable management of groundwater resources. The policy focuses on 'water below the ground surface in a geological structure or formation, and on the ecosystems from which these waters are recharged or into which they discharge', (DLWC, undated). The policy operates by managing the use of groundwaters according to the degree of stress or potential threat to an aquifer's integrity. It comprises the *Quality Protection Policy*, the *Quantity Management Policy* and the *Dependent Ecosystems Policy*, and is based on a set of principles centred on facilitating the co-operative and sustainable use of groundwater resources.

The policy provides for Groundwater Management Plans to be prepared across the state with an initial focus on aquifers at risk or stressed at the local level. These plans are intended to determine appropriate uses and values of groundwater resources, levels of protection required, mechanisms to protect dependent ecosystems and places of cultural significance, remediation strategies and monitoring methods.

2.18 Water Management Act 2000

The *Water Sharing Plan for the Lower Murray Groundwater Source* and the *Water Sharing Plan for the Lower Murray Shallow Groundwater Source* are given legal effect by the *Water Management Act 2000*. These plans include rules for environmental protection, and managing extractions, licenses and water trading.

The Murray River is also subject to the *Murray Darling Basin Plan*. Under the basin plan, a *Water Resource Plan* has to be developed by the NSW Government by the end of June 2019 to replace the water sharing plans.

The Murray River at Moama is within the surface-water water resource plan area of the NSW Murray and Lower Darling and the groundwater water resource plan area of Murray Alluvium.

2.19 Fisheries Management Act 1994

The *Fisheries Management Act 1994* contains provisions for the identification, conservation and recovery of threatened fish species, aquatic invertebrates and marine vegetation. Threatened species, populations and ecological communities considered by the Fisheries Scientific Committee to be at risk of extinction are listed under schedules in the Act. The Act also identifies key threatening processes and establishes

mechanisms by which such processes can be managed, such as recovery and threat abatement plans. The provisions of the *Fisheries Management Act 1994* may apply to development within a rural residential zone.

2.20 Biodiversity legislation reforms

The NSW government has been carrying out a review of biodiversity legislation. Two new laws, the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016*, have been passed by Parliament and are due to take effect from 25 August 2017.

The *Biodiversity Conservation Act 2016* replaces the *Threatened Species Conservation Act 2003*, *Nature Conservation Trust Act*, and parts of the *National Parks and Wildlife Act 1974* that apply to licensing and offences.

The *Local Land Services Amendment Act 2016* replaces the *Native Vegetation Act 2003*, *Native Vegetation Regulation 2005* and the *Environmental Outcomes Assessment Method* that aims to maintain or improve biodiversity, soil, water, salinity.

Legislation will be supported by a new tool known as the Biodiversity Assessment Method to determine 'offsets' or 'set-asides' when the clearing of native vegetation or development that may impact on threatened species is proposed, and self-assessable rural land clearing codes. Mapping is also to be prepared to identify excluded, regulated and unregulated land.

Supporting regulations and instruments, including the *Draft Environmental Planning and Assessment Amendment (Biodiversity Conservation) Regulation 2017* are currently being prepared. A new State Environmental Planning Policy (Vegetation) that applies to clearing in urban and environmental zones including R5 Large Lot Residential is also under preparation. This policy will cause the repeal of standard instrument LEP clauses *5.9 Preservation of trees or vegetation* and *5.9AA Trees or vegetation not prescribed by development control plan* that regulate the clearing of vegetation by enabling a council to make a DCP that identifies which vegetation is protected in its local government area.

3. THE COMMUNITY AND LOCAL ECONOMY

Data has been sourced from the Australian Bureau of Statistics *2016 Census of Population and Housing* and the NSW Department of Planning & Environment for this section of the strategy. Statistical area local data has been used for the settlements of Moama and Echuca which cover the townships and surrounding rural areas. Comparisons are made with Murray River LGA and the state of NSW. Population figures are based on estimated resident population, place of enumeration or place of usual residence according to tables prepared by ABS. some rounding error may occur.

It is an approach of this strategy to view Moama-Echuca as a single entity for planning purposes as there is overlap in the provision of services and the supply of residential land to satisfy demand for incoming residents.

3.1 The population

The population of Moama and Murray Shire as a whole grew steadily over the 15 years between 2001 and 2016. At the time of the 2001 ABS Census of Population and Housing there were 4,019 persons living in the statistical area of Moama. This increased to 4,630 persons in 2006, 5,145 persons in 2011 and 5,840 persons in 2016 – a growth of 45.5% over the 15 year period, giving an average annual growth rate of 3% for the period. Estimated resident populations are given in Table 3.1 below. Figures for the new Murray River LGA (an amalgamation of Murray and Wakool Shires) and the Victorian town of Echuca are provided for comparative purposes.

In 2011 the population of Moama encompassed 47% of the new Murray River LGA. This proportion rose to 50% in 2016.

Table 3.1: Population Change (based on estimated residential population)

Population	ERP 2001	ERP 2006	% change 2001-06	ERP 2011	% change 2006-11	ERP 2016	% change 2011-16
Moama	4,019	4,630	15.2%	5,145	11.1%	5,849	13.7%
Murray River LGA	10,713	10,895	1.7%	10,893	0.0%	11,680	7.2%
Echuca	12,550	13,325	6.2%	14,154	6.2%	14,574	3.0%

Estimates of population numbers for Murray River LGA for each census year and annual average growth rates for intercensal periods are given in the table below.

Population projections are based on a modelled estimated population in 2011 and do not necessarily correlate with actual ABS census figures. The 2011 census shows that the actual population is below the projected 2011 population by 300 persons.

Table 3.2: Projected population growth of Murray River LGA, 2011 to 2036

	Murray River LGA	
Year	Total population	Average annual growth
2011	11,250	
2016	11,550	0.5%

2021	11,900	0.6%
2026	12,100	0.4%
2031	12,300	0.3%
2036	12,400	0.2%

Population projections issued by the Department of Planning and Environment in 2014 indicate that the population of Murray River LGA is expected to rise from 11,250 persons in 2011 to 12,400 persons in 2036. This represents an increase of 1,150 residents or 10.2% over the 25 year period.

The age distribution of Moama and Murray River LGA at the time of the 2016 census is given in Table 3.1 below. Figures for the neighbouring Victorian town of Echuca and the state of NSW are provided for comparison.

Table 3.3: Age distributions 2016 (based on place of usual residence)

Age group	Moama		Murray River LGA		Echuca		NSW	
	persons	% of total	persons	% of total	persons	% of total	persons	% of total
0-14	1,026	17.6	1,994	17.1	2,625	18.0	1,386,330	18.5
15-64	3,134	53.6	6,553	56.2	8,694	59.7	4,876,255	65.2
65 +	1,687	28.8	3,119	26.7	3,250	22.3	1,217,641	16.3
Total	5,847		11,666		14,569		7,480,226	

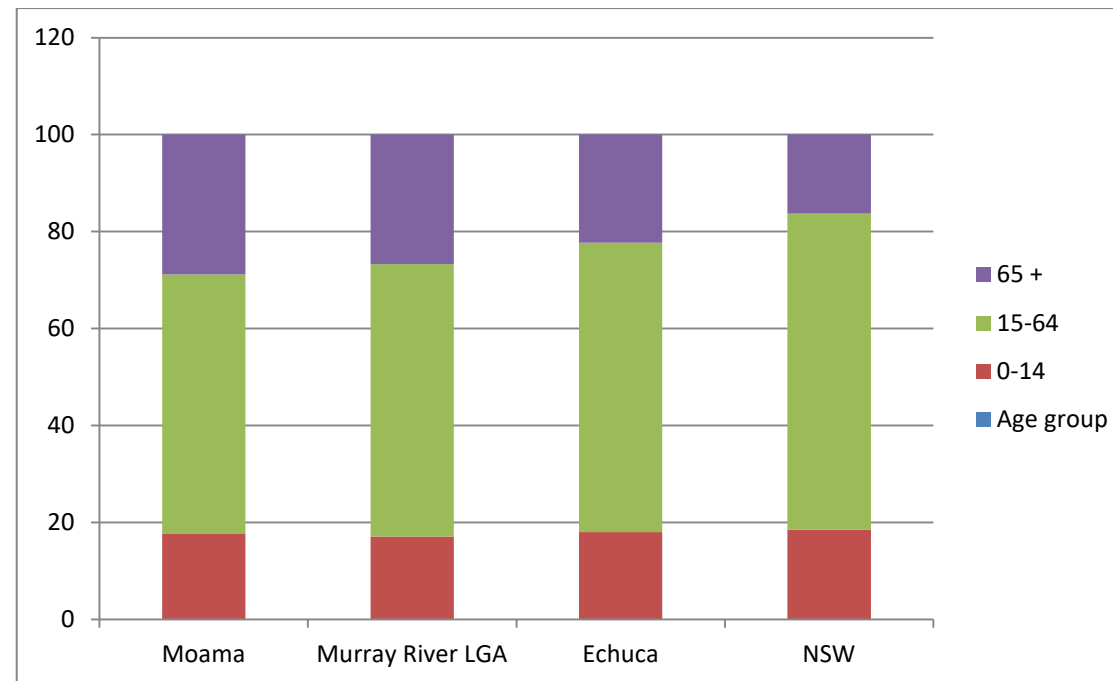


Figure 3.1: Age distribution, 2016

Figures released by the Department also suggest that the population of the former Murray River is ageing, with a gradually declining proportion of persons aged less than 15 years and in the working age group of 15 to 64 years, and an increase in persons aged 65 years or more over the period 2011 to 2031 reaching almost 40%.

The key driver of this change is likely to be an increase in life expectancy coupled with a movement of retirees to the LGA.

3.2 Housing

The majority of occupied private dwellings, 83.6%, in Moama are separate houses. These accommodate 88.5% of the population and less than half of these dwellings are owned outright. A third of occupied private dwellings are under mortgage and about a quarter are being rented. These statistics reflect the low density urban environments of Australian inland towns and the reasonably high home ownership levels of these towns. Dwelling structure, occupancy and tenure data for Moama and Echuca is given in Tables 3.4 and 3.5 below.

Table 3.4: Dwelling structure in Moama and Echuca, 2016

Dwelling structure	proportion of all dwellings		proportion of population	
	Moama	Echuca	Moama	Echuca
Separate house	83.6%	86.0%	88.5%	90.6%
Semi-detached, villa, townhouse, etc	5.7%	12.5%	3.7%	7.9%
Flat, unit or apartment	7.7%	0.8%	5.4%	0.5%
Other (caravan, cabin, shop-top, house etc)	2.9%	0.5%	2.2%	0.3%
No stated	0.3%	0.4%	0.4%	0.4%
Unoccupied (% of total dwellings)	12.6%	12.3%		

Table 3.5: Dwelling tenure in Moama and Echuca, 2016 (other/not stated are excluded)

	Moama				Echuca			
	Separate houses	Villas, etc	Flats	Total	Separate houses	Villas, etc	Flats	Total
Owned outright	42.1%	39.7%	18.9%	40.7%	37.4%	20.0%	14.3%	35.0%
Owned with mortgage	36.1%	6.4%	8.3%	31.2%	35.2%	8.5%	7.1%	31.5%
Rented	18.8%	27.8%	61.5%	23.3%	23.3%	63.0%	83.3%	28.8%
Other/not stated	2.6%	23.0%	10.7%	5.0%	4.1%	8.8%	7.1%	4.7%

These figures show that the types of dwellings and occupancy is similar across these settlements, i.e. high proportions of separate detached dwellings accommodating the majority of the inhabitants of each town.

Table 3.6 below gives selected medians and averages for age, dwellings, occupancy rates, incomes and dwelling expenditure.

Table 3.6: Summary – selected medians and averages for Moama, Murray River LGA and Echuca, 2016

Statistic	Moama	Murray River LGA	Echuca
Population	5,849	11,680	14,574
Median age (years)	47	49	44
Number of private dwellings	2,741	5,869	6,558
Average household size (persons per dwelling)	2.3	2.3	2.4

Statistic	Moama	Murray River LGA	Echuca
Median total household income (\$/week)	\$1,157	\$1,061	\$1,144
Median mortgage repayment (\$per month)	\$1,560	\$1,300	\$1,387
Median rent (\$/week)	\$275	\$200	\$250
Average motor vehicles per dwelling	1.8	1.9	1.8

The average household size in Moama and Murray River in 2016 was 2.3 persons. It was slightly higher at 2.4 persons per dwelling in Echuca. The median age in Moama and Murray River LGA was 47 and 49 years respectively in 2016, substantially more than the median of 44 years across the border in Echuca.

The median weekly household income in Moama was \$1,157 per week - higher in Moama than for Murray River LGA and Echuca.

According to the 2016 Census, the median monthly mortgage repayment in Moama was \$1,560, higher than for the LGA and Echuca. The median weekly rent in Moama was \$275, significantly higher than for the LGA and Echuca.

The percentage of all dwellings being rented was around one-quarter in Moama and just under one-third in Echuca reflecting the higher proportion of medium density housing in Echuca which represents the highest proportion of the rental market.

3.3 Industry and employment

Industry and employment data derived from the 2016 Census is not available until October 2017. Data from the 2011 Census is presented in this section.

The labour force of Moama grew over the period 2001 to 2011 from 1,833 persons to 2,345 persons. The labour force comprises all persons in full time or part time employment and unemployed persons who are actively looking for work.

The labour force participation rate fell marginally, from 56.9% to 55% and unemployment fell from 4.5% to 4% during this period.

Trends in employment in Moama and Echuca are shown in Tables 3.7 and 3.8 below as numbers of jobs within each industry sector as a percentage of total jobs.

Table 3.7: Employment by industry sector, Moama 2001 - 2011

Industry in Moama	2001 %	2006 %	2011 %
Agriculture, forestry and fishing	9.0%	5.4%	5.0%
Mining	0.0%	0.1%	0.3%
Manufacturing	12.9%	11.6%	10.1%
Electricity, gas, water and waste services	0.2%	0.6%	0.9%
Construction	7.2%	9.8%	9.2%
Wholesale trade	6.2%	3.9%	4.1%

Retail trade	11.0%	13.0%	13.5%
Accommodation and food services	16.5%	14.1%	13.4%
Transport, postal and warehousing	3.8%	4.0%	3.3%
Information media and telecommunications	0.7%	1.0%	0.8%
Financial and insurance services	1.8%	1.8%	1.9%
Rental, hiring and real estate services	1.8%	1.9%	1.4%
Professional, scientific and technical services	3.1%	3.5%	4.0%
Administrative and support services	2.6%	1.9%	2.1%
Public administration and safety	3.3%	3.7%	4.8%
Education and training	4.9%	5.3%	6.4%
Health care and social assistance	9.0%	10.1%	11.4%
Arts and recreation services	0.9%	2.0%	2.0%
Other services	3.5%	3.2%	3.2%
Inadequately described/Not stated	1.7%	2.9%	2.3%

There was a marked decline in employment in primary industry (agriculture, forestry, fishing and mining) over the period 2001 to 2011 in both towns. This has meant that other sectors of the local economy which are primarily located in urban areas have increased in importance relative to rural industry. There have been significant increases in the proportional employment in the services sector which includes health care, public administration and education. There were lesser increases in Echuca in professional services than in Moama.

