
Annex C – North Burnett Risk Assessment & Disaster Risk Register

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Introduction

This Annex describes the risk assessment process undertaken in assessing disaster risks in the North Burnett Region. It defines the disaster risks to the region and to specific localities and rates (prioritises) these risks based on their likelihood and consequence.

This annex also documents the North Burnett Disaster Risk Register, which details how each of the risks is to be treated to prevent or mitigate the risk. The Disaster Risk Register is the principal reference and management tool used by the LDMG in undertaking disaster management in the North Burnett.

Maintenance of the Risk Register

The risk assessment and the North Burnett Disaster Risk Register are to be reviewed by the LDMG not less than once each year to ensure they accurately reflect the disaster risks to the North Burnett Community and inform ongoing disaster risk reduction treatments. Amendments to the Disaster Risk Assessment or the Disaster Risk Register are to be endorsed by the LDMG.

Risk Assessment Process

This risk assessment conforms to the Australian Standard for Risk Management (AS/NZS ISO 31000:2009) as depicted in Diagram 1 below:

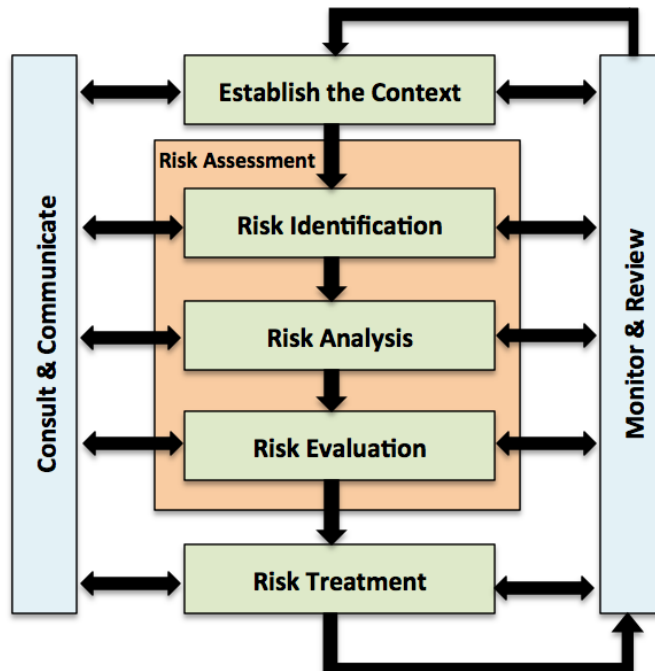


Diagram 1 – Risk Management process

Risk Evaluation Criteria

The Risk Evaluation Criteria for the North Burnett Region are defined in the following table.

| |
|--|
| <p>Human and Social Factors</p> <p>A risk that a hazard may cause fatality or serious injury is unacceptable.</p> <p>A risk that a hazard may result in serious health effects (e.g. contamination of water supplies) is unacceptable.</p> <p>A risk that a hazard may cause significant damage to cultural or heritage sites is unacceptable.</p> |
| <p>Built Environment</p> <p>A risk that a hazard may result in extensive damage to buildings is unacceptable.</p> <p>A risk that a hazard may result in loss of critical transport routes is unacceptable.</p> <p>A risk that a hazard may result in extended loss of lifelines (e.g. power, water, food supplies) is unacceptable.</p> |
| <p>Natural Environment</p> <p>A risk that a hazard may result in long-term deterioration of water or soil quality is unacceptable.</p> <p>A risk that a hazard may result in significant loss of ecological habitat is unacceptable.</p> <p>The risk that a hazard may result in loss of threatened or endangered species is unacceptable</p> |
| <p>Economic Loss</p> <p>A risk that a hazard may result in significant economic loss to the community is unacceptable.</p> |
| <p>Risk Escalation</p> <p>Escalation of impacts to people, the built and natural environment and the local economy resulting from inadequate control of future development is unacceptable.</p> <p>Escalation of impacts to people, the built and natural environment and the local economy resulting from inadequate preparedness or response resources is unacceptable.</p> <p>The significant occurrence of secondary risks, resulting from inadequate preparedness or response resources is unacceptable.</p> |
| <p>Risk Frequency</p> <p>The consequences of a range of hazards of varying frequencies will be evaluated on the basis of their likelihood of occurrence (encounter probability)</p> <p>.</p> |
| <p>Legal and Social Justice Implications</p> <p>In conducting its emergency management responsibilities, Council and other responsible agencies shall act in accordance with their statutory and legal responsibilities and their</p> |

duty of care to the community.

Emergency management shall be undertaken in a manner that minimises physical damage and reduces social and economic disruption.

The greater vulnerability of certain sections of the community shall be accounted for in the proposed treatments so as to provide social justice and equity.

Political Implications

In evaluating options, and determining proposed actions, Council may exercise political considerations as it sees fit

Manageability

The evaluation of proposed actions will take account of manageability of the proposals by Council and other relevant components of the community.

Table 1 – Risk Evaluation Criteria

The above criteria provide guidance on how risks are to be evaluated (e.g. ranked against each other).

Hazard Analysis

The hazards that may impact in the North Burnett are described in detail in Section 2 of the North Burnett Disaster Management Plan. An analysis of these hazards to assess their extent, frequency, severity/intensity, time of onset and duration is detailed in Table 2 below:

| Hazard | Extent | Frequency | Severity/ Intensity | Time Onset | Duration |
|---------------|---------------|------------------|--|--|----------------------------------|
| Severe Storm | Region | Every year | Severe, potential loss of life, damage to property, loss of utilities. | 1-3 hours notice | Short duration less than 3 hours |
| Cyclone | Region | Every decade | Severe, potential loss of life, damage to property, loss of utilities. | 1-3 days | Up to 24 hours |
| Bushfire | Region | Every decade | Severe bushfire has potential for loss of life, damage to property. | Anywhere from a few hours to a few days. | 1-3 days |

| Hazard | Extent | Frequency | Severity/ Intensity | Time Onset | Duration |
|--|--|--|--|---|---|
| Flood Three Moon Ck, Nogo & Burnett Rivers and associated tributaries | Region | Minor Flooding Every Year Moderate Flooding Every Decade Major Flooding Every Decade | Major, moderate or minor flooding possible. Moderate and major flooding impacts on people and property. Potential loss of life, damage to property, loss of utilities. | Anywhere from 1 day to several days notice. | Major Flooding 5-7 days. Moderate Flooding 3-5 days. Minor Flooding 1-3 days. |
| Earthquake | Region | Perhaps In our lifetime | Damage to buildings, infrastructure. Potential loss of life and damage to property. | Immediate | Short duration. Aftershocks may persist for days or weeks. |
| Pandemic | Region | Perhaps In our lifetime | Widespread illness. Potential loss of life. Disruption to services due to absenteeism | Weeks or months | Expected to last several months. |
| Dam Failure | Waruma, Cania & Paradise Dams | Possibly in our lifetime | Potentially catastrophic if dam is full and complete failure were to occur. | Short notice onset (hours) | Unknown but likely to be as per Moderate /Major Flooding. |
| Hazardous Material Event | Towns and Council Yards | Once in our Generation | May cause multiple casualties | Immediate | Several hours |
| Multi Casualty Event (transport crash) | Region | Perhaps any year | More than five injuries will stretch hospital and ambulance resources | Immediate | Up to several Hours |
| Emergency Animal & Plant Disease | Region | Once in our generation | Financial Hardship and economic loss to the region | May be immediate | May last for months |
| Landslip | Region | Once in our generation | Variable but may impact on homes, buildings, roads and utility services | Immediate | Short duration event. Cleanup may take days to |

| Hazard | Extent | Frequency | Severity/ Intensity | Time Onset | Duration |
|-----------|--------|------------------------------|---|---------------|--|
| | | | | | weeks |
| Terrorism | Region | Perhaps once in our lifetime | Variable but may impact on people, infrastructure or services | Immediate | Likely to be short duration. 1-4 days |

Table 2 – Hazard Analysis

Elements of the Community at Risk

| |
|---|
| People - especially those who may need lots of help. For example the aged, children and sick people. |
| Houses - The types of houses they live in and their construction and condition. |
| Personal Property - like furniture, TV, fridges, washing machines, cars, kids toys. |
| Business and Industry – Service and retail industries, manufacturing, transport and distribution. |
| Community Buildings - like the schools, Council offices, Hospital, Community Centres, etc. |
| Services - like electricity, telephones, water supply, sewerage, rubbish disposal, medical services. |
| Infrastructure – Bridges, culverts, roads, power transmission lines, etc. |
| Livestock and Agriculture - livestock holdings, crops. |
| Cultural - Cultural and heritage items and places. |
| Environment – like the quality of the soil and our natural flora and fauna. |

Table 3 – Important things in the Community that may be harmed

Interaction of Hazards and Elements at Risk

The following Table depicts the hazards and their impact on important things in the community (elements at risk).

| Element at Risk | Hazards | | | | | | | | | | |
|-------------------------|---------|------|---------------|------------|--------------------|--------------|----------|------------------------|-----------|-----------|----------|
| | Flood | Fire | Storm/Cyclone | Earthquake | Transport Accident | HAZMAT Event | Pandemic | Animal / Plant Disease | Dam Break | Terrorism | Landslip |
| People | x | x | x | x | x | x | x | x | x | x | x |
| Houses | x | x | x | x | | x | | | x | | x |
| Personal Property | x | x | x | | | | | | x | | x |
| Business & Industry | x | x | x | x | | x | x | x | x | | |
| Community Buildings | x | x | x | x | | | | | | | |
| Services | x | x | x | x | | | x | | | | |
| Infrastructure | x | x | x | | | | | | | x | |
| Livestock & Agriculture | x | x | x | | | | | x | x | | |
| Cultural | x | x | x | | | | | | | | |
| Environment | x | x | x | | | | | | x | | |

Table 4 – Interaction Hazards with Elements at Risk

Likelihood and Consequence Descriptors

The following Tables contain definitions used for Likelihood (how often could it happen) and Consequence (How bad could things be).

| Level | Description | Examples |
|-----------------------|---|--|
| Almost certain | The event is expected to occur in most conditions | Expected frequency range: Greater than one or more per annum |
| Likely | The event will probably occur in most conditions | Expected frequency range: Between one in 5 years and one per annum |
| Possible | The event should happen at some time | Expected frequency range: Between one in 10 years and one in 5 years |
| Unlikely | The event could happen at some time | Expected frequency range: Between one in a 100 years and one in 10 years |

| | | |
|-------------|---|--|
| Rare | The event may only occur in exceptional circumstances | Expected frequency range: Less than one in a hundred years |
|-------------|---|--|

Table 5: Definition of Likelihood

Explanation of Likelihood (Probability)

The above contains statements about the likelihood of a hazard event happening and they are expressed as Average Return Interval (ARI) 2, 10, 100 years etc.

The table below is provided to illustrate probabilities related to the chance of one or, more events of a given magnitude occurring in a given time frame. In this table, an event with a given ARI occurring in a specific time frame is compared with the betting odds (given in parenthesis) that most punters are familiar with.

Probability of one or more events in a specific period (from Granger, 2001)

| Period in which event might occur (years) | 50 year ARI (2.0% AEP) | 100 year ARI (1.0% AEP) | 200 year ARI (0.5% AEP) | 500 year ARI (0.2% AEP) | 1000 year ARI (0.01% AEP) |
|---|---------------------------|----------------------------|----------------------------|----------------------------|------------------------------|
| 5 | 10% (10 to 1) | 5% (20 to 1) | 2% (50 to 1) | 1% (100 to 1) | 0.5% (200 to 1) |
| 10 | 18% (5 to 1) | 10% (10 to 1) | 5% (20 to 1) | 2% (50 to 1) | 1% (100 to 1) |
| 25 | 39% (2 to 1) | 22% (5 to 1) | 12% (10 to 1) | 5% (20 to 1) | 2% (50 to 1) |
| 50 | 63% (2 to 1 on) | 39% (2 to 1) | 22% (5 to 1) | 10% (10 to 1) | 5% (20 to 1) |
| 100 | 86% (7 to 1 on) | 63% (2 to 1 on) | 39% (2 to 1) | 18% (5 to 1) | 10% (10 to 1) |
| 200 | 98% (near certain) | 86% (7 to 1 on) | 63% (2 to 1 on) | 33% (3 to 1) | 18% (5 to 1) |
| 500 | 99.999% (certain) | 99% (near certain) | 92% (near certain) | 63% (2 to 1 on) | 39% (2 to 1) |

Table 6: Probability Matrix (to assess Likelihood)

Definitions of Consequence

The following table provides guidance on how to assess consequence e.g. the scale of impact on the community (the elements at risk).

Table 7 – Consequence Descriptors

| Level | Description | Examples |
|--------------|---------------------|---|
| 1 | Slight | Nobody hurt, houses and possession OK, low cost, most services working normally. |
| 2 | Small | A few people need slight first aid treatment, some pets lost, a few personal possessions damaged, slight house damage, a few people may need to move to other houses until the hazard passes, occasional disruption to some services, nearly all things can be handled by the Community and Council. |
| 3 | Medium | Some people need medical treatment for injuries, a few houses have damage that can be fixed within the Community, some services fail, Council enterprises stop working normally, and numbers of people are worried. |
| 4 | Large | A few lives may be lost, many serious injuries, numbers of houses badly damaged, many people homeless, large costs, damage to culture and traditions, many Community services not working, evacuation likely, external help needed. |
| 5 | Catastrophic | The Community cannot work properly, many lives lost and many serious injuries, most houses and other buildings wrecked or badly damaged, major failures of Community services, huge costs, people scared and really worried, evacuation probable, people may leave the Community for good, long term counselling of the Community members needed, massive recovery effort needed. Almost all recovery resources must come from outside the Community. |

Risk Rating Matrix

The following is the Risk Rating Matrix used to determine risk ratings in the risk register.

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

Table 8 – Risk Rating Matrix

Legend

| | |
|----------|---|
| E | Extreme risk; immediate action required |
| H | High risk; Council or relevant agency management attention needed |
| M | Moderate risk; management responsibility must be specified |
| L | Low risk; manage by routine procedures |

Notes:

1. This matrix is consistent with AS/NZS ISO 31000:2009 Risk Management Table E3, except for Cell A1, which is rated H (high risk) in the Risk Management Standard. This difference is due to the application of the formula described in Note 2, and only applies to risks for which the Consequences are negligible.
2. To assist in risk ranking, scores (which are not included in AS 4360) are also allocated for each level of risk. The scores are derived from the following formula:
 - Risk = (Likelihood x 2) + (Consequence x 3) (The result is multiplied by 4 to produce a scale of 20 to 100).

Risk Management and Town Planning Development

In approving development applications, the Regional Council should ensure that the development is not adversely impacted upon by natural hazards and does not subject the future occupants, critical infrastructure or essential services to unacceptable levels of risk.

Appendices:

1. North Burnett Region Disaster Risk Register
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Appendix 1 – Disaster Risk Register

Appendix 1 is maintained as a spreadsheet on the North Burnett Regional Council's IT networks. The custodian of the register is the CEO on behalf of the LDMG.

Having the Register in spreadsheet format enables the filtering of risks by various categories making ongoing management and reporting of Risk Management easier.

The Risk Register is to be reviewed by the LDMG at least annually to ensure it remains accurate, and relevant and to ensure progress is being made on outstanding risk treatments.

The register can be produced in a portable document format (PDF) for electronic distribution and printed if required. It is designed to be used electronically.
