

PROJECT
**RURAL LAND STUDY
GOONDIWINDI REGION
QUEENSLAND**

PREPARED FOR
GOONDIWINDI REGIONAL COUNCIL

DATE
AUGUST 2011

DOCUMENT CONTROL

DOCUMENT 110801_GRC_RURAL LAND USE_D7.doc

TITLE Rural Land Study, Goondiwindi, Queensland

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CLIENT REFERENCE –

SYNOPSIS This document comprises the Rural Land Study that will help inform Goondiwindi Regional Council's preparation of a new planning scheme for the region, which now incorporates a more diverse range of rural land types and uses as a result of the 2008 amalgamation of the former Waggamba Shire Council, Inglewood Shire Council and Goondiwindi Town Council.

REVISION HISTORY

REVISION #	DATE	EDITION BY	APPROVED BY
1	10/2010	R. Walker & C. Ross	R. Walker
2	07/2011	R. Walker	R.Walker

DISTRIBUTION

	REVISION NUMBER									
Distribution	1	2	3	4	5	6	7	8	9	10
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SUMMARY

Rural industries within the Goondiwindi Regional Council (GRC) area have historically proven to be resilient and have provided the economic basis for growth. The region is spread across a number of landform types and features a range of generally productive soils that support strong cropping industries such as cereals and cotton, a world recognized fine wool industry, a stable horticultural industry, a forestry sector and a grazing sector. The GRC area has access to irrigation water supplies in defined locations; is serviced by good transport distribution networks through road and rail and has ready access to professional technical support services in terms of agronomy, natural resource and irrigation management and finance.

This Rural Land Study, prepared by Gilbert & Sutherland Pty Ltd (G&S) for Humphreys Reynolds Perkins Planning Consultants on behalf of GRC, addresses objectives set by GRC to help inform the preparation of its new planning scheme. This report considers the current GRC area whilst acknowledging the historical context and implications of the rural land use planning policies and practices of the three former local government areas that now form the GRC.

In pursuing the stated objective, this study applied a methodology based on the following three key components:

- A comprehensive desktop review of relevant literature, Federal and State legislation and regulatory regimes, current and previous studies, mapping and documentation.
- A detailed, objective examination, interrogation and interpolation of geographic information system (GIS) data and available satellite and aerial photography.
- Extensive, structured consultation with identified key stakeholders.

Consultation undertaken for this study consistently supported a desire to maintain the integrity of existing rural industries and to provide opportunities whereby new rural industries are encouraged to establish and value adding opportunities are supported. This report identifies areas where the revised planning scheme can contribute to the preservation of the region's rural industries and encourage future investment. Mechanisms to achieve this outcome through the planning scheme are documented in this report.

Legislatively, the state government requires regional councils to implement a range of state planning policies. State Planning Policy 1/92: Development and Conservation of Agricultural Land (SPP 1/92) and the recent Strategic Cropping Lands Framework aim to protect 'farming' areas. This study has designated, defined and mapped Good Quality Agricultural Land (GQAL) areas and made recommendations to protect them from non-rural development. Recently released SCL trigger maps have been considered and incorporated into this report's recommendations.

In order to protect and enhance these natural attributes, this study proposes a number of strategies recognising the principle of maintaining precinct areas that reflect viability and sustainability needs. This study proposes that the rural lands of the Council area be split into four (4) rural precincts. These precincts support different predominant land uses and as such, each has distinct and separate requirements in terms of minimum areas needed to enhance viability. This study recommends the following minimum lot sizes for the 4 rural precincts:

- Alluvial Plains- 400 hectares
- East Traprock- 600 hectares
- Kumbarilla Rises- 800 hectares
- West Griman- 1 000 hectares

Policies that encourage land amalgamations within each of these precinct areas are supported.

Irrigated horticultural development along defined reaches of the Macintyre Brook and Dumaresq River may be encouraged through a precinct designation. Procedures for this style of development in these defined areas are specified and are rigorous in terms of confirming soil and water resource requirements. A minimum area of 100ha for these development opportunities is recommended, reflecting viability and sustainability requirements and property infrastructure needs.

Consultation and regional GIS data review informed the identification of zones within the GRC area that could meet the demand for rural residential development by consuming lands of relatively inferior agricultural suitability that are close to townships and exhibit amenity value in terms of space and/or outlook. Whilst recognising the need for detailed agricultural suitability assessment

of such lands, this study identifies indicative potential rural residential areas near Goondiwindi and adjacent to and near Coolmunda Dam and proposes:

- 16 hectare lots adjacent to selected borders with Coolmunda Dam
- 40 hectare lots surrounding the 16ha areas surrounding Coolmunda Dam
- 50 hectare lots in an area predominantly north and east of Goondiwindi
- 2 hectare lots also located in an area predominantly north and east of Goondiwindi, adjacent to existing larger lot development.

Value adding industries that support the main rural industries are proposed to be encouraged on rural industrial areas.

Rural area land designations include significant areas of forestry, national parks and remnants scattered throughout mainly grazing enterprises. This study encourages retention of these 'vegetated' areas through limitations that form part of rural precinct development, encouraging property amalgamations and support for the continued sustainable management of the cypress resource areas. These actions support the provisions of the Vegetation Management Act.

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1 Introduction

The Goondiwindi Regional Council was formed in March 2008 through the amalgamation of the former local government areas of Goondiwindi Town, Inglewood Shire and Waggamba Shire. Goondiwindi Regional Council (GRC) now covers an area of 19,292 square kilometres and has an estimated population of approximately 11,000.

GRC has undertaken to prepare a new planning scheme for the area that will provide an integrated planning framework for the new Council. The process aims to develop a coherent and easy to understand Planning Scheme for the Goondiwindi Region and to promote a clear vision that will drive development for the next eight to ten years.

Agricultural and pastoral production is the cornerstone of the region's economy. To this end, a Rural Land Use Study was commissioned to inform the greater planning process to ensure strategies to maintain and enhance the productive capacity of the region are identified.

This Rural Land Study has been prepared by Gilbert & Sutherland Pty Ltd (G&S) for Humphreys Reynolds Perkins Planning Consultants on behalf of GRC.

1.1 Report scope and objectives

The study area for the overall planning study is the Goondiwindi Regional Council (GRC) area. This Rural Land Study considers the current GRC area whilst acknowledging the historical context and implications of the rural land use planning policies and practices of the three former local government areas that now form the GRC.

The objectives of the Rural Land Study, as outlined by GRC, are to:

- Identify and analyse the rural areas of the Goondiwindi Regional Council area.
- Identify the potential uses for rural areas.
- Identify areas of high conservation value.
- Identify the constraints and opportunities for agriculture (including grazing) and intensive animal husbandry in the rural area.
- Provide recommendations for the spatial distribution of the various uses that may be located in the rural area, including minimum lot sizes for particular uses.
- Provide recommendations for scheme provisions and performance standards that could be incorporated to protect areas of high conservation value.

2 Methodology

To achieve the objectives as detailed in Section 1.1, this study developed and employed a tailored methodology built upon the following three key elements:

- A comprehensive desktop review of relevant literature, Federal and State legislation and regulatory regimes, current and previous studies, mapping and documentation.
- A detailed and objective examination, interrogation and interpolation of geographic information system (GIS) data and satellite and aerial photography.
- Extensive, structured consultation with identified key stakeholders.

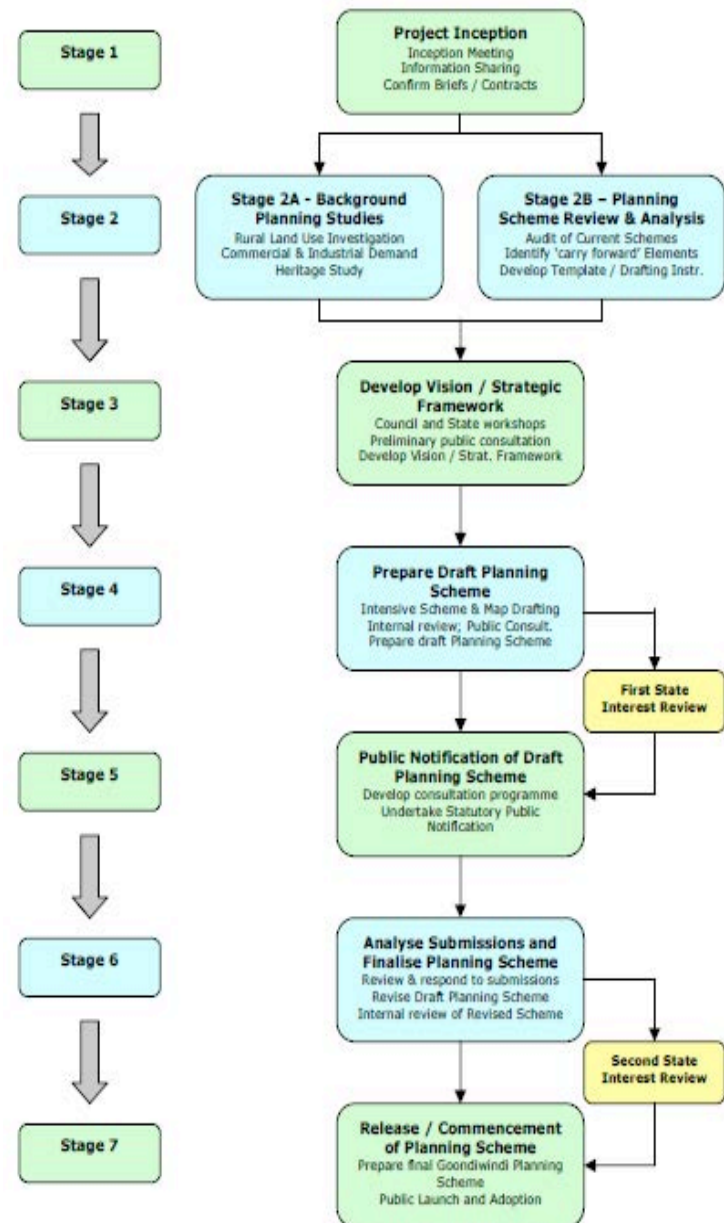
Whilst each of these key elements is discussed further below, a summary of the methodology developed and adopted for this study is depicted in Figure 2.1.

