



Town of Bassendean Local Climate Change Adaptation Action Plan



**Produced by the EMRC
Environmental Services and
the Town of Bassendean**

September 2011
Adopted OCM2 - 10/09/11

Executive Summary

This strategic document provides outcomes of the climate change risk assessment and adaptation action planning workshops which were held with the Town's key staff in early 2009 as part of the Future Proofing Perth's Eastern Region – Adapting to Climate Change Project. The Town has been participating in this project since 2008 – 2009, and the report focuses on adaptation measures that refer to climate change risk treatment and look at ways that the Town of Bassendean can adapt to climate change.

Scientific modelling indicates that the South West of Western Australia will continue to be hard hit by forecast reductions in rainfall, increased temperatures and further reductions in surface and groundwater resources.

Climate change represents a huge challenge for Local Government, including impact on infrastructure, land use planning, environmental health and fire and emergency services as well as parks and reserve management. Other key risks include changing economic viability of local industries.

To address anticipated climate change impact on Perth's Eastern Region EMRC has developed and implemented the Future Proofing Perth's Eastern Region – Adapting to Climate Change Project in order to identify major climate change risks relevant to EMRC and member Council assets and operations. It will assist member Councils assess and prioritise these risks to provide a basis for adaptation responses and to develop an action plan for appropriate adaptation.

The Town of Bassendean is a progressive and innovative local government working in partnership with Eastern Metropolitan Regional Council to ensure that climate change adaptation is integrated into day to day planning and risk management activities of the Council and its community.

To identify and address climate change impact, not only on the regional but also on the local scale, the Town of Bassendean's key staff participated in the Future Proofing Perth's Eastern Region – Adapting to Climate Change Project workshops which were conducted in early 2009. The outcomes of these workshops resulted in the development of the Regional Climate Change Adaptation Action Plan (RCCAAP) and provided a foundation for the Town of Bassendean's Local Climate Change Adaptation Action Plan (LCCAAP). While the RCCAAP identified actions which benefit from a regional approach, the Town of Bassendean's LCCAAP focuses on actions related to the Council operations and services and provides a risk management approach that develops local policies and clarifies planning procedures to enable the Town to adapt to the impact of climate change as well as prepare and educate community.

The climate change risk assessment workshop was undertaken in accordance with the relevant Australian Standard (AS/NZS 4630:2004) and identified the following key risk areas to the Town of Bassendean's operations, services and community:

- Infrastructure Failure;
- Impact on Essential Services (Power Loss and Water Availability);
- Watercourse Damage and Loss;
- Increase in Bushfire and Urban Fire Events;
- Water Decline and Reduced Water Quality;
- Greenhouse Gas Emissions and Related Air Pollution;

- Loss of Ecosystems and Provision of Public Open Space;
- Decline in Population Health and Displaced Wellbeing;
- Economic Challenges and Opportunities; and
- Changing Leadership and Development Requirements.

The Risk Analysis applied one of the scenarios from the CSIRO's Climate Change in Australia Report (CSIRO & BOM, 2007), which is based on the latest 2007 scenarios produced by the Intergovernmental Panel on Climate Change (IPCC). Given that the climate change risk assessment for the Perth's Eastern Region is strategic in nature, a single scenario of 2070 High (IPCC A1FI 50th percentile) is used as a method of demonstrating the strategic level vulnerability of natural and built systems in the region.

The use of this scenario was consistent with those used by other Local Governments undertaking similar strategic assessments, thus contributing to a coherent overall picture of the challenges facing Local Government in the State and across Australia.

The projections for Perth under the chosen scenario indicate a future with higher average temperatures, lower annual rainfall (and reduction in intense rainfall from storms), and increased potential evaporation, transpiration and solar radiation.

Adaptation measures were developed by the EMRC Project team that were specific to the Town's context using the Risk Assessment framework developed by the Australian Government. The measures were aligned to the identified risks levels from the results of the first risk assessment workshop. At the climate change adaptation workshop the Town's key staff identified a range of adaptation actions specific to the Town to treat priority risks.

Adaptation actions are the specific tasks that need to be undertaken to ensure that the adaptation measure is implemented.