The construction industry and retail trade sectors have also increased significantly as a proportion of total employment in both towns.

Table 3.8: Employment by industry sector, Echuca 2001 - 2011

Industry in Echuca	2001 %	2006 %	2011 %
Agriculture, forestry and fishing	5.5%	3.0%	2.3%
Mining	0.0%	0.1%	0.3%
Manufacturing	11.2%	11.3%	10.0%
Electricity, gas, water and waste services	0.5%	0.6%	0.6%
Construction	5.2%	6.8%	7.3%
Wholesale trade	3.6%	2.4%	2.1%
Retail trade	9.4%	10.3%	10.0%
Accommodation and food services	8.1%	7.8%	7.8%
Transport, postal and warehousing	2.5%	2.7%	2.7%
Information media and telecommunications	0.8%	0.8%	0.7%
Financial and insurance services	1.1%	1.4%	1.2%
Rental, hiring and real estate services	1.0%	1.2%	0.8%
Professional, scientific and technical services	2.3%	2.3%	2.6%
Administrative and support services	1.9%	1.6%	1.4%
Public administration and safety	2.0%	3.0%	3.4%
Education and training	5.2%	5.4%	5.7%
Health care and social assistance	7.8%	8.1%	10.2%
Arts and recreation services	1.1%	1.2%	1.6%
Other services	2.9%	3.1%	3.2%

Industry in Echuca	2001 %	2006 %	2011 %
Inadequately described/Not stated	1.1%	1.7%	1.8%

The value of agriculture to Murray LGA at the time of the 2010-11 Agriculture Census was \$100,288,775. This was up by more than \$8.6 million on the 2005-06 census. Significant contributors to production are cereal and other broadacre crops, stonefruit, wool, milk and meat (beef, poultry and lambs).

Cereal crops contributed 10% of agricultural production in Murray LGA in 2011-11, down from 14.1% in 2005-06. Increases in proportional contributions have been made by other broadacre crops, nurseries (cut flowers and cultivated turf) and crops for hay. Meat production has declined significantly over the period by over \$1 million and a 20% overall contribution.

3.4 Development trends

Development applications lodged for residential development with Murray Shire Council over the period 2007/08 to 2014/15 have been steady in number other than a decline during the years 2010/11 to 2012/13. The data has been sourced from the Department of Planning & Environment and does not specify whether these DAs were approved or refused. It also does not specify whether these applications were for urban or rural dwellings. Despite these shortcomings the data is the best available indicator of residential demand.

Unfortunately, annual Local Development Performance Monitoring publications by the Department of Planning do not include construction or occupation certificates. This data would be useful to provide a realistic indication of supply and demand as approvals are often not enacted.

Table 3.7: Numbers of development applications for new residential, development Murray Shire Council, 2007/08 – 2014/15

Category	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Alterations & additions	106	100	79	74	43	45	60	62
Single new dwellings	49	27	42	34	35	53	53	62
New second occupancy	0	0	1	1	1	0	0	3
New multi unit	1	4	4	6	6	1	1	0
Seniors living	0	0	1	0	0	0	0	0
Other	0	2	0	0	0	4	7	0
Total	156	133	127	115	85	103	121	127

The bulk of the applications of some two-thirds were for alterations and additions at the beginning of the eight year period although new single dwellings have maintained a steady flow to now equal applications for alterations and additions. Applications for medium density dwellings peaked during the middle of the period.

Historically there has been no land zoned and made available for rural living in the Moama district other than land that is now zoned R5 Large Lot Residential with minimum lot sizes ranging from 4,000m² to 8,000m². These are effectively large urban allotments that are subdivided in the same way (pattern and layout) as land within the low density residential zone. There is no available information to assist to identify the drivers for development of rural residential land. There is land zoned R5 Large Lot Residential to the east and a small area to the west of Mathoura but that land is yet to be subdivided for rural living.

However, as Echuca and Moama operate to a large extent as a single property market, the drivers for demand for rural living lots that were identified in the *Shire of Campaspe Rural Living Strategy 2015* can be reasonably assumed to also apply to Moama.

The main drivers of demand for rural residential demand in the Campaspe Shire are:

- The capacity of the supply of land zoned for rural living to satisfy demand,
- Local economic health and employment opportunities for occupants of rural living land, and
- The relative affordability of land and housing compared to metropolitan Melbourne and regional centres.

Elsewhere in NSW, retirees and families seeking opportunities to accommodate pets such as horses and to carry out small-scale agricultural pursuits are characteristic of rural residential development. Housing affordability is also an obvious driving factor as land values rise in close proximity to capital cities coupled with declining real incomes.

The source of incoming rural living occupants are therefore expected to be existing residents of the Moama-Echuca area seeking a lifestyle change, an overflow of persons who would ordinarily choose a metropolitan area or larger regional centre but seek more affordable land, and retirees primarily from Melbourne, regional Victoria and surrounding districts in NSW.

According to the *Shire of Campaspe Rural Living Strategy 2015* and the *Echuca South East Rural Living Precinct Final Draft Structure Plan 2014* there is a total of 832 hectares of land zoned for rural living to the south-east of the settlement of Echuca comprising 163 lots, 19 of which are vacant. There is the potential to yield 255 additional lots if additional land is rezoned for rural living as recommended in the draft structure plan. The bulk of the rural living area is subject to a minimum lot size of 1 hectare whilst the remainder may be subdivided to either 2 or 4 hectares.

To determine the adequacy of existing supply, demand has been forecast as a base case scenario and an alternative case. The base case assumes that the rate of take-up of rural living lots in Echuca between 2002 and 2013 of 6 lots per annum will continue indefinitely. The

alternative case assumes an increased take-up to 10 lots per annum on the assumption that the additional supply recommended in the draft structure plan will stimulate demand. As there is no available data concerning the take-up of land for rural residential development in Moama, the estimates used in Campaspe Shire for the Echuca South East Rural Living Precinct have been used in this strategy as an estimate of demand.

There are many variables that will influence demand over coming years, including the availability of land to match lifestyle preferences, proximity to services, and the development of infrastructure. Recent strong urban residential growth in Moama and Echuca may continue with investment in the Echuca Regional Health, a new river crossing funded by the Commonwealth, NSW and Victorian governments, and an extension to the Bendigo-Echuca rail line. The extent to which this demand applies to rural residential land in Moama is unknown until such time as land is made available to the market.

4. THE LAND AND ENVIRONMENT

The study area has been divided into five separate areas. The attributes of each of these areas is described in detail in this chapter. Information and maps supplied by Council, the Office of Environment & Heritage and the Department of Primary Industries of land zoning, land use, land capability, mineral resources, land contamination, terrestrial biodiversity, wetlands, key fish habitat, vegetation type, heritage, bushfire prone land and flood prone land have been used to identify characteristics of the study area.

These maps are appended to this strategy as Attachment B. Ground-truthing to verify the accuracy of mapping layers or to identify and map other environmental attributes has not been carried out.

4.1 Attribute descriptions

Below is an explanation of the attributes described in this chapter grouped as Land use and capability, Landscape and ecology, Natural hazards and Cultural heritage.

4.1.1 Land use and capability

The description of land use is based on site visits to the study area, verification using satellite and aerial imagery, and confirmation of descriptions by Council's project manager. Agricultural uses are broadly defined as crops or vines.

The mapping of sites within and surrounding the study area that have been identified as potentially contaminated due to past or current land uses has been supplied by Council.

Mapping illustrating mineral resources on land within and surrounding the study area has also been provided by Council.

Land capability mapping has been prepared using data provided by the Office of Environment & Heritage. The methodology for the classification of land is explained in *The land and soil capability assessment scheme – A general rural land evaluation scheme for NSW, 2nd Approximation* which is available on www.environment.nsw.gov.au. Land capability classes are described in Table 4.1.

Table 4.1: Land capability classes

Land capability	Description
Class 1	Extremely high capability land: Land has no limitations. No special land management practices required. Land capable of all rural land uses and land management practices
Class 2	Very high capability land: Land has slight limitations. These can be managed by readily available, easily implemented management practices. Land is capable of most land uses and land management practices, including intensive cropping with cultivation
Class 3	High capability land: Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation
Class 4	Moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology.

Land capability	Description
Class 5	Moderate–low capability land: Land has high limitations for high-impact land uses. Will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long-term degradation
Class 6	Moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology
Class 7	Very low capability land: Land has severe limitations that restrict most land uses and generally cannot be overcome. On-site and off-site impacts of land management practices can be extremely severe if limitations not managed. There should be minimal disturbance of native vegetation.
Class 8	Extremely low capability land: Limitations are so severe that the land is incapable of sustaining any land use apart from nature conservation. There should be no disturbance of native vegetation
Flood irrigation	<i>Flood irrigation</i> applies to specific areas of land that are irrigated with floodwaters
Mining and quarrying	<i>Mining and quarrying areas</i> are occupied by an existing extractive industry

The agricultural land classification of the study area has been sourced from the *Agricultural Land Classification Atlas* and the *Agricultural Lands Report - Moama Environs* dated July 1987. The land classification system is used to determine the suitability of land for general agricultural use. Land is classed in the five categories described in Table 4.2.

Table 4.2: Agricultural land classification descriptions

Agricultural land classification	Description
Class 1	Arable land suited to continuous cultivation for uses such as intensive horticulture and field crops. Constraints to sustained high levels of production are absent or minor
Class 2	Arable land suited to regular cultivation for uses such as intensive horticulture and field crops. Constraints to sustained levels of production are minor to moderate
Class 3	Land suited to cropping but not continuous cultivation. Production risks are managed through a pasture phase, conservation tillage and/or fallowing. Constraints to sustained levels of production are moderate
Class 4	Land suited to grazing but not cultivation. Agriculture is based on native pastures and/or improved pastures established using minimum tillage techniques. Overall level of production is comparatively low due to major environmental constraints
Class 5	Land not suited for agriculture or only light grazing. Agricultural production, if any, is low due to major environmental constraints

All land within the study area is classed as prime crop and pasture land (class 1 or 2) other than foreshore areas which are class 4 and land between Goldsborough Road and the foreshore in Area 5 which is class 3 and 4.

4.1.2 Landscape and ecology

The *Biodiversity Map* and *Wetlands Map of Murray LEP 2011* have been used to identify areas affected by environmental sensitivity and that are subject to planning provisions that restrict development.

Data provided by the Office of Environment and Heritage has been interrogated to determine vegetation types within and surrounding the study area. Of these vegetation types, potential endangered ecological communities have been identified along with estimates of the representativeness of potential EECs within the study area as a percentage of the extent of each EEC within five kilometres of the study area. Mapping of vegetation types is broad and any native vegetation within the study area may be an EEC. Ground-truthing should be carried out to determine the extent and integrity of any potential EEC prior to development proceeding.

Vegetation types that exist within the study area are given in Table 4.3 below along with the percentage of each vegetation type within the study area compared to land within a distance of 5 kilometres from the boundaries of the study area. Likely endangered ecological communities are identified in the table.

Table 4.3: Vegetation types within the study area

Vegetation type	Potential EEC (Yes/No)	% of study area & surrounding 5 km
Grassland and/or forbland on dunes	No	64%
Grey box woodlands on alluvial plains and floodplains	Yes	11%
Mixed box woodlands on alluvial plains and floodplains	Yes	10%
Planted natives		49%
Grassland with scattered trees on alluvial plains	Yes	14%
Forests and woodlands (Murray-Edward-Wakool floodplain)	No	10%
Mixed woodlands on the Murray-Edward-Wakool	No	1%

Vegetation type	Potential EEC (Yes/No)	% of study area & surrounding 5 km
floodplain		
Areas with less than 5% native woody vegetation including cropping, regrowth grassland which may have been previously cleared and/or cropped or grazed	No	16%
Areas with greater than 5% native woody vegetation in cropping or urban environments	Yes	12%

Land that is identified as being greater than 5% native vegetation cover may comprise the EEC Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepain, Nandewar and Brigalow Belt South Bioregions.

Key fish habitat mapping has been supplied by Council.

4.1.3 Natural hazards

The *Flood Planning Map of Murray LEP 2011* is based on data contained in the *Moama Floodplain Management Study* prepared by Sinclair Knight Merz in January 2001. The Flood Planning Area identified on the *Flood Planning Map* is land subject to a 1 in 100 year average recurrence interval flood event.

The *Moama Floodplain Management Study 1999* mapped land subject to a 1 in 200 year flood event and a probable maximum event. Both scenarios are included in *Murray DCP 2012* and cover much of the rural land surrounding Moama township. Provisions of *Murray DCP 2012* do not exclude development in these areas but apply controls to manage the impact of flooding on life and property.

Bushfire mapping has been supplied by Murray River Council. The bushfire categories given in Table 4.4 below are used in the bushfire prone land map.

Table 4.4: Bushfire categories

Category	Mapping colour	Description
Bushfire Prone Vegetation - Category 1	Orange	Forests, woodlands, heaths and wetlands greater than one hectare
Bushfire Prone Vegetation - Category 2	Yellow	Forests, woodlands, heaths and wetlands less than one hectare
Nil category	uncoloured	Rainforests, shrublands, open woodlands, mallee and grasslands
Bushfire Prone Vegetation Buffer Zone	Red	Land within 100m of Category 1 and 30m of Category 2 bushfire prone vegetation

4.1.4 Cultural heritage

Sites, objects and places of indigenous heritage have been sourced from the *Aboriginal Heritage Information Management System (AHIMS)* managed by the Office of Environment and Heritage. An extensive search report prepared on 30 September 2015 has identified the location of sites that comprise scarred trees and middens near the Murray River foreshore.

The location of non-indigenous heritage sites and places has been sourced from *Schedule 5 Environmental Heritage* and the *Heritage Map of Murray LEP 2011*. Two sites are located within the study area.

4.2 Description of Area 1



Figure 4.1: Area 1 – land to the east of the Cobb Highway

AREA 1	
ATTRIBUTE	DESCRIPTION
Land use and capability	Land east of the Cobb Highway is zoned RU1 Primary Production and is not mapped as being subject to <i>Murray REP No. 2</i> .
	The majority of this area is of Class 2 land capability and is suitable for regular cultivation. Patches of Class 3 land capability exist in the centre and near the eastern boundary. Crops are the main land use along with a sand and gravel quarry near the eastern boundary. All land within this area is prime arable land of an agricultural land class 1 or 2.
	Lots sizes in Area 1 are generally large, the majority being approximately 40 hectares with some smaller 20 hectares lots.
	Adjoining land uses comprise a buffer to the Cobb Highway to the north and west, with cropping and bushland elsewhere.
	A potentially contaminated site exists on adjoining land at the south-western corner of this area, this site being occupied by electricity generating infrastructure.
	A site mapped as a mineral resource with a buffer is located to the east of the existing quarry.
Landscape and ecology	Small scattered patches of land are mapped as terrestrial biodiversity. Analysis of vegetation data indicates that vegetation comprises mixed box woodlands (a likely EEC), grasslands with scattered trees on alluvial plains (a likely EEC) and planted natives.
	Another potential EEC, grey box woodlands, is present within the highway buffer along the southern part of the western boundary.