2.1 Desktop review

The review of relevant, available studies, statutory obligations and documentation enabled the study to broadly identify key rural land considerations for the development of GRC's new planning scheme. The desktop review included, but was not limited to, the following:

- Previous planning schemes completed for the former local government areas of Goondiwindi Town, Inglewood Shire and Waggamba Shire, effective 2006.
- Queensland State Planning Policy No.1 of 1992 – 'Development and the Conservation of Agricultural Land' ('SPP 1/92').
- Department of Environment and Resource Management (DERM), Strategic Cropping Lands- Strategic Cropping Protection and Management Areas, Proposed Criteria for Identifying Strategic Cropping Land and Identifying and Mapping Strategic Cropping Land, 2011.

Figure 2.1 Proposed project methodology



- Biggs, A., K. Watling, et al. (2010). Salinity Risk Assessment for the Queensland Murray-Darling Region.

2.2 GIS data and imagery interrogation

The study was informed with a quantity of objective data that was available through DERM data. A summary of data sets used and maps produced is provided in Appendix 1. Analysis of

these data sets informed decision-making, albeit at a regional scale, with objective data.

2.3 Stakeholder consultation

In order to prepare a rural land study that was reflective of key stakeholder sentiment, consultation was undertaken with a range of councillors, council staff, agri-business operators, land holders, NRM regional bodies, government agencies and community representatives.

Councillors and staff from the Goondiwindi Regional Council participated in a structured meeting process in September 2010. At this meeting, participants were presented with regional scale information that depicted the natural and rural resources of the Council area. Information relating to infrastructure and cadastral configurations was also represented and discussed.

Consultation processes identified a number of rural issues that required attention in the planning scheme through the rural land study. These issues included identifying:

- A basis for determining lot sizes to be applied through sub-division policies; within different locations, land types and infrastructure (existing and proposed);
- The location and extent of land to be used for rural residential purposes;
- The location and extent of land to be used as rural precinct areas planned to service local rural industries;
- Industries that value-add or encourage processing of product produced from local rural industries.

In addition to local issues, representatives from the Queensland Department of Infrastructure and Planning (DIP) and Department of Environment and Resource Management (DERM) outlined ramifications associated with State Planning Policy 1/92 on the Development and Conservation of Agricultural Land (SPP 1/92) and the recent Strategic Cropping Land Framework.

Consultation with the Queensland Murray Darling Committee (QMDC), the regional natural resource

management (NRM) group responsible for the region, identified resource management issues that need to be considered through the planning process. These issues include:

- Preserve good quality agricultural land (GQAL);
- Buffer requirements to avoid land use conflict, generally in accordance with Planning Guidelines for Separating Agricultural and Residential Land Uses;
- Sustainably manage the use of rural land for agriculture, mining, rural residential and industrial purposes;
- Manage degradation issues such as salinity, weed infestations and pest outbreaks, erosion and water quality decline;
- Preserve areas of high conservation value.

Findings from the consultation with agri-business identified the need to:

- Create social infrastructures that encourage the retention of professional staff within the council area;
- Provide infrastructure that supports value-adding opportunities for rural products;
- Maximise efficiencies and opportunities associated with the region's water resources;
- Consider buffer requirements to avoid land use conflict.

Findings from consultation with community groups identified the need to:

- Preserve the rural economy of the council area;
- Create a balance in land use that preserves rural amenity values;
- Provide opportunities for rural residential life-style living;
- Create employment opportunities in value-adding and/or processing industries.

3 Rural land characterisation

3.1 Soils

Soils of the GRC area were assessed in a series of departmental studies dating back to 1957. Further, QDPI published a Land Management Manual for the former Waggamba Shire in 1991.

This report identifies and describes areas with similar resource attributes in terms of soils, geology and vegetation. Units that have a recurring pattern of these attributes are called Land Resource Areas (LRA). In addition, more detailed analysis has identified agricultural management units that occur within each LRA. On the basis of the attributes assessed, land suitability is determined and management practices are recommended. This management manual was developed from findings from the initial 'The Soils of the Inglewood - Talwood - Tara - Glenmorgan Region, Queensland', published by R.F. Isbell in 1957.

Map 3.1- Landscapes illustrates the main landscape areas for the council area. **Map 3.2- Soil Orders** illustrate current departmental soils mapping that exists for the region.

An analysis of Map 3.1 indicates that areas to the east are predominantly comprised of traprock geology; areas to the north are generally weathered residual Kumbarilla beds; areas in the centre of the Waggamba Shire are predominantly alluvial deposits; areas along the river support alluvial land systems; and, areas to the west are predominantly Griman Creek residuals.

Although mapped at a regional scale, Map 3.2 delineates major soil distributions across the GRC area. In general terms, more productive cropping soils are located within alluvial land systems with soils described as sodosols, vertosols and dermosols.

3.2 Agricultural land suitability

In terms of agricultural land suitability, both the Waggamba Land Management Manual and the Department of Employment, Economic Development and Innovation (DEEDI) Grazing

Land Management (GLM) reports have classified the GRC area into land types. The GLM land types are illustrated on **Map 3.3 - Land Types** and in summary the main land types identified in the GRC area are:

Land type	Area (ha)	%
Brigalow with melonholes (MB)	484,644	25.15%
Traprock hills with narrow-leaved ironbark and tumbledown gum	278,511	14.45%
Poplar box on red soils	155,536	8.07%
Coolibah floodplain (BR)	137,974	7.16%
Brigalow with softwood scrub species	137,322	7.13%
Box flats	106,544	5.53%
Cypress pine and carbeen forest on undulating sandy plains	97,020	5.03%

Information sheets associated with these land types have been prepared and are available on departmental websites. In summary, these land types document landform characteristics, vegetation, expected pasture composition, introduced weeds, soils, expected enterprise mix, land management recommendations, land use limitations, conservation features and regional ecosystems.

In terms of the implications that the distribution of soil types, soil qualities and agricultural suitability has on the Council's planning scheme, it is proposed that the scheme should consider the following initiatives:

- Protect most of the soil types as they are good quality and should be retained for agricultural purposes, be that cropping or grazing uses;
- Plan discrete rural land use areas (specified as rural land precincts later in the report) with allied services, infrastructure and industry specific support such as processing plants, transport hubs and storage facilities as defined areas. The basis for this is that the soil distribution supports rural land use options that are

reasonably discrete, enabling a consolidation of land use. As an example, there is a cereal belt through the northern central areas, irrigated cotton areas along the main river systems, sheep producing areas to the east and more extensive grazing to the west; and

- Account for industry specific initiatives in catchment planning where possible.

3.3 Good quality agricultural land

DERM has categorised soil suitability assessment in terms of the Good Quality Agricultural Land (GQAL) status for the council area. This classification represents land in terms of Agricultural Land Classes (ALC) as defined in SPP 1/92. This policy categorises land as:

Class A – land suitable for current and potential crops

Class B – land that is marginal for current and potential crops

Class C – land suitable for improved or native pastures

Class D – land not suitable for agricultural purposes.

These classes are divided into sub-units depending on the severity of land resource limitations.

In terms of SPP 1/92, GQAL is defined as land which is 'capable of sustainable use for agriculture, with a reasonable level of input, and without causing degradation of land or other natural resources'. In the Goondiwindi area, GQAL is considered to include Class A – crop land in all areas, Class B – limited crop land where agricultural land is scarce and better quality Class C – pasture land where pastoral industries predominate.

Land and water resources across the GRC area support a wide range of rural industries and land uses. **Map 3.4 – Land Use** represents the distribution of these land uses. The key features of this distribution are:

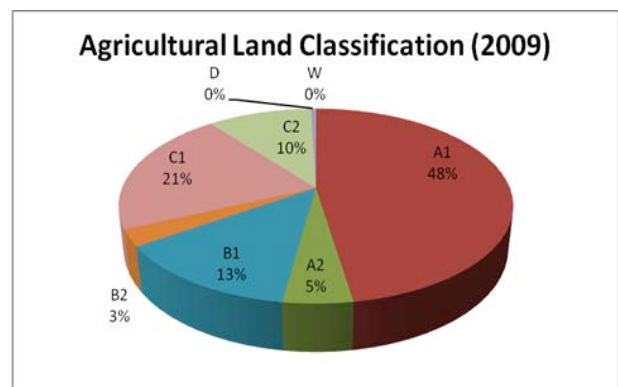
- Areas along the river network support high value irrigation cropping uses including cotton and cereal crops.

- Areas to the east support high value sheep grazing industries.
- Areas through the central and northern sections support dry land cereal crops.
- Areas to the west support grazing uses.

As a result of the high value nature and diversity of agriculture in the council area, agricultural land classes (ALC) classes A1, A2, B1, B2 and C1 are considered to be GQAL in accordance with SPP 1/92 principles and guidelines.

The delineation of these classes across the Council area has relied on data collected and mapped by DERM in 2009. This data resulted in a revision of past ALC categories and composite areas. At this stage, the usefulness of the 2009 data is slightly limited due to the lack of metadata, however clarification on this issue is being sought from the department.

