

Corporate Climate Change

Adaptation Plan

Date

# Climate Change Snapshot for xxxx Council

Tasmania is fortunate to have the highest resolution climate modelling conducted in Australia. The Climate Futures for Tasmania Project, completed in 2011, provides detailed climate modelling down to the municipal scale out to 2100. It provides a sound knowledge base for identifying climate related risks at a local level and subsequently in informing appropriate decisions to manage climate change related risks such as increasing temperatures, changing rainfall patterns, sea level rise and extreme events (torrential rain, flooding, storm surge and bushfire). Climate Futures for Tasmania prepared a detailed report specifically for xxx municipal area, this report is included in the package of supporting documents provided to the Council with this Plan. The material provided below is a summary of key points from the report.

#### Current climate and recent trends

|  |
| --- |
|  |

#### Projected change in conditions by 2100 (A2 emissions scenario)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Climate Change Variable** | **Change** | | | **Relative change** |
| Temperature (annual average) |  | | |  |
| Summer days (>25°C) |  | | |  |
| Warm spells (days) |  | | |  |
| Hottest day of the year |  | | |  |
| Frost risk days/year |  | | |  |
| Rainfall (annual average) |  | | |  |
| Rainfall (wettest day of the year) |  | | |  |
| Rainfall extreme (ARI-200) |  | | |  |
| Evaporation |  | | |  |
| Runoff |  | | |  |
| River flows |  |  | | |
| Coastal inundation |  | |  | |

#### Extreme events

The changes in climate that are most likely to impact upon council’s infrastructure, roads, and the local community and environment is a magnification in intensity of extreme events. Specific impacts on xxxx Council are as follows:

|  |
| --- |
|  |
|  |
|  |
|  |

# Table of Contents

Acknowledgements ii

Climate Change Snapshot for XXXX Council iii

Table of Contents v

1. Introduction 6

1.1 Project Background 6

1.2 Project Context 7

1.4 Purpose and scope 9

2. Climate Change & Council’s Corporate Risks 10

2.1 Rainfall & Flooding Risks 11

2.2 Sea Level Rise and Storm Surge Risks 13

2.3 Heat Risks 16

2.4 Bushfire 17

2.5 Other Priority Risks 19

3. Strategic Corporate Adaptation Actions 22

4. Legal Implications of Climate Change Action 23

5. Implementation Approach 25

5.1 Financial and resource requirements 26

5.3 Monitoring and Evaluation 26

5.4 Review 27

6. Stakeholder Involvement & Collaboration 29

6.1 Aurora Energy 29

6.2 Dept. of Health and Human Services (DHHS) 29

6.3 Dept. of Infrastructure Energy and Resources (DIER) 30

6.4 Dept. Primary Industries, Parks, Water & Environment (DPIPWE) 31

6.5 MAV Insurance Liability Mutual Insurance (LMI) 32

6.6 State Emergency Services (SES) 32

6.7 Tasmania Fire Service (TFS) 33

6.8 Tasmanian Planning Commission (TPC) 34

# 1. Introduction

## 1.1 Project Background

## 1.2 Project Context

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

There is an expansive and growing body of scientific evidence that the global climate is changing and that extreme weather events and sea level rise will increase in the 21st century[[1]](#footnote-1). It is now recognised that there are a range of potential future climate scenarios dependent upon the scale of effort achieved in reducing greenhouse gas emissions. Even if the composition of today's atmosphere was fixed (which would imply a dramatic reduction in current emissions), surface air temperatures would continue to warm by up to 0.9 ºC[[2]](#footnote-2). Under a ‘best-case scenario’ where significant reductions in greenhouse gas emissions are achieved it is still pertinent to initiate an adaptation response in order to minimise climate change impacts associated with the warming climate on infrastructure, economy, community and the environment.

In Australia, it is recognised by all tiers of government that it is appropriate and effective to manage climate change at a ‘local’ scale. The Australian Government recognises that local governments will be key actors in adapting to the local impacts of climate change and their engagement will be a critical part of any national reform agenda[[3]](#footnote-3). It has produced publications aimed at assisting local government manage climate change risk[[4]](#footnote-4) and implement adaptation actions[[5]](#footnote-5). The TCCO also works in a collaborative manner to support local government in climate change adaptation projects.

The Council of Australian Government’s (COAG) Select Committee on Climate Change, in September 2012, released the Paper the ‘Roles and Responsibilities for Climate Change in Australia’[[6]](#footnote-6). The Paper stated that local government will:

* Administer relevant state and territory and / or Commonwealth legislation to promote adaptation as required including the application of relevant codes, such as the Building Code of Australia;
* Manage risks and impacts to public assets owned and managed by local governments;
* Manage risks and impacts to local government service delivery;
* Collaborate across councils and with State and Territory Governments to manage risks of regional climate change impacts;
* Ensure policies and regulations under their jurisdiction, including local planning and development regulations, incorporate climate change considerations and are consistent with State and Commonwealth Government adaptation approaches;
* Facilitate building resilience and adaptive capacity in the local community, including through providing information about relevant climate change risks;
* Work in partnership with the community, locally-based and relevant NGOs, business and other key stakeholders to manage the risks and impacts associated with climate change; and
* Contribute appropriate resources to prepare, prevent, respond and recover from detrimental climatic impacts

Local government’s roles and responsibilities in responding to climate change, is reinforced by the *Local Government Act* (Tas) 1993, which requires councils to provide for the health, safety and welfare of the community; as well as represent and promote the interests of the community; and provide for the peace, order and good government of its municipal area.[[7]](#footnote-7)

In managing and preparing for the impacts of climate change, Local Government is well positioned to work with communities due to its:

* core function to directly support and assist local communities;
* local knowledge and experience;
* understanding of community needs and vulnerabilities;
* key role in responding to emergencies;
* role in infrastructure design, construction and maintenance;
* role in review and update of planning schemes (in relation to identified local impacts and threats); and
* ability to effectively disseminate information and provide support to the community.

Pioneering work undertaken by Clarence City Council with its community identified local government as the most trusted tier of government with regards to information on climate change[[8]](#footnote-8).