	Area 1 is not affected by wetlands or key fish habitat.
Natural hazards	There are small patches of land affected by bushfire category 2 in the northern section of this area.
	The eastern half of Area 1 has been identified as being subject to a 1:100 flood event and is mapped as a Flood Planning Area.
Heritage	There are no known or mapped indigenous or non-indigenous cultural heritage sites within this area. An on-line search of AHIMS was carried out on 18 January 2017 based on centrally-located lots with a buffer of 1,000 metres to cover the whole of Area 1. No Aboriginal sites or places have been recorded with the area.

4.3 Description of Area 2

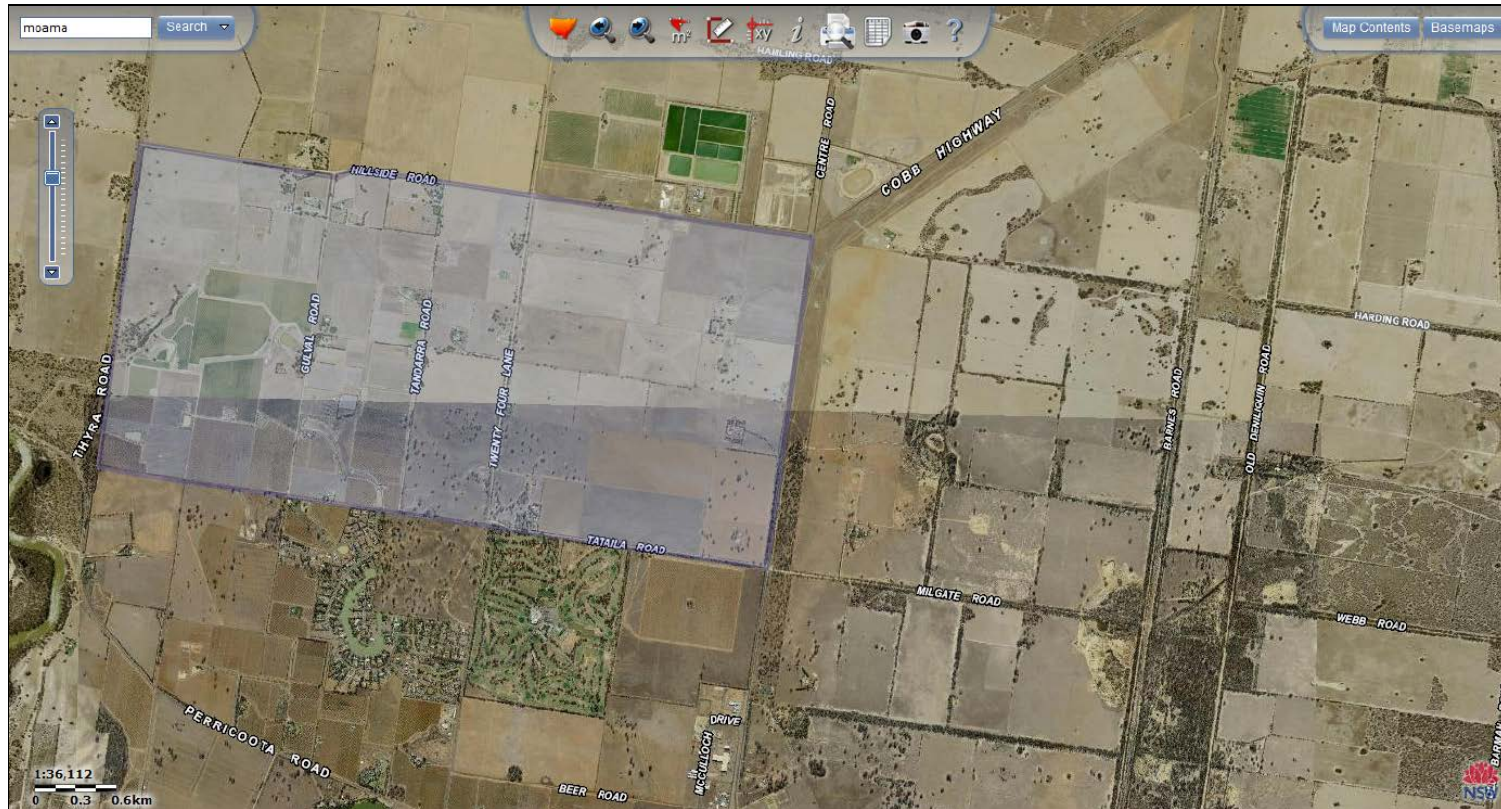


Figure 4.2: Area 2 – land to the west of the Cobb Highway and north of Tataila Road

AREA 2	
ATTRIBUTE	DESCRIPTION
Land use and capability	Area 2 is mostly zoned RU1 Primary Production with two allotments at the north-eastern corner zoned as IN1 General Industrial and mapped as an Urban Release Area in <i>Murray LEP 2011</i> . The area is mapped as being subject to the provisions of <i>Murray REP No.2</i> .
	This area is mostly used for the cultivation of crops with viticulture occupying properties at the south-western corner. Most adjoining land to the north and west is cropping. An established industrial area and a sewerage treatment plant are located across Hillside Road at the north-western corner. Adjoining land on the southern side of Tataila Road is occupied by viticulture and crops, urban residential development and a golf course.
	The area is predominantly land capability Class 2 and suitable for regular cultivation with a large area of flood irrigation over the western section. All land within this area is prime arable land of an agricultural land class 1 or 2
	There is no land mapped as containing mineral resources or as being potentially contaminated.
	Lot sizes are mixed. All lots are 40 hectares in the eastern section between the Cobb Highway and Twenty Four Lane, predominantly 8 hectares with some 4 and 16 hectare allotments in the central section between Twenty Four Lane and Gulval Road, and lots ranging between 10 and 20 hectares given over to vines at the south-western corner. A large agricultural lot in excess of 100 hectares is located at the north-western corner.

<p>Landscape and ecology</p>	<p>Small scattered patches of land are mapped as terrestrial biodiversity. These are located within the eastern section, along Twenty Four Lane and near the western boundary coinciding with the following potential EECs - grey box woodland, mixed box woodlands, grasslands with scattered trees and land with greater than 5% native woody cover. Other vegetation comprises planted natives.</p>
	<p>Area 2 is not affected by wetlands or key fish habitat.</p>
<p>Natural hazards</p>	<p>There are small patches of land affected by bushfire categories 1 and 2 across this area. The category 1 hazard includes a 100 metre buffer and is near the eastern boundary and at the south-western corner.</p>
	<p>Area 2 has not been identified as being subject to flooding and is not mapped as a Flood Planning Area.</p>
<p>Heritage</p>	<p>There are no known or mapped indigenous or non-indigenous cultural heritage sites within this area. An on-line search of AHIMS was carried out on 18 January 2017 based on centrally-located lots with a buffer of 1,000 metres to cover the whole of Area 2. No Aboriginal sites or places have been recorded with the area.</p>

4.4 Description of Area 3

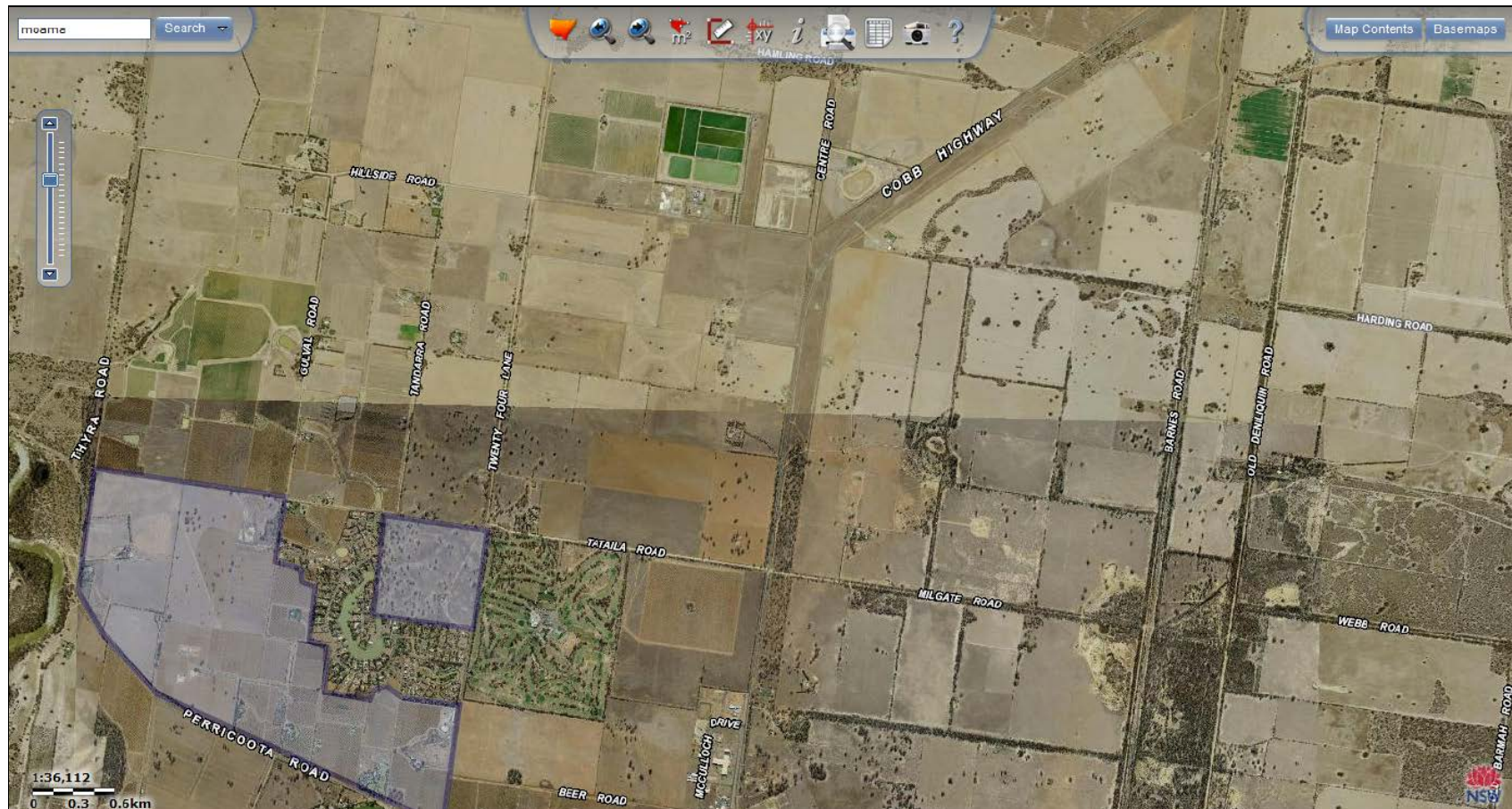


Figure 4.3: Area 3 – land to the west of the Cobb Highway and south of Tataila Road

AREA 3	
ATTRIBUTE	DESCRIPTION
Land use and capability	Area 3 is zoned RU1 Primary Production with an existing tourist facility zoned SP3 Tourist at the south-eastern corner of this area. The area is mapped as being subject to the provisions of <i>Murray REP No.2</i> .
	There is no land mapped as containing mineral resources or as being potentially contaminated.
	The land capability rating is class 2 and flood irrigation over the bulk of the area with cropping generally taking place on class 2 land and viticulture on the flood irrigation land. The majority of the section located between urban development and the golf course is class 3 and currently vacant. All land within this area is prime arable land of an agricultural land class 1 or 2
	Adjoining uses are vines to the north in Area 2, vines and urban development to the east, cropping to the south of Perricoota Road and crops and bushland (e.g. grey box woodlands) to the west.
	Lot sizes vary over this area, ranging from about 7 hectares up to 40 hectares. The smaller lots are located close to the existing urban residential development and Perricoota Road. Most of these are currently used to grow grape vines.
Landscape and ecology	The section located between urban residential development and the golf course is mapped as being affected by terrestrial biodiversity. Vegetation comprises the potential EEC grey box woodland, grasslands and planted natives

	Area 3 is not mapped as being affected by wetlands or key fish habitat.
Natural hazards	There are two patches of land affected by bushfire category 2 with buffers of 30 metres at the western edge of this area.
	Area 3 has not been identified as being subject to flooding and is not mapped as a Flood Planning Area.
Heritage	There are no known or mapped indigenous or non-indigenous cultural heritage sites within this area. An on-line search of AHIMS was carried out on 18 January 2017 based on centrally-located lots with a buffer of 1,000 metres to cover the whole of Area 3. No Aboriginal sites or places have been recorded with the area.

A local environmental study was prepared by Advanced Environmental Systems to support a rezoning of the land located along Tataila Road between the R5 zoned land and the golf course in 2008 which is described as Lot 24 DP 668368 and Lot 2 DP 1213446. It was found that the major constraints to development of this property are the remnant grey box vegetation community and the drainage lines running towards the west and south-west across the property. A cultural heritage survey was carried out which found that there were no indigenous heritage items or places on the land. This finding was endorsed by the Moama Local Aboriginal Lands Council.

The LES recommended that the land be zoned residential under the new comprehensive planning scheme that was being prepared at the time and that minimum lot sizes of 875m² to 1,000m² be applied with larger lots of between 1,000m² and 1,500m² as buffers around the perimeter of the site. It was suggested in the LES that no grey box gums would be removed as a consequence of the rezoning and that surface water flows could be managed using water sensitive urban design techniques.