Map 3.5 - Existing GQAL Distribution Areas outlines current distribution of land designated as GQAL. **Map 3.6 - Updated GQAL Distribution** outlines the distribution of land designated as GQAL using updated data. The relative abundance of updated land classes is



represented in Figure 3.1.

Figure 3.1 Distribution of GQAL areas¹

An analysis of this data has identified that 90% of the Council area is considered to be GQAL.

¹ Source: Queensland Department of Environment and Resource Management (DERM) GIS data, 2009, Map 3.6.

In terms of the implication of the extent and distribution of GQAL across the Council area, it is proposed that the scheme should consider the following initiatives:

- Define GQAL in the scheme so that it is similar to that of State Planning Policy 1/92;
- Adopt ALC categories for a GQAL designation to include ALC class A1, A2, B1, B2 and C1;
- Separate rural land from non-rural land with adequate buffering so that it is consistent SPP1/92 planning guidelines on ‘Separating Agricultural and Residential Land Uses’.

3.4 Strategic cropping land

In August 2010, DERM released a document titled ‘A Policy Framework for the Protection of Queensland’s Strategic Cropping Land’ (SCL). The intent of this policy is to ‘protect the best cropping lands of the state’. The policy outlines a framework and range of legislative and planning instruments to implement the proposed intent. These documents have since been updated in April 2011.

Updated indicative trigger maps have been prepared at a regional scale to locate strategic cropping land resources. These trigger maps are indicative only and consideration should be given to validating these maps through comparison with SCL criteria recently released by DERM.

If the SCL draft provisions are implemented, a new State Planning Policy (SPP) under the Sustainable Planning Act 2009 will be developed in conjunction with a new Act. A new SPP will guide planning (including regional plans) and development assessment under the SPA. The new SPP will operate in tandem with SPP 1/92, which protects a broader range of agricultural land from development. Council will need to be informed as these changes occur so as to gauge the impact on farming lands and rural industry viability in the area.

Map 3.7- Strategic Cropping Lands and Map 3.8- Slope Values outline the regional scale extent of identified strategic cropping lands (SCL) and the substantial effect slope has on the classification of SCL. Data supporting this map is

still considered to be ‘draft’, and until a final ‘SCL mapping protocol is established and agreed, this data should be treated as transitional. The consequences of this delineation for Council are that non- agricultural uses including mining and sub-division, are only permitted in these areas provided it can be demonstrated that the land will not be permanently alienated from agricultural use.

In terms of the implication of the extent and distribution of SCL across the GRC area, it is proposed that the scheme should consider the following initiatives:

- Adopt strategic cropping land as designated in the Framework as land to be protected through the planning scheme;
- Separate strategic cropping land as designated in the Framework land from non-rural land with adequate buffering so that it is consistent with SPP1/92 planning guidelines on ‘Separating Agricultural and Residential Land Uses’; and
- Develop, in association with gas and mining companies, a code of practice for managing access, disturbance and rehabilitation of land affected by gas exploration and mining.

3.5 Water resource

The GRC area is serviced by a wide network of rivers and tributaries discharging into the Macintyre River system. Two river systems drain the former Waggamba Shire, these being:

- The Border Rivers system including the major rivers of the Dumaresq, Macintyre and Barwon; and
- The Weir River system.

The Border Rivers system rises on the eastern edge of the Council area and flows westwards, forming the southern boundary of the region and the state border between Queensland and New South Wales. The Weir River rises in the north-east and flows south-westwards across the Council area eventually entering the Border Rivers system near the south-west corner.

Coolmunda Dam is a 67,000ML dam located 18km east of the town of Inglewood located on

one of the tributaries to the Macintyre Brook. The Macintyre Brook joins the Macintyre River south of Yelarbon. This drainage network is represented in **Map 3.9 – River Networks**. A review of this map highlights the following attributes:

- Large sections of the Council area are alluvial and subject to occasional flooding;
- The Council area contains the headwaters and upper catchments of the Macintyre River and this system ultimately flows into the Murray Darling system;
- Eastern areas are dissected due to undulating topography.

These attributes contribute considerably to the development of agricultural opportunity within the Council area. Large farms are serviced with allocations for irrigation purposes, albeit functional on adequate flows in the river. Of more recent times, the reliability of these allocations has been low due to dry seasonal conditions. Recent rainfall has temporarily alleviated prior poor conditions for irrigation.

Further, the recent release of the Framework for the Murray Darling Basin Plan (MDBP) has identified potential irrigation allocation cuts in the order of 14-18%. This level of allocation reduction is currently under further review, and should these cuts eventuate, the outlook for rural industries will have a changed perspective. It is too early to predict the effects, however consideration should be given to these as information becomes available.

The use of groundwater complements surface water use. The Council area is on the eastern extremity of the Great Artesian Basin and lies within the Surat Basin. The more localised alluvium aquifers are shallower than the identified artesian basin aquifers. Alluvium aquifers are generally used for irrigation purposes and the deeper artesian aquifers used for stock watering purposes.

The hydrology of the catchment area is such that the management of surface and ground waters should be mutually considered.

In terms of the implication of the effect the management of region's water resources has on wider rural growth opportunities, it is proposed that the scheme should consider the following initiatives:

- Improve water quality in the region's river systems through the progressive adoption of Erosion and Sediment Controls on new urban and rural residential developments;
- Improve water quality in the region's river systems through involvement with QMDC's sub-catchment planning initiatives;
- Improve water quality in the region's river systems through rehabilitation of waterways within the urban footprint;
- Implement water saving initiatives within the urban footprint, so as to account for likely allocation cuts resulting from the Murray Basin Plan initiatives; and
- Undertake drought management planning for town's surface and ground-water supplies.

3.6 Areas of high conservation value

Large areas of the region's vegetation have been modified through clearing, burning and grazing of stock. Clearing levels have ranged from complete removal of the vegetation for cropping purposes to selective thinning of trees and shrubs to increase palatable grass species for grazing purposes. Stock preferences and tolerance of plants to grazing affect the composition of the ground flora and have brought about changes to the vegetation type and composition across the GRC area.

Aside from the areas modified, other significant areas have remained intact. **Map 3.10 - Regional Ecosystems** identified the predominant regional eco-systems found within the GRC area. These areas are predominantly located to the east and north of the township of Yelarbon. Much of this area is held under a range of tenures including state forests, national parks and remnant areas scattered through grazing enterprises. Smaller less discrete areas are scattered through grazing and cropping lands located to the west and north of Yelarbon.

Within these regional eco-system areas, sections have been classified as requiring forms of protection through the Vegetation Management Act (1999). These areas have been designated as areas containing endangered, of concern, least concern or remnant communities.

In addition, bio-regional corridors have been identified and these are represented in **Map 3.11 - Vegetation Corridors**.

In terms of the implication of this vegetation distribution on the Council's planning scheme, it is proposed that the scheme considers the following initiatives:

- Limit development activities within areas designated as corridors or vegetation communities warranting protection;
- Encourage land owners within corridor designations to protect existing or plant new vegetation;
- Support the sustainable management of the region's cypress pine plantations;
- Participate in QMDC's sub-catchment planning initiatives aimed at coordinating vegetation management strategies.

3.7 Mining and gas developments

Mining and gas exploration is expanding rapidly across SW Queensland. The GRC area is no exception to this interest.

Historically, a prospective oil and gas field across the north-western boundary of the Council area and extending south-east towards the Macintyre River and Goondiwindi was investigated. A number of wells were drilled in this field in the 1970s, but were subsequently abandoned.

Since, there has been renewed interest, particularly in gas developments. The GRC area has a number of mining leases, petroleum and

mineral development leases over the majority of land from roughly Inglewood west. Mining leases cover potential deposits from both the Bowen and Surat Basins and are scattered throughout the area. Mineral development leases are remotely scattered in areas generally to the east of Inglewood.

Petroleum permits are generally located in the central northern parts of the Council area. **Map 3.12 - Mining and Mineral Resources** documents the location and extent of these activities. There is a small amount of limestone mining occurring and one silver mine in the Texas district.

In terms of the implication of mining uses and gas extraction developments on the Council's planning scheme, it is recognized that mining and petroleum (including gas) proposals are not subject to assessment against the *Sustainable Planning Act 2009*. Without any legislative basis, Council can only encourage proponents to comply with State legislative requirements. Council should seek involvement through required consultation processes in terms of:

- Environmental impact assessment (EIS) and strategic cropping lands assessment;
- Cumulative impact assessment of mining developments on groundwater and land condition post mining;
- Support mining developments on areas outside lands identified in the strategic cropping framework; and
- Develop, in association with gas companies, a code of practice for managing access, disturbance and rehabilitation of land affected by gas exploration.

4 Constraints and opportunities

In order to plan for and conceptualise the Council area's future economy, land use, business structures, rural industries and resource use pattern, an appraisal of the constraints and opportunities that stem from the rural characterisation provides a basis for 'moving forward'.

This analysis of the area's constraints and opportunities builds on the philosophy that in order to implement planned changes, Councils are but one player. One of their roles is to set a land use and regulatory framework whereby local industries and areas prosper, new and diversified opportunities are encouraged and the area's resource base is not degraded.

In addition to establishing planning and regulatory frameworks, mechanisms such as incentives and education initiatives will support the implementation of the plan and long-term delivery of outcomes.

This section describes the reality of the past and prospects for the future.

4.1 Locational attributes

GRC's geography is strategically located.

From an agricultural perspective, the central and eastern areas are located where they potentially receive rainfall from both northern monsoonal influences in summer and western frontal influences in winter. The reliability of rainfall in western areas of the Council is much lower. This rainfall pattern provides opportunities through reduced risk for both summer and winter cropping options. However, as is the case with all agricultural areas, this area can 'miss' both sets of seasonal influences. This has been the circumstance over the last decade or so prior to recent rainfall and flooding events.