The formulation of the Local Climate Change Adaptation Action Plan required Town of Bassendean's staff to look at three key areas, one being the timeframe for implementation, the other being responsibility for implementation and the third one being budget allocation for action implementation. Timeframes for action were based on the Town's planning and budget cycles. To ensure that adaptation actions are put into operation by the appropriate Town officers a suggested delegation of responsibility for each action has been assigned to the appropriate Town's department. Considerable consultation with key staff members identified as being responsible for action implementation has occurred, specifically regarding the action, implementation timeframe and risk rating. In accordance with the community and staff consultation feedback proposed adaptation actions were discussed and amended to reflect the Town's climate change adaptation needs.

In relation to the Town's financial plan each action has been given a suggested budget based on:

- If the action is standard practice it is subject to normal budget expenditure;
- If the action relates to officer time it is subject to costs in kind; and
- If the action is not currently part of the Town's management plan it will be subject to funding.

The climate change adaptation workshop delivered a large number of adaptation actions for the Town of Bassendean with four timeframes. To narrow down the number of proposed actions in order to effectively facilitate the development of a LCCAAP an additional prioritisation assessment was undertaken. The Australian Government's framework suggests that organisations should look for 'win-win' or 'no-regrets' options, meaning actions that should be

taken regardless of whether climate change is an issue. Consequently a second level of analysis was undertaken to inform the implementation of local adaptation actions.

The LCCAAP is strategic document that provides a set of adaptation actions for the Town to implement in order to effectively adapt to current and future climate change impacts. In consultation with its key staff, the Town of Bassendean will be responsible for regular monitoring, review and evaluation of the progress of the local adaptation actions.

Town of Bassendean recognised climate change as a key emerging issue in the local government sector and has undertaken a range of actions to mitigate climate change by participating in various programs such as the Perth Solar City and International Council for Local Environmental Initiatives' (ICLEI) Cities for Climate Protection, Water Campaign and has reduced carbon emissions by using "Green Power" for street lighting, off set Council vehicle carbon emissions and used renewable energy to power civic buildings.

The LCCAAP is the Town's guiding adaptation document, implementation of which will enable the Town to adapt to climate change and provide leadership to the community and other local and state government agencies.

Foreword

The Town of Bassendean recognises the need to adapt to the new reality that climate change will bring. The Town also understands that some of the climate change impacts will develop slowly while others will be in the form of big events that will shock and devastate communities. The Town of Bassendean has no other option except to adapt and be ready for these events. Adaptation is about taking action to avoid, manage or reduce the consequences that will be brought about from climate events. Adapting to climate change must be integrated into day to day planning and risk management activities of Local Government and this discipline must be transferred within local communities.

The Town of Bassendean in partnership with Eastern Metropolitan Regional Council (EMRC) has developed the Local Climate Change Adaptation Action Plan (LCCAAP) to address impacts of climate change that will create a huge challenge for Local Government, impacting not only on the environment but the Town's business operations and its communities.

This Local Climate Change Adaptation Action Plan (LCCAAP) incorporates Town of Bassendean's Community views in the area of climate change adaptation and LGIS experts' advice on insurance/ liability issues associated with anticipated climate change impacts.

The LCCAAP compliments and consolidates the implementation of the Bassendean Environment Plan. This Environment Plan provides a strategic framework for actions that target a number of key environmental areas and environmental threats.

Adoption and implementation of the LCCAAP will enable the Town of Bassendean to establish local government leadership in the area of climate change adaptation and mitigation, protect and enhance the environment as well as foster economic prosperity within the Eastern Region.

BOB JARVIS
Chief Executive Officer
Town of Bassendean

Acknowledgements

The preparation of the Local Climate Change Adaptation Action Plan (LCCAAP) required considerable effort, resources and coordination between the Town's relevant officers and the EMRC staff.

The Town of Bassendean would like to thank its staff members and other stakeholders for their contribution and support in this process.

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Introduction

The Town of Bassendean is located approximately 10 kilometres north-east of Perth, has over 14,000 residents and covers a total area of 11 square kilometres. The Town has 7 kilometres of river foreshore and some highly significant areas of public open space including the riverside parks of Success Hill Reserve, the former Pyrtton site, Point Reserve, Sandy Beach Reserve, Ashfield Flats and the river foreshore itself. Two areas, Success Hill Reserve and Ashfield Flats, are 'Bush Forever' sites and have great conservation value.

