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Supplementary Report

(Available from Gulf Savannah Development)

- G. Mason: Scoping Brief on the proposed Gilbert River Agricultural Precinct including a Marketing and Gross Margin Analysis Perspective: DEEDI 2009
1. Executive Summary

The Gilbert River in the Gulf Savannah region of northern Queensland has long been identified as having the potential to develop an irrigated agriculture industry. Serious investigations in this regard were undertaken by the Queensland Government from 1998 to 2000, resulting in a proposal to establish ‘Green Hills’ dam. Further investigations have recently been undertaken into the irrigation potential of the region, driven by recent private sector expressions of interest, and its significance as a nation-building and regional development initiative.

The purpose of this report is to provide a balanced summary of the potential of the Gilbert River and to facilitate Government and private sector investment in the irrigated agriculture opportunities.

A recent Scoping Brief on the Proposed Gilbert River Agricultural Precinct examined a production scenario which assumed a dam of 300,000 ML capacity and 100,000 ML annual yield, and principal crops of rice and peanuts. These crops were selected partly based on investment interest. Under this scenario, 100,000 ML of water would be sufficient to irrigate 13,800 ha of land, with a gross annual revenue of $68.5 million and a gross margin per hectare of $830.61. This compares favourably with gross margin projections prepared for the recent expansion of the Ord irrigation area in Western Australia.

Under this scenario, opportunities to also value add to the region’s beef cattle industry have been identified. In addition an estimated $19.2 million of total variable input costs would be expended within the region, to support and grow local business.

The Scoping Brief identified other crops which could be grown in the area but for which further market and production analysis would be required. The option of establishing an organic precinct is also identified, given the significant comparative advantages for organic production that are offered by the region.

Soil assessments undertaken at a 1:100 000 scale have identified 20,984 ha of land that is highly suitable for irrigated agriculture and a further 7,580 hectares that is moderately suitable. Given that the soil assessments only covered 108,000 ha, further soil assessments may identify additional land suitable for irrigated agriculture, allowing for an expansion of the irrigation area.

Numerous indicators point to ongoing socio-economic disadvantage in Gulf Savannah Shires, including for the Gulf’s majority indigenous population. Social impact assessments undertaken in 2000 identified broad local community support for the irrigation area, although some concerns exist over compulsory acquisition of land.

An annual water take-off of around 200,000 ML for Green Hills dam would represent about 4.5% of the Gilbert River’s annual discharge. A statement of environmental values prepared for this report indicates potential concerns regarding downstream impacts and puts a case for further research into the region’s environmental values.

A dam of around 300,000 ML capacity is thought to cost approximately $200 million. A range of supporting investments have also been identified to enhance the profitability of the area, to facilitate private sector investment and to deliver broad regional development outcomes.

A range of compelling competitive advantages exist for establishment of the Gilbert River irrigation area and a strong alignment with national policy objectives has been identified.

This report also reaffirms the commitment of Gulf Savannah Development and Etheridge Shire Council to sustainable economic development and to ongoing discussions with both levels of Government, including seeking funds for the additional research required to progress the project. The report also provides contact points for private sector investment interest.

2. Introduction

The Gilbert River in the Gulf Savannah region of northern Queensland has long been identified as having the potential to develop an irrigated agriculture industry.

Serious investigations in this regard were undertaken by the Queensland Government from 1998 to 2000, resulting in a proposal to establish ‘Green Hills’ dam, named after a property on the Gilbert River. In 2008, Etheridge Shire Council sought further investigations into the irrigation potential of the region, based on its perceived significance as a nation-building initiative and as a driver for regional development. A multi-disciplinary team was convened in early 2009 to look at a range of issues and this report is an output of their work. The purpose of this report is to provide a balanced summary of the potential of the Gilbert River and to facilitate Government and private sector investment in the irrigated agriculture opportunities.

The drivers for this renewed interest in the Gilbert River include:

- the need to address the ongoing socio-economic disadvantage experienced in Etheridge Shire and other parts of the Gulf Savannah region
- recent interest from private sector interests to invest in irrigated agriculture along the Gilbert River
- three quarters of Australia’s current irrigated land area is occurring in catchments nominated as ‘high’ or ‘very high’ risk. In the irrigation regions of the Murray-Darling Basin, north-eastern New South Wales and south-eastern Queensland, multiple factors interact to threaten water resources, including significant development of surface and groundwater resources and recent declines in rainfall in recent decades
- climate change projections forecast further decreases in rainfall for those parts of Australia where irrigated agriculture is currently based, and potential increases in rainfall across Australia’s northern savannas
- global demand for food, and both national and global food security concerns, are driving a push for increased food production
- global and national concerns about fuel security and the need to develop alternatives to fossil fuels, are driving a push for planting of crops to provide ethanol and biofuels.

2020 Summit: Closing Speeches
“...we need to chase the water in the north.....be part of a global response to the world food shortages...”

Tim Fischer and Tony Burke
3. History

The potential of the Gilbert River was recognised from the early days of European settlement, when market gardens were developed around the Gilbert River to feed the large mining population. Formal investigations of the irrigation potential of the Gilbert River commenced in 1997, through the State Government’s Water Infrastructure Task Force. The Task Force evaluated water supply proposals from across the State and recommended a Gulf Region Study be undertaken to identify priorities for water resource development within the region and to confirm the feasibility of individual proposed projects. The Gulf Region Study was identified as a Category 1 (highest priority) project.