In addition to this potential climatic advantage for the area, the cropping soils are of high quality and generally are deep enough and structured so that

their water holding capacity is high. This ability to store soil moisture also reduces risk for local cropping systems.

Cropping systems, until recently, have been categorized as either grazing or cropping. Of recent times, and most likely due to unseasonal drought conditions, there has been interest in mixed cropping/ grazing systems across the Council area. This diversity of farming system offers opportunities to adapt to seasonal changes and market forces.

This confluence of 'high quality' natural resources provides the natural ingredients for a comparative advantage over many other rural areas.

In addition to bio-physical attributes, the region is well serviced with transport, storage and distribution networks. This provides the region with ability to market produce and sometimes in large quantities.

In terms of locational constraints, the area's position near the headwaters of a 'stressed' Murray Darling river system creates constraints. Extractions from the river are under investigation and are likely to result in some reductions in irrigation allocations as a result of the implementation of the Murray River Basin Plan. The extent of this effect is unknown.

In terms of risks within pastoral systems, livestock are run mainly in western areas or areas of marginal soils. These enterprises run higher risk profiles due to either reduced rainfall and/or shallow low fertility soils. This can de-stabilize local rural economies and strategies to reduce this risk, however limited through planning scheme provisions, and should be considered.

4.2 Agricultural potential

Rural industries within the GRC area are in the fortunate position of having access to 'high quality' soils and 'high quality' water resources. Recent studies have identified shortages in world food supplies, and in some commodities, Australia has become a net food importer. The consequence of this is that in areas where water is reasonably reliable, soils have a capacity to store moisture and infrastructure networks are functional,

advantages exist in retaining the capacity to produce food. It is expected that these areas will be well compensated in the future for their food products. The Goondiwindi region is well positioned to take this comparative advantage.

Farmers and graziers in the Council area produce:

- cotton and super fine wool
- large quantities of high quality grain
- cattle in large number
- sheep in localised areas
- horticultural products

This range of high quality products is used in food producing systems and the garment trade. Preservation of this mix of industries provides a mechanism for reducing regional risk. Opportunities exist for:

- Maintenance of food producing products that potentially will benefit for increasing food prices in real terms
- Diversification into alternative food producing systems as the market changes. This is enabled through the area's sound resource base and infrastructure;
- Specialty and niches raw materials (eg cotton and fine wool) have room for expansion should the market present itself; and
- Food production to move in and out of alternative systems as seasons and markets dictate.

To realise this potential, Council can assist through quarantining the resource base from non rural development, minimising conflicting land uses, encouraging diversification and assisting with the provision of infrastructure.

Other influences are generally external, namely seasonal and markets. If prudent risk management strategies are implemented, the inherent advantages of the area will assist in overcoming these ever-present universal constraints.

The other constraint to achieving full agricultural potential is the reduced quantity of water that might be made available to the irrigation sector

due reductions as suggested in the Guide to the Proposed Murray Darling Basin Plan. Water use efficiency initiatives, changing irrigation types and changes to the crop mix are likely responses that will be applied by local business operators.

4.3 Specialist agricultural markets

Operators within the Council area currently engage in some specialist market areas for agricultural industries. These industries and the community are able to access organisations such as QMDC, a strong and professional rural private sector and industry organization (eg GRDC) researchers to help inform opportunities and to maintain skill development for operators in the rural sector. Although requiring further specific analysis, likely opportunities exist in the areas of:

- Grain products raw and processed, feed and milling, winter and summer
- Specialist fruit and vegetables for overseas markets. It is expected the region's location will provide disease management benefits as it is separated from existing horticultural producing areas;
- Fine wool in the Traprock area;
- Stone fruit in the Traprock and Granite Belt areas;
- Cattle types for particular markets;
- Cattle as a protein source in emerging Asian, Chinese and Indian markets;
- Processed cotton products;
- Professional skilling of young Australians and overseas students in the areas of agronomy, animal production, resource management and rural economics to fill current void in training now not available at universities.

Constraints to fulfilling these opportunities are multi-faceted and in summary relate to:

- lifestyle perceptions of the area
- lack of clear visioning of the concept
- conservative links to past systems and commodity types
- lack of market and/or exposure

- poor risk management in farming systems
- lack of value adding and processing facilities
- occasional poor infrastructure support.

4.4 Biodiversity, vegetation protection and eco-tourism

Rural areas within the Council area are well served with vegetation communities that have high biodiversity values. These values in their own right have environmental benefits and contribute to a wider ecological system. The opportunity exists, in an ecological sense, to further develop vegetation areas strategically so as to reduce ecological risks.

A recent salinity risk study completed by DERM has identified areas across the Council area that are of high salinity risk. These areas are predominately located in the north-western areas of the region.

Landholders in these areas have been pro-active, and have managed this risk through the adoption of better farm management practices. Extensions to vegetation communities in key locations will be needed to reduce salinity risks so that agricultural production is not compromised and infrastructure is not damaged by any emergence of a salinity problem.

In addition to the ecological aspects, high value vegetation communities with biodiversity value have open-space and eco-tourism benefits. Although most of the larger national parks are located in neighbouring regional Council areas, some of the areas designated as State Forest are purportedly being considered for conversion to a conservation protected tenure.

In areas where this occurs, eco-tourism opportunities such as passive recreation areas through open-space are worthy of investigation.

Constraints and costs associated with these types of decisions include reductions in a cypress pine native forestry industry that employs and supports families. Also, if these areas are not well managed, a weed and pest problem or a bushfire hazard often arises. Each of these risks needs to be considered in management arrangements for these areas.

4.5 Amenity of rural areas

Rural areas within the council area exhibit an amenity in terms of space, vegetation type, land use mix and diversity of landform. Consultation feedback is that this mix is an attraction to a lifestyle people enjoy. In other words, the amenity value is high.

Planning schemes help mould amenity and if preservation of many of the existing values is to be progressed, actions that aim to maintain key elements of the status quo or enhance values need to be considered.

Support exists to maintain the rural amenity of the Council area. The maintenance of the rural resource base, encouragement of rural diversification, maintenance of rural skills training and the maintenance of rural lifestyle attributes will preserve this rural amenity. These actions create the socio-economic framework needed to preserve rural industries and by default, rural amenity.

The opportunity is for this planning scheme to provide the balance between incentives and regulation so that rural industries are not compromised.

In addition to direct agricultural benefits, the maintenance of the key natural assets within the rural setting will enable complementary activities such as rural value-adding and processing industries, eco-tourism and passive recreation activities (e.g. hiking, art) to prosper.

A constraint associated with a reliance of rural pursuits is that the local economy is too dependent on seasonal factors. A preservation of key resources, whilst building in diversification across and within rural industries reduces these risks.

The current expansion of mining and gas interests in districts to the north and the likely growth of these industries into the Council area will challenge current amenity values in rural landscapes. These industries will change amenity values in rural areas in terms of the key ingredients of space, vegetation type, land use mix and diversity of landform.

4.6 Infrastructure for rural industries

The Goondiwindi Regional Council area is well serviced with supportive infrastructure.

The road and rail transportation system connects the area to larger markets in south east Queensland and distributions of large volume commodities to southern destinations. This network is reasonably extensive and with expectations for expansion through proposed 'Inland Rail' aspirations. The extent of this road and rail network enables rural industries to move produce to a range of market areas. This creates opportunities in terms of optimising volume production (eg grain, cotton), diversifying product range (eg specialist produce), value adding and processing and distribution.

In addition, current irrigation infrastructure that is owned and maintained by both public and private enterprises, provides a good base for optimising volume production, diversifying product range, value adding and processing and the distribution of fresh food produce. The area is fortunate in that it has predominantly fair to good quality soils supported by fair to good water resources supported by fair to good water distribution infrastructure. This is an enviable position.

In terms of communication infrastructure, the advent of the national broadband network is expected to reduce perceptions of isolation that occasionally limit rural growth expectations.

Consultation feedback has recognised that there is a need to retain professionally trained staff to service existing rural enterprises and potentially, an expanding rural sector. Increasingly, areas

west of the Great Dividing Range are being 'seen as remote'. Some of the infrastructure constraints raised through the consultation included the lack of choice in secondary education for children, limited professional development opportunities through training institutions for young staff and the poor connectivity of airline destinations.

It is recognised that that the planning scheme cannot address all of these constraints. They are presented so as consultation feedback is documented.

4.7 Processing and value adding

Rural industries produce fluctuating volumes of cotton, cereal crops, stone-fruits and wool from rural areas. Consultation feedback has recognised that marketing of these products would benefit from some form of processing or value-adding. Stakeholders were supportive of these opportunities being located close to the primary source and in areas, where their use complements surrounding uses. Processing and value-adding opportunities within the agricultural sector are examined in Section 5.2 of this report.

In support of these industries, either existing or future, maintenance of existing infrastructure will be required. Sound infrastructure in terms of transport systems, both rail and road, will be needed for efficient collection and distribution. Access to reliable water supplies will also be required to encourage diversified rural development. Professionally qualified staff will need to be attracted to the area so as to further develop value-adding and processing opportunities.

5 Strategies

This section outlines strategies on key issue areas that affect rural lands in the future. These issue areas were identified through consultation and have been informed through interpretation of rural attribute data, lot size distribution and our understanding of the region's constraints and opportunities.