The diverse and varied landscapes, activities and communities of the Town are at risk from the impacts of climate change. Scientific modelling indicates that the South West of Western Australia, including the Town of Bassendean, will continue to be hard hit by forecast reductions in rainfall, increased temperatures and further reductions in surface and groundwater resources.

How Climate Change is Likely to Affect Perth's Eastern Region	
Climate change impacts for 2030 have been predicted to include (IPCC 2007, IOCI 2005):	Our Climate in 2070:
<ul style="list-style-type: none"> • WA will be hotter, particularly in inland regions. Expected average temperature will increase 0.5 to 2 degrees. • Annual average number of days above 35 degrees could increase from the current 28 days to 29 – 48 days. • WA will be dryer, particularly in the South West. Rainfall reductions of 2 to 20% in annual rainfall with a 17% reduction in winter rain days and catchment runoff decreases of 5 to 40% are expected. • Sea-level will increase by 3 to 17 cm. • More frequent heat waves per year. • More frequent and severe droughts. • Increased bushfire risk. • Increased storm and flooding intensity. • More frequent and intense tropical cyclone occurrence. 	<ul style="list-style-type: none"> • WA average temperature will continue to rise. Expected average temperature will increase up to 3 to 4 degrees. • Perth's annual average number of days above 35°C could increase from the current 28 days to 36 – 67 days. • WA will continue to become drier, with rainfall reductions of 5 to 20%. • Sea level will increase by 25 to 75 cm. • More frequent heat waves per year. • More frequent and severe droughts – up to 80% more droughts than current patterns. • Increased bushfire risk. • Increased storm and flooding intensity. • More frequent and intense tropical cyclone occurrence.

Source: CSIRO and BOM (2007), IPCC (2007) and IOCI (2005)

These forecasted changes to the climate will create a huge challenge for Local Government, impacting on infrastructure, land use planning, biodiversity, environmental health, fire and emergency services as well as parks and reserve management. Other broader key risks include the potential for changing economic viability of local industries and social dislocation.

The Town has already taken considerable steps to reduce its contribution to climate change by reducing or mitigating its greenhouse gas emissions. While mitigation continues to be important (as it is only through continuing reducing carbon emissions that climate change trends can be

slowed or even halted), it is now widely recognised that some climate change is unavoidable and that we will need to adapt to these changes.

Adaptation is about taking action to avoid, manage or reduce the consequences that will be brought about from climate change and extreme weather events. Effective adaptation also requires recognising and taking advantage of the opportunities that new markets and new skills may present.

This Local Climate Change Adaptation Action Plan (LCCAAP) compliments and consolidates the implementation of the Town's Environment Plan and Strategic Plan. These Plans provide a strategic framework for actions that target a number of key environmental areas and environmental threats. The LCCAAP, on the other hand, focuses on the threat of climate change and how it will affect not only the environment but the Town's business operations and its communities.

This Plan will ensure that the Town has the capacity and knowledge to adapt to the changing circumstances and can continue to strengthen our community, foster economic prosperity and protect and enhance the environment.

