BURDEKIN SHIRE COUNCIL
NATURAL DISASTER
RISK MANAGEMENT STUDY

Revised Report Parts A and B – Identification, Assessment and Mitigation of Natural Disaster Hazards

JULY 2003

Study Manager:
Graham J Webb
Burdekin Shire Council
PO Box 974
Ayr Qld 4807

Prepared by:
David Kelly
dkelly@qrmc.com.au
0407 754 041
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABBREVIATIONS</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>1. EXECUTIVE SUMMARY</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>2. SUMMARY OF PROJECT PLAN</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>3. PROBLEM DEFINITION AND ESTABLISHMENT OF THE CONTEXT</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>4. HAZARD IDENTIFICATION</strong></td>
<td>17</td>
</tr>
<tr>
<td><strong>5. RISK ANALYSIS AND EVALUATION</strong></td>
<td>19</td>
</tr>
<tr>
<td><strong>6. NEXT STEPS</strong></td>
<td>21</td>
</tr>
<tr>
<td><strong>ATTACHMENT 1:</strong> DISASTER RISK MANAGEMENT STUDY COMMITTEE MEMBERSHIP</td>
<td>22</td>
</tr>
<tr>
<td><strong>ATTACHMENT 2:</strong> COMMUNICATION PLAN</td>
<td>23</td>
</tr>
<tr>
<td><strong>ATTACHMENT 3:</strong> PROBLEM DEFINITION AND ESTABLISHMENT OF CONTEXT</td>
<td>25</td>
</tr>
<tr>
<td><strong>ATTACHMENT 4:</strong> ESTABLISHMENT OF THE RISK MANAGEMENT STRUCTURE</td>
<td>28</td>
</tr>
<tr>
<td><strong>ATTACHMENT 5.0:</strong> DEVELOPMENT OF RISK EVALUATION CRITERIA</td>
<td>31</td>
</tr>
<tr>
<td><strong>ATTACHMENT 5.1:</strong> MEASURES OF CONSEQUENCE</td>
<td>34</td>
</tr>
<tr>
<td><strong>ATTACHMENT 5.2:</strong> MEASURES OF LIKELIHOOD</td>
<td>35</td>
</tr>
<tr>
<td><strong>ATTACHMENT 5.3:</strong> RISK ANALYSIS MATRIX</td>
<td>36</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.1:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: CYCLONE, CATEGORY 1 - 5</td>
<td>37</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.2:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: FLOODING OF THE BURDEKIN RIVER</td>
<td>40</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.3:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: FLOODING OF THE HAUGHTON RIVER</td>
<td>73</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.4:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: BURDEKIN RIVER BRIDGE CLOSURES</td>
<td>88</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.5:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: MAJOR LOCALISED FLOODING</td>
<td>89</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.6:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: STORM SURGE/TIDE – COASTAL, RIVERS &amp; FLATS</td>
<td>90</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.7:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: BUSHFIRES</td>
<td>113</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.8:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: EARTHQUAKES AND TREMORS</td>
<td>117</td>
</tr>
<tr>
<td><strong>ATTACHMENT 6.9:</strong> IDENTIFICATION AND DESCRIPTION OF HAZARDS: LANDSLIDE/SLIP</td>
<td>120</td>
</tr>
<tr>
<td><strong>ATTACHMENT 7:</strong> IDENTIFICATION AND DESCRIPTION OF COMMUNITY AND ENVIRONMENT</td>
<td>122</td>
</tr>
<tr>
<td><strong>ATTACHMENT 8:</strong> COMMUNITY VULNERABILITY PROFILE</td>
<td>129</td>
</tr>
<tr>
<td><strong>ATTACHMENT 9.1:</strong> RISK DESCRIPTION REGISTER – URBAN CYCLONES (CAT 1-3) (FORMS A9 &amp; A10)</td>
<td>135</td>
</tr>
</tbody>
</table>
ATTACHMENT 9.2: RISK DESCRIPTION REGISTER – URBAN CYCLONES (CAT 4-5) (FORMS A9 & A10) ................................................................. 142
ATTACHMENT 9.3: RISK DESCRIPTION REGISTER – URBAN – BURDEKIN RIVER FLOODING (24 HOUR WARNING) (FORMS A9 & A10).... 149
ATTACHMENT 9.4: RISK DESCRIPTION REGISTER – URBAN - HAUGHTON RIVER FLOODING (12 HOUR WARNING) (FORMS A9 & A10).... 154
ATTACHMENT 9.5: RISK DESCRIPTION REGISTER – URBAN LOCALISED FLOODING – AYR, HOME HILL & BRANDON (FORMS A9 & A10) ................................................................................................... 159
ATTACHMENT 9.6: RISK DESCRIPTION REGISTER – URBAN & RURAL BURDEKIN RIVER BRIDGE CLOSURE – AYR - HOME HILL (FORMS A9 & A10)........................................................................... 163
ATTACHMENT 9.7: RISK DESCRIPTION REGISTER – RURAL CYCLONES (CAT 1-3) (FORMS A9 & A10) ................................................................. 167
ATTACHMENT 9.8: RISK DESCRIPTION REGISTER – RURAL CYCLONES (CAT 4-5) (FORMS A9 & A10) ................................................................. 174
ATTACHMENT 9.9: RISK DESCRIPTION REGISTER – RURAL - BURDEKIN RIVER FLOODING (FORMS A9 & A10) ................................................................. 181
ATTACHMENT 9.10: RISK DESCRIPTION REGISTER – RURAL – HAUGHTON RIVER FLOODING (FORMS A9 & A10) ................................................................. 186
ATTACHMENT 9.11: RISK DESCRIPTION REGISTER – RURAL LOCALISED FLOODING (FORMS A9 & A10) ................................................................. 191
ATTACHMENT 9.13: RISK DESCRIPTION REGISTER – BUSHFIRE - URBAN (FORMS A9/A10) ...................................................................................... 200
ATTACHMENT 9.14: RISK DESCRIPTION REGISTER – BUSHFIRE – RURAL (FORMS A9/A10) ...................................................................................... 204
ATTACHMENT 9.15: RISK DESCRIPTION REGISTER – EARTHQUAKE/TREMOR - URBAN & RURAL (FORMS A9/A10) ...................................................................................... 209
ATTACHMENT 9.16: RISK DESCRIPTION REGISTER – LANDSLIDE/SLIPS - RURAL - ISOLATED EVENTS (FORMS A9/A10) ................................................................. 214
ATTACHMENT 10: IDENTIFICATION AND EVALUATION OF TREATMENT OPTIONS (FORM A11).............................................................................. 218
ATTACHMENT 11: RISK TREATMENT ACTION AND MONITORING SCHEDULE (FORM A12) ...................................................................................... 224
ATTACHMENT 12: DETAILED RISK ACTION (DISASTER MITIGATION) PLANS (FORM A13) RISK ACTION (DISASTER MITIGATION) PLAN........ 226
ATTACHMENT 13: TREATMENT STRATEGY DEVELOPMENT (FORM A14)...................................................................................... 276
ATTACHMENT 14: TREATMENT STRATEGY DEVELOPMENT - PAST YEARS (FORM A14/1) ...................................................................................... 296
## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA</td>
<td>Building Code of Australia</td>
</tr>
<tr>
<td>BoM</td>
<td>Bureau of Meteorology</td>
</tr>
<tr>
<td>BSC</td>
<td>Burdekin Shire Council (Client)</td>
</tr>
<tr>
<td>CDRS</td>
<td>Counter Disaster &amp; Rescue Services</td>
</tr>
<tr>
<td>DDCG</td>
<td>District Disaster Control (Group)</td>
</tr>
<tr>
<td>DMR</td>
<td>Department of Main Roads</td>
</tr>
<tr>
<td>DNR&amp;M</td>
<td>Department of Natural Resources &amp; Mines</td>
</tr>
<tr>
<td>LCD</td>
<td>Local Counter Disaster (Plan/Committee)</td>
</tr>
<tr>
<td>QRMC</td>
<td>QRMC Risk Management (Appointed Consultant)</td>
</tr>
<tr>
<td>RACQ</td>
<td>Royal Automobile Club of Queensland</td>
</tr>
<tr>
<td>RFS</td>
<td>Rural Fire Services</td>
</tr>
<tr>
<td>SAG</td>
<td>Study Advisory Group</td>
</tr>
<tr>
<td>SES</td>
<td>State Emergency Service</td>
</tr>
<tr>
<td>F&amp;RS</td>
<td>Urban Fire &amp; Rescue Services</td>
</tr>
</tbody>
</table>
1. EXECUTIVE SUMMARY

Burdekin Shire Council (BSC) commissioned a review on natural disasters affecting the Shire against a backdrop of the history of incidents in the Shire and the current emphasis on improved methods of managing proactively, the physical environment in which natural disasters occur.

The Shire has released a Counter Disaster Plan (October 1998) that provides a basis for managing disasters when a crisis arises. The Plan is supported by Standing Operating Procedures for the Disaster Coordination Centre (October 2000). The Plan was subsequently updated to include an Animal Disease Emergency Plan, at the request of the Department of Primary Industries (December 2000). The approach is intended to provide for process improvements in the description and analysis of natural hazards and other disasters and the development of responsive strategies that proactively and reactively address the defined risks.

This review is being undertaken in the context of the earlier events and release of guidelines for the Local Government sector. The project is being undertaken in accordance with the principles contained in the Risk Management Standard, AS/NZS 4360:1999 with reference to "how to" guides released on this topic by the Department of Emergency Services and the text, "Disaster Risk Management" by Zamecka and Buchanan.

The Council formed a Study advisory group (Natural Disaster Risk Management Committee, Study Advisory Group) (SAG). The Committee membership includes the Mayor, two Councillor representatives, Council CEO, senior Council staff and key stakeholder representatives. The details are provided in Attachment 1.

The SAG decided that the Study would examine the following natural hazards against a framework that differentiates the hazards in terms of location (Urban and rural) and the related consequences within the community:

- Cyclones (Category 1 – 5); *
- Flooding of the Burdekin River;
- Flooding of the Haughton River;
- Burdekin River Bridge Closures;
- Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
- Coastal Storm Surge;
- Landslide/slip;
- Bushfire; and
- Earthquake/tremor.
* A review of past events suggested that Categories 1-3 and 4-5 be examined separately.

The SAG agreed that Burdekin Dam failure would be considered under Flooding of the Burdekin River/Burdekin River Bridge Closures. In addition, it was recognised that Council had commissioned detailed technical studies for (1) Coastal Storm Surge and (2) Flooding – Giru, Home Hill and Ayr. The findings from these studies were not available to the SAG when the original Natural Disaster Risk Management Study was completed (April 2002). Accordingly, the SAG used its best endeavours and reviewed existing evidence to assess residual risks associated with these hazard areas.

This updated report includes a commentary on the findings of these new technical studies together with consideration of impacts on proposed mitigation measures.

The first stage of the risk identification process led to the identification, assessment and prioritisation of key priority risks in the Burdekin Shire as:

**URBAN:**

**High Priority:**

1. Storm Surge – Major Inland Towns (M28-H68)
2. Storm Surge – Minor Inland Towns (L12-H68)
3. Cyclone (Cat 4-5) – People (H66)
4. Burdekin River Bridge Closure - People (H60)
5. Burdekin River Bridge Closure – Commercial Infrastructure (H60)
6. Earthquake/tremor (L4-H60)
7. Cyclone (Cat 1-3) – People (H56)
8. Cyclone (Cat 1-3) – Residential Infrastructure (H52)
9. Localised Flooding – Council Infrastructure (H44)

**Medium Priority:**

10. Burdekin River Flooding – People (M36)
11. Haughton River Flooding – People (M36)
12. Cyclone (Cat 4-5) – Residential Infrastructure (M36)
13. Burdekin River Flooding – Residential Infrastructure (M36)
14. Haughton River Flooding - Residential Infrastructure (M36)
15. Cyclone (Cat 4-5) – Commercial Infrastructure (M36)
16. Burdekin River Flooding – Commercial Infrastructure (M36)
17. Cyclone (Cat 4-5) – Council Infrastructure (M36)
18. Burdekin River Flooding – Council Infrastructure (M36)
19. Haughton River Flooding – Council Infrastructure (M36)
20. Burdekin River Bridge Closure – Council Infrastructure (M32)
21. Cyclone (Cat 1-3) – Commercial Infrastructure (M28)
22. Cyclone (Cat 1-3) – Council Infrastructure (M28)  
23. Cyclone (Cat 1-3) – Natural Environment (M28)  
24. Bushfire – Urban (M28)  
25. Localised Flooding - People (M24)  
26. Localised Flooding – Residential Infrastructure (M24)  
27. Localised Flooding – Commercial Infrastructure (M24)  
28. Localised Flooding – Natural Environment (M24)

**RURAL:**

**Extreme Priority:**

1. Storm Surge – Coastal Communities – Cyclone Cat 1-5 (E68-E76)  
2. Storm Surge – Other Components (H48-E76)

**High Priority:**

3. Cyclones (Cat 4-5) – People (H52)  
4. Cyclones (Cat 1-3) – People (H44)

**Medium Priority:**

5. Burdekin River Flooding – People (M36)  
6. Haughton River Flooding – People (M36)  
7. Cyclone (Cat 4-5) – Residential Infrastructure (M32)  
8. Localised Flooding - People (M28)  
9. Cyclone (Cat 1-3) – Residential Infrastructure (M28)  
10. Burdekin River Flooding – Residential Infrastructure (M28)  
11. Haughton River Flooding (Residential Infrastructure – (M28)  
12. Localised Flooding – Residential Infrastructure (M28)  
13. Cyclone (Cat 1-3) – Council Infrastructure (M28)  
14. Cyclone (Cat 4-5) – Council Infrastructure (M28)  
15. Burdekin River Bridge Closure – Council Infrastructure (M28)  
16. Haughton River Flooding – Council Infrastructure (M28)  
17. Localised Flooding – Council Infrastructure (M28)  
18. Cyclone (Cat 1-3) – Natural Environment (M28)  
19. Cyclone (Cat 4-5) – Natural Environment (M28)  
20. Burdekin River Flooding – Natural Environment (M28)  
21. Haughton River Flooding – Natural Environment (M28)  
22. Localised Flooding – Natural Environment (M28)

**Low Priority:**

23. Bushfire – Rural (L12)  
24. Landslide/slip – Rural (L12)
A review of current mitigation strategies being applied by BSC reveals an extensive range of activities that are directly aimed at priority areas identified during previous natural disaster events. The emphasis of Council on flood mitigation and storm surge studies and dealing with the preparation for and consequences of natural disasters provides evidence of this resolve. BSC and the Shire’s key stakeholders involved in natural disasters speak highly of the cooperation and collaboration between the agencies and large sector operators such as Main Roads, Telstra and Ergon Energy.

It would appear from the community consultation process employed that community awareness and preparedness may be directly related to the community’s experience of past events. The low attendance at public meetings, discussed further in Attachment 2, highlights this concern. The role of an extensive education program proposed in the Detailed Risk Action (Disaster Mitigation) plan is crucial.

The endorsed mitigation strategies include the following:

1. Review the role and function of the Local Counter Disaster Committee and revise the Local Counter Disaster Plan (in keeping with the new requirements) to ensure the focus is on strategic natural (and man-made) disasters (Prevention, Preparedness, Response and Recovery), rather than responsive strategies for individual incident management through:
   a) Review of key emergency service capability and development of appropriate education/training programs;
   b) Establishment of an annual calendar of events including an annual table top scenario exercise;
   c) Establishment of regular meeting schedules of the Committee including member education and presentations by key agencies (e.g. CDRS, SES, UF&RS, RFS, and Police etc);
   d) Establish a risk based recovery clean up system;
   e) Identify extent of equipment and personnel that may be able to be used in emergency situations such as bushfires and flooding events etc (water carriers, transport, dozers and graders) in the rural home site, rural residential and rural parts of the Shire;
   f) Identify key/lead agencies that contribute to the Shire disaster mitigation process and through the annual emergency planning exercise, identify gaps in service provision and develop integrated actions across the sector
   g) Develop a comprehensive public education program for key areas of risk (see also 2).
2. Develop a comprehensive Public Education Program (including new residents, residents, tenants, schools and tourists, and rural sector members):

   a) What to do (pre event, during and post event);
   b) Where to go, who to call, when to evacuate;
   c) Role of emergency services (SES, Police, Fire & Rescue), for key hazards (including the development of a coordinated education plan) to ensure professional and consistent presentations;
   d) Public education about clean up options prior to cyclone season;
   e) Reinstate the pre-cyclone clean up of yards (fee free);
   f) Identify key home based medical support equipment which may be affected by services failure (e.g. electricity) and develop resident information kits;
   g) Review and adopt as appropriate, recommendations/advice incorporated into the various reports on Cyclone Aivu, that can be addressed through public education programs;
   h) Identify self support education solutions (e.g. use of neighbours and relatives during emergencies inc. emergency accommodation) and incorporate outcomes into the LCDP, SOPs;
   i) Examine the options to improve educational opportunities through the community FM radio station;
   j) Increase community awareness about the safe use of emergency generators, impact of structural damage and fallen power lines;
   k) Examine options to increase availability of emergency accommodation;
   l) Provision of education to the community about bridge crossing safety;
   m) Identify early warning and remedial action strategies to support outlying communities (limited numbers of personnel) (see also 1).

3. Consider an increased coordination role of Council in the resumption of key commercial services through the identification of and support for strategies that allow commercial businesses to return to normal activities (e.g. additional building surveyors and certifiers to process & assess damage/applications).

4. Review and seek funding and approval for key/outstanding recommendations from (1) the Brandon Flood Study; (2) the Town of Ayr Flood Study; the Town of Home Hill Flood Study; (3) the Giru Flood Study and (4) the Burdekin Shire Storm Surge Study.
5. Develop a brief and lobby/encourage Government to build a second crossing of the Burdekin River and (2) development/construction of temporary by pass arrangements during periods of bridge closure.

6. Develop a Shire wide alternative emergency garbage disposal system in association with Thuringowa S/TCC.

7. Develop an emergency Council staffing service model (staff required to work in Council facilities on their home side of the River).

8. Identify utility service shortcomings and develop remedial strategies with the service providers.

9. Review and update the Evacuation & Recovery Plan (under the LCDP), evaluate needs and capacity of evacuation centres and develop a response and coordinated plan in association with welfare agencies with specific attention to the suitability and appropriateness of Dalbeg and Millaroo community halls for emergency accommodation (see also Action 1, 2, 4 & 7).

10. Evaluate and if feasible, develop Mt Kelly water supply.

11. Support the Haughton River Trust to develop solutions and future studies for the effects of river flooding (see also Giru Flood Study – Action 4).

12. Develop an alternative strategy for emergency waste removal – inability to access to the Giru transfer station (Donohue Road).

13. In conjunction with the Water Trust and SunWater, review the Water Resources Burdekin Falls Dam Emergency Action plan as it affects the Shire.

14. Develop a risk based annual Asset Management operational plan for timber bridge, culvert and drain maintenance/replacement that is consistent with the identified areas of risk identified in this Study and longer term requirements of the Shire.

15. Identify and consult with DMR about roads and infrastructure that are the responsibility of DMR that are affected by significant flooding events using a risk based assessment process, as part of the annual performance agreement process.

The work to date is encouraging and provides a useful basis for the development of further mitigation strategies to enhance the overall approach being taken.
2. SUMMARY OF PROJECT PLAN

Burdekin Shire Council (BSC) gained approval and sought submissions for the conduct of a Disaster Mitigation Plan Study. QRMC – Risk Management (QRMC) was appointed initially 14 August 2001 to facilitate the Study and subsequently to update the Study, following receipt by Council of reports (some draft) on commissioned Studies on Storm Surge and Flood Studies for Ayr, Home Hill and Giru.

The methodology proposed in the Tender response was one based on project planning with extensive document review, consultation with key stakeholders, research and analysis, within the context of the Risk Management Standard, AS/NZS 4360:1999, Disaster Risk Management, by Zamecka and Buchanan, together with the associated readings on Counter Disasters. The plan was presented to the SAG for endorsement, at the first meeting. The key project risks were considered to be (1) failure to deliver appropriate outcomes against the requirements of the consultancy brief and (2) failure to deliver project outcomes on time. QRMC undertook to manage these risks in conjunction with the Natural Disaster Risk Management Committee (SAG).

2.1. STUDY AIM

The aim of the Study is to increase community safety through identification, analysis, evaluation and treatment of certain natural hazards/risks, defined below, within the area of the Burdekin Shire:

- Cyclones (Category 1 – 5); *
- Flooding of the Burdekin River;
- Flooding of the Haughton River;
- Burdekin River Bridge Closures;
- Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
- Coastal Storm Surge;
- Landslide/slip
- Bushfire; and
- Earthquake/tremor.

* A review of past events suggested that Categories 1-3 and 4-5 be examined separately.

The Study aim was also to develop the Shire’s Disaster Mitigation Plan for identified significant hazards affecting the Shire and its community.
The Study was undertaken to provide an initial view of the risks within the Shire and identify what additional treatment options are necessary to deal with those risks.

A significant element of the process was consideration of how reduction in disaster risk can protect the community against economic failures brought about by disasters.

The first stage of the risk identification process led to the identification, assessment and prioritisation of key high priority risks in the Burdekin Shire as:

**URBAN:**

**High Priority:**
1. Storm Surge – Major Inland Towns (M28-H68)
2. Storm Surge – Minor Inland Towns (L12-H68)
3. Cyclone (Cat 4-5) – People (H66)
4. Burdekin River Bridge Closure - People (H60)
5. Burdekin River Bridge Closure – Commercial Infrastructure (H60)
6. Earthquake/tremor (L4-H60)
7. Cyclone (Cat 1-3) – People (H56)
8. Cyclone (Cat 1-3) – Residential Infrastructure (H52)
9. Localised Flooding – Council Infrastructure (H44)

**Medium Priority:**
10. Burdekin River Flooding – People (M36)
11. Haughton River Flooding – People (M36)
12. Cyclone (Cat 4-5) – Residential Infrastructure (M36)
13. Burdekin River Flooding – Residential Infrastructure (M36)
14. Haughton River Flooding - Residential Infrastructure (M36)
15. Cyclone (Cat 4-5) – Commercial Infrastructure (M36)
16. Burdekin River Flooding – Commercial Infrastructure (M36)
17. Cyclone (Cat 4-5) – Council Infrastructure (M36)
18. Burdekin River Flooding – Council Infrastructure (M36)
19. Haughton River Flooding – Council Infrastructure (M36)
20. Burdekin River Bridge Closure – Council Infrastructure (M32)
21. Cyclone (Cat 1-3) – Commercial Infrastructure (M28)
22. Cyclone (Cat 1-3) – Council Infrastructure (M28)
23. Cyclone (Cat 1-3) – Natural Environment (M28)
24. Bushfire – Urban (M28)
25. Localised Flooding - People (M24)
26. Localised Flooding – Residential Infrastructure (M24)
27. Localised Flooding – Commercial Infrastructure (M24)
28. Localised Flooding – Natural Environment (M24)
RURAL:

Extreme Priority:

1. Storm Surge – Coastal Communities – Cyclone Cat 1-5 (E68-E76)
2. Storm Surge – Other Components (H48-E76)

High Priority:

3. Cyclones (Cat 4-5) – People (H52)
4. Cyclones (Cat 1-3) – People (H44)

Medium Priority:

5. Burdekin River Flooding – People (M36)
6. Haughton River Flooding – People (M36)
7. Cyclone (Cat 4-5) – Residential Infrastructure (M32)
8. Localised Flooding - People (M28)
9. Cyclone (Cat 1-3) – Residential Infrastructure (M28)
10. Burdekin River Flooding – Residential Infrastructure (M28)
11. Haughton River Flooding (Residential Infrastructure – (M28)
12. Localised Flooding – Residential Infrastructure (M28)
13. Cyclone (Cat 1-3) – Council Infrastructure (M28)
14. Cyclone (Cat 4-5) – Council Infrastructure (M28)
15. Burdekin River Bridge Closure – Council Infrastructure (M28)
16. Haughton River Flooding – Council Infrastructure (M28)
17. Localised Flooding – Council Infrastructure (M28)
18. Cyclone (Cat 1-3) – Natural Environment (M28)
19. Cyclone (Cat 4-5) – Natural Environment (M28)
20. Burdekin River Flooding – Natural Environment (M28)
21. Haughton River Flooding – Natural Environment (M28)
22. Localised Flooding – Natural Environment (M28)

Low Priority:

23. Bushfire – Rural (L12)
24. Landslide/slip – Rural (L12)

2.2. DISASTER RISK MANAGEMENT STUDY TEAM

The Council formed a Natural Disaster Risk Management Committee (SAG),
details of which are provided in Attachment 1.
2.3. COMMUNICATION PLAN

The BSC Consultancy brief provided direction in terms of stakeholder consultation requirements. The SAG developed a communication plan, details of which are provided in Attachment 2. Stakeholder contributions to the Study outcomes to date have been commendable, with open communication being achieved. Consultation will occur with adjacent Shire representatives as the Study evolves.

2.4. ESTABLISHMENT OF THE RISK MANAGEMENT STRUCTURE

The physical and time boundaries of the Study, methods of communication and analysis of hazards, community vulnerability as well as an expression of expected outcomes is provided in Attachment 4.
3. PROBLEM DEFINITION AND ESTABLISHMENT OF THE CONTEXT

A description of the scope and nature of issues that comprise the Study Context are provided in Attachment 3. The risk acceptance criteria are provided in Attachments 5.1 – 5.3.

3.1. METHODOLOGY

The initial approach involved the examination of all existing studies and findings, including counter disaster measures. Documentation associated with planning, risk assessments and community concerns were identified and the issues reviewed.

Discussions were held with the SAG and appropriate objectives agreed in relation to the scope and approach to be adopted in the conduct of the Study.

Consultation with key stakeholders will occur to determine concerns and opinions.

Research into other jurisdictions where Disaster Management Plans have included the aspect of mitigation were identified and examined. National and International best practice standards will be researched and where appropriate the findings applied to the determinations for this Study.

Site visits were undertaken by QRMC with a senior Council Officer to all key areas of risk to assist determinations made on the level of impact to the community in the event of a natural disaster. Meeting discussion included technical information with the view to exploring historical processes, developing a list of issues and the extent of current mitigation strategies. The presence of strong river height recording and predicting systems for the Burdekin and Haughton River systems provides a very useful basis of assessing proactive and reactive strategies, given the extensive Council data held. The emergency procedures for the Burdekin Falls dam produced by SunWater also provide a very useful basis for determining responsive strategies.

Findings were collated into progress documents for review by the SAG.
3.2. GUIDING PRINCIPLES

The framework in which the project is structured reflects the Disaster Risk Management Guidelines issued by the Department of Emergency Services in July and September 2000 and updated 9 February 2001 (version 3.3). These guidelines embrace the principles and processes of the Risk Management Standard, AS/NZS: 4360 in which a logical sequential approach is applied to the identification, analysis and development of treatments to risks. All identification, analysis and development of treatment strategies to address the various risks incorporated the relevant legislative requirements and legal compliance requisites.

Examples include the State Counter-Disaster Organisation Act 1975, recognising that this Act is not prescriptive of process. It enshrines the position of local governments as the primary custodian of responsibility to manage disasters, including natural disasters. Commonwealth legislation dealing with the NDRA has been observed.

Other relevant legislation: Local Government Act 1993, Building Act 1975 and relevant financial management subordinate legislation have been considered where appropriate.
4. HAZARD IDENTIFICATION

4.1. HAZARDS

The SAG met to agree the key hazards and risk evaluation criteria. It was agreed by the SAG that the key hazards are:

- Cyclones (Category 1 – 5); *
- Flooding of the Burdekin River;
- Flooding of the Haughton River;
- Burdekin River Bridge Closures;
- Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
- Coastal Storm Surge;
- Landslide/slip
- Bushfire; and
- Earthquake/tremor.

* A review of past events suggested that Categories 1-3 and 4-5 be examined separately.

It was agreed that risks would be considered on two fronts, within the context of (1) the Urban areas of Burdekin and (2) Rural sector, being the remainder of the Shire. Detailed descriptions are provided in Attachments 6.1.to 6.9.

4.2. IDENTIFICATION AND DESCRIPTION OF COMMUNITY AND ENVIRONMENT


Mobility/immobility is seen as crucial factors in describing the ability of the community to deal with the immediate impact of a natural disaster. The presence of aged members of the community and Schools requires consideration. The high volume of traffic through the Shire from visitors and commercial transport requires some consideration.

The study has considered the impact on at risk groups (including the disabled regardless of age), subject to availability of data, namely:

- Older people (65 years and over)
- adult (18 – 65 years)
- youth (15 – 18 years)
- child (<15 years)
The age distribution data (2001) suggests that 22.0% of the population are 15 and under. The age grouping from 15 to 64 represents 64.1%, down from 65.3% (1996), while 13.9% of the population is 65 or over, up from 1996 (12.6%), suggesting an ageing population.

Attachment 7 provides demographic information on the BSC.

4.3. COMMUNITY VULNERABILITY PROFILE

It is recognised that certain groups or individuals are more susceptible to hazards than others in the community. The same principle applies equally to the public and private infrastructure. The ability of Council and other public sector providers to maintain its roads, bridges, water supply, waste removal, power and communications as well as community systems and support during emergencies, all contribute to the well being of the community during a crisis. It is acknowledged that BSC has an emergency power supply attached to the Shire Offices at Ayr that has the capacity to drive the Shire key water supply and sewerage systems if the main power supply fails.

The level of vulnerability depends on both the characteristics of the community and the nature and severity of the hazard when it arises. While the Counter Disaster plan has clear directions with regard to evacuation accommodation points, the unpredictable nature of natural disasters requires that decisions to open such centres must be made by the appropriate authority at the time rather than providing such information in advance. It is of no value and possibly dangerous for the community to move to a venue to find it inhabitable due to damage. It is acknowledged that fear is strong determinate of action on the part of the community. The Counter Disaster measures must therefore acknowledge the presence of fear and the need for orderly, clear, appropriate and timely communication.

A summary of the Community’s vulnerability profile is provided in Attachment 8.

4.4. RISK DESCRIPTION REGISTER

The SAG considered and developed a profile of the hazards facing the Shire. The findings are provided in Attachment 9 (Risk Description Register).
5. RISK ANALYSIS AND EVALUATION

Risks have been considered in the context of the effect of economic loss on the community and its ability to respond in the short to medium term. Consideration has also been given to the likelihood of risk escalation and frequency of events as well as the political implications of actions and responses. For the purpose of this Study, risks have been considered within the following sub-categories:

- Social environment (People);
- Built Environment (Residential, Commercial and Council/Utility Infrastructure); and
- Natural environment.

Further details are provided in Attachment 5.0

The Preliminary Risk Evaluation Criteria adopted for the study follows:

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human &amp; Social Factors</td>
<td>Loss of life and serious injury is unacceptable; Significant damage to homes causing homelessness is unacceptable; Significant damage to cultural and heritage sites is unacceptable.</td>
</tr>
<tr>
<td>Built Environment</td>
<td>Loss of engineering lifelines for more than 24 hours is unacceptable; Extensive and widespread damage to buildings is unacceptable; Loss of critical transport infrastructure and routes is unacceptable; Damage to critical utility services that makes them inoperable is unacceptable.</td>
</tr>
<tr>
<td>Natural Environment</td>
<td>Long term deterioration of water and soil quality is unacceptable; Significant loss of ecological habitat is unacceptable; Loss of threatened or endangered species is unacceptable.</td>
</tr>
<tr>
<td>Economic Loss</td>
<td>It is unacceptable that medium-long term viability of commerce in the Shire is impaired; Significant damage or loss to crops, horticulture and stock is unacceptable; Major economic loss to the community generally is unacceptable.</td>
</tr>
<tr>
<td>Risk Escalation</td>
<td>It is unacceptable that new developments in the Shire occur in areas identified as subject to unacceptable risk from natural disasters.</td>
</tr>
<tr>
<td>Risk Frequency</td>
<td>It is unacceptable that localised hazardous events isolate communities for more than one day.</td>
</tr>
<tr>
<td>Manageability</td>
<td>It is unacceptable that any risks which can be managed within normal Council budget are left untreated for more than one year, once identified.</td>
</tr>
</tbody>
</table>

(Adapted from Disaster Risk Management, Zamecka and Buchanan (1999)).
5.1. CONSEQUENCES

The SAG reviewed options available to it and chose to adopt the Consequence table covered in Zamecka and Buchanan (p96) and reproduced in Attachment 5.1.

5.2. LIKELIHOOD

The SAG reviewed options available to it and chose to adopt the Likelihood table provided in Attachment 5.2 that is based on AS/NZS 4360 and that offered in Zamecka and Buchanan.

5.3. RISK RATING MATRIX

The SAG reviewed options available to it and chose to adopt the Risk Rating Matrix provided in Attachment 5.3 that is based on AS/NZS 4360 and that offered in Zamecka and Buchanan but provides further differentiation in the area of risk prioritisation.

5.4. RISK EVALUATION REGISTER

The SAG considered the risks identified in Attachment 9 and developed the Risk Treatment Evaluation worksheet, provided at Attachment 10.
6. NEXT STEPS

The Risk Register (Attachment 9) together with the Risk Treatment Action Plans and Treatment Development Strategy sheets (Attachment 12 and 13), will provide the core documents for ongoing review and monitoring purposes. Other documents such as the Community Vulnerability Profile (Attachment 8) will require annual review and update as necessary, particularly as community demographics change. The outcomes of the 2001 Census have been incorporated into this revised report.

Council will consider and implement adopted actions within agreed time frames, subject to availability of funding, balance against the emergence of new priorities. The process will be reviewed and monitored by Council over the coming period to ensure the achievement of agreed outcomes. The Mitigation Plan itself will be reviewed on an annual basis to ensure currency and appropriateness.
ATTACHMENT 1: DISASTER RISK MANAGEMENT STUDY
COMMITTEE MEMBERSHIP

Chair

- Mr John Woods  Mayor (Chair)  4783 9800

Members

- Mr Graham Webb  Chief Executive Officer  4783 9800
- Mr Trevor Williams  Director of Works  4783 9800
- Mr Gary Keane  Technical Supervisor  4783 9800
- Cr Treena List  Councillor  4783 9800
- Cr Llew Davies  Councillor  4783 9800
- Mr Paul McAlonan  District Manager, Disaster Operations, Counter Disaster and Rescue Services (Northern District)  4722 1113
- Mr Kody Royal  SES Controller  4783 5411
- Snr Sgt Mick Isles  Officer in Charge, Queensland Police, Ayr  4783 5888

Facilitator

- Mr David Kelly  Senior Consultant, QRMC Risk Management  3229 1744
ATTACHMENT 2: COMMUNICATION PLAN

Communication with Executive Management

Shire Councillors will be provided with briefings at normal Council meetings. Senior Council managers will be briefed at critical stages as required.

Communication with the Natural Disaster Risk Management Committee (SAG)

Communication with the Committee (SAG) members is continuous with updates provided at Committee meetings. The Council provides copies of minutes to members as soon as possible after the meeting for action as agreed. Minutes are confirmed at the next available meeting.

Communication within Burdekin Shire Council (BSC)

Council staff will be briefed at critical stages as required by the Chief Executive Officer and or delegate.

Communication with External Agencies

Council has identified the critical external agencies that need to be consulted, in the Consultancy brief. The key stakeholder group will include the Burdekin Local Government Counter Disaster Committee together with representatives of:

- Department of Main Roads
- Department of Transport
- Department of Natural Resources
- Bureau of Meteorology
- Queensland Environmental Protection Agency
- Telstra
- Ergon
- Queensland Ambulance Service
- Department of Primary Industries

QRMC will undertake this task in consultation with Council officers. Arrangements will be made for both one on one and or group meetings as required at critical stages. All such meetings will be documented by QRMC.
Communication with the Community

Community consultation will occur once the SAG has endorsed draft documents that provide clarity about the expected Study direction in terms of hazards, understanding about consequences of such events on the community, current mitigation strategies, likelihood of such events occurring and ranking. It is expected that a second round of community consultation will occur once the SAG has reviewed the Study draft report and outcomes in terms of future treatment options and implementation strategies.

The Consultancy brief required two (2) separate series of six (6) meetings in each round in the townships of Ayr, Home Hill, Brandon, Clare, Millaroo and Dalberg. The SAG reviewed this matter in light of outcomes to date and agreed that only one series of meetings will be held at each of Clare, Home Hill, Ayr and Giru. An advertisement was placed in the Ayr Advocate on 14 November 2001. Meetings were held 22 and 23 November 2001, attended by Mr David Kelly and a representative of Council. Attendance was lower than expected, despite meeting times being arranged for morning, afternoon and night, indicating community awareness or unpreparedness due to complacency. Meeting notes were maintained and further discussed by the SAG and reinforced the need for increased community education.
Problem Definition

The Burdekin Shire covers approximately 5,067 square kilometres. It is located in the northern area of Queensland and is approximately 90 km by road south of Townsville. The Shire lies on the eastern edge of the Great Dividing Range and the towns of Ayr, Brandon, Home Hill located in the Burdekin River delta. The towns of Clare, Millaroo and Dalbeg are located along the Burdekin River on the eastern side of the Great Dividing Range and below the Burdekin Dam. The town of Giru is located on the flood plain of the Haughton River. A dam is constructed across the Burdekin River which along with the under-ground water table provides a continuous agricultural water supply for the vast agricultural area.


1996 population data indicates a Shire distribution with Ayr being the largest centre with approximately 8,697 residents, together with the towns of Home Hill (3,071), Brandon (883), Giru (436), Kalamia (363), Clare (157), Millaroo (103), Dalbeg (46), Jarvisfield (39), Groper Creek (37) and Rita Island (28), with the remainder residing in small rural communities.

The Shire experiences a humid, hot temperature climate, with a concentration of rainfall in the warmer half of the year and a fairly high degree of rainfall variability. Average annual rainfall is 1,076mm. Daytime temperatures are in the range of 20 – 39 degrees for most of the year, although short periods of heat wave conditions can be experienced.

The Shire’s wealth is based on primary production (mainly sugar cane), though other products such as mangos and melons are increasing in capacity, together with some secondary industries, which support those industries. Other crops include grains, cucumbers, capsicums, green beans, pumpkins, rockmelons, honeydew melons, watermelons and mangoes. The Shire recognises the enormous potential to expand horticultural production. In broad terms, the eastern half of the Shire is largely agriculture land while the western sector is cattle grazing.

Major transport infrastructure is comprised of the north coast railway line running through the Shire from Cairns to Brisbane and the declared main roads network. Major feeder roads are the Ayr/Dalberg Road, Ayr/Kirknie Road and Clare area to the Bruce Highway. In addition there is a well-developed network of Shire roads.
The Shire has experienced problems with cyclones, storms and floods affecting townships within the Shire. The Burdekin and Haughton River basins have traditionally been prone to flooding. Counter disaster mitigation plans have been implemented, evaluated and successively improved over several years to address high priority concerns.

The Council has maintained a history of natural events with financial records for events from March 1988 to 30 June 2001 indicating total actual expenditure of $10,329,342 on relief from natural disasters. The Shire experienced six (6) successive years of drought with the effect that the underground water table declined progressively as a result of demand outstripping supply. The water table has been described as liquid gold and is a crucial part of sustainable development.

The Shire, during the period from 1987 to 2001 experienced a series of cyclones and district flooding. The most severe cyclones were “Charlie” (1988) and “Aivu” (1989). The latter was accompanied by a tidal surge that devastated the coastal strip. Severe flooding occurred during each of the years from 1988 with the exception of 1992, 1993, 1995, 1996 and 1999. The flooding was associated with cyclones or rain depressions at or near the Burdekin Shire. Records indicate that the town of Giru has been inundated on 31 occasions in the last 23 years. The towns of Ayr, Home Hill and Alva Beach experienced major problems in a violent storm on 19 January 2001 when systems recorded 26,200 lightning strikes within 1 hour at the height of the storm.

Clients and Stakeholders

Stakeholders include:

- Burdekin Shire Council (BSC)
- Emergency Response Agencies
- Counter Disaster Committee
- Shire residents
- Farmers
- Rural Graziers
- Primary Production Industry support groups
- Tourism Industry
- State and Federal Government agencies
- Commercial and Industrial businesses
- Visitors

Factors that affect the Risk Management Process
The Council Mission Statement and Corporate Values clearly enunciate the focus on community safety, risk management and counter disaster obligations. These statements are translated into actions within the corporate, capital and annual operating plans. Council has spent a significant portion of its capital and operational budgets on flood mitigation and support strategies in the Shire.