5.1 Rural residential zone in key locations

5.1.1 Consultation

Rural residential use of rural land emerged as an issue as a result of data and information reviews, and through consultation with community members and businesses. The hypothesis considered, from a rural planning perspective, is that rural residential areas offer their community economic and amenity benefits through the provision of larger areas close to services; however these areas should be located so that there is no impact on the operations and performance of established rural industries. Rural residential areas offer space for a 'rural lifestyle' and also a location for allied and value-adding enterprises.

Areas considered through consultation for rural residential expansion within the Council area are:

- Areas near the townships of Goondiwindi and Inglewood and
- surrounding and near Coolmunda Dam.

In all cases, lifestyle, space and non conflicting land use considerations are the main driving factors. Consultation feedback has identified that these lifestyle considerations play a key role in attracting groups such as young professionals and retirees to the district.

5.1.2 Rural planning considerations

From a rural and resource protection perspective, growth into rural residential uses needs to be carefully considered. Some of the more prominent negative aspects of poorly considered rural residential growth relate to:

- High cost per unit area for the delivery of services and infrastructure;
- Resource degradation resulting from the over-use of land;
- Higher vulnerability to natural hazards and disasters; and
- Social isolation

In determining the location of rural residential areas and relevant lot size differences across these areas, the following rural factors have been considered:

- Differences in land type in terms of agricultural suitability status;
- Land type constraints in terms of degradation processes;
- Relative position to vegetation protection areas;
- Relative position in terms of minimising the potential for land use conflict with extensive agricultural areas;
- Relative position to local and regional population growth areas;
- Relative position to the Council area's main population centres of Goondiwindi, Inglewood, Texas and Yelarbon; and
- Relative amenity values.

• In addition, the following land use factors have been considered for the location of rural residential zones. Rural residential zoning is not supported on land:

- ⇒ Designated as GQAL or Strategic Cropping Land (SCL). If it is, the development application planning process should require a demonstration of over-riding planning need or more detailed analysis that downgrades the GQAL and/or the SCL status of the area;
- ⇒ Not protected by flood mitigation infrastructure (e.g. by levee) when the proposed rural residential development is intensive (e.g. 2 hectares minimum lot size); and
- ⇒ Located close to areas where current or potential land use conflict with irrigated agriculture exists. If it is, provision should

be made for adequate buffering from noise, dust and odour.

Rural residential precinct areas should allow for a range of lot sizes to accommodate the differing needs of people who wish to live in this setting.

Based on the above factors and the analysis of available data for the region, a number of locations have been identified that would suit rural residential zones in the Council area, and these are discussed in further detail below.

5.1.3 Lot sizing considerations

A lot size analysis concluded that:

- Lots surrounding Goondiwindi are mainly 10 - 50 Ha or 50 - 100 Ha;
- Lots surrounding Inglewood and Texas are mainly 10 – 50ha and 50 – 100ha;
- Lots surrounding Coolmunda Dam are mainly 50 – 100ha
- The following factors were considered when determining minimum lot size for the proposed rural residential uses:
 - Locality relative to the townships of Goondiwindi, Inglewood and Texas;
 - The driving distance from population growth areas such as south east Queensland and the eastern Downs for 'week-ender' properties eg overlooking Coolmunda Dam;
 - Land quality. Land classed should be classed as Class B, C1 or C2 (this will require further detailed assessment in terms of need and land quality);
 - Separation from extensive cropping areas; and
 - Flood inundation areas.

Goondiwindi

Participants involved in the consultation raised the issue of a lack of 'rural' lifestyle areas within 5 - 10 minutes of Goondiwindi. This appears to have resulted from past urban development trends where Goondiwindi has experienced little development in areas outside the town over the last decade. People moving to and working in Goondiwindi are now largely constrained to live in town on an average size house block.

The Macintyre River and the NSW border negate any prospect of rural residential areas to the south. The river creates significant flooding constraints that further limit rural residential opportunities. This flooding constraint is alleviated by a protective levee that protects the town on the eastern, southern and a small part of western boundaries. The highest area surrounding the current Goondiwindi settlement is to the north-east, on either side of the Goondiwindi-Moonie Road.

In areas to the north of Goondiwindi town, residential uses and broad-acre agricultural uses are separated by poorer quality lands best suited to grazing uses, with only small areas supporting dryland cropping.

This report recommends that the area north and east of Goondiwindi Township to Brigalow Creek should be further investigated as an appropriate location for a rural residential zone. This location is represented on **Map 5.1- Rural Residential-Goondiwindi Surrounds**.

This area offers the opportunity to house a range of rural residential sized lots, ranging from 2 hectares up to 50 hectares. It is recommended that larger lots be established closer to Brigalow Creek, smaller lots in and around existing small lot developments. These areas have the capacity to offer a rural residential type lifestyle without significant land use conflicts from current and future agricultural use.

From a rural perspective, this area offers the following benefits:

- Smaller rural residential lots in areas that are less flood prone;
- It is adjacent to a number of already established road networks, namely highways and Goodar Road;
- It is located adjacent to land uses that are unlikely to change from low intensity agriculture, so potential for land use conflict is minimised;
- It is within 5 - 10 minutes of town;

- The quality of the land is likely to contain areas of Class C land. The GQAL status would need to be subjected to more detailed investigation.

Coolmunda Dam

Participants involved in the consultation also raised the issue of a lack of 'rural' lifestyle areas around one of the region's key water features, Coolmunda Dam. The dam offers a locally unique opportunity to attract people who want to live 'by the water'. This may take the form of holiday houses/retreats or permanent residents. Coolmunda Dam is within 15 minutes from Inglewood. During the summer, the dam is a key attraction for water enthusiasts.

An area identified as worthy of consideration for a rural residential lifestyle living is the area to the immediate south of the dam wall and the area on the northern shores of the dam adjacent to the highway. Current land use in these areas is low intensity agriculture. A significant portion of these areas are considered to be GQAL Class C.

When considering this option for rural residential expansion, it is noted that these areas fall within the declared catchment area of the dam. This is likely to limit the intensity of development, and require additional approval conditions.

Downstream of the dam on the western side, irrigated agriculture is currently an established land use and these areas should be avoided for rural residential development so as to prevent land use conflicts.

It is recommended that a range of rural residential lot sizes be considered. The recommended minimum lot sizes are:

- Areas adjacent to the high water mark of the dam be 16 hectares;
- Transition areas between high water front areas and the established rural production areas be 40 hectares.

These areas are represented on **Map 5.2- Rural Residential- Coolmunda Surrounds**.

Inglewood & Texas

Inglewood and Texas townships currently have designated rural residential areas. These areas

have not 'filled' over the recent timeframe of the former Inglewood Shire planning scheme. As a result, further expansion of rural residential uses is not supported. In addition, any expansion of rural residential areas around Inglewood should avoid the intensive agricultural areas that surround the Macintyre Brook, as this is likely to lead to land use conflicts in the future.

5.2 Value adding and secondary processing facilities

Primary products such as wheat, cotton, super-fine wool, organic chickens and stone fruit are generally exported from the district in their raw form. The issue of encouraging value adding and secondary processing opportunities within the Council area was recognised through consultation.

The planning scheme can account for this preferred outcome through encouraging rural industries to establish value adding and secondary processing plants in or near production areas. It is recommended that this type of infrastructure be located on the periphery of towns (particularly Goondiwindi). However from a rural perspective, there is benefit in locating some forms of this infrastructure on-farm where it complements the local rural industry.

Based on the agricultural pursuits of the district, the types of value adding or secondary processing enterprises that complement established rural industries would include:

- Silos for grain storage;
- Boutique processing of cotton;
- Packing facilities for horticultural products;
- Organic chicken expansion;
- General industry and manufacturing to support rural activities (irrigation, chemicals, packaging); and
- Transport industries.

The following criteria are proposed for determining the lot size of sites considered suitable for value adding or secondary processing facilities:

- The site should have access to a highway and/or rail networks;

- The site should be of sufficient size to allow for safe access of vehicles, machinery and equipment necessary to operate;
- If located on farm, the site should not reduce the net area available for cropping purposes;
- The site should be located higher than flood inundation areas or be protected from flooding;
- The site should be a sufficient distance from residential areas or provide adequate buffering from noise, dust and odour; and
- The site should have access to adequate water.

Our analysis identified land currently zoned industrial located near the Goondiwindi town periphery and Inglewood as land suitable for value adding or secondary processing facilities.

5.2.1 On-farm facilities

It is considered that many secondary processing facilities are better suited to on-farm arrangements rather than in designated industrial areas. These facilities will include packing sheds for horticultural produce and silo facilities to store grain in bulk. The location of such facilities on-farm allows the secondary processing/storage to occur at the point of production and reduces costs in the production chain. It also has benefits to the broader community of reducing truck traffic around and through towns, and is likely to reduce dust and noise issues.

From a land availability perspective, good quality agricultural land is not in short supply in the council area, so the relatively small footprint of a facility should not be considered an overwhelming constraint if the proposed facility is supportive of current rural uses present at the time of application. The most limiting factor will be its location relative to other land uses and activities, and access to water.

Ideally, on-farm facilities that collect produce from more than one farm (e.g. packing shed that is supplied by a number of growers in the district) should be encouraged. This would provide economies of scale to the one facility and limit the number of smaller facilities that could be developed over time.

5.2.2 Rural-industrial areas

Potential rural industrial areas in and around Goondiwindi are represented in **Map 5.3 - Potential Rural Industrial Areas**. These areas are located north of Boundary Road.

In Inglewood, it is recommended that future value adding or secondary agricultural facilities be located within the existing industrial area.

Development of these industrial areas as outlined would complement the proposed expansion areas resulting from the 'diversification through intensification' concepts outlined below.