Local experience, in combination with relevant scientific data and technical expertise, provides the key inputs for undertaking a well informed ‘risk management’ approach to climate change. Moreover, effective adaptation requires a portfolio of actions, ranging from fortifying infrastructure, building capacity (individual and institutional) to advocacy and collaboration. There is also an appreciation that managing current and future risks in relation to climate change can have benefits (such as improving human well-being and protecting biodiversity) regardless of the magnitude of climate change that occurs. It is in this context that the RCCAP is based.

## 1.4 Purpose and scope

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

This Corporate Climate Change Adaptation Plan (the Plan) aims to improve the capability of xxxx Council to manageits identified priority corporate risks associated with climate change.

The development of the Plan was based upon council-specific, climate projection data provided by the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) ‘Climate Futures for Tasmania’ program. The Plan identifies priority climate change risks within the context of currently available climate change data. Scientific research and modelling of climate change is continually evolving. Therefore, there is a potential that future climate change projection data may require reassessment of the risks, actions and timeframes identified in this Plan.

Specific outputs from the modelled climate scenario for the xxxx Council, such as future rainfall patterns, extreme events, bushfire likelihood and projected sea level rise formed the basis of ‘risk management’ and ‘adaptation action’ workshops held with the Council’s staff in development of the Plan. Workshops were conducted in a manner consistent with the International Organisation for Standardisation (ISO) 31000:2009 Standard for Risk Management as well as the Australian Government publication *Climate Change Impacts and Risk Management: A Guide for Business and Government*. Full details of the project methodology are included in the package of supporting documents provided to the Council with the Plan.

Outputs of the workshops conducted with the Council’s staff underlie the content of the Plan. The Plan is structured so that the prioritised adaptation actions have been allocated to specific business units within the Council. Each priority action has associated roles, responsibilities and timeframes.

The Plan also presents adaptation actions to manage risks that are within the Council's sphere of influence, but are the responsibility, to some degree, of other organisations (such as State Government Agencies, Community Groups and Private Corporations). The primary purpose of the ‘stakeholder’ section of the Plan is to ensure there is: clear understanding of roles and responsibilities; clarity as to where partner organisations are at in managing climate change risk; and identification of collaborative opportunities for managing risks that are relevant to local communities.

The adaptation plan incorporates an ‘implementation plan’ to ensure there is:

* a consistent process for the endorsement of corporate climate change adaptation plans by all councils of the region/State;
* a logical way for incorporation of key local risks and adaptation actions into council documents and processes such as risk registers, strategic plans, annual plans or asset management plans;
* an appropriate mechanism to implement sub-regional and regional adaptation actions either through advocacy or collaboration; and
* a mechanism for plan review and updating.

# 2. Climate Change & Council’s Corporate Risks

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

This section presents xxxx Council’s:

* Summarised scientific climate projections for each of the key climate impacts: Rainfall, Sea Level Rise and Storm Tide, Heat and Bushfire.
* Risk statements and adaptation actions for the highest 5 priority climate change risks based on a review and update of risks identified through the Adaptation Working Group risk assessment workshop.
* Corporate risk statements identified, reviewed and prioritised for the purposes of the Project.

The numbering of the treated risks are based on the numbering from the xxxx Council Risk Assessment Spreadsheet to enable ready reference and for review purposes.

**RAINFALL**

**at a Glance**

**Climate Change Projections***(A2 emission scenario from Climate Futures Tasmania)*

By 2100 the xxxx Municipal area will experience:

* X
* Y
* Z

*(from Local Climate Profile Hobart - Climate Futures Tasmania)*

**Key Vulnerabilities**

* X
* Y
* Z

## 

## 2.1 Rainfall & Flooding Risks

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

Rainfall events and flooding of a magnitude & frequency not experienced before have the potential to be devastating for infrastructure, agriculture, public safety and the regional economy.

The identified ‘priority’ rainfall and flooding risks and adaptation actions for xxxx Council are presented below:

| Risk Code | Risk Statement 1 | | Success criteria | Likelihood | | Consequence | | | Risk Level | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Risk 1 | Increased frequency and intensity of extreme rain events flooding leading to damage, maintenance and repair of roads. | | Financial | Likely | | Moderate | | | High | |
| Action Code | | Adaptation Action 1 | Responsibility | Relevant Council document | | Timeline for delivery | | Treated Likelihood | Treated Consequence | | Treated risk level |
| Risk 1 (Financial) | | | | | | | | | | | |
| Action 1 | | Quantify climate impacts of increased rainfall and extreme storm events and the repair, maintenance and upgrade costs on the Council's assets (roads, bridges and stormwater infrastructure) under 30, 50 and 100 year predictions**.** | Works | Asset Management plan | | Immediate | | Possible | Moderate | | Moderate |

| Risk Code | Risk Statement 2 | | Success criteria | Likelihood | | Consequence | | | Risk Level | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Risk 2 | Increased extreme wind/weather events resulting in power outages to Council building and assets resulting in an inability of the council to coordinate and deliver services and emergency management responses placing the community at risk | | Public Safety | Unlikely | | Minor | | | Low | |
| Action Code | | Adaptation Action 2 | Responsibility | Relevant Council document | | Timeline for delivery | | Treated Likelihood | Treated Consequence | | Treated risk level |
| Risk 2 (Public Safety ) | | | | | | | | | | | |
| Action 2 | | Clarification of power supply and vulnerability across the municipality**.** | Works | Asset Management plan | | Immediate | | Possible | Moderate | | Moderate |

**SEA LEVEL RISE & STORM TIDE**

**at a Glance**

**Climate Change Projections***(A2 emission scenario from Climate Future Tasmania)*

* X
* Y
* Z

**Key Vulnerabilities**

Sea level rise & storm tide in xxxx may result in:

* X
* Y
* Z

## 2.2 Sea Level Rise and Storm Surge Risks

Sea level has been rising recently at approximately 3.3 mm/year. A rise of 0.82 meters in global average sea level is expected by 2100 under continuing high emissions of greenhouse gases (*Climate Futures Tasmania Municipal Profile*). LIDAR data is now available for much of the Tasmanian coast which shows how this inundation will affect low-lying areas of the Tasmanian coast under a range of inundation levels. This gradual filling of the ‘bathtub’ does not however account for the complexity of the full range of interacting factors and forces that occur on the shoreline e.g. shoreline type, wind conditions, wave run-up, freshwater flooding, or event timing and frequency. Coastal geomorphic studies that consider all of these factors are the most accurate method currently available for predicting the likely impact on specific areas of the coastline.