Council is clearly committed to the principles of Disaster Risk Management.

A Counter Disaster Plan (October 1998), that follows traditional practice is in place and reviewed periodically. Council recognises the definition of risk provided in AS/NZS 4360:1999 as well as the definition of risk provided by AGSO (Granger and Hayne, 2001) (Natural Hazards & the risks they pose to South-East Queensland) – “the expected number of lives lost, persons injured, damage to property and disruption of economic activity due to a particular natural phenomenon”.

The Council understands its obligations about land use and places strict compliance requirements on applications.

The Council is active in its responsibilities as they relate to the following legislative directives:


**Commonwealth:** Natural Disaster Relief Arrangements, Emergency Management Australia – Best Practice Guidelines, Natural Disaster Mitigation Strategy, and National Landcare Program.

**Other:** AS/NZS 4360:1999 Risk Management Standard.

**Other Issues**

The risk of public and private infrastructure damage either through cyclonic conditions, high winds, falling rain or rising floodwaters remains a serious concern to the BSC, in Urban and rural areas.
ATTACHMENT 4: ESTABLISHMENT OF THE RISK MANAGEMENT STRUCTURE

Physical and Time Boundaries of the Study

The SAG undertook an initial assessment of the likely hazards facing the Shire. The Disaster Risk Management process was applied to the key risks. It is expected that Part A of the Study will be completed by the end of November 2001.

Methods and Time Boundaries of the Study

The Council chose to develop a Consultancy brief and seek expressions of interest from experienced consultants to develop a Study response. A consultative approach has been adopted that combines Council’s experience in its affairs, participation of key stakeholders, consultation with the community, facilitation by the Consultant and research of historical records and trends. The underlying expectation is the development of opportunities to address the consequences of natural disasters proactively. The principles espoused by the National Disaster Relief Arrangements (NDRA) have been applied.

Terms of Reference, Goals and Objectives

The Study was undertaken within stated risk management guidelines. Specific objectives were confirmed with the SAG:

- To identify critical areas of concern in terms of essential services
- To detail specific risks which will result in significant loss in the event of a natural disaster
- To examine existing strategies for dealing with those risks and rank the risks through an evaluation process
- To develop mitigation strategies to minimise potential loss to the community in the event of a natural disaster
- To identify indicative costs of measures that may be required to reduce uncertainties about assumptions made during this initial process
- To develop a monitoring program to measure the effectiveness of the mitigation strategies.
Expected Outcomes

The scope of the Study will encompass the major natural disasters impacting the Shire including:

- Cyclones (Category 1 – 5); *
- Flooding of the Burdekin River;
- Flooding of the Haughton River;
- Burdekin River Bridge Closures;
- Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
- Coastal Storm Surge;
- Landslide/slip;
- Bushfire; and
- Earthquake/tremor.

* A review of past events suggested that Categories 1-3 and 4-5 be examined separately.

The Study examined the effect on the population, existing infrastructure, and emergency response capability in the event of any of the above occurrences. This review considered the relevance and capacity of current systems to cater for natural disasters.

The Consultancy Brief specifies a two stage Study reporting process, with a progress report expected after Stage 1 (Identification and Analysis of Risks) (Part A). Stage 2 (Part B) will cover the Evaluation and recommendations for Treatment of Risks and the development of a mitigation strategy. The total Study will provide:

- Risk Evaluation Criteria
- Identification and Description of Hazards
- Identification and Description of Community and Environment
- Community Vulnerability Profiles
- Risk Register (Parts A and B)
- Identification and Evaluation of Treatment Options
- Treatment Strategy Development
- Risk Treatment Action and Monitoring Schedule

Extent and Comprehensiveness of the Risk Management Activities

The Disaster Risk Management process will be applied to each of the agreed hazards identified above within the constraint of the budget.
Type of Analysis and Expression of Outcomes

The principles of AS/NZS 4360:1999 Risk Management Standard will form the basis of the review. Analysis of the identified hazards will be undertaken in conjunction with the SAG, with the initial results discussed with key community stakeholders. The Consultant will use its expertise to undertake an analysis of the outcomes for presentation to the SAG and Council. The outcomes are expected to assist the Council in its planning for natural disasters through a revision of the Burdekin Counter Disaster plan, and the development of contemporary mitigation measures that are developed in response to the identified hazards. The overall goal is to improve strategies to deal with natural disasters and their impact on the economic and social life of the community.

Parameters and Sequence Activities

The Terms of Reference described herein, provides a description of the steps to be undertaken which will include:

- Review management structures, systems and processes
- Review available information and information sources
- Identify factors that influence outcomes for the hazards
- Describe the community and its vulnerability
- Establish unacceptable risks and prioritise same
- Develop treatment options and identify recommended treatments
- Develop Part A and B reports and present to the SAG.

Other Issues

It is expected that the process will assist Council to consider future options to reduce uncertainty.
ATTACHMENT 5.0: DEVELOPMENT OF RISK EVALUATION CRITERIA

The SAG has decided that the Study will be undertaken through consideration of the hazards on Urban and rural areas. The Committee decided that the Urban areas would include the towns of Ayr, Home Hill, Brandon, Giru, Clare and Alva Beach. Each of the remaining townships and rural communities in the Shire will be considered and described within a rural context.

Human and Social Factors

This includes possible significant loss of life and injury as well as significant disruption to the community, within the context of the community descriptors identified in the body of the report.

Social Environmental – People

This involves possible significant loss of life and injury as well as significant disruption to the community.

Mobility/immobility are seen as crucial factors in describing the ability of the community to deal with the immediate impact of a natural disaster. The presence of Nursing Homes and Schools are secondary factors under consideration.

The Study has considered the impact on at risk groups namely:

- elderly (65 years)
- adult (18 – 65 years)
- youth (15 – 18 years)
- child (<15 years)

Built and Natural Environment

Consideration is given to the effects on built structures within the community and the scale of natural environmental degradation that may arise in the event of a natural disaster.

Built Environment

This includes the effect on built structures within the community across the dimensions of:

Residential
- residential housing
- units and duplexes
• aged care facilities

**Commercial**
- hotels, motels, caravan parks and other short term accommodation
- retail businesses, supplies, offices and shops
- other commercial enterprises (e.g. small industry – manufacturing, storage, distribution and other wholesale enterprises)

**Community Infrastructure**
- public facilities and services provided by Council, state and federal government agencies
- electricity supply
- water supply and sewerage
- waste removal
- telecommunications
- emergency services and rescue (e.g. Police, Fire and Ambulance)
- hospital and community health services
- schools and other education facilities
- social, church, library, day care and voluntary services
- airport, rail and transport infrastructure
- roads, footpaths, bridges and drainage
- fuel supplies

**Natural Environment**

This includes the effect and scale of natural environmental degradation. It has been considered in the context of the following:

**Urban**
- sporting and recreation facilities
- parks and gardens

**Rural**
- pastoral holdings
- dams and waterways
- Council and state forests and reserves

**Economic Loss**

Consideration is given to the impact of a natural disaster on the economy of the Shire and the impact of the loss on the community.
Risk Escalation

Consideration is given to the impact of the “do nothing” option and whether the situation may stay the same, get better or worse.

Risk Frequency

Consideration is given to the frequency of the risk arising.

Legal and Social Justice Implications

Consideration is given to the legal implications of the risks and actions taken by Council to mitigate against those risks. The Council place importance on the impact natural disasters have on the community and the reliance the community places on public institutions such as Councils. Those in greatest need or most susceptible to harm in natural disasters require special attention through social justice obligations.

Political Implications

Consideration is given to the political fall out of the risks and consequences and the likely reaction of the community to actions or decisions to take any action or no action at all.

Manageability

Consideration is given to the ability of the Council, key support groups and service providers to manage the risks during emergencies.
<table>
<thead>
<tr>
<th>Level</th>
<th>Descriptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insignificant</td>
<td>No fatalities; no injuries; low financial loss; little disruption to community; no measurable impact on environment.</td>
</tr>
<tr>
<td>2</td>
<td>Minor</td>
<td>Small number of injuries; no fatalities; first aid treatment required; some displacement of people (very short period of time (&lt;24hrs)); some personal support required; some damage; some disruption (&lt;24hrs); small impact environment with no lasting affects; some financial loss.</td>
</tr>
<tr>
<td>3</td>
<td>Moderate</td>
<td>Medical treatment required; no fatalities; some hospitalisation; displacement of people (24hrs); personal support satisfied through local arrangement; localised damage which is rectified by routine arrangements; normal community functioning with some inconvenience; some impact on environment with long-term effect; significant financial loss.</td>
</tr>
<tr>
<td>4</td>
<td>Major</td>
<td>Extensive injuries; fatalities; significant hospitalisation; large number displaced (&gt;24 hrs); external resources required for personal support; significant damage that requires external resources; community only partially functioning; some services unavailable; some impact on environment with long term effects; significant financial loss - some financial assistance required.</td>
</tr>
<tr>
<td>5</td>
<td>Catastrophic</td>
<td>Large numbers of severe injuries; extended and large numbers requiring hospitalisation; general and widespread displacement for extended duration; significant fatalities; extensive personal support; extensive damage; community unable to function without significant support; significant impact on environment and/or permanent damage; huge financial loss - unable to function without significant support.</td>
</tr>
</tbody>
</table>
## ATTACHMENT 5.2: MEASURES OF LIKELIHOOD

<table>
<thead>
<tr>
<th>Level</th>
<th>Descriptor (as per AS4360)</th>
<th>Description (as per AS4360)</th>
<th>Quantification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Almost Certain</td>
<td>The event is expected to occur in most circumstances</td>
<td>More than once per year</td>
</tr>
<tr>
<td>B</td>
<td>Likely</td>
<td>The event will probably occur in most circumstances</td>
<td>At least once in 5 years</td>
</tr>
<tr>
<td>C</td>
<td>Possible</td>
<td>The event might occur at some time</td>
<td>At least once in 10 years</td>
</tr>
<tr>
<td>D</td>
<td>Unlikely</td>
<td>The event could occur at some time</td>
<td>At least once in 30 years</td>
</tr>
<tr>
<td>E</td>
<td>Rare</td>
<td>The event may occur only in exceptional circumstances</td>
<td>Less than once in 30 years</td>
</tr>
</tbody>
</table>
## ATTACHMENT 5.3: RISK ANALYSIS MATRIX

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Consequence</th>
<th>Insignificant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>A. Almost certain</td>
<td>5</td>
<td>M  52</td>
<td>H  64</td>
<td>E  76</td>
<td>E  88</td>
<td>E  100</td>
</tr>
<tr>
<td>B. Likely</td>
<td>4</td>
<td>M  44</td>
<td>H  56</td>
<td>H  68</td>
<td>E  80</td>
<td>E  92</td>
</tr>
<tr>
<td>C. Possible</td>
<td>3</td>
<td>L  36</td>
<td>M  48</td>
<td>H  60</td>
<td>E  72</td>
<td>E  84</td>
</tr>
<tr>
<td>D. Unlikely</td>
<td>2</td>
<td>L  28</td>
<td>L  40</td>
<td>M  52</td>
<td>H  64</td>
<td>E  76</td>
</tr>
<tr>
<td>E. Rare</td>
<td>1</td>
<td>L  20</td>
<td>L  32</td>
<td>M  44</td>
<td>H  56</td>
<td>H  68</td>
</tr>
</tbody>
</table>

**Legend**

- **E**: Extreme risk; immediate action required
- **H**: High risk; senior management attention needed
- **M**: Moderate risk; management responsibility must be specified
- **L**: Low risk; manage by routine procedures
ATTACHMENT 6.1: IDENTIFICATION AND DESCRIPTION OF HAZARDS: CYCLONE, CATEGORY 1 - 5

Hazard Description

1. Urban and Rural

The Burdekin Shire is located near the tropics and has a high likelihood of being inundated by a cyclone. The distinction between a storm and a cyclone for the purpose of this Study is largely the presence of strong winds and heavy rain associated with an identified cyclone. Damage and hazards may arise in the same manner as a storm though the intensity, high winds and sudden impact may be greater. Cyclone strength is measured by wind velocity. The descriptions of the five categories are:

- Category 1 = Wind gusts 90 – 125km/h
- Category 2 = 125 – 170 km/h
- Category 3 = 170 – 225km/h
- Category 4 = 225 – 280 km/h
- Category 5 = > 280km/h

It is recognised that there are several aspects of cyclones that must be considered when reviewing risk and determining remedial actions. Research suggests that the following require consideration:

- The relatively short cyclone record;
- Reliability considerations (pre and post 1969);
- The characteristics of cyclones (e.g. size and coastal crossing speed);
- Cyclone frequency versus intensity;
- Effect of Greenhouse gasses;
- Natural variability of cyclones;
- Size of the Shire and location of towns and villages;
- Extent of Urban and rural spread (coast areas are more vulnerable than inland sectors).

Council has maintained significant records of recent cyclonic events, including a detailed descriptive and social review of cyclone Aivu (April 1989). This data has provided useful information on which policy and procedural changes have been made. The current Shire Counter Disaster Plan reflects this experience.

The Burdekin Shire coastal area has been subjected to many recent major tropical cyclones events, with the cyclone centres primarily being
located in the area between Cape Tribulation and Mackay. The following cyclonic events have been noted:

- Tessi (April 2000);
- Rona (February 1999);
- Nathan (March 1998);
- Justin (March 1997);
- Gillian (February 1997);
- Celeste (January 1996);
- Rewa (January 1994);
- Aivu (April 1989);
- Charlie (February 1988);
- Kerr (February 1979);
- Otto (March 1977);
- Vera (January 1974);
- Gertie (February 1971);
- Ada (January 1970);
- 1959 (February 1959);
- 1958 (March 1958);
- Agnes (March 1958);
- 1956 (January 1956);
- 1945 (March 1945);
- 1943 (February 1943);
- 1942 (February 1942);
- 1910 (January 1910).

Tropical Cyclone Aivu (April 1989), has been extensively documented by the Bureau of Meteorology and Burdekin Shire Council. The cyclone made landfall between Home Hill and Inkerman on 4 April with a central pressure of 957 hPa and wind gusts in the vicinity of 200 km/h. Moderate flooding of the Don River was reported during Tuesday 4 April 1989.

The Beach Protection Authority conducted a review of tropical cyclone Charlie (February 1988). This cyclone crossed the coast on 1 March with a central pressure of 972 hPa, between Ayr and Cape Upstart.

The James Cook University Study released as an interim report (October 1989) entitled “The effects of Cyclone Aivu on the Burdekin Shire”, provides a useful set of actions for the cyclone season:

- Practical tasks (clearing, tidying, cutting back etc);
- Public information and advice;
- Preparedness;
- Establishing a Welfare Committee;
- And the role of the Counter Disaster Organisation.
There is evidence that Council has considered the impact of these findings and taken action to incorporate useful strategies into the Counter Disaster Plan.

The data provided by the Department of Primary Industries on rainfall at Burdekin is provided at the end of Attachment 6.2.

2. Current Treatments

Burdekin has a well-developed emergency response infrastructure in place and a developed Counter Disaster Plan (October 1998) and Standing Operating Procedures (October 2000), that covers responsive strategies associated with Cyclones.

3. Secondary Hazards

The aftermath of cyclones is usually classed as a rain depression and may add further complications should the rain continue and create flooding problems.

There are no expected events that are not mentioned above.
ATTACHMENT 6.2: IDENTIFICATION AND DESCRIPTION OF HAZARDS: FLOODING OF THE BURDEKIN RIVER

Hazard Description

1. Urban and Rural – Burdekin Dam

The Burdekin Falls Dam is the largest dam in Queensland, with the capacity to hold four times the amount of water in Sydney Harbour. The dam wall is 876 metres long, with a 504-metre spillway, which drops 37 metres to the streambed. The structure creates a body of water known as Lake Dalrymple, which at full capacity holds about 1,860,000 megalitres of water.

The Burdekin Shire Council Flood Reporting Centre is located in the Council chambers and monitors the water levels in the Burdekin River. Following heavy rains in one or more of the river catchments, floodwaters can break out of the Burdekin River in its lower reaches. The Reporting Centre continually monitors water levels at critical points along the river and is activated when floodwaters are expected. Warnings are conveyed to residents and visitors via radio and television. The Bureau of Meteorology also releases flood warnings but the Council Centre, through its decades of data and knowledge is able to offer a reliable service. The Council produces community literature of likely flood break out points. Reliable predictive correlations have been determined between river height at the Inkeman Bridge (Home Hill) and lower reaches breakout.

The Department of Primary Industries, Water Resources Commission (SunWater) has developed a model to identify flood prone areas surrounding the Burdekin River. The Study (Dam Break Analysis) of July 1993 provides information of impacts of flooding that would result from a failure of Burdekin Falls Dam. The analysis considers the impact of the following flooding events:

- Sunny Day Break (unexpected failure); and
- Probable Maximum Flood (PMF).

The result of the analysis, without consideration of probability / likelihood, reveals the following:
1.1. Sunny Day Failure – Main Dam Wall

- Dalbeg – 6.12 metres above the town’s lowest point – inundated for 15.9 hours, 8.2 hours after outflow;
- Millaroo – 1.83 metres above the town’s lowest point – inundated for 16.9 hours, 19.8 hours after outflow;
- Clare – 4.04 metres above the town’s lowest point – inundated for 55.8 hours, 18.6 hours after outflow;
- Home Hill – 0.98 metres above the town’s lowest point – inundated for 36.8 hours, 62.7 hours after outflow;
- Ayr – 1.11 metres below the town’s low points – no major flooding would occur;
- The Burdekin River Bridge was not affected.

1.2. Sunny Day Failure – Left Bank Saddle Dam

- Dalbeg – 6.33 metres below the town’s lowest point;
- Millaroo – 4.32 metres below the town’s lowest point;
- Clare – 2.10 metres above the town’s lowest point – inundated for 44.9 hours, 26.7 hours after outflow;
- Home Hill – 0.44 metres below the town’s lowest point;
- Ayr – 1.98 metres below the town’s low points – no major flooding would occur;
- The Burdekin River Bridge was not affected.

1.3. Seven Hundred and Forty Four Hour PMF – No Dam Failure

- Dalbeg – 8.10 metres above the town’s lowest point – inundated for 261.8 hours, 261.9 hours after outflow;
- Millaroo – 8.13 metres above the town’s lowest point – inundated for 298.0 hours, 279.9 hours after outflow;
- Clare – 9.82 metres above the town’s lowest point – inundated for 505.4 hours, 171.6 hours after outflow;
- Home Hill – 8.28 metres above the town’s lowest point – inundated for 451.5 hours, 243.8 hours after outflow;
- Ayr – 6.64 metres above the town’s lowest point – inundated for 316.0 hours, 316.1 hours after outflow;
- The Burdekin River Bridge was affected with peak water levels reaching the bridge deck.
1.4. Seven Hundred and Forty Four Hour PMF – Main Dam Failure

- Dalbeg – 11.36 metres above the town’s lowest point – inundated for 226.5 hours, 261.3 hours after outflow;
- Millaroo – 9.93 metres above the town’s lowest point – inundated for 252.2 hours, 280.0 hours after outflow;
- Clare – 12.69 metres above the town’s lowest point – inundated for 436.0 hours, 177.3 hours after outflow;
- Home Hill – 10.93 metres above the town’s lowest point – inundated for 392.9 hours, 242.7 hours after outflow;
- Ayr – 10.34 metres above the town’s lowest point – inundated for 271.8 hours, 317.3 hours after outflow;
- The Burdekin River Bridge was affected with peak water levels reaching 2.59 metres above the bridge deck for a period of 49.1 hours, 365.5 hours after outflow.

1.5. Seven Hundred and Forty Four Hour PMF – Left Bank Saddle Dam Piping Failure

- Dalbeg – 11.64 metres above the town’s lowest point – inundated for 229.0 hours, 268.8 hours after outflow;
- Millaroo – 10.07 metres above the town’s lowest point – inundated for 271.2 hours, 277.2 hours after outflow;
- Clare – 12.75 metres above the town’s lowest point – inundated for 476.5 hours, 176.4 hours after outflow;
- Home Hill – 10.89 metres above the town’s lowest point – inundated for 426.1 hours, 243.6 hours after outflow;
- Ayr – 10.28 metres above the town’s lowest point – inundated for 291.3 hours, 319.2 hours after outflow;
- The Burdekin River Bridge was affected with peak water levels reaching 2.55 metres above the bridge deck for a period of 43.5 hours, 366.4 hours after outflow.

It is evident that certain events would cause significant damage, though warning times under certain circumstances are sufficient to prevent loss of life. It is recognised that the Council flood warning system would in fact be destroyed during major events, significantly impacting its ability to provide early warning support.
2. Urban Flooding – Ayr, Home Hill & Brandon

The Urban sub-catchment consists of low and medium density residential development interspersed with small amounts of light industrial and commercial development, together with farmlands.

Council has progressively upgraded high risk areas and has undertaken flood studies for:

- Brandon (May 1992);
- Ayr (Final Report – December 2001);

The Brandon Flood Study included several recommendations that have been progressively implemented over the subsequent years.

The Ayr Flood Study (December 2001) remains under consideration with actions proposed on a priority basis, as funds become available. A synopsis of the report’s objectives and outcomes is included with this Attachment.

The key findings are:

**Executive Summary**

1. ‘Natural’ drainage in the area is relatively inefficient due to flat longitudinal grades along depression lines. This is not compatible with the drainage needs of rural and Urban areas.
2. The ‘natural’ conditions have been considerably modified due to land clearing, Urban and rural development, water supply and drainage works, and man-made obstructions to flow.
3. There is considerable unrest along Kalamia Creek and the Lilliesmere Lagoon system over the effects of the Kanaka Drain on flooding in those downstream areas. These concerns must be accounted for in the development of a flood management strategy.
4. Flooding behaviour in the Study Area is complicated, under large events by overflows from the Burdekin River.
5. At present, responsibilities for managing drainage in the Study area are not clearly defined.
6. The impacts of vegetation growth on capacity of the main drainage lines are believed to be significant, particularly for small to intermediate storm events. In some sections this growth is influenced by the presence of irrigation water stored in the depression systems. Under flood conditions, vegetation has the potential to block culverts, thereby further exacerbating flooding.
The Home Hill Flood Study remains in Draft form (May 2003). A synopsis of the report’s objectives and outcomes is included with this Attachment.

The key findings are:

<table>
<thead>
<tr>
<th>Proposed Options</th>
<th>Assessment Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional River Flooding</strong></td>
<td></td>
</tr>
<tr>
<td>• Proposed levee</td>
<td>• Not feasible</td>
</tr>
<tr>
<td>• Flood warning system</td>
<td>• To be upgraded</td>
</tr>
<tr>
<td>• Emergency response plan</td>
<td>• To be improved</td>
</tr>
<tr>
<td>• Land planning</td>
<td>• To be implemented</td>
</tr>
<tr>
<td>• Bank vegetation clearing</td>
<td>• Worth investigating</td>
</tr>
<tr>
<td>• Bank stabilisation</td>
<td>• Worth investigating</td>
</tr>
<tr>
<td><strong>Local Rainfall Flooding</strong></td>
<td></td>
</tr>
<tr>
<td>• Proposed pump</td>
<td>• Not effective</td>
</tr>
<tr>
<td>• Proposed floodways</td>
<td>• Some benefit, not economical</td>
</tr>
<tr>
<td>• Aquatic weed reduction</td>
<td>• Vital, to be implemented</td>
</tr>
<tr>
<td>• Waterway management</td>
<td>• Worth pursuing</td>
</tr>
<tr>
<td>• Flood easements</td>
<td>• vital</td>
</tr>
</tbody>
</table>

Ayr, Home Hill and Brandon are susceptible to inflows from flooding of the Burdekin river system. Copies of Shire flood maps are included at the end of this Attachment.

The Urban catchments have primary flow systems underground with major storm events generally catered for within road reserves.

Primary drainage is expected to cater for Q2 year events, within the underground drainage system, the road networks and defined overland flow paths. Secondary drainage is expected to cater for up to Q100 year events contained within the road network, defined flow paths and defined detention areas. Recommendations in current reports have suggested amendments to the current catchment flows and removal of weed growth etc.

The volume of stormwater flow leaving a catchment is related to the intensity and duration of the rainfall, the topography of the catchment, the level of Urban development, the capacity of the road network and overland flow paths and the flow and detention/retention within the overall catchment area and designated areas.

Records suggest that the period November to March offer the greatest risk to the community of serious damage to infrastructure and potential loss of life. Flooding is a by-product both during and as an aftermath of cyclones and storms. The time of day and day will impact the possible extent of damage to life and property and the disaster response of Council.
The Urban areas of Ayr, Home Hill and Brandon do not have a local town river/stream system but do have a water flow and retention system of drains and ponding as part of the town common flood mitigation system in place, designed around the drainage system described above. Council records confirm that the areas now most susceptible to local flooding have been addressed. Isolated incidents of local flooding will occur during heavy rainfalls in a short time period.

The extent and duration of flooding or flash flooding will determine the extent of potential damage to life and property.

3. Rural Flooding

The Burdekin has broken or overtopped its banks on many occasions, causing widespread localised flooding to the many farms and holdings along the river course, through to the ocean. Records suggest that floods with an average annual recurrence interval of up to ten years are totally contained within the banks of the main river channel, with only larger events breaking out of the riverbanks. Some areas of relatively high ground remain above flood levels, but these are quite limited.

4. Burdekin River Flood Monitoring System

4.1. Flood Risk

The Burdekin River basin drains an area of about 130,000 sq. km. Two main tributaries drain the catchment, the Burdekin River flowing from the north and the Belyando from the south, which join at the Burdekin Falls Dam. Downstream of the Dam, the Bowen and Bogie Rivers join the Burdekin River before it flows into the sea near Ayr/Home Hill. Major floods, causing inundation of properties and closure of main roads, can occur along the major rivers both upstream and downstream of the Burdekin Falls Dam. Downstream of the Dam, major flooding in the Ayr and Home Hill areas results from either flood waters traveling down from the upper Burdekin and Belyando basin or from intense rain in areas below the Dam. Ayr and Home Hill occasionally experience severe flooding with many houses and businesses affected, especially in the Home Hill township.

4.2. Previous Flooding

Records of large floods at Ayr extend back as far as 1911, and since then 10 major floods have occurred. The most recent major flood was
in February 1991 when the river rose to 12.53 metres at the Inkerman Bridge gauge.

Local Information

The Burdekin Shire Council operates a local flood information service during periods of lower Burdekin River flooding. The Council’s Flood Reporting Centre issues regular bulletins to update the river heights from the ALERT system for the Bowen, Bogie and Lower Burdekin Rivers. These heights, together with information about the expected effects of the flood in the Ayr and Home Hill district, are issued by facsimile to radio and TV stations for broadcast. Residents who are in flood threatened areas should contact the Burdekin Shire Council for detailed local information and be prepared to take appropriate action before floodwaters reach their property.

Burdekin ALERT System

The Burdekin ALERT Flood Warning System was completed in 1990 as a cooperative project between the Bureau of Meteorology and the Burdekin Shire Council. The system comprises of a network of rainfall and river height stations which report via VHF radio to a base station computer located in the Council office in Ayr. The stations send reports for every one millimetre of rainfall and every 50 millimetre change in river height.
The base station computer in the Burdekin Shire Council office collects the data and has software that displays it in graphical and tabular form. This data is also received by the Bureau's Flood Warning Centre where it is used in hydrologic models to produce river height predictions.

**Interpreting Flood Warnings and River Height Bulletins**

Flood Warnings and River Height Bulletins contain observed river heights for a selection of the river height monitoring locations. The time at which the river reading has been taken is given together with its tendency (e.g. rising, falling, steady or at its peak). The Flood Warnings may also contain predictions in the form of minor, moderate or major flooding for a period in the future. River Height Bulletins also give the height above or below the road bridge or causeway for each river station located near a road crossing.

One of the simplest ways of understanding what the actual or predicted river height means is to compare the height given in the Warning or Bulletin with the height of previous floods at that location.

The table below summarises the flood history of the Burdekin River catchment - it contains the flood gauge heights of the highest known floods recorded at selected river height locations, together with heights of recent floods.
Historical flood heights for all river stations in the Burdekin River Flood warning network, as shown on the map, are available from the Bureau of Meteorology upon request.

### Burdekin River Catchment – Assessment of the Flood Potential

Major flooding requires a large scale rainfall situation over the Burdekin River catchment. The completion of the Burdekin Falls Dam in the 1980’s has reduced to some extent the occurrence of major flooding in the lower reaches. Major flooding still occurs, however, in the lower reaches from the runoff produced by heavy rainfall and flooding in the lower Burdekin, Bowen and Bogie River catchments. The following can be used as a rough guide to the likelihood of flooding in the catchment:

Average catchment rainfalls of in excess of 200mm in 48 hours may cause moderate to major flooding and traffic disabilities to develop, particularly in low-lying areas of the Burdekin River catchment downstream of the Burdekin Falls Dam and extending into the Burdekin River delta area.

Average catchment rainfalls of in excess of 300mm in 48 hours may cause major flooding and traffic disabilities to develop, particularly in low-lying areas of the Burdekin River catchment downstream of the Burdekin Falls Dam and extending into the Burdekin River delta area.
Flood Classifications

At each flood warning river height station, the severity of flooding is described as minor, moderate or major according to the effects caused in the local area or in nearby downstream areas. Terms used in Flood Warnings are based on the following definitions.

**Major Flooding:** This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.

**Moderate Flooding:** This causes the inundation of low lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by floodwaters.

**Minor Flooding:** This causes inconvenience such as closing of minor roads and the submergence of low level bridges and makes the removal of pumps located adjacent to the river necessary.

Each river height station has a pre-determined flood classification which details heights on gauges at which minor, moderate and major flooding commences. Other flood heights may also be defined which indicate at what height the local road crossing or town becomes affected by floodwaters.
The table below shows the flood classifications for selected river height stations in the Burdekin River catchment.

<table>
<thead>
<tr>
<th>River Height Station</th>
<th>First Report Height</th>
<th>Crossing Height</th>
<th>Minor Flood Level</th>
<th>Crops &amp; Grazing</th>
<th>Moderate Flood Level</th>
<th>Towns and Houses</th>
<th>Major Flood Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenvale</td>
<td>6.0</td>
<td>8.0</td>
<td>17.0</td>
<td>12.0</td>
<td></td>
<td></td>
<td>18.0</td>
</tr>
<tr>
<td>Blue Range</td>
<td>2.0</td>
<td>3.2 (B)</td>
<td>8.0</td>
<td>20.0</td>
<td>12.0(d/s)</td>
<td>15.0(d/s)</td>
<td></td>
</tr>
<tr>
<td>Mt Fullstop</td>
<td></td>
<td>5.5</td>
<td></td>
<td>11.5</td>
<td>17.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sellheim</td>
<td>2.0</td>
<td>13.5 (B)</td>
<td>12.0</td>
<td>14.0</td>
<td>18.0</td>
<td>15.0</td>
<td></td>
</tr>
<tr>
<td>Mt Douglas</td>
<td>4.0</td>
<td>9.2 (B)</td>
<td>5.0</td>
<td>6.0</td>
<td>10.0</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>Burdekin Falls Dam</td>
<td>0.0</td>
<td>0.0 (S)</td>
<td>3.0</td>
<td>5.5</td>
<td>8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birralee</td>
<td>4.0</td>
<td>15.0 (B)</td>
<td>8.0</td>
<td>18.0</td>
<td>18.0</td>
<td>21.0</td>
<td></td>
</tr>
<tr>
<td>Myuna</td>
<td></td>
<td>1.8 (B)</td>
<td>5.0</td>
<td>13.0</td>
<td>15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dalbeg</td>
<td>5.0</td>
<td>10.0</td>
<td>5.0</td>
<td>15.0</td>
<td>20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millaroo</td>
<td></td>
<td>9.0</td>
<td></td>
<td>13.0</td>
<td>17.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clare</td>
<td>5.0</td>
<td>8.0</td>
<td></td>
<td>13.0</td>
<td>17.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inkerman Bridge</td>
<td>3.0</td>
<td>18.3 (B)</td>
<td>7.0</td>
<td>9.0(d/s)</td>
<td>10.0</td>
<td>12.1</td>
<td>12.0</td>
</tr>
</tbody>
</table>

All heights are in metres on flood gauges.
(B) = Bridge  (A) = Approaches  (C) = Causeway  (X) = Crossing  (S) = Spillway  (d/s) = Downstream

Source: The Regional Director, Bureau of Meteorology, GPO Box 413, Brisbane Q 4001
4.3. Flood Forecasting

The Burdekin Shire Council, in conjunction with the Bureau of Meteorology operates a flood warning system for the Burdekin River catchment. The ALERT network consists of automatic rainfall and river height stations which regularly forward data via radio telemetry to a base station located at the Council office in Ayr and the Bureau's Flood Warning Centre in Brisbane. The system provides early warning of heavy rainfall and river rises in the catchment below the Dam and enables more accurate and timely flood warning and forecasts. The balance of the network consists of volunteer rainfall and river height observers who forward observations by telephone when the initial flood height has been exceeded at their station. The Department of Natural Resources and Mines also operates a number of automatic telemetry stations throughout the catchment which provide data during floods. The Bureau's Flood Warning Centre issues Flood Warnings and River Height Bulletins for the Burdekin River catchment during flood events. River height predictions are issued when moderate flood levels are likely to be exceeded at Inkerman Bridge.

5. Community Consultation

The community consultation process confirms much of the recorded data on major flooding events. Key concerns include:

- Preparedness for a flooding event and a reliance on early warnings and communication;
- The fact that it has been some years since the last major event, there are many new residents in the area and preparedness may be lacking;
- The effects of isolated flooding, access to and loss of property, impact of visitors, impact of man made structures on floodwater entry and exit (raising of the railway line (Home Hill and Giru);
- The natural flow of the rivers (Burdekin and Haughton) have changed due to the presence of man made structures and the accompanying regulatory environment, particularly environmental protection which, to some community members, exacerbates the dangers of flooding events;
- The presence of the early warning systems for the Burdekin and Haughton are welcomed. However some suggestions have been made to improve the outcomes.

Suggestions offered by the community through the consultation process have been considered and incorporated where appropriate into the suggested treatment and action plans.
6. **Current Treatments**

Council has an annual maintenance program for its roads, bridges and drainage systems. Council relies on its road teams and Councillors/staff to undertake much of the identification of needs. Road gangs are dispatched to ensure the safety of the community and remove debris, during significant events. Equipment such as warning and reduced speed signs, flashing lights, guardrails and repair supplies are provided. All actions occur in conjunction with the Counter Disaster Committee process, when activated and the State Emergency Service.

7. **Secondary Hazards**

The heavy rainfall may impact vehicular and rail traffic during the higher risk months. Traffic accidents and related system failures could occur.