4.5 Description of Area 4



Figure 4.4: Area 4 – land to the south of Perricoota Road, east of Thyra Road

AREA 4	
ATTRIBUTE	DESCRIPTION
Land use and capability	Area 4 is zoned partly RU1 Primary Production, W2 Recreational Waterway, SP3 Tourist and E3 Environmental Management. The area is mapped as being subject to the provisions of <i>Murray REP No.2</i> .
	There is no land mapped as containing mineral resources.
	Two sites are mapped as being potentially contaminated, these being an allotment mapped as a heritage item for former boiling down works and a lot at the south-eastern corner of Area 4.
	The area is mapped as a mix of land capability classes – 2, 3, 6 and flood irrigation. It is being used mainly for cropping with a tourism facility located at the north-eastern corner. The foreshore to the Murray River is predominantly bushland. Land within this area is prime arable land of an agricultural land class 1 or 2 other than the foreshore area which is class 4.
	Adjoining uses are cropping and viticulture to the north of Perricoota Road and the Murray River waterway elsewhere.
	Lot sizes range from 3 to 15 hectares in the east and 10 to 30 hectares across the western section of this area. There are two small house lots at the eastern end close to Perricoota Road,
Landscape and ecology	Much of the foreshore land and a large patch in the centre of this area is mapped as terrestrial biodiversity. This coincides with the Murray-Edward-Wakool floodplain forests and woodlands (including river red gum) and two potential EECs – mixed box woodlands and land with greater than

	<p>5% native woody cover. A small patch of mixed woodlands is present at the north-western corner and planted natives in the centre of Area 4.</p>
	<p>The extent of biodiversity and vegetation coincides with the wetlands map.</p>
	<p>Key fish habitat is mapped along the immediate Murray River foreshore and in a wetland near the western boundary of the area.</p>
Natural hazards	<p>All mapped vegetation in Area 4 is classed as bushfire category 1 interspersed with category 2.</p>
	<p>More than two-thirds of this area is subject to a 1:100 ARI flood event and is therefore mapped as a flood planning area.</p>
Heritage	<p>There are two non-indigenous properties included in Schedule 5 Environmental Heritage and identified on the Heritage Map of Murray LEP 2011. Item 6 described as 16 Mile Tree 311 is located at Dead Horse Point at Lot 73 DP 75115 at the southern tip of Area 4. Item 64 described as Boiling Down Works located on Lot 1 DP 1088592 is at the north-eastern corner of the area.</p>
	<p>An on-line search of AHIMS was carried out for an allotment in Area 4 on 22 September 2015 for assessment of a development application. The search found that four sites within this area, comprising middens and a scarred tree. All are located within the riparian edge of the Murray River.</p>

AREA 5	
ATTRIBUTE	DESCRIPTION
Land use and capability	Area 5 is zoned part RU1 Primary Production and part W2 Recreational Waterway. The area is mapped as being subject to the provisions of Murray REP No.2.
	There is no land mapped as containing mineral resources or as being potentially contaminated.
	The area is predominantly flood irrigation land capability other than class 6 at the southern edge and a small intervening patch of class 3. It is being used mainly for cropping with some small agricultural/rural living lots to the east some of which service river tour businesses. The foreshore to the Murray River is predominantly bushland. .
	Adjoining uses are cropping to the north of Perricoota Road and the Murray River waterway elsewhere. Land within this area is a mix of prime arable land of an agricultural land class 1 or 2, the foreshore area which is class 4 and land between Goldsborough Road and the foreshore which is class 3 and 4
	A large central lot with an area of more than 110 hectares is surrounded by lots with an approximate average lot size of 10 hectares.
Landscape and ecology	Much of the foreshore land of this area is mapped as terrestrial biodiversity which comprises Murray-Edward-Wakool floodplain forests and woodlands (including river red gum), the potential EEC of grey box woodland and planted natives. .
	Vegetation occupies the land mapped as wetland and the immediate foreshore is identified as key fish habitat

Natural hazards	All mapped vegetation in Area 5 is classed as bushfire category 1 with category 2 patches located in the centre and north.
	Approximately one-third of this area is subject to a 1:100 ARI flood event and is therefore mapped as a flood planning area.
Heritage	An on-line search of AHIMS was carried out on 18 January 2017 based on centrally-located lots with a buffer of 1,000 metres to cover the whole of Area 5. No Aboriginal sites or places have been recorded with the area
	There are no known or mapped non-indigenous cultural heritage sites within this area.

Table 4.5 provides a summary of land and environmental attributes for each of the five areas.

Table 4.5: Summary table of study area attributes

Attribute	Area 1	Area 2	Area 3	Area 4	Area 5
Land zoning	RU1 Primary Production	RU1 Primary Production/IN1 General Industrial (urban release area)	RU1 Primary Production, SP3 Tourist	RU1 Primary Production/W2 Recreational Waterway, SP3 Tourist, E3 Environmental Management	RU1 Primary Production/W2 Recreational Waterway
Murray REP No 2	No	Yes	Yes	Yes	Yes
Land capability and agricultural class	Class 2 & 3 land capability, prime crop and pasture land	Class 2, 3 & Flood irrigation land capability, prime crop and pasture land	Class 2, 3 & Flood irrigation, land capability, prime crop and pasture land	Class 2, 3, 6 & Flood irrigation land capability, prime crop and pasture land, class 4 foreshore	Class 3, 6 & Flood irrigation land capability, prime crop and pasture land, class 3, 4 foreshore
Existing land uses	Crops, sand and gravel quarry	Crops, grapevines, industrial zone at the north-western corner	Crops, vines, vacant land	Crops, foreshore bushland, tourism development	Crops, foreshore bushland, rural living residences
Adjoining uses	Buffer to the Cobb Highway to the north, croplands and bushland elsewhere	Croplands to the north and west, industrial land and an STP to the north-west, vines, crops, urban development and golf course to the south	Vines to the north, vines and urban development to the east, cropland to the south, bushland and crops to the west	Vines and cropland to the north, Murray River elsewhere	Croplands to the north, ay River elsewhere
Contamination potential	Nil	Nil	Nil	Two sites	Nil
Mapped mineral resources	Yes, buffer	Nil	Nil	Nil	Nil

Attribute	Area 1	Area 2	Area 3	Area 4	Area 5
Vegetation	mixed box woodlands, grasslands with scattered trees on alluvial plains and planted natives	grey box woodland, mixed box woodlands, grasslands with scattered trees, land with greater than 5% native woody cover, planted natives	grey box woodland, grasslands, planted natives	Murray-Edward-Wakool floodplain forests and woodlands, mixed box woodlands, land with greater than 5% native woody cover, mixed woodlands, planted natives	Murray-Edward-Wakool floodplain forests and woodlands, grey box woodland, planted natives
Likely EECs	mixed box woodlands, grasslands with scattered trees on alluvial plains	grey box woodland, mixed box woodlands, grasslands with scattered trees, land with greater than 5% native woody cover,	grey box woodland	mixed box woodlands, land with greater than 5% native woody cover	grey box woodland
Mapped wetlands	Nil	Nil	Nil	Yes, river foreshore	Yes, river foreshore
Key fish habitat	Nil	Nil	Nil	Yes, immediate foreshore of Murray River & wetlands	Yes, immediate foreshore of Murray River
Bushfire prone	Minor Category 2	Minor Category 1 & 2	Minor Category 2	Significant Category 1, minor Category 2	Significant Category 1, minor Category 2
Flood prone	Yes, partial	No	No	Yes, approximately two-thirds of area	Yes, approximately one-third of area
Mapped indigenous heritage	Nil	Nil	Nil	Yes, 3 Aboriginal middens and a scarred tree	Nil
Mapped non-indigenous heritage	Nil	Nil	Nil	Yes, I6 Mile Tree 311, I64 Boiling Down Works	Nil

5. ASSESSMENT OF SUITABILITY

5.1 Suitability criteria

An analysis of the suitability of the suitability of land within each investigation area has been carried out. This task has involved establishing a set of land use criteria by which the suitability of potential rural residential land may be assessed. The criteria have been developed to take into account the available environmental and servicing information for Murray River LGA.

Ideally, to be suitable for rural lifestyle development a property must be:

- Unconstrained - already mostly cleared of native vegetation, free from bushfire and/or flooding hazard, not occupied by known cultural heritage and not identified as potentially contaminated land,
- Located so as to be visually acceptable and to not adversely impact on rural landscapes (described as low, medium or high),
- In close proximity to a centre so that access to commercial and institutional services is optimized and distances to be travelled to these services are minimized,
- Of low potential for land use conflict with neighbouring urban development or rural uses (described as low, medium or high),
- Of low land capability in terms of primary production potential due to low arability and/or size of parcels,
- Located where it forms a contiguous cluster with existing rural lifestyle lots, or is infill development of an area that has been partially subdivided in order to minimise the potential for land use conflict with adjoining primary industry uses, and
- Able to be efficiently serviced with reticulated filtered water, sewerage disposal and access roads.

The conclusion as to whether an area of land is suitable or not for rural residential development is made 'on balance'. That is, if the majority of the criteria are satisfied and there are no absolute limiting constraints such as flooding or ability to provide services, then the land may be considered suitable. It may be that parts of each area under consideration are suitable for rural residential subdivision. In this case it is a matter of determining the 'most suitable' area and proceeding to rezone that land based on achieving an estimated lot yield.

Each area is a mix of land capability classes but all contain land that is suitable for regular or occasional cultivation. Most land within the study area is also classified as prime crop and pasture land based on agricultural land classification. Each area is therefore considered to be of value for agricultural activities and is currently being used for the cultivation of crops or vines or both.

The main issue to be considered is therefore the potential for land use conflict between these existing uses and any future rural residential development. It is important to avoid a situation where ongoing agricultural activities are threatened by complaints made by occupants of small lots about spray drift, odours and noise emissions associated with these agricultural activities.

Details of existing filtered water and sewer mains and infrastructure have been supplied by Council's engineering division. The potential staged expansion of these services to supply reticulated water and sewer to land within the study area has also been provided.

Average daily traffic movements and the proportions of heavy vehicle usage have been obtained for major roads within the study area.

An Assessment of the Traffic Impacts of Future Development at Perricoota Road, Moama prepared by Earth Tech Engineering Pty Ltd in January 2007 provides details of road infrastructure, capacities and recommended improvements for roads in and around the study area.

5.2 Assessment of potential rural residential areas

5.2.1 Area 1

Land to the east of the Cobb Highway is constrained by flooding with the eastern half of this area subject to inundation in a 1 in 100 year ARI flood event.

Area 1 is close to Moama at its closest point on the Cobb Highway, however, the area is linear and runs parallel to the highway extending out to nearly 11 kilometres from the town centre. This area does not effectively connect to the existing urban area and would not extend existing urban development.

Visual impacts of any rural residential development on this land are considered relatively low due to the presence of vegetation within the buffer to the highway. There is the potential for conflict between residential development and the extractive industry due to dust, noise emissions and heavy vehicles accessing the quarry site.

The lower section of Area 1 south of Hillside Road can be readily serviced by way of extensions to water and sewer mains. However, an extension of filtered water infrastructure along the Cobb Highway to the north of Hillside Road in Area 1 would be in the form of a spur from existing water mains rather than a ring main. This would negatively impact on the service provided to the rest of the network.

On balance and primarily due to being flood prone, this area is not considered suitable for rural residential development. Rezoning this land would be inconsistent with Local Planning Direction *4.3 Flood Prone Land* and the principles of *Murray Regional REP No. 2 – Riverine Land* in that suitable land is available elsewhere.

5.2.2 Area 2

Land to the east of Twenty Four Lane and fronting the Cobb Highway comprises twelve 40 hectare lots. Some of this land is under cultivation and the north-western allotment is zoned IN1 General Industrial. The north-western lot is adjacent occupied industrial land and a sewer treatment plant. As direct access to the Cobb Highway, a classified road, would not be supported by Roads and Maritime Services for road safety and traffic efficiency reasons, internal roads would need to be created that would result in rear yards and fences to the highway. This would detract from the surrounding rural landscape and have adverse visual impacts to motorists. There is potential for land use conflict between existing and future industrial uses including the sewer treatment plant and neighbouring rural residential uses due to dust, odours, noise, truck movements and the like.

Most allotments in the section bounded by Hillside Road, Gulval Road, Tataila Road and Twenty Four Lane and bisected by Tandarra Road are 8 hectares in size. This land area is unaffected by significant vegetation or EECs although some small patches of terrestrial biodiversity are mapped along Twenty Four Lane along with some category 2 bushfire hazard.

Land west of Gulval Road comprises a range of irregularly-shaped lot sizes and is generally under cultivation for viticulture. Although demand may be receding at the present time for wines, it would be prudent to exercise the precautionary principle and protect this agricultural land to satisfy future increases in demand. International demand for Australian produce should increase as free trade agreements take effect and there is rising local demand for organic produce including wines. Opportunities for the agricultural industry should not be constrained by other types

of development that would sterilise land from primary production. This view is supported by the Riverina Murray Regional Plan *Direction 1: Protect the region's diverse and productive agricultural lands* and *Direction 2: Promote and grow the agribusiness sector*.

Despite being relatively unconstrained Area 2 is not considered suitable for rezoning to permit rural residential development at the time of writing this strategy and should remain zoned for rural uses until such time as additional urban or rural residential land is required. The justification for this conclusion is that the area is some considerable distance from the centre of Moama and is primarily used for agricultural activities on land that is classed as prime arable land. There are other sites considered more suitable and able to provide an adequate supply of land for rural residential development (see *5.2.3 Area 3*).

However as Moama grows and land supply shrinks, Area 2 should be further investigated to provide for rural living or as an extension of the urban residential zone. This land is flood-free and is able to be readily provided with reticulated water and sewer services as discussed in section *5.4 Service provision*.

Urban release areas are identified to the north-west of the township of Moama and land north of Tataila Road would form a logical extension to existing residential and rural residential development located between industrial estates. There is scope for the future subdivision of 8 hectare and 40 hectare lots to a smaller size to cater for future expansion and there is also the potential to allocate dwelling entitlements to either existing lots or at a set minimum lot size to cater to demand. The gradual or staged development of this land may necessitate buffers to agricultural and industrial uses on adjoining land to be applied through an amendment to the *Murray DCP 2011* in order to avoid land use conflict due to spraydrift, odours and machinery noise. Screening of rear yards by vegetation may also be required between setbacks to lots and the Cobb Highway.

5.2.3 Area 3

Due to being relatively unconstrained, Area 3 is considered suitable for rural residential development. It is relatively close to urban services provided within Moama and adjoins an existing urban area, providing a logical extension to that development.

As this area is partially developed and urban residential development is already visible from Perricoota Road, the visual impacts of additional development on rural landscape qualities when viewed from Perricoota Road or Thyra Road would be acceptable.

Area 3 has access from Perricoota Road to the south, Tataila Road to the north, Thyra Road to the west, Twenty Four Lane to the east and adjoins existing urban residential development.

The total area of land is approximately 375 hectares. This comprises 320 hectares spread over 21 lots to the west and south of the urban area and 55 hectares across two lots between the golf course and existing urban area. Land described as Strata Plan 68224 which is zoned SP3 Tourist and occupied by a tourist facility located near the intersection of Perricoota Road and Twenty Four Lane has been excluded from calculations.

Part of the area adjoining the golf course and a small area adjoining and west of existing urban development is mapped as Terrestrial Biodiversity in *Murray LEP 2011*. Data supplied by OEH indicates that it is vegetated with grasslands and a potential endangered ecological community grey box woodlands. Approximately 110 hectares is mapped as a potential EEC which represents 11% of the total area occupied by grey box woodland within 5 kilometres of the study area. It was noted during site inspections carried out during preparation of this strategy that the land located along Tataila Road between large lot residential development and the golf course despite being mapped as possessing terrestrial biodiversity is significantly degraded and is being used for agriculture. Remnant grey box gums survive, however, the understorey

has been removed over many years of grazing and cropping activities. The extent and integrity of this grey box vegetation community would need to be ground-truthed to confirm whether it qualifies as an EEC. If so, future subdivision of this land would be subject to development applications that would necessarily have regard to environmental sensitivity and the biodiversity provisions of *Murray LEP 2011*. It would be important to design subdivisions with a layout and sufficient lot size that retains remnant grey box gums.