5.3 Agricultural diversification through intensification

Currently, diversification and intensification of agricultural pursuits is market driven. This fundamental basis is not challenged. Market decisions consider many factors, including resource suitability and logistic factors. Specifically, some of these factors include:

- Availability of suitably designated land
- Availability of useful data and information on the region;
- Agricultural suitability of water and land resources;
- Geographic location and;
- Proximity to transport and markets.

Other factors influencing decisions to entry into the agricultural market is 'buy in' capital costs. In the Council area, 'buy in' capital costs are generally high due to large block size and high 'on farm' infrastructure costs. Consultation feedback considers that Council's existing lot sizing rules constrains the subdivision of rural lots to a size that discourages diversification to intensive irrigated agricultural pursuits such as horticulture crops (small crops, tree crops), niche cropping options such a premium stone-fruits or organic produce.

It is recommended that an assessment process be developed to enable and encourage rural industry diversification and intensification. The application will require technical assessment

(similar to GQAL assessment needs) and be able to:

- Demonstrate the suitability of the land for diversified and more intense agricultural production;
- Assess catchment and site impacts resulting from diversification and intended use- see Appendix 2 for a working example;
- Document how identified impacts will be managed.

Criteria that will need to be fulfilled so that agricultural diversification through intensification is supported include:

- ‘Diversified agricultural uses’ will include ‘cropping’ uses such as vegetable, fruit and nut crops, fodder and pasture seed, vineyards, niche cropping options such a premium stone-fruits and organic produce and ‘intensive horticulture’ uses such as greenhouse and shade house plant production, hydroponic farms and mushroom farms;
- Uses will be restricted to GQAL Class A land;
- Uses will be restricted to irrigated agricultural pursuits;
- Soils of the site will be assessed by a qualified assessor as suitable for irrigated cropping;
- Water delivery infrastructure will be available;
- Irrigation methods applied will incorporate industry recognised water use efficient systems;
- Vegetation and biodiversity values will not be negatively affected;
- Off sites natural resource values will not be negatively affected.

Geographically, this ‘diversification through intensification’ initiative is limited to the irrigated areas along the Macintyre Brook area and the Dumaresq River. These areas are represented on **Maps 5.4 to 5.8** via the proposed Intensive Horticultural Precinct. These maps indicate that:

- Lots along the Macintyre Brook are mainly 10 - 50 Ha or 50 - 100 Ha;
- Lots surrounding Coolmunda Dam range from 50 – 100+ha.

A minimum area of 100 hectares is recommended for rural industry diversification through intensification. The basis for this minimum lot size for these recommended areas are that it:

- Satisfies current thinking on viability needs for irrigated horticultural operations;
- Constitutes an area large enough to discourage ‘blocky’ type development that potentially would manifest itself through the use of areas for unproductive rural residential purposes;
- It requires technical assessment (similar to GQAL assessment needs), providing potential investors the ability to decide for themselves if the area is adequate;
- Allows for farm infrastructure such as buildings and sheds;
- Provides an economy of scale for intensive irrigation operations;
- Accounts for land quality differences;
- Allows for the adoption of good land management practice eg. crop rotation;
- Is consistent with existing lot sizes, facilitating easy amalgamations in many cases.

5.4 Rural use

This GRC planning study has attempted to reconcile the three different approaches of former local government areas amalgamated to form Goondiwindi Regional Council to minimum lot size determination of rural land. Our aim was to make the analysis evidence based so as to account for differences across the Council area.

Consultation feedback expressed a desire for Council to consider the following matters when planning future land-use patterns and planning needs for rural land:

- encourage the economic and environmental sustainability of current agricultural production industries;
- diversify agricultural industries into specialist and production types such as intensive horticulture crops (small crops and tree crops), niche cropping options such a premium stone-fruits and organic produce;

- locate rural residential living in non-conflicting areas; and
- support value-adding industrial uses.

In order to accommodate these expectations, an analysis of a number of data sets was undertaken. These data-sets included:

- current land use patterns;
- current crop distribution patterns;
- current lot size distributions;
- climatic zonal patterns across the region;
- viability of rural industries;
- adopted farm management practices; and
- adjoining Council area minimum lot sizes adjacent to all Council’s boundaries.

After our analysis of this evidence and targeted consultation with Council and the wider community, discussions were held with regional agricultural economists and rural industry organizations. It is recommended that Council consider changes in minimum lot size arrangements of rural land.

The rural lands of the Council area have been divided into four (4) precincts of the future Rural Zone in the planning scheme. These areas were initially delineated through landscape and rural land use patterns and refined using slope analysis and sustainability risks assessment through salinity risk and climate variations mapping. The four rural zones are represented on **Map 5.9- Rural Zones**. On this map, the rural zone with their respective precinct minimum lot size are presented in **Table 5.1- Rural Zone Precincts and Minimum Lot Sizes**.

Table 5.1- Rural Zone Precincts and Minimum Lot Sizes

Precinct Name	Minimum Lot Size (ha)
Alluvial Plains	400
East Traprock	600
Kumbarilla Rises	800
West Griman	1 000

5.4.1 Alluvial Plains

This zone is the predominant zone in the GRC area and is located centrally. Land on this zone is extensively used for both dry-land cereal and irrigated cropping and comprises most of the alluvial soils and geologies of the area. These areas are considered to be GQAL and/or strategic cropping land. Under good seasonal conditions, these areas are capable of highly profitable crops.

In order to achieve regional goals and objectives, it is proposed that development on these areas be restricted to rural uses or associated rural uses. Existing lot size distribution indicates that the majority of this zone has a lot size of 400 ha or less.

Interrogation of GIS data for this zone, in the context of the examination of historical and current land use and consultation outcomes, indicates an appropriate minimum lot size for this zone is 400 ha.

5.4.2 East Traprock

This zone is located on the eastern edge of the Council area. Land on this zone is extensively used for sheep production, super fine wool production and specialist horticultural tree areas in selected areas where water is abundant. These areas are generally considered to be GQAL and/or strategic cropping land. High quality wool product and some specialist horticultural tree crop (eg plums) are produced.

In order to achieve regional goals and objectives, it is proposed that development on these areas be restricted to rural uses or associated rural uses and that designated areas be allocated for horticultural intensification.

Existing lot size distribution and lot size distribution on adjoining regional council areas indicates that the majority of the Traprock has an existing lot size of 400 ha or more.

Aerial photography and GIS data review, supported by historical and current land use considerations and consultation feedback, confirms that an appropriate minimum lot size for this zone is 600 ha.

5.4.3 Kumbarilla Rises

Land in this zone is used for mixed farming or forestry uses. Soils are generally poorer than the adjoining alluvial zone and as a result, land use options are narrower and cropping options more risky. These areas are generally not considered to be GQAL and/or strategic cropping land. This zone accounts for a significant component of the Council area that is largely vegetated with native communities and constitutes areas of habitat corridor value.

In order to achieve regional goals and objectives, it is proposed that development on these areas be restricted to rural uses, associated rural uses or habitat protection. Existing lot size distribution indicates that the majority of this zone has a lot size of 400 ha or more.

Given the GIS data review outcomes and feedback derived through consultation, a minimum lot size of 800 ha is appropriate for this zone.

5.4.4 West Griman

This zone constitutes rural land that is subject to the highest level of degradation risk if poorly managed. This zone is located on the north western margins of the GRC area and much of

the area supports grazing uses including beef, sheep meat and sheep wool. These areas are generally not considered to be GQAL and/or strategic cropping land.

Much of the area has a high salinity risk rating and as such, good management of this land is required. In addition, the zone is subject to seasonal climatic variation and production levels fluctuate according to seasonal conditions. Under good seasonal conditions, these areas are capable of good pasture production, but under drought conditions, production is severely limited. As a result, well managed grazing systems are recommended.

In order to achieve regional goals and objectives, it is proposed that development on these areas be restricted to rural uses, specifically grazing uses. Existing lot size distribution indicates that the majority of this zone has an existing lot size of 400 ha or more.

On this basis of the GIS data review, consultation outcomes and considering critical constraints to agricultural land use in this zone, the minimum lot size has been set at 1 000 ha.

6 Planning scheme

6.1 Land use designations and identifiers

Relevant to this Rural Land Study, rural areas of the GRC area will be divided into two zones:

- Rural Zone (to be further divided into five precincts)
- Rural Residential Zone (to be further divided into four precincts).

6.1.1 Rural Zone precincts

For the purposes of the new planning scheme and having regard to the Queensland Planning Provisions (QPP), the following Rural Zone precincts are recommended:

- Alluvial Plains
- East Traprock
- Kumbarilla Rises
- West Griman
- Rural Diversification by Intensification incorporating Macintyre Brook and the Dumaresq River.

6.1.2 Rural Residential Zone precincts

Having regard to the QPP, the following Rural Residential Zone precincts are recommended for the purposes of the new planning scheme:

- Western and Eastern Goondiwindi
 - Small lot- 2 ha
 - Large lot- 50ha
- Lake Coolmunda
 - Lake areas- 16ha
 - Transition areas- 40ha

Value Adding and Secondary Processing Facilities will be accommodated in existing and proposed industrial zones.

6.1.3 Intent of proposed rural precinct classes

A description of rural precinct class intents will be provided to inform the drafting of the planning scheme.

6.2 Legislative basis

The planning scheme has been developed under a state policy framework. In relation to this rural lands study, state policy mechanisms that have been considered include:

- State Planning Policy 1/92- Development and Conservation of Agricultural Land
- Proposed State Planning Policy- Strategic Cropping on the protection of land designated as strategic cropping lands
- State Planning Policy 2/07- Protection of Extractive Industries.