The identified ‘priority’ risks and actions for the xxxx municipal area in relation to sea level rise and storm surge are presented below.

The identified ‘priority’ sea level rise and storm tide risks and adaptation actions for xxxx Council are presented below:

| Risk Code | Risk Statement 1 | Success criteria | Likelihood | Consequence | Risk Level |
| --- | --- | --- | --- | --- | --- |
| Risk 1 | Extreme storm tide events resulting in foreshore erosion impacting on council owned and managed reserves, parks and facilities resulting in increased costs to the council to repair/clean up, maintain upgrade and/or replace | Financial | Likely | Moderate | Extreme |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Action Code | Adaptation Action 1 | Responsibility | Relevant Council document | Timeline for delivery | Treated Likelihood | Treated Consequence | Treated risk level |
| Risk 1 (Financial) | | | | | | | |
| Action 11 | Investigate existing report, studies and research into localised geomorphology and vulnerabilities and identify suitable responses (to repair or not repair) by the Council following extreme storm tide events | Corporate Services | Strategic Plan | Immediate | Likely | Moderate | Extreme |
| Action 12 | Develop options paper for vulnerable areas for elected representatives. education and awareness | Corporate Services | Strategic Plan | Immediate | Likely | Moderate | Extreme |
| Action 13 | Develop awareness and education program for impacted communities | Community Development | Asset Management Plan | Immediate | Possible | Moderate | Moderate |
| Action 14 | Investigate with DIER capacity of to protect highways and state managed roads under storm tide events | Corporate Services |  | Immediate | Likely | Moderate | Extreme |

| Risk Code | Risk Statement | | Success criteria | | Likelihood | | Consequence | | | Risk Level | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Risk 5 | Sea level rise and storm tide impact on coastal settlements and resulting in property loss and damage exposing the council potential liabilities. | | Reputation | | Likely | | Moderate | | | High | |
| Action Code | | Adaptation Action 1 | Responsibility | | Relevant Council document | | Timeline for delivery | | Treated Likelihood | Treated Consequence | | Treated risk level |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Risk 1 (Financial) | | | | | | | |
| Action 21 | Refer to Waratah Wynyard equivalent risks | Corporate Services | Strategic Plan | Immediate | Likely | Moderate | Extreme |
| Action 22 | Review Existing approvals and conditions | Development Planning | Strategic Plan | Immediate | Likely | Moderate | Extreme |
| Action 23 | Development of education and awareness program and resources for elected representatives and property owners | Community Development | Asset Management Plan | Immediate | Possible | Moderate | Moderate |

**HEAT**

**at a Glance**

**Climate Change Projections**

*(A2 emission scenario)*

By 2100 the xxxx municipal area will experience:

* X
* Y
* Z

**Key Vulnerabilities**

Increased heat in the xxxx municipal area may result in:

* X
* Y
* Z

## 2.3 Heat Risks

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

Rising average temperatures and more frequent extreme temperatures have the potential to contribute to a variety of impacts including heat related illness and mortality, particularly in vulnerable demographics such as the elderly. Impacts may also be incurred on the Council’s infrastructure and assets, on agricultural industries that are important to the region’s economy, as well as on the environment. Heat related risks identified by the Project were evaluated as a low priority, therefore they are not considered here. Please refer to the xxxx Council’s climate change risk register spreadsheet.

**BUSHFIRE**

**at a Glance**

**Climate Change Projections**

*(A2 emission scenario)*

* X

*(BRAM; Antarctic Climate Ecosystems 2011)*

**Key Vulnerabilities**

Changes to bushfire likelihood & behaviour in xxxx may result in:

* X
* Y
* Z

## 2.4 Bushfire

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

Climate change may result in increased bushfire risk in xxxx Council’s municipal area although at this stage there is no conclusive data for this impact. However, factors that may contribute to an increase in likelihood and severity of bushfire are:

* changes to land-use could lead to changes in fuel density and distribution as well as a change to the vulnerability of particular vegetation communities; and
* potential increase in vegetation growth as a result of increases in rainfall, temperature and atmospheric CO2.

The key identified risks and actions in relation to bushfire for the xxxx Council are presented below

| Risk Code | Risk Statement | Success criteria | Likelihood | Consequence | Risk Level |
| --- | --- | --- | --- | --- | --- |
| Risk 4 | Increased likelihood and severity of bushfire across the Council's municipal area severely impacting on private property and businesses leading to increased costs and resource implications to the Council to deliver recovery programs. | Financial | Almost Certain | Major | Extreme |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Action Code | Adaptation Action 1 | Responsibility | Relevant Council document | Timeline for delivery | Treated Likelihood | Treated Consequence | Treated risk level |
| Risk 1 (Financial) | | | | | | | |
| Action 16 | Review and update operating budget if an event occurs | Corporate Services | Strategic Plan |  | Likely | Moderate | Extreme |

## 2.5 Other Priority Risks

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

The untreated risks below are included in the Plan to provide an overview of possible climate change risks that the Council may be exposed to and for review as part of this Plan’s implementation. A full list of the risks is contained in xxxx Council’s climate change risk register spreadsheet.