8. **Department of Primary Industries – Rainfall Analysis**

Seasonal rain and probability analysis for the Shire is provided at the end of this Attachment.
RAINFALL DATA

Monthly rainfall recorded at AYR (BURDEKIN SHIRE COUNCIL)
Mean monthly rainfall (mm)

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>256</td>
<td>261</td>
<td>182</td>
<td>62</td>
<td>38</td>
<td>31</td>
<td>18</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>44</td>
<td>115</td>
<td>1,06</td>
</tr>
<tr>
<td>Median</td>
<td>198</td>
<td>215</td>
<td>136</td>
<td>32</td>
<td>18</td>
<td>14</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>23</td>
<td>69</td>
<td>1,024</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>228</td>
<td>219</td>
<td>158</td>
<td>51</td>
<td>55</td>
<td>43</td>
<td>39</td>
<td>25</td>
<td>49</td>
<td>37</td>
<td>55</td>
<td>123</td>
<td>445</td>
</tr>
<tr>
<td>Highest on record</td>
<td>954</td>
<td>1,681</td>
<td>689</td>
<td>524</td>
<td>422</td>
<td>223</td>
<td>315</td>
<td>115</td>
<td>419</td>
<td>237</td>
<td>317</td>
<td>738</td>
<td>2,432</td>
</tr>
<tr>
<td>Lowest on record</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>261</td>
</tr>
<tr>
<td>Mean raindays</td>
<td>11</td>
<td>11</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>63</td>
</tr>
<tr>
<td>No. of years</td>
<td>114</td>
<td>114</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>113</td>
</tr>
</tbody>
</table>

(Source: Australian Rainman)
Probabilities of monthly rainfall recorded at AYR (BURDEKIN SHIRE COUNCIL)

Probabilities of monthly rainfall

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest on record</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>261</td>
</tr>
<tr>
<td>90% yrs at least</td>
<td>37</td>
<td>31</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>504</td>
</tr>
<tr>
<td>80% yrs at least</td>
<td>77</td>
<td>80</td>
<td>37</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>29</td>
<td>727</td>
</tr>
<tr>
<td>70% yrs at least</td>
<td>105</td>
<td>127</td>
<td>67</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>40</td>
<td>805</td>
</tr>
<tr>
<td>60% yrs at least</td>
<td>131</td>
<td>181</td>
<td>100</td>
<td>23</td>
<td>11</td>
<td>11</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>16</td>
<td>54</td>
<td>899</td>
</tr>
<tr>
<td>Median, 50% yrs</td>
<td>198</td>
<td>215</td>
<td>136</td>
<td>32</td>
<td>18</td>
<td>14</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>23</td>
<td>69</td>
<td>1,024</td>
</tr>
<tr>
<td>40% yrs at least</td>
<td>240</td>
<td>280</td>
<td>188</td>
<td>40</td>
<td>31</td>
<td>19</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>16</td>
<td>38</td>
<td>92</td>
<td>1,094</td>
</tr>
<tr>
<td>30% yrs at least</td>
<td>309</td>
<td>326</td>
<td>229</td>
<td>62</td>
<td>43</td>
<td>32</td>
<td>13</td>
<td>14</td>
<td>13</td>
<td>28</td>
<td>53</td>
<td>130</td>
<td>1,299</td>
</tr>
<tr>
<td>20% yrs at least</td>
<td>404</td>
<td>421</td>
<td>336</td>
<td>87</td>
<td>62</td>
<td>48</td>
<td>20</td>
<td>23</td>
<td>30</td>
<td>45</td>
<td>73</td>
<td>177</td>
<td>1,432</td>
</tr>
<tr>
<td>10% yrs at least</td>
<td>556</td>
<td>512</td>
<td>421</td>
<td>162</td>
<td>93</td>
<td>88</td>
<td>53</td>
<td>58</td>
<td>57</td>
<td>77</td>
<td>124</td>
<td>278</td>
<td>1,692</td>
</tr>
<tr>
<td>Highest on record</td>
<td>954</td>
<td>1,681</td>
<td>689</td>
<td>524</td>
<td>422</td>
<td>223</td>
<td>315</td>
<td>115</td>
<td>419</td>
<td>237</td>
<td>317</td>
<td>738</td>
<td>2,432</td>
</tr>
<tr>
<td>Mean</td>
<td>256</td>
<td>261</td>
<td>182</td>
<td>62</td>
<td>38</td>
<td>31</td>
<td>18</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>44</td>
<td>115</td>
<td>1,067</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>228</td>
<td>219</td>
<td>158</td>
<td>91</td>
<td>55</td>
<td>43</td>
<td>39</td>
<td>25</td>
<td>49</td>
<td>37</td>
<td>55</td>
<td>123</td>
<td>445</td>
</tr>
</tbody>
</table>

(Source: Australian Rainman)
Burdekin Shire Council
Natural Disaster Risk Management Study

Rainfall recorded at AYR (BURDEKIN SHIRE COUNCIL)
Historical monthly rainfall (mm)
Year
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941

Jan
297
36
77
685
281
417
35
771
124
951
522
265
206
216
455
44
33
116
457
196
145
360
302
483
948
41
223
257
54
144
554
791
170
404
206
166
8
49
198
36
408
97
645
365
100
313
131
244
24
273
198
326
73
108
508

Feb
165
388
147
274
459
17
342
320
624
610
179
697
322
3
205
151
167
105
16
463
125
76
77
219
317
127
295
80
10
190
267
211
71
106
25
233
3
399
384
206
376
524
105
105
132
71
200
319
64
727
133
327
462
530
72

Mar
477
10
136
524
432
176
243
266
8
348
218
145
365
36
144
5
499
51
12
142
99
228
66
438
227
104
361
286
4
102
126
12
78
39
165
26
16
112
127
41
89
148
423
17
130
67
3
6
79
313
245
48
135
80
357

Apr
65
8
299
40
107
12
0
387
161
39
0
19
82
26
87
11
35
63
123
14
0
36
32
44
75
30
168
124
12
7
71
47
98
287
8
1
14
132
0
0
3
5
158
0
42
13
70
26
27
64
15
0
6
524
188

May
21
1
14
111
59
87
5
77
0
2
28
0
32
24
18
0
76
2
10
52
36
62
50
0
2
17
52
10
9
23
68
1
11
141
37
14
0
2
0
0
1
0
0
76
33
77
16
20
44
3
6
0
3
7
85

© 2003 QRMC Risk Management

Jun
18
0
16
17
223
16
25
115
9
14
32
11
0
13
9
0
42
15
11
6
59
3
90
31
2
177
44
65
0
3
11
2
20
49
9
19
100
41
36
3
132
19
82
44
0
0
105
36
0
136
12
6
25
11
24

Jul
2
0
34
119
0
2
9
7
7
12
7
6
15
16
6
0
9
0
18
0
0
28
16
8
0
13
0
0
11
98
0
5
0
13
144
53
2
0
4
0
105
0
0
5
0
2
53
13
20
0
9
84
0
0
6

Aug
20
0
3
4
14
12
87
17
4
1
6
5
16
1
58
2
1
0
1
10
0
8
2
0
1
1
0
0
10
16
78
31
14
64
10
0
26
104
22
0
0
0
0
3
0
0
48
6
0
0
0
0
9
93
1

Sep
15
0
121
419
12
92
2
52
8
2
5
30
0
6
13
0
53
18
184
103
0
28
4
138
0
0
1
1
12
4
6
5
2
23
34
1
35
6
38
118
24
0
5
0
7
0
61
4
4
3
0
0
0
0
8

Oct
3
2
14
7
45
65
47
18
0
0
32
23
3
18
28
1
46
65
2
18
0
53
19
0
78
12
3
2
88
30
8
1
0
87
91
25
1
76
0
0
5
0
0
100
28
0
22
8
2
0
6
35
4
0
4

Nov
10
10
136
55
6
3
23
105
4
9
78
17
0
2
8
4
110
0
63
89
78
8
25
114
0
38
0
0
3
131
317
31
27
46
4
72
6
53
7
4
18
101
5
7
44
38
127
170
4
3
109
5
13
0
25

Dec
78
77
154
58
30
157
40
30
140
39
89
56
40
45
14
79
173
54
1
213
247
0
337
90
23
4
233
74
48
211
209
59
24
71
231
151
78
115
31
89
245
105
39
44
394
122
60
3
7
207
0
13
66
2
42

Page 55 of 306

Total
1,171
532
1,151
2,313
1,668
1,056
858
2,165
1,089
2,027
1,196
1,274
1,081
406
1,045
297
1,244
489
898
1,306
789
890
1,020
1,565
1,673
564
1,380
899
261
959
1,715
1,196
515
1,330
964
761
289
1,089
847
497
1,406
999
1,462
766
910
703
896
855
275
1,729
733
844
796
1,355
1,320


<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1942</td>
<td>53</td>
<td>466</td>
<td>40</td>
<td>40</td>
<td>24</td>
<td>128</td>
<td>83</td>
<td>19</td>
<td>10</td>
<td>13</td>
<td>14</td>
<td>738</td>
<td>1,628</td>
</tr>
<tr>
<td>1943</td>
<td>80</td>
<td>546</td>
<td>34</td>
<td>8</td>
<td>1</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>16</td>
<td>15</td>
<td>36</td>
<td>804</td>
</tr>
<tr>
<td>1944</td>
<td>195</td>
<td>238</td>
<td>266</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td>7</td>
<td>17</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>140</td>
<td>902</td>
</tr>
<tr>
<td>1945</td>
<td>105</td>
<td>421</td>
<td>396</td>
<td>34</td>
<td>16</td>
<td>86</td>
<td>56</td>
<td>2</td>
<td>5</td>
<td>47</td>
<td>8</td>
<td>59</td>
<td>1,235</td>
</tr>
<tr>
<td>1946</td>
<td>358</td>
<td>305</td>
<td>334</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>1947</td>
<td>13</td>
<td>1,681</td>
<td>485</td>
<td>0</td>
<td>26</td>
<td>4</td>
<td>0</td>
<td>24</td>
<td>63</td>
<td>3</td>
<td>73</td>
<td>60</td>
<td>2,432</td>
</tr>
<tr>
<td>1948</td>
<td>105</td>
<td>144</td>
<td>99</td>
<td>26</td>
<td>31</td>
<td>7</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>22</td>
<td>172</td>
<td>626</td>
</tr>
<tr>
<td>1949</td>
<td>300</td>
<td>337</td>
<td>689</td>
<td>39</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>68</td>
<td>19</td>
<td>10</td>
<td>1,466</td>
</tr>
<tr>
<td>1950</td>
<td>315</td>
<td>207</td>
<td>122</td>
<td>45</td>
<td>14</td>
<td>51</td>
<td>11</td>
<td>3</td>
<td>13</td>
<td>11</td>
<td>0</td>
<td>5</td>
<td>1,151</td>
</tr>
<tr>
<td>1951</td>
<td>873</td>
<td>122</td>
<td>238</td>
<td>266</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td>7</td>
<td>17</td>
<td>0</td>
<td>11</td>
<td>5</td>
<td>902</td>
</tr>
<tr>
<td>1952</td>
<td>330</td>
<td>460</td>
<td>377</td>
<td>51</td>
<td>422</td>
<td>12</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>15</td>
<td>23</td>
<td>1,062</td>
</tr>
<tr>
<td>1953</td>
<td>13</td>
<td>1,681</td>
<td>485</td>
<td>0</td>
<td>26</td>
<td>4</td>
<td>0</td>
<td>24</td>
<td>63</td>
<td>3</td>
<td>73</td>
<td>60</td>
<td>2,432</td>
</tr>
<tr>
<td>1954</td>
<td>105</td>
<td>144</td>
<td>99</td>
<td>26</td>
<td>31</td>
<td>7</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>22</td>
<td>172</td>
<td>626</td>
</tr>
</tbody>
</table>

**Burdekin Shire Council**

**Natural Disaster Risk Management Study**

© 2003 QRMC Risk Management
Executive Summary:

1. ‘Natural’ drainage in the area is relatively inefficient due to flat longitudinal grades along depression lines. This is not compatible with the drainage needs of rural and Urban areas.
2. The ‘natural’ conditions have been considerably modified due to land clearing, Urban and rural development, water supply and drainage works, and man-made obstructions to flow.
3. There is considerable unrest along Kalamia Creek and the Lilliesmere Lagoon system over the effects of the kanaka Drain on flooding in those downstream areas. These concerns must be accounted for in the development of a flood management strategy.
4. Flooding behaviour in the Study Area is complicated, under large events by overflows from the Burdekin River.
5. At present, responsibilities for managing drainage in the Study area are not clearly defined.
6. The impacts of vegetation growth on capacity of the main drainage lines are believed to be significant, particularly for small to intermediate storm events. In some sections this growth is influenced by the presence of irrigation water stored in the depression systems. Under flood conditions, vegetation has the potential to block culverts, thereby further exacerbating flooding.

In light of the above considerations, mitigation options were evaluated against the following criteria:

- Equity (sharing the pain)
- Effectiveness in removing current obstructions to flow
- Capital and ongoing costs
- Environmental impacts
- Ease of implementation
- Likely degree of stakeholder acceptance
- The degree to which ‘natural’ flooding characteristics are restored or maintained

The proposed strategy includes:
- Upgrading road crossings and access crossings to reduce afflux.
- Modify/remove embankments to improve flood passage, particularly at the downstream and of the system.
- Implement measures to improve water management within the water courses, thereby reducing aquatic weed growth.
- Undertake works to optimize the efficiency of the Browns Lagoon overflow.
• Implement an improved control system on the Kanaka Drain control gate to minimize the risk of undue flooding downstream and to optimise the natural storage characteristics of Browns Lagoon.
• Establish a network of contiguous flood easements over important watercourses.
• Nomination of a designated authority responsible for future management of the watercourses to ensure flood carrying capacity is maintained or improved.

Costs:

Year 1
1. Install floodway in Cox’s dam downstream of the tramline
2. Undertake Browns Lagoon overflow works
3. Install culverts and floodways in Lilliesmere and Kalamia Creek NBWB dams and lower little Oyster creek dam
4. Commence flood easement acquisition
Cost:
   1. 8,000
   2. 29,420
   3. 52,200
   4. 50,000
   5. Total Year 1: $139,620

Year 2
1. Kanaka control gate upgrade
2. Upgrade structures on Kalamia Creek and Lilliesmere Lagoon
3. Commence NBWB irrigation supply channel works
4. Continue flood easement acquisition
Cost:
   1. 44,200
   2. 160,600
   3. 48,400
   4. 50,000
   5. Total Year 2: $303,200

Year 3
1. Upgrade road crossings
2. Continue NBWB irrigation supply channel works
3. Continue acquisition of flood easements
Cost:
   1. 622,400
   2. 50,000
   3. 65,000
   4. Total Year 3: $737,400
   5. Grand Total - $1,180,220
Study Area:

The extent of the Study area for the Town of Ayr Flood Study is shown on the attached map (Map 1). It covers an area of approximately 75 square kilometres extending from south of the Bruce highway in a north-east direction to the coast adjacent to the township of Alva Beach. The catchments are greater than the Study area, extending west of the Bruce Highway. It is predominately cane land (with the exception of the Urbanized centre of Ayr), and is relatively flat. The highest areas in the catchments are typically around 10 m AHD in elevation. The Study area does not include the Brandon catchments as these have been subject to previous studies (1992), but allowances have been made for flows upstream of the tramline which delineates the western boundary of the Study area. Less than 5% of the catchments area was identified as Urbanised. However water quality issues were of concern including:

1. Piped discharges from old Urban catchments;
2. Quality of storm water runoff from development catchments; and
3. Potential for contamination from industrial areas and the sewage treatment plant.

Flood Level Summary – Appendix C:

A series of flood levels have been collected for the calibration events, particularly for the recent event in December 2000. The surveyed levels are a mix of debris levels at the peak of the events and levels taken at the water edge during the event. In addition to levels surveyed during the course of the project, there are discrete levels taken from flood mapping of historical events (refer to Appendix A). A summary of flood levels available for calibration purposes of both regional and local flood events is provided in Appendix C.

Impacts of proposed Measures:

The impacts of the proposed measures are best described in terms of peak water level reductions in the duration of flooding. The various elements of the strategy act in an integrated manner to achieve these objectives.

Unfortunately, one of the key improvements proposed, the improved control and operation of the Kanaka Drain gate could not be modelled using the computer packages available for the Study. It has therefore been necessary to assume, for the purposes of modelling, that the control gate remains fully open at all times. The results presented, therefore, are conservative in that they do not include the added benefits that would accrue due to better gate operation.
Ayr Flood Study Attachments:

1. Study Area Maps
3. Flood level summary
4. Peak flood levels
1. Study Area Maps
## 3. Flood level summary

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time</th>
<th>Level (m AHD)</th>
<th>Location / Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>7:15 am</td>
<td>5.8081</td>
<td>Nelsons Lagoon @ Edward St D/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>7:15 am</td>
<td>4.684</td>
<td>Nelsons Lagoon @ Chippendale St</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>7:20 am</td>
<td>7.217</td>
<td>Nelsons Lagoon @ Airdmillian Rd D/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>7:30 am</td>
<td>7.249</td>
<td>Nelsons Lagoon @ Gibson St U/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>7:45 am</td>
<td>4.624</td>
<td>Nelsons Lagoon @ Cox St D/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>8:00 am</td>
<td>4.048</td>
<td>Nelsons Lagoon @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>8:00 am</td>
<td>3.929</td>
<td>Nelsons Lagoon @ Beach Rd D/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>8:15 am</td>
<td>4.449</td>
<td>NBWB Channel @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>8:15 am</td>
<td>3.22</td>
<td>Kalamia Creek @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>Peak</td>
<td>6.450</td>
<td>Chippendale St @ Joy St End</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>Unknown</td>
<td>2.37</td>
<td>Trent Crossing @ Trent Road</td>
</tr>
<tr>
<td>2000 Storm 1</td>
<td>29/12/00</td>
<td>Unknown</td>
<td>2.31</td>
<td>Kalamia Creek @ Fabrellis crossing</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>5.126</td>
<td>Nelsons Lagoon @ Edward St D/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>5.044</td>
<td>Nelsons Lagoon @ Chippendale St</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>7.709</td>
<td>Nelsons Lagoon @ Airdmillian Rd D/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>7.423</td>
<td>Nelsons Lagoon @ Gibson St U/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>4.644</td>
<td>Nelsons Lagoon @ Cox St D/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>4.328</td>
<td>Nelsons Lagoon @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Unknown</td>
<td>4.778</td>
<td>Lilliesmere Lagoon @ Patricia RdS</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>8:15 am</td>
<td>3.719</td>
<td>Kalamia Creek @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>8:30 am</td>
<td>2.808</td>
<td>Lilliesmere Lagoon @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>8:30 am</td>
<td>3.040</td>
<td>Lilliesmere Lagoon @ Beach Rd U/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>6.614</td>
<td>Chippendale St @ Joy St End</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>5.794</td>
<td>Industrial Estate Entrance</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>5.870</td>
<td>Bruce Highway @ Suicide Bend U/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>5.897</td>
<td>Bruce Highway @ Suicide Bend D/S</td>
</tr>
<tr>
<td>2000 Storm 2</td>
<td>30/12/00</td>
<td>Peak</td>
<td>5.000*</td>
<td>Kanaka Drain @ Control Structure U/S</td>
</tr>
<tr>
<td>1988</td>
<td>29/02/88</td>
<td>Peak</td>
<td>6.183#</td>
<td>Nelsons Lagoon @ Edward St D/S</td>
</tr>
<tr>
<td>1988</td>
<td>29/02/88</td>
<td>Peak</td>
<td>7.847#</td>
<td>Town Drain @ Irving St U/S</td>
</tr>
<tr>
<td>1988</td>
<td>29/02/88</td>
<td>Peak</td>
<td>4.355</td>
<td>Lilliesmere Lagoon @ Beach Rd – Trent Road Corner, Base of Power Pole</td>
</tr>
<tr>
<td>1988</td>
<td>29/02/88</td>
<td>Peak</td>
<td>3.713</td>
<td>Lilliesmere Lagoon @ Beach Rd – Gabiola’s Residence, Mango Tree</td>
</tr>
<tr>
<td>1958</td>
<td>–</td>
<td>Peak</td>
<td>8.700#</td>
<td>Bower St Overflow</td>
</tr>
<tr>
<td>1958</td>
<td>–</td>
<td>Peak</td>
<td>8.500#</td>
<td>Little Drysdale St Overflow</td>
</tr>
<tr>
<td>1958</td>
<td>–</td>
<td>Peak</td>
<td>8.000#</td>
<td>Nelsons Lagoon @ Edward St D/S</td>
</tr>
<tr>
<td>1958</td>
<td>–</td>
<td>Peak</td>
<td>7.800#</td>
<td>Overflow from Nelsons to Town Drain</td>
</tr>
<tr>
<td>1958</td>
<td>–</td>
<td>Peak</td>
<td>7.300#</td>
<td>Nelsons Lagoon @ Airdmillian Rd D/S</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>6.974#</td>
<td>Nelsons Lagoon @ Edward St</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>6.877#</td>
<td>Nelsons Lagoon @ Adelaide U/S</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>6.753#</td>
<td>Nelsons Lagoon @ Chippendale St</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>6.524#</td>
<td>Nelsons Lagoon @ Airdmillian Rd</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>6.242#</td>
<td>Nelsons Lagoon @ Gibson St</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>5.907#</td>
<td>Nelsons Lagoon @ Ross St</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>5.580#</td>
<td>Nelsons Lagoon @ Cox St</td>
</tr>
<tr>
<td>1991</td>
<td>–</td>
<td>Peak</td>
<td>5.317#</td>
<td>Nelsons Lagoon @ Beach Rd</td>
</tr>
</tbody>
</table>

* Level not surveyed, based on verbal advice from Gary Keane, Burdekin Shire Council
# Source: Flood Maps – State Datum (-30 to 80 mm for AHD)
## 4. Peak flood levels

<table>
<thead>
<tr>
<th>Location</th>
<th>Identification Number</th>
<th>Peak Flood Level Reduction (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5 Year ARI</td>
</tr>
<tr>
<td>NBWB Kalamia Dam</td>
<td>K1</td>
<td>(23)</td>
</tr>
<tr>
<td>Fabrelli’s Crossing</td>
<td>K4</td>
<td>255</td>
</tr>
<tr>
<td>Lilliesmere Crossing Beach Road</td>
<td>L3</td>
<td>52</td>
</tr>
<tr>
<td>Kalamia Ck at Beach Road</td>
<td>K6</td>
<td>4</td>
</tr>
<tr>
<td>Browns Lagoon Overflow</td>
<td>B2</td>
<td>36</td>
</tr>
<tr>
<td>Beach Road at Ayr</td>
<td>N1</td>
<td>742</td>
</tr>
<tr>
<td>Prawn Farm Upstream Crossing</td>
<td>P4</td>
<td>47</td>
</tr>
<tr>
<td>Farm Crossing on Prawn Farm Branch</td>
<td>P7</td>
<td>74</td>
</tr>
<tr>
<td>Airdmillian Road</td>
<td>N5</td>
<td>429</td>
</tr>
<tr>
<td>Edward Street</td>
<td>N7</td>
<td>298</td>
</tr>
<tr>
<td>Clayton Street</td>
<td>T2</td>
<td>860</td>
</tr>
<tr>
<td>Gibson Street</td>
<td>T7</td>
<td>388</td>
</tr>
</tbody>
</table>
ATTACHMENT 6.2 APPENDIX 2: DRAFT HOME HILL FLOOD STUDY
(SINCLAIR KNIGHT MERZ) – MAY 2003

Aims:

- Improve the understanding of flooding and drainage behaviour over the Study area;
- Identify the main risks to human life and property damage due to major flooding in the township of home Hill;
- Establish flood mitigation measures and strategies that address and reduce the risks of flooding; and
- Recommend and develop a Flood Risk Management Strategy Plan.

Study Area:

- (see Report Figure 2.1 – page 3, at end of this Appendix)
- Town of Home Hill – population approximately 3,000 Urban and 1,600 rural residents – including Groper Creek.
- Major Creeks and irrigation channels – (Figure 2.2 – page 4)
- 1946 flood was the largest event – prolonged
- Sub-catchments boundaries – (Figure 3.2 – page 13)

Regional Mitigation Measures:

1. Home Hill Levee (see Figure 5.1 - page 31)
2. Flood Warning System and Emergency Response Plan
3. Land planning – designated flood corridors (see Figure 5.2 – page 33)
4. Sand deposit and vegetation clearing (see Figure 5.3 – page 34)

Local Mitigation Measures:

1. Option A – pump to River (see Figure 5.4 – page 36)
2. Option B – Floodways (see Figure 5.6 – page 38)
3. Option C – Aquatic weed reduction ( see Figure 5.8 – page 40)
4. Waterway management
5. Flood easements
### Summary of Proposed Options

(See Table 5.2)

**Table 5.2: Summary of Proposed Options**

<table>
<thead>
<tr>
<th>Proposed Options</th>
<th>Assessment Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional River Flooding</strong></td>
<td></td>
</tr>
<tr>
<td>Proposed levee</td>
<td>Not feasible</td>
</tr>
<tr>
<td>Flood warning system</td>
<td>To be upgraded</td>
</tr>
<tr>
<td>Emergency response plan</td>
<td>To be improved</td>
</tr>
<tr>
<td>Land planning</td>
<td>To be implemented</td>
</tr>
<tr>
<td>Bank vegetation clearing</td>
<td>Worth investigating</td>
</tr>
<tr>
<td>Bank stabilisation</td>
<td>Worth investigating</td>
</tr>
<tr>
<td><strong>Local Rainfall Flooding</strong></td>
<td></td>
</tr>
<tr>
<td>Proposed pump</td>
<td>Not effective</td>
</tr>
<tr>
<td>Proposed floodways</td>
<td>Some benefit, not economical</td>
</tr>
<tr>
<td>Aquatic weed reduction</td>
<td>Vital, to be implemented</td>
</tr>
<tr>
<td>Waterway management</td>
<td>Worth pursuing</td>
</tr>
<tr>
<td>Flood easements</td>
<td>vital</td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
Table 5.3: Risk Management Strategic Plan

<table>
<thead>
<tr>
<th>Process</th>
<th>Probability</th>
<th>Consequence</th>
<th>Risk</th>
<th>Management Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional River Flooding</td>
<td></td>
<td></td>
<td></td>
<td>• Flood warning system</td>
</tr>
<tr>
<td>• Widespread flooding from Burdekin River</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>• Emergency response plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Land planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Vegetation management plan</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>• Vegetation management plan</td>
</tr>
<tr>
<td>• New Burdekin River breakouts</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>• Bank stabilisation</td>
</tr>
<tr>
<td>• Flooding of isolated Groper Creek community</td>
<td>High</td>
<td>Medium</td>
<td>Medium/High</td>
<td>• Flood warning system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Air Sea Rescue services</td>
</tr>
<tr>
<td>Local Rainfall Flooding</td>
<td></td>
<td></td>
<td></td>
<td>• Vegetation management plan</td>
</tr>
<tr>
<td>• Flooding in downstream areas</td>
<td>Medium/High</td>
<td>Medium</td>
<td>Medium</td>
<td>• Waterway management</td>
</tr>
<tr>
<td>• Local flooding in Home Hill township</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>• Flood easement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Waterway management</td>
</tr>
</tbody>
</table>
Home Hill Flood Study Area
ATTACHMENT 6.3: IDENTIFICATION AND DESCRIPTION OF HAZARDS: FLOODING OF THE HAUGHTON RIVER

Hazard Description

1. Urban – Urban and Rural

The Bureau of Meteorology is responsible for recording Haughton River water levels and providing alerts to the community. Close contact is maintained between the Council Flood Reporting Centre and the Bureau, during higher risk times.

The Haughton River Improvement Trust supervises levee banks in the area. It is a regular occurrence that the Haughton River overflows into the township of Giru. A large levee bank has been constructed near the riverbank at the Invicta Mill, which may assist in protecting the town in future floods. Giru and the surrounding area becomes virtually isolated when flooded, even if little rain has fallen on the township. The township residents and Mill owners are prepared for flooding and act collectively to protect life and property.

The Bruce Highway crosses the Haughton River and may be cut during heavy falls, particularly around the “Reedbeds/Haley’s Lagoon”.

The community consultation process comments have been reported in Attachment 6.2, with some being relevant to the Haughton River.

2. Giru Flood Study

A draft Giru Flood Study (May 2003) has been received by Council and is currently being reviewed. Giru has a long history of flooding during significant rainfall events in the river catchment. A synopsis of the draft Report is provided at the end of this Attachment. Key findings from the Study are:

2.1. Mitigation Strategies

2.1.1. Non-Structural Mitigation

1. Town planning
2. Public education
3. Council maintenance – monitoring, maintenance, reporting, removal of debris, control of vegetation
4. Flood warden – formalising an existing arrangement
5. Flood totems
6. Voluntary property buy back by Council
7. Voluntary house raising program
8. Counter disaster planning

2.1.2. Structural Mitigation Strategies

1. Levee bank – 7 options – including removal of all levees
2. Floodplain improvements – 7 options
3. Channel improvements – 4 options
4. Structural upgrades – Giru and Val Bird Weirs

3. Haughton River Flood Monitoring System

3.1. Flood Risk

The Haughton River catchment covers an area of approximately 1850 square kilometres and includes the major tributaries, Reid River and Major Creek. Barratta Creek is the overflow for both the Haughton and Burdekin Rivers. The headwaters of the Haughton catchment rise in the Hervey Range. As this is a relatively small catchment and due to the rapid response of the catchment to rainfall, travel times are very short. Heavy rainfalls over the catchment are capable of causing major flooding of agricultural areas adjacent to the waterways and major flooding of residential and commercial areas in Giru. The township has a levee constructed around the town to protect it from floods up to about 2.30 metres on the flood gauge.

3.2. Previous Flooding

Flood records for Giru only go back to 1978. The highest flood on record occurred in April 2000 with a recorded peak height of 2.85 metres on the flood gauge, causing widespread inundation of the Giru township.
Local Information

Local Shire Councils are able to provide further information on flooding in your area of the Haughton River catchment. The Burdekin Shire Council monitors Haughton River floods via the ALERT system.

Haughton ALERT System

The Haughton ALERT Flood Warning System was completed in 1993 as a co-operative project between the Bureau of Meteorology and the then Thuringowa City Council. The system, now transferred to Burdekin Shire Council, comprises of a network of rainfall and river height stations which report via VHF radio to a base station computer located in the Council office in Ayr. The stations send reports for every 1 millimetre of rainfall and every 50 millimetre change in river height.

In consultation with the Burdekin Shire Council, the Bureau issues Flood Warnings for the Haughton River.

The base station computer in the Burdekin Shire Council office collects the data and has software that displays it in graphical and tabular form. This data is also received by the Bureau's Flood Warning Centre where it is used in hydrologic models to produce river height predictions.

Interpreting Flood Warnings and River Height Bulletins

Flood Warnings and River Height Bulletins contain observed river heights for a selection of the river height monitoring locations. The time
at which the river reading has been taken is given together with its tendency (e.g. rising, falling, steady or at its peak). The Flood Warnings may also contain predictions in the form of minor, moderate or major flooding for a period in the future. River Height Bulletins also give the height above or below the road bridge or causeway for each river station located near a road crossing.

One of the simplest ways of understanding what the actual or predicted river height means is to compare the height given in the Warning or Bulletin with the height of previous floods at that location.

The table below summarises the flood history of the Haughton River catchment - it contains the flood gauge heights of the highest known floods recorded at selected river height locations, together with heights of recent floods.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flora Valley</td>
<td>8.90</td>
<td>5.20</td>
<td>8.20</td>
<td>7.50</td>
<td>7.70</td>
<td>7.05</td>
<td>6.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mt Piccaninny</td>
<td>9.09</td>
<td>4.06</td>
<td>7.73</td>
<td>4.63</td>
<td>7.64</td>
<td>6.65</td>
<td>5.75</td>
<td>5.90</td>
<td>7.83</td>
</tr>
<tr>
<td>Powerline</td>
<td>11.50</td>
<td>6.97</td>
<td>10.87</td>
<td>6.87</td>
<td>10.41</td>
<td>9.50</td>
<td>9.12</td>
<td>10.62</td>
<td></td>
</tr>
<tr>
<td>Hustons Farm</td>
<td>10.54</td>
<td></td>
<td>9.46</td>
<td>5.95</td>
<td>9.30</td>
<td>9.85</td>
<td>8.25</td>
<td>8.25</td>
<td></td>
</tr>
<tr>
<td>Giru</td>
<td>1.77*</td>
<td>2.35*</td>
<td>2.44*</td>
<td>2.35*</td>
<td>2.53*</td>
<td>2.65</td>
<td>2.72</td>
<td>2.73</td>
<td>2.85</td>
</tr>
</tbody>
</table>

All heights are in metres on flood gauges. [*] Indicated height in metres prior to the construction of the Giru levee.

Historical flood heights for all river stations in the Haughton River catchment Flood warning network, as shown on the map, are available from the Bureau of Meteorology upon request.

**Haughton River Catchment – Assessment of the Flood Potential**

Major flooding requires a large scale rainfall situation over the Haughton River catchment. However, the following can be used as a rough guide to the likelihood of flooding in the catchment:

Average catchment rainfalls of in excess of 200mm in 24 hours may cause moderate to major flooding and traffic disabilities to develop, particularly in low-lying areas of the Haughton River catchment downstream of Hustons Farm, extending into the Giru township and Haughton River delta area.

Average catchment rainfalls of in excess of 300mm in 24 hours may cause major flooding and traffic disabilities to develop, particularly in
low-lying areas of the Haughton River catchment downstream of Hustons Farm, extending into the Giru township and Haughton River delta area.

Flood Classifications

At each flood warning river height station, the severity of flooding is described as minor, moderate or major according to the effects caused in the local area or in nearby downstream areas. Terms used in Flood Warnings are based on the following definitions.

**Major Flooding:** This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.

**Moderate Flooding:** This causes the inundation of low lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by floodwaters.

**Minor Flooding:** This causes inconvenience such as closing of minor roads and the submergence of low level bridges and makes the removal of pumps located adjacent to the river necessary.
Each river height station has a pre-determined flood classification which details heights on gauges at which minor, moderate and major flooding commences. Other flood heights may also be defined which indicate at what height the local road crossing or town becomes affected by floodwaters.

The table below shows the flood classifications for selected river height stations in the Haughton River catchment.

<table>
<thead>
<tr>
<th>River Height Station</th>
<th>First Report Height</th>
<th>Crossing Height</th>
<th>Minor Flood Level</th>
<th>Crops &amp; Grazing</th>
<th>Moderate Flood Level</th>
<th>Towns and Houses</th>
<th>Major Flood Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flora Valley</td>
<td>3.0</td>
<td>12.0 (B)</td>
<td>5.0</td>
<td>5.5</td>
<td>5.0</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Mt Piccaninny</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powerline</td>
<td></td>
<td></td>
<td>6.0</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hustons Farm</td>
<td>3.0</td>
<td>6.1 (B)</td>
<td>4.0</td>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giru</td>
<td>1.0</td>
<td>3.5 (B)</td>
<td>1.8</td>
<td>2.1</td>
<td></td>
<td>2.5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

All heights are in metres on flood gauges.  
(B) = Bridge  (A) = Approaches  (C) = Causeway  (X) = Crossing  (d/s) = Downstream

Source: The Regional Director, Commonwealth Bureau of Meteorology, GPO Box 413, Brisbane Q 4001

3.3. Flood Forecasting

The Burdekin Shire Council, in conjunction with the Bureau of Meteorology operates a flood warning system for the Haughton River catchment. The ALERT network consists of automatic rainfall and river height stations which regularly forward data via radio telemetry to a base station located at the Council office in Ayr and the Bureau’s Flood Warning Centre in Brisbane. The system provides early warning of heavy rainfall and river rises in the catchment and enables more accurate and timely flood warning and forecasts. The balance of the network consists of volunteer rainfall and river height observers, who forward observations by telephone when the initial flood height has been exceeded at their station. The Department of Natural Resources and Mines also operates a number of automatic telephone telemetry stations throughout the catchment. The Bureau's Flood Warning Centre issues Flood Warnings and River Height Bulletins for the Haughton River catchment during flood events. Quantitative flood forecasts are issued when moderate flood levels are likely to be
exceeded at Giru, with an objective to provide between 3 and 12 hours warning of these flood levels.

4. **Current Treatments**

Current treatments extend to the provisions of the Counter Disaster Plan (1998), Council emergency and routine response teams for debris removal, roads, footpaths and drainage clearing and maintenance. Giru residents are well prepared for flooding and support each other as a collective response. Problems that do arise are usually associated with sightseers and those not part of the regular community.

There is close cooperation between Council and the Bureau of Meteorology, who are responsible for monitoring the Haughton River.

All key agencies have a presence in Giru (SES, Police and QAS).

5. **Secondary Hazards**

There are no expected events that are not mentioned above.
ATTACHMENT 6.3 APPENDIX 1: DRAFT GIRU FLOOD STUDY
(COMMISSIONED BY THE BURDEKIN SHIRE RIVERS IMPROVEMENT
TRUST – GHD – MAY 2003)

Objectives:
- Understanding the potential extent and associated hazard of flooding from the Haughton River;
- Analysing Haughton River flooding focusing on flow paths through and around Giru for ARI events 1,5,20 and 100 years an PMF;
- Reviewing evacuation procedures, and providing recommended evacuation plans for the risk population;
- Assessing existing infrastructure and drainage path problems within the township, identifying improvement options and providing ongoing maintenance recommendations for each mitigation solution;
- Undertaking a risk analysis with analysis of likelihood, consequence and risk of:
  - Loss of life or injury to persons residing; and
  - The damage to infrastructure within the Study area.

Mitigation Strategies:

Non-Structural Mitigation
1. Town planning
2. Public education
3. Council maintenance – monitoring, maintenance, reporting, removal of debris, control of vegetation
4. Flood warden – formalising an existing arrangement
5. Flood totems
6. Voluntary property buy back by Council
7. Voluntary house raising program
8. Counter disaster planning

Structural Mitigation Strategies
1. Levee bank – 7 options – including removal of all levees
2. Floodplain improvements – 7 options
3. Channel improvements – 4 options
4. Structural upgrades – Giru and Val Bird Weirs
Mitigation Strategies – Option Ranking

The report tabulates the mitigation options listed in order of their effectiveness to reduce peak flood levels at the Giru gauging station. Details are provided at the end of this Appendix.

1. Giru Evacuation sub-plan - within 1 year - $25,000
2. Action Guide – within 2 years - $15,000
3. Flood totems – within 1 year - $5,000
4. Option 7 (Giru township levee) development – within 5 years - $2,320,000.

Attachments:

1. Mitigation Option Ranking
2. Probable Maximum Flood Inundation Contour Map
3. Probable Maximum Flood Hazard Map
4. April 2000 Event Inundation Contour Plan
### 1. Mitigation Option Ranking

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Rank</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Placed levee around perimeter of town, including mill but not mill yards. Levee has breaks for Shirbourne Rd and railway</td>
<td>1</td>
<td>Substantial decrease in flood levels within the township is possible without adverse impacts elsewhere</td>
</tr>
<tr>
<td>7A</td>
<td>Placed levee around portion 2 of Giru on north side of rail line only</td>
<td>2</td>
<td>Partial leveeing of town provides only partial protection of the town. Option 7 precludes further consideration of Option 7A</td>
</tr>
<tr>
<td>7B</td>
<td>Placed levee along northern 3 perimeter of Giru only</td>
<td>3</td>
<td>Partial leveeing of town provides only partial protection of the town. Option 7 precludes further consideration of Option 7B</td>
</tr>
<tr>
<td>13</td>
<td>Complete removal of all levees from DTM</td>
<td>4</td>
<td>Figure 13 indicates that whilst there is a large localised decrease in flood levels in northern end of the township there is a large area of land upstream of the rail line which is adversely impacted. Consequently this option has not been considered further</td>
</tr>
<tr>
<td>22</td>
<td>Reinstate levees as per NR&amp;M Plan No. A3-A-5000</td>
<td>5</td>
<td>Reinstatement of levees to license levels will provide large decreases in flood levels in the northern end of the township. Whilst it is accepted there are increases in flood levels in the southern part of town and in the rural areas upstream of the rail line, control of levees should be paramount and reinstatement supported</td>
</tr>
<tr>
<td>9</td>
<td>Cut 60m wide channel from Haughton River at AMTD 17 km and 2.6 km west through to Crooked Waterhole</td>
<td>6</td>
<td>Large decreases in flood levels are possible with only marginal increase in disbenefited areas</td>
</tr>
<tr>
<td>15</td>
<td>Complete removal of Giru weir</td>
<td>7</td>
<td>Whilst the weir has an affect on water levels in the Township of up to 100 mm, complete removal of the weir is not considered feasible due to impact on irrigation supply. Lowering of weir provides only minor reduction in flood levels</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
<td>Rank</td>
<td>Comment</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Deepened river downstream of Giru weir to river mouth by 2m</td>
<td>8</td>
<td>Reduction in flood levels are only minor given the substantial increase in waterway area. Obstructions within the waterway should however be removed to prevent decreasing the already limited waterway particularly in the vicinity of the weir</td>
</tr>
<tr>
<td>11</td>
<td>Cut 60m wide channel at constant downward grade along Ironbark Ck alignment from Haughton River through to Bruce Highway</td>
<td>9</td>
<td>Provides little reduction in flood levels and involves substantial earthworks. This option has not been considered further</td>
</tr>
<tr>
<td>1</td>
<td>200 m wide channel truncating the oxbow bend downstream of Giru</td>
<td>10</td>
<td>Provides little reduction in flood level and involves substantial earthworks and land acquisition costs. This option has not been considered further</td>
</tr>
<tr>
<td>18</td>
<td>690 m base width into left floodplain on anabranch d/s of Giru at AMTD 14.8 km and 1.2 km west towards Cromarty’s lagoon area</td>
<td>11</td>
<td>Provides little reduction in flood levels and involves substantial earthworks. This option has not been considered further</td>
</tr>
</tbody>
</table>

Based on the above table the following are considered feasible options for further consideration:

- Option 7 Leveeing township.
- Option 22 Reinstate license levee levels.
- Option 9 Increasing waterway capacity of Crooked waterhole.
2. Probable Maximum Flood Inundation Contour Map
3. Probable Maximum Flood Hazard Map
4. April 2000 Event Inundation Contour Plan
Hazard Description

1. Urban and Rural

The Burdekin River bridge links the townships of Ayr and Home Hill and is the sole north south link for road and rail traffic on the coastal fringe. It is accordingly a lifeline of significant proportions.

The characteristics of a dual road and rail bridge create a set of risks that are greater than the presence of one from of transport alone. The bridge height is well above most flooding events other than certain dam break conditions described in Attachment 6.2.

While this Study is examining natural events that may cause a system failure, accidents on or adjacent to the bridge may cause considerable disruption to traffic and cause the community to find alternative means of crossing the river. Council is aware that there is a high proportion of the community that daily commute across the bridge to/from work or other reason, in either direction. There is evidence that during bridge closures some community members find opportunities to cross the river through identification of entry and exit points along the riverbank, causing potential bank damage.

Extended periods of bridge closure will create problems with traffic build up on either side or disruption to the supply of goods and services. Shortage of supplies may be a byproduct if accompanied with other natural or related events.

2. Current Treatments

The Shire has facilities on either side of the river as part of its contingency plan to cover emergency situations. It is possible that with the use of technology, most Council operations could continue for a period of time without severe disruption. The Counter Disaster Plan (1998) is in place.

3. Secondary Hazards

There are no expected events that are not mentioned above.
ATTACHMENT 6.5: IDENTIFICATION AND DESCRIPTION OF HAZARDS: MAJOR LOCALISED FLOODING

Hazard Description

1. Urban

The areas identified in this Study include Ayr, Home Hill and Brandon. Flood studies have been commissioned for all three areas:

- Brandon (May 1992);
- Ayr (draft – August 2001);
- Home Hill (draft – May 2003).

Council has undertaken high priority works in Brandon to address local flooding. Some actions remain under consideration. Action has been taken by Council to address priority needs in Ayr and Home Hill within annual and capital works programs.

The current draft Ayr and Home Hill Flood Studies have several recommendations currently being considered by the Council.

The Burdekin Falls Dam, dam break Study (referenced in Attachment 6.2), highlights potential impacts of catastrophic events that will cause major damage and possible loss of life, though in most cases early warning systems will allow evacuation.

2. Current Treatments

All reports on flooding of Urban areas are currently under consideration. The SAG agreed that Mitigation Action Plan 4 will address the need to implement actions that have been endorsed by Council/Rivers Trust and funding is provided.

Council has a well-developed emergency response infrastructure in place and a developed Counter Disaster Plan (1998) that covers the risks associated with localised flooding.

3. Secondary Hazards

There are no expected events that are not mentioned above.
ATTACHMENT 6.6: IDENTIFICATION AND DESCRIPTION OF HAZARDS: STORM SURGE/TIDE – COASTAL, RIVERS & FLATS

Hazard Description

1. Burdekin Shire and Adjacent Coastal Areas

Cyclones are largely associated with coastal regions of northern and central Queensland, with BSC having direct and recent experience as a result of Cyclone Aivu (1989) and lesser known events. Storm surge is usually associated with a Cyclone or Severe Storm, but similar effects can arise from earthquake events although they are generally referred to as a Tsunami event. Further information on cyclone and earthquake is provided in Attachments 6.1 and 6.8 respectively.

Storm surge is the rise (or fall) of open coast water levels relative to the normal water level and is due to the action of wind stress, wave action and a reduction in atmospheric pressure on the water surface. The combined storm surge and normal tide level is often referred to as a storm tide.

Burdekin Shire commenced a Storm Surge Study in May 2002. The draft report from that Study dated May 2003 has now been released for public comment.

The topography of the Shire and geographic location adds to the threat of storm surge. The Shire is flat, with low lying coastal plains and the coastal communities of Jerona, Alva Beach, Rita Island, Groper Creek and Wunjunga face a significant storm surge threat. In the more severe cyclones categories, the inland towns of Giru, Brandon, Home Hill and Ayr also face the threat of inundation from storm surge.