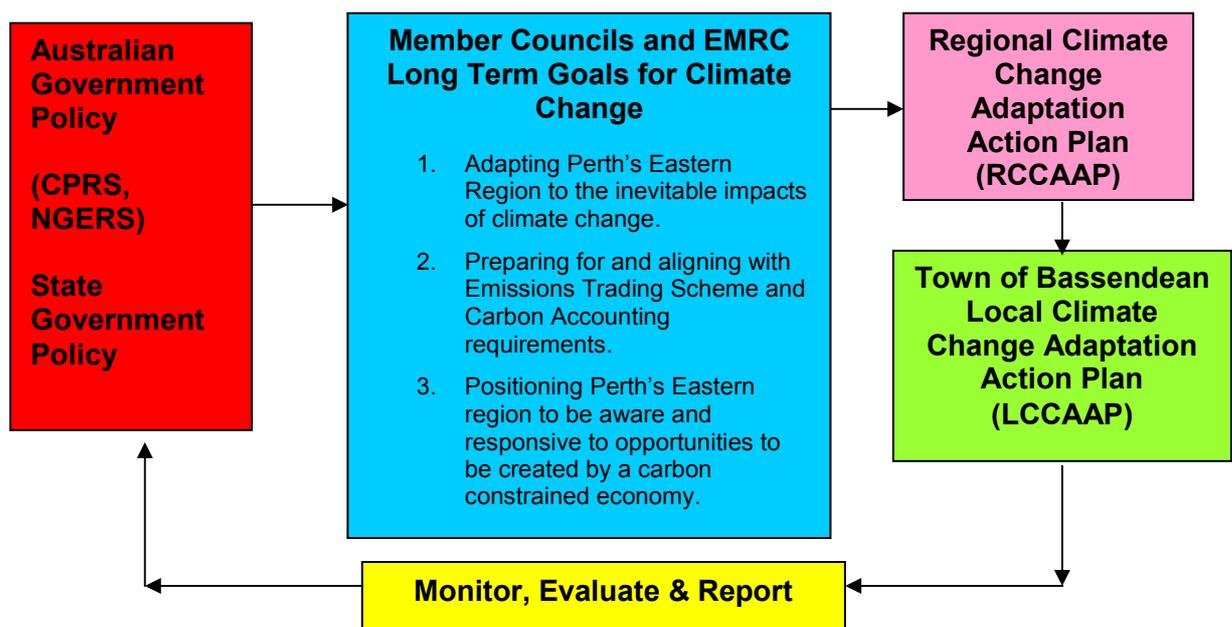
Regional Strategic Framework for Climate Change Adaptation

The potential impacts from climate change are both varied and extensive. In order to effectively adapt to the impacts of climate change the Town cannot act in isolation from the regional, state or national context.

For this reason, the Town of Bassendean along with the EMRC and other member Councils collaborated to undertake a comprehensive risk assessment to identify potential impacts and risks from climate change for the Perth Eastern Region. In addition, actions that could better prepare the Region to adapt to the pressures of climate change were identified. This formed the basis of a Regional Climate Change Adaptation Action Plan (RCCAAP) outlining what needs to be done at the regional level to adapt to climate change. A comprehensive methodology overview, which has been applied to assess regional and local climate change risks and identify adaptation measures and actions to treat the risks, is included in Attachment 1 of this document.

To consolidate the complement of work done at the Regional level, the Town has developed this Local Climate Change Adaptation Action Plan (LCCAAP). While the Regional Plan identifies actions which benefit from a regional approach, the LCCAAP focuses on actions related to the Town's operations, and those that are local in nature and/or partner with the community. This will ensure that climate change adaptation is integrated into the day to day planning and risk management activities of the Town and its communities. Attachment 2 outlines the Town of Bassendean's risk assessment and adaptation processes the Town undertook to develop its LCCAAP.

The relationship between the RCCAAP, the LCCAAP and the wider state and national context is described in the diagram below. The alignment of local and regional planning, within the wider context, will ensure a well planned and comprehensive approach for adapting to the challenges that are presented by climate change.



Vision Statement

Town of Bassendean's Strategic Plan 2010 – 2011 Vision:

- To value our heritage, protect and enhance our environment and provide sustainable living environments.
- To provide good governance with a focus on sustainable outcomes.

To reflect this vision the Town will implement a range of climate change adaptation and mitigation measures in order to better prepare, protect and inform its residents and rate payers for anticipated impacts of climate change.

The vision will be achieved through the application of a best practice risk management framework that sets strong, clear goals and is underpinned by sustainable principles that drive all actions outlined in this plan.

Aim and Principles

The aim of the LCCAAP is to provide a risk management approach and to clarify and develop local policy and planning to enable the Town to adapt to the issues of climate change.

The LCCAAP will address key issues by aiming to:

- Prepare itself and take necessary action so that it can adapt to the expected impacts of climate change with minimal impact to its operations and its community;
- Promote resilience and support local communities in partnering with the Town to improve the management of the local environment and community public assets;
- Secure future-focussed transport, planning and building systems that support low emissions and accommodate a changed climate;
- Identify and support communities to adjust to the cost of a low emissions economy so they are not disadvantaged as a result of climate change.