Table: Untreated xxxx Council’s Corporate Risks

| **Risk Code** | **Climate Impact** | **Success Criteria** | **Risk Statement (Impact Hazard + Outcome)** | **Likelihood** | **Consequence** | **Level of Risk** |
| --- | --- | --- | --- | --- | --- | --- |
| R-1 | Rainfall and Flooding |  | Treated refer to Risk 1 p.12 | | | |
| R-2 | Rainfall and Flooding |  | Treated see Risk 2 p.12 | | | |
| R-3 | Sea Level Rise |  | Treated see Risk 3 p.20 | | | |
| R-5 | Sea Level Rise |  | Treated see Risk 5 p. 15 | | | |
| R-4 | Bushfire |  | Treated see Risk 4 p. 21 | | | |
| R-6 | Sea Level rise and Storm Tide |  | Coastal inundation during storm tide events resulting in damage to Council owned assets such as recreational parks, reserves, buildings, roads leading loss of amenity, increased clean-up and maintained costs and loss of recreational opportunity and sense of community wellbeing | Likely | Moderate | High |
| R-7 | Heat | Public Safety | Increased temperatures resulting heat related illness in vulnerable community sectors including the aged and very young | Likely | Moderate | High |
| R-8 | Heat | Financial | Increased energy costs to the Council due increased air-conditioning use to maintain buildings at suitable comfort levels for employees | Possible | Minor | Moderate |
| R-9 | Heat | Public safety | Increased temperatures of 30+ resulting in reduced productivity of Council employees - particularly those engaged in the outdoor workforce | Possible | Minor | Moderate |
| **Risk Code** | **Climate Impact** | **Success Criteria** | **Risk Statement (Impact Hazard + Outcome)** | **Likelihood** | **Consequence** | **Level of Risk** |
| R-10 | Heat | Public safety | Increased risk of skin cancer, sun stroke and heat stress related illnesses to Council employees particularly those engaged in the outdoor workforce working at higher latitude | Possible | Minor | Moderate |
| R-11 | Rainfall and Flooding | Financial | Increases in the intensity and frequency of hail events resulting in damage of council assets such as building and community facilities resulting in increased costs for repair/clean up, maintenance and /or replacement or upgrade | Possible | Minor | Moderate |
| R-12 | Rainfall and Flooding | Financial | Increased intensity and frequency of extreme wet weather events leading to blocked drains and associated flooding resulting in increased hazard to community and increased costs to the council for repair, maintenance, replacement and upgrade | Possible | Moderate | Moderate |
| R-13 | Rainfall and Flooding | Financial | Increased costs to the council to identify and divert the Councils stormwater system were it enters the sewage system | Unlikely | Minor | Low |
| R-14 | Rainfall and Flooding | Financial | Damage and potential loss of bridges due to flooding events leading to damage or requirement for upgrade or replacement by the Council. | Likely | Moderate | High |
| R-15 | Rainfall and Flooding | Public Safety | Increased potential for incidence of landslips throughout the council municipal area due to increased intensity and frequency of rainfall events | Possible | Moderate | Moderate |
| R-16 | Rainfall and Flooding | Community & Lifestyle | increases in the intensity and frequency of drought requiring more water to maintain community expectations in relation to watering of recreational areas and community parks and gardens. | Possible | Moderate | Moderate |
| R-17 | Rainfall and Flooding | Strategy | Changes in rainfall variability affecting associated issues such as dams, Acid Sulphate soil, soil structure and recharge of groundwater resulting the Council investigating, reviewing and updating strategic plans and planning scheme to mitigate affects through strategic planning and when triggered by development application | Possible | Minor | Moderate |
| R-18 | Rainfall and Flooding | Financial | Increased frequency of drought events reducing the profitability of primary production across the municipal areas resulting in reduced council rates and capacity to deliver services and maintain assets | Likely | Major | Extreme |
| R-19 | Sea Level Rise and Storm Tide | Strategy | Increased training requirement to council employees involved in statutory planning on the requirements for the Tas Building Code (Alpine) and associated with climate impacts, risks and hazards | Unlikely | Insignificant | Low |
| **Risk Code** | **Climate Impact** | **Success Criteria** | **Risk Statement (Impact Hazard + Outcome)** | **Likelihood** | **Consequence** | **Level of Risk** |
| R-20 | Sea Level Rise and Storm Tide | Financial | Increased requirement for the council program to inspect, maintain and remove tree limbs located on council owned land that maybe vulnerable to falling due to extreme wind events | Possible | Moderate | Moderate |
| R-21 | Bushfire | Financial | Increased likelihood and severity of bushfire impacting on Council assets (buildings/road verge/parks and reserves), leading to increased replacement costs and upgrade for greater levels of fire resistance | Likely | Major | Extreme |
| R-22 | Bushfire | Service Delivery | Increased likelihood and severity of bushfire across the Council's municipal area severely impacting on economic activity reducing the Councils rates base and reducing its capacity to deliver programs and services and maintain | Likely | Moderate | High |
| R-23 | Bushfire | Environmental | Loss of local biodiversity due to the impacts of bushfire | Likely | Moderate | High |
| R-24 | Bushfire | Environmental | Increased potential for the spread of weeds across council and private property following bushfire events leading to increased weed management costs and loss of biodiversity | Likely | Moderate | High |
| R-25 | Bushfire | Community and Lifestyle | Loss of cultural heritage due bushfire leading to reduced sense of amenity and loss of community values | Possible | Moderate | Moderate |
| R-26 | Sea Level Rise and Storm Tide | Financial | Sea level rise and storm tide events severing Montague Rd resulting in the isolation of the community and the requirement for Council to maintain, reroute or upgrade the road to maintain access | Possible | Moderate | Moderate |
| R-27 | Sea Level Rise and Storm Tide | Financial | Coastal inundation of the landfill during storm events resulting increased clean up maintenance costs the council along with environmental pollution and public safety concerns | Possible | Moderate | Moderate |
| R-28 | Sea Level Rise and Storm Tide | Financial | Increased coastal inundation due to sea level rise resulting in beach erosion resulting in litigation of the Council by affected properties owners | Likely | Moderate | High |

# 3. Strategic Corporate Adaptation Actions

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

Strategic priorities are broad level climate change adaptation actions that do not specifically address a particular area or risk and fall across numerous Council service areas. There are key overarching corporate functions that are worth considering for minimising the Council’s risk in the face of extreme events posed by climate change including: incorporation of climate change risks into the Council’s risk register to minimise the Council’s exposure to litigation in relation to extreme events; incorporation of climate change planning into strategic, annual and financial planning; and developing a process for communication within the Council and to the community. Potential overarching corporate actions for the Council to pursue are provided in the following Table:

**Table:** Potential strategic corporate actions

|  |
| --- |
| **Ensure legal liability issues are addressed**  The legal advice established for Tasmanian Councils is covered in Section 4. |
|
| **Update Council’s risk register**  Integrate climate change risk management into the Council’s existing risk assessment framework and migrate treated risks to the risk register. |
|
| **Emergency management planning in relation to climate hazards**  Ensure that the projected impacts of climate change are properly considered in the Council’s emergency management planning processes. Emergency response plans should be investigated, developed and implemented considering the best available climate change projections. Up to date emergency response procedures can minimise consequences when extreme events occur. |
| **Implement communication strategy**  Develop and implement a climate change communication and education plan for Council staff. Increased staff capacity and awareness will assist in incorporating climate change scenarios and impacts into policy and decision making processes. |
| **Incorporate identified actions into other the Council plans & strategies**  Consideration of climate change risks and impacts in other Council strategies, policies and plans (such as Strategic & Annual Plan). The climate change impacts and risk process outlined throughout this Adaptation Plan should be considered in the development of future plans, policies and strategies. This will also ensure there are a range of potential internal mechanisms for important actions to be implemented. |
| **Annual reporting**  Consider developing climate change related Key Performance Indicators that could be reported on through the Council’s annual report. |
| **Climate Change Coordinator**  Appoint a climate change coordinator supported by a cross-Council team to implement the Adaptation Plan. |

Success of the strategic actions is dependant on senior management support. Implementation of strategic actions will provide the Council with a solid framework in climate change adaptation and will build an internal culture that supports the implementation of the adaptation actions specific to the Council business areas described in subsequent sections.

# 4. Legal Implications of Climate Change Action

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

Councils are at the forefront of responding to climate change impacts and increasingly local communities are looking to their councils to provide solutions to adapt to, manage, transfer or share the risks associated with climate change impacts.[[9]](#footnote-9) A key consideration of councils in the face of climate change is potential liability that they are exposed to through their various statutory roles, powers and functions. A particular concern is the potential liability that councils are exposed to through their adopted action or inaction in particular circumstances.

Baker and McKenzie (BMK), in a report to the Australian Local Governments Authority on the risk of councils’ climate change liability, outline a number of actions that councils may follow to reduce liability.[[10]](#footnote-10) These include:

* **exercising reasonable care when making planning decisions**, which involves taking care to ensure all relevant facts are known and understood, that relevant law is identified and understood, and that reasons for decisions are expressed in clear and accurate terms
* **keeping up to date with general climate change science and information**, particularly in relation to potential risks from natural hazards, relevant to their local government area
* **developing clear and certain criteria for decision making** to increase public confidence that decisions are made on the basis of the best available scientific evidence
* **increasing public consultation**, as this may improve transparency around decision-making processes and limit administrative review following consideration resourcing required to manage consultation process; and
* facilitating the **provision of information to property owners** on potential risks to property.

BMK also noted that there are a number legislative and policy frameworks that create barriers to effective climate change adaptation by councils. These included: lack of decision-making power, lack of consistency, and lack of clear guidance, materials, expertise and funding.[[11]](#footnote-11) They particularly advocated for a nationally consistent approach to managing climate change impacts on the coastal zone.

RCCAP engaged Shaun McElwaine + Associates (SMA)[[12]](#footnote-12) to provide advice on the legal context within which the impacts of climate change reside and how they relate to Tasmanian councils as a whole.[[13]](#footnote-13) SMA’s advice is provided as an accompanying report to this plan. The advice, dated 18 December 2011, established that overall councils are not liable for existing use or development, nor will they incur liability for ‘no action’ in response to climate impacts; however, should they take action they could be liable should that action cause harm or damage. It also considered that councils may be found liable for operational advice such as the assessment of planning applications and new developments.

The advice also noted that while the development and adoption of a [council’s CCAP] ‘climate risk plan and/or climate change adaptation action(s)’ was positive it would also set the standard for the discharge of the duty of care. Thus if a council did not take the climate risk plan and or action(s) into consideration when making operational decisions it may become liable for the consequences of the operational decision.[[14]](#footnote-14)

The advice contained three actions that could be undertaken by the State Government to reduce Tasmanian council’s exposure and potential liability.

1. Amendment to the *Local Government Act (Tas) 1996* by the State Government to insert an equivalent section to that of the s733 *Local Government Act (NSW)* that exempts local governments from civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are undertaken in good faith and in accordance with manual(s) prepared by the State Government.
2. Review of the State Coastal Policy 1996 by the State Government so as to provide clarity on what is required to satisfy its requirements, i.e.

* how planning schemes must deal with the impacts of climate change
* provide specific recommendations and guidelines to manage climate change impacts
* set prescribed levels for sea level rise in developed coastal regions throughout the State.

1. Formulation of a state-wide code to deal with climate change impacts (with the outcome to achieve a uniform set of provisions across the State) that:

* is measureable, i.e. contains specific development controls
* removes decision making from planning authorities
* does not require risk analysis
* sets prescribed levels for seal level rise in developed coastal regions throughout the State.

It is considered that the SMA’s recommendations whilst reasonable and sound are unlikely to be successful or progressed in time efficient manner. Therefore reflecting on SMA’s full advice, and to address the barriers to effective climate change adaptation identified by BMK, it is prudent and sagacious for the Council, through the Cradle Coast Authority or as an individual council to advocate for the Tasmanian Government to:

* play a more active role in the provision of information and guidance in relation to climate change and natural hazards, particularly in coastal areas; and
* consider exempting local governments from civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are undertaken in good faith and in accordance with manual(s) prepared by the Tasmanian Government.

**Disclaimer**

The purpose of this advice is for the Council generally and the Council should not rely upon it. No liability is accepted for the content of the advice, or for the consequences of any actions taken on the basis of the information provided. If the Council wishes to rely upon the advice it is recommended that they seek their own advice prior to doing so

# 5. Implementation Approach

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

The implementation of this Adaptation Plan requires a co-ordinated approach, both across the Council business, in partnership with other councils, and with external stakeholders. Key components of implementation include:

* a consistent process for the endorsement of Adaptation Plans by all councils of the region;
* a logical way for incorporation of key local risks and adaptation actions into the Council’s documents and processes such as risk registers, strategic plans, annual plans or asset management plans;
* an appropriate mechanism to implement sub-regional and regional adaptation actions either through advocacy or collaboration; and
* a mechanism for the review and updating of Adaptation Plans

Implementation of the adaptation actions in the Adaptation Plan will provide xxxx Council with an initial response to the challenges posed by climate change. Effective implementation does not mean ‘re-inventing the wheel’, to the contrary many of the Council's current activities/operational practices can be modified to assist in managing future climate variability. To this end, it will be important that outcomes from the risk assessment process used to support the development of the Adaptation Plan are integrated with other xxxx Council’s strategic risk management and planning activities. It is recommended that a climate change ‘champion/coordinator’ is appointed to oversee implementation of the actions included in the Plan. To ensure a coordinated and whole of council approach they should be supported by a cross- Council team. Senior management will also provide a key role in the Plan’s implementation by remaining engaged with this process and through assuming responsibility for maintaining the risk assessment and implementing adaptation actions.