In 1998, the Department of Natural Resources produced the report *Engineering Assessment of Storage Options* in partial response to the Task Force’s recommendation. This report identified eleven possible storage development options in the Gulf, mostly located in Etheridge Shire, which were “selected on the basis of ability to serve potentially irrigable land”. One of the options was the North Head dam on the Gilbert River, and associated weirs downstream at Green Hills and Prestwood.

All eleven possible storage options were then subjected to further investigations by the State. The North Head dam was rejected (for several reasons) in favour of a dam at one of two sites on Green Hills station, one costing approximately $30 million and the other approximately $33 million (costings in 1999 dollars). The recommended option was for a dam wall height of 20 metres which would submerge 2,767 ha, and store 131,000 ML, sufficient to irrigate around 7,500 ha. A downstream regulating weir was also proposed at a cost around $4 million. The storage curves for the preferred Green Hills site included an option for a dam wall height of 35.4 metres, which would submerge 12,739 ha and store up to 1,320,000 ML, sufficient to irrigate over 65,000 ha. It seems the recommended size of the dam was indexed to perceptions that land with soils suitable for irrigation was limited to 7,500 ha. It is now known that the available soil is far in excess of 7,500 ha.

The State also prepared a *Social Issues Report* in 2000, which identified social issues that required further consideration and analysis (principal issues were compulsory resumption of land, environmental impacts and labour supply).

Allocation and use of water in the Gulf Savannah is governed by the Gulf Water Resource Plan, which took effect in 2007, and the associated Gulf Resource Operations Plan. When the State began planning for the Gulf Water Resource Plan in 2003, it ruled out development of the Green Hills dam from the outset: “water to accommodate Green Hills Dam will not be accommodated during the life of this Plan due to the lack of an identified economically and ecologically sustainable use. However its viability may be reconsidered through a trigger mechanism if certain criteria are met.”

This exclusion was made notwithstanding the extensive planning undertaken by the State up to 2000, and the findings of the 2006 land and water resource assessment (which accompanied the Gulf Water Resource Plan) that the potential Green Hills Dam on the Gilbert was “considered worthy of further investigation” and would allow a “substantial irrigation development”.

The State’s own evaluation of the Gulf Water Resource Plan process (2008) has found that the planning framework was not appropriate for the Gulf, and reinforces current stakeholder concerns about the Plan: “the water planning framework had been developed to correct the legacy of over-allocated systems and state investment in water resources. In the Gulf, where there has been limited cultivation of water resources… the application of the framework was not as appropriate…”

This report indicates that an economically and ecologically sustainable use of water from Green Hills dam may now exist, based on a gross margin analysis prepared by the Department of Employment, Economic Development and Innovation (DEEDI) in 2009, and expressions of interest received from a number of large agricultural production companies. As such, this could trigger reconsideration of Green Hills dam under the Gulf Water Resource Plan.

A 50-year Regional Water Supply Strategy for North-West Queensland, currently being prepared for the Department of Environment and Resource Management (DERM), is also examining the demand factors underpinning potential growth of irrigated agriculture in the region.
4. Economic Opportunities

As part of the research undertaken for this report, the Queensland Department of Employment, Economic Development and Innovation (DEDEI) prepared a Scoping Brief on the Proposed Gilbert River Agricultural Precinct which included a market analysis and gross margin analysis.

The Scoping Brief is based on an assumption generated from the Department of Environment and Resource Management (DERM), for a dam of 300,000ML capacity that would yield an average annual yield of 100,000ML. An economic assessment of a dam with a larger storage capacity was not included within the Scoping Brief.

The current principal land use in the Gulf region is grazing of beef cattle. There is a small number of cropping developments occurring within the Etheridge Shire (Table 1). These enterprises principally draw upon Gilbert River water.

Table 1: Current Cropping Activity: Etheridge Shire

<table>
<thead>
<tr>
<th>Crop type</th>
<th>Approx area (ha)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangoes</td>
<td>150</td>
<td>Two major enterprises</td>
</tr>
<tr>
<td>Peanuts</td>
<td>70-150</td>
<td>One major enterprise</td>
</tr>
<tr>
<td>Broad acre cropping</td>
<td>70-150</td>
<td>Two major enterprises</td>
</tr>
<tr>
<td>Hay based crops</td>
<td>150-200</td>
<td>3-5 major enterprises</td>
</tr>
</tbody>
</table>

The Scoping Brief looks at three production scenarios:

1. Selected Cropping Options: this scenario looks at crops which are currently grown and crops which required limited market investigation. Under this scenario the principal crops selected were mangoes, peanuts, rice, maize, soybeans, mung bean, melons, pumpkins, fodder crops and a cattle/silage production system. The selection of these crops was supported by expressions of interest received from several large agricultural production companies. This scenario is thus based on a generalised enterprise cropping mixing reflecting production risk strategies, climatic conditions and current market opportunities.

2. Potential Cropping Options: this scenario looks at crops which can be grown in the region but which need further market and production analysis.

3. Cropping Alternatives: this scenario looks at longer term potential cropping and industry alternatives which require in-depth analysis but could have long term economic, social and environmental benefits.

Selected Cropping Options: Under this scenario, the Scoping Brief found that at least two major crops (peanuts and rice) and doubling of the mango production would be required to gain an infrastructural critical mass for this agricultural precinct. This would also be in conjunction with a range of small cropping options. It would appear that this type of cropping mix and production area is required to limit production failure, market distortions and maximise the efficient use of land and water infrastructure.

The findings are summarised in Table 2 and assume the principal crops being rice and peanuts (3000 ha each) plus maize and sorghum. Under this scenario, 100,000 ML of water would be sufficient to irrigate 13,800 ha of land, with a gross annual revenue of $68.8 million.