The following principles will underpin all future planning of initiatives relating to climate change adaptation while also addressing the key drivers for change.

The key principles are:

- Continue to seek knowledge and improve our understanding of future climate change and its expected impacts;
- Value and engage with the community and other stakeholders in planning for climate change;
- Ensure that risk from climate change impacts are minimised and benefits to the community are maximised;
- Ensure that the Town's planning schemes and development plans for commercial and residential development reflect the principles of future proofing for climate change;
- Ensure that local initiatives are supportive of the RCCAAP actions that are taken at a regional level; and
- Ensure community awareness and engagement occurs during planning and implementation processes.

Priority Risk Areas

Ten priority risk areas, which contain actions for implementing climate change adaptation, have been identified. These align with the ten priority risk areas identified in the RCCAAP for Perth's Eastern Region (Appendix 1 and 2).

The 10 Priority Risk Areas, listed in no particular order, are found in the table below.

Priority Risk Areas	
1	Infrastructure Failure
2	Impacts on Essential Services (Power Loss and Water Availability)
3	Watercourse Damage and Loss
4	Increase in Bushfire and Urban Fire Events
5	Water Decline and Reduced Water Quality
6	Greenhouse Gas Emissions and Related Air Pollution
7	Loss of Ecosystems and Provision of Public Open Space
8	Decline in Population Health and Displaced Wellbeing
9	Economic Challenges and Opportunities
10	Changing Leadership and Development Requirements

Note: Some actions cross over more than one priority risk area.

RISK ANALYSIS

A risk matrix was applied to establish a prioritisation value for each risk. A risk matrix presents combinations of consequence and likelihood and aligns them to a risk level.

Risk Matrix

LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	Medium
Rare	Low	Low	Low	Low	Medium

Following this matrix, an impact that is Almost Certain to occur, which has a Moderate consequence, is considered to be a High Risk. While an impact that is Unlikely to occur, and has a Minor consequence, is considered to be a Low Risk. The definitions for each risk level are presented below.

EXTREME priority risks demand urgent attention at the most senior level and cannot be simply accepted as part of routine operations. Actions required to treat an extreme priority risk are likely to be beyond the standard operational procedures and require additional human and/or financial resources.

HIGH priority risks are the most severe that can be accepted as part of routine operations, but they will be the responsibility of the most senior operational management. Senior management will be responsible for ensuring that adaptation actions towards management of the risk are implemented.

MEDIUM priority risks can be expected to form part of routine operations but they will be explicitly assigned to relevant managers for action and maintained under review.

LOW priority risks will be maintained under review but it is expected that existing controls will be sufficient.

In general, EXTREME and HIGH priority risks need to be treated immediately or subject to more detailed analysis. Low priority risks on the other hand, may be set aside with no further action to treat them apart from routine reviews to ensure that there has been no change that would make them more severe.

TIMEFRAMES

The timeframes link to Local Government planning and budget cycles and were selected based on an understanding of the local context in which the action would be implemented. This four year plan will address each of the priority risk areas in turn and identify the actions necessary to achieve the objectives.

Timeframe	Time	Comment
Immediate	2011 - 2012	Actions to be completed in 2011 - 2012
Short term	2012 - 2013	Actions to be completed in 2012 - 2013
Medium term	2013 - 2014	Actions to be completed in 2013 - 2014
Long term	2014 - 2015	Actions to be completed in 2014 - 2015
Ongoing	Are in progress and will continue as part of business as usual	Some activities have already commenced by virtue of other programs/projects being undertaken to date. These activities complement and support climate change adaptation and are therefore being reflected in this plan and will also be delivered through other plans.

MONITORING AND REVIEW

The Town of Bassendean's LCCAAP is an informing document. Therefore, its contents should be regularly reviewed and updated, as should the progress in implementation, and the effectiveness of the adaptation measures in achieving their objective. This includes incorporating new climate change impact information as it emerges to feed into the Town's strategic planning process.