## 

## 5.1 Prioritisation of Actions

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

## 5.1.1 Financial and resource requirements

Financial and resource availability are critical factors for enabling implementation of adaptation actions. The adaptation options identified in this Plan will come at varying degrees of cost and resource requirement. It is likely that the xxxx Council will initially support implementation of those adaptation actions which are cost effective and align with current resource capacity and availability. Implementation of these actions i.e. ‘low hanging fruit’ will enable Council to gain some initial momentum in responding to impacts posed by climate change.

It is important to recognise that not all climate change action within the Council will require its own funding, but will become embedded in the operational business of the Council through appropriate governance arrangements, planning and policy. Notwithstanding this some of the more complex adaptation options will require substantial financial support and resources. For these actions, pursuing grant funding and establishing partnerships for collaborative or common actions can be effective in reducing the overall cost of action for the Council, enabling the full cost of action to be offset.

## 5.3 Monitoring and Evaluation

Monitoring and evaluating the implementation of actions contained within this Plan will be critical in tracking progress with regard to the appropriateness and effectiveness of actions. Monitoring, evaluation and reporting (MER) is a systematic and objective review of either (or a combination of) the appropriateness, efficiency, effectiveness and impact of a set of actions. An example of the key aspects of the climate monitoring, evaluation, review and improvement cycle are highlighted in Figure 1.

Figure 1: MER Framework to support climate change adaptation plan implementation[[15]](#footnote-15)



Tracking progress against actions in this Plan is important to determine:

* Whether actions need to be reviewed; and
* Whether actions are being implemented via operational plans.

Ongoing monitoring of this Plan should include the following:

* Reporting of implementation of adaptation actions;
* Reviewing progress for each council business area;
* Testing whether actions are still relevant;
* Consideration of barriers and barriers to implementing this Plan; and
* Consulting with external stakeholders to determine progress with regard to implementation of actions of a collaborative nature.

Annual monitoring of this Plan should be reported in the Council’s annual report.

As discussed in the previous sections, this Plan focuses on the treatment or priority climate change risks. Although non-priority risks are not addressed in this Plan they should not be ignored. The Council should maintain a ‘watching brief’ on non-priority risks rated as ‘moderate’ or ‘low’ as part of the Plan review process. This would include:

* Reviewing the ratings of non-priority risks should new information become available; and
* Upgrading risks to priority risks and developing adaptation actions where appropriate.

## 5.4 Review

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

The Plan should be reviewed every three years, or earlier if circumstances require. The Plan review will be required in context of:

* progress on initial actions;
* updated information on climate science and its relevance at the municipal scale;
* progress in regional and state-wide planning instruments, particularly in relation to codes that guide development in areas likely to be impacted by climate change e.g. the coastal zone;
* developments in State policy in relation to climate change and the coastal zone;
* changes to the legal framework in relation to the Council’s liability in relation to managing climate change risk and implementing actions;

# 6. Stakeholder Involvement & Collaboration

*The following text is an example from a Tasmanian council’s corporate adaptation plan.*

Climate change projections are likely to impact either directly or indirectly on all aspects of the Council’s function. Further to this, impacts are likely to be felt throughout the community and within many other organisations that council has direct involvement with. A collaborative adaptation response between all stakeholders is therefore essential for council to maintain its high service levels in a changing climate.

There is also a significant body of work currently being undertaken within other organisations throughout the community that contribute to meeting climate change adaptation objectives , and that act to assist council in meeting its own objectives. It is therefore important that these linkages are identified; that complimentary processes value-add to one another and duplication of efforts is avoided wherever possible.

In order for there to be clear understanding of roles and responsibilities in relation to management of the identified climate change risks, together with recognition of opportunities to develop or strengthen existing collaborations, RCCAP engaged with the identified stakeholders.

## 6.1 Aurora Energy

Aurora manages the local electricity distribution network around Tasmania and is the electricity provider for the majority of Tasmania’s electricity usage. Many of council’s services are dependent on the proper operation of Aurora’s assets.

The Tasmanian Electricity Code governs Aurora, requiring it to maintain its infrastructure to minimise risks associated with the failure or reduced performance of assets. Thus, if the operating environment changes in a way that increases the risk of asset failure, as a result of climate change, then Aurora has an obligation to manage that change.

Aurora has not identified climate change as a key business risk, however the Distribution Business Division (responsible for managing Aurora’s network) has identified climate change broadly as one of 19 divisional risks.

A key area of concern for Aurora is the lack of consultation during assessment of development applications in vulnerable areas. When new developments are approved by councils, Aurora is required under law to provide power to site. Aurora is not included in the planning assessment process and where proposals may be vulnerable to the projected impacts of climate change, delivery of this requirement may in the future become difficult. Collaboration in the planning approval stage could better manage these situations.

## 6.2 Dept. of Health and Human Services (DHHS)

The Department of Health and Human Services (DHHS) is responsible for delivery of integrated services that maintain and improve the health and wellbeing of individual Tasmanians and the Tasmanian community.

A national process, coordinated by the Department of Health and Aging, which is developing a national human health climate change adaptation plan, drives climate action for DHHS. The internal draft climate change plan is to be developed by the Australian Health Protection Committee’s Environmental Health Committee, however there is no clear timeframe for its completion. It is not expected that climate impacts will be as significant as that experienced by other States.

In lieu of the national plan the DHHS does not currently have any documents for the management of climate change risks.

## 6.3 Dept. of Infrastructure Energy and Resources (DIER)

DIER provides infrastructure and related services for the social and economic development of Tasmania. DIER reports to the Minister for Infrastructure, Hon David O’Byrne MP; the Minister for Energy and Resources and the Minister for Racing, Hon Bryan Green MP; and the Minister for Sustainable Transport, Hon Nick McKim MP. By providing a strategic approach to the provision of both physical infrastructure and regulatory frameworks, DIER aims to (amongst other unrelated factors):

* Enhance infrastructure decision-making across Government;
* Facilitate a safe, sustainable and efficient transport system that enhances economic and social development, in the context of the challenges of climate change, and
* Promote reliable, efficient, safe and sustainable energy systems.