Recorded storm surge/tide events have been identified as incomplete. The Bathurst Bay cyclone of 1899 allegedly produced a storm surge in excess of 10 metres, with 307 lives lost at sea. Other notable surges include 3.7 metres at Mackay (1918), 3.6 metres just north of Townsville (Cyclone Althea, 1971), and 3.3 metres in Upstart Bay near Ayr (Cyclone Aivu, 1989) (Bureau of Meteorology (BoM), 1992).

Table 1 below, provides an assessment of Storm Surge/Tide on Burdekin Shire’s coastal areas (Bureau of Meteorology, October 1992):

### Table 6.6-1

**Burdekin Shire Coastal Areas Subject to Storm Surge/Tide**  
**Estimated Effect of a Surge on Coastal centres**

<table>
<thead>
<tr>
<th>Centre</th>
<th>Assumed highest tide on AHD(M)</th>
<th>Zone A Height AHD(M)</th>
<th>Zone A Effect</th>
<th>Zone B Height AHD(M)</th>
<th>Zone B Effect</th>
<th>Zone C Height AHD(M)</th>
<th>Zone C Effect</th>
<th>ARI 500Ys AHD(M)</th>
<th>ARI 10,000Ys AHD(M)</th>
<th>HAT(1992) Qld Tide Tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrattas</td>
<td>2.2</td>
<td>3.7</td>
<td>Yes</td>
<td>5.2</td>
<td>Yes</td>
<td>6.7</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alva</td>
<td>2.1</td>
<td>3.6</td>
<td>Yes</td>
<td>5.1</td>
<td>Yes</td>
<td>6.6</td>
<td>Yes</td>
<td>3.2</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>Phillips Camp</td>
<td>2.1</td>
<td>3.6</td>
<td>Yes</td>
<td>5.1</td>
<td>Yes</td>
<td>6.6</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fieldings Landing</td>
<td>2.1</td>
<td>3.6</td>
<td>Yes</td>
<td>5.1</td>
<td>Yes</td>
<td>6.6</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hell Hole</td>
<td>2.1</td>
<td>3.6</td>
<td>Yes</td>
<td>5.1</td>
<td>Yes</td>
<td>6.6</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mays Landing</td>
<td>2.1</td>
<td>3.6</td>
<td>Yes</td>
<td>5.1</td>
<td>Yes</td>
<td>6.6</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groper Creek</td>
<td>2.1</td>
<td>3.6</td>
<td>Yes</td>
<td>5.1</td>
<td>Yes</td>
<td>6.6</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table Notes:**

a. Assumed Highest Tide – height in metres of the assumed highest tide at the particular location above the Australian Height Datum.

b. Zone A - height in metres of the first evacuation zone – up to 1.5 metres above assumed highest tide. Effect – a statement of whether water up to this level would inundate any developed areas – i.e. whether evacuation could be required.

c. Zone B - height in metres of the first evacuation zone – from 1.5 to 3 metres above assumed highest tide. Effect – a statement of whether water up to this level would inundate any developed areas – i.e. whether evacuation could be required.

d. Zone C - height in metres of the first evacuation zone – from 3 to 4.5 metres above assumed highest tide. Effect – a statement of whether water up to this level would inundate any developed areas – i.e. whether evacuation could be required.

e. ARI – where available, storm tide levels for Average Recurrence Intervals (ARI) for 500 and 10,000 years.

f. The review acknowledges that MSC has developed a coded Shire map that displays the effects of these three (3) flood impact levels.

A summary of the Maunsell Study is provided at the end of this Attachment.

The Study examined the residual risk of storm surge to:

- Major Inland Towns (Report Table 15);
- Residual Risk - Cyclone:
The Study mitigation plan outcomes include:

- Recommendations on mitigation measures and costs for implementation;
- Development of storm surge warning and evacuation plans and procedures for the nominated communities (Ayr, Home Hill, Brandon, Giru, Jerona, Alva Beach, Rita Island, Groper creek and Wunjunga); and
- Identification of those cyclone events that will result in inundation of the Bruce Highway.

It is evident that Storm Surge presents a serious problem for BSC, should such an event arise. The report and mitigation plan described above is currently subject to consideration by Council and the community. The draft Storm Surge (Maunsell) Study outcomes will however be incorporated into the revised Natural Disaster Risk Management Study report.

2. Current Treatments

Burdekin has a well-developed emergency response infrastructure in place and a developed Local Counter Disaster Plan that covers the risks associated with key events such as Storms, Cyclones and
Flooding. Council encourages the community to follow the advice provided through the Bureau of Meteorology on local radio and television during such events.

A sub-plan for Cyclone and Storm covers the expected threat of Storm surge/tide and potential areas of operation (coastal resort areas, rural towns and rural communities).

The SES has centres at Ayr, Home Hill, Clare, Giru and Rita Island. The Air See Rescue Centre is located at Alva Beach. The QAS, F&RS and QPS have centres at Ayr, Home Hill and Giru.

Six (6) designated evacuation centres are located at Ayr, Home Hill, Alva Beach and Giru.

A review was undertaken of reports on Cyclone Aivu (April 1989) and Cyclone Charlie (May 1988). These events were significant for the area, with the reports providing a useful analysis of prevention, preparedness, response and recovery strategies.

Burdekin Shire Council has recognised the importance by incorporating requirements into the Council Planning Scheme. Relative flood levels for susceptible coastal areas have been identified, with conditions attached to an application for a building permit of land likely to be impacted by a flooding event, however caused. Council recognises the need to continually review levels.

The sub-plan for Cyclone and Storm should be reviewed and updated to reflect recent outcomes of Maunsell Storm Surge Study report (May 2003) and consider the key points in the Storm Tide Warning-Response System report issued by the State Counter-Disaster Organisation and Bureau of Meteorology (October 1992).

3. Secondary Hazards

There are no expected events that are not mentioned above.
Primary Objectives:

- Investigate and provide storm surge counter disaster plans, including evacuation plans and storm surge mitigation solutions for the Burdekin Shire – townships of Ayr, Home Hill, Brandon, Giru, Jerona, Alva Beach, Rita Island, Groper Creek and Wunjunga;
- To reduce/minimize risk of death and injury due to storm surge events; and
- To reduce flooding isolation and infrastructure damage due to storm surge events.

Study Activities:

- Independently calculating storm surges over the range of events specified in the Consultancy Brief (Category 3, 4 7 5 cyclones at various locations). This process included extensive data collection, calibration of a tidal model, application of wave and wind filed models and a design surge analysis based on a hindcast model calibrated to two historical cyclone events (Aivu and Althea).
- Assessment of the effects of simultaneous major river flood events with storm surge, for the Burdekin and Haughton Rivers.
- Development of design storm surge inundation and hazard maps.
- Development of an operational storm surge forecast model that Council can run in the event of an approaching cyclone (to assist with local disaster response planning), and provision of software and training in use of the forecast model.

Study Outcomes:

- Recommendations on mitigation measures and costs for implementation;
- Development of storm surge warning and evacuation plans and procedures for the nominated communities (Ayr, Home Hill, Brandon, Giru, Jerona, Alva Beach, Rita Island, Groper creek and Wunjunga); and
- Identification of those cyclone events that will result in inundation of the Bruce Highway.

Cyclone Storm Surge History in the Study Area:

- Tropical Cyclone Connie (16 February 1959) – 948 hPa, severe wind damage – 33% of Ayr homes severely damaged, halls, schools and hotels unroofed, 100 persons left homeless at Home Hill, all shops in CBD suffered some – to extreme damage, 700 windmills damaged in Shire.
- Tropical cyclone Charlie (1 March 1988) – 981 hPa – eye of 37 km – crossed at Upstart Bay near Ayr – recorded speeds of 75-80 knots, 2 metre water in Ayr, 4 houses unroofed, widespread sugar cane damage – crop losses of $15 million (1990$), large seas to 3.1 m – 5.6 m), beach erosion, dune breach at Beachmont – inundation of over 1,800 Ha.

- Tropical cyclone Aivu (4 April 1989) – 959 hPa – eye of 30 km near Ayr, Insurance payout - $26 million (1990 $), Total damage estimated at $40 million (1990 $), Agriculture damage estimated at $40 million and infrastructure damage at $10 million, wind destroyed some houses – many lost roofs, a 3 metre surge destroyed many beachfront properties in Upstart Bay and drowned one man.

- Tropical cyclone Ita (24 February 1997) – crossed coast near Cungulla in Bowling Green Bay around 1200 UTC, strongest winds recorded at Alva Beach AWS – 42 - 52 knots, power lines brought down, flooding at Alva Beach and in coastal streams to the south.

- Many other cyclone events outside the Study area (in the north) have resulted in flooding of the Burdekin and Haughton Rivers – Cyclone Althea (1971)

Data Collection:

**Table 6.6-2**

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Central Pressure (Hpa)</th>
<th>Radius to Maximum Wind (km)</th>
<th>Maximum Windspeed (m/s)</th>
<th>Background Pressure</th>
<th>Cyclone Speed*</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (1/4/89 22700)</td>
<td>989</td>
<td>10</td>
<td>21</td>
<td>1007</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>986</td>
<td>15</td>
<td>24</td>
<td>1007</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>984</td>
<td>18</td>
<td>25</td>
<td>1007</td>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>980</td>
<td>20</td>
<td>26</td>
<td>1007</td>
<td>27</td>
<td>2</td>
</tr>
<tr>
<td>24</td>
<td>975</td>
<td>22</td>
<td>31</td>
<td>1007</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>962</td>
<td>25</td>
<td>38</td>
<td>1007</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>36</td>
<td>950</td>
<td>28</td>
<td>43</td>
<td>1007</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>42</td>
<td>935</td>
<td>28</td>
<td>49</td>
<td>1007</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>48</td>
<td>942</td>
<td>30</td>
<td>46</td>
<td>1007</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>54</td>
<td>948</td>
<td>27</td>
<td>43</td>
<td>1007</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>60</td>
<td>955</td>
<td>25</td>
<td>40</td>
<td>1007</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>66</td>
<td>987</td>
<td>20</td>
<td>26</td>
<td>1007</td>
<td>24</td>
<td>1</td>
</tr>
</tbody>
</table>
* Cyclone speed derived from posted coordinates of the eye at different time steps.
Source: Bureau of Meteorology

### Table 6.6-2
**Cyclone Althea Parameters**

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Central Pressure (Hpa)</th>
<th>Radius to Maximum Wind (km)</th>
<th>Maximum Windspeed (m/s)</th>
<th>Background Pressure</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (20/12/71 09:00)</td>
<td>999</td>
<td>70</td>
<td>14</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>998</td>
<td>65</td>
<td>15</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>997</td>
<td>60</td>
<td>15</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>36</td>
<td>991</td>
<td>50</td>
<td>20</td>
<td>1010</td>
<td>1</td>
</tr>
<tr>
<td>42</td>
<td>986</td>
<td>45</td>
<td>24</td>
<td>1010</td>
<td>1</td>
</tr>
<tr>
<td>48</td>
<td>980</td>
<td>45</td>
<td>26</td>
<td>1010</td>
<td>2</td>
</tr>
<tr>
<td>54</td>
<td>973</td>
<td>40</td>
<td>32</td>
<td>1010</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>962</td>
<td>40</td>
<td>38</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>66</td>
<td>952</td>
<td>40</td>
<td>43</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>72</td>
<td>952</td>
<td>40</td>
<td>43</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>78</td>
<td>952</td>
<td>40</td>
<td>43</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>84</td>
<td>952</td>
<td>35</td>
<td>45</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>90</td>
<td>952</td>
<td>28</td>
<td>45</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>96</td>
<td>952</td>
<td>28</td>
<td>43</td>
<td>1010</td>
<td>3</td>
</tr>
<tr>
<td>102</td>
<td>975</td>
<td>30</td>
<td>30</td>
<td>1010</td>
<td>2</td>
</tr>
<tr>
<td>108</td>
<td>988</td>
<td>40</td>
<td>22</td>
<td>1010</td>
<td>1</td>
</tr>
<tr>
<td>114</td>
<td>990</td>
<td>50</td>
<td>20</td>
<td>1010</td>
<td>1</td>
</tr>
<tr>
<td>120</td>
<td>995</td>
<td>60</td>
<td>17</td>
<td>1010</td>
<td>1</td>
</tr>
<tr>
<td>126</td>
<td>997</td>
<td>70</td>
<td>15</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>132</td>
<td>998</td>
<td>75</td>
<td>15</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>138</td>
<td>998</td>
<td>75</td>
<td>15</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>144</td>
<td>998</td>
<td>75</td>
<td>15</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>150</td>
<td>998</td>
<td>70</td>
<td>16</td>
<td>1010</td>
<td>-</td>
</tr>
<tr>
<td>156</td>
<td>997</td>
<td>65</td>
<td>16</td>
<td>1010</td>
<td>-</td>
</tr>
</tbody>
</table>
Community Vulnerability Assessment:

Assessment of services and infrastructure – Ambulance Stations and Fire Stations, Bridges, Hospitals, police Stations, SES buildings, Sewage and Water infrastructure:

- The communities of Jerona, Brandon, Rita Island, Groper Creek and Wunjunga have no dedicated facilities. Of these only Brandon has town water supply and reticulated sewage;

- Alva Beach has an official evacuation centre (Surf Lifesaving Clubhouse) and an Air Sea Rescue Centre, located on high ground east of the community. Alva Beach has town water supply but waste water disposal is via on-site detention (septic system);

- Giru has ambulance, SES, police and fire services, and an official evacuation centre. Like Alva Beach, Giru has reticulated water supply but no reticulated sewage;

- Being the largest centre in the Shire, Ayr has the full range of services including water infrastructure (bore fields), a sewage treatment plant and hospital, official evacuation centre and aged care facilities;

- Home Hill, the second largest population centre also has a full range of services including three official evacuation centres.
Access Roads:

- **Giru** – two access roads (Woodstock/Giru Road and Shirbourne Road, both access the Bruce Highway). The roads are sealed and have one lane each way. The Woodstock/Giru Road has two low points, a section located 1 km from the Highway (RL 3.5 AHD) and the crossing of Crocked Waterhole (RL 3.5 AHD). Shirbourne Road is generally higher as it runs along the left bank of the Haughton River, however a low point exists (RL 4.0 m AHD) on the Bruce Highway side of the intersection with Woodstock/Giru Road;

- **Jerona** – is located 16 km from the Bruce Highway – accessed via Jerona Road – generally low lying with frequent causeways and is regularly inundated by high tides. There are several low lying sections along the roadway – 1.7 km from Jerona (RL 1.5 m AHD) and an extended low section (about 1.9 km long with an average level of RL 1.5 m AHD, starting approximately 7 km from Jerona. The lowest section of road is approximately RL 1.0 m AHD (2 km from railway);

- **Groper Creek** – is located 15 km from Home hill and is accessed via Groper creek Road – generally low lying points susceptible to surge inundation – first, 1 km from Groper Creek (RL 2.7 m AHD), second at the intersection of Groper Creek Road and Mt Alma Road (RL 2.75 m AHD), third, at the causeway located on the Home Hill side of Coppo Road (RL 3.25 m AHD) approximately 6 km from Groper Creek. Several alternative routes exist including Mt Alma Road and Coppo Road;

- **Wunjunga** – is accessed from the Bruce highway via a single lane dirt road that traverses a low lying salt pan, before running parallel with the coastline behind the dunal ridge. The road crosses a series of floodways and ridges, with low lying sections having an average level of RL 1.0 – 1.5 m AHD. The level of the ridges is generally RL 2.0 – 2.5 m AHD;

- **Alva Beach** – is located 16 km from Ayr via a sealed road with one lane in each direction (Beach Road). There is a location 1 km from Alva Beach where a tidal creek is immediately adjacent to the roadway (normal tidal flows come close to the road but do not inundate it. Lillesmere Lagoon branches near the Kalamia Mill and crosses Alva Beach Road on the Ayr side of the turn off to the Mill and on the Alva Beach side of the intersection with Trent Road. Both crossings have low point. The upstream end of Lillesmere Lagoon enters Ayr at the Lando Street Park. There are two low points along Beach Road near to town where the level is approximately RL 4.0 m AHD (crossings of Plantation Creek overflow and Nelsons Lagoon. There is also a low point of RL 2.5 m AHD approximately 2.5 km on the beach side of the intersection with Trent Road. From this point to Alva Beach, the road level averages RL 3.0 m
AHD with some isolated points of RL 2.5 m AHD. Nearer to Ayr, an alternative route exists via Parker Road.

- **Bruce Highway** – there are several low sections of the Bruce Highway, and other sections where storm surge propagation inland via drainage systems can result in storm surge approaching the highway (if not overtopping). The flat section of the Highway on the western side of Woodstock/Giru Road (known as the Reed Beds) has an average level of only RL 3.5 m AHD and a low point at RL 3.0 m AHD. There are two low points between Ayr and Brandon, including the bend near the sewage treatment plant (RL 5.5 – 6.0 m AHD) and Dal Santo crossing (RL 6.0 m AHD). To the west of Brandon, there are low points at Sheep Station Creek (RL 6.0 m AHD) and Collinsons Lagoon (RL 6.5 m AHD). The Highway is also at risk at Plantation Creek crossing (RL 5.5 m AHD) located just south of Ayr. A number of low points also exist south of Home Hill towards Mt Inkerman. Near the Wunjunga turnoff, two creek depressions (Saltwater Creek and Yellow Gin Creek) have potential to convey storm surge inundation inland as far as the Highway.

**Summary of Community Vulnerability Assessment:**

**Table 6.6-3**

**Summary of Community Vulnerability Assessment**

<table>
<thead>
<tr>
<th>Location</th>
<th>Category</th>
<th>Description / Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giru</td>
<td>1</td>
<td>• No impact.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>• Woodstock/Giru Road potentially inundated by storm surge. The road is still trafficable with water depths less than 0.5m.</td>
</tr>
</tbody>
</table>
|          | 4 *      | • Approximately 50% of properties in Giru potentially inundated by a maximum of 0.5m.  
• The length of Woodstock/Giru Road within the Study Boundary potentially inundated by a maximum of 1.5m.  
• Shirbourne Road potentially inundated at the intersection with Woodstock/Giru Road, by a maximum depth of 0.6m. |
|          | 5        | • All properties in Giru potentially inundated with storm surge, with depths 2-4m.  
• The length of Woodstock/Giru Rd within the Study Boundary potentially inundated by more than 4m.  
• Shirbourne Road potentially inundated with water depths of 2-4m. |
<table>
<thead>
<tr>
<th>Location</th>
<th>Category</th>
<th>Description / Comments</th>
</tr>
</thead>
</table>
| Jerona   | 1        | - All properties in Jerona potentially inundated by an average of 0-0.5m in this event.  
- Jerona Road potentially inundated until the railway line, with a maximum depth of 0.9m. |
|          | 2 *      | - All properties in Jerona potentially inundated by an average of 0-1 m in this event.  
- Jerona Road potentially flooded until the railway line, with a maximum depth of 1.0m. |
|          | 3        | - All properties in Jerona potentially inundated by an average of 1-1.5 m in this event.  
- Jerona Road is flooded beyond the railway line, with a maximum depth of about 2.4m. |
|          | 5        | - All properties in Jerona potentially inundated by an average of 2-4 m in this event.  
- Jerona Road potentially flooded to the Bruce Highway with a maximum depth of approximately 5m. |
| Brandon  | 1        | - No impact. |
|          | 3        | - No impact. |
|          | 4 *      | - Approximately 20-30% of Brandon properties, on the north side of the Bruce Highway potentially inundated (average depths of 0-0.5m). |
|          | 5        | - All Brandon properties within the study area potentially inundated with depths ranging from less than 0.5m to over 2m. |
| Alva     | 1        | - About 95% of properties potentially inundated an average of 0-0.5m. Some properties are inundated by over 1 m.  
- Evacuation centre potentially flooded by maximum of 0.3m.  
- Alva Beach Rd potentially inundated by less than 0.5m for approximately 2km from Alva Beach. |
|          | 2 *      | - Over 95% of properties potentially inundated, with water depths up to 1.5m.  
- Evacuation centre potentially flooded by a maximum of 0.5m.  
- Alva Beach Road potentially inundated by a maximum of 0.6m for approximately 5km from Alva Beach. |
|          | 3        | - All properties potentially inundated with maximum depths over 1.5m.  
- Evacuation centre potentially flooded by up to 1.5m.  
- Alva Beach Road potentially inundated at Lilliesmere Lagoon crossings (Kalamia Mill and Trent Road), and from Trent Road to Alva Beach. The maximum depth is over 1 m. |
|          | 5        | - All properties potentially inundated by 1-4m.  
- Evacuation centre potentially flooded over 2m.  
- Alva Beach Road potentially flooded from Alva Beach to Ayr, average depth 2-4m. |
<table>
<thead>
<tr>
<th>Location</th>
<th>Category</th>
<th>Description / Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayr</td>
<td>1</td>
<td>No impact.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Potential inundation of properties adjacent to Plantation Creek in the vicinity of Rita Island Road. Potential inundation of industrial estate north of Ayr. SES is located in this area and is accessed via Bird Street, which is inundated by less than 0.30m. Potential minor flooding of some properties adjacent to Lilliesmere Lagoon.</td>
</tr>
<tr>
<td></td>
<td>4 *</td>
<td>Storm surge enters Ayr from Lilliesmere Lagoon. Properties adjacent to Lilliesmere Lagoon potentially flooded and along drainage overflow path from Lagoon and Plantation Creek overflow that flows through Ayr. Potential flooding of industrial estate north of Ayr. SES potentially flooded with up to 1 m. Potential inundation of properties adjacent to Plantation Creek in the vicinity of Rita Island Road. Possible inundation of properties on Kennedy Street. Bruce Highway potentially cut at Plantation Creek crossing. Flooding of water infrastructure near Churchill St (Nelsons Lagoon, bore fields). Sewerage infrastructure on Conley St potentially inundated.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Over 95% of Ayr (within the Study Boundary) is potentially inundated by storm surge. All community service facilities, including Ayr Hospital, sewerage infrastructure, Fire Station, SES, Evacuation Centre, Police Station, Ambulance and Water Infrastructure) potentially flooded.</td>
</tr>
<tr>
<td>Home Hill</td>
<td>1</td>
<td>No impact.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>No impact.</td>
</tr>
<tr>
<td></td>
<td>4 *</td>
<td>No impact.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Some properties potentially inundated near Cemetery (less that 0.5m).</td>
</tr>
<tr>
<td>Rita Island</td>
<td>1</td>
<td>Potential inundation of some rural properties.</td>
</tr>
<tr>
<td></td>
<td>2 *</td>
<td>Potential inundation of some rural properties.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Potential inundation of some rural properties. Rita Island Road potentially cut at Plantation Creek crossing by over 1.5m. Road potentially cut near intersection with Ruddy Street (maximum depth 0.7m). Road potentially inundated approximately 3km from Anabranch Bridge (on Rita Island side). The maximum depth here is 0.8m.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>All of Rita Island potentially inundated by storm surge (average depth 2-4m). Rita Island Road potentially inundated for entire length.</td>
</tr>
<tr>
<td>Location</td>
<td>Category</td>
<td>Description / Comments</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Groper Creek | 1        | • 95% of properties potentially inundated by less than 0.5m.  
• Groper Creek Road potentially inundated at Groper Creek and 1 km from town at low point (less than 0.5m depth). |
|            | 2 *      | • All properties in Groper Creek potentially inundated by up to 1.5m.  
• Groper Creek Road potentially cut at low point 1 km from Groper Creek (maximum depth 1.2m). |
|            | 3        | • All properties in Groper Creek potentially inundated by over 1 m.  
• Groper Creek Road potentially inundated for Urn from Groper Creek. |
|            | 5        | • Groper Creek properties potentially inundated by over 4m.  
• Groper Creek Road potentially flooded from Groper Creek to Home Hill (average depth 2-4m). |
| Wunjunga   | 1        | • 50-60% of Wunjunga Road potentially inundate by an average of 0.5-1 m, with depths up to 1.5m. |
|            | 2 *      | • Approximately 80% of Wunjunga Road potentially inundated by an average of 1-2m. |
|            | 3        | • Wunjunga Road potentially inundated to Bruce Highway by an average of 2-4m.  
• Some property potentially inundation (less than 0.5m). |
|            | 5        | • Wunjunga Road potentially inundated to Bruce Highway by an average of 4-6m.  
• Some property potentially inundated (less than 0.6m). |

* Intermediate event: either Category 2 or Category 4 considered, not both.
## Disaster Mitigation Plan:

### Treatment Strategy Development

<table>
<thead>
<tr>
<th>Endorsed Treatment</th>
<th>Responsible Agency</th>
<th>Complete Implementation Timetable</th>
<th>Estimated Cost</th>
<th>Funding Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adopt Storm Surge Evacuation Plan</td>
<td>Burdekin Shire Council</td>
<td>To be completed by July 2003</td>
<td>Time and Materials</td>
<td>Council Budget</td>
</tr>
<tr>
<td>Initiate Development of a Storm Surge Action</td>
<td>Burdekin Shire Council</td>
<td>To be completed by December 2003</td>
<td>$5000 – Time and Materials</td>
<td>Council Budget, Industry Partners</td>
</tr>
<tr>
<td>Update Evacuation Centre Locations</td>
<td>Counter Disaster Committee</td>
<td>To be completed by December 2003</td>
<td>$5000 – Time and Materials</td>
<td>Council Budget, Natural Disaster Funding Schemes</td>
</tr>
<tr>
<td>Assess structural integrity of all nominated evacuation centres to withstand cyclonic conditions</td>
<td>Counter Disaster Committee</td>
<td>To be completed by December 2003</td>
<td>$5000 – Time and Materials</td>
<td>Council Budget, Natural Disaster Funding Schemes</td>
</tr>
<tr>
<td>Update the Counter Disaster Plan (Recovery Sub-plan) to include procedures for assessing health risks associated with relocation of evacuees to storm surge affected areas</td>
<td>Counter Disaster Committee</td>
<td>To be completed by June 2004</td>
<td>Time and Materials</td>
<td>Council Budget</td>
</tr>
<tr>
<td>Initiate and support a community awareness program relating specifically to storm surge</td>
<td>Burdekin Shire Council</td>
<td>Information pack and media plan to be completed by June 2004</td>
<td>$10000 – Time and Materials</td>
<td>Council Budget, Industry Partners</td>
</tr>
<tr>
<td>Endorsed Treatment</td>
<td>Responsible Agency</td>
<td>Complete Implementation Timetable</td>
<td>Estimated Cost</td>
<td>Funding Source(s)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------</td>
<td>----------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Implement town planning controls in coastal communities to ensure that habitable</td>
<td>Burdekin Shire Council</td>
<td>To be completed by December 2003</td>
<td>Time and Materials</td>
<td>Council Budget</td>
</tr>
<tr>
<td>floor levels in new development have an acceptable freeboard above Highest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Astronomical Tide (HAT).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consider Relocation of the Ayr SES Centre to a more appropriate location less</td>
<td>State Emergency Service</td>
<td>Decision to be made by June 2004</td>
<td>$50000 – Time and Materials</td>
<td>State Emergency Service</td>
</tr>
<tr>
<td>prone to surge and flooding.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigate measures to improve the surge immunity and recovery of Ayr sewerage</td>
<td>Burdekin Shire Council</td>
<td>To be completed by December 2003</td>
<td>$5000 – Time and Materials</td>
<td>Council Budget</td>
</tr>
<tr>
<td>treatment plant.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiate and support research into the environmental and rural impacts of surge</td>
<td>Burdekin Shire Council</td>
<td>Research to commence by July 2004</td>
<td>$5000 – Time and Materials</td>
<td>Council Budget, Industry and Agency Partners</td>
</tr>
<tr>
<td>inundation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install dedicated surge warning sirens at coastal communities of Jerona, Alva</td>
<td>Burdekin Shire Council</td>
<td>To be implemented by December 2005</td>
<td>$25000 – Time and Materials</td>
<td>Council Budget, State and Federal Schemes</td>
</tr>
<tr>
<td>Beach, Groper Creek and Wunjunga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upgrade the Bruce Highway crossing of Plantation Creek</td>
<td>Department of Main Roads</td>
<td>To be constructed by 2010</td>
<td>$5 million</td>
<td>QDMR, State and Federal Funding</td>
</tr>
<tr>
<td>Stage upgrade of Jerona Road to above HAT</td>
<td>Burdekin Shire Council</td>
<td>Staged construction over 15 years.</td>
<td>$1 million</td>
<td>Council Budget, Natural Disaster Funding Schemes,</td>
</tr>
<tr>
<td>Endorsed Treatment</td>
<td>Responsible Agency</td>
<td>Complete Implementation Timetable</td>
<td>Estimated Cost</td>
<td>Funding Source(s)</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>Stage upgrade of Wunjunga Road to above HAT</td>
<td>Burdekin Shire Council</td>
<td>Forward works programme without compromising other worthy projects that benefit a greater number of people</td>
<td>$750000</td>
<td>Council Budget, Natural Disaster Funding Schemes, Wunjunga Community</td>
</tr>
</tbody>
</table>
Storm Surge Evacuation Plan:

Appendix ‘D’ provides the proposed Storm Surge Evacuation Plan. The reader is referred to that report for more details of this important strategy.

Maps:

The Burdekin Shire Storm Surge Study Area map and Storm Surge Study Hazard Maps – Cyclone Categories 1 to 5 from the draft report are included herein.
Burdekin Shire Storm Surge Study Area
Storm Surge Study Hazard Map – Cyclone Category 1

Category: 1
Landfall: Centre
Bearing: East
Tide Level: High

Legend
Bruce Highway
Primary Access Roads
Major Inland Towns
A Ayr
H Home Hill
Minor Inland Towns
G Giru
B Brandon
Coastal Communities
J Jeron
AB Alva Beach
R Rita Island
GC Groper Creek
W Wunjunga

BURDEKIN SHIRE COUNCIL

Storm Surge Study

Hazard Level
- Low
- Medium
- High
- Extreme

Prepared by:
Maunsell
Storm Surge Study Hazard Map – Cyclone Category 2

Category: 2
Landfall: Centre
Tide Level: High
Bearing: East

Legend
Bruce Highway
Primary Access Roads

Major Inland Towns
A Ayr
H Home Hill

Minor Inland Towns
G Giru
B Brandon

Coastal Communities
J Jerona
AB Alma Beach
R Rita Island
GC Groper Creek
W Wunjunga

Hazard Level
Low
Medium
High
Extreme

BURDEKIN SHIRE COUNCIL

Storm Surge Study

Prepared by:
Maunsell
Storm Surge Study Hazard Map – Cyclone Category 3

Category: 3  Tide Level: High
Landfall: Centre  Bearing: East

Legend
- Bruce Highway
- Primary Access Roads
- Coastal Communities
- Cyclone Landfall Location

Minor Inland Towns
- Ayr
- Home Hill
- Giru
- Brandon

Major Inland Towns
- Jerona
- Alva Beach
- Ritz Island
- Groper Creek
- Wunjinga

Prepared by: Maunsell
Storm Surge Study Hazard Map – Cyclone Category 4

Category: 4
Landfall: Centre
Tide Level: High
Bearing: East

Legend
- Bruce Highway
- Primary Access Roads

Major Inland Towns
A. Ayr
H. Home Hill

Minor Inland Towns
C. Giru
B. Brandon

Coastal Communities
J. Jerona
AB. Alva Beach
RJ. Rita Island
GC. Groper Creek
W. Wunjunga

BURDEKIN SHIRE COUNCIL

Storm Surge Study

Hazard Level
- Low
- Medium
- High
- Extreme

Prepared by:
Maunsell
Storm Surge Study Hazard Map – Cyclone Category 5

**Category:** 5  **Tide Level:** High
**Landfall:** Centre  **Bearing:** East

**Legend**
- Bruce Highway
- Primary Access Roads

**Major Inland Towns**
- Ayr
- Home Hill

**Minor Inland Towns**
- Giru
- Brandon

**Coastal Communities**
- Jerona
- Alva Beach
- Rita Island
- Groper Creek
- Wunjunga

**Hazard Level**
- Low
- Medium
- High
- Extreme

Prepared by: Maunsell
ATTACHMENT 6.7: IDENTIFICATION AND DESCRIPTION OF HAZARDS: BUSHFIRES

Hazard Description

1. Bushfires - Urban and Rural

The Shire has a chance of being subject to bushfire activity due to its terrain in the western and south-western parts of the Shire. In addition the Shire places a high value on economic sustainability, protection of the natural environment and native flora and fauna. The Shire Planning Scheme is focused on the maintenance of a balanced development, economic and social environment.

The Shire has large tracts of land devoted to sugar production, with increasing development of new horticultural pursuits as the sugar industry crisis unfolds. The necessity for cane burn offs before and during the crushing season, increases the likelihood of fire penetration to residences and associated infrastructure. Although the presence of fire breaks around the townships reduces the likelihood of such events occurring and minimises the consequences, the risk of bushfire is always present.

The Shire is generally primary production, open plains for grazing and some reserves and parks. The review of the hazard area by the SAG identified limited concerns due to existing controls and the history of past events. The key concern centres on the time it will take Urban or Rural Fire Services to respond to a call for assistance, the presence of flammable material in and adjacent to buildings, the availability of a water supply in close proximity to the fire, traffic congestion and associated preventative practices adopted by landowners.

Rural and remote areas of the Shire could be subject to adverse outcomes from localised bush fires caused through storm events (lightning strikes), unintended consequences of heat and light or deliberate events. Damage to property, the environment, rural reserves, pasture and crops may be likely consequences.

The SAG decided to review the hazard area of Bush fire under the following areas of risk:

- Urban; and
- Rural.

Each location has its own set of circumstance but the overall assessment of risk was considered ‘Low’.
A bushfire danger map is provided at the end of this Attachment.

2. Current Treatments

Burdekin Shire has a well-developed emergency response infrastructure in place and a developed a Local Counter Disaster Plan that covers the risks associated with bushfire and is served by an established Urban and Rural Fire and Rescue Services. Those areas identified as inaccessible are a general concern but their inaccessibility restricts mitigation opportunities.

The Queensland Fire and Rescue Authority has Urban brigades at Ayr, Home hill and Giru.

Active Rural brigades are located at:

- Burdekin 1 Manns Road Rural 1612 44
- Inkerman Rural 1129
- Klondyke Rural 836
- Fredericksfield Rural 1974
- Barrattas Rural 900
- Airdmillan Rural 870
- McDowell Road Rural 1843
- Coppo Road Rural 1845
- Down River Rural 1846
- Hurneys Road Rural 1956
- Causeway Rural 1960
- Rivermead Rural 1574
- Launs Rural 1069
- Arkendeith Rural 985
- Iona Road Rural 1464
- Kirknie Rural 492
- Dicks Two Rural 1609
- Ripley Rural 1506
- Horseshoe Lagoon Rural 1566
- Osbourne Rural 1017
- Upper Haughton Rural 748
- Scott Rural 425
- Upper Shirbourne Rural 736
- Pink Lily Rural 735
- Top Crossing Rural 772
- Marshalls Road Rural 1019
- Carstairs Rural 1018
- Millaroo Dalbeg Rural 1841
- Keebah Rural 1634
• Maidavale Rural 1611
• Mid Plantation Rural 1068
• Leichhardt Downs Rural 490
• Anabranche Rural 811
• El C El Rural 1583
• Margarets Creek Rural 1992
• Sheep Station Rural 486
• Lower Haughton Rural 801
• Mount Surround Rural 751
• Kalamia Rural 755
• Parkdale Rural 1582
• Plains Road Rural 1608
• Snake Gully Rural 1954
• Groper Creek Rural 1272
• Wunjunga Rural 2015
• 2 Clare Rural 4633

Total Brigades: 47

Source: Rural Fire Service Rural Information Management System Date: 14/07/2003

3. Secondary Hazards

There are no expected events that are not mentioned above.
Bushfire Risk Analysis Map
ATTACHMENT 6.8: IDENTIFICATION AND DESCRIPTION OF HAZARDS: EARTHQUAKES AND TREMORS

Hazard Description

1. Earthquakes and Tremors

From historical data it could be stated that BSC is not at extreme risk in terms of likelihood of being subjected to an earthquake at sufficient a level to cause significant loss. However, there was a recorded event in the Gayndah area, identified below. Nevertheless, as increasing volumes of information are gathered and a better understanding of earthquakes is gained, it is within the realms of possibility that BSC could be impacted by such an event. Unrecorded suggestions of tremors in recent times suggest that the Shire may be impacted.