To assess performance, regular monitoring and evaluation needs to be undertaken. This enables improvement of operational plans and allows corrective action to be taken in the case of shortfalls and constraints. Regular monitoring also ensures that the process is implemented in a timely and cost effective manner. To assist with the monitoring and ongoing review of the LCCAAP the Town of Bassendean will maintain the current Timeframe, Budget and Responsible Department columns in the action tables when recording and documenting Actions Required.

The LCCAAP will be monitored annually to determine progress against the Plan. The Town will be responsible for regular monitoring and review of the actions on an annual basis. This will be included in relevant officers' work plans and reported upon via various Council reporting mechanisms.

A major review of the LCCAAP will be undertaken in 2013 - 2014 to identify future action that might be needed and will take into account any changes to climate change action at a regional scale.

Priority Risk Area 1 – Infrastructure Failure

The provision and maintenance of infrastructure is one of the core responsibilities of local government and is vital for making the environment more practical and accessible for the community. Each year, the Town spends a significant amount of its budget on improving existing and providing new footpaths, dual pathways, roads, facilities, parks and drainage.

Climate change factors such as drought, bushfires, extreme rainfall and flooding, extreme temperatures and acid sulfate soils will have the potential to impact upon this physical infrastructure. Infrastructure, including roads, building and drainage, may all require higher costs for maintenance, more frequent repair and maintenance schedules and additional costs for upgrading. Similarly, consideration needs to be given to changing requirements in relation to higher building and construction standards when planning for and maintaining assets.

The Town must also play a role when it comes to infrastructure that, while not owned by the Town, is located within the Town boundaries. Through its planning and development functions the town has the potential to influence the climate resilience of privately owned infrastructure.

Objective(s)

- To ensure the Town’s current and future infrastructure is resilient to the impacts of climate change.
- To ensure the Town’s planning processes and development approvals give due consideration to potential future climate change impacts.

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
1.1	Advise residents of Council adopted capital works programs.	Ongoing	High	Part of Bassendean Briefings + in kind support	Asset Services
1.2	Deliver community education programs on the relevance of Asset Management programs.	Ongoing	High	~ \$2,500 Subject to funding; Subject to cost in kind	Asset Services
1.3	Install, where appropriate, signage to indicate flood prone areas.	Immediate	High	Part of \$32,000 Grant + in kind support	Community Development / Asset Services
1.4	Review and update the Local Emergency Management Plan to ensure known climate change impacts are considered and vulnerable groups are protected.	Short	High	Subject to normal budget expenditure; Subject to funding;	Community Development

#	Action Required	Timeframe	Risk Level	Budget <i>(subject to funding, subject to costs in kind, subject to normal budget expenditure)</i>	Responsible Department
1.5	Review and where necessary increase insurance coverage to ensure adequate protection.	Ongoing	High	Reviewed annually and subject to normal budget expenditure	Corporate Services
1.6	Update local planning strategies to incorporate a discussion on the potential impacts of climate change.	Medium	High	Subject to cost in kind	Development Services
1.7	Review the Town Planning Scheme to take into consideration future climate change impacts.	Long	High	Subject to cost in kind	Development Services
1.8	Apply Australian Standard as revised for Residential/Commercial Slabs & Footings – Construction to all new building licences.	Long	High	Subject to normal budget expenditure	Development Services

Priority Risk Area 2 – Impacts on Essential Services

Power and water services are essential for the Town’s operations, the Town’s business and community sectors, households and residents. Interruption to or loss of these services for any period of time can have severe repercussions.

Disruption to electricity, fuel and/or power supplies may result in consequences such as increased electricity and fuel costs; lack of access to air conditioning and lighting; and disruptions to medical equipment, refrigeration and commercial equipment, resulting in various negative health and financial consequences.

Increased temperatures and decreased rainfall have reduced water availability in the South West of Western Australia. This has implications for residential, rural and industrial/commercial water use and could result in increasing costs and further restrictions being placed on water consumption.

The provision of power and water are essential services provided for by the State Government and as such the Town has limited ability to influence future proofing of these services other than through advocacy.

The RCCAAP details a comprehensive range of advocacy actions that focus on pursuing positive and sustainable outcomes for the provision of these services in the Perth Eastern Region. While the EMRC will take the lead in advocating for the Region, the Town will provide support and strength to these advocacy campaigns.