Area 3 can be adequately serviced with filtered water and sewer. This is discussed in section *5.4 Service provision*. It will also be important to ensure that subdivision of the land between existing large lot residential and the golf course along Tataila Road incorporates water sensitive urban design principles to manage stormwater surface runoff towards existing development to the south and west.

5.2.4 Area 4

Area 4 south of Perricoota Road is heavily constrained by EECs, wetlands, heritage, bushfire hazard and, in particular, flooding that affects two-thirds of this land.

Despite being relatively close to Moama, this area does not present as an extension to existing urban development. Further residential development in this area would impact adversely on the scenic qualities that are dependent on glimpses of the river and the backdrop of riparian vegetation.

Rezoning this land would be inconsistent with Local Planning Direction *4.3 Flood Prone Land*. It would also conflict with the principles of *Murray Regional REP No. 2 – Riverine Land* given that suitable land is available elsewhere, and new settlement including rural residential development should be located on flood free land. Development would impact upon the landscape and high conservation value land through edge effects associated with exotic flora and pets encroaching from occupied properties.

The area is also affected by the existence of two listed non-indigenous heritage items and four recorded indigenous heritage items.

Although this area can be readily serviced by way of extensions to water and sewer mains, it is preferable that, rather than permitting rural residential subdivision of the land above the 1 in 100 year flood line, it be retained for primary production and that Perricoota Road continue to provide separation between peri-urban and rural development west of Moama.

5.2.5 Area 5

For the same reasons given for Area 4 although not constrained by the presence of known heritage items, this area is not considered suitable for rezoning for rural residential development. Being considerably remote from the town centre and existing urban development Area 5 is not close to services. Due to the location of this land and distance from existing treatment and storage facilities, servicing this area would require the construction of a secondary storage and treatment facility to the west of town. Further rural residential development in this area would impact adversely on the scenic qualities that are dependent on glimpses of the river and the backdrop of riparian vegetation.

Rezoning this land would be inconsistent with Local Planning Direction *4.3 Flood Prone Land*. It would also conflict with the principles of *Murray Regional REP No. 2 – Riverine Land* given that suitable land is available elsewhere, new settlement including rural residential development should be located on flood free land and subdivision could impact upon the landscape and high conservation value land through edge effects associated with exotic flora and pets encroaching from occupied properties.

Table 5.1: Summary table of criteria assessment

Criteria	Area 1 – east of Cobb Hwy	Area 2 - west of Cobb Hwy, north of Tataila Rd	Area 3 - west of Cobb Hwy, south of Tataila Rd	Area 4 - south of Perricoota Rd, east of Thyra Road	Area 5 - south of Perricoota Rd, west of Thyra Road
Constraints	EECs, flooding, bushfire (minor), contamination	EECs, bushfire (minor)	EECs, bushfire (minor)	EECs, heritage, flooding, bushfire, wetlands, key fish habitat	EECs, flooding, bushfire, wetlands, key fish habitat
Visual significance (low, medium or high)	Low due to vegetated highway buffer	Low due to infill between industrial areas	Low due to existing fragmented lots and existence of urban development	High due to likely need for clearing for bushfire APZs and existing rural landscape	High due to likely need for clearing for bushfire APZs and existing rural landscape
Proximity to a centre (road distance from town centre)	4.1km to 10.8km	4.5km to 10.7km	4.2km to 8.2km	4.9km to 7.3km	9.9km to 11.8km
Land use conflict potential	high for land close to sand and gravel quarry, low elsewhere	high for land close to industrial development and vines, low elsewhere	high for land close to vines, low elsewhere	medium for land close to bushland due to edge effects	medium for land close to bushland due to edge effects
Land capability	High	High	High	High	High
Extension of existing development	Nil	Yes, extension of urban development south of Tataila Road	Yes, extension of urban development south of Tataila Road	Nil	Nil
Access to water and	Extensions viable to lower	Extensions to water	Extensions to water and	Extensions to water	Construction of

Criteria	Area 1 – east of Cobb Hwy	Area 2 - west of Cobb Hwy, north of Tataila Rd	Area 3 - west of Cobb Hwy, south of Tataila Rd	Area 4 - south of Perricoota Rd, east of Thyra Road	Area 5 - south of Perricoota Rd, west of Thyra Road
sewer services	section. Spur extensions to northern section would impact adversely on existing system	and sewer mains viable	sewer mains viable	and sewer mains viable	secondary storage and treatment facility required
Suitability assessment	Nil	Further investigation	Yes	Nil	Nil

5.3 Forecast land supply

The potential yield of land assessed to be suitable for rural residential development in Area 3 is given in Table 5.2 below. Calculations are based on a mix of 2 and 5 hectare lots. Calculations are estimates only and subject to rounding.

An allowance of 10% is made for internal roads and service easements within Area 3 and this is deducted from the total area of land. A 100 metre wide buffer has also factored in and excluded from land area to minimise the potential for land use conflict that may arise due to spraydrift and odours from viticulture management on land to the north of Tataila Road.

In order to provide a range of lots, it is recommended that land close to the existing urban area be subdivided to a minimum lot size of 2 hectares and the remainder to an MLS of 5 hectares. Land subject to an MLS of 2 and 5 hectares are shown in Figures 4.1 and 4.2 respectively. The division between the 2 hectare and 5 hectare MLS is along existing cadastral boundaries and follows a formed/unformed road at the south-

eastern interface. These minimum lot sizes have been chosen to provide a point of difference and to appeal to a different segment of the market than rural living lots available to the south-east of Echuca.

An MLS of 1 hectare has not been considered as neighbouring R5 zoned estates such as Rich River Lakes Estate and Kilkerrin Lakes Estate are subject to 4,000 square metre and 8,000 square metre lot sizes, thereby catering to demand for this large residential lot size. It is recommended that zone RU4 Primary Production Small Lots be applied to the proposed rural residential areas to establish a point of difference to existing large residential lots and to clarify that lots of 2 hectares and 5 hectares in area are lifestyle lots for hobby farming and small scale agricultural activities.

The total yield for Area 3 is 120 lots. Borrowing the forecast demand estimates prepared by Campaspe Shire Council for the Echuca South East rural living precinct, this yield would cater for 20 years at 6 lots take-up per annum or 12 years at the alternative higher demand scenario of 10 lots p.a. Table 5.2 gives yield calculations.

It is recommended that Council monitor the availability of rural residential land going forward using the attached land monitor template. Should demand exceed expectations then additional land may need to be rezoned as part of the 5-yearly review of *Murray LEP 2011* that is required under the *Environmental Planning and Assessment Act 1979*.



Figure 5.1: 2 hectare minimum lot size

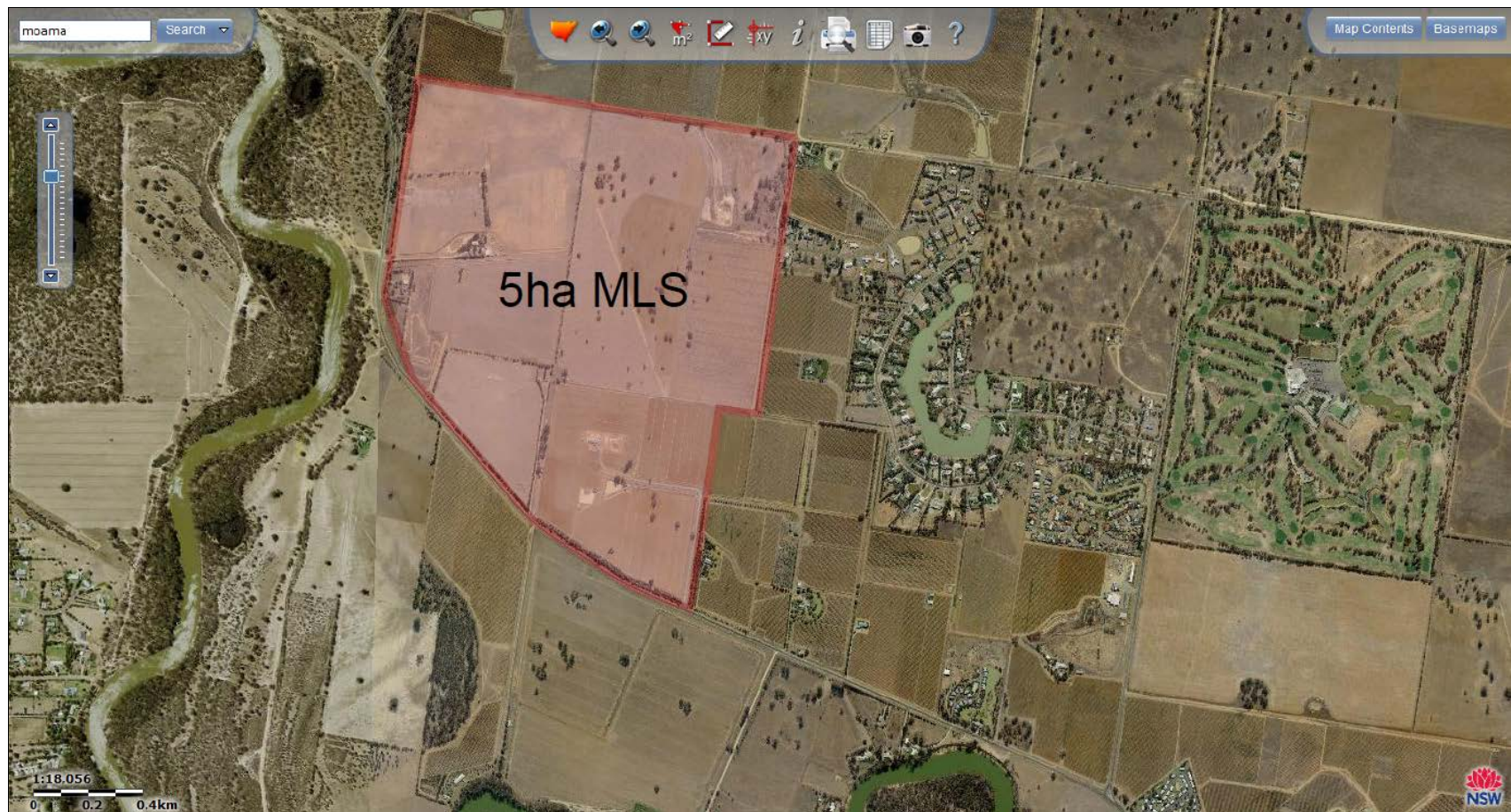


Figure 5.2: 5 hectare minimum lot size

Table 5.2: Yield calculations

Location of land	Property descriptions	Land area	minus10% for services	Yield at 2ha MLS	Yield at 5ha MLS
Area 3 - south of Tataila Road adjoining the golf course and residential development as shown in Figure 5.1	Lot 24 DP 668368; Lot 2 DP 1213446	55ha	50ha	25 lots	-
Area 3 - adjoining urban area and Perricoota Road as shown in Figure 5.1	Lot 1 DP 856889; Lots 1, 2, 3, 4 DP 1129736; Lots 1 DP 862181; Lots 1 – 4 DP 854487; Lot 2 DP 819593	138ha	124ha	62 lots	-
Area 3 - adjoining Thyra Road and and Perricoota Road as shown in Figure 5.2	Lot 7 DP 598879; Lots 1 & 2 DP 1069295; Lot 5 DP 1129736; Lot 1 DP 1086557; Lots 1, 3, 4 DP 1108133; Lots 1 & 2 DP 1113007	182ha	164ha	-	33 lots
Total yield				87 lots	33 lots

5.4 Service provision

Land bounded by Tatalia Road north to Hillside Road and from the Cobb Highway west to Thyra Road including land adjoining Perricoota Road is able to be serviced by way of augmentation of existing filtered water infrastructure and sewer rising mains. The design of all water, sewer, stormwater and access infrastructure, including landscaping, should be in accordance with Murray Shire Council *Engineering Guidelines for Subdivisions and Development Standards*, dated September 2012.

5.4.1 Filtered water

Council provides a dual reticulated water system to the urban areas of Moama comprising raw and treated (filtered) water. The water treatment plant was upgraded in 2001 and designed to treat 6 megalitres per day to cater for 20,000 equivalent persons. An average of 1.5 megalitres was treated per day at the time of the preparation of the *Murray Shire Strategic Land Use Plan 2010-2030* which catered for 5,000 EP and 3 megalitres per day for 10,000 EP during peak holiday times. There is sufficient spare capacity in the filtered water system to cater for the proposed 120 rural residential lots which would provide accommodation for an additional 276 equivalent persons based on the 2016 Census occupancy rate of 2.3 persons per dwelling.

There is existing filtered water infrastructure already in place along the Cobb Highway, Hillside Road, Tatalia Road, Twenty Four Lane and Perricoota Road. The network is able to be expanded via the installation of extensions to create a system of ring mains which would improve the pressure of the existing system.

Extensions would need to comprise installation of an additional 1km section of 100mm main along Twenty Four Lane, between the

existing main mid-block on Twenty Four Lane to Hillside road to create a ring main. In the future and subject to further investigation of the suitability of Area 2, an additional 4 kilometres of 150mm filtered main pipes may be installed between Hillside Road and Tataila Road, along Hillside Road and Gulval Roads. Once this has been installed an additional 2.5 kilometre section along Tandara Road could also be installed.

A 7 kilometre extension to the ring main along Hillside Road, Thyra Road and Perricoota Road (purple dashed line) could be installed from the end of the main at the Hillside Rd/Gulval Rd intersection to the Perricoota Road, Twenty Four Lane intersection. To allow this extension, the existing 100mm main which runs for 1 kilometre west from Twenty Four Lane along Perricoota Road would need to be upgraded to a 200mm main.

5.4.2 Sewerage

Moama's sewerage treatment plant is located to the north of Hillside Road, just off the Cobb Highway. It is a gravity fed system designed for 11,000 equivalent persons. At the time of preparation of the *Murray Shire Strategic Land Use Plan 2010-2030*, the system was serving about 5,000 EP and 9,000 EP during peak holiday periods.

The population of Moama in 2016 was 5,849 persons and the projected average annual growth for the next twenty years for Murray River LGA as a whole is less than 1% per annum. There is sufficient spare capacity in the sewerage system to cater for the proposed 120 rural residential lots which would provide accommodation for an additional 276 equivalent persons based on the 2016 Census occupancy rate of 2.3 persons per dwelling.