Table 2: Selected Cropping Options: Snap Shot of the Gilbert River Agricultural Precinct

<table>
<thead>
<tr>
<th>Total Area Under Major Production (ha)</th>
<th>Total Gross revenue - farm gate ($)</th>
<th>Total Variable input costs ($) - adjusted to cropping only</th>
<th>Gross Margin ($ - adjusted to cropping only)</th>
<th>Gross Margin per hecactare ($) - adjusted to cropping only</th>
<th>Total Irrigation Water Used (ML)</th>
<th>Average Irrigation used per hectare (ML/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,800</td>
<td>$68,821,671</td>
<td>$53,258,682</td>
<td>$11,462,990</td>
<td>$830.61</td>
<td>95,550</td>
<td>6.74</td>
</tr>
<tr>
<td>13,800</td>
<td>$68,821,671</td>
<td>$53,258,682</td>
<td>$11,462,990</td>
<td>$830.61</td>
<td>95,550</td>
<td>6.74</td>
</tr>
<tr>
<td>13,800</td>
<td>$68,821,671</td>
<td>$53,258,682</td>
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<td>95,550</td>
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<tr>
<td>13,800</td>
<td>$68,821,671</td>
<td>$53,258,682</td>
<td>$11,462,990</td>
<td>$830.61</td>
<td>95,550</td>
<td>6.74</td>
</tr>
</tbody>
</table>

Table 2 also shows that a gross margin per hectare of $830.61 is projected by the Scoping Brief. This compares favourably with gross margin projections prepared for the recent expansion of the Ord irrigation area in Western Australia (Table 3 refers). The estimate of costs in the Scoping Brief includes costs of water usage, drawing upon rates paid in comparative irrigation areas in North Queensland, but not the costs of buying water allocations.

Potential Cropping Options: the Scoping Brief also identifies a range of other crops that could be grown in the region, including cotton, bananas, cashews, citrus, and horticultural crops. Some of these are higher value crops than those included under the selected cropping scenario. However further market and production analysis would be required to assess whether these crops are commercially viable in the region and to assess their impacts on the gross margins presented under scenario one.

Cropping Alternatives: the Scoping Brief also highlights possible industry and production alternatives such as an organic precinct, aquaculture, forestry and bio energy options for the proposed precinct. However in-depth analysis and research would again be required to evaluate these opportunities.

An organic precinct would open up opportunities for a range of crops which currently have limited market access due to over production and potentially open up new markets both locally and overseas. Advice from the DEDEI Trade and Investment Officer (Primary Industry & Fisheries) has suggested that there is a large export market opportunity for organic grains in Asia and Arabic states which currently cannot be met.

The Gilbert River region is considered to have important comparative advantages for organic production:

- the dry climate means reduced disease, insect and fungal threats. Current producers have reported, for example, that the region has a reduced reliance on herbicides and insecticides as against coastal locations
- as a region which has not been extensively cropped before, this creates a distinctive opportunity for any new agricultural precinct as it could be developed from a base concept where all controls and accreditation would be in place prior to any type of cropping development occurring.

An organic precinct would be perceived as having environmental benefits which could potentially create fewer issues from a planning prospective. This type of precinct would be marketed as a total organic precinct similar to the King Island concept offering special brand recognition in the market and thus potentially attracting a price premium.

This type of concept would be unique within the tropics and offer attributes such as a staple food, tourism destination and possibly create food processing opportunities for the region.

Secondary Benefits: Based on current expenditure patterns, an estimated $19.2 million of the identified total variable input costs for the Gilbert River irrigation area would remain in the local economy annually. However, it is considered that the irrigation area would facilitate establishment and growth of local business within the Gulf Savannah and that the amount of expenditure in the local economy would increase beyond this figure over time. A large agricultural supplies company is already proposing to establish an outlet in Georgetown, for example. Unemployment rates in Gulf Savannah Shires (Etheridge – 5.8%, Croydon – 5.5%, Carpentaria 5.5%) would also be expected to decrease.
## Potential Agricultural Economic Profile for the Gilbert River Precinct

### Summary

<table>
<thead>
<tr>
<th>Agricultural Activity</th>
<th>Area (ha)</th>
<th>Total Water Used (ML)</th>
<th>Volume Sold</th>
<th>Farm Gate Gross Rev ($)</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle Stores (silage)</td>
<td>-</td>
<td>2,500 Head</td>
<td>6,199</td>
<td>4,100,599</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fodder**</td>
<td>800</td>
<td>2,800 Tonnes</td>
<td>6,000</td>
<td>1,000,000</td>
<td></td>
<td></td>
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<tr>
<td>Pumpkins**</td>
<td>500</td>
<td>2,500 Tonnes</td>
<td>9,000</td>
<td>6,750,000</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Peanuts**</td>
<td>3,000</td>
<td>28,000 Tonnes</td>
<td>21,000</td>
<td>12,150,000</td>
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<tr>
<td>Mangoes</td>
<td>300</td>
<td>2,700 Tonnes</td>
<td>3,234</td>
<td>8,061,900</td>
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<tr>
<td>Maize**</td>
<td>2,500</td>
<td>15,000 Tonnes</td>
<td>20,500</td>
<td>6,150,000</td>
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<tr>
<td>Mung Beans**</td>
<td>500</td>
<td>2,000 Tonnes</td>
<td>800</td>
<td>586,672</td>
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<tr>
<td>Navy Beans**</td>
<td>500</td>
<td>2,500 Tonnes</td>
<td>1,100</td>
<td>990,000</td>
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<tr>
<td>Rock/honeydew Melons**</td>
<td>200</td>
<td>800 Tonnes</td>
<td>8,929</td>
<td>7,905,000</td>
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<tr>
<td>Rice**</td>
<td>3,000</td>
<td>25,500 Tonnes</td>
<td>21,000</td>
<td>9,450,000</td>
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<tr>
<td>Sorghum**</td>
<td>1,500</td>
<td>6,000 Tonnes</td>
<td>9,300</td>
<td>2,790,000</td>
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<tr>
<td>Soybeans**</td>
<td>500</td>
<td>2,750 Tonnes</td>
<td>1,250</td>
<td>687,500</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Watermelons**</td>
<td>500</td>
<td>2,000 Tonnes</td>
<td>10,000</td>
<td>8,200,000</td>
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<td>13,800</td>
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<td>68,821,671</td>
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</table>