In addition, the following Federal and State environmental legislation has been considered:

- Sustainable Planning Act 2009.
- Environmental Protection and Biodiversity Conservation Act 1999
- Queensland Vegetation Management Act 1999
- Queensland Environmental Protection Act 1994
- Queensland Nature Conservation Act 1992

A regional planning document considered was:

- Queensland Murray Darling Committee (QMDC) NRM Plan and Strategic Plan.

6.3 Local planning policies position

The local policy positions considered necessary to support the Rural Land Study were:

- Create social infrastructures that encourage the retention of professional staff in the GRC area.
- Preserve the rural economy of the council area.
- Create a balance in land use that preserves rural amenity values.
- Preserve good quality agricultural land (GQAL).
- Buffer requirements to avoid land use conflict, generally in accordance with Planning Guidelines for Separating Agricultural and Residential Land Uses.
- Sustainably manage the use of rural land for agriculture, mining, rural residential and industrial purposes.
- Manage degradation issues such as salinity risk, weed infestations and pest outbreaks, erosion risk and water quality decline.

- Preserve areas of high conservation value.
- Provide infrastructure that supports value-adding opportunities for rural products.
- Provide opportunities for rural residential lifestyle living.
- Create employment opportunities in value-adding and/or processing industries.

6.4 Desired environmental outcomes

The Desired Environmental Outcomes (DEO) provides one of the key foundations of the Goondiwindi Regional Council's planning scheme.

The DEOs represent what rural outcomes are sought through the planning scheme and relate to rural matters broadly influenced by the scheme. In terms of the Rural Land Study, the DEOs are grouped under the following topic areas:

- Economic development with an emphasis on rural sustainability.
- Ecological processes and natural systems.
- Social well-being with an emphasis on rural sustainability.

Specific DEOs relevant to the identified topic areas are specified in **Table 6.1**.

Table 6.1 Desired Environmental Outcomes (DEO).

Topic area	DEO	Key points	Performance indicators
Economic development with emphasis on rural sustainability	Primary production continues to be a major contributor to the region's economy	Diversity of crop type, access to irrigation supplies, degradation minimised, restrict conversion to other uses	Primary industries continue their significant contribution to the region's economy / employment; GQAL areas are protected; Strategic Cropping Land (SCL) areas are protected
	Selective intensification of horticultural uses and livestock uses	Food/fibre production focus, access to water and good soils, employment generation	Selected areas supporting intensified rural land uses diversifying agricultural base and encouraging value adding opportunities
	Preservation of rural sector's natural resources	Landscape level planning, infrastructure expansion, land use capability assessment	Natural resources in terms of soils, GQAL, SCL and forestry developed in a sustainable manner
Ecological processes and natural systems	In-stream water quality is conserved and improved	Wetland preservation, riverine habitat value retention, water for domestic, agricultural and industrial uses	Surface water quality in cropping areas not declining with rural land development
	Groundwater water quantity and quality is conserved and improved	Groundwater aquifer integrity, water for domestic, agricultural and industrial uses	Groundwater quality is not declining with rural land development through agricultural or mining uses
	Scenic landscape values enjoyed, conserved and improved	Conservation / forestry areas revitalised, rural character retained	Scenic landscape unaffected by rural and associated industrial development
Social wellbeing	Biodiversity and nature conservation values of terrestrial and freshwater ecosystems conserved and enhanced	Conservation of biodiversity, recreational and scenic amenity	Corridor areas retained Biodiversity values conserved
	Pattern of rural development compatible with sustained rural growth	Discrete rural areas; access to natural resources; employment generation	Location of non-rural activities do not encroach of rural pursuits, access to natural resources
	Supportive rural industrial infrastructure	Transport systems, value adding, processing facilities	Supporting infrastructure established and functional

7 Recommendations

7.1 Rural Lands Precinct class recommendations

It is recommended that Council consider changes in minimum lot size arrangements of rural land.

The rural lands of the Council area have been divided into the four (4) precincts of the future Rural Zone in the planning scheme. These areas have been delineated through interpretation of landscape and rural land use patterns and refined using slope analysis and sustainability risk assessment through salinity risk and climate variations mapping.

The four rural zones are represented on **Map 5.9- Rural Zones. Table 7.1- Rural Zone Precincts and Minimum Lot Sizes presents recommended minimum area for each rural zone precinct.**

Table 7.1- Rural Zone Precincts and Minimum Lot Sizes

Precinct Name	Minimum Lot Size (ha)
Alluvial Plains	400
East Traprock	600
Kumbarilla Rises	800
West Grimman	1 000

7.2 Rural Diversification by Intensification Precinct class recommendations

The establishment of a fifth ‘Rural Diversification by Intensification’ precinct is recommended. The geographic extent of this precinct area is limited to the irrigated areas along the Macintyre Brook area and the Dumaresq River. These areas are represented on **Maps 5.4 to 5.8.** A minimum area of 100 ha is recommended for the rural industry diversification through intensification precinct.

It is further recommended that an assessment process be developed to enable and encourage rural industry diversification and intensification. The application will require technical assessment

(similar to GQAL assessment needs). In order to progress this initiative, it is recommended that the following criteria will need to be fulfilled:

- ‘Diversified agricultural uses’ will include ‘cropping’ uses such as vegetable, fruit and nut crops, fodder and pasture seed, vineyards, niche cropping options such as premium stone-fruits and organic produce and ‘intensive horticulture’ uses such as greenhouse and shade house plant production, hydroponic farms and mushroom farms;
- Uses will be restricted to GQAL Class A land;
- Uses will be restricted to irrigated agricultural pursuits;
- Soils of the site will be assessed by a qualified assessor as suitable for irrigated cropping;
- Water delivery infrastructure will be available;
- Irrigation methods applied will incorporate industry recognised water use efficient systems;
- Vegetation and biodiversity values will not be negatively affected;
- Off site natural resource values will not be negatively affected.

7.3 Rural Residential Precinct class recommendations

It is recommended that the area north and east of Goondiwindi Township to Brigalow Creek should be further investigated as an appropriate location for a rural residential zone. This location is represented on **Map 5.1- Rural Residential-Goondiwindi Surrounds.**

The basis for recommending further planning investigations in this zone is that the area offers opportunities to accommodate a mix of rural residential sized lots, ranging from 2 hectares up to 50 hectares. Whilst the range of lot size is proposed to address a diverse range of rural residential demand profiles, it is recommended that larger lots be established closer to Brigalow Creek whilst smaller lots may be created in and around existing small lot developments.

A key factor in recommending these lot sizes and configurations is that these areas (which are likely to include substantial tracts of Class C

agricultural land) have the capacity to offer a rural residential type lifestyle without significant land use conflicts from current and future agricultural use. This study notes that the quality of the land, including GQAL status, would need to be subjected to more detailed investigation.

In addition to Goondiwindi Surrounds, 'rural' lifestyle areas around Coolmunda Dam are also recommended. The dam offers a locally unique opportunity to attract people who want to live 'by the water'. It is recommended that a range of rural residential lot sizes be considered. The recommended minimum lot sizes around Coolmunda Dam are:

- Areas adjacent to the high water mark of the dam be 16 hectares;
- Transition areas between high water front areas and the established rural production areas be 40 hectares.

These areas are represented on **Map 5.2- Rural Residential- Coolmunda Surrounds**.

Finally, Inglewood and Texas townships currently have designated rural residential areas. These areas have not 'filled' over the recent timeframe of the former Inglewood Shire planning scheme. As a result, further expansion of rural residential uses in these areas is not recommended.

7.4 Value Adding and Secondary Processing Facilities Precinct class recommendations

It is recommended that the establishment of following types of value adding or secondary processing enterprises be supported through the planning scheme:

- Silos for grain storage;
- Boutique processing of cotton;

- Packing facilities for horticultural products;
- Organic chicken expansion;
- General industry and manufacturing to support rural activities (irrigation, chemicals, packaging); and
- Transport industries.

It is recommended to locate these industries in existing identified land currently zoned industrial located near the Goondiwindi town periphery and Inglewood.

It is further recommended that some secondary processing facilities are better suited to on-farm arrangements rather than in designated industrial areas. These facilities will include packing sheds for horticultural produce and silo facilities to store grain in bulk.

On-farm facilities that collect produce from more than one farm (e.g. packing shed that is supplied by a number of growers in the district) are recommended.

It is further recommended that potential rural industrial areas be established in and around Goondiwindi. These areas are represented in **Map 5.3 - Potential Rural Industrial Areas**. These areas are located north of Boundary Road.

In Inglewood, it is recommended that future value adding or secondary agricultural facilities be located within the existing industrial areas.

It is considered that development of these industrial areas as outlined would complement the proposed expansion areas resulting from the 'diversification through intensification' concepts outlined below.

8 Appendix 1 – GIS data and mapping summary

Maps produced for this report need to be read in conjunction with the original reports from which data was sourced, including (but not limited to):

- Salinity Risk Assessment for the Queensland Murray-Darling Region (Biggs, Burton, Cupples, Darr, Minehan & Watling, 2010) ISBN 978-1-7423-0015-3
<http://www.qmdc.org.au/publications/browse/weBSITE-pdfs/land-soils>
- Protecting Queensland's strategic cropping land: A policy framework (DERM, 2010)
<http://derm.qld.gov.au/land/planning/strategic-cropping/index.html>
- Strategic Cropping land – Draft Trigger Map Metadata/limitations
<http://dds.information.qld.gov.au/DDS/Metadata.aspx?uri=aHR0cDovL2dpc2JuZXByZGEwMS5pcS5nb3ZuZXQucWxkLmdvdi5hdS9vdXRwdXQvVE9PTEtJVF9Ccm93c2VftWV0YWRhdGFfUD E4OTA4X1QxMzA4OF9EMzA5NzgueG1>

Reports and data that were reviewed in the derivation of land resource areas, soils and land systems reporting and associated mapping included:

- WLM Land Management Field Manual: Waggamba Shire (QE90014)
- ZBA Lands of the Balonne-Maranoa Area Queensland (CSIRO, 1974)
- MWD Understanding and managing soils in the Murilla Tara and Chinchilla Shires land management manual.
- ITTG Soils of the Inglewood – Tara – Talwood – Glenmorgan Region. QBITB05
- GRT The Granite and Traprock Area of South East Queensland – A Land Inventory and Land Utilisation Study (TB13)
- MCD Central Darling Downs Land Management Manual (Harris, Biggs & Coutts 1999).