Examination of data provided by Mr Col Lynam (Senior Observer, Quakes Unit, University of Queensland) clearly indicates the level of activity in the region. It is of particular note that the epicentre of an earthquake can be over 100km from the point of impact.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Coordinates</th>
<th>Mag</th>
<th>MMI</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1883 Aug 28</td>
<td>Gayndah (QLD)</td>
<td>25.5 S 151.7 E</td>
<td>5.9</td>
<td>VII</td>
<td>“Gayndah” earthquake (ML5.9). Effects felt over entire region with intensity MM3-4 (shaking of houses but no obvious damage)</td>
</tr>
<tr>
<td>1897 May 10</td>
<td>Beachport (SA)</td>
<td>37.3 S 139.7 E</td>
<td>6.5</td>
<td>VIII</td>
<td>Severe damage and extensive liquefaction in the epicentral area. About 250 km south of Adelaide. Minor damage in Adelaide.</td>
</tr>
<tr>
<td>1902 Sep 19</td>
<td>Warooka (SA)</td>
<td>35.0 S 137.4 E</td>
<td>6.0</td>
<td>VII</td>
<td></td>
</tr>
<tr>
<td>1918 Jun 6</td>
<td>Gladstone (QLD)</td>
<td>23.5 S 152.5 E</td>
<td>6.0</td>
<td>VI</td>
<td>Among the largest E. Australian earthquakes and the largest according to a magnitude estimate of 6.3 which was based on felt area. Located 135 km offshore Gladstone. Felt area spanned Mackay (to Nth), Grafton NSW (to Sth) and Charleville (to Wst). Damage in Rockhampton region included fallen chimneys, cracks in walls, broken windows. Minor damage reported in Bundaberg area and Gladstone. MMI of VII and VIII were noted on Quaternary floodplain alluvium in the Rockhampton area (i.e. similar ground shaking as Newcastle earthquake).</td>
</tr>
<tr>
<td>1935 Apr 4</td>
<td>Gayndah (QLD)</td>
<td>25.5 S 151.67 E</td>
<td>6.1</td>
<td>VII</td>
<td>“Gayndah” earthquake (ML6.1). Effects felt at Gympie and Murgon – Kingaroy with intensity MM5 (minor damage) and in other parts of the region with intensity MM3-4 (shaking of houses).</td>
</tr>
<tr>
<td>1935 Jun 1</td>
<td>Murgon (Qld)</td>
<td>4.1</td>
<td>III</td>
<td>“Gayndah” earthquake aftershock (ML4.1. Effects felt in Murgon area with intensity MM3 (felt inside houses).</td>
<td></td>
</tr>
<tr>
<td>1935 Jul 18</td>
<td>Murgon (Qld)</td>
<td>3.5</td>
<td>III</td>
<td>“Gayndah” earthquake aftershock (ML3.5. Effects felt in Murgon area with intensity MM3 (felt inside houses).</td>
<td></td>
</tr>
<tr>
<td>1941 Apr 29</td>
<td>Mooballie (WA)</td>
<td>26.8 S 116.1 E</td>
<td>7.2</td>
<td>VIII</td>
<td>Largest onshore earthquake in Australia. Caused minor damage in Perth some 600 km distant.</td>
</tr>
<tr>
<td>1947 Jun 11</td>
<td>Gympie Sunshine</td>
<td>4.8</td>
<td>III-IV</td>
<td>“Maryborough” earthquake (ML4.8). Effects felt in Gympie and Sunshine Coast with intensity MM3-4 (shaking of houses).</td>
<td></td>
</tr>
<tr>
<td>1954 Feb 28</td>
<td>Adelaide (SA)</td>
<td>34.93 S 138.67 E</td>
<td>5.4</td>
<td>VIII</td>
<td>Intensities MMI 5 to 6 in the central Adelaide area. Small area of MM 8 in the outer southern suburbs. $100M damage.</td>
</tr>
<tr>
<td>Year</td>
<td>Month</td>
<td>Location</td>
<td>Magnitude</td>
<td>Depth</td>
<td>Intensity</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>----------</td>
<td>-----------</td>
<td>-------</td>
<td>-----------</td>
</tr>
<tr>
<td>1954</td>
<td>June 24</td>
<td>Gympie Nambour Sunshine Coast (Qld)</td>
<td>5.0</td>
<td>III-IV</td>
<td>“Maryborough” earthquake (ML5.0). Effects felt over Gympie – Sunshine Coast area with intensity MM3-4 (shaking of houses).</td>
</tr>
<tr>
<td>1955</td>
<td>Apr 10</td>
<td>Murgon (Qld)</td>
<td>3.2</td>
<td>III</td>
<td>“Mt Stanley” earthquake (ML3.2). Effects felt in Murgon area with intensity MM3 (felt in houses).</td>
</tr>
<tr>
<td>1960</td>
<td>Nov 11</td>
<td>Brisbane/Mt Glorious (QLD)</td>
<td>27.33 S 152.83 E</td>
<td>5.0</td>
<td>V</td>
</tr>
<tr>
<td>1968</td>
<td>Oct 14</td>
<td>Meckering (WA)</td>
<td>31.6 S 117.0 E</td>
<td>6.9</td>
<td>IX</td>
</tr>
<tr>
<td>1978</td>
<td>Nov 28</td>
<td>Heron Island (QLD)</td>
<td>23.34 S 152.52 E</td>
<td>5.7</td>
<td>IV</td>
</tr>
<tr>
<td>1979</td>
<td>Jun 2</td>
<td>Cadoux (WA)</td>
<td>30.79 S 117.16 E</td>
<td>6.2</td>
<td>VIII</td>
</tr>
<tr>
<td>1984</td>
<td>Mar 4</td>
<td>Kingaroy (Qld)</td>
<td>2.7</td>
<td>III</td>
<td>“Cooyar” earthquake (ML2.7), effects felt in Kingaroy area with intensity MM3 (felt indoors)</td>
</tr>
<tr>
<td>1985</td>
<td>Oct 10</td>
<td>Goomeri Murgon Wondai Nanango (Qld)</td>
<td>4.7</td>
<td>VI</td>
<td>“Murgon” earthquake (ML4.7), effects felt in Goomeri-Nanango area with intensity MM3-6 (houses shaken)</td>
</tr>
<tr>
<td>1986</td>
<td>Jan 8</td>
<td>Kilcoy &amp; Pine Rivers (Qld)</td>
<td>3.2</td>
<td>VI</td>
<td>“Somerset Dam” earthquake (ML3.2), effects felt in Kilcoy/Pine Rivers area with intensity MM3 (Significant damage on Bribie Island)</td>
</tr>
<tr>
<td>1988</td>
<td>Jan 22</td>
<td>Tennant Creek (NT)</td>
<td>-</td>
<td>-</td>
<td>Three earthquakes of magnitude above 6 in the same day. The Darwin-Alice Spring pipeline was shortened by a metre.</td>
</tr>
<tr>
<td>1989</td>
<td>Dec 28</td>
<td>Newcastle (NSW)</td>
<td>32.95 S 151.61 E</td>
<td>5.6</td>
<td>VII</td>
</tr>
<tr>
<td>1991</td>
<td>Dec 1</td>
<td>Jimna (Qld)</td>
<td>3.7</td>
<td>IV</td>
<td>“Jimna” earthquake (ML3.7), effects felt in Jimna area with intensity MM4 (shaking houses)</td>
</tr>
<tr>
<td>1992</td>
<td>Mar 3</td>
<td>Gympie (Qld)</td>
<td>2.3</td>
<td>III</td>
<td>“Borumba” earthquake (ML2.3), effects felt in Widgee area with intensity MM3 (felt indoors)</td>
</tr>
<tr>
<td>1993</td>
<td>Aug 22</td>
<td>Imbil (Qld)</td>
<td>2.2</td>
<td>III</td>
<td>“Borumba” earthquake (ML2.2); effects felt in Imbil-Borumba area with intensity MM3 (felt indoors)</td>
</tr>
<tr>
<td>1994</td>
<td>Aug 06</td>
<td>Cessnock (NSW)</td>
<td>32.96 S 151.37 E</td>
<td>5.2</td>
<td>VII</td>
</tr>
<tr>
<td>1996</td>
<td>Jul 18</td>
<td>Brisbane (QLD)</td>
<td>27.59 S 153.04 E</td>
<td>2.9</td>
<td>IV</td>
</tr>
<tr>
<td>1998</td>
<td>Nov 2</td>
<td>Rockhampton (QLD)</td>
<td>22.81 S 151.15 E</td>
<td>4.7</td>
<td>-</td>
</tr>
</tbody>
</table>


It is recognised from recent experience from the Newcastle earthquake that the consequences may be extreme and stretch Council resources. It is expected that the State Counter Disaster measures will come into play should such a serious event arise.

It is recognised that Council and the State’s infrastructure could be subjected to substantial damage. It is expected that Council will follow...
a first line of defence to protect life and put into action its Counter Disaster measures.

2. **Current Treatments**

Council is able to monitor earthquake/tremor events through the Bureau of Meteorology and adheres to building codes and Council laws.

Current treatments extend to the provisions of the Local Counter Disaster Plan, Council emergency and routine response teams for debris removal, roads, footpaths and drainage clearing and maintenance.

3. **Secondary Hazards**

It is inevitable that secondary hazards will emerge should an event occur of significant magnitude that services are disrupted. Such an event will no doubt lead to major external assistance. There are no expected events that are not mentioned above.
ATTACHMENT 6.9: IDENTIFICATION AND DESCRIPTION OF HAZARDS: LANDSLIDE/SLIP

HAZARD DESCRIPTION

1. Landslip

Landslide is defined as movement of material down-slope in a mass as a result of shear failure at the boundaries of the mass. Landslides can be triggered by both natural changes in the environment and human activities, such as road construction through hilly country. The draft State Planning Policy (2002) proposes that all land with a slope of 15% or greater be regarded as a possible landslide/slip area for natural hazard management. BSC has been identified in the Policy as being subject to consideration of Landslide/slip.

The period of greatest storm and cyclone activity is from November to April; though wind and rainstorms have been known to occur at other times of the year. History suggests that apart from possible loss of life, such activity may cause a failure of the power distribution system for periods of up to several hours, structural damage to buildings (mainly roofs), damage from fallen trees, landslides, slips and related debris associated with heavy rain, hail, high winds and or electrical activity.

The extent of damage to life, property and infrastructure from a landslide/slip will be determined to a large extent by the time and day as well as the extent and ferocity of the storm and structural dimensions of the surrounding land mass.

Burdekin Shire is essentially flat with the exception of parts of the western and south-western fringe towards the base of the Great Dividing Range.

Council has reason to believe that landslides/slips will be of minor impact due to the remoteness and limited population of the area in question.

2. Current Treatments

Burdekin Shire has a well-developed road maintenance program, emergency response infrastructure in place and a developed Local
Counter Disaster Plan that covers the risks associated with key events but not specifically Landslide/slip.

Council encourages the community to follow the advice provided through the Bureau of Meteorology on local radio and television for advice on road closure.

The SES and emergency service activities are coordinated through the main centre at Ayr.

Council has applied resources within the limitations of its funding capacity, to reduce exposures as well as upgrading its network of rural roads, culverts and bridges on a priority basis.

The Local Counter Disaster Plan is focused on the aftermath events of storm damage and local flooding (not specifically landslide/slip).

The SAG rating of this risk area suggests that current Council management strategies should continue to evolve, with management to be incorporated into current operational activities.

3. Secondary Hazards

There are no expected events that are not mentioned above.
Description of Community

Community Demographics


1996 population data indicates a Shire distribution with Ayr being the largest centre with approximately 8,697 residents, together with the towns of Home Hill (3,071), Brandon (883), Giru (436), Kalamia (363), Clare (157), Millaroo (103), Dalbeg (46), Jarvisfield (39), Groper Creek (37) and Rita Island (28), with the remainder residing in small rural communities.

At the time of the 1996 Census, ABS predicted a medium series growth of 0.1% pa resulting in a population of 19,010 by 2001. Information released in 2000 by the Office of the Government Statistician, Queensland, indicating a population reduction of 5.4%, confirmed to some degree with the release of the 2001 Census data.

14.07% of families with dependent children under 15 years are one parent families (1,345 residents) (2000 data estimated by the department of Family Services). The 2001 Census records 1,510 one parent families.

There is said to be 7,457 private dwellings. Average household size is 2.7 persons (1996). The 2001 Census records 7,581 private dwellings. The majority live in separate houses (5,902), flats (526) and other dwellings (516). Unoccupied dwellings accounted for 940 dwellings or 12.0% of total dwelling stock.

Population density for the Shire (2001) is 3.66 per sq. km., down marginally from 3.74 per sq. km (1996).

Age

The age distribution data (2001) suggests that 22.0% of the population are 15 and under. The age grouping from 15 to 64 represents 64.1%, down from 65.3% (1996), while 13.9% of the population is 65 or over, up from 1996 (12.6%), suggesting an ageing population.
**Ethnicity**

The Burdekin Shire has a strong multi-cultural history. 1999 household survey data in which a language other than English is spoken is high at 1,525 from a total of 6,461 households (23.6%). The major language is Italian including associated dialects (1,085), together with German (41), Chinese (16) and other (383). 1996 Census data suggests that 1,727 residents were born overseas.

At the time of the 2001 Census, a total of 805 persons (up from 639 (1996)), identified as being of Aboriginal or Torres Strait Islander descent (4.4% of the Shire population).

**Workforce**

Workforce participation rates (2001 Census) against the estimated population suggest a participation rate of 47.8%, down from the 1996 rate of 49.1% (2001 - 8,829). Persons not in the workforce represented 26.7% (4,932), down marginally on 1996 data (28.1%).

**Household Income**

The number of households in the Shire totalled 6,519 (2001), down from 6,838 (1999 data provided by the Department of Family Services). The median household weekly income was $800-$999 (669 households), up from $500-$699 (1996). The next most frequent was $300-$399 (571). 13.0% households reported earning less than $300, down from 199 (17.75%).

**Occupational Groupings**

The top eight- (8) occupational groupings out of a labour force of 8,372 (2001), down from 8,745 (1996) were:

- Agricultural, Forestry & Fishing – 2,240
- Manufacturing – 1,232
- Retail – 1,154
- Health & Community Services – 561
- Education – 543
- Construction – 383
- Property & Business Services – 349
- Wholesale - 316

**Disability**

While reliance on government benefits is not a totally reliable indicator of disability, the extent of household reliance on government benefits in
the Shire was 12.61% (2,368 recipients) (1996). 2001 data is unavailable.

Description of the Built Environment

**Buildings**


A review of Burdekin Shire residential housing including houses, units, duplexes, and aged care residential facilities reveals a range of age across the continuum with older residences clustered around the town’s business district. New development has occurred in the fringe of the major towns and Urban residential.

Two aged care facilities are located in each of Ayr and Home Hill. A number of community agencies have established centres to support the aged, disadvantaged and disabled in their homes.

A review of facilities including retail businesses, offices, shops, manufacturing and related secondary industries, storage facilities, Council, State and Federal Government offices, transport infrastructure and fuel depots revealed buildings dating from the early 1900’s.

The Burdekin Counter Disaster Plan (1998) is comprehensive in its approach and identifies a number of evacuation centres around the Shire. The extent of recent natural disasters has allowed the Counter Disaster Committee to test systems and processes to the full. The Council CEO as Executive Officer of the Burdekin Local Counter Disaster Committee has compiled a comprehensive set of information on the natural disasters affecting the Shire.

**Engineering Lifelines**

**Roads**

Council administers roads, streets and the supporting infrastructure with responsibility for declared main roads being the financial responsibility of Department of Main Roads. The Council is contracted by the Department of Main Roads to maintain a series of declared main roads. Council has a comprehensive annual program of road maintenance and upgrade.
Electricity Supply

Ergon Energy services Burdekin. Ergon Energy is currently undergoing change that will likely change the structure of services in the area. The call centre structure will also change though it appears not likely to directly match the other emergency services in terms of regional areas. The Ergon 995 Disaster plan is currently being reviewed.

Burdekin Shire experienced significant power outages during the 1989 category 3 cyclone Aivu. The experience of Aivu has provided the Counter Disaster Committee with useful information about natural disaster preparation; management and post event clean up, including closer working relationships between the parties.

Telecommunications

Telstra is the main supplier of telecommunication services, though the deregulation of the industry has opened it up to competition. The regional base for Telstra is Bowen. Telstra has a service network that is designed to support day to day and emergency operations.

Telstra is committed to the provision of services to the Shire and has extensive back up facilities to service emergencies. Extensive use is made of the PSTN, digital, CDMA, satellite and UHF/CB systems. It is recognised by Telstra that the CDMA and digital network requires improved coverage in the Shire.

Water Supply

Burdekin Shire Council is responsible for the delivery of public water supplies of adequate and reliable quantity and quality to Ayr/Brandon, Home Hill, Mt. Kelly and Giru water supply schemes and the Airdmillan, Klondyke, Colevale, Groper Creek, Alva Beach and Sutcliffe water supply extensions.

The Burdekin Falls Dam is the main source of water for the Burdekin irrigation system. Surrounding rural communities are serviced by their own water supply systems.

Bottled or packaged water is available commercially.

The Burdekin Falls Dam on the Burdekin River has a capacity of 1.86 million ML at full supply level (FSL). The submerged area at FSL is 22,400 Ha. The catchment area is 111,220-sq. km., approximately 7.5% of Queensland.

The Burdekin River is recognised as having the highest mean annual discharge of any Australian River (9,864 ml/year), the greatest
probable instantaneous discharge of any river in Australia (at 82,000 cu m) and the greatest range of flows from zero flow from time to time.

Waste Removal and Sewerage

The Council carries out 7,936 weekly domestic waste management services and 5,572 fortnightly recycling services. The Burdekin sewerage reticulation system serves 3,179.06 properties per 100km of main.

Critical Facilities

Fuel Supplies, Retail Services and Health Services

Fuel supplies are available throughout the shire in the main centres. Ayr itself has the largest holding as the main centre in the Shire. The Sugar Mills have large holdings of fuel to service their facilities for the 24 hour, 7 day shifts that occur during the crushing season.

The Shire has two local hospitals, one each at Ayr and Home Hill, together with Community Health services and medical and dental centres and related infrastructure to support emergency needs.

Emergency Services

BSC has developed a draft Counter Disaster Plan for the Burdekin Shire (1998).

The Department of Emergency Services, District Manager, Disaster Operations, Counter Disaster and Rescue Services for the Shire is based in Townsville.

The State Emergency Service (SES) has centres in Ayr, Home Hill, Clare, Giru, Rita Island. In the context of the Counter Disaster Plan, the SES takes a lead role in natural disasters that relate to Flooding, Storms and Cyclones, key hazards identified by the SAG. The service is well organised, has a stable and numerically strong contingent of volunteers and receives strong support from the Council and local community. The service has a range of equipment and resources to meet the expected needs within the Shire and can call on adjacent Shires in times of crisis.

The Queensland Ambulance Service (QAS) has service based in Ayr, Home Hill and Giru. The QAS motor vehicle fleet is ageing with plans in place to upgrade services on a staged basis. The service would benefit from a 4WD ambulance that is also included in future plans.
The QFRA and QAS report strong support for the efforts of the Shire to name/number their road system, which has greatly assisted emergency travel.

Queensland Police has units based in Ayr, Home Hill and Giru.

Hospital and Community Health Services

The Shire has two local public hospitals, one each at Ayr and Home Hill, together with Community Health services and medical and dental centres and related infrastructure to support emergency needs.

The public hospitals have a disaster management plan that is tested regularly and in particular at the time of the Y2K problem. There is close cooperation between the Health Department and QAS in terms of the respective roles of QAS and a health service. An agreement is in place between the two agencies that covers issues of roles and role delineation of facilities and is regularly reviewed.

Schools

Burdekin is serviced by a number of schools conducted by the State Education Department (pre-school, primary, secondary and special) and private Church based organisations (kindergarten, pre-school, primary and secondary).

Day Care and Respite

Burdekin has a community/senior citizen centre that provides integrated day and respite programs. The Community Health Centre provides access to medical, nursing and allied health services. Some community-based services such as those provided by Blue Care are also available.

Airport

The Council is responsible for the Ayr airport. The airport does not have pilot activated lighting and relies on a system of hand held flares during emergency night landings. There is limited aircraft parking facilities.

Rail

The main north/south rail link passes through the Shire. Queensland Rail is constantly upgrading its rail link and has raised the height of its track, in many cases above road levels. The frequency and extent of flooding places the rail link at risk of service disruption. A further problem lies in the fact that the Burdekin Bridge is both a road and rail bridge. The entry and exit to/from the bridge is frequently under water.
during peak river outflows. The bridge has been the site of two recent derailments that while not part of this Study do place significance on the impact of natural disasters on the Burdekin Bridge.

Description of Natural Environment

The Shire lies between the Councils of Bowen to the south and Townsville to the north and spreads from the coast to the Great Dividing Range to the west. The eastern sector is largely agriculture with an emphasis on cane farming while the western sector is grazing. The largest population catchment is in the eastern sector. The major townships of Ayr, Home Hill, Dalberg, Millaroo, Clare, Brandon, Kalamia and Giru, together with the coastal township of Alva Beach, are located adjacent to the major river systems of Burdekin and Haughton.

A River Trust has been established for the Burdekin and Haughton Rivers. The Trust has a significant role in water supply regulation and bank stability including issues affecting the natural environment.

Description of the Social Environment

The Council makes considerable effort to support existing farming operations, related secondary industries and infrastructure as well as opportunities to introduce new business initiatives into community life.

The nature of cane production and crushing as well as the growing interests in horticulture results in a mobile workforce with considerable reliance on casual staff during crop harvesting. Other demographic data suggests a high proportion of residents have a reliance on social or government payments.

The Shire is seen as progressive and competitive and willing to work closely with industry and neighboring Shires to further the Regional interests.

There is a high degree of professional recognition of the roles of the respective parties involved in community affairs and emergency service provision. The services are well regarded by the community served.
ATTACHMENT 8: COMMUNITY VULNERABILITY PROFILE

Description of the Community


1996 population data indicates a Shire distribution with Ayr being the largest centre with approximately 8,697 residents, together with the towns of Home Hill (3,071), Brandon (883), Giru (436), Kalamia (363), Clare (157), Millaroo (103), Dalbeg (46), Jarvisfield (39), Groper Creek (37) and Rita Island (28), with the remainder residing in small rural communities.

Vulnerability of People

The economic position of many Shire residents and businesses likely to be impacted by natural disasters is such that the resilience of the community will be impaired. While there will be a small degree of community self-reliance, it is anticipated that there will be a strong reliance on the Council, Emergency Services and associated social support organisations (e.g. Church and community support organisations).

The age distribution data (2001) suggests that 22.0% of the population are 15 and under. The age grouping from 15 to 64 represents 64.1%, down from 65.3% (1996), while 13.9% of the population is 65 or over, up from 1996 (12.6%), suggesting an ageing population.

The BSC is reliant on a strong small business and light industry network to support its major rural interests. The BSC is committed, through its Corporate Plan (2001 – 2006) and annual operational/budget plans, to supporting growth in new initiatives and encouraging the community to be proud of its endeavours.

The flat terrain over most of the Shire and presence of several coastal communities increases the scope for natural disaster impacts from cyclones, severe storms, winds, flooding and storm surge. The significant amount of time since the last major natural disaster (1989) increases the scope of risk of harm and suffering.

Vulnerability of Social Structures

There is a strong sense of community with a number of community based organisations active in the twin towns of Ayr and Home Hill. A range of community facilities is available and appears to be supported. This occurs in
the context of a strong sense of purpose, present in most rural communities. The community response to major catastrophes such as the recent cyclones and flooding is evidence of the community spirit and the strong links between the Council and community agencies.

**Vulnerability of Buildings**

The majority of houses and buildings in and around the towns in the Shire range in age from new to 30 or more years old. Council has approved several new rural residential developments in and around the major centres. The township areas include a mix of residential, commercial and light industrial. Several residential areas are adjacent to flood plains (Ayr, Home Hill, Brandon, Giru, Dalberg, Millaroo. The Council has commissioned a number of risk mitigation studies over the years. The know history of major natural events in the Shire and the presence of major river systems in the Burdekin and Haughton, places significant pressure on Council. The Council has been proactive in identifying the crucial issues and has commissioned flood studies of the communities of Ayr, Home Hill and Brandon. A Study of the effects of Storm Surge will be commissioned shortly.

A significant problem facing Council and residents away from the major centres is roads, culverts and bridges across watercourses that are subject to localised flooding.

**Vulnerability of Lifelines**

*Electricity Supply*

BSC is serviced through the Ergon Energy grid.

Council has supported the supply of electricity to the communities of Jerona and Wunjunga. Households are levied on a shared basis for the annual component of interest and redemption for the Council’s financial obligations in this regard.

*Telecommunications*

Telstra is the main supplier of telecommunication services, though the deregulation of the industry has opened it up to competition.

Telstra has a number of stations, which are accessible to most Telstra vehicles.
**Water Supply**

Burdekin Shire Council is responsible for the delivery of public water supplies of adequate and reliable quantity and quality to Shire residents.

The Shire has established a series of Water Supply Schemes for the areas of Ayr/Brandon, Home Hill, Giru and the Airdmillan, Klondyke, Colevale, Groper Creek, Alva Beach and Sutcliffe Water Supply Extensions.

The Burdekin Shire covers a major underground water table that provides for the local agricultural needs. The Burdekin Dam is a significant supplier of irrigation water supply for the Shire and adjacent Shires. Rural properties are required to arrange their own water supply.

Bottled or packaged water is available commercially.

**Waste Removal and Sewerage**

The Council carries out 7,936 weekly domestic waste management services and 5,572 fortnightly recycling services. The Burdekin sewerage reticulation system serves 3,179.06 properties per 100km of main.

**Vulnerability of Critical Facilities**

**Emergency Services**

BSC has developed a draft Counter Disaster Plan for the Burdekin Shire (1998).

The Department of Emergency Services, District Manager, Disaster Operations, Counter Disaster and Rescue Services for the Shire is based in Townsville.

The State Emergency Service (SES) has centres in Ayr, Home Hill, Clare, Giru, Rita Island. In the context of the Counter Disaster Plan, the SES takes a lead role in natural disasters that relate to Flooding, Storms and Cyclones, key hazards identified by the SAG. The service is well organised, has a stable and numerically strong contingent of volunteers and receives strong support from the Council and local community. The service has a range of equipment and resources to meet the expected needs within the Shire and can call on adjacent Shires in times of crisis.
The Queensland Ambulance Service (QAS) has service based in Ayr, Home Hill and Giru. The QAS motor vehicle fleet is ageing with plans in place to upgrade services on a staged basis. The service would benefit from a 4wd ambulance that is also included in future plans.

The QFRA and QAS report strong support for the efforts of the Shire to name/number their road system, which has greatly assisted emergency travel.

Queensland Police has units based in Ayr, Home Hill and Clare.

Hospital and Community Health Services

The Shire has two local public hospitals, one each at Ayr and Home Hill, together with Community Health services and medical and dental centres and related infrastructure to support emergency needs.

The public hospital has a disaster management plan that is tested regularly and in particular at the time of the Y2K problem. There is close cooperation between the Health Department and QAS in terms of the respective roles of QAS and a health service. An agreement is in place between the two agencies that covers issues of roles and role delineation of facilities and is regularly reviewed.

Schools

Burdekin is serviced by a number of schools conducted by the State Education Department (pre-school, primary, secondary and special) and private Church based organisations (kindergarten, pre-school, primary and secondary).

Day Care and Respite

Burdekin has a community/senior citizen centre in Burdekin that provides integrated day and respite programs. The Community Health Centre provides access to medical, nursing and allied health services. Some community-based services are available.

Airport

The Council is responsible for the Burdekin airport. The airport is capable of taking smaller commercial jet aircraft and has pilot activated lighting, non-directional beacon and limited terminal facilities.

Rail

The main north/south rail link passes through the Shire. Queensland Rail is constantly upgrading its rail link and has raised the height of its
track, in many cases above road levels. The frequency and extent of flooding places the rail link at risk of service disruption. A further problem lies in the fact that the Burdekin Bridge is both a road and rail bridge. The entry and exit to/from the bridge is frequently under water during peak river outflows. The bridge has been the site of two recent derailments that while not part of this Study do place significance on the impact of natural disasters on the Burdekin Bridge.

Vulnerability of Local Economic Production and Employment

**Topography**

The Shire experiences a humid, hot temperature climate, with a concentration of rainfall in the warmer half of the year and a fairly high degree of rainfall variability. Average annual rainfall is 1,076mm. Daytime temperatures are in the range of 20 – 39 degrees for most of the year, although short periods of heat wave conditions can be experienced.

**Industry and Economic Profile**

The Shire's wealth is based on primary production (mainly sugar cane) and some secondary industries, which support those industries. Other crops include grains, cucumbers, capsicums, green beans, pumpkins, rockmelons, honeydew melons, watermelons and mangoes. The Shire recognises the enormous potential to expand horticultural production. In broad terms, the eastern half of the Shire is largely agriculture land while the western sector is cattle grazing.

Major transport infrastructure is comprised of the north coast railway line running through the Shire from Cairns to Brisbane and the declared main roads network. Major feeder roads are the Ayr/Dalberg Road, Ayr/Kirknie Road and Clare area to the Bruce Highway. In addition there is a well-developed network of Shire roads.

Natural disasters will inevitably impact the economic viability of the Shire. Several new initiatives identified above could particularly be impacted because of the early stage development. The renewed interest in tourist development in the area provides added incentives to address such concerns and their impact on business.

Vulnerability of Other Elements

The Counter Disaster Plan for the BSC (1998) provides a basis for the management of emergencies:
• Flood;
• Cyclones and Storms;
• Storm Surge;
• Fire – Urban;
• Fire – Rural;
• Hazardous Materials/Industrial Accident;
• Aircraft Accident – Civil;
• Aircraft Accident – Military;
• Boating Accident;
• Road Accident – Vehicular/Chemical;
• Rail accident;
• Search and Rescue – Land;
• Search and Rescue – Sea;
• Exotic Animal Disease;
• Earthquakes;
• Vertical Rescue – Confined Spaces.
## ATTACHMENT 9.1: RISK DESCRIPTION REGISTER – URBAN CYCLONES (CAT 1-3) (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>People</th>
<th>RIC</th>
<th>Risk Description</th>
<th>Causation</th>
<th>Consequence</th>
<th>Level</th>
<th>Existing Treatment/S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>•</td>
<td>Injury from flying debris</td>
<td>Occurrence of a natural disaster</td>
<td>Injury to or death of residents or helpers</td>
<td>3</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Health of the community</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Putting at risk the lives of emergency service personal</td>
<td></td>
<td>Active Counter Disaster Committee</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Lack of preparedness of the community</td>
<td>Age and limitations on mobility</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Lack of knowledge of responsive strategies</td>
<td>Loss of infrastructure</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Well educated and trained SES teams</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Impact of power loss on the disabled</td>
<td></td>
<td>Building a stronger community</td>
<td></td>
<td>Community preparedness plans</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Transport needs of the frail and disabled and their carers</td>
<td></td>
<td>Additional need for counseling and support services</td>
<td></td>
<td>Critical agency plans – e.g. Hospitals, Ambulance</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Ability of the utility services to function (garbage, sewerage, water and power)</td>
<td></td>
<td>An unprepared community</td>
<td></td>
<td>Council site preparation plans (inc. Vehicles etc)</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Inappropriate actions of sightseers</td>
<td></td>
<td>Economic loss</td>
<td></td>
<td>Cyclone watch systems</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Location of the community at the time of the events</td>
<td></td>
<td>Loss of employment</td>
<td></td>
<td>On-call staff</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Impact of economic loss on the community and service providers post event</td>
<td></td>
<td></td>
<td></td>
<td>Active staff education plans</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Injury to members of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Destruction of residential abode</td>
<td></td>
<td></td>
<td></td>
<td>Building design requirements</td>
</tr>
</tbody>
</table>

**Likelihood:** B  **Risk Rating:** H56
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Requirements for emergency accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disruption to communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access of the community to insurers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of limited insurance cover on the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of community to use generators and like equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of community to understand the role of the SES, Police etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of falling powerlines and poles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible financial benefit to community and economy from development on improved infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homelessness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Built environment: Residential | • Damage from flying debris  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Impact of economic loss on the community and service providers post event  
• Destruction of residential abode  
• Requirements for emergency accommodation  
• Disruption to communications  
• Panic amongst the community | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of infrastructure  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | C | H52 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
|     | • Theft and presence of looters  
     | • Impact of limited insurance cover on the community  
     | • Ability of community to use generators and like equipment  
     | • Impact of falling powerlines and poles  
     | • Impact of structural damage  
     | • Loss of accommodation  
     | • Ability of Shire to provide temporary accommodation  
     | • Loss of access to facilities  
     | • Impact on aged persons homes |

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment: Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>2</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td>C</td>
<td>M28</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Age and limitations of the buildings to withstand major natural events</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Loss of infrastructure</td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td></td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td></td>
<td>Economic loss</td>
<td></td>
<td>plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td></td>
<td>Loss of employment</td>
<td></td>
<td>Council site preparation plans (inc. Vehicles etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td></td>
<td></td>
<td></td>
<td>Cyclone watch systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td></td>
<td></td>
<td>On-call staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td></td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td>Building design requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
<td></td>
<td>Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td></td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| Built Environment: Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study  
• Council action in place for emergencies | C | M28 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
|     | Natural Environment | • Damage to the natural amenity                                            | • Occurrence of a natural disaster                                        | 2     | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements |
|     |                  | • Inability of the community to heed or interpret warnings                | • Degradation of the natural environment                                   |       | C M28                                                                                                                                                                                                             |
## ATTACHMENT 9.2: RISK DESCRIPTION REGISTER – URBAN CYCLONES (CAT 4-5) (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| People | • Injury from flying debris  
• Health of the community  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Inappropriate actions of sightseers  
• Location of the community at the time of the events  
• Impact of economic loss on the community and service providers post event  
• Injury to members of the community and those assisting  
• Destruction of residential abode | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations on mobility  
• Loss of infrastructure | • Injury to or death of residents or helpers  
• Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• Additional need for counseling and support services  
• An unprepared community  
• Economic loss  
• Loss of employment | 4   | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Critical agency plans – e.g. Hospitals, Ambulance  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Active staff education plans  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system | D  | H64 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Requirements for emergency accommodation</td>
<td></td>
<td></td>
<td></td>
<td>• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Disruption to communications</td>
<td></td>
<td></td>
<td></td>
<td>with nominated and supported volunteers and other smaller settlements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
<td>• Access of the community to insurers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td>• Impact of limited insurance cover on the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td>• Ability of community to use generators and like equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td>• Ability of community to understand the role of the SES, Police etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td>• Impact of falling powerlines and poles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td>• Loss of income</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td>• Possible financial benefit to community and economy from development on improved infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td>• Homelessness</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>---------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| B2  | Natural Disaster Risk Management Study | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of infrastructure  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements |

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Impact of limited insurance cover on the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ability of community to use generators and like equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Impact of falling powerlines and poles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Impact of structural damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Loss of accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ability of Shire to provide temporary accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Loss of access to facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Impact on aged persons homes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Built Environment – Commercial | • Property damage  
• Loss of trade (temporary and permanent)  
• Possible closure of the business  
• Loss of services  
• Security of business systems  
• Loss of stock  
• Restocking costs  
• Insurance claims and re-insurance impact – delays, costs etc  
• Ability to return to business  
• Loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Ability of the aged care and hostel sectors to deliver services during an event  
• Impact on the Hospitals and health care services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | D | M36 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment – Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study | D | M36 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment</td>
<td>Damage to the natural amenity</td>
<td>Occurrence of a natural disaster, Inability of the community to heed or interpret warnings, Loss of infrastructure</td>
<td>Degradation of the natural environment, Loss of natural amenity</td>
<td>2</td>
<td>Comprehensive and rehearsed Counter Disaster Plan, Active Counter Disaster Committee, Active Counter Disaster planning, Well educated and trained SES teams, Community preparedness plans, Council site preparation plans (inc. Vehicles etc), Cyclone watch systems, On-call staff, Hand outs on emergency procedures for staff and the community, Building design requirements, Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system, Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
<td>D</td>
<td>L20</td>
</tr>
</tbody>
</table>
### ATTACHMENT 9.3: RISK DESCRIPTION REGISTER – URBAN – BURDEKIN RIVER FLOODING (24 HOUR WARNING) (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| People | - People not receiving the warning  
- People not heeding the warning  
- Time and day of event requires consideration in terms of warning strategy  
- Complacency on the part of the community (“I haven’t been flooded before”)  
- Road closures being ignored, endangering lives  
- Injury to members of the community and emergency personnel  
- Accommodation limitations  
- Presence of sightseers  
- Presence of debris (garbage bins and other litter)  
- Sewerage problems of short duration | - Occurrence of a natural disaster  
- Inability of the community to heed or interpret warnings  
- Age and limitations on mobility  
- Loss of infrastructure | - Flooding to the townships of: Groper Creek, Rita Island, Alva Beach, Dalbeg (bridge too low), Millaroo, Clare, Mt Kelly (Sheepstation Creek, Sutcliffe Estate)  
- Possible injury and loss of life | 3 | - Predictive modeling by Council officers  
- Monitoring and recording water levels | D | M36 |
### Risk Description:
- Possibility of injury from fallen power lines and underground power supplies
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Homes washed away

### Table:

<table>
<thead>
<tr>
<th>RIC</th>
<th>Risk Description</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>-----------------------</td>
<td>------------</td>
</tr>
</tbody>
</table>
|     | Built environment: Residential | • Damage from flood waters  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Impact of economic loss on the community and service providers post event  
• Destruction of residential abode  
• Requirements for emergency accommodation  
• Disruption to communications  
• Panic amongst the community | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations on mobility  
• Loss of infrastructure | 3 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | D | M36 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment: Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>3</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Age and limitations of the buildings to withstand major natural events</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Loss of infrastructure</td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td></td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td></td>
<td>Economic loss</td>
<td></td>
<td>Council site preparation plans (inc. Vehicles etc)</td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td></td>
<td>Loss of employment</td>
<td></td>
<td>Cyclone watch systems</td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td></td>
<td></td>
<td></td>
<td>On-call staff</td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td></td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td></td>
<td></td>
<td>Building design requirements</td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td>Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system</td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
</tr>
<tr>
<td></td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| Built Environment: Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study | D | M36 |
| Natural Environment | • Damage to river bank  
• Impact of Vegetation on restricting flood waters (legislation restrictions)  
• Change of path of river | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | • Degradation of the natural environment  
• Loss of natural amenity | 2 | • Burdekin River Trust established 1973  
• Catchment management plan  
• Town planning scheme | D | L20 |
## ATTACHMENT 9.4: RISK DESCRIPTION REGISTER – URBAN - HAUGHTON RIVER FLOODING (12 HOUR WARNING) (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>People not receiving the warning</td>
<td>• Occurrence of a natural disaster&lt;br&gt;• Inability of the community to heed or interpret warnings&lt;br&gt;• Age and limitations on mobility&lt;br&gt;• Loss of infrastructure</td>
<td>• Flooding to the townships of: Groper Creek, Rita Island, Alva Beach, Dalbeg (bridge too low), Millaroo, Clare, Mt Kelly (Sheepstation Creek, Sutcliffe Estate&lt;br&gt;• Possible injury and loss of life</td>
<td>3</td>
<td>• Predictive modeling by Council officers&lt;br&gt;• Monitoring and recording water levels</td>
<td>D</td>
<td>M36</td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>-----------------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>Accommodation limitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of debris (garbage bins and other litter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possibility of injury from fallen power lines and underground power supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homes washed away</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Built environment: Residential

<table>
<thead>
<tr>
<th>RIC Description</th>
<th>Causation</th>
<th>Consequence</th>
<th>Level</th>
<th>Existing Treatment/S</th>
<th>Likelihood</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage from flood waters</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>3</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td>D</td>
<td>M36</td>
</tr>
<tr>
<td>Lack of preparedness of the community</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of knowledge of responsive strategies</td>
<td>Age and limitations on mobility</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of power loss on the disabled</td>
<td>Loss of infrastructure</td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport needs of the frail and disabled and their carers</td>
<td></td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability of the utility services to function (garbage, sewerage, water and power)</td>
<td></td>
<td>Economic loss</td>
<td></td>
<td>Council site preparation plans (inc. Vehicles etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of economic loss on the community and service providers post event</td>
<td></td>
<td>Loss of employment</td>
<td></td>
<td>Cyclone watch systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destruction of residential abode</td>
<td></td>
<td></td>
<td></td>
<td>On-call staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requirements for emergency accommodation</td>
<td></td>
<td></td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disruption to communications</td>
<td></td>
<td></td>
<td></td>
<td>Building design requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
<td>Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| Built Environment: Commercial | • Property damage  
• Loss of trade (temporary and permanent)  
• Possible closure of the business  
• Loss of services  
• Security of business systems  
• Loss of stock  
• Restocking costs  
• Insurance claims and re-insurance impact – delays, costs etc  
• Ability to return to business  
• Loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Ability of the aged care and hostel sectors to deliver services during an event  
• Impact on the Hospitals and health care services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | D | L20 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
|     | Built Environment: Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study |
|     | Natural Environment | • Damage to river bank  
• Impact of Vegetation on restricting flood waters (legislation restrictions)  
• Change of path of river | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | • Degradation of the natural environment  
• Loss of natural amenity | 2 | • Haughton River Trust established 1995  
• Catchment management plan  
• Town planning scheme  
• Bank vegetation management |
### ATTACHMENT 9.5: RISK DESCRIPTION REGISTER – URBAN LOCALISED FLOODING – AYR, HOME HILL & BRANDON (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| People | People not receiving the warning  
Public may not be aware of who reports what in relation to the Haughton  
Sightseers interfering with community affairs  
People become trapped  
Threats to life (inc. road closure volunteers)  
Vehicles and trucks ignoring road closed signs and directions  
Time and day of event requires consideration in terms of warning strategy  
Presence of debris (garbage bins and other litter) | Occurrence of a natural disaster  
Inability of the community to heed or interpret warnings  
Age and limitations on mobility  
Loss of infrastructure | Minor flooding to the townships of Ayr, Brandon and Home Hill  
Possible injury and loss of life  
Isolation of the dual communities of Ayr and Home Hill | 1 | Predictive modeling by Council officers  
Monitoring and recording water levels  
Counter Disaster measures in place | B | M24 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Built Environment: Residential</td>
<td>• Damage from flood waters</td>
<td>• Occurrence of a natural disaster</td>
<td>1</td>
<td>• Comprehensive and rehearsed Counter Disaster Plan</td>
<td>B</td>
<td>M24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of preparedness of the community</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td></td>
<td>• Active Counter Disaster Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of knowledge of responsive strategies</td>
<td>• Age and limitations of infrastructure</td>
<td></td>
<td>• Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Impact of power loss on the disabled</td>
<td>• Loss of infrastructure</td>
<td></td>
<td>• Well educated and trained SES teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Transport needs of the frail and disabled and their carers</td>
<td></td>
<td></td>
<td>• Community preparedness plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ability of the utility services to function (garbage, sewerage, water</td>
<td></td>
<td></td>
<td>• Council site preparation plans (inc. Vehicles etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and power)</td>
<td></td>
<td></td>
<td>• Cyclone watch systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Impact of economic loss on the community and service providers post</td>
<td></td>
<td></td>
<td>• On-call staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>event</td>
<td></td>
<td></td>
<td>• Hand outs on emergency procedures for staff and the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Damage to residential abode</td>
<td></td>
<td></td>
<td>• Building design requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Requirements for temporary accommodation</td>
<td></td>
<td></td>
<td>• Council offices are serviced by an emergency power generator that also meets the needs of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disruption to communications</td>
<td></td>
<td></td>
<td>water supply and sewerage pumping system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Panic amongst the community</td>
<td></td>
<td></td>
<td>• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>and supported volunteers and other smaller settlements</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
| Built Environment; Commercial | - Property damage  
- Loss of trade (temporary and permanent)  
- Possible closure of the business  
- Loss of services  
- Security of business systems  
- Loss of stock  
- Restocking costs  
- Insurance claims and re-insurance impact – delays, costs etc  
- Ability to return to business  
- Loss of employment within the community  
- Ability of the commercial business to respond during and post event  
- Ability of the aged care and hostel sectors to deliver services during an event  
- Impact on the Hospitals and health care services  
- Isolation of Ayr Council Caravan Park | - Occurrence of a natural disaster  
- Inability of the community to heed or interpret warnings  
- Age and limitations of the buildings to withstand major natural events  
- Loss of infrastructure | - Putting at risk the lives of emergency service personal  
- Community disharmony – perception of disproportionate access to services and help  
- Camaraderie amongst members of the community – common bond  
- Building a stronger community  
- An unprepared community  
- Economic loss  
- Loss of employment | 1 | - Comprehensive and rehearsed Counter Disaster Plan  
- Active Counter Disaster Committee  
- Active Counter Disaster planning  
- Well educated and trained SES teams  
- Community preparedness plans  
- Council site preparation plans (inc. Vehicles etc)  
- Cyclone watch systems  
- On-call staff  
- Hand outs on emergency procedures for staff and the community  
- Building design requirements  
- Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
- Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements |

<table>
<thead>
<tr>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>M24</td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Built Environment: Council Infrastructure | • Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services  
• Localised flooding in Home Hill, Brandon, East End centre, Third Avenue and Fifth Avenue, Home Hill and Second Avenue between 10 and 14th Street, Home Hill, South Ayr and Chippendale Street | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of infrastructure | 2 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study  
• Raising road heights as opportunities arise  
• Improving access                                                                                                                                                                                                 | B          | H44         |
| Natural Environment | • Damage to river bank  
• Impact of Vegetation on restricting flood waters (legislation restrictions)  
• Change of path of river | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | • Degradation of the natural environment  
• Loss of natural amenity | 1 | • Haughton River Trust established 1995  
• Catchment management plan  
• Town planning scheme  
• Bank vegetation management                                                                                                                                                                                                 | B          | M24        |
**ATTACHMENT 9.6: RISK DESCRIPTION REGISTER – URBAN & RURAL BURDEKIN RIVER BRIDGE CLOSURE – AYR - HOME HILL (FORMS A9 & A10)**

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
| People | • People may attempt to cross the river by other means (e.g. 4WD during dry season or boat in wet season)  
• Loss of business Home Hill and Ayr  
• Affect on the local economy  
• Loss of employment  
• Isolation of workers (living on the Home Hill side and working in Ayr or vice versa)  
• Impact on freight and general transport north to south and vice versa  
• Impact on Queensland Railways transport system  
• Impact on medical retrievals  
• Accumulation of people on either side of the river | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations on mobility  
• Loss of infrastructure | • Minor flooding to the townships of Ayr, Brandon and Home Hill  
• Possible injury and loss of life  
• Isolation of the dual communities of Ayr and Home Hill | 4     | • Predictive modeling by Council officers  
• Monitoring and recording water levels |

LIKELIHOOD | RISK RATING |
-----------|-------------|
E          | H60         |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opportunistic individuals ($)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not receiving the warning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of debris (garbage bins and other litter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sightseers interfering with community affairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People become trapped</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threats to life (inc. road closure volunteers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vehicles and trucks ignoring road closed signs and directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>-------</td>
<td>--------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>4</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment: Commercial</td>
<td>Possible closure of the business</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td></td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td></td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td></td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td>Economic loss</td>
<td></td>
<td>Council site preparation plans (inc. Vehicles etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td>Loss of employment</td>
<td></td>
<td>On-call staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LIKELIHOOD E H M L N**

- **E**
- **H60**

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environ-ment: Council Infrastructure | Inability of Council to meet demands for services between Ayr and Home Hill | Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Implementation of Counter Disaster measures  
• River water height alert system | E | M32 |
| Natural Environment | Damage to river bank | Occurrence of a natural disaster (e.g. earthquake)  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | Degradation of the natural environment  
• Loss of natural amenity | 2 | • Access restrictions | E | L16 |
## ATTACHMENT 9.7: RISK DESCRIPTION REGISTER – RURAL CYCLONES (CAT 1-3) (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>• Injury from flying debris</td>
<td>• Occurrence of a natural disaster</td>
<td>• Injury to or death of residents or helpers</td>
<td>2</td>
<td>• Comprehensive and rehearsed Counter Disaster Plan</td>
<td>B</td>
<td>H44</td>
</tr>
<tr>
<td></td>
<td>• Health of the community</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td>• Putting at risk the lives of emergency service personal</td>
<td></td>
<td>• Active Counter Disaster Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lack of preparedness of the community</td>
<td>• Age and limitations on mobility</td>
<td>• Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>• Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lack of knowledge of responsive strategies</td>
<td></td>
<td>• Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>• Well educated and trained SES teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Transport needs of the frail and disabled and their carers</td>
<td>• Loss of infrastructure</td>
<td>• Building a stronger community</td>
<td></td>
<td>• Community preparedness plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ability of the utility services to function: water and power</td>
<td></td>
<td>• Additional need for counseling and support services</td>
<td></td>
<td>• Critical agency plans – e.g. Hospitals, Ambulance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inappropriate actions of sightseers</td>
<td></td>
<td>• An unprepared community</td>
<td></td>
<td>• Council site preparation plans (inc. Vehicles etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Location of the community at the time of the events</td>
<td></td>
<td>• Economic loss</td>
<td></td>
<td>• Cyclone watch systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Impact of economic loss on the community and service providers post event</td>
<td></td>
<td>• Loss of employment</td>
<td></td>
<td>• On-call staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Injury to members of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td>• Hand outs on emergency procedures for staff and the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Destruction of residential abode</td>
<td></td>
<td></td>
<td></td>
<td>• Building design requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
|     | • Requirements for emergency accommodation  
     | • Disruption to communications  
     | • Panic amongst the community  
     | • Theft and presence of looters  
     | • Sustenance of the community and those assisting  
     | • Access of the community to insurers  
     | • Impact of limited insurance cover on the community  
     | • Ability of community to understand the role of the SES, Police etc  
     | • Impact of falling powerlines and poles  
     | • Loss of income  
     | • Possible financial benefit to community and economy from development on improved infrastructure  
     | • Homelessness  
<pre><code> | • Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements |
</code></pre>
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>Risk</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lack of preparedness of the community</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td>Risk</td>
<td>Active Counter Disaster Committee</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lack of knowledge of responsive strategies</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td>Risk</td>
<td>Active Counter Disaster planning</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Impact of power loss on the disabled</td>
<td>Building a stronger community</td>
<td>Risk</td>
<td>Well educated and trained SES teams</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Transport needs of the frail and disabled and their carers</td>
<td>An unprepared community</td>
<td>Risk</td>
<td>Community preparedness plans</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ability of the utility services to function: water and power</td>
<td>Economic loss</td>
<td>Risk</td>
<td>Council site preparation plans (inc. Vehicles etc)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Impact of economic loss on the community and service providers post event</td>
<td>Loss of employment</td>
<td>Risk</td>
<td>Cyclone watch systems</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Destruction of residential abode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Requirements for emergency accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Disruption to communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Built environment:** Residential / Farms

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theft and presence of looters</td>
</tr>
<tr>
<td></td>
<td>Impact of limited insurance cover on the community</td>
</tr>
<tr>
<td></td>
<td>Ability of community to use generators and like equipment</td>
</tr>
<tr>
<td></td>
<td>Impact of falling powerlines and poles</td>
</tr>
<tr>
<td></td>
<td>Impact of structural damage</td>
</tr>
<tr>
<td></td>
<td>Loss of accommodation</td>
</tr>
<tr>
<td></td>
<td>Ability of Shire to provide temporary accommodation</td>
</tr>
<tr>
<td></td>
<td>Loss of access to facilities</td>
</tr>
<tr>
<td></td>
<td>Impact on aged persons homes</td>
</tr>
</tbody>
</table>

- ☐ Theft and presence of looters
- ☐ Impact of limited insurance cover on the community
- ☐ Ability of community to use generators and like equipment
- ☐ Impact of falling powerlines and poles
- ☐ Impact of structural damage
- ☐ Loss of accommodation
- ☐ Ability of Shire to provide temporary accommodation
- ☐ Loss of access to facilities
- ☐ Impact on aged persons homes
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment: Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>1</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Age and limitations of the buildings to withstand major natural events</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Loss of infrastructure</td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td>Loss of employment within the community</td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td>Ability of the commercial business to respond during and post event</td>
<td>Economic loss</td>
<td></td>
<td>Plans</td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td>Loss of employment</td>
<td></td>
<td>SES teams</td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td>Impact on the health care services</td>
<td></td>
<td></td>
<td>Cyclone watch systems</td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td></td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td></td>
<td></td>
<td>Building design requirements</td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
</tr>
</tbody>
</table>
| Built Environment: Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study | C | M28 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
| Natural Environment | Damage to the natural amenity | Occurrence of a natural disaster  
Inability of the community to heed or interpret warnings  
Loss of infrastructure | Degradation of the natural environment  
Loss of natural amenity | 2     | Comprehensive and rehearsed Counter Disaster Plan  
Active Counter Disaster Committee  
Active Counter Disaster planning  
Well educated and trained SES teams  
Community preparedness plans  
Council site preparation plans (inc. Vehicles etc)  
Cyclone watch systems  
Hand outs on emergency procedures for staff and the community  
Building design requirements  
Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| People | • Injury from flying debris  
• Health of the community  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Inappropriate actions of sightseers  
• Location of the community at the time of the events  
• Impact of economic loss on the community and service providers post event  
• Injury to members of the community and those assisting  
• Destruction of residential abode | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations on mobility  
• Loss of infrastructure | • Injury to or death of residents or helpers  
• Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• Additional need for counseling and support services  
• An unprepared community  
• Economic loss  
• Loss of employment | 3 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Critical agency plans – e.g. Hospitals, Ambulance  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• Active staff education plans  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements | C | H52 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Requirements for emergency accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disruption to communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sustenance of the community and those assisting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access of the community to insurers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of limited insurance cover on the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of community to use generators and like equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of community to understand the role of the SES, Police etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of falling powerlines and poles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible financial benefit to community and economy from development on improved infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homelessness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
| Built Environment: Residential / Farms | Damage from flying debris  
Lack of preparedness of the community  
Lack of knowledge of responsive strategies  
Impact of power loss on the disabled  
Transport needs of the frail and disabled and their carers  
Ability of the utility services to function (garbage, sewerage, water and power)  
Impact of economic loss on the community and service providers post event  
Destruction of residential abode  
Requirements for emergency accommodation  
Disruption to communications  
Panic amongst the community | Occurrence of a natural disaster  
Inability of the community to heed or interpret warnings  
Age and limitations of infrastructure  
Loss of infrastructure | Putting at risk the lives of emergency service personnel  
Community disharmony – perception of disproportionate access to services and help  
Camaraderie amongst members of the community – common bond  
Building a stronger community  
An unprepared community  
Economic loss  
Loss of employment | 3 | Comprehensive and rehearsed Counter Disaster Plan  
Active Counter Disaster Committee  
Active Counter Disaster planning  
Well educated and trained SES teams  
Community preparedness plans  
Council site preparation plans (inc. Vehicles etc)  
Cyclone watch systems  
Hand outs on emergency procedures for staff and the community  
Building design requirements  
Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements |

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of limited insurance cover on the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of community to use generators and like equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of falling powerlines and poles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact of structural damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of Shire to provide temporary accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of access to facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on aged persons homes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Built Environment: Commercial | • Property damage  
• Loss of trade (temporary and permanent)  
• Possible closure of the business  
• Loss of services  
• Security of business systems  
• Loss of stock  
• Restocking costs  
• Insurance claims and re-insurance impact – delays, costs etc  
• Ability to return to business  
• Loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Ability of the aged care and hostel sectors to deliver services during an event  
• Impact on the health care services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council officers are serviced  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | D | L20 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment: Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2     | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study | C        | M28          |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
| Natural Environment | • Damage to the natural amenity | • Occurrence of a natural disaster  
| | | • Inability of the community to heed or interpret warnings  
| | | • Loss of infrastructure | • Degradation of the natural environment  
| | | | • Loss of natural amenity | 2 | • Comprehensive and rehearsed Counter Disaster Plan  
| | | | | | • Active Counter Disaster Committee  
| | | | | | • Active Counter Disaster planning  
| | | | | | • Well educated and trained SES teams  
| | | | | | • Community preparedness plans  
| | | | | | • Council site preparation plans (inc. Vehicles etc)  
| | | | | | • Cyclone watch systems  
| | | | | | • Hand outs on emergency procedures for staff and the community  
| | | | | | • Building design requirements  
| | | | | | • Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | C | M28 |
# ATTACHMENT 9.9: RISK DESCRIPTION REGISTER – RURAL - BURDEKIN RIVER FLOODING (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>People not receiving the warning</td>
<td>Occurrence of a natural disaster</td>
<td>Flooding to the townships of: Groper Creek, Rita Island, Alva Beach, Dalbeg (bridge too low), Millaroo, Clare, Mt Kelly (Sheepstation Creek, Sutcliffe Estate)</td>
<td>3</td>
<td>Predictive modeling by Council officers</td>
<td>D</td>
<td>M36</td>
</tr>
<tr>
<td></td>
<td>People not heeding the warning</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Possible injury and loss of life</td>
<td></td>
<td>Monitoring and recording water levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td>Age and limitations on mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complacency on the part of the community (“I haven’t been flooded before”)</td>
<td>Loss of infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Road closures being ignored, endangering lives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Injury to members of the community and emergency personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accommodation limitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of sightseers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of debris (garbage bins and other litter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewerage problems of short duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>Possibility of injury from fallen power lines and underground power supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possibility of community members being under or un-insured (for flood)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Destruction of personal property</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homes washed away</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| E M28 | Built Environment: Residential / Farms | • Damage from flood waters  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Impact of economic loss on the community and service providers post event  
• Destruction of residential abode  
• Requirements for emergency accommodation  
• Disruption to communications  
• Panic amongst the community | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of infrastructure  
• Loss of infrastructure | 2 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | C | M28 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment: Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>1</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td>C</td>
<td>L12</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Age and limitations of the buildings to withstand major natural events</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Loss of infrastructure</td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td>Property damage</td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Economic loss</td>
<td></td>
<td>plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td>Loss of infrastructure</td>
<td>Loss of employment</td>
<td></td>
<td>Cyclone watch systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td>Occurrence of a natural disaster</td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td>On-call staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td>Hand outs on emergency procedures for staff and the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td>Building design requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td>Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on the Hospitals and health care services</td>
<td>Loss of trade (temporary and permanent)</td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td>Impact on the Hospitals and health care services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>---------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Built Environment: Council Infrastructure | • Damage to Council buildings, equipment and facilities  
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study |
| Natural Environment | • Damage to river bank  
• Impact of Vegetation on restricting flood waters (legislation restrictions)  
• Change of path of river | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | • Degradation of the natural environment  
• Loss of natural amenity | 2 | • Burdekin River Trust established 1973  
• Catchment management plan  
• Town planning scheme |
# ATTACHMENT 9.10: RISK DESCRIPTION REGISTER – RURAL – HAUGHTON RIVER FLOODING (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>People not receiving the warning</td>
<td>• Occurrence of a natural disaster</td>
<td>• Flooding to the townships of: Groper Creek, Rita Island, Alva Beach, Dalbeg (bridge too low), Millaroo, Clare, Mt Kelly (Sheepstation Creek, Sutcliffe Estate)</td>
<td>3</td>
<td>Predictive modeling by Council officers, Monitoring and recording water levels</td>
<td>D</td>
<td>M36</td>
</tr>
<tr>
<td></td>
<td>Shire does not predict water levels (undertaken by the Bureau of Meteorology)</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public may not be aware of who reports what in relation to the Haughton</td>
<td>• Age and limitations on mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sightseers (not locals) interfering with community affairs</td>
<td>• Loss of infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People become trapped</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threats to life (inc. road closure volunteers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vehicles and trucks ignoring road closed signs and directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of communities to receive food supplies Giru)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Road access limitations (Giru)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>- Accommodation limitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Presence of debris (garbage bins and other litter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Possibility of injury from fallen power lines and underground power supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Homes washed away</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Built Environment; Residential / Farms | • Damage from flood waters  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Impact of economic loss on the community and service providers post event  
• Destruction of residential abode  
• Requirements for emergency accommodation  
• Disruption to communications  
• Panic amongst the community | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of Infrastructure  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | C | M28 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment: Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>1</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Active Counter Disaster Committee</td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Age and limitations of the buildings to withstand major natural events</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Loss of infrastructure</td>
<td>Building a stronger community</td>
<td></td>
<td>Well educated and trained SES teams</td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td></td>
<td>An unprepared community</td>
<td></td>
<td>Community preparedness plans</td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td></td>
<td>Economic loss</td>
<td></td>
<td>Buildings design requirements</td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td></td>
<td>Loss of employment</td>
<td></td>
<td>Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system</td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td></td>
<td>Impact on the health care services</td>
<td></td>
<td>Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements</td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on the health care services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>-------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Built Environment: Council Infrastructure | - Damage to Council buildings, equipment and facilities  
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
- Inability of Council to meet demands for sewerage, water supply and garbage services | - Age and limitations of the buildings to withstand major natural events  
- Loss of infrastructure | - Putting at risk the lives of emergency service personal  
- Community disharmony – perception of disproportionate access to services and help  
- Camaraderie amongst members of the community – common bond  
- Building a stronger community  
- An unprepared community  
- Economic loss  
- Loss of employment | 2     | - Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
- Implementation of Counter Disaster measures  
- River water height alert system  
- Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
- Early commencement of a tidal surge Study | C          | M28               |
| Natural Environment | - Damage to river bank  
- Impact of Vegetation on restricting flood waters (legislation restrictions)  
- Change of path of river | - Occurrence of a natural disaster  
- Inability of the community to heed or interpret warnings  
- Inability of the community to follow safe environmental practice | - Degradation of the natural environment  
- Loss of natural amenity | 2     | - Haughton River Trust established 1995  
- Catchment management plan  
- Town planning scheme  
- Bank vegetation management | C          | M28               |
## ATTACHMENT 9.11: RISK DESCRIPTION REGISTER – RURAL LOCALISED FLOODING (FORMS A9 & A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>People not receiving the warning</td>
<td>• Occurrence of a natural disaster</td>
<td>• Minor flooding to isolated townships</td>
<td>2</td>
<td>• Predictive modeling by Council officers</td>
<td>C</td>
<td>M28</td>
</tr>
<tr>
<td></td>
<td>Public may not be aware of who reports what in relation to the Haughton</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td>• Possible loss of life</td>
<td></td>
<td>• Monitoring and recording water levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sightseers interfering with community affairs</td>
<td>• Age and limitations on mobility</td>
<td>• Isolation from the dual communities of Ayr and Home Hill</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People become trapped</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threats to life (inc. road closure volunteers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vehicles and trucks ignoring road closed signs and directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of debris (garbage bins and other litter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment: Residential / Farms | • Damage from flood waters  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, sewerage, water and power)  
• Impact of economic loss on the community and service providers post event  
• Damage to residential abode  
• Requirements for temporary accommodation  
• Disruption to communications  
• Panic amongst the community | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of infrastructure  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council offices are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | C | M28 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment: Commercial | • Property damage  
• Loss of trade (temporary and permanent)  
• Possible closure of the business  
• Loss of services  
• Security of business systems  
• Loss of stock  
• Restocking costs  
• Insurance claims and re-insurance impact – delays, costs etc  
• Ability to return to business  
• Loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Ability of the aged care and hostel sectors to deliver services during an event  
• Impact on the Hospitals and health care services  
• Isolation of Ayr Council Caravan Park | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 1 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster Committee  
• Active Counter Disaster planning  
• Well educated and trained SES teams  
• Community preparedness plans  
• Council site preparation plans (inc. Vehicles etc)  
• Cyclone watch systems  
• On-call staff  
• Hand outs on emergency procedures for staff and the community  
• Building design requirements  
• Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Well equipped SES teams in all critical centres (Ayr, Home Hill, Clare and Giru) with nominated and supported volunteers and other smaller settlements | C | L12 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment: Council Infrastructure | • Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for sewerage, water supply and garbage services  
• Localised flooding in Home Hill, Brandon, East End centre, Third Avenue and Fifth Avenue, Home Hill and Second Avenue between 10 and 14th Street, Home Hill, South Ayr and Chippendale Street | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Council officers are serviced by an emergency power generator that also meets the needs of the water supply and sewerage pumping system  
• Implementation of Counter Disaster measures  
• River water height alert system  
• Initiation of flood studies for the towns of Ayr, Home Hill and Brandon  
• Early commencement of a tidal surge Study  
• Raising road heights as opportunities arise  
• Improving access | C | M28 |
| Natural Environment | • Damage to river bank  
• Impact of Vegetation on restricting flood waters (legislation restrictions)  
• Change of path of river | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | • Degradation of the natural environment  
• Loss of natural amenity | 2 | • Haughton River Trust established 1995  
• Catchment management plan  
• Town planning scheme  
• Bank vegetation management | C | M28 |

(A) Major Inland Towns – Cyclone Cat 3, 4 and 5 (A1, A2 and A3)
(B) Minor Inland Towns – Cyclone Cat 3, 4 and 5 (B1, B2 and B3)
(C) Coastal Communities – Cyclone Cat 1, 3 and 5 (C1, C2 and C3)
(D) Other Components (Environmental Damage and Rural Losses) – Cyclone Cat 1, 3 and 5 (D1, D2 and D3)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public may become confused by conflicting reports</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Possible injury and loss of life</td>
<td>A3-5 B1-1</td>
<td>Monitoring and recording events (BoM)</td>
<td>A2-D</td>
<td>A2-M36-H64</td>
</tr>
<tr>
<td></td>
<td>Sightseers, tourists, backpackers and locals may interfere with community affairs</td>
<td>Age and limitations on mobility</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>B2-2-4</td>
<td>Well educated, trained and equipped SES and Volunteer Marine Rescue teams</td>
<td>A3-E</td>
<td>A3-H68</td>
</tr>
<tr>
<td></td>
<td>People become trapped</td>
<td>Loss of infrastructure</td>
<td>Community disharmony – perception of disproportionate access to services and help</td>
<td>B3-3/5 C1-3</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td>B1-C</td>
<td>B1-L12</td>
</tr>
<tr>
<td></td>
<td>Threats to life (inc. road closure volunteers)</td>
<td>Worse (W) case scenario – high tide with wind in a SE/E direction with a severe depression</td>
<td>Building a stronger community</td>
<td>C2-4 C3-5</td>
<td>Active Counter Disaster planning</td>
<td>B2-D</td>
<td>B2-L20-H64</td>
</tr>
<tr>
<td></td>
<td>Vehicles and trucks ignoring road closed signs and directions</td>
<td>Ability of communities to receive food supplies</td>
<td>An unprepared community</td>
<td>D1-2 D2-3/4 D3-5</td>
<td>Community evacuation plans</td>
<td>B3-E</td>
<td>B3-M32-H68</td>
</tr>
<tr>
<td></td>
<td>Ability of communities to receive food supplies</td>
<td>Road access limitations</td>
<td>Economic loss</td>
<td></td>
<td>Cyclone watch systems</td>
<td>C1-A</td>
<td>C1-E72</td>
</tr>
<tr>
<td></td>
<td>Road access limitations</td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td>Loss of employment</td>
<td></td>
<td>Consultation with key agencies about their disaster mitigation plans</td>
<td>C2-C</td>
<td>C2-E76</td>
</tr>
<tr>
<td></td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td>Accommodation limitations</td>
<td></td>
<td></td>
<td>Current Storm Surge Study</td>
<td>C3-E</td>
<td>C3-H68</td>
</tr>
<tr>
<td></td>
<td>Accommodation limitations</td>
<td>Presence of debris</td>
<td></td>
<td></td>
<td></td>
<td>D1-A</td>
<td>D1-H48</td>
</tr>
<tr>
<td></td>
<td>Presence of debris</td>
<td>Possibility of injury from fallen power lines</td>
<td></td>
<td></td>
<td></td>
<td>D2-C</td>
<td>D2-H52-E76</td>
</tr>
<tr>
<td></td>
<td>Possibility of injury from fallen power lines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D3-E</td>
<td>D3-H68</td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td>LIKELIHOOD</td>
<td>RISK RATING</td>
</tr>
<tr>
<td>-----</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>People cont.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E H M L N</td>
</tr>
</tbody>
</table>

- Pre-cyclone season education and consultation
- Early movement of frail, disabled and those requiring electronic medical support to safe respite centres
- Council Planning Scheme
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
</tr>
</thead>
</table>
| Built environment - Residential | · Damage from flood waters  
· Lack of preparedness of the community  
· Lack of knowledge of responsive strategies  
· Impact of power loss on the disabled  
· Transport needs of the frail and disabled and their carers  
· Ability of the utility services to function (garbage, sewerage, water and power)  
· Impact of economic loss on the community and service providers post event  
· Destruction of residential abode  
· Requirements for emergency accommodation  
· Disruption to communications  
· People not willing to leave | · Occurrence of a natural disaster  
· Inability of the community to heed or interpret warnings  
· Age and limitations on mobility  
· Loss of infrastructure  
· Worse (W) case scenario – high tide with wind in a SE/E direction with a severe depression | · Flooding to the coastal beaches and surrounds  
· Possible loss of personal property  
· Possible injury and or loss of life | A1-2  
A2-3/4  
A3-5  
B1-1  
B2-2-4  
B3-3/5  
C1-3  
C2-4  
C3-5  
D1-2  
D2-3/4  
D3-5 | · Predictive planning by Council officers  
· Monitoring and recording events (BoM)  
· Well educated, trained and equipped SES and Volunteer Marine Rescue teams  
· Comprehensive and rehearsed Counter Disaster Plan  
· Active Counter Disaster planning  
· Community evacuation plans  
· Cyclone watch systems  
· Current storm surge Study  
· Early movement of frail, disabled and those requiring electronic medical support to safe respite centres  
· Council Planning Scheme | A1-C  
A2-D  
A3-E  
B1-C  
B2-D  
B3-E  
C1-A  
C2-C  
C3-E  
D1-A  
D2-C  
D3-E |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environm    - Commercial | • Property damage  
• Loss of trade (temporary and permanent)  
• Possible closure of the business  
• Loss of services  
• Security of business systems  
• Loss of stock  
• Restocking costs  
• Insurance claims and re-insurance impact – delays, costs etc  
• Ability to return to business  
• Loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Ability of the aged care and hostel sectors to deliver services during an event  
• Impact on the Hospital and health care services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations of the buildings and infrastructure to withstand major natural events  
• Loss of infrastructure  
• Worse (W) case scenario – high tide with wind in a SE/E direction with a severe depression | • Flooding to the coastal beaches and surrounds  
• Possible loss of personal property  
• Possible injury and or loss of life | A1-2  
A2-3/4  
A3-5  
B1-1  
B2-2-4  
B3-3/5  
C1-3  
C2-4  
C3-5  
D1-2  
D2-3/4  
D3-5 | • Predictive planning by Council officers  
• Monitoring and recording events (BoM)  
• Well educated, trained and equipped SES and Volunteer Marine Rescue teams  
• Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster planning  
• Community evacuation plans  
• Cyclone watch systems  
• Current storm surge Study  
• Early movement of frail, disabled and those requiring electronic medical support to safe respite centres  
• Council Planning Scheme | A1-C  
A2-D  
A3-E  
B1-C  
B2-D  
B3-E  
C1-A  
C2-C  
C3-E  
D1-A  
D2-C  
D3-E | A1-M28  
A2-M36-H64  
A3-H68  
B1-L12  
B2-L20-H64  
B3-M32-H68  
C1-E72  
C2-E76  
C3-H68  
D1-H48  
D2-H52-E76  
D3-H68 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Built Environment – Council Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Damage to Council buildings and infrastructure, equipment and facilities</td>
<td>• Age and limitations of the buildings and infrastructure to withstand major natural events</td>
<td>• Putting at risk the lives of emergency service personal</td>
<td>A1-2</td>
<td>Predictive planning by Council officers</td>
<td>A1-C</td>
<td>A1-M28</td>
</tr>
<tr>
<td></td>
<td>• Damage to Council infrastructure (roads, bridges, culverts, fences etc)</td>
<td></td>
<td>• Possible community disharmony – perception of disproportionate access to services and help</td>
<td>A2-3/4</td>
<td>Monitoring and recording events (BoM)</td>
<td>A2-D</td>
<td>A2-M36-H64</td>
</tr>
<tr>
<td></td>
<td>• Inability of Council to meet demands for sewerage, water supply and garbage services</td>
<td></td>
<td>• Camaraderie amongst members of the community – common bond</td>
<td>A3-5</td>
<td>Well educated, trained and equipped SES and Volunteer Marine Rescue teams</td>
<td>A3-E</td>
<td>A3-H68</td>
</tr>
<tr>
<td></td>
<td>• Failure of other Utility services</td>
<td></td>
<td>• Building a stronger community</td>
<td>B1-1</td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td>B1-C</td>
<td>B1-L12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• An unprepared community</td>
<td>B2-2-4</td>
<td>Active Counter Disaster planning</td>
<td>B2-D</td>
<td>B2-L20-H64</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Economic loss</td>
<td>B3-3/5</td>
<td>Cyclone watch systems</td>
<td>B3-E</td>
<td>B3-M32-H68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Loss of employment</td>
<td>C1-3</td>
<td>Current storm surge Study</td>
<td>C1-A</td>
<td>C1-E72</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Possible contamination</td>
<td>C2-4</td>
<td>Early movement of frail, disabled and those requiring electronic medical support to safe respite centres</td>
<td>C2-C</td>
<td>C2-E76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C3-5</td>
<td>Council Planning Scheme</td>
<td>C3-E</td>
<td>C3-H68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D1-2</td>
<td></td>
<td>D1-A</td>
<td>D1-H48</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D2-3/4</td>
<td></td>
<td>D2-C</td>
<td>D2-H52-E76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D3-5</td>
<td></td>
<td>D3-E</td>
<td>D3-H68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Natural Environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Damage to rivers and creek banks</td>
<td>• Occurrence of a natural disaster</td>
<td>• Degradation of the natural environment</td>
<td>D1-2</td>
<td>Catchment management plan</td>
<td>D1-A</td>
<td>D1-H48</td>
</tr>
<tr>
<td></td>
<td>• Impact of Vegetation on restricting flood waters</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td>• Loss of natural amenity</td>
<td>D2-3/4</td>
<td>Bank vegetation management</td>
<td>D2-C</td>
<td>D2-H52-E76</td>
</tr>
<tr>
<td></td>
<td>(legislation restrictions)</td>
<td>• Inability of the community to follow safe environmental practice</td>
<td>• Foreshore damage</td>
<td>D3-5</td>
<td>Council Planning Scheme</td>
<td>D3-E</td>
<td>D3-H68</td>
</tr>
<tr>
<td></td>
<td>• Change of path of rivers and creeks</td>
<td>• Worse (W) case scenario – high tide with wind in a SE/E direction with a severe depression</td>
<td>• River and stream bank erosion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Run off and Siltation</td>
<td></td>
<td>• Surge waters may not be able to escape</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Salt water damage to the soil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ATTACHMENT 9.13: RISK DESCRIPTION REGISTER – BUSHFIRE - URBAN (FORMS A9/A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>• People not receiving the warning</td>
<td>• Occurrence of a natural disaster</td>
<td>• Possible injury and loss of life</td>
<td>2</td>
<td>• Presence of fire breaks, grading, slashing and other mitigation strategies by Council</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• People not heading warnings – locals, tourists, transport drivers (e.g. smoke over road)</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td>• Age and limitations on mobility</td>
<td></td>
<td>• Well educated, trained and equipped Urban &amp; Rural Fire Services, supported by SES teams and other agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sightseers and tourists being injured</td>
<td>• Lack of adequate water supply</td>
<td>• Smoke inhalation – respiratory distress</td>
<td></td>
<td>• Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Health of the community may be affected (respiratory distress)</td>
<td>• Lightning strike</td>
<td></td>
<td></td>
<td>• Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• People become trapped</td>
<td>• Type of vegetation – fuel load</td>
<td></td>
<td></td>
<td>• Bushfire control is on the agenda for major State agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Threats to life (inc volunteers)</td>
<td></td>
<td></td>
<td></td>
<td>• Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Vehicles and trucks ignoring road closed signs and directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Time and day of event requires consideration in terms of warning strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Presence of smoke hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Damage from fire and smoke</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personnel</td>
<td>2</td>
<td>Presence of fire breaks, grading, slashing and other mitigation strategies by Council</td>
</tr>
<tr>
<td></td>
<td>Lack of preparedness of the community</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Possible community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Well educated, trained and equipped Urban &amp; Rural Fire Services, supported by SES teams and other agencies</td>
</tr>
<tr>
<td></td>
<td>Lack of knowledge of responsive strategies</td>
<td>Lack of adequate water supply</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td>Impact of power loss on the disabled</td>
<td>Lightning strike</td>
<td>Building a stronger community</td>
<td></td>
<td>Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td>Transport needs of the frail and disabled and their carers</td>
<td>Type of vegetation – fuel load</td>
<td>An unprepared community</td>
<td></td>
<td>Bushfire control is on the agenda for major State agencies</td>
</tr>
<tr>
<td></td>
<td>Ability of the utility services to function (garbage, effluent, water, telephone and power)</td>
<td>Age and materials used in construction</td>
<td>Economic loss</td>
<td></td>
<td>Council Planning Scheme</td>
</tr>
<tr>
<td></td>
<td>Damage to residential abode</td>
<td>Inadequate preparation and reduction in fire load around buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Requirements for temporary accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disruption to communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment – Commercial | • Property damage  
• Loss of trade (temporary and permanent)  
• Impact of economic loss on the community and service providers post event  
• Possible closure of the business  
• Loss of services  
• Security of business systems  
• Loss of stock  
• Restocking costs  
• Insurance claims and reinsurance impact – delays, costs etc  
• Ability to return to business  
• Loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Impact on the health care services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Lack of adequate water supply  
• Lightning strike  
• Type of vegetation – fuel load  
• Age and materials used in construction  
• Inadequate preparation and reduction in fire load around buildings | • Putting at risk the lives of emergency service personal  
• Possible community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment | 2 | • Presence of fire breaks, grading, slashing and other mitigation strategies by Council  
• Well educated, trained and equipped Urban & Rural Fire Services, supported by SES teams and other agencies  
• Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster planning  
• Bushfire control is on the agenda for major State agencies  
• Council Planning Scheme | C | M28 |
### Built Environment – Council Infrastructure

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Damage to Council infrastructure (buildings, fences etc)</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>2</td>
<td>Presence of fire breaks, grading, slashing and other mitigation strategies by Council</td>
<td>C</td>
<td>M28</td>
</tr>
<tr>
<td></td>
<td>Possible evacuation of the community/visitors</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Well educated, trained and equipped Urban &amp; Rural Fire Services, supported by SES teams and other agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Failure of other Utility services</td>
<td>Lack of adequate water supply</td>
<td>Building a stronger community</td>
<td></td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lightning strike</td>
<td>Economic loss to Council and community</td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type of vegetation – fuel load</td>
<td></td>
<td></td>
<td>Bushfire control is on the agenda for major State agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age and materials used in construction</td>
<td></td>
<td></td>
<td>Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inadequate preparation and reduction in fire load around buildings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Natural Environment

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loss of flora and fauna</td>
<td>Occurrence of a natural disaster</td>
<td>Degradation of the natural environment</td>
<td>2</td>
<td>Presence of fire breaks, grading, slashing and other mitigation strategies by Council</td>
<td>C</td>
<td>M28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inability of the community to follow safe environmental practice</td>
<td>Loss of natural amenity</td>
<td></td>
<td>Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bushfire control is on the agenda for major State agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>Rural residential residents, Caravan Park residents and tourists/public visiting Shire tourist sites - not receiving the warning</td>
<td>Occurrence of a natural disaster</td>
<td>Possible injury and loss of life</td>
<td>1</td>
<td>Presence of fire breaks and other mitigation strategies around residential property and outbuildings</td>
<td>C</td>
<td>L12</td>
</tr>
<tr>
<td></td>
<td>People not heeding warnings – locals, tourists, transport drivers (e.g. smoke over road)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Age and limitations on mobility</td>
<td></td>
<td>Well educated, trained and equipped Rural Fire Services, supported by SES teams and other agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health of the community may be affected (respiratory distress)</td>
<td>Lack of adequate water supply</td>
<td>Sightseers and tourists being injured</td>
<td></td>
<td>Rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transport needs of the frail and disabled and their carers</td>
<td>Lightning strike</td>
<td>Vehicles and trucks ignoring road closed signs and directions</td>
<td></td>
<td>Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People become trapped</td>
<td>Type of vegetation – fuel load</td>
<td>Smoke inhalation – respiratory distress</td>
<td></td>
<td>Ability of Police to call out volunteers and second them for special duties</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threats to life (Incl. volunteers)</td>
<td>Age and materials used in construction</td>
<td></td>
<td></td>
<td>Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td>Inadequate preparation and reduction in fire load around buildings</td>
<td></td>
<td></td>
<td>Bushfire control is on the agenda for major State agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of smoke hazard</td>
<td>Increasing number of rural residential developments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>RISK DESCRIPTION</td>
<td>CAUSATION</td>
<td>CONSEQUENCE</td>
<td>LEVEL</td>
<td>EXISTING TREATMENT/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1   | Built environment - Residential | • Damage from fire and smoke  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power and telecommunication loss on the disabled  
• Ability of the utility services to function (garbage, effluent, water, telephone and power)  
• Impact of economic loss on the community and service providers post event  
• Damage to residential abode  
• Requirements for temporary accommodation  
• Disruption to communications  
• Panic amongst the community | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Lack of adequate water supply  
• Lightning strike  
• Type of vegetation – fuel load  
• Age and materials used in construction  
• Inadequate preparation and reduction in fire load around buildings  
• Increasing number of rural residential developments | • Putting at risk the lives of emergency service personal  
• Possible community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Short term loss of employment  
• Impact on absentee landholders  
• Property loss | 1 | • Presence of fire breaks and other mitigation strategies around residential property and outbuildings  
• Well educated, trained and equipped Rural Fire Services, supported by SES teams and other agencies  
• Rehearsed Counter Disaster Plan  
• Active Counter Disaster planning  
• Ability of Police to call out volunteers and second them for special duties  
• Council Planning Scheme  
• Bushfire control is on the agenda for major State agencies | C | L12 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment - Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Putting at risk the lives of emergency service personal</td>
<td>1</td>
<td>Presence of fire breaks and other mitigation strategies around residential property and outbuildings</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Possible community disharmony – perception of disproportionate access to services and help</td>
<td></td>
<td>Well educated, trained and equipped Rural Fire Services, supported by SES teams and other agencies</td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Lack of adequate water supply</td>
<td>Camaraderie amongst members of the community – common bond</td>
<td></td>
<td>Rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Lightning strike</td>
<td>Building a stronger community</td>
<td></td>
<td>Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td>Type of vegetation – fuel load</td>
<td>An unprepared community</td>
<td></td>
<td>Ability of Police to call out volunteers and second them for special duties</td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td>Age and materials used in construction</td>
<td>Economic loss to Council and community</td>
<td></td>
<td>Council Planning Scheme</td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td>Inadequate preparation and reduction in fire load around buildings</td>
<td></td>
<td></td>
<td>Bushfire control is on the agenda for major State agencies</td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td>Increasing number of rural residential developments</td>
<td>Loss of employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on the health care services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Likelihood:** C  **Risk Rating:** L12
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment – Council Infrastructure | • Damage to Council infrastructure (buildings, fences etc)  
• Failure of other Utility services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Lack of adequate water supply  
• Lightning strike  
• Type of vegetation – fuel load  
• Age and materials used in construction  
• Inadequate preparation and reduction in fire load around buildings  
• Increasing number of rural residential developments | • Putting at risk the lives of emergency service personal  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• Economic loss to Council | 1 | • Presence of fire breaks and other mitigation strategies around residential property and outbuildings  
• Well educated, trained and equipped Rural Fire Services, supported by SES teams and other agencies  
• Rehearsed Counter Disaster Plan  
• Active Counter Disaster planning  
• Ability of Police to call out volunteers and second them for special duties  
• Council Planning Scheme  
• Bushfire control is on the agenda for major State agencies | C | L12 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural Environment</td>
<td>• Occurrence of a natural disaster</td>
<td>• Degradation of the natural environment</td>
<td>1</td>
<td>• Presence of fire breaks, grading, slashing and other mitigation strategies by Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inability of the community to follow safe environmental practice</td>
<td>• Loss of natural amenity</td>
<td></td>
<td>• Comprehensive and rehearsed Counter Disaster Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Active Counter Disaster planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Bushfire control is on the agenda for major State agencies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Council Planning Scheme</td>
</tr>
</tbody>
</table>