### Harvesting Seasonality

- **Green**: Harvested during the wet season (December to May)
- **Red**: Harvested during the dry season (June to November)
- **Blue**: Harvested during both seasons

*Note: “* area double cropped in a 12-18 month cropping cycle*
5. Soils

A separate response to the State Water Infrastructure Task Force’s 1997 report was An Assessment of Agricultural Potential of Soils in the Gulf Region (1999), prepared by the former Queensland Department of Natural Resources. This assessment was undertaken at a broad reconnaissance scale (1:1 000 000) and found that the Gilbert River basin had soils with Class 1 suitability for tree crops, banana, row crops, field crops, peanuts, and sugar.

Subsequent detailed soil mapping at a 1:100 000 scale was undertaken by the Department of Natural Resources over a section of the Gilbert River between Chadshunt Station and Green Hills Station. This is the most detailed mapping available over the Gilbert River catchment. Of the approximately 108,000 hectares of land mapped, 20,984.2 hectares was identified as arable land that is highly suitable for irrigated agriculture with negligible to minor limitations, and another 7580.3 hectares was identified as arable land that is moderately suitable for irrigated agriculture with moderate limitations.

For the 20,984.2 hectares identified as arable land that is highly suitable for irrigated agriculture, the soils are typically deep to very deep, well drained on level to gently undulating and undulating plans and rises. The mapping identified that the most limiting attributes would be soil moisture holding capacity/moisture availability on the sandier soils, erosion potential on sloping soils, and low fertility on soils other than the recent alluvials. The study said that the “land has the potential for the sustainable production of a wide range of irrigated land uses climatically suited to the area, with the lowest risks of degradation. Management inputs will be no more than typical best practice for irrigated land management”.

For the 7580.3 hectares identified as arable land that is moderately suitable for irrigated agriculture, these are lands with soils that have a measurably lower potential than the highly suited lands described above due to moderate limitations. Soils and landscapes are superficially similar but the severity of limitations may result from either, or a combination of, a lower moisture availability, low fertility, poorer landscape drainage and lower permeability, moderate soil depth, sodicity, higher erosion potential and steeper slopes.

Many soils, due to their landscape position being lower elevated than the above soils, receive soil moisture from elevated areas in excess of normal rainfall inputs during the wet season that will create short-term waterlogging and drainage problems. The effect of the limitations encountered will necessitate a greater level of management input to prevent degradation and maintain production.

In addition to the highly suitable and moderately suitable soils, the study also found 14460.0ha of limited arable land - arable land that has quite pronounced limited irrigated agricultural potential due to moderate and largely severe limitations. 64834.4ha of the 108,000 ha surveyed was classified as unsuitable land.

Drawing upon this research, a 2004 report prepared for the Gulf Water Resource Plan concluded that “the Gilbert River … alluvial soils appear to be suited to irrigated agriculture … and have few limitations other than those associated with their landscape position”. Further soil analysis along the Gilbert River (beyond the 108,000 ha surveyed at a 1:100 000 scale) may identify more suitable land for irrigated agriculture along the river.

“By 2020, half of the world’s population will be on Australia’s northern doorstep – an estimated four billion people – an increase of 500 million – across Asia, with economic growth of 7% per annum, presents unparalleled opportunities for Australia’s economy, especially our farm sector.”

National Farmers Federation President,
David Crombie, 23 November 2007

Gilbert River Investment Report, 2009
6. Social Context

General characteristics of the Gulf communities include18:
- Welfare reliance
- Low skills levels
- Low education, minimal education facilities
- Low income levels
- Low levels of home and land ownership
- 55% plus of population indigenous.

The Gulf Savannah Shires are classified as disadvantaged19 and the 2007 Financial Sustainability Review by the Queensland Treasury Corporation, classified Carpentaria as ‘Very Weak’ and Etheridge as ‘Moderate’, emphasizing their delicate financial position. A recent Productivity Commission report (Assessing Local Government Revenue Raising Capacity) acknowledged that Councils in remote and rural areas would struggle to increase their revenue from rates “and would remain dependent on grants from other levels of government”20.

This level of disadvantage is evident in Table 4, which shows a comparison between Etheridge Shire and Queensland/ Australia for three key income and education indicators.

Table 4: Key Socio-Economic Indicators: Etheridge Shire21

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Etheridge</th>
<th>Queensland</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Weekly Industrial Income</td>
<td>$84</td>
<td>$476</td>
<td>$466</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$673</td>
<td>$1033</td>
<td>$1027</td>
</tr>
<tr>
<td>Completed Year 12</td>
<td>21.44%</td>
<td>32.77%</td>
<td>33.86%</td>
</tr>
</tbody>
</table>

In 2000, a Social Issues Report was prepared by the Department of Natural Resources to allow for the scanning of social issues that would require further assessment and analysis in later stages of planning for water infrastructure associated with the Gilbert River. The report put forward a range of recommendations “that should be used to develop terms of reference for the social impact assessment component of any future impact assessment study”22.