However, the Town can encourage the use of alternative energy and water sources as a diversity of energy and water sources will create less pressure on the existing systems and will provide a valuable source if the existing services are lost or disrupted.

Objective(s)

- Promote and encourage the use of alternative energy and water sources.

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
2.1	Promote the use of storm or rain water and recycled water, and promote these principles in new civic infrastructure.	Ongoing	High	Subject to costs in kind	Asset Services
2.2	Advocate the use of rainwater tanks through Council policy, and promote this policy via Council's website and Bassendean Briefings.	Ongoing	High	Subject to normal budget expenditure	Development Services

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
2.3	Promote and encourage PV panel and solar hot water system installation and other renewable energy source supplies within residential and commercial sector.	Ongoing	High	Subject to normal budget expenditure	Development Services
2.4	Incorporate passive solar building design in the Town Planning Scheme.	Ongoing	High	Subject to normal budget expenditure	Development Services
2.5	Incorporate Water Sensitive Urban Design in the town planning and development processes.	Ongoing	High	Subject to normal budget expenditure	Development Services
2.6	Undertake community education campaign with a focus on water and energy conservation.	Ongoing	High	Subject to normal budget expenditure	Asset Services
2.7	Support community engagement programmes such as 'Living Smart'.	Immediate	High	Subject to normal budget expenditure	Asset Services/EMRC
2.8	Promote available grant/rebate funding for alternative energy and improve information provided to residents on energy efficiency.	Short	High	Subject to costs in kind	Asset Services
2.9	Support community engagement programmes such as 'Travel Smart'.	Medium	High	Subject funding to	Asset Services/EMRC

Priority Risk Area 3 – Watercourse Damage and Loss

The Town's watercourses play a vital role in collecting and distributing water, sustaining ecosystems and contributing to water supply. They support an extremely high diversity of living organisms and play an important role in many physical, biological and chemical processes. Watercourses are an important feature of the natural environment and as such, it is critical that their health and viability is maintained.

In addition to the existing pressures from land use, salinity and loss of vegetation, climate change will add further pressure by increasing erosion and subsidence, sedimentation, flooding and creating potential acid sulfate soils.

The Town's watercourses are likely to be impacted by alterations to sea levels and tidal and saltwater incursion further up the Swan River (Swan River Trust, 2007) leading to salt water incursion into wetlands and groundwater supplies, flooding of low lying areas and altered biodiversity. The consequences of increased periodic river flooding events include:

- Damage to infrastructure;
- Higher risks to public safety and therefore higher costs for management, e.g., signage for peak events, temporary road and park closures and diversion of traffic;
- Higher costs for storm water drainage maintenance, repairs and upgrades; and
- Higher emergency management and response costs.

Foreshore erosion and subsidence poses a significant risk to infrastructure, vegetation and habitat along waterways. It also can be a risk to public safety and amenity. Rigid building structures along the river foreshores such as dual use paths, bridges, jetties, retaining walls and sandy beach fronts are at risk from erosion and subsidence.

Drought conditions are likely to exacerbate erosion and downstream sedimentation. Higher sediment loads enter rivers following extreme rainfall events or extreme bushfire events, both of which are projected to increase with climate change. Changed climatic conditions are also likely to produce conditions that favour riparian and aquatic weeds and algal blooms (Australian Government Department of Climate Change, 2009). Sedimentation may also lead to increased blockage of gutters and drains.

The Town's watercourses which are used for both public and private extraction provide important environmental flows supporting wetlands and groundwater dependent vegetation. Falling groundwater tables and pressure for inner city high rise density development in and around waterways have the potential to expose potential acid sulfate soils (PASS).

The Town's watercourses and foreshore areas are an invaluable environmental and community asset that will be under significant threat unless adaption measures are put in place sooner rather than later.

Objective(s)

- To effectively manage the impact of acid sulfate soils within the Town's boundaries.
- Improve the community's understanding and awareness of watercourse and foreshore management and protection.
- Ensure the Town's planning and development activities create a positive impact on foreshore areas and watercourses.

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
3.1	Test for acid sulfate soils when undertaking construction