**Likelihood (L)**
- L: Low
- E: Exceptional
- H: High
- M: Medium
- N: None

**Risk Rating (R)**
- L12
## ATTACHMENT 9.15: RISK DESCRIPTION REGISTER – EARTHQUAKE/TREMOR - URBAN & RURAL (FORMS A9/A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>People not receiving the warning</td>
<td>Occurrence of a natural disaster</td>
<td>Major:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of sightseers, tourists and backpackers may interfere with community affairs</td>
<td>Inability of the community to heed or interpret warnings</td>
<td>Probable personal injury – accidents, flying debris</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People become trapped</td>
<td>Age and limitations on mobility</td>
<td>Major loss of mobility and access</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threats to life (inc. road closure volunteers)</td>
<td>Loss of infrastructure</td>
<td>Probable loss of life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vehicles and trucks ignoring road closed signs and directions</td>
<td>Time and day of event requires consideration in terms of warning strategy</td>
<td>Some evacuation likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of debris</td>
<td>Presence of debris</td>
<td>Loss of possessions/food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lifelines will be affected</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Services will be disrupted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Economic loss to the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moderate:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Possible personal injury – accidents, flying debris</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Probable loss of mobility and access – short duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Possible loss of life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Likelihood: E  L 4-H60
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| People (cont) | | | • Some evacuation possible  
| | | | • Probable loss of possessions/food  
| | | | • Lifelines will be affected  
| | | | • Services will be disrupted  
| | | Minor:  
| | | • Possibly some personal injury  
| | | • Some evacuation may be necessary  
| | | • Some loss of possessions and food  
| | | • Possible loss of life  
| | | • Lifelines may be affected  
<p>| | | • Services may be affected | | | | |</p>
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built environment - Residential | High incidence of high rise in Shire | Occurrence of a natural disaster | Major:  
- Likely building/roof/window damage – residential, commercial  
- Probable damage to Schools and other related services  
- Probable Council infrastructure damage  
- Loss of power  
- Loss of water supply services  
- Loss of communications  
- Loss of consumables – food and groceries  
- Possible short term flooding | 1-4 | Counter Disaster measures in place  
- Council Planning Scheme  
- Dam flood plain emergency management plan | E | L4-H60 |
| | Potential structural damage | Inability of the community to heed or interpret warnings | Moderate:  
- Probable building/roof/window damage – residential, commercial  
- Possible damage to Schools and other related services  
- Possible Council infrastructure damage  
- Possible short term loss of power  
- Possible short term loss of water supply services  
- Possible loss of communications  
- Possible loss of consumables – food and groceries  
- Possible short term flooding  
- Possible vehicle damage | | |
| | Lack of preparedness of the community | Age and limitations of infrastructure | | | |
| | Lack of knowledge of responsive strategies | Loss of infrastructure | | | |
| | Impact of power loss on the disabled | Transport needs of the frail and disabled and their carers | | | |
| | | Ability of the utility services to function (garbage, effluent, water and power) | | | |
| | Impact of economic loss on the community and service providers post event | | | | |
| | Damage to residential abode | | | | |
| | Requirements for temporary accommodation | | | | |
| | Disruption to communications | | | | |
| | Panic amongst the community | | | | |
| | | | | | |

- E: Existing  
- H: High  
- M: Moderate  
- L: Low  
- N: None  

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment - Commercial</td>
<td>Property damage</td>
<td>Occurrence of a natural disaster</td>
<td>Major: Major building/roof/window damage – residential, commercial</td>
<td>1-4</td>
<td>Counter Disaster measures in place</td>
<td>E</td>
<td>L4-H60</td>
</tr>
<tr>
<td></td>
<td>Loss of trade (temporary and permanent)</td>
<td>Inability of the community to heed or interpret warnings</td>
<td></td>
<td></td>
<td>Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible closure of the business</td>
<td>Age and limitations of the buildings to withstand major natural events</td>
<td></td>
<td></td>
<td>Dam flood plain emergency management plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of services</td>
<td>Loss of infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security of business systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of stock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restocking costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insurance claims and re-insurance impact – delays, costs etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability to return to business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of employment within the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impact on the health care services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isolation of the Shire’s Caravan Parks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate: Probable building/roof/window damage – residential, commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible damage to Schools and other related services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible Council infrastructure damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible short term loss of power</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible short term loss of water supply services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible loss of communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible loss of consumables – food and groceries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible short term flooding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible vehicle damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minor: Minor structural damage possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some localised damage to residences and infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some short term disruption to retail and commercial business is possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built Environment – Council Infrastructure | • Damage to Council infrastructure (roads, bridges, culverts, fences etc)  
• Inability of Council to meet demands for effluent, water supply and garbage services  
• Localised flooding  
• Failure of other Utility services | • Age and limitations of the buildings to withstand major natural events  
• Loss of infrastructure | • Putting at risk the lives of emergency service personal  
• Camaraderie amongst members of the community – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss  
• Loss of employment  
• Substantial damage to council roads and infrastructure | 1-4 | • Counter Disaster measures in place  
• Council Planning Scheme  
• Dam flood plain emergency management plan | E | L4-H60 |
| Natural Environment | • Damage to river banks  
• Impact of vegetation on restricting flood waters  
• Change of path of rivers and streams  
• Loss of flora and fauna | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Inability of the community to follow safe environmental practice | • Degradation of the natural environment  
• Loss of natural amenity | 1-4 | • Counter Disaster measures in place  
• Council Planning Scheme  
• Dam flood plain emergency management plan | E | L4-H60 |
### ATTACHMENT 9.16: RISK DESCRIPTION REGISTER – LANDSLIDE/SLIPS - RURAL - ISOLATED EVENTS (FORMS A9/A10)

<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>• People may attempt to pass through landslip or by other means (e.g. 4WD)</td>
<td>• Occurrence of a natural disaster</td>
<td>• Possible injury and loss of life</td>
<td>1</td>
<td>• Council maintenance program</td>
<td>C</td>
<td>L12</td>
</tr>
<tr>
<td></td>
<td>• Isolation of children and workers</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td>• Isolation of some community members and tourists</td>
<td></td>
<td>• Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Impact on medical retrievals</td>
<td>• Age and limitations on mobility</td>
<td>• Disruption to travel and transport</td>
<td></td>
<td>• Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Accumulation of people on either side of the damaged sections of road</td>
<td>• Loss of infrastructure</td>
<td></td>
<td></td>
<td>• Well educated, trained and equipped SES teams and other agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minor/major damage to Urban &amp; rural roads</td>
<td></td>
<td></td>
<td>• Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
</table>
| Built environment - Residential | • Damage from falling trees, rocks and earth  
• Lack of preparedness of the community  
• Lack of knowledge of responsive strategies  
• Impact of power and telecommunication loss on the disabled  
• Transport needs of the frail and disabled and their carers  
• Ability of the utility services to function (garbage, effluent, water, telephone and power)  
• Damage to residential abode  
• Requirements for temporary accommodation  
• Disruption to communications  
• People not willing to move | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings  
• Age and limitations on mobility  
• Loss of infrastructure | • Possible damage to buildings and infrastructure | 1 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster planning  
• Well educated, trained and equipped SES teams and other agencies  
• Council Planning Scheme | C | L12 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
</tr>
</thead>
</table>
| Built Environment Commercial | • Loss of trade (temporary)  
• Loss of services  
• Restocking costs  
• Insurance claims and re-insurance impact – delays, costs etc  
• Temporary loss of employment within the community  
• Ability of the commercial business to respond during and post event  
• Short term impact on the health care services | • Occurrence of a natural disaster  
• Inability of the community to heed or interpret warnings | • Putting at risk the lives of emergency service personnel  
• Possible community disharmony – perception of disproportionate access to services and help  
• Camaraderie amongst members of the community during events – common bond  
• Building a stronger community  
• An unprepared community  
• Economic loss to Council and community  
• Transport delays | 1 | • Comprehensive and rehearsed Counter Disaster Plan  
• Active Counter Disaster planning  
• Well educated, trained and equipped SES teams and other agencies  
• Council Planning Scheme | C | L12 |
<table>
<thead>
<tr>
<th>RIC</th>
<th>RISK DESCRIPTION</th>
<th>CAUSATION</th>
<th>CONSEQUENCE</th>
<th>LEVEL</th>
<th>EXISTING TREATMENT/S</th>
<th>LIKELIHOOD</th>
<th>RISK RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Built Environment – Council Infrastructure</td>
<td>• Inability of Council to meet demands for services</td>
<td>• Inadequate road infrastructure maintenance</td>
<td>1</td>
<td>• Consultation with Dam authorities about contingency plans</td>
<td>C</td>
<td>L12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Failure of other Utility services</td>
<td>• Occurrence of a natural disaster</td>
<td></td>
<td>• Comprehensive and rehearsed Counter Disaster Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Loss of infrastructure – roads, effluent and water supply</td>
<td></td>
<td>• Active Counter Disaster planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Well educated, trained and equipped SES teams and other agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Maintenance of Council assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natural Environment</td>
<td>• Damage to river and creek banks</td>
<td>• Occurrence of a natural disaster</td>
<td>1</td>
<td>• Catchment management plan</td>
<td>C</td>
<td>L12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Damage from falling trees, rocks and earth</td>
<td>• Inability of the community to heed or interpret warnings</td>
<td></td>
<td>• Bank vegetation management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Inability of the community to follow safe environmental practice</td>
<td></td>
<td>• Council Planning Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Degradation of the natural environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Loss of natural amenity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ATTACHMENT 10: IDENTIFICATION AND EVALUATION OF TREATMENT OPTIONS (FORM A11)

<table>
<thead>
<tr>
<th>Summary of Risk</th>
<th>Risk Priority (RL)</th>
<th>Treatment Options</th>
<th>Treatment Evaluation</th>
</tr>
</thead>
</table>
| **URBAN & RURAL:**  
1. Cyclones (Category 1 – 5);  
2. Flooding of the Burdekin River;  
3. Flooding of the Haughton River;  
4. Burdekin River Bridge Closures;  
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);  
6. Coastal Storm Surge;  
7. Landslide/slip  
8. Bushfire; and  
2. M36  
3. M36  
4. M32-H60  
5. M24-H44  
6. L12-E76  
7. L12  
8. L4-H60 | 1. Review the role and function of the Local Counter Disaster Committee and revise the Local Counter Disaster Plan (in keeping with the new requirements) to ensure the focus is on strategic natural (and man-made) disasters (Prevention, Preparedness, Response and Recovery), rather than responsive strategies for individual incident management through:  
   a. Review of key emergency service capability and development of appropriate education/training programs;  
   b. Establishment of an annual calendar of events including an annual tabletop scenario exercise;  
   c. Establishment of regular meeting schedules of the Committee including member education and presentations by key agencies (e.g. CDRS, SES, UF&RS, RFS, and Police etc);  
   d. establish a risk based recovery clean up system;  
   e. identify extent of equipment and personnel that may be able to be used in emergency situations such as bushfires and flooding events etc | • These are cost effective options to remind the public about risks and solutions.  
• Review and release of the Local Counter Disaster Plan is a crucial task to support the key stakeholder and community education & training process.  
• The development of a comprehensive Evacuation Plan for the Shire will enhance public safety  
• Appropriate and compliant warning signage and management systems are crucial.  
• Policies and practices of key parties must be consistent.  
• Cooperation between adjoining Shires and key agencies is crucial during emergency events to avoid unnecessary injury and or congestion in centres that have insufficient capacity  
• Review of the Shire Planning Scheme as it relates to the Context, Objectives and Outcomes in areas such as |

**RIC: PEOPLE**
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents

© 2003 QRMC Risk Management

Page 218 of 306
<table>
<thead>
<tr>
<th>Summary of Risk</th>
<th>Risk Priority (RL)</th>
<th>Treatment Options</th>
<th>Treatment Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Inability of residents to get supplies</td>
<td></td>
<td>(water carriers, transport, dozers and graders) in the rural home site, rural residential and rural parts of the Shire;</td>
<td>environmental management, sustainable land development land and the building approval process with its focus on safety, will improvements community safety</td>
</tr>
<tr>
<td>• Time and day of event requires consideration in terms of warning strategy</td>
<td></td>
<td>f. identify key/lead agencies that contribute to the Shire disaster mitigation process and through the annual emergency planning exercise, identify gaps in service provision and develop integrated actions across the sector</td>
<td>A risk based annual operational plan for asset maintenance and replacement will improve resource allocation decisions and ensure assets are replaced appropriately on a priority basis</td>
</tr>
<tr>
<td>• Presence of tourists and sightseers – crowd control</td>
<td></td>
<td>g. Develop a comprehensive public education program for key areas of risk (see also 2).</td>
<td>A proactive risk based review of DMR assets maintained under an agreement by WSC, will assist in negotiations with DMR</td>
</tr>
<tr>
<td>• Impact on family pets</td>
<td></td>
<td>2. Develop a comprehensive Public Education Program (including new residents, residents, tenants, schools and tourists, and rural sector members):</td>
<td>The establishment of a formal history database of natural disaster events will increase decision making reliability</td>
</tr>
<tr>
<td>• Effluent problems of short duration</td>
<td></td>
<td>(a) what to do (pre event, during and post event);</td>
<td>The reduction of debris in and around creeks will increase community safety</td>
</tr>
<tr>
<td>• Possibility of injury from fallen power lines and underground power</td>
<td></td>
<td>(b) where to go, who to call, when to evacuate;</td>
<td>The formal identification of assets that may be used during emergencies will better inform the Counter Disaster measures and increase community safety</td>
</tr>
<tr>
<td>• Possibility of community members being under or un-insured (for flood)</td>
<td></td>
<td>(c) role of emergency services (SES, Police, Fire &amp; Rescue), for key hazards (including the development of a coordinated education plan) to ensure professional and consistent presentations;</td>
<td>The identification of at risk areas subject to landslide/slip and the development of responsive strategies will enhance overall</td>
</tr>
<tr>
<td>• Destruction of personal property</td>
<td></td>
<td>(d) public education about clean up options prior to cyclone season;</td>
<td></td>
</tr>
<tr>
<td>• Complacency on the part of the community (&quot;I haven’t been flooded before&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Road closures being ignored, endangering lives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Injury to members of the community and emergency personnel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Emergency accommodation limitations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Disease/presence of debris (garbage and other litter)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Panic amongst the community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability of Hospital to meet demands (incl. Mortuary)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003 QRMC Risk Management
<table>
<thead>
<tr>
<th>Summary of Risk</th>
<th>Risk Priority (RL)</th>
<th>Treatment Options</th>
<th>Treatment Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RIC: RESIDENTIAL</strong></td>
<td></td>
<td>(e) reinstate the pre-cyclone clean up of yards (fee free);</td>
<td>community safety</td>
</tr>
<tr>
<td>• Damage from flying debris</td>
<td></td>
<td>(f) identify key home based medical support equipment which may be affected by services failure (e.g. electricity) and develop resident information kits;</td>
<td></td>
</tr>
<tr>
<td>• Lack of preparedness of the community</td>
<td></td>
<td>(g) review and adopt as appropriate, recommendations/advice incorporated into the various reports on Cyclone Aivu, that can be addressed through public education programs;</td>
<td></td>
</tr>
<tr>
<td>• Lack of knowledge of responsive strategies</td>
<td></td>
<td>(h) identify self support education solutions (e.g. use of neighbours and relatives during emergencies inc. emergency accommodation) and incorporate outcomes into the LCDP, SOPs;</td>
<td></td>
</tr>
<tr>
<td>• Impact of power loss on the disabled</td>
<td></td>
<td>(i) examine the options to improve educational opportunities through the community FM radio station;</td>
<td></td>
</tr>
<tr>
<td>• Transport needs of the frail and disabled and their carers</td>
<td></td>
<td>(j) increase community awareness about the safe use of emergency generators, impact of structural damage and fallen power lines;</td>
<td></td>
</tr>
<tr>
<td>• Ability of the utility services to function (garbage, effluent, water and power)</td>
<td></td>
<td>(k) examine options to increase availability of emergency accommodation;</td>
<td></td>
</tr>
<tr>
<td>• Impact of economic loss on the community and service providers post event</td>
<td></td>
<td>(l) provision of education to the community about bridge crossing</td>
<td></td>
</tr>
<tr>
<td>• Destruction of residential abode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Requirements for emergency accommodation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Disruption to communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• People not willing to leave</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Theft and presence of looters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Impact of limited insurance cover on the community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability of community to use equipment/ generators and like equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Impact of falling powerlines and poles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Impact of structural damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Loss of accommodation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability of Shire to provide temporary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Summary of Risk

<table>
<thead>
<tr>
<th>Risk Priority (RL)</th>
<th>Treatment Options</th>
<th>Treatment Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>accommodation</td>
<td></td>
<td>safety; (m) Identify early warning and remedial action strategies to support outlying communities (limited numbers of personnel) (see also 1).</td>
</tr>
<tr>
<td>• Loss of access to facilities</td>
<td></td>
<td>3. Consider an increased coordination role of Council in the resumption of key commercial services through the identification of and support for strategies that allow commercial businesses to return to normal activities (e.g. additional building surveyors and certifiers to process &amp; assess damage/applications).</td>
</tr>
<tr>
<td>• Impact on aged persons homes</td>
<td></td>
<td>4. Review and seek funding and approval for key/outstanding recommendations from (1) the Brandon Flood Study; (2) the Town of Ayr Flood Study; the Town of Home Hill Flood Study; (3) the Giru Flood Study and (4) the Burdekin Shire Storm Surge Study.</td>
</tr>
<tr>
<td>RIC: COMMERCIAL</td>
<td></td>
<td>5. Develop a brief and lobby/encourage Government to build a second crossing of the Burdekin River and (2) development/construction of temporary bypass arrangements during periods of bridge closure.</td>
</tr>
<tr>
<td>• Property damage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Loss of trade (temporary and permanent)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Possible closure of the business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Loss of services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Security of business systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Loss of stock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Restocking costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Insurance claims and re-insurance impact – delays, costs etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability to return to business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Short term loss of employment within the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability of the commercial business to respond during and post event</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability of the aged care and hostel sectors to deliver services during an event</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Impact on the health care services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC: COUNCIL &amp; UTILITY INFRASTRUCTURE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Damage to Council buildings, equipment and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary of Risk</td>
<td>Risk Priority (RL)</td>
<td>Treatment Options</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>facilities</td>
<td></td>
<td>6. Develop a Shire wide alternative emergency garbage disposal system in association with Thuringowa SC.</td>
</tr>
<tr>
<td>• Damage to Council infrastructure (roads, bridges, culverts, fences etc)</td>
<td></td>
<td>7. Develop an emergency Council staffing service model (staff required to work in Council facilities on their home side of the River).</td>
</tr>
<tr>
<td>• Inability of Council to meet demands for effluent, water supply and garbage services</td>
<td></td>
<td>8. Identify utility service shortcomings and develop remedial strategies with the service providers.</td>
</tr>
<tr>
<td>• Failure of other Utility services</td>
<td></td>
<td>9. Review and update the Evacuation &amp; Recovery Plan (under the LCDP), evaluate needs and capacity of evacuation centres and develop a response and coordinated plan in association with welfare agencies with specific attention to the suitability and appropriateness of, Dalbeg and Millaroo community halls for emergency accommodation.</td>
</tr>
<tr>
<td>RIC: NATURAL ENVIRONMENT</td>
<td></td>
<td>10. Evaluate and if feasible, develop Mt Kelly water supply.</td>
</tr>
<tr>
<td>• Damage to the natural amenity</td>
<td></td>
<td>11. Support the Haughton River Trust to develop solutions and future studies for the effects of river flooding (see also Giru Flood Study – Action 4).</td>
</tr>
<tr>
<td>Summary of Risk</td>
<td>Risk Priority (RL)</td>
<td>Treatment Options</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>12. Develop an alternative strategy for emergency waste removal – inability to access to the Giru transfer station (Donohue Road).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. In conjunction with the Water Trust and SunWater, review the Water Resources Burdekin Falls Dam Emergency Action plan as it affects the Shire.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Develop a risk based annual Asset Management operational plan for timber bridge, culvert and drain maintenance/replacement that is consistent with the identified areas of risk identified in this Study and longer term requirements of the Shire.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Identify and consult with DMR about roads and infrastructure that are the responsibility of DMR that are affected by significant flooding events using a risk based assessment process, as part of the annual performance agreement process.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ATTACHMENT 11: RISK TREATMENT ACTION AND MONITORING SCHEDULE (FORM A12)

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>HAZARD PROJECT LEADER</th>
<th>REPORTING FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>URBAN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CYCLONE (Cat 1-3)</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>CYCLONE (Cat 4-5)</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>FLOODING – Burdekin River</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>FLOODING – Haughton River</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>BUSHFIRE</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>LOCALISED FLOODING (Ayr, Brandon and Home Hill)</td>
<td>Director of Works</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td><strong>URBAN &amp; RURAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BURDEKIN RIVER BRIDGE CLOSURE</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>STORM SURGE</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>EARTHQUAKE</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td><strong>RURAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CYCLONE (Cat 1-3)</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>CYCLONE (Cat 4-5)</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>FLOODING – Burdekin River</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>FLOODING – Haughton River</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>LANDSLIDE</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td>BUSHFIRE</td>
<td>Chief Executive Officer</td>
<td>Annually and after major events</td>
</tr>
<tr>
<td><strong>GENERIC DUTIES</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Chief Executive Officer is the senior accountable officer to Council. That officer may delegate responsibility to another. It is acknowledged that the officer is not responsible for actioning each and every endorsed action. Specific responsibilities
have been assigned as indicated (see Form A14).

The Director of Works, as the senior operational officer responsible for the maintenance of Council infrastructure will be responsible for coordinating the Council’s review and monitoring program for each of the endorsed actions.

Recorded by…………………………….

Date……………………………………..
ATTACHMENT 12: DETAILED RISK ACTION (DISASTER MITIGATION) PLANS (FORM A13) RISK ACTION (DISASTER MITIGATION) PLAN

URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 1

1. Review the role and function of the Local Counter Disaster Committee and revise the Local Counter Disaster Plan (in keeping with the new requirements) to ensure the focus is on strategic natural (and man-made) disasters (Prevention, Preparedness, Response and Recovery), rather than responsive strategies for individual incident management through:
   a) Review of key emergency service capability and development of appropriate education/training programs;
   b) Establishment of an annual calendar of events including an annual table top scenario exercise;
   c) Establishment of regular meeting schedules of the Committee including member education and presentations by key agencies (e.g. CDRS, SES, UF&RS, RFS, and Police etc);
   d) establish a risk based recovery clean up system;
   e) identify extent of equipment and personnel that may be able to be used in emergency situations such as bushfires and flooding events etc (water carriers, transport, dozers and graders) in the rural home site, rural residential and rural parts of the Shire;
   f) identify key/lead agencies that contribute to the Shire disaster mitigation process and through the annual emergency planning exercise, identify gaps in service provision and develop integrated actions across the sector
   g) Develop a comprehensive public education program for key areas of risk (see also 2).

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
Impact on new residents  
Inability of residents to get supplies  
Time and day of event requires consideration in terms of warning strategy  
Presence of tourists and sightseers – crowd control  
Impact on family pets  
Effluent problems of short duration  
Possibility of injury from fallen power lines and underground power  
Possibility of community members being under or un-insured (for flood)  
 Destruction of personal property  
Complacency on the part of the community (“I haven’t been flooded before”)  
Road closures being ignored, endangering lives  
Injury to members of the community and emergency personnel  
Emergency accommodation limitations  
Disease/presence of debris (garbage and other litter)  
Panic amongst the community  
Ability of Hospital to meet demands (incl. Mortuary)

RIC: RESIDENTIAL
- Damage from flying debris  
- Lack of preparedness of the community  
- Lack of knowledge of responsive strategies  
- Impact of power loss on the disabled  
- Transport needs of the frail and disabled and their carers  
- Ability of the utility services to function (garbage, effluent, water and power)  
- Impact of economic loss on the community and service providers post event  
- Destruction of residential abode  
- Requirements for emergency accommodation  
- Disruption to communications  
- People not willing to leave  
- Theft and presence of looters  
- Impact of limited insurance cover on the community  
- Ability of community to use equipment/generators and like equipment  
- Impact of falling powerlines and poles  
- Impact of structural damage  
- Loss of accommodation  
- Ability of Shire to provide temporary accommodation  
- Loss of access to facilities  
- Impact on aged persons homes
RIC: COMMERCIAL

- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

RIC: COUNCIL & UTILITY INFRASTRUCTURE

- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

RIC: NATURAL ENVIRONMENT

- Damage to the natural amenity
- Loss of top soil

Summary – Recommended response & expected outcomes

1. Review the role and function of the Local Counter Disaster Committee and revise the Local Counter Disaster Plan (in keeping with the new requirements) to ensure the focus is on strategic natural (and man-made) disasters (Prevention, Preparedness, Response and Recovery), rather than responsive strategies for individual incident management through:
   a) Review of key emergency service capability and development of appropriate education/training programs;
   b) Establishment of an annual calendar of events including an annual table top scenario exercise;
   c) Establishment of regular meeting schedules of the Committee including member education and presentations by key agencies (e.g. CDRS, SES, UF&RS, RFS, and Police etc);
   d) establish a risk based recovery clean up system;
   e) identify extent of equipment and personnel that may be able to be used in emergency situations such as bushfires and flooding events etc (water carriers, transport, dozers and graders) in the rural home site, rural residential and rural parts of the Shire;
   f) identify key/lead agencies that contribute to the Shire disaster mitigation process and through the annual emergency planning exercise, identify gaps in service provision and develop integrated actions across the sector
   g) Develop a comprehensive public education program for key areas of risk (see also 2).

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee and key stakeholders to prepare for, respond to and recover from natural disasters.
**Action (Disaster Mitigation) plan**

**Proposed actions**

1. Review current plan and outcomes of the Natural Disaster Risk Management Study
2. Develop new framework that covers the strategic issues in one document (e.g. Local Counter Disaster Committee membership, key stakeholders and delegates, roles and responsibilities, communication plan and links to a set of sub-plans that cater for the elements of Prevention, Preparedness, Response and Recovery
3. Develop a template for the sub-plan requirements
4. Incorporate requirements into the Local Counter Disaster Plan for key agencies to develop counter disaster plans and integrate these plans into the related sub-plans
5. Undertake the development of the Burdekin Evacuation Plan using this template
6. Undertake an audit of key agencies to ascertain their current plans with regard to natural disasters
7. Meet with stakeholders in second quarter 2003
8. Consult the DDC
9. Release the plan and stakeholder/community education program
10. Evaluate the plan by October 2004

**Resources required**

1. Clerical and administration time supplied by Council
2. Voluntary time of key stakeholders
3. Materials and overheads

**Responsibilities**

Local Counter Disaster Committee through CEO

**Timetable – Operational plan year & Timeframe**

1. It is intended to incorporate the program in the 2003/04 financial year/operational plan
2. Delivery of the program will occur in the latter part of the year
3. Evaluation will occur in October 2004

**Estimated cost and Possible funding source.**

Council resources (recurrent):

1. Labour - $3,000
2. Materials and overheads - $500
3. Total - $3,500 per year

**Reporting & Monitoring**

- Desk top exercise undertaken annually
- Debrief after exercise and actual event
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 2

2. Develop a comprehensive Public Education Program (including new residents, residents, tenants, schools and tourists, and rural sector members):
   a) what to do (pre event, during and post event);
   b) where to go, who to call, when to evacuate;
   c) role of emergency services (SES, Police, Fire & Rescue), for key hazards (including the development of a coordinated education plan) to ensure professional and consistent presentations;
   d) public education about clean up options prior to cyclone season;
   e) reinstate the pre-cyclone clean up of yards (fee free);
   f) identify key home based medical support equipment which may be affected by services failure (e.g. electricity) and develop resident information kits;
   g) review and adopt as appropriate, recommendations/advice incorporated into the various reports on Cyclone Aivu, that can be addressed through public education programs;
   h) identify self support education solutions (e.g. use of neighbours and relatives during emergencies inc. emergency accommodation) and incorporate outcomes into the LCDP, SOPs;
   i) examine the options to improve educational opportunities through the community FM radio station;
   j) increase community awareness about the safe use of emergency generators, impact of structural damage and fallen power lines;
   k) examine options to increase availability of emergency accommodation;
   l) provision of education to the community about bridge crossing safety;
   m) Identify early warning and remedial action strategies to support outlying communities (limited numbers of personnel) (see also 1).

RISK AREAS:
URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
• People not receiving the warning
• People not heeding the warning
• Transport needs of the frail and disabled and their carers – safe evacuation
• Impact of power loss/isolation on the disabled – medication other
• School children/others becoming isolated
• Impact on new residents
• Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**

- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**
- Damage to the natural amenity
- Loss of top soil

**Summary – Recommended response & expected outcome**

2. Develop a comprehensive Public Education Program (including new residents, residents, tenants, schools and tourists, and rural sector members):
   a) what to do (pre event, during and post event);
   b) where to go, who to call, when to evacuate;
   c) role of emergency services (SES, Police, Fire & Rescue), for key hazards (including the development of a coordinated education plan) to ensure professional and consistent presentations;
   d) public education about clean up options prior to cyclone season;
   e) reinstate the pre-cyclone clean up of yards (fee free);
   f) identify key home based medical support equipment which may be affected by services failure (e.g. electricity) and develop resident information kits;
   g) review and adopt as appropriate, recommendations/advice incorporated into the various reports on Cyclone Aivu, that can be addressed through public education programs;
   h) identify self support education solutions (e.g. use of neighbours and relatives during emergencies inc. emergency accommodation) and incorporate outcomes into the LCDP, SOPs;
   i) examine the options to improve educational opportunities through the community FM radio station;
   j) increase community awareness about the safe use of emergency generators, impact of structural damage and fallen power lines;
   k) examine options to increase availability of emergency accommodation;
   l) provision of education to the community about bridge crossing safety;
   m) Identify early warning and remedial action strategies to support outlying communities (limited
numbers of personnel) (see also 1).

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee and key stakeholders to prepare for, respond to and recover from natural disasters.

### Action (Disaster Mitigation) plan

#### Proposed actions

1. Confirm the key stakeholders, issues and objectives
2. Confirm status of current initiatives (SES handout, DES material, radio broadcasts, service club activity, schools etc)
3. Revise the SES handout
4. Develop a general information sheet on key hazards, strategies and actions
5. Develop targeted communication articles during peak season for inclusion in the Council and SES publications (2-3 times per year)
6. Arrange for members of the Local Counter Disaster Committee to address local service and community clubs
7. Identify opportunities for education of children and young adults in local schools
8. Prepare materials for review in the local libraries
9. Contact local estate agents and ask them to provide educational material to new residents
10. Contact local media outlets for assistance with publication and educational opportunities
11. Provide local accommodation houses – motels, caravan parks, units, and back-packer hostels, with educational material and action plans
12. Arrange a letter box drop of published materials

#### Resources required

1. Clerical and administration time supplied by Council
2. Voluntary time of key stakeholders
3. Materials and Council overheads
4. Distribution costs

#### Responsibilities

- Local Counter Disaster Committee through CEO

#### Timetable – Operational plan year & Timeframe

1. It is intended to incorporate the program into the last quarter of the 2002/03 financial year
2. Delivery of the program will occur during the early part of 2003/04
3. Evaluation will occur in October 2004

#### Estimated cost and Possible funding source.

Council funds:
1. Labour - $3,000
2. Materials and overheads - $2,500
3. Total - $5,500 per year

#### Reporting & Monitoring

To be monitored and reviewed annually as part of the budget development process.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 3

3. Consider an increased coordination role of Council in the resumption of key commercial services through the identification of and support for strategies that allow commercial businesses to return to normal activities (e.g. additional building surveyors and certifiers to process & assess damage/applications).

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community ("I haven’t been flooded before")
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services
### RIC: COUNCIL & UTILITY INFRASTRUCTURE
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

### RIC: NATURAL ENVIRONMENT
- Damage to the natural amenity
- Loss of top soil

## Summary – Recommended response & expected outcomes

3. Consider an increased coordination role of Council in the resumption of key commercial services through the identification of and support for strategies that allow commercial businesses to return to normal activities (e.g. additional building surveyors and certifiers to process & assess damage/applications).

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee and key commercial stakeholders to prepare for, respond to and recover from natural disasters.

## Action (Disaster Mitigation) plan

### 1. Proposed actions
- Develop and release a plan (one stop shop), that identifies key information and pro-forma to assist the commercial sector make a speedy recovery to normal services following a major natural disaster (inc. building approvals, emergency generators (safety and availability if needed), insurance and supply of materials etc). It is to be made clear that Council will provide a facilitation role only. Damage assessment and availability of emergency equipment may limit the capacity of Council to service all needs, requiring priorities to be set by the Counter Disaster Committee;
- Communicate the availability of the plan and “pack” with stakeholders.

### 2. Resources required
- Redirection of Council staff to service emergency needs;
- Labour and materials to prepare the “pack” and communication strategy;
- Identification of a suitable emergency “site” office.

### 3. Responsibilities
- Director of Development – program development
- Counter Disaster Committee – consultation, information and support;
- Director of Administrative Services – program support during emergencies;
- CEO – overall responsibility.

### 4. Timetable – Operational plan year & Timeframe
Plan to be finalised and released by end March 2004

### 5. Estimated cost and possible funding source.
Council labour and materials - $20,000 (to be reviewed after first cycle)
6. Reporting & Monitoring

- CEO to provide a status report to Council by end June 2004;
- Plan to be in place by August each year and reviewed annually after the Cyclone season.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 4

4. Review and seek funding and approval for key/outstanding recommendations from (1) the Brandon Flood Study; (2) the Town of Ayr Flood Study; the Town of Home Hill Flood Study; (3) the Giru Flood Study and (4) the Burdekin Shire Storm Surge Study.

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community ("I haven’t been flooded before")
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services
### RIC: COUNCIL & UTILITY INFRASTRUCTURE
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

### RIC: NATURAL ENVIRONMENT
- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes

4. Review and seek funding and approval for key/outstanding recommendations from (1) the Brandon Flood Study; (2) the Town of Ayr Flood Study; the Town of Home Hill Flood Study; (3) the Giru Flood Study and (4) the Burdekin Shire Storm Surge Study.

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee, key stakeholders and community to prepare for, respond to and recover from natural disasters.

### Action (Disaster Mitigation) plan

#### 1. Proposed actions
- Review all the recommendations/outstanding recommendations from each of the reports;
- Develop a staged and costed implementation plan;
- Agree actions and consider funding sources;
- Implement agreed actions within budget and timelines;
- Review outcomes against plans.

#### 2. Resources required
- Agreed plan of action to be developed by Council officers within operational resources;
- Substantial capital funding to undertake agreed works.

#### 3. Responsibilities
Recommendations from Director of Works and CEO to Council

#### 4. Timetable – Operational plan year & Timeframe
Director of Works to consider priorities and prepare works program and budget for consideration and approval.

#### 5. Estimated cost and possible funding source.
- Planning: within Council resources.
- Implementation: To be advised.

#### 6. Reporting & Monitoring
- Director of Works to provide report annually as part of the annual budget cycle to Council
through the CEO;

- Evaluation of implemented actions to occur 12 months after implementation and or after each natural disaster.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 5

5. Develop a brief and lobby/encourage Government to build a second crossing of the Burdekin River and (2) development/construction of temporary by pass arrangements during periods of bridge closure.

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE

- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

**Summary – Recommended response & expected outcomes**

5. Develop a brief and lobby/encourage Government to build a second crossing of the Burdekin River and (2) development/construction of temporary by pass arrangements during periods of bridge closure.

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee, key stakeholders and community to prepare for, respond to and recover from natural disasters.

**Action (Disaster Mitigation) plan**

1. **Proposed actions**

- Develop a second bridge strategy in conjunction with key stakeholders;
- Lobby Government(s) for the construction of a second major crossing of the Burdekin River;
- Develop a contingency plan for a (a) dry weather and (b) wet weather crossing of the Burdekin River at a suitable location, and reach agreement with the appropriate agencies about the contingency plan.

2. **Resources required**

- Director of Works – labour and materials to prepare a submission to DMR;
- Labour and time – Mayor, CEO and Councillors.

3. **Responsibilities**

Director of Works: Preparation of submission.
Mayor and CEO: Gaining support from key stakeholders

4. **Timetable – Operational plan year & Timeframe**

Discussion paper prepared end March 2004;
Submission prepared and agreement reached with key stakeholders & DMR by end September 2002.

5. **Estimated cost and possible funding source.**

Planning: labour and materials - $5,000 (Council funds);
Implementation of temporary measures: Labour and materials - $20,000 (dry weather temporary crossing – possibly recovered from DMR; wet weather crossing to be costed as part of submission preparation;
Second Bridge: - TBA
6. Reporting & Monitoring

Director of Works to update CEO end June 2004.
CEO to update Council end September 2004.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 6

6. Develop a Shire wide alternative emergency garbage disposal system in association with Thuringowa S/TCC.

RISK AREAS:
URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
• People not receiving the warning
• People not heeding the warning
• Transport needs of the frail and disabled and their carers – safe evacuation
• Impact of power loss/isolation on the disabled – medication other
• School children/others becoming isolated
• Impact on new residents
• Inability of residents to get supplies
• Time and day of event requires consideration in terms of warning strategy
• Presence of tourists and sightseers – crowd control
• Impact on family pets
• Effluent problems of short duration
• Possibility of injury from fallen power lines and underground power
• Possibility of community members being under or un-insured (for flood)
• Destruction of personal property
• Complacency on the part of the community (“I haven’t been flooded before”)
• Road closures being ignored, endangering lives
• Injury to members of the community and emergency personnel
• Emergency accommodation limitations
• Disease/presence of debris (garbage and other litter)
• Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes

6. Develop a Shire wide alternative emergency garbage disposal system in association with Thuringowa S/TCC.

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee, key stakeholders and community to recover from natural disasters.

### Action (Disaster Mitigation) plan

#### 1. Proposed actions

- Agree a plan of action with Thuringowa SC & Townsville City Council;
- Consider the additional equipment and labour needs;
- Develop a costing system to capture the additional costs;
- Identify the mechanism for additional cost recovery.

#### 2. Resources required

- Labour and materials to prepare submission and process;
- Possible additional equipment needs (yet to be determined);
- An additional cost to Council until cost recovery is arranged.

#### 3. Responsibilities

Director of Works

#### 4. Timetable – Operational plan year & Timeframe

Director of Works to complete task by end December 2003

#### 5. Estimated cost and possible funding source.

- Preparation of submission - $1,000
- Additional collection system costs - $10,000 per week.

#### 6. Reporting & Monitoring

Director of Works to inform CEO of outcomes by end June 2004.
RISK MITIGATION ACTION PLAN – ACTION NUMBER: 7

7. Develop an emergency Council staffing service model (staff required to work in Council facilities on their home side of the River).

RISK AREAS:
URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip;
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
• Ability of Hospital to meet demands (incl. Mortuary)

RIC: RESIDENTIAL
• Damage from flying debris
• Lack of preparedness of the community
• Lack of knowledge of responsive strategies
• Impact of power loss on the disabled
• Transport needs of the frail and disabled and their carers
• Ability of the utility services to function (garbage, effluent, water and power)
• Impact of economic loss on the community and service providers post event
• Destruction of residential abode
• Requirements for emergency accommodation
• Disruption to communications
• People not willing to leave
• Theft and presence of looters
• Impact of limited insurance cover on the community
• Ability of community to use equipment/generators and like equipment
• Impact of falling powerlines and poles
• Impact of structural damage
• Loss of accommodation
• Ability of Shire to provide temporary accommodation
• Loss of access to facilities
• Impact on aged persons homes

RIC: COMMERCIAL
• Property damage
• Loss of trade (temporary and permanent)
• Possible closure of the business
• Loss of services
• Security of business systems
• Loss of stock
• Restocking costs
• Insurance claims and re-insurance impact – delays, costs etc
• Ability to return to business
• Short term loss of employment within the community
• Ability of the commercial business to respond during and post event
• Ability of the aged care and hostel sectors to deliver services during an event
• Impact on the health care services

RIC: COUNCIL & UTILITY INFRASTRUCTURE
• Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

**Summary – Recommended response & expected outcomes**

7. Develop an emergency Council staffing service model (staff required to work in Council facilities on their home side of the River).