Sewerage may be provided to the recommended rural residential areas via a rising main system running along the same alignment as water main extensions. The sewer services would be comprised of Council rising mains which are fed by private low pressure pump stations and piped connections to be located on each property. Council would view this as beneficial as it would remove the need for onsite disposal of effluent from all rural residential properties and centralise the treatment and disposal of waste at the existing sewer treatment works on Hillside road.

5.4.3 Stormwater

Stormwater generally drains to the west of Moama with a number of natural and man-made features affecting flows and the capacity of the land to retain stormwater. There is a need to provide retention of runoff prior to discharge to the Murray River during extreme rainfall events. Arrangements for stormwater management to cater for runoff from roads and other hard surfaces can be carried out during subdivision design within the proposed rural residential areas.

5.4.4 Access

Intersections with major roads that would be affected by rural residential development are shown in Figure 5.3 below. Reference is made in this section to the reports *Assessment of the Traffic Impacts of Future Development at Perricoota Road, Moama* prepared by Earth Tech Engineering Pty Ltd dated January 2007 and the *Review of Perricoota Road Study* by TTM Consulting (Vic) Pty Ltd dated 12 September 2012.

The arterial routes serving the western part of Moama are the Cobb Highway and Perricoota Road and each plays a significantly different role. The Cobb Highway is the major regional route connecting Moama to Echuca and north to Deniliquin and beyond. It carries the majority of heavy vehicle freight as well as catering to private motorists. It also provides local access to the northern parts of Moama, including industrial

precincts, and surrounding rural areas. Perricoota Road is an important local distributor that performs a lower order regional function. It provides a link between Moama to settlements and recreational destinations to the west for regional transport and motoring tourists.

It is expected that most of the traffic generated by new rural residential allotments would use Perricoota Road to gain access to the town centre of Moama via the intersections of Thyra Road and Twenty Four Lane, due to low usage by heavy vehicles on the local roads that access these intersections. Heavy vehicles represented only 8.8% of average daily traffic movements on Twenty Four Lane north of Perricoota Road during traffic counts in February 2016, and 17.8% of movements on Thyra Road north of Perricoota Road in September 2014. The intersections of Thyra Road and Twenty Four Lane with Perricoota Road are considered primary intersections and are shown circled yellow in Figure 5.3. New subdivisions should be designed such that there are no or minimal additional access points to Perricoota Road.

Based on estimated traffic generation volumes used in the Earth Tech and TTM Consulting reports, the proposed rural residential areas will generate traffic with local origins and destinations such as shops and facilities north of Perricoota Road at the rate of 9 vehicle movements per day per allotment, i.e. a total of 1,080 vehicle movements upon the completed subdivision and occupation of all lots. Vehicle trips reaching the external road network have been estimated to be 6 movements per day for the new urban residential areas north-west of Moama. Using this estimate, an additional 720 vehicle movements may be generated after subdivision and occupation of all 120 rural residential lots.

When developed to capacity it is assumed that traffic would be evenly split between the Thyra Road/Perricoota Road and Twenty Four Lane/Perricoota Road intersections for vehicles accessing the external road network of Perricoota Road and beyond towards Moama. This would add about 360 traffic movements to each intersection, increasing usage by 50% to 714 movements on Thyra Road and by 12% to 3,049 average daily traffic movements on Twenty Four Lane (based on traffic information supplied by Council for traffic counts undertaken in February 2015 and February 2016 respectively). These roads are classified as collector roads with a maximum capacity of 3,000 vehicle movements per day. Each has the capacity to cater for the increase generated by rural residential development, however, Council may wish to monitor the

performance of the intersection of Twenty Four Lane/Perricoota Road and the amenity of Twenty Four Lane for adverse impacts due to the expected increase in traffic movements which may be slightly above capacity upon full development of rural residential lots.

The Twenty Four Lane/Perricoota Lane intersection is a standard 'T' intersection with priority to Perricoota Road with auxiliary lanes for turning movements. The analysis carried out for the Earth Tech report found that this intersection would continue to operate efficiently up to 2016 with the expected traffic increases of 6% per annum due to known proposed developments at the time the report was prepared. However, it was recommended that if development is expected to continue to grow beyond 2016 then upgrading of the intersection with installation of a roundabout should occur. However, TTM Consulting consider a roundabout unnecessary even under full development of the new urban areas of the north-west. This is because westbound traffic turning into Twenty Four Lane will do through very low eastbound traffic and southbound traffic will be largely turning left. The intersection already has turning lanes including an acceleration lane for left turns out of Twenty Four Lane.

No analysis of the Thyra Road/Perricoota Road intersection was carried out for the report. It is expected that with a significant increase in the volume of traffic movements utilising this intersection due to new rural residential development, upgrading of that intersection with at least auxiliary turning lanes may be required.

Some motorists may seek to access Moama by entering the Cobb Highway at either the Tataila Road or Beer Road intersections. These are considered secondary points of access and are shown circled in blue in Figure 5.3. It is not expected that upgrades to these intersections would be required due to expected low volumes of traffic movements in and out of the rural residential areas that would make a right turn onto the highway to access services in Moama town centre.

It was recommended By Earth Tech and supported by TTM Consulting that traffic signals be installed at the Perricoota Road/Cobb Highway intersection to cater for existing traffic. This intersection is yet to be signalised. Earth Tech estimated that due to the high level of service that

signalisation will provide to all users it would be adequate beyond 2016. It is therefore concluded that no upgrading of this intersection is required in addition to the recommended signalisation.

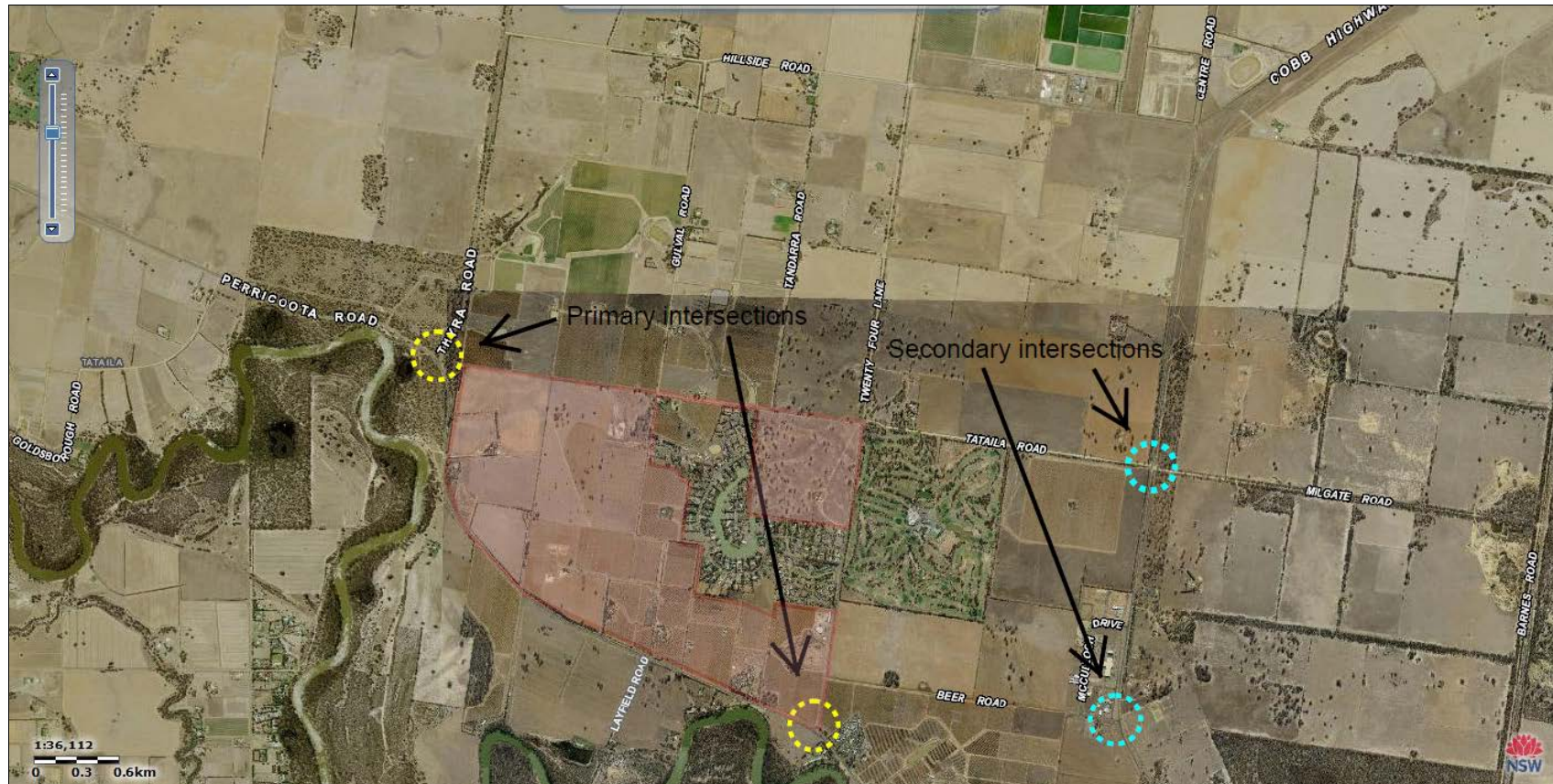


Figure 5.3: Affected intersections with major roads

An extension of Tataila Road to connect to Thyra Road would benefit the future subdivision of land at the northern end of Area 3 and facilitate sequential planned subdivision. Land to become a future extension to the road reserve could be dedicated as a condition of consent upon approval to subdivide. Council may wish to acquire land for a road reserve in advance of subdivision to ensure the linkage is made. Costs could then be recouped by way of developer contributions.

An extension of Tataila Road should be shown in concept masterplans prepared for Area 3 and the source of funds identified, e.g. development contributions or dedication. This would ensure that a logical pattern of subdivision is developed and that access roads are optimised.

5.4.5 Land release staging

In order to provide services efficiently and to prevent leap-frogging, rural residential land should be released over two stages. The first stage would comprise the land subject to a minimum lot size of 2 hectares that fronts Perricoota Road and Twenty Four Lane and that adjoins the existing R5 zone. The first stage should also allow for limited development of land subject to a minimum lot size of 5 hectares that immediately adjoins this land. The second stage should comprise the remaining land with a 5 hectare lot size that fronts Perricoota Road, Thyra Road and Tataila Road.

Table 5.3 provides a breakdown of lots that would be created in each of two stages. These estimates are derived from the lot yield calculations given in Table 5.2 and allow for a deduction of 10% of total land area for the provision of services and are based on recommended minimum lot sizes. The recommended staging is shown in Figure 5.5 below.

Table 5.3: Estimated lot yield per stage

Recommended stage	Yield at 2ha MLS	Yield at 5ha MLS	Yield per stage
Stage 1	87 lots	11 lots	98 lots
Stage 2	-	22 lots	22 lots
Total yield	87	33	120 lots

The timeframe to commence Stage 1 is estimated to be 2 to 3 years given that the recommendations of this strategy are to be implemented by way of an amendment to *Murray LEP 2011* and the fact that *Murray LEP 2011* is to be reviewed and consolidated with *Wakool LEP 2013* before any rezoning takes effect. Therefore, any planning for subdivisions associated with Stage 1 is not likely to commence before mid-2020. At the assumed take up rate of 6 lots per annum Stage 1 should carry forward for approximately a decade and a half, i.e. provide supply up to around 2035. Stage 2 could then commence and provide supply up until 2040. Ongoing monitoring of supply and demand by Council will indicate whether adjustments to land areas and subsequent lot yields are necessary.

In response to submissions made during the exhibition period and at the community workshop, it is recommended that Council consider including the standard instrument LEP clause for lot averaging into the forthcoming review of *Murray LEP 2011* and *Wakool LEP 2013*. The lot averaging process can improve environmental outcomes by enabling subdivision layouts that create lots smaller than the minimum lot size and the conservation of sensitive land within a residue lot. It is considered that the provisions should only apply where there is a defined environmental benefit such as the subdivision of the land located west of the golf course and south of Tataila Road (Lot 2 DP 1213446 and Lot 24 DP 668368). This may be achieved by inserting a provision in *Schedule 1 Additional permitted uses* of the LEP to apply to these lots only. A minimum lot size may also be prescribed to prevent subdivision to a small lot size that is effectively urban and to prevent clusters of urban development from occurring within rural landscapes.

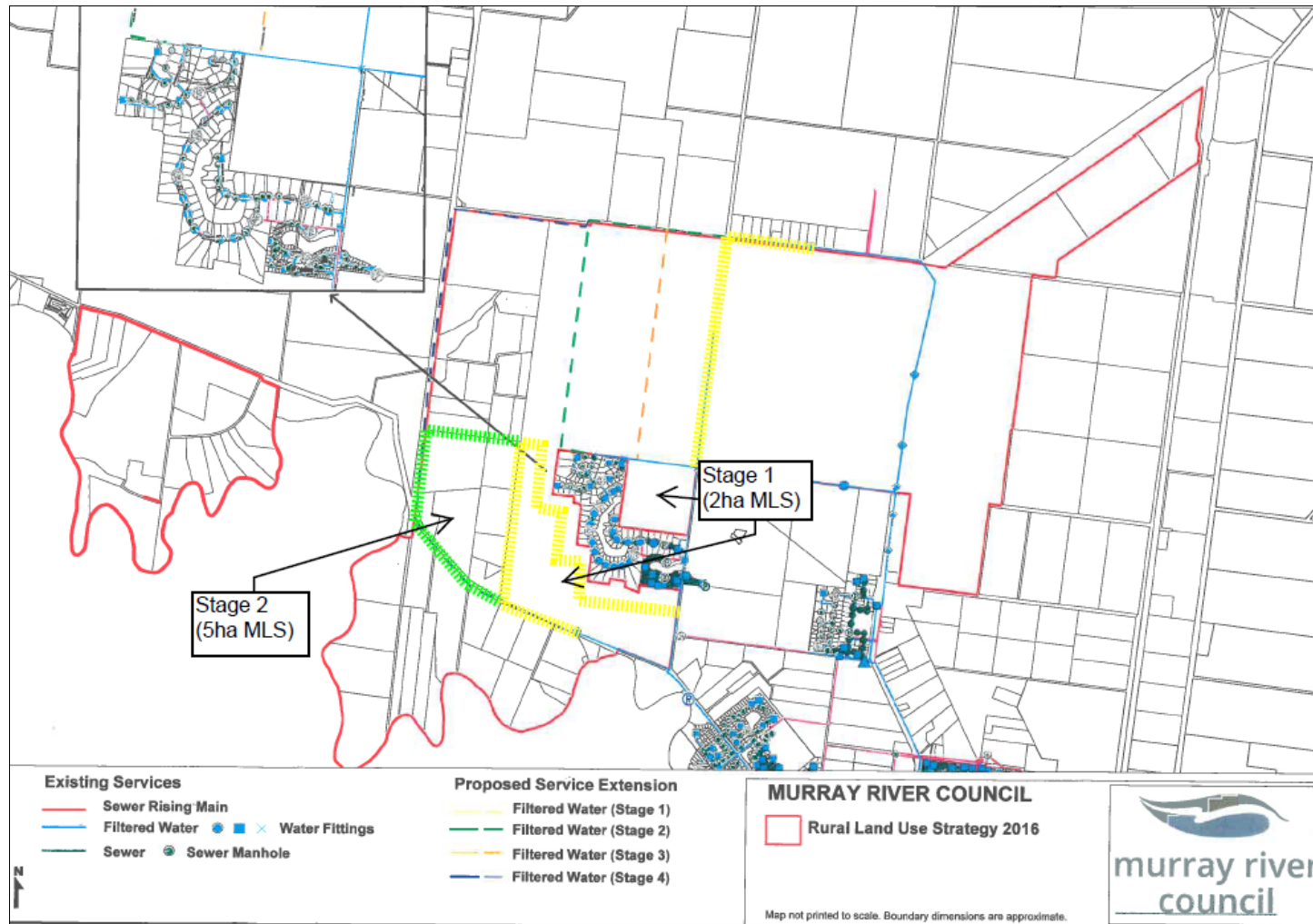


Figure 5.4: Land release staging plan and layout of water and sewer services

6. CONCLUSION AND RECOMMENDATIONS

6.1 Summary of findings

Although population growth is expected to be low –less than 1% per annum across Murray River LGA for the next two decades, it is recognised that there is demand for land to be made available for rural living in the Moama district. It is necessary to provide a range of housing choice and at the same time protect primary production, in particular existing viticulture operations in the vicinity of Moama and opportunities for extensive agriculture such as cropping. It is important to ensure that Australia can respond to rising demand from offshore markets and that productive rural land is not taken out of the food producing system. The recommendations made in this strategy are therefore ‘on balance’ and should be subject to review following implementation through amendments to *Murray LEP 2011* and ongoing five-yearly reviews of that planning scheme.