The report found that:
- there is broader local community support for the dam options due to the perceived development and recreational opportunities
- the dam options will inundate some areas of pastoral leases and will potentially inundate the Green Hills homestead
- the resumption of land will be required with the dam options with no resumption of land required with the weir option
- some local landholders have raised concerns over the compulsory resumption of land around the potential irrigation area
- concerns associated with the options include the environmental impact including the impacts on fisheries located in the Gulf of Carpentaria
- the current local availability of labour in the Etheridge Shire is limited and a strategy would be required on labour market requirements during the associated operational phases.

Subsequent discussions with the community in 2009 indicate that landholders within the irrigation area are concerned that their land may be compulsory acquired if they do not wish to pursue cropping.

Gulf Savannah Development, in partnership with Etheridge Shire Council, launched a five-year Investment and Migration Attraction project in July 2008, which is endeavoring to build labor supply in the region. Other Shires have been supportive of further investigations into the Gilbert River, given perceived broader regional benefits from the project.

It is noted that the area of interest from Chadshunt to Mount Stirling is subject to three separate native title determination applications that have been lodged and registered with the Federal Court. The applications are EWAMIAN #2 QC90/013; EWAMIAN #3 QC05/016; and TAGALAKA #2 QC01/022.

Prior to undertaking any dealing with land or water that may affect or extinguish native title rights and interests, native title issues need to be addressed in accordance with the provisions of the Native Title Act 1993. It may also be necessary to enter into a cultural heritage management plan or plans with the custodian Aboriginal cultural heritage body or bodies.

7. Environmental Context

The Gulf of Carpentaria drainage division is the largest in Australia with a massive 24.4% of the nation’s water runoff23. The Gilbert River catchment has a mean annual discharge of 4,375,000 ML per annum24, of which only 0.81% is currently allocated25. A dam of 300,000 ML capacity with an annual yield of 100,000 ML would require an annual water take-off of around 200,000 ML per annum (taking into account evaporation).

Rainfall records demonstrate that the Gilbert River experiences reliable annual rainfall whereas other rivers in the region may quite regularly miss out at least one year. The Gilbert River thus appears to have some natural advantage over other catchments in the region due possibly to its closer proximity to the east coast and Gulf of Carpentaria rainfall influences and possibly to the nature of the catchment in the Einasleigh Uplands26.

Northern Gulf Resource Management Group (NGRMG) was commissioned to provide a statement of environmental values associated with the Gilbert River for the purpose of this report27.

The report does indicate that potential environmental issues are:
- impacts on downstream wetlands and impacts on the river and its aquatic communities
- impacts on the Gulf of Carpentaria fishing industry.

The report also identifies that:
- the majority of remnant vegetation that would be inundated is not considered to be of current concern
- the majority of vegetative communities within the irrigation area is not considered to be of current concern.

The Vegetation Management Act 1999 regulates the clearing of native vegetation in Queensland. The Act sets the rules and regulations that guide vegetation clearing. It regulates clearing of remnant vegetation on freehold land, and of remnant and some non-remnant vegetation on state tenures.
8. Competitive Advantages

Competitive Advantages of the Gilbert River include:

- The Gilbert River catchment has regular and reliable annual rainfall
- Gulf region projected to have steady/ increased rainfall through climate change (unlike southern Australia)
- Water allocations from the Gilbert River are currently very low and under-utilised
- Growing conditions are highly suitable for a diverse range of crops
- Dry climate means reduced pest and disease loads and thus reduced business inputs/costs
- Irrigation area highly suitable for organic production and establishment of an organic precinct
- The region’s early cropping season opens up market windows and the opportunity for premium prices
- Additional suitable soils already identified and thus scope for expansion into the future
- Competitive land prices
- Opportunities to integrate cropping activities with, and add value to, the established beef cattle grazing industry
- Proximate to Asian export markets and counter seasonality with agricultural production in Asia
- Equidistant to the Ports of Townsville, Cairns and Karumba
- Gulf Development Road runs through the proposed irrigation area
- Gilbert River runs into the Gulf of Carpentaria, thus would not add to environmental pressures on the Great Barrier Reef
- Federal Government policy supports agricultural development in Northern Australia.
9. Investment

It is apparent that Queensland Government policy in recent years has favored private sector investment in water infrastructure that is principally for agricultural purposes. The Federal Government has recently demonstrated a willingness to invest in the ‘social and open access’ infrastructure that would support growth of irrigated agriculture in Northern Australia.

The State’s 1999 cost estimate of $33 million for a 23 metre high dam on the Gilbert River is considered “very approximate”.

A more certain cost estimate for a dam at the Green Hills site requires major investigation including development of a dam arrangement based on current mapping with a high level of geotechnical and hydrologic investigation, a rigorous assessment of general and overhead costs, and allowances for environmental management and compensation costs.

In 2007, consultants were engaged by the Department of Infrastructure and Planning to review cost estimates for Queensland water projects including for the Connors River Dam in Central Queensland, which is closest in size to the Green Hills Dam. Based on recent estimates for the Connors River Dam project, a Green Hills Dam with a storage capacity from 150000 ML to 336000 ML could be expected to cost around $200 million.

Etheridge Shire Council has also identified a range of investments that would facilitate the viability and growth of irrigated agriculture in the region and facilitate broader regional development outcomes. These are summarised in Table 5. Investments could be private sector or Government-led.

Table 5: Supporting Investments

<table>
<thead>
<tr>
<th>Item</th>
<th>Rationale</th>
<th>Indicative Cost (where available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement of Einasleigh River bridge</td>
<td>Improves access into and out of the region during the wet season</td>
<td>$16 million</td>
</tr>
<tr>
<td>Upgrade of Gilbert River Power Supply</td>
<td>Provision of 3-phase power to irrigators to improve the economic efficiency of irrigated agriculture and reduce greenhouse emissions</td>
<td>$5 million</td>
</tr>
<tr>
<td>Upgrade of Hann Highway</td>
<td>To improve access into southern markets for Gilbert River and other North Queensland products</td>
<td>$50 million</td>
</tr>
<tr>
<td>Establishment of Gulf Agricultural College</td>
<td>A ‘virtual’ college to develop appropriate skills among the local community in terms of irrigated agriculture and grazing and promote retention of youth in the region</td>
<td>$2 million</td>
</tr>
<tr>
<td>Upgrade of Health Services, Education Services</td>
<td>To support the increase in population likely to result from irrigated agriculture</td>
<td>n/a</td>
</tr>
<tr>
<td>Improved Housing Supply</td>
<td>To support the increase in population likely to result from irrigated agriculture</td>
<td>n/a</td>
</tr>
<tr>
<td>Indigenous Training and Employment Initiatives</td>
<td>To facilitate indigenous participation in the agricultural economy</td>
<td>n/a</td>
</tr>
<tr>
<td>Upgrade of Port Karumba/ Normanby airport</td>
<td>To facilitate export of product from the Gulf and improve the international competitiveness of Gulf product</td>
<td>n/a</td>
</tr>
<tr>
<td>Mobile Phone coverage at Gilbert River</td>
<td>To improve operational efficiency of Gilbert River producers</td>
<td>$1.5 million</td>
</tr>
</tbody>
</table>
10. Policy Setting

Development of an irrigation area along the Gilbert River would meet a range of national policy objectives. This is elaborated within Table 6.

- Nationally significant due to drying of southern Australia and national food and water security issues
- Would lift national productivity
- Would strengthen Australia’s international competitiveness, especially through proximity to Asia including via the Port of Karumba
- Would develop a region classified as Very Remote and Disadvantaged and would improve the quality of life for Gulf Savannah residents
- Would provide employment opportunities in the construction and agricultural industries.

Table 6: Gilbert River Policy Matrix

<table>
<thead>
<tr>
<th>Policy</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand Australia’s Productive Capacity</td>
<td>- A new irrigation area would increase Australia’s agricultural productive capacity at a time when other agricultural regions are under threat from climate change and over allocation.</td>
</tr>
<tr>
<td></td>
<td>- Suitable soils exist for possible expansion of the area over time, once key infrastructure investments have been made.</td>
</tr>
<tr>
<td></td>
<td>- Investments in human resources and common use infrastructure would also lift productive capacity of the region.</td>
</tr>
<tr>
<td>Increase Australia’s Productivity</td>
<td>- 13,800 ha of irrigated agriculture along the Gilbert River would conservatively generate gross revenue of $68.8 million per annum and provide opportunities for growth of small business in supply of relevant goods and services.</td>
</tr>
<tr>
<td>Diversify Australia’s Economic Capabilities</td>
<td>- A new irrigation area would assist in maintaining the diversity of Australian agricultural industries at a time when other agricultural regions are under threat from climate change and over allocation.</td>
</tr>
<tr>
<td></td>
<td>- Would diversify the economy of the Gulf Savannah region and would add-value to the region’s beef cattle industry through fastening within the region.</td>
</tr>
<tr>
<td></td>
<td>- Investments in human resources and common use infrastructure would also lift economic capabilities and enhance our international competitiveness in Asian markets (eg: Port Karumba).</td>
</tr>
<tr>
<td>Build on Australia’s Competitive Advantages</td>
<td>- The project builds on Australia’s position as a globally significant food exporter.</td>
</tr>
<tr>
<td></td>
<td>- An organic precinct would strengthen Australia’s image as a ‘clean and green’ agricultural producer.</td>
</tr>
<tr>
<td></td>
<td>- Infrastructure investments such as Port Karumba would improved access into Asia for agricultural exports.</td>
</tr>
<tr>
<td></td>
<td>- Develop Australia’s ‘dry tropics’ expertise.</td>
</tr>
<tr>
<td>Develop our Cities/ Regions</td>
<td>- The Gulf Savannah region is classified as Very Remote and Disadvantaged. Irrigation would significantly contribute to wealth creation and retention of wealth within the region.</td>
</tr>
<tr>
<td></td>
<td>- The Gilbert River project would have flow-on benefits for neighboring Shires including the Gulf’s majority indigenous population, as well as for larger service centers such as Cairns and Atherton.</td>
</tr>
<tr>
<td></td>
<td>- Sustainable agricultural production provides long term benefits as compared to the boom and bust cycle of mining.</td>
</tr>
<tr>
<td>Reduce Greenhouse Emissions</td>
<td>- Shifting agricultural production to Northern Australia will reduce transport costs and greenhouse emissions for exports into Asia.</td>
</tr>
<tr>
<td></td>
<td>- Better social infrastructure will facilitate mining workers being resident in the region.</td>
</tr>
<tr>
<td></td>
<td>- Better availability and local delivery of goods and services within the Gulf Savannah will reduce transport costs for residents.</td>
</tr>
<tr>
<td></td>
<td>- Reduced diesel generation costs through improved power supply to the Gilbert River.</td>
</tr>
<tr>
<td></td>
<td>- Possible scope for bio-diesel or hydro power production within the region.</td>
</tr>
<tr>
<td>Improve Social Equity and Quality of Life</td>
<td>- Will facilitate improved economic and social conditions for Gulf Savannah residents.</td>
</tr>
<tr>
<td></td>
<td>- Will provide important employment and training benefits for the region’s indigenous population.</td>
</tr>
<tr>
<td></td>
<td>- Provides a sustainable economic future for the region.</td>
</tr>
</tbody>
</table>

11. Next Steps

Establishment of the Gilbert River irrigation area requires private sector investment, as well as support from both the Federal and State Governments:

- Federal Government investment in the irrigation area, and in the supporting investments identified in Table 5, would facilitate private sector investment, enhance the profitability of the area and deliver significant regional development outcomes
- the State Government would need to address relevant issues including issues under the Vegetation Management Act and the Gulf Water Resources Plan
- private sector investment interest is required to prove the demand for Gilbert River water that would trigger a review of the Gulf Water Resources Plan and to take up the actual production opportunities within the irrigation area.

Gulf Savannah Development and Etheridge Shire Council are committed to an irrigated agriculture area that is environmentally and ecologically sustainable, and will continue discussions with both levels of Government in this regard and will seek to confirm private sector investment interest. Further research will be required to progress this project and an approach will be made to the Commonwealth Government for funds to undertake this work.
Soil Landscapes of the Gilbert River Area - Chadshunt to Mount Sircom

Map 1: Soil Landscapes of the Gilbert River Area - Chadshunt to Mount Sircom

**Soil Landscapes of the Gilbert River Area**

**Chadshunt to Mount Sircom**

- Severely eroded land
- Principal locations
- Stream channels, swamps, dams and other water bodies
- Roads
- Cadastral boundaries

REFERENCE

Soils formed from Quaternary (recent) alluvium on the Gilbert River and its tributaries:
- Well drained, deep, uniform and gradational, massive, brown, sandy loams to loam soils.
- Well drained, deep, gradational, well structured, reddish-brown friable clay loams to fine sand and clays.
- Imperfectly to poorly drained, deep, uniform and gradational, well structured, grey-brown clay loam to clay soils, often sodic and saline.
- Poorly drained, deep, dark gray to dark brown, uniform cracking clay soils, sodic, with carboniferous nodules.

Soils formed from Tertiary-Quaternary (old) alluvium on level to gently undulating plains and undulating rises:
- Well drained, deep, massive and well structured, red duplex soils.
- Moderately drained, deep, massive and well structured, yellow-brown duplex soils.
- Moderately drained, moderately deep, massive, mottled, yellow-grey duplex soils.

Residual and old alluvial soils overlying Tertiary duricrusts on level to gently undulating plains and plateau:
- Deep, massive, yellow gradational and duplex soils.
- Moderately deep, massive, yellow or red-yellow gradational and duplex soils.
- Shallow, pale to yellow, sandy loam to sandy clay loam soils.

Landscapes of the undulating and rolling hills and rises:
- Well weathered Tertiary-Quaternary conglomerate; red to brown clay loam to clay soils with abundant rounded gravels and stones.
- Sedimentary sandstone, mudstone and siltstones with minimal soil profile development.
- Granitic rock with minimal soil profile development; some areas of shallow to moderately deep sandy loam to clay loam soils on lower slopes.
- Rhyolitic rock with minimal soil profile development; some areas of shallow to moderately deep sandy loam to clay loam soils on lower slopes.

Other landscapes of pediments and drainage depressions:
- Moderately to imperceptibly drained, moderately deep to deep, yellow to grey mottled duplex and uniform clay soils; often nodular and sodic.

This map has been derived from a land resources survey undertaken at a scale of 1:100,000 by the Queensland Department of Natural Resources and Water, Mareeba.


Gilbert River Investment Report, 2009
Map 2: Agricultural Potential of the Gilbert River Area - Chadshunt to Mount Sircom

This map has been derived from a land resources survey undertaken at a scale of 1:100,000 by the Queensland Department of Natural Resources and Water, Mareeba.


Legend

- Arable land, land suitable for a wide range of irrigated land uses with negligible to minor limitations (20,984 ha)
- Arable land, land suitable for a range of irrigated land uses due to moderate limitations (7,580 ha)
- Soil Survey Boundary (107,859 ha)

- Principal locations
- Stream channels, swamps, dams and other water bodies
- Roads
- Cadastral boundaries

Kilometres
1:100,000

Gilbert River Investment Report, 2009
Map 4: Gilbert River - Chadshunt to Mount Sircom - Native Title

**Legend**
- **Locality**
- **Project Boundary**
- **Rivers and Creeks**
  - Major Rivers and Creeks
  - Minor Tributaries
  - DCDB - Tenure
- **Native Title**
- **Name and Number**
  - EWAMIAN #2 QC99/013
  - EWAMIAN #3 QC01/016
  - TAGALAKA #2 QC01/022

**Disclaimer**
While every care is taken to ensure the accuracy of this information, the Department of Natural Resources and Water makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which might be incurred as a result of the information being inaccurate or incomplete in any way and for any reason.

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Map 5: Gilbert River In Context

<table>
<thead>
<tr>
<th>Name</th>
<th>Area (ha)</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilbert river catchment</td>
<td>4,600,000</td>
<td>887</td>
</tr>
<tr>
<td>Irrigation area</td>
<td>98,000</td>
<td>103</td>
</tr>
</tbody>
</table>

Data sources:
- Green hills station supplied by QLD EPA 2004
- Important wetlands supplied by Geoscience Australia 2008
- National parks & reserves supplied by Dept. QLD Natural Resources and Water 2007
- Cadastral boundary supplied by QLD EPA 2004

Accuracy statement:
Length and area measures are approximate and do not include lakes.
Due to varying sources of data, spatial locations may not coincide when overlaid.
Map 7: Gilbert River Proposed Irrigation Area - Vegetation Management Status

GILBERT RIVER PROPOSED IRRIGATION AREA
Vegetation Management Status

Vegetation management status Land use
- Of Concern - Dominant
- Of Concern - Sub-dominant
- Not Of Concern
- Cropping
- Irrigated cropping
- Perennial horticulture
- Reservoir/dam
- Services
- Transport and communication
- Utilities

Cadastral boundary
- Proposed irrigation area
- Homestead
- Freshwater sawfish capture

Data origin note:
- Landuse based on QLUMP 1999 supplied by Dept. QLD Natural Resources and Water 2007
- Regional Ecosystems version 5.2 supplied by EPA 2009
- Roads, homesteads, drainage 250K Geodata supplied by Geoscience Australia 2008
- Catchment boundaries, Cadastre supplied by Dept. QLD Natural Resources and Water 2007

Accuracy Statement
- Area measurements do not consider terrain due to varying sources of data, spatial locations may not coincide when overlaid.

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Map 8: Green Hills Damsite - Inundation Mapping

Vegetation management status
- Cleared / regrowth
- Of Concern - Dominant
- Of Concern - Sub-dominant
- Not Of Concern
- Water

<table>
<thead>
<tr>
<th>Dam Site</th>
<th>Inundation</th>
<th>Area (km²)</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Hills</td>
<td>128</td>
<td>32</td>
<td>5180</td>
</tr>
</tbody>
</table>

Dam wall 26 metres
Green hills station
Cadastral boundary
250 metre estimated inundation
Track
250K drainage
Major
Minor
Homestead

Data origin note:
Imagery SPOT5 10xi July 2006 supplied by RGC spatial imagery project 2006
Contours created from SRTM 3 second DSM product supplied by Geoscience Australia 2007
Drainage, roads, homesteads 250K Geodata supplied by Geoscience Australia 2008

Accuracy Statement
Damsite and size only indicative and not to scale
Inundation only indicative, calculated at 250 metre elevation using SRTM 1 second DSM supplied by Geoscience Australia 2009
Due to varying sources of data, spatial locations may not coincide when overlaid.

Projection: UTM Zone 54
Datum: GDA94

Map production: Northern Gulf Resource Management Group Ltd
March 2009

Gilbert River Investment Report, 2009
12. Investment Enquiries

Investment enquiries in relation to the Gilbert River irrigation area should be directed to:

Cr Warren Devlin  
Mayor, Etheridge Shire  
mayor@etheridge.qld.gov.au  
Phone: (07) 40 621 233 or mobile 0458 621 233

Rob Macalister  
Chief Executive Officer, Gulf Savannah Development  
ceo@gulf-savannah.com.au  
Phone: (07) 40 311 631 or mobile 0447 167 092

Footnotes:

1p.273, CSIRO, An overview of climate change adaptation in Australian primary industries, February 2008
2p.659, ABARE, Australian Commodities, December 2007
4p.7, Department of Natural Resources Gulf Region Study - Engineering Assessment of Storage Options, July 1998
5Department of Natural Resources, Water Infrastructure Planning - Gulf Region Social Issues Report, February 2000
7p.68-9, Department of Natural Resources, Mines and Energy, Gulf and Mitchell Agricultural Land and Water Resource Assessment Report, 2004
8Executive Summary, TriAct, Collaborative Water Planning: Retrospective Case Studies: Water Planning in the Gulf of Carpentaria, May 2008

It needs to be noted that the projections in the Scoping Brief only give indicative likely outcomes of the proposed cropping income, production and water consumption streams. It does not indicate the profitability or viability of the proposed Gilbert River agriculture precinct.

10p. 6, G. Mason, op. cit
11p. 17, G. Mason, op. cit
12p. 28, East Kimberley Development Package: Expanding the Ord, Government of Western Australia, 2008
13The 2009 GSD report Economic Leakage in the Gulf Savannah identified that households, organizations and, in particular, small business, were purchasing a high-level of goods and services outside of the region. A 2007 Tropical Savannah CRC report (Regional Economic Multipliers in Australia's Tropical Savannah) found that, in 'very remote' areas across Northern Australia, the agriculture industry spent 0.36% of their revenue locally.
14Department of Natural Resources: An Assessment of Agricultural Potential of Soils in the Gulf Region, 1999
15p. 29, Department of Natural Resources, Mines and Energy, Gulf and Mitchell Agricultural Land and Water Resource Assessment Report, 2004
17County Matters: Social Atlas of Rural and Regional Australia, Commonwealth Government 2004
19ABS Census Results 2006
20p. 4, Department of Natural Resources, Water Infrastructure Planning, Gulf Region Social Issues Report, February 2000
21Table 5, State of the Environment: Inland Waters, Environment Australia, 2001
23p.45, Department of Natural Resources and Water, Gulf Draft Water Resource Plan, 2006
24personal communication: DERM May 2009
26p. 8-9, R. Greiner op. cit
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28personal communication: DERM, 2009
Gulf Savannah