The state road network is approximately 3700km in length and includes approximately 800 bridge structures and 500 culverts. The network is divided in to three regional networks; each network has its own Network Manager (NM) and three Network Supervisors (NS). This structure sees each NS responsible for the management of approximately 400km of road. Not surprisingly, these staff have an in-depth knowledge of their ‘turf’ and the direct/indirect effects of extreme weather events. Therefore it is fair to state that DIER staff have inadvertently been documenting and managing the effects of a changing climate for some time now and are thus well positioned to manage the road network in to the future. DIER acknowledges that climate change per se has not featured prominently in past decision-making; however, this is not to say that DIER is unaware of the impacts of a changing climate. Climate change is but one element of the ‘risk assessment’ (RA) process. DIER acknowledges the significance/weighting of climate change within the RA process is increasing in-line with DIER’s continually improving awareness and understanding.

DIER acknowledges that the impacts of a changing climate are highly varied, but notes there are impacts more likely to affect the serviceability of the state road network. From a DIER perspective, the key threatening climate change related impacts are:

* Increased intensity of rainfall events (and the effects of);
* Sea level rise, and
* Storm surge.

DIER has chosen not to independently fund climate change research; instead, opting for a collaborative approach that has to date, proven quite successful. Given that DIER has limited financial resources (at present and into future) with particular reference to climate change type investments; DIER will continue to support and sponsor collaborative research and the development of tools and applications that have the capacity to make DIER a ‘more informed’ client. In terms of projects, DIER has co-funded/sponsored three climate change related projects in the past 18 months; these include:

* Climate Futures Tasmania – Infrastructure (CFT-I);
* Greenhouse Gas Assessment Workbook for Road Projects – Transport Authorities Greenhouse Group (TAGG), and
* ‘Carbon Gauge – Calculating the Greenhouse Footprint of Roads’.

DIER is considering a whole-of-asset risk assessment to identify those sections of the road network more at risk from the effects of climate change over the next 20-40 years for road infrastructure, and 100 years for bridges. Outputs from this project would then assist development of DIER’s work plan for the next 5-10 years. Anecdotally, DIER considers that in the absence of major construction projects, managing the road asset for the effects of climate change should in fact be affordable under historical road transport funding levels.

## 6.4 Dept. Primary Industries, Parks, Water & Environment (DPIPWE)

DPIPWE have three key programs in relation to climate change adaptation:

* Natural Systems Resilient to Climate Change Project;
* Climate Change and Coastal Vulnerability Program; and
* Climate Change Impact Monitoring Program for the World Heritage Area (WHA)

Key elements of the Natural Systems Resilient to Climate Change Project are the unpublished report: [DPIPWE (2010) Vulnerability of Tasmania’s Natural Environment to Climate Change: An Overview], and a series of relevant spatial resources:

1. spatial layer predicting spread/occurrence of WONS (weeds of national significance) in the future;
2. spatial layer predicting areas that are not vulnerable to the root-rot fungus (*Phytophthora cinnamomi*);
3. spatial layer as a predictor of biosecurity and disease issues related to the natural environment;
4. spatial layer identifying fire ‘refugia’ i.e. areas in the landscape with low vulnerability to wildfire; and
5. spatial layer highlighting past glacial ‘refugia’, i.e. where vegetation communities have contracted to in the past during changing climate.

Components of the *Climate Change and Coastal Vulnerability Program* include:

* the Climate Change and Coastal Risk Assessment Project which has tools and resources to assist with risk-based management and planning for various assets and values in the coastal zone; and
* The ‘Sharples’ Report – Indicative Mapping of Tasmanian Coastal Vulnerability to Climate Change and Sea Level Rise.

*The Climate Change Impact Monitoring Program (WHA)* includes:

* Vegetation community monitoring, particularly endemic conifers.
* Efforts to improve understanding of the effect of sea level changes on coastal geodiversity and biodiversity and identification of opportunities for adaptive management. There is alignment here with the NRM South saltmarsh inundation mapping project.
* A recently released report [Climate Change and Geodiversity in the World Heritage Area] which highlights how climate change may impact upon Tasmania’s geological, geomorphological and soil features (and processes).

## 6.5 MAV Insurance Liability Mutual Insurance (LMI)

MAV Insurance Liability Mutual Insurance (LMI) is the primary insurer for Tasmania councils. Many of the Councils have identified LMI as their most critical risk management framework that should be considered in climate change risk management and adaptation planning.

LMI does not have a statutory obligation to manage climate risks. They do however have a general commitment to assist member councils in effectively managing their risks with a focus on continuous improvement. LMI has developed a broad range of manuals and guidance documents for its members, although not specific and limited to climate change. These documents and support materials may be made available on request.

LMI conducts a biennial audit on all its members, part of which is an Organisational Risk Management section. As part of this section we examine the comprehensiveness of risk assessments for 4 risk areas of council in some detail, one of which is climate change.

LMI also has an internal risk register that includes risks to the scheme from a key claims driver view as well as unusual, new and emerging risks. Climate Change is one of the risks, and is being monitored by the Risk Committee. LMI is unable to provide this risk register to Councils, as it is an internal document only.

LMI does not dictate to members about how they manage their risks. Recommendations and suggestions for improvements may be made, however they have neither the power nor the inclination to ‘demand’ changes.

## 6.6 State Emergency Services (SES)

The State Emergency Services is the statutory authority that coordinates emergency management responses Tasmania-wide. It is a division of the Department of Police and Emergency Management and is comprised of both paid staff and volunteers. It has four core functions that are set out in the Emergency Management Act (Tas) 2006 s.26 as follows:

* The provision of advice and services relating to emergency management in accordance with emergency management plans or as otherwise authorised by the State Controller or Minister in writing provided to the Director SES, other than the provision of a service provided by another statutory service.
* The provision of services relating to rescue and retrieval operations as authorised by the Minister or State Controller.
* The provision of administrative services for the State Committee and each Regional Committee, including support in the preparation and review of emergency management plans as required by the State Committee and Regional Committees.
* The recruitment, training and support of volunteer members of the State Emergency Service.