Area 3, bounded by Tataila Road, Thyra Road, Perricoota Road and Twenty Four Lane, has been assessed to be suitable for rural residential development. This area is relatively unconstrained by environmental attributes and natural hazards and can be readily provided with reticulated water and sewer services by way of augmentation of existing mains lines. It is recommended that this area be rezoned from RU1 Primary Production to RU4 Primary Production Small Lots.

A range of lot sizes are recommended – 2 and 5 hectares – to cater for differing demand preferences and reflecting proximity to the town centre of Moama. Smaller lots of 2 hectares would suit those seeking large residential lots for rural lifestyle reasons with land areas greater than has been made available in the district to date. Lots of 5 hectares would suit hobby farmers and may continue to be used for small scale

agricultural activities including viticulture. The increase in lot size moving away from the urban area of Moama provides a transition from urban to rural farmland.

These recommended rural residential zones are estimated to yield a total of 120 lots (87 two hectare lots and 33 five hectare lots). It is estimated that the supply of land to be made available for rural living as recommended in this strategy is 20 years at the current rate of take-up of 6 lots per annum in the Echuca South East Rural Living Precinct in neighbouring Campaspe Shire, or 12 years at an optimistic annual demand of 10 lots. Given that this estimated yield is less than the supply in the Echuca South East Rural Living Precinct in Campaspe and would more than double supply in the Moama-Echuca district, it is more likely that the lower rate of take-up will occur in the near to medium term. The actual rate of take-up is subject to many variables including that the increase in supply of land for rural residential development that would result from implementation of this strategy may affect demand across both Echuca and Moama. Other variables are property values in Melbourne and regional NSW and Victoria, and the availability of land elsewhere that matches demand preferences including lot sizes, proximity to services and ability to carry out small scale agricultural pursuits.

The statutory assessment (Attachment A) concludes that the recommendations are consistent with the provisions of legislation, environmental planning instruments and policy. Rural residential development will consume prime crop and pasture land, however and on balance, offering housing choice and catering to pent-up demand would benefit the local community and economy.

Certain amendments to the land zoning map and lot size map of *Murray LEP 2011* are recommended to implement the findings of this strategy. These are explained below. A land use table for zone RU4 Primary Production Small Lots needs to be prepared. This is essentially a lifestyle farming or other primary industry zone and intensive plant agriculture, extensive agriculture and farm buildings are mandatory permitted uses in this zone. Permitted and prohibited uses should reflect the mandatory objectives of this zone which are to:

- *to enable sustainable primary industry and other compatible land uses*
- *to encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature*
- *to minimise conflict between land uses within this zone and land uses within adjoining zones*

Preparation of a concept masterplan and amendments to *Murray DCP 2012* are also recommended such as to ensure that new development is energy and water efficient, to implement buffers between rural residential and agricultural uses to prevent land use conflict and ensure that cropping and viticulture on neighbouring and surrounding land can continue, and to guide subdivision design.

The release of land for development should follow a logical sequence whereby land that is subdivided and developed is initially in close proximity to existing development. Adjacent land can then be released. This allows for orderly and economic development through the efficient delivery of infrastructure and services, satisfying the objects of the *Environmental Planning and Assessment Act 1979*. A land release strategy also prevents the leap-frogging phenomenon whereby land that is distant from the geographical extent of services is developed first causing the provision of service mains that are not utilised by intervening land. This can significantly increase the value of land as unnecessary infrastructure costs are passed on to purchasers of that land. In the case of the land that has been found suitable for rural residential development, reticulated water and sewer services can be readily provided, as can power and telecommunications. However, a staged release of land is recommended to ensure the cost effective augmentation of these services. The staging of the release of rural residential land should follow the sequential provision of water and sewer mains lines.

A land monitor template formatted in an Excel spreadsheet has been prepared to enable Council to record vacant unsubdivided and subdivided rural residential land, dwelling capacity and the overall availability of RU4 zoned land. This is provided as Attachment C. Use of the spreadsheet would enable Council to accurately record take-up of land for rural residential development and to detect any preferences for land based on

location, amenity, access and the like. Noting the issue of subdivision certificates and construction certificates in the database is important as an indicator of approvals that translate into actual development. The data recorded in the spreadsheet can then be used as a measure of demand for rural residential land during reviews of this strategy and/or *Murray LEP 2011*. The review of *Murray LEP 2011* that is legislatively required every 5 years is an opportunity for Council to determine whether any further land should be rezoned for rural residential development to satisfy recent and anticipated demand. The spreadsheet template may also be used for urban residential zones, including RU5 Large Lot Residential, in Murray River LGA.

6.2 Recommended actions

6.2.1 Action 1: Prepare a concept masterplan and development servicing plan

It is recommended that Council prepare a concept masterplan for the proposed new rural residential areas to guide subdivision design and the staged provision of infrastructure (see Action 4) including:

- internal road layout and pathways,
- upgrades to collector roads that feed local traffic into rural residential areas,
- stormwater management based on water sensitive urban design and on-site detention,
- lot orientation to ensure energy efficient dwellings,
- boundary setbacks and buffers to neighbouring agricultural land uses,
- ways to protect sensitive landscapes, biodiversity and significant vegetation,
- the process for identifying the presence of and preserving cultural heritage,

- means to minimise the threat of natural hazards, and
- facilitating the future subdivision of rural residential land into urban residential allotments to cater for the expansion of Moama.

The concept masterplan should be a policy document of Council to ensure that guidelines are applied in a flexible manner and are able to take account of local conditions and circumstances. The masterplan should ensure that connectivity within the rural residential area and to surrounding areas is optimised.

It is recommended that a development servicing plan be prepared to ensure that the recommended land release staging plan is applied, to facilitate the provision of reticulated water and sewer services, and to ensure that land owners co-operate to provide these services in advance of subdivision and development. The DSP should also contain specifications for and cost estimates of infrastructure. No dwellings should be constructed on any newly-created rural residential lots until such time as the staged provision of water and sewer services are available and dwellings are able to connect to these services.

6.2.2 Action 2: Amendments to Murray LEP 2011

Prepare a planning proposal to make the following amendments to *Murray LEP 2011*:

- a) Amend *Murray LEP 2011* land zoning maps to apply zone RU4 Primary Production Small Lots to land as shown in extracts from those maps in Figures 6.1, 6.2 and 6.3, and
- b) Prepare and insert a land use table for zone RU4 Primary Production Small Lots, and
- c) Amend Lot Size Map Sheets LSZ_006, LSZ_006A and LSZ_006B to apply minimum lot sizes of 2 hectares and 5 hectares to land to be zoned RU4 Primary Production Small Lots as shown in Figures 5.1 and 5.2 in *Chapter 5 Assessment of Suitability*.