The mapping units associated with these reports are sub-divisions of land resource areas and give a broad regional picture only. They are suitable for regional scale planning. Boundaries are approximate and can only be confirmed by field survey. Each mapping unit contains a range of common and associated soils. Users should refer to the field manuals for more information on the use and interpretation of maps, in conjunction with the Soil Summary Sheets.

In general all of the information presented on maps was captured, and should be used at a scale of 1:250,000 or smaller (1:800,000 for the map provided). Thematic maps produced are summarised as follows:

Map #	Description
3-1	Landscapes
3-2	Soil Orders
3-3	Land Types
3-4	Land Use (Secondary)
3-5	Existing GQAL Distribution
3-6	Updated GQAL Distribution
3-7	Strategic Cropping Lands
3-8	Slope Values
3-9	River Networks
3-10	Regional Ecosystems
3-11	Vegetation Corridors
3-12	Mining and Mineral Resources
5-1	Rural Res – Goondiwindi
5-2	Rural Res – Coolmunda
5-3	Rural Industrial
5-4	Horticultural Area
5-5	Macintyre Brok Hort. Area
5-6	Yelarbon Hort. Area
5-7	Dumaresq Hort. Area
5-8	Upper Coolmunda Hort. Area
5-9	Rural Zone Precincts
5-10	Rural Zone Precincts

9 Appendix 2 – Indicative investigation requirements

Data and information for Macintyre Brook is here used to demonstrate suggested investigation requirements for applicants applying to amend minimum lot sizes or block subdivision for intensive agricultural purposes. Information for this case study has been sourced from studies undertaken by the Irrigators Association.

The Catchment

The Macintyre Brook catchment covers an area of approximately 4,193 km². Of the total area, approximately 2,361 ha (only 0.6% of the catchment) is irrigated with the remaining catchment constituting natural vegetation, production forestry, grazing and dryland farming. Most of the irrigation undertaken in the catchment occurs downstream of Coolmunda Dam adjacent to the Macintyre Brook. **Figure A1** shows the location of irrigation areas.

The town of Inglewood is the main community centre within the catchment with Yelarbon bordering on the south-western edge of the catchment. The Cunningham Highway (the main arterial road between Melbourne and Brisbane), runs through the centre of the catchment. Main roads connect to Millmerran in the north, Stanthorpe to the east and Texas to the south. The irrigation areas are mainly located in the Rural B and Rural C precincts of the current Inglewood Shire Planning Scheme.

Regional Suitability for Agricultural Production

Coolmunda Dam is the major storage in the catchment and supplies the Macintyre Brook Water Supply Scheme. The dam serves water users along the Macintyre Brook and beyond Goondiwindi. Coolmunda Dam is situated 11 km east of Inglewood and has a capacity of 69,000 ML. Water is used from the Macintyre Brook Water Supply Scheme to support:

- Irrigation - lucerne, citrus, stone fruit, vines, olives and cereal.

- Urban Water Supplies - The town of Inglewood, bowls and golf clubs.
- Industrial - Stock intensive industries such as feedlots and chicken production companies.

The Border Rivers Resource Operations Plan (ROP) has a nominal volume of 24,997 ML allocated to 114 license holders on the Macintyre Brook Water Supply Scheme *Macintyre Brook Irrigation Area (MBIA)*.

A total of 2,506 ha of land is irrigated in the MBIA. When irrigation was first undertaken in the Macintyre Brook, surface irrigation was the only method. However, due to the undulating topography and lighter soils, this has been phased out over the years. Spray or drip irrigation is undertaken on all but 0.8% of the area.

Irrigation occurs predominantly after releases from Coolmunda Dam. There are only a few on-farm irrigation dams in the MBIA, none of which are used for irrigation. Evidence suggests that there is little to no irrigation of either flood-harvested water or overland flow water in the MBIA except occasionally from a farm dam on one farm.

Current irrigated land use

A wide range of crops are irrigated in the MBIA including lucerne (the dominant crop) and:

- olives
- apples
- grains (sorghum)
- pasture
- pulses
- stone fruit
- grapes
- corn (for silage)
- lavender.

Evidence suggests that several enterprises within the Macintyre Brook Irrigators Association are considering pursuing organic certification. The reported use of fertilizer and pesticide usage within the MBIA is low.

Expansion of irrigation areas

In 2008, the Macintyre Brook Irrigators Association (MBIA) assessed irrigated cropland suitability at a catchment scale. The overall goal

was to evaluate land suitability for an irrigation expansion or retirement assessment on the basis of topography, soil and groundwater objectives. The results indicated that most (95%) of existing irrigated cropping is located in highly suitable and moderately suitable lands in the southwest part of the catchment; suitable areas lie in the north part of the catchment where irrigation could be expanded. The possible expansion north appears to be largely along Canning Creek. In some areas, this extends outside the GRC region.

Whilst this study identified these areas suitable for irrigation expansion, water availability was not included in the evaluation criteria, and so whilst these areas have been identified as suitable from a soil, topography and groundwater perspective, consideration as to the source, volume and reliability of water to service this area would need to be undertaken.

Climate

The average annual rainfall at Inglewood Post Office is 658 mm and 601 mm at Yelarbon Post Office. This rainfall is summer dominant with an average of 65% of the year’s precipitation falling between October and March. The region fits into the broad transitional zone influenced by both tropical northern systems and winter westerly-influenced southern systems.

December is the wettest month of the year with 13.5% of the year’s total rainfall. June through to August is generally dry months. High intensity storms are common over the summer period while winter rain tends to be of lower intensity and is generally more widely spread.

The region experiences hot summer days and warm summer nights with an average January daily maximum temperature of 32.8°C and an average daily minimum of 18.5°C. Winter days are warm with cold night time temperatures. The average daily maximum temperature for July is 17.8°C and the average daily minimum is 2.3°C. The area experiences an average of 55 frost days per year occurring from May to September and approximately 27 days above 35°C occurring between October and April. Diurnal temperature range is significant at approximately 15.5°C

throughout the year. At Inglewood, the daytime temperature exceeds 36.5°C on an average of once each week in December, and the night-time temperature falls below -2.8°C on an average of once each week in July.

Wind rose observations recorded between 1973 and 1985 at the Inglewood Tobacco Research Station indicate that wind predominately blows from the north-east in all months except June and July, when winds are more likely from the south-west.

Topography

The Macintyre Brook catchment is predominantly hilly traprock terrain in the east dropping to lower undulating plains and alluvial areas in the west. The eastern edge of the catchment rises to almost 800m AHD. The lowest elevation in the region is the surrounding areas of the Macintyre Brook River at a minimum elevation of about 240m AHD.

The slope of the land throughout the catchment mirrors the elevation with the lower elevated land having little to no slope with the hilly terrain possessing up to a maximum slope of 80%.

Soils and GQAL Status in the Catchment

Only 7.6% of the catchment is considered Class A land. The majority of the catchment is Class C and therefore only suitable for grazing.

Table 1 – GQAL Assessment of Land Irrigated in the MBIA

GQAL Class	1999 QLUMP	
	Area (ha)	% of Irrigated Area
A	5264	86%
B	71	1%
B2	43	0.7%
C1	69	1%
C2	645	10%
D	26	0.4%

Source: www.macbrook.com.au

The majority of the Class A land is located within the MBIA, with almost 80% of the MBIA being Class A.

FSA Consulting undertook a study involving 79% of irrigated farms in the MBIA in 2009. This study

reports that the predominate irrigated soil is the Grey Kandosol. Table 2 summarises the soil types (based on Harris (1986a)) that are currently irrigated in the MBIA.

Table 2 – Soils Types Irrigated in the MBIA (Harris 1986a)

Soil Type	Area (ha)	% of Irrigated Area
Grey Kandosol	2186	87.3%
Yellow Sodosol	43	1.7%
Brown Sodosol	27	1.1%
Grey Vertosol	51	2.0%
Grey-brown Sodosol	37	1.5%
Leptic Rudosol	75	3.0%
Yellow Sodosol	43	1.7%
Yellow-brown-grey Sodosol	44	1.7%

Source: www.macbrook.com.au

Grey Kandosols represent 48% of the mapped catchment area. They are formed on the most recent alluvial deposits and run along the length of

the Macintyre Brook. Grey Kandosols were divided by McAllister (unpublished) into sand clay loam (levee 1) soils, which are situated closer to the waterway, and silty clay loam (levee 2) soils.

Sixty-five percent of MBIA irrigated land is considered to have low or very low salinity risk.

Figure A2 shows the location of the currently irrigated areas on the salinity risk mapping of the area. There are some areas of high and very high risk, notably land irrigated near Yelarbon.

Site Suitability for Agricultural Production

In addition to regional scale overview assessments, site specific investigations in terms of:

- Projected water use and supply
- Water use efficiency initiatives proposed
- Suitability assessment of soils
- Salinity risk
- Vegetation and biodiversity status
- Proximity to transport and markets
- are proposed.