Local Government is an important stakeholder in the delivery of emergency management responses and planning. It is identified in key SES documents and plans that set out the key roles and responsibilities of stakeholders. Pursuant to section 34 of the EMA each Council must: prepare an Emergency Management Plan: review the EMP every 2 years; appoint an emergency management coordinator and establish and maintain voluntary units.

The SES’s response to climate change, through the ‘Natural Disaster Resilience Program and other funding programs, has been to fund and engage in research initiatives that identify and seek to quantify key climate risks as they apply across Tasmania, including:

* Climate Futures Tasmania – Bushfire.
* Climate Futures Tasmania - Extreme Events.
* Clarence City Council study into the effect of sea level rise – this was the precursor to the current work that CCC has undertaken.
* Tasmanian Extreme Wind Hazards Stand-alone Tool (TEWHST).
* State Framework for natural hazards and Land Use Planning Project.

The SES is the custodian of a significant body of climate change data as a result of its involvement in the Climate Futures Tasmania project and collaboration with Geoscience Australia (Extreme Wind Hazard Project). Opportunities exist for the utilisation of this data to inform local, regional and state emergency management planning.

## 6.7 Tasmania Fire Service (TFS)

Tasmania Fire Service (TFS) is involved with multiple forums dealing with the impacts of climate change and the potential risks associated with the onset of climate change. Through the bushfire cooperative research council (BCRC) and the Australasian Fire & Emergency Service Council (AFAC), TFS is participating in research and modelling for bushfire. The research being conducted includes, looking at current bushfire risks and assessing current prediction tools to determine modelling for the future. This research will have a bearing on issues such as:

* resource to risk modelling;
* community protection planning;
* bushfire prediction tools;
* bushfire weather modelling;
* prescribed burning modelling; and
* fire management planning.

TFS has also participated in the Climate Futures for Tasmania Project, especially the ‘Extreme Events’ component. TFS will use this to map a pathway forward for future strategic planning.

Currently, TFS is reviewing the State Fire Protection Plan in which the above issues are called up. Additionally, as part of another review process, TFS is incorporating these developed strategies into its operational corporate plan.

From TFS’s perspective the relationship with local government will be important, if not critical for future directions in climate change. Through the State Fire Management Council (SFMC), where LGAT is represented, TFS will engage with local government to ensure they are consulted regarding climate change and bushfire risk into the future. SFMC is currently lobbying State Government for funding to assist with additional programs to develop strategies for vegetation management for the mitigation of bushfires. This also includes legislative changes. Although currently in its infancy, this program will include climate change contingencies as part of the planning process. LGAT are an identified key stakeholder in this program and will be consulted throughout the development of this strategy.

SFMC provides a forum for local government to work with TFS and other land management agencies in relation to climate change and bushfire mitigation. At a ‘coal face’ level TFS will need to work closely with local government for the development of fire management planning, prescribed burning programs and development planning, especially in bushfire prone areas.

## 6.8 Tasmanian Planning Commission (TPC)

The TPC has formed a Coastal Planning Advisory Committee to:

* prepare a Coastal Planning Framework for consideration by Cabinet (The TPC has been requested by the Premier to prepare the framework following the Premier’s decision to accept the TPC’s recommendation to reject the revised draft State Coastal Policy);
* peer review and conduct community and stakeholder consultation on a draft ‘coastal hazards’ code prepared by the TPC’s Policy Division; and
* coordinate the state-wide ‘coastal hazards’ code review with the formal assessment and determination of a state-wide ‘flooding’ code.

In terms of other natural hazards and risks, the TPC formed an Assessment Panel in the second half of 2011 to formally assess draft state-wide planning codes prepared by the TPC’s Policy Division covering bushfire prone areas, flooding and landslide.

1. IPCC, 2011: Summary for Policymakers. In: Intergovernmental Panel on Climate Change Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C. B., Barros, V., Stocker, T.F., Qin, D., Dokken, D., Ebi, K.L., Mastrandrea, M. D., Mach, K. J., Plattner, G.-K., Allen, S., Tignor, M. and P. M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. [↑](#footnote-ref-1)
2. IPCC, 2007: Climate Change, 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning (eds.)]. [↑](#footnote-ref-2)
3. Department of Climate Change, 2010: Adapting to climate change in Australia, an Australian Government Position Paper [↑](#footnote-ref-3)
4. Australian Greenhouse Office, 2006: Climate Change Impacts and Risk Management – a Guide for Business and Government. [↑](#footnote-ref-4)
5. Department of Climate Change, 2009: Climate Change Adaptation Actions for Local Government. [↑](#footnote-ref-5)
6. http://climatechange.gov.au/roles-and-responsibilities-climate-change-australia [↑](#footnote-ref-6)
7. *Local Government Act* (Tas) 1993.Section 20 Function and Powers. [↑](#footnote-ref-7)
8. SGS Economics and Planning, July 2007: Socioeconomic Assessment and Response for the climate change impacts on Clarence’s Foreshore, for the Clarence City Council [↑](#footnote-ref-8)
9. Baker and McKenzie; 22 July 2011. ‘Local Council Risk of Liability in the Face of Climate Change – Resolving uncertainties’, a report for the Australian Local Government Association. [↑](#footnote-ref-9)
10. *Ibid* pp 82 – 83. [↑](#footnote-ref-10)
11. *Ibid* pp 75- 81 [↑](#footnote-ref-11)
12. A copy of the legal advice can be obtained by contacting the STCA [↑](#footnote-ref-12)
13. This legal advice was considered alongside two similar reports:

    * ‘Legal issues for Local Government in addressing coastal erosion risks, a research report for Clarence City Council’, Dr. McDonald, 18 March 2011
    * ‘Local Councils Risk of Liability in the Face of Climate Change Resolving Uncertainties’, a report for the Australian Local Government Association’, Baker and McKenzie, 22 July 2011.

    Overall SMA’s advice is consistent with the legal comments provided in these two reports. [↑](#footnote-ref-13)
14. McElwaine, 2011, p. 24. [↑](#footnote-ref-14)
15. Department of Environment, Water, Heritage and the Arts (2008). Australian Government Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework, May 2008. [↑](#footnote-ref-15)