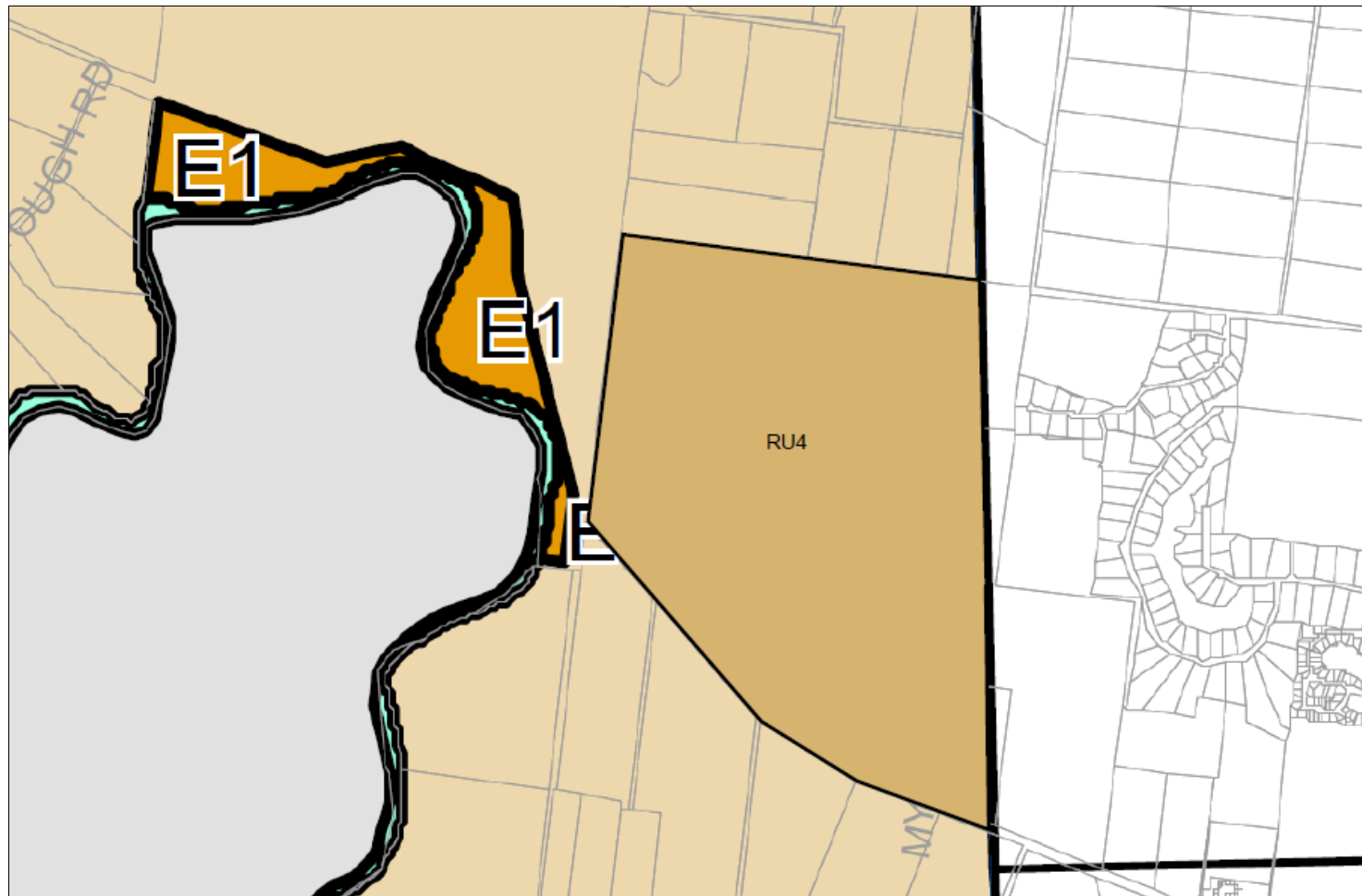


Figure 6.1: Amendments to Land Zoning Map Sheet LZN_006

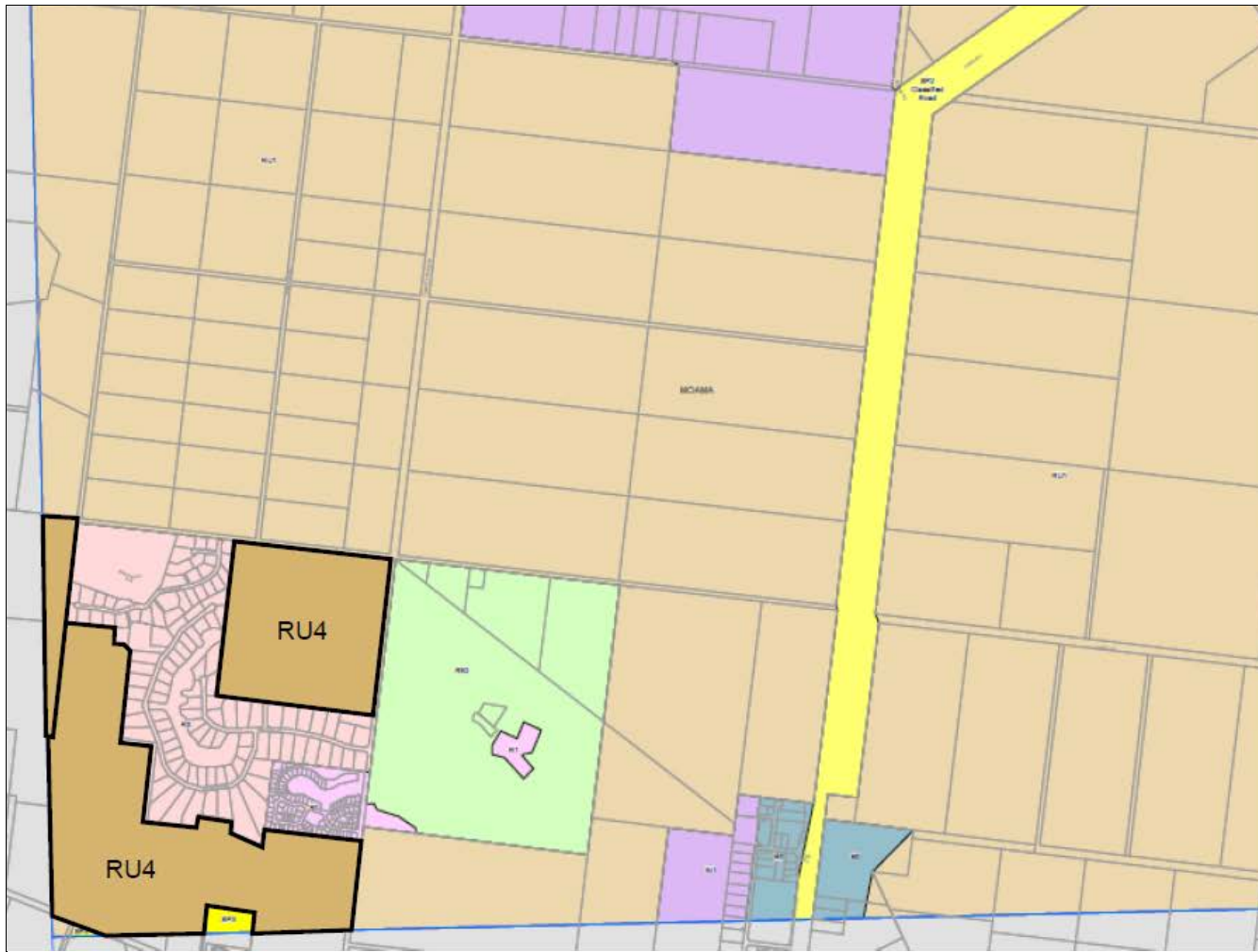


Figure 6.2: Amendments to Land Zoning Map Sheet LZN_006A

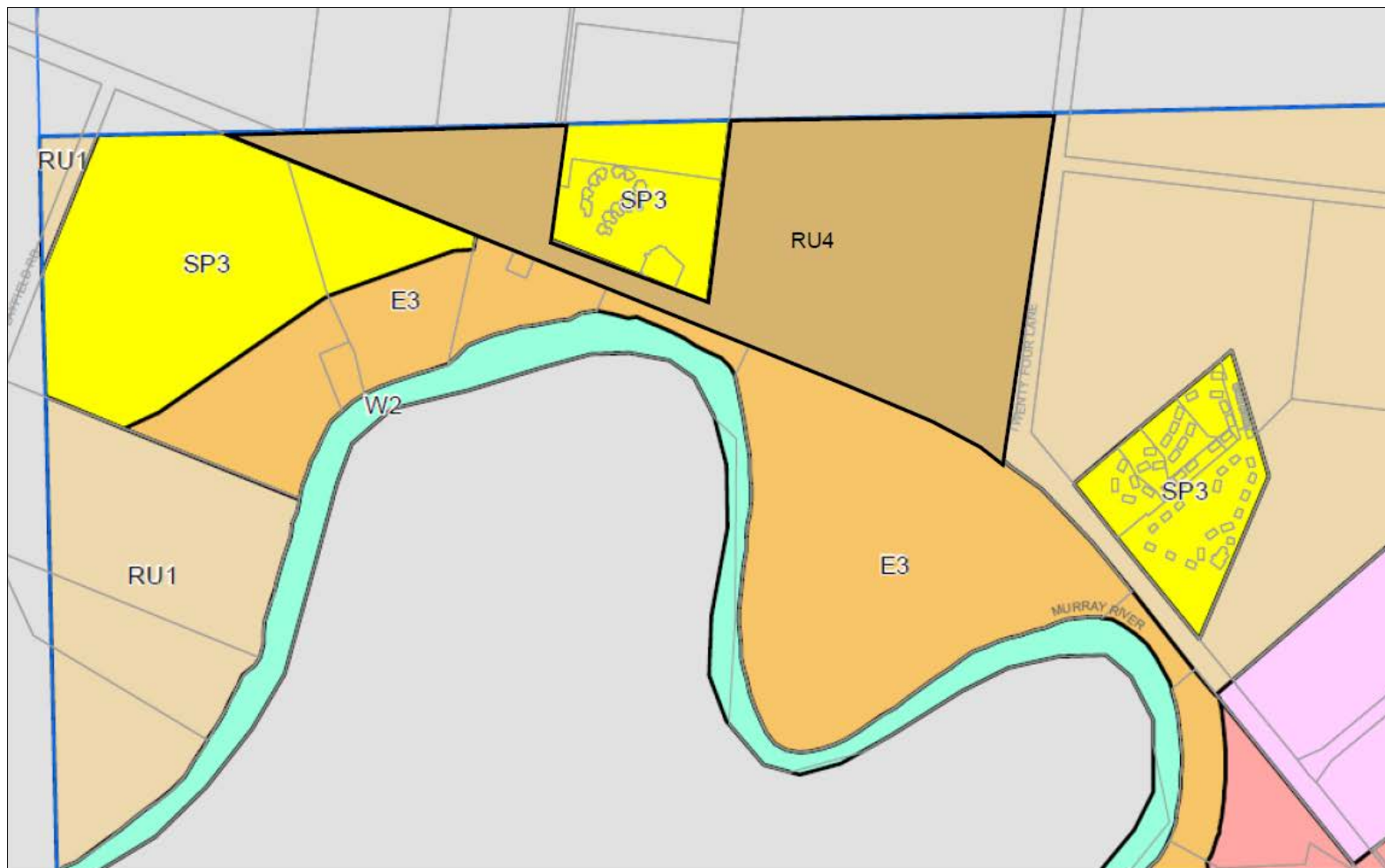


Figure 6.3: Amendments to Land Zoning Map Sheet LZN_006B

A planning proposal would need to be prepared in accordance with *A guide to preparing planning proposals* issued by the Department of Planning and Environment in August 2016 to effect these recommendations and amend *Murray LEP 2011*. The planning proposal would need to include:

- objectives and justification for amending the *Murray LEP 2011*,
- the process for the amendment,
- the relationship to Council's strategic planning framework, e.g. *Murray River Community Strategic Plan* and the *Moama and District Rural Residential Strategy*,
- relevant legislation and policy as detailed in *Chapter 2 Statutory and Planning Framework* and as assessed in *Attachment A - Statutory Assessment of the Moama and District Rural Residential Strategy*,
- likely environmental, social and economic impacts,
- state and commonwealth interests, and
- details of any preliminary consultations with relevant agencies.

The vegetation mapping prepared for this strategy is based on data supplied by the Office of Environment & Heritage and is broad-based. OEHL have recommended in their submission to this strategy that a detailed flora and fauna survey be prepared as part of the planning proposal. The survey would determine the extent and integrity of the potential EECs identified within the study area, the likelihood of threatened fauna species and the presence of hollow-bearing trees. In addition OEHL recommend that an assessment under the *Biodiversity Assessment Method* of the *Biodiversity Conservation Act 2016* and an assessment of potential impacts on Aboriginal heritage would be required to support the planning proposal.

It is noted that referral to the Commonwealth Minister for Energy and the Environment may subsequently be required under the *EPBC Act*. It is also noted that a review of the extent and impacts of flooding is being undertaken by Murray River and Campaspe Shire Councils. The effect of any revised flood planning area mapping will be taken into account in the planning proposal and/or future development proposals should new information become available and additional land be mapped as flood prone.

Following a Council resolution to proceed with the amendments the planning proposal would be forwarded to the Minister for Planning requesting a Gateway Determination. The Gateway Determination would specify exhibition procedures and further consultation to be carried out, including with state agencies, so that comment may be made on the intent of the planning proposal as well as the documentation prepared to support the amendment.

After exhibition of the amendments Council may adjust the planning proposal and forward it to the Department so that drafting of the legal instrument may be carried out by Parliamentary Counsel followed by notification in the NSW Government Gazette.

6.2.3 Action 3: Consider including lot averaging provisions in Murray LEP 2011

It is recommended that Council consider including the standard instrument LEP clause for lot averaging into the forthcoming review of *Murray LEP 2011* and *Wakool LEP 2013*. It is considered that the clause should only apply where there is a defined environmental benefit such as the subdivision of the land located west of the golf course and south of Tataila Road (Lot 2 DP 1213446 and Lot 24 DP 668368) and a minimum lot size be prescribed to prevent small urban lots being proposed. This may be achieved by inserting a provision in *Schedule 1 Additional permitted uses* of the LEP to apply to these lots only.

6.2.4 Action 4: Amend Murray Shire DCP 2012

It is recommended that *Murray DCP 2012* be amended to include the concept masterplan to guide indicative lot layouts and to insert objectives and controls to provide guidance for land owners when preparing subdivision plans. In particular, the DCP should include provisions requiring buffer setbacks to urban residential development and primary production activities taking place on adjoining land to prevent land use conflict. The amendments to *Murray DCP 2012* should take effect following gazettal of amendments to *Murray LEP 2011* to apply zone RU4 with minimum lots sizes.

Additional detail may also need to be inserted into Council's *Engineering Guidelines for Subdivisions and Development Standards* to specify standards for infrastructure and services to apply to rural residential subdivision.

6.2.5 Action 5: Implement land release strategy

It is recommended that the staged release of land occur as shown in Figure 6.4. The first stage should comprise the land zoned RU4 Primary Production Small Lots and subject to a minimum lot size of 2 hectares that fronts Perricoota Road and Twenty Four Lane and that adjoins the existing R5 zone. The first stage should also allow for limited development of land zoned RU4 Primary Production Small Lots and subject to a minimum lot size of 5 hectares that immediately adjoins this land. The second stage should comprise the remaining RU4 zoned land that fronts Perricoota Road, Thyra Road and Tataila Road. Staging should be included in the concept masterplan prepared in accordance with Action 1.

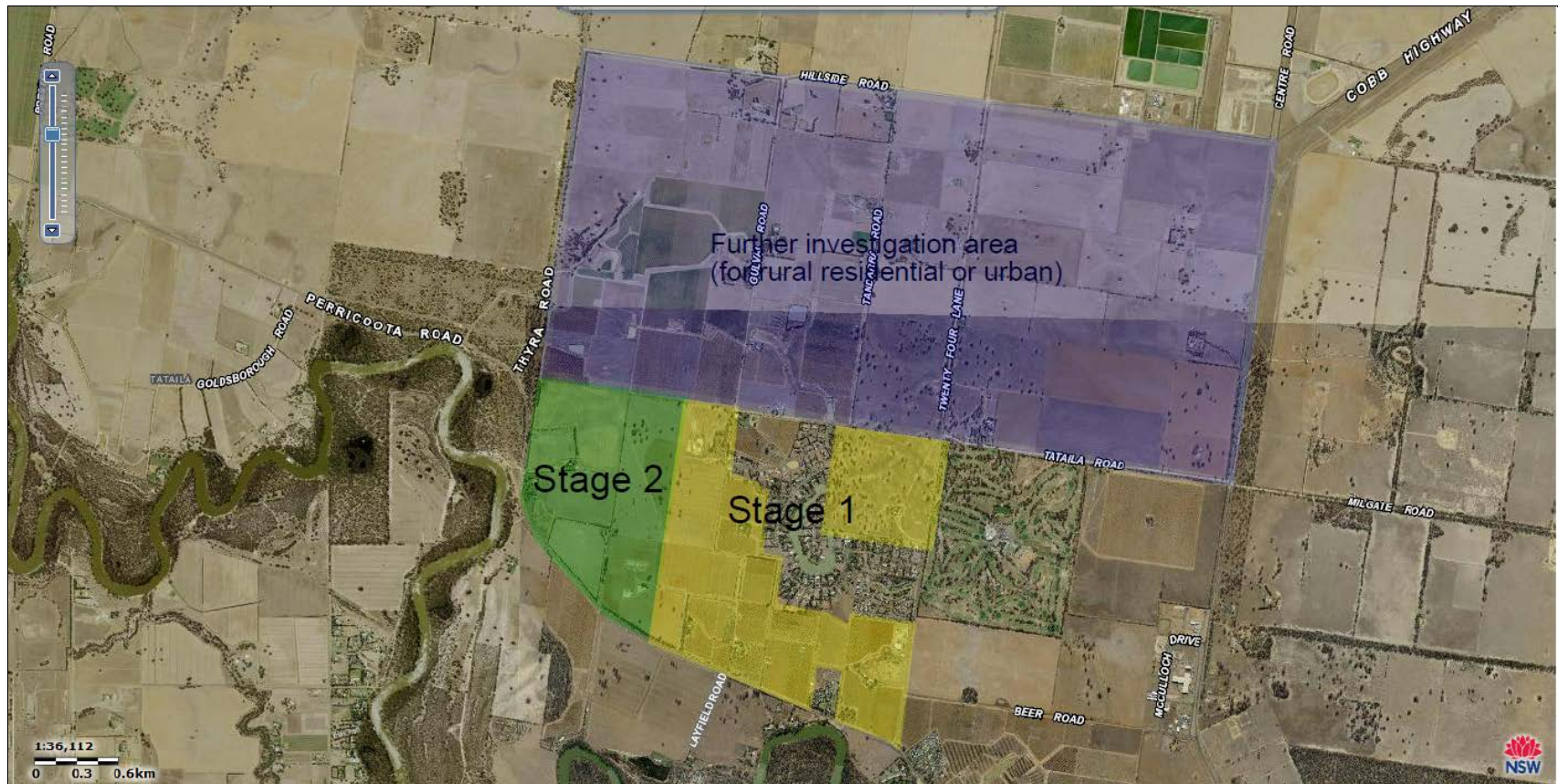


Figure 6.4: Land release staging plan

6.2.6 Action 6: Amend Murray Shire Development Contributions Plan

It is recommended that the *Murray Shire Development Contributions Plan* be reviewed to apply to new rural residential areas and to enable Council to levy contributions for open space, road improvements, car parking, community facilities and waste management services where there is a nexus between rural residential development and the provision of these public services and facilities. The works schedule should be updated to include any intersection treatments to collector roads that feed local traffic into rural residential areas and the extension of Tataila Road to connect with Thyra Road.

6.2.7 Action 7: Monitor land availability and approvals

It is recommended that Council monitor the demand for and supply of rural residential land using the Excel spreadsheets provided as Attachment C and in an electronic version. Tracking demand by way of subdivision and development approvals will provide a future estimate of demand. A review of *Murray LEP 2011* to increase the land area zoned RU4 may be required if and when supply reaches 10 years based on take-up over the previous five year period.

6.2.8 Action 8: Further investigation area

Land bounded by the Cobb Highway, Hillside Drive, Tataila Road and Thyra Road is shown labelled *Further investigation area (for rural residential or urban)* in Figure 6.4 above. Should the land monitor provide evidence that the supply of land zoned RU4 is 10 years or less, or the take-up of rural residential land resulting from Action 2 is higher than anticipated and supply is constrained, then it is recommended that further investigation of this area be carried out to assess the suitability for the allocation of dwelling entitlements to existing lots by way of an

amendment to the Lot Size Map.

Alternatively and depending upon the nature of demand, this land could be rezoned to RU4 Primary Production Small Lots and made available to be subdivided for smaller rural residential lots. Similarly, if the supply of residential land reaches a critical low point in the future then Council may seek to investigate the potential to rezone this area for the expansion of the urban settlement of Moama.

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