The achievement of this Action will enhance the capability of the Council to deliver services across the Shire, should access routes be cut.

**Action (Disaster Mitigation) plan**

1. **Proposed actions**
   - Identification of needs
   - Identification of staff home address locations
   - Development of a plan;
   - Gain agreement with the staff and unions;
   - Implement plan when necessary.

2. **Resources required**

   Labour and materials to undertake process

3. **Responsibilities**

   Director of Works and Director of Administrative Services

4. **Timetable – Operational plan year & Timeframe**

   To be completed by end June 2004

5. **Estimated cost and possible funding source.**

   Labour and materials to develop proposal and gain agreement with stakeholders – Council operational resources

6. **Reporting & Monitoring**

   Director of Works and Director of Administrative Services by end June 2004
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 8

8. Identify utility service shortcomings and develop remedial strategies with the service providers.

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
• People not receiving the warning
• People not heeding the warning
• Transport needs of the frail and disabled and their carers – safe evacuation
• Impact of power loss/isolation on the disabled – medication other
• School children/others becoming isolated
• Impact on new residents
• Inability of residents to get supplies
• Time and day of event requires consideration in terms of warning strategy
• Presence of tourists and sightseers – crowd control
• Impact on family pets
• Effluent problems of short duration
• Possibility of injury from fallen power lines and underground power
• Possibility of community members being under or un-insured (for flood)
• Destruction of personal property
• Complacency on the part of the community (“I haven’t been flooded before”)
• Road closures being ignored, endangering lives
• Injury to members of the community and emergency personnel
• Emergency accommodation limitations
• Disease/presence of debris (garbage and other litter)
• Panic amongst the community
• Ability of Hospital to meet demands (incl. Mortuary)
**RIC: RESIDENTIAL**
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**
- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes
8. Identify utility service shortcomings and develop remedial strategies with the service providers.

The achievement of this Action will enhance the capability of the Council to deliver services across the Shire, should access routes be cut.

### Action (Disaster Mitigation) plan

#### 1. Proposed actions
- Identify critical electricity services/facilities that are inadequate/fail during critical events (particularly where underground power would reduce risks of power outage);
- Prepare a submission and discuss Council’s concerns with the service provider;
- Encourage the service provider to undertake priority works before the 2003/4 cyclone season.

#### 2. Resources required
Labour and materials to undertake the review and prepare the submission.

#### 3. Responsibilities
- Director of Works to undertake review and prepare the submission;
- CEO and Councillors to undertake a lobbying role.

#### 4. Timetable – Operational plan year & Timeframe
Update to be provided by end December 200

#### 5. Estimated cost and possible funding source.
Minimal – labour and materials – Council funds for Planning purposes
Utility Service providers costs: TBA

#### 6. Reporting & Monitoring
Update to be provided to CEO by Director of Works by end December 2003.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 9

9. Review and update the Evacuation & Recovery Plan (under the LCDP), evaluate needs and capacity of evacuation centres and develop a response and coordinated plan in association with welfare agencies with specific attention to the suitability and appropriateness of, Dalbeg and Millaroo community halls for emergency accommodation (see also Action 1, 2, 4 & 7).

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE

- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
• Panic amongst the community
• Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
• Damage from flying debris
• Lack of preparedness of the community
• Lack of knowledge of responsive strategies
• Impact of power loss on the disabled
• Transport needs of the frail and disabled and their carers
• Ability of the utility services to function (garbage, effluent, water and power)
• Impact of economic loss on the community and service providers post event
• Destruction of residential abode
• Requirements for emergency accommodation
• Disruption to communications
• People not willing to leave
• Theft and presence of looters
• Impact of limited insurance cover on the community
• Ability of community to use equipment/generators and like equipment
• Impact of falling powerlines and poles
• Impact of structural damage
• Loss of accommodation
• Ability of Shire to provide temporary accommodation
• Loss of access to facilities
• Impact on aged persons homes

**RIC: COMMERCIAL**
• Property damage
• Loss of trade (temporary and permanent)
• Possible closure of the business
• Loss of services
• Security of business systems
• Loss of stock
• Restocking costs
• Insurance claims and re-insurance impact – delays, costs etc
• Ability to return to business
• Short term loss of employment within the community
• Ability of the commercial business to respond during and post event
• Ability of the aged care and hostel sectors to deliver services during an event
• Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes

9. Review and update the Evacuation & Recovery Plan (under the LCDP), evaluate needs and capacity of evacuation centres and develop a response and coordinated plan in association with welfare agencies with specific attention to the suitability and appropriateness of, Dalbeg and Millaroo community halls for emergency accommodation (see also Action 1, 2, 4 & 7).

The achievement of this Action will enhance the capability of the Local Counter Disaster Committee and Council to deliver safe evacuation services to community members in these areas.

### Action (Disaster Mitigation) plan

**1. Proposed actions**

- (1) Undertake the evaluation and provide a report with recommendations, budget and action plan;
- (2) Undertake approved works.

**2. Resources required**

- (1) Labour and materials to undertake review and write report ($6,000);
- (2) Cost of approved works to be determined.

**3. Responsibilities**

- Director of Works;
- Counter Disaster Committee (SES).

**4. Timetable – Operational plan year & Timeframe**

- Report to be provided in time for consideration at the 2003/04 operational and capital works budget cycle;
- Approved works will be undertaken on a priority basis as funding is identified.

**5. Estimated cost and possible funding source.**

- **Planning:** $6,000 – Council funds;
- **Implementation:** $250,000 – Source of funding yet to be determined.

**6. Reporting & Monitoring**

Director of Works to keep Council informed annually.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 10

10. Evaluate and if feasible, develop Mt Kelly water supply.

RISK AREAS:
URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)
RIC: RESIDENTIAL

- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

RIC: COMMERCIAL

- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

RIC: COUNCIL & UTILITY INFRASTRUCTURE

- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

<table>
<thead>
<tr>
<th>RIC: NATURAL ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Damage to the natural amenity</td>
</tr>
<tr>
<td>• Loss of top soil</td>
</tr>
</tbody>
</table>

Summary – Recommended response & expected outcomes
10. Evaluate and if feasible, develop Mt Kelly water supply.

The achievement of this Action will enhance the capability of the Council to deliver safe preventative, response and recovery services to community members in the Shire.

### Action (Disaster Mitigation) plan

1. **Proposed actions**
   - Undertake a review of the status of the mains and system as a whole;
   - Undertake maintenance as required to maintain the integrity of the system

2. **Resources required**
   - Labour and materials to undertake review;
   - Work gang to undertake repairs.

3. **Responsibilities**
   Director of Development

4. **Timetable – Operational plan year & Timeframe**
   - Review completed by end March 2004;
   - Works completed by end December 2004;
   - To be included in annual maintenance review program.

5. **Estimated cost and possible funding source.**
   **Evaluation & Review:** Labour and materials - $5,000 – Council funds.
   **Implementation:** TBA.

6. **Reporting & Monitoring**
   Director of Development to report by end of June 2004.
UBERAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 11

11. Support the Haughton River Trust to develop solutions and future studies for the effects of river flooding (see also Giru Flood Study – Action 4).

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

**RIC: COMMERCIAL**
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

**Summary – Recommended response & expected outcomes**

11. Support the Haughton River Trust to develop solutions and future studies for the effects of river flooding (see also Giru Flood Study – Action 4).

The achievement of this Action will enhance the capability of the Council to provide for the safety of the community in and around the Haughton River catchment.

**Action (Disaster Mitigation) plan**

1. **Proposed actions**

   Continue to support and encourage the River Trusts to maintain the integrity of the Riverbanks.

2. **Resources required**

   Minimal.

3. **Responsibilities**

   Mayor and CEO;
   Director Development.

4. **Timetable – Operational plan year & Timeframe**

   Ongoing.

5. **Estimated cost and possible funding source.**

   Minimal – labour/time of CEO, Councillors and senior staff as required – Council funds.

6. **Reporting & Monitoring**

   Mayor and CEO to Council annually.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 12

12. Develop an alternative strategy for emergency waste removal – inability to access to the Giru transfer station (Donohue Road).

RISK AREAS:
URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
• Panic amongst the community
• Ability of Hospital to meet demands (incl. Mortuary)

RIC: RESIDENTIAL
• Damage from flying debris
• Lack of preparedness of the community
• Lack of knowledge of responsive strategies
• Impact of power loss on the disabled
• Transport needs of the frail and disabled and their carers
• Ability of the utility services to function (garbage, effluent, water and power)
• Impact of economic loss on the community and service providers post event
• Destruction of residential abode
• Requirements for emergency accommodation
• Disruption to communications
• People not willing to leave
• Theft and presence of looters
• Impact of limited insurance cover on the community
• Ability of community to use equipment/generators and like equipment
• Impact of falling powerlines and poles
• Impact of structural damage
• Loss of accommodation
• Ability of Shire to provide temporary accommodation
• Loss of access to facilities
• Impact on aged persons homes

RIC: COMMERCIAL
• Property damage
• Loss of trade (temporary and permanent)
• Possible closure of the business
• Loss of services
• Security of business systems
• Loss of stock
• Restocking costs
• Insurance claims and re-insurance impact – delays, costs etc
• Ability to return to business
• Short term loss of employment within the community
• Ability of the commercial business to respond during and post event
• Ability of the aged care and hostel sectors to deliver services during an event
• Impact on the health care services

RIC: COUNCIL & UTILITY INFRASTRUCTURE
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**
- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes

12. Develop an alternative strategy for emergency waste removal – inability to access to the Giru transfer station (Donohue Road).

The achievement of this Action will enhance the capability of the Council to provide for the safety of the community in and around the Haughton River catchment.

### Action (Disaster Mitigation) plan

1. **Proposed actions**
   
   Upgrade the road to the transfer station at Giru.

2. **Resources required**
   
   Estimated funding to complete task - $100,000.

3. **Responsibilities**
   
   Director of Works.

4. **Timetable – Operational plan year & Timeframe**
   
   Include works in 2004/5 capital works program.

5. **Estimated cost and possible funding source.**
   
   $100,000 – Capital works program 2004/5, unless alternative funding is found earlier.

6. **Reporting & Monitoring**
   
   Director of Works to keep Council informed through annual planning process.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 13

13. In conjunction with the Water Trust and SunWater, review the Water Resources Burdekin Falls Dam Emergency Action plan as it affects the Shire.

RISK AREAS:

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
- Ability of Hospital to meet demands (incl. Mortuary)

### RIC: RESIDENTIAL
- Damage from flying debris
- Lack of preparedness of the community
- Lack of knowledge of responsive strategies
- Impact of power loss on the disabled
- Transport needs of the frail and disabled and their carers
- Ability of the utility services to function (garbage, effluent, water and power)
- Impact of economic loss on the community and service providers post event
- Destruction of residential abode
- Requirements for emergency accommodation
- Disruption to communications
- People not willing to leave
- Theft and presence of looters
- Impact of limited insurance cover on the community
- Ability of community to use equipment/generators and like equipment
- Impact of falling powerlines and poles
- Impact of structural damage
- Loss of accommodation
- Ability of Shire to provide temporary accommodation
- Loss of access to facilities
- Impact on aged persons homes

### RIC: COMMERCIAL
- Property damage
- Loss of trade (temporary and permanent)
- Possible closure of the business
- Loss of services
- Security of business systems
- Loss of stock
- Restocking costs
- Insurance claims and re-insurance impact – delays, costs etc
- Ability to return to business
- Short term loss of employment within the community
- Ability of the commercial business to respond during and post event
- Ability of the aged care and hostel sectors to deliver services during an event
- Impact on the health care services

### RIC: COUNCIL & UTILITY INFRASTRUCTURE
- Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes

13. In conjunction with the Water Trust and SunWater, review the Water Resources Burdekin Falls Dam Emergency Action plan as it affects the Shire.

The achievement of this Action will enhance the capability of the Council to provide for the safety of the community in and around the Burdekin River, below the Dam.

#### Action (Disaster Mitigation) plan

1. **Proposed actions**

   - Ensure agreements and actions discussed at a meeting held 30 October 2001, conveyed in writing by the Council’s CEO to SunWater, 31 October 2001, are completed.

2. **Resources required**

   Minimal labour and materials.

3. **Responsibilities**

   Director of Works and CEO.

4. **Timetable – Operational plan year & Timeframe**

   Actions to be reviewed by Director of Works by end December 2003 and reported to CEO.

5. **Estimated cost and possible funding source.**

   Minimal – Council funds (for Council related costs).

6. **Reporting & Monitoring**

   Actions to be reviewed by Director of Works by end December 2003 and reported to CEO.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 14

14. Development of a risk based annual asset management operational plan for timber bridge, culvert and drain maintenance/replacement that is consistent with the identified areas of risk identified in this Study and longer term requirements of the Shire.

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
• Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**

• Damage from flying debris
• Lack of preparedness of the community
• Lack of knowledge of responsive strategies
• Impact of power loss on the disabled
• Transport needs of the frail and disabled and their carers
• Ability of the utility services to function (garbage, effluent, water and power)
• Impact of economic loss on the community and service providers post event
• Destruction of residential abode
• Requirements for emergency accommodation
• Disruption to communications
• People not willing to leave
• Theft and presence of looters
• Impact of limited insurance cover on the community
• Ability of community to use equipment/generators and like equipment
• Impact of falling powerlines and poles
• Impact of structural damage
• Loss of accommodation
• Ability of Shire to provide temporary accommodation
• Loss of access to facilities
• Impact on aged persons homes

**RIC: COMMERCIAL**

• Property damage
• Loss of trade (temporary and permanent)
• Possible closure of the business
• Loss of services
• Security of business systems
• Loss of stock
• Restocking costs
• Insurance claims and re-insurance impact – delays, costs etc
• Ability to return to business
• Short term loss of employment within the community
• Ability of the commercial business to respond during and post event
• Ability of the aged care and hostel sectors to deliver services during an event
• Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**

• Damage to Council buildings, equipment and facilities
• Damage to Council infrastructure (roads, bridges, culverts, fences etc)
• Inability of Council to meet demands for effluent, water supply and garbage services
• Failure of other Utility services

RIC: NATURAL ENVIRONMENT
• Damage to the natural amenity
• Loss of top soil

Summary – Recommended response & expected outcomes

14. Development of a risk based annual asset management operational plan for timber bridge, culvert and drain maintenance/replacement that is consistent with the identified areas of risk identified in this Study and longer term requirements of the Shire.

Implementation of a risk based system will greatly reduce potential loss of life/injury and potentially save loss of assets.

Action (Disaster Mitigation) plan

1. Proposed actions
   1. Identify sites and undertake a risk assessment
   2. Consult DMR (if necessary)
   3. Identify priority, project and material needs
   4. Incorporate priority projects into capital works/budget program
   5. Evaluate program annually

2. Resources required

   Initial Planning: will occur within current Council resources;
   Initiating of works program: will occur subject to availability of resources/priorities.

3. Responsibilities

   Director of Works.

4. Timetable – Operational plan year & Timeframe

   Planning: annually by 30 September
   Implementation: Will occur annually subject to availability of funding

5. Estimated cost and possible funding source.

   The actual allocation will be determined by Council subject to the availability of funds and other priorities.

6. Reporting & Monitoring

   Annually as part of the budget development process.
URBAN & RURAL

RISK MITIGATION ACTION PLAN – ACTION NUMBER: 15

15. Identify and consult with DMR about roads and infrastructure that are the responsibility of
DMR that are affected by significant flooding events using a risk based assessment process, as
part of the annual performance agreement process.

URBAN & RURAL:
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

RIC: PEOPLE
- People not receiving the warning
- People not heeding the warning
- Transport needs of the frail and disabled and their carers – safe evacuation
- Impact of power loss/isolation on the disabled – medication other
- School children/others becoming isolated
- Impact on new residents
- Inability of residents to get supplies
- Time and day of event requires consideration in terms of warning strategy
- Presence of tourists and sightseers – crowd control
- Impact on family pets
- Effluent problems of short duration
- Possibility of injury from fallen power lines and underground power
- Possibility of community members being under or un-insured (for flood)
- Destruction of personal property
- Complacency on the part of the community (“I haven’t been flooded before”)
- Road closures being ignored, endangering lives
- Injury to members of the community and emergency personnel
- Emergency accommodation limitations
- Disease/presence of debris (garbage and other litter)
- Panic amongst the community
• Ability of Hospital to meet demands (incl. Mortuary)

**RIC: RESIDENTIAL**
• Damage from flying debris
• Lack of preparedness of the community
• Lack of knowledge of responsive strategies
• Impact of power loss on the disabled
• Transport needs of the frail and disabled and their carers
• Ability of the utility services to function (garbage, effluent, water and power)
• Impact of economic loss on the community and service providers post event
• Destruction of residential abode
• Requirements for emergency accommodation
• Disruption to communications
• People not willing to leave
• Theft and presence of looters
• Impact of limited insurance cover on the community
• Ability of community to use equipment/generators and like equipment
• Impact of falling powerlines and poles
• Impact of structural damage
• Loss of accommodation
• Ability of Shire to provide temporary accommodation
• Loss of access to facilities
• Impact on aged persons homes

**RIC: COMMERCIAL**
• Property damage
• Loss of trade (temporary and permanent)
• Possible closure of the business
• Loss of services
• Security of business systems
• Loss of stock
• Restocking costs
• Insurance claims and re-insurance impact – delays, costs etc
• Ability to return to business
• Short term loss of employment within the community
• Ability of the commercial business to respond during and post event
• Ability of the aged care and hostel sectors to deliver services during an event
• Impact on the health care services

**RIC: COUNCIL & UTILITY INFRASTRUCTURE**
• Damage to Council buildings, equipment and facilities
- Damage to Council infrastructure (roads, bridges, culverts, fences etc)
- Inability of Council to meet demands for effluent, water supply and garbage services
- Failure of other Utility services

**RIC: NATURAL ENVIRONMENT**

- Damage to the natural amenity
- Loss of top soil

### Summary – Recommended response & expected outcomes

15. Identify and consult with DMR about roads and infrastructure that are the responsibility of DMR that are affected by significant flooding events using a risk based assessment process, as part of the annual performance agreement process.

Implementation of a risk based system will greatly reduce potential loss of life/injury and potentially save loss of assets.

### Action (Disaster Mitigation) plan

1. **Proposed actions**
   1. Evaluate current delineation of responsibilities, including review of the Road Maintenance Performance Contract (RMPC)
   2. Identify sites on a risk based assessment
   3. Consult DMR
   4. Prepare briefing paper for DMR
   5. Implement approved program
   6. Evaluate outcomes

2. **Resources required**
   1. Site inspection, clerical and administration time supplied by Council
   2. Voluntary time of key stakeholders
   3. Materials and overheads

3. **Responsibilities**

   Director of Works.

4. **Timetable – Operational plan year & Timeframe**
   1. Undertake site review annually before commencement of negotiations with DMR by 30 December 2003 and annually thereafter
   2. Consultation and proposal development process to occur thereafter
   3. Evaluate outcomes annually

5. **Estimated cost and possible funding source.**

   **Planning:** Council funds.
   **Implementation:** to be funded by DMR as agreed.

6. **Reporting & Monitoring**

   Project to be evaluated 12 months after agreed action plan (with DMR) and after first major event affecting refurbished sites.
For each treatment strategy approved to be implemented, record the responsible agency, consequential actions, estimated cost, funding source and time frame within the operation year for implementation.

### ATTACHMENT 13: TREATMENT STRATEGY DEVELOPMENT (FORM A14)

**OPERATIONAL PLAN YEARS 2003-2008**

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review the role and function of the Local Counter Disaster Committee and revise the Local Counter Disaster Plan (in keeping with the new requirements) to ensure the focus is on strategic natural (and man-made) disasters (Prevention, Preparedness, Response and Recovery), rather than responsive strategies for individual incident management through: a) Review of key emergency service capability and development of appropriate education/training programs;</td>
<td>URBAN &amp; RURAL: 1. Cyclones (Category 1 – 5); 2. Flooding of the Burdekin River; 3. Flooding of the Haughton River; 4. Burdekin River Bridge Closures; 5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon); 6. Coastal Storm Surge; 7. Landslide/slip 8. Bushfire; and 9. Earthquake/tremor.</td>
<td>Burdekin Shire Council</td>
<td>A better informed Council, Counter disaster Committee, key agencies and community. Increased levels of community education and support available</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>Revised Plan by end June 2004</td>
<td>$3,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Evaluation &amp; review by end October 2004</td>
<td>$3,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Annual evaluation &amp; review</td>
<td>$3,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Annual evaluation &amp; review</td>
<td>$3,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Annual evaluation &amp; review</td>
<td>$3,500 PA Council funds</td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>HAZARD</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>FUNDING SOURCE</td>
<td>YEAR</td>
<td>TIMEFRAME</td>
<td>ESTIMATED COST ($)</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>--------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>------</td>
<td>-----------</td>
<td>--------------------</td>
</tr>
<tr>
<td>b) Establishment of an annual calendar of events including an annual table top scenario exercise;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Establishment of regular meeting schedules of the Committee including member education and presentations by key agencies (e.g. CDRS, SES, UF&amp;RS, RFS, and Police etc);</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Establish a risk based recovery clean up system;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Identify extent of equipment and personnel that may be able to be used in emergency situations such as bushfires and flooding events etc (water carriers, transport, dozers and graders) in the rural home site, rural residential and rural parts of the Shire;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
f) Identify key/lead agencies that contribute to the Shire disaster mitigation process and through the annual emergency planning exercise, identify gaps in service provision and develop integrated actions across Develop a comprehensive public education program for key areas of risk (see also 2).the sector;

(refer page)
2. Develop a comprehensive Public Education Program (including new residents, residents, tenants, schools and tourists, and rural sector members):
   - a) what to do (pre event, during and post event);
   - b) where to go, who to call, when to evacuate;
   - c) role of emergency services (SES, Police, Fire & Rescue), for key hazards (including the development of a coordinated education plan) to ensure professional and consistent presentations;
   - d) public education about clean up options prior to cyclone season;

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN &amp; RURAL: 1. Cyclones (Category 1 – 5); 2. Flooding of the Burdekin River; 3. Flooding of the Haughton River; 4. Burdekin River Bridge Closures; 5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon); 6. Coastal Storm Surge; 7. Landslide/slip 8. Bushfire; and 9. Earthquake/tremor.</td>
<td>Burdekin Shire Council</td>
<td>A better informed Council, Counter Disaster Committee, key agencies and community. Increased levels of community education and support available</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>Paper to be developed by end June 2004</td>
<td>$5,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Delivery of program First evaluation of program by October 2004</td>
<td>$5,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Evaluation &amp; review – October 2005</td>
<td>$5,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Evaluation &amp; review – October 2006</td>
<td>$5,500 PA Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Evaluation &amp; review – October 2007</td>
<td>$5,500 PA Council funds</td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>HAZARD</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>FUNDING SOURCE</td>
<td>YEAR</td>
<td>TIMEFRAMES</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>-------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>e) reinstate the pre- cyclone clean up of yards (fee free); f) identify key home based medical support equipment which may be affected by services failure (e.g. electricity) and develop resident information kits; g) review and adopt as appropriate, recommendations/advice incorporated into the various reports on Cyclone Aivu, that can be addressed through public education programs;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) identify self support education solutions (e.g. use of neighbours and relatives during emergencies inc. emergency accommodation) and incorporate outcomes into the LCDP, SOPs;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) examine the options to improve educational opportunities through the community FM radio station;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j) increase community awareness about the safe use of emergency generators, impact of structural damage and fallen power lines;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k) examine options to increase availability of emergency accommodation;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>HAZARD</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>FUNDING SOURCE</td>
<td>YEAR</td>
<td>TIMEFRAME</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>----------------</td>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>l) provision of education to the community about bridge crossing safety; m) Identify early warning and remedial action strategies to support outlying communities (limited numbers of personnel) (see also 1). (refer page)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>HAZARD</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>FUNDING SOURCE</td>
<td>YEAR</td>
<td>TIMEFRAME</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>--------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>3. Consider an increased coordination role of Council in the resumption of key commercial services through the identification of and support for strategies that allow commercial businesses to return to normal activities (e.g. additional building surveyors and certifiers to process &amp; assess damage/applications).</td>
<td>URBAN &amp; RURAL: 1. Cyclones (Category 1 – 5); 2. Flooding of the Burdekin River; 3. Flooding of the Haughton River; 4. Burdekin River Bridge Closures; 5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon); 6. Coastal Storm Surge; 7. Landslide/slip 8. Bushfire; and 9. Earthquake/tremor.</td>
<td>Burdekin Shire Council</td>
<td>Improved ability of Council to set priorities. A safer community. A safer environment for Council staff and emergency services during an emergency.</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>Planning finalised by March 2004 Status report by June 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>To be incorporated into Operational Plan 2004-2008 – implementation subject to approval &amp; funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Annual planning and funding approval process as part of budget program</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Annual planning and funding approval process as part of budget program</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Annual planning and funding approval process as part of budget program</td>
</tr>
</tbody>
</table>
4. Review and seek funding and approval for key/outstanding recommendations from (1) the Brandon Flood Study; (2) the Town of Ayr Flood Study; the Town of Home Hill Flood Study; (3) the Giru Flood Study and (4) the Burdekin Shire Storm Surge Study.

(Refer page )

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Review and seek funding and approval for key/outstanding recommendations from (1) the Brandon Flood Study; (2) the Town of Ayr Flood Study; the Town of Home Hill Flood Study; (3) the Giru Flood Study and (4) the Burdekin Shire Storm Surge Study.</td>
<td>URBAN &amp; RURAL: 1. Cyclones (Category 1 – 5); 2. Flooding of the Burdekin River; 3. Flooding of the Haughton River; 4. Burdekin River Bridge Closures; 5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon); 6. Coastal Storm Surge; 7. Landslide/slip 8. Bushfire; and 9. Earthquake/tremor.</td>
<td>Burdekin Shire Council</td>
<td>Improved ability of Council to set priorities. A safer community. A safer environment for Council staff and emergency services during an emergency.</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>Planning/review of recommendations to be completed in conjunction with operational and budget planning</td>
<td>Planning: Council funds - minimal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Implementation Review and evaluation annually</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Implementation Review and evaluation annually</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Implementation Review and evaluation annually</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Implementation Review and evaluation annually</td>
<td>TBA</td>
</tr>
</tbody>
</table>
5. (1) Develop a brief and lobby/encourage Government to build a second crossing of the Burdekin River and (2) development/construction of temporary bypass arrangements during periods of bridge closure.

(refer page )

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003/04</td>
<td>Discussion paper by March 2004 Report by June 2004</td>
<td>Planning: $5,000 PA Implementation of (2) : $20,000 (dry weather)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004/05</td>
<td>Implementation will depend on recommendations, timing &amp; cost</td>
<td>CEO review by September 2004</td>
<td>TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005/06</td>
<td>Implementation will depend on recommendations, timing &amp; cost</td>
<td>TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006/07</td>
<td>Implementation will depend on recommendations, timing &amp; cost</td>
<td>TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007/08</td>
<td>Implementation will depend on recommendations, timing &amp; cost</td>
<td>TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Burdekin Shire Council
Natural Disaster Risk Management Study

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Implementation subject to approval &amp; funding</td>
<td>Preparation $1,000 Expense if enacted $10,000 p/w - Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Implementation subject to approval &amp; funding</td>
<td>Preparation $1,000 Expense if enacted $10,000 p/w - Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Implementation subject to approval &amp; funding</td>
<td>Preparation $1,000 Expense if enacted $10,000 p/w - Council funds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Implementation subject to approval &amp; funding</td>
<td>Preparation $1,000 Expense if enacted $10,000 p/w - Council funds</td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>HAZARD</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>FUNDING SOURCE</td>
<td>YEAR</td>
<td>TIMEFRAME</td>
<td>ESTIMATED COST ($)</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------</td>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>----------</td>
<td>----------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Annual review as part of Operational Planning process</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Annual review as part of Operational Planning process</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Annual review as part of Operational Planning process</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Annual review as part of Operational Planning process</td>
<td>TBA</td>
</tr>
</tbody>
</table>
### Table: Natural Disaster Risk Management Study - Burdekin Shire Council

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN &amp; RURAL:</td>
<td>Burdekin Shire Council</td>
<td>Improved ability of Council to set priorities. A safer community. A safer environment for Council staff and emergency services during an emergency.</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>Planning completed by December 2003 Implementation subject to approval and funding</td>
<td>Planning – Council funds (Implementation - TBA)</td>
</tr>
<tr>
<td>1. Cyclones (Category 1 – 5);</td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Planning completed by December each year Implementation subject to approval and funding</td>
<td>TBA</td>
</tr>
<tr>
<td>2. Flooding of the Burdekin River;</td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Planning completed by December each year Implementation subject to approval and funding</td>
<td>TBA</td>
</tr>
<tr>
<td>3. Flooding of the Haughton River;</td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Planning completed by December each year Implementation subject to approval and funding</td>
<td>TBA</td>
</tr>
<tr>
<td>4. Burdekin River Bridge Closures;</td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Planning completed by December each year Implementation subject to approval and funding</td>
<td>TBA</td>
</tr>
<tr>
<td>5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Coastal Storm Surge;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Landslide/slip</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Bushfire;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Earthquake/tremor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Identify utility service shortcomings and develop remedial strategies with the service providers.

*(refer page*)
<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Implementation subject to approval and funding</td>
<td>$250,000 Council funds/other</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Review &amp; evaluation</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Review &amp; evaluation</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Review &amp; evaluation</td>
<td>TBA</td>
</tr>
</tbody>
</table>

(refer page )
## Natural Disaster Risk Management Study

### 10. Evaluate and if feasible, develop Mt Kelly water supply. (refer page)

### HAZARD

**URBAN & RURAL:**
1. Cyclones (Category 1 – 5);
2. Flooding of the Burdekin River;
3. Flooding of the Haughton River;
4. Burdekin River Bridge Closures;
5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon);
6. Coastal Storm Surge;
7. Landslide/slip
8. Bushfire; and

### RESPONSIBLE AGENCY

Burdekin Shire Council

### CONSEQUENTIAL ACTIONS

A better informed Council, Counter Disaster Committee, key agencies and community. Increased levels of community education and support available

### FUNDING SOURCE

Council Funds/other funds as indicated

### YEAR

2003/04

### TIMEFRAME

Complete review by end March 2004
Review June 2004

### ESTIMATED COST ($)

$5,000
Council funds

2004/05

Implementation subject to approval and funding – December 2004

TBA

2005/06

Review & evaluation

TBA

2006/07

Review & evaluation

TBA

2007/08

Review & evaluation

TBA
11. Support the Haughton River Trust to develop solutions and future studies for the effects of river flooding (see also Giru Flood Study – Action 4).

(refer page )

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/05</td>
<td>Annual review &amp; evaluation</td>
<td>Planning: Minimal Implementati on: TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005/06</td>
<td>Annual review &amp; evaluation</td>
<td>Planning: Minimal Implementati on: TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006/07</td>
<td>Annual review &amp; evaluation</td>
<td>Planning: Minimal Implementati on: TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007/08</td>
<td>Annual review &amp; evaluation</td>
<td>Planning: Minimal Implementati on: TBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>HAZARD</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>FUNDING SOURCE</td>
<td>YEAR</td>
<td>TIMEFRAME</td>
<td>ESTIMATED COST ($)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
<td>---------</td>
<td>-----------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>12. Develop an alternative strategy for emergency waste removal – inability to</td>
<td>URBAN &amp; RURAL: 1. Cyclones (Category 1 – 5); 2. Flooding of the Burdekin</td>
<td>Burdekin Shire Council</td>
<td>Improved ability of Council to set priorities. A safer community. A safer environment</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>access to the Giru transfer station (Donohue Road).</td>
<td>River; 3. Flooding of the Haughton River; 4. Burdekin River Bridge</td>
<td></td>
<td>for Council staff and emergency services during an emergency.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closures; 5. Major Localised Flooding (not covered above, for Ayr, Home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hill and Brandon); 6. Coastal Storm Surge; 7. Landslide/slip 8. Bushfire;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and 9. Earthquake/tremor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Refer page )
<table>
<thead>
<tr>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003/04</td>
<td>Planning completed by December 2003</td>
<td>Planning – Council funds – minimal Implementati on - TBA</td>
</tr>
<tr>
<td>2004/05</td>
<td>Implementation subject to approval and funding</td>
<td>TBA</td>
</tr>
<tr>
<td>2005/06</td>
<td>Implementation subject to approval and funding</td>
<td>TBA</td>
</tr>
<tr>
<td>2006/07</td>
<td>Review &amp; evaluation</td>
<td>TBA</td>
</tr>
<tr>
<td>2007/08</td>
<td>Review &amp; evaluation</td>
<td>TBA</td>
</tr>
</tbody>
</table>

13. In conjunction with the Water Trust and SunWater, review the Water Resources Burdekin Falls Dam Emergency Action plan as it affects the Shire.

(refer page )
<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>HAZARD</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>FUNDING SOURCE</th>
<th>YEAR</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
</tbody>
</table>
### Endorsed Treatment

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Responsible Agency</th>
<th>Consequential Actions</th>
<th>Funding Source</th>
<th>Year</th>
<th>Timeframe</th>
<th>Estimated Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN &amp; RURAL: 1. Cyclones (Category 1 – 5); 2. Flooding of the Burdekin River; 3. Flooding of the Haughton River; 4. Burdekin River Bridge Closures; 5. Major Localised Flooding (not covered above, for Ayr, Home Hill and Brandon); 6. Coastal Storm Surge; 7. Landslide/slip 8. Bushfire; and 9. Earthquake/tremor.</td>
<td>Burdekin Shire Council</td>
<td>A better informed Council, Counter Disaster Committee, key agencies and community. Increased levels of community education and support available</td>
<td>Council Funds/other funds as indicated</td>
<td>2003/04</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2004/05</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2005/06</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/07</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007/08</td>
<td>Review to be completed by September each year</td>
<td>Review – minimal Implementati on: TBA</td>
</tr>
</tbody>
</table>
## ATTACHMENT 14: TREATMENT STRATEGY DEVELOPMENT - PAST YEARS (FORM A14/1)

### IMPLEMENTED STRATEGIES: PAST YEARS

**HAZARD:** Urban & Rural – Cyclone (Category 1 – 5)

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of the Shire Counter Disaster Plan and Standard Operating Procedures</td>
<td>Burdekin Shire Council</td>
<td>Progressive implementation of recommended changes</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Establishment of the Counter Disaster Centre in the Shire Chambers</td>
<td>Burdekin Shire Council</td>
<td>Progressive refinement of processes</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Provision of emergency power to key Council facilities</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>1996</td>
</tr>
<tr>
<td>Establishment of the Burdekin River water flow and height monitoring system</td>
<td>Burdekin Shire Council</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>ESTIMATED COST</td>
<td>FUNDING SOURCE</td>
<td>YEAR IMPLEMENTED</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Review of cyclone disaster response – Cyclone Aivu</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1989 and ongoing</td>
</tr>
<tr>
<td>Liaison with DNR (SunWater) regarding emergency response for the Burdekin Falls Dam</td>
<td>Burdekin Shire Council and SunWater</td>
<td>Plan is reviewed regularly</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Annual cyclone season education and clean up program</td>
<td>Burdekin Shire Council</td>
<td>Selected sites and issues are identified for attention</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by……………………………… Date…………………………………………
IMPLEMENTED STRATEGIES: PAST YEARS

HAZARD: Urban & Rural – Burdekin River Flooding

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Provision of early warning system (see Cyclones)</td>
<td>Burdekin Shire Council</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Shire Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Establishment of work teams on each side of the Burdekin River during possible flooding events</td>
<td>Burdekin Shire Council</td>
<td></td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Annual cyclone season education and clean up program</td>
<td>Burdekin Shire Council</td>
<td>Selected sites and issues are identified for attention</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>ENDORSED TREATMENT</td>
<td>RESPONSIBLE AGENCY</td>
<td>CONSEQUENTIAL ACTIONS</td>
<td>ESTIMATED COST</td>
<td>FUNDING SOURCE</td>
<td>YEAR IMPLEMENTED</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>DNR, SunWater, Burdekin Falls Dam break Study</td>
<td>DNR (SunWater)</td>
<td>Regular review of emergency procedures</td>
<td></td>
<td></td>
<td>1993 and ongoing</td>
</tr>
<tr>
<td>Flood studies for the Towns of Ayr, Brandon and Home Hill</td>
<td>Burdekin Shire Council</td>
<td>To be considered by Council</td>
<td></td>
<td></td>
<td>Ongoing – Brandon (1992); Ayr and Home Hill (currently in progress)</td>
</tr>
</tbody>
</table>

Compiled by…………………………….    Date……………………………………..
IMPLEMENTED STRATEGIES: PAST YEARS

HAZARD: Urban & Rural – Haughton River Flooding

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of early warning service</td>
<td>Bureau of meteorology with consultation to the Burdekin Shire Council during expected major flooding events</td>
<td>Reviewed annually during wet season</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Shire Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Annual cyclone season education and clean up program</td>
<td>Burdekin Shire Council</td>
<td>Selected sites and issues are identified for attention</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Giru Flood Study</td>
<td>Rivers Trust/Burdekin Shire Council</td>
<td>To be determined</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by…………………………….  Date……………………………………..
IMPLEMENTED STRATEGIES: PAST YEARS

HAZARD: Urban & Rural – Burdekin River Bridge Closure

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of early warning system (see Cyclones)</td>
<td>Burdekin Shire Council</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Establishment of work teams on each side of the Burdekin River during possible flooding events</td>
<td>Burdekin Shire Council</td>
<td></td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Lobbying Government for construction of a second bridge</td>
<td>Burdekin Shire Council</td>
<td></td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by…………………………….  Date……………………………………..
## IMPLEMENTED STRATEGIES: PAST YEARS

### HAZARD: Urban & Rural – Major Localised Flooding

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of early warning services</td>
<td>Burdekin Shire Council</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Flood studies for the Towns of Ayr, Brandon and Home Hill</td>
<td>Burdekin Shire Council</td>
<td>To be considered by Council</td>
<td></td>
<td></td>
<td>Ongoing – Brandon (1992); Ayr and Home Hill (currently in progress)</td>
</tr>
<tr>
<td>Annual cyclone season education and clean up program</td>
<td>Burdekin Shire Council</td>
<td>Selected sites and issues are identified for attention</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by…………………………….  Date…………………………………..
**IMPLEMENTED STRATEGIES: PAST YEARS**

**HAZARD:** Urban & Rural – Coastal Storm Surge

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of early warning services</td>
<td>Burdekin Shire Council</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Counter Disaster Plan and action</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Storm Surge Study</td>
<td>Burdekin Shire Council</td>
<td>To be considered by Council</td>
<td></td>
<td></td>
<td>2002</td>
</tr>
<tr>
<td>Annual cyclone season education and clean up program</td>
<td>Burdekin Shire Council</td>
<td>Selected sites and issues are identified for attention</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by…………………………….. Date……………………………………..
IMPLEMENTED STRATEGIES: PAST YEARS

HAZARD: Urban & Rural – Landslide/slip

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Annual cyclone season education and clean up program</td>
<td>Burdekin Shire Council</td>
<td>Selected sites and issues are identified for attention</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by…………………………. Date…………………………………………
## IMPLEMENTED STRATEGIES: PAST YEARS

### HAZARD: Urban & Rural – Bushfire

<table>
<thead>
<tr>
<th>ENDORSED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for the UF&amp;RS and RFS</td>
<td>F&amp;RS and RFS/Council/SES/Police</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Provision of early warning services</td>
<td>Burdekin Shire Council</td>
<td>Reviewed annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by…………………………………… Date……………………………………
IMPLEMENTED STRATEGIES: PAST YEARS

HAZARD: Urban & Rural – Earthquake/tremor

<table>
<thead>
<tr>
<th>ENDORED TREATMENT</th>
<th>RESPONSIBLE AGENCY</th>
<th>CONSEQUENTIAL ACTIONS</th>
<th>ESTIMATED COST</th>
<th>FUNDING SOURCE</th>
<th>YEAR IMPLEMENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter Disaster Plan</td>
<td>Burdekin Shire Council</td>
<td>Plan is tested annually</td>
<td></td>
<td></td>
<td>1998 and ongoing</td>
</tr>
<tr>
<td>Rural Roads, Culverts and Bridges Upgrade</td>
<td>Burdekin Shire Council</td>
<td>Priorities determined annually</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Compiled by……………………………. Date……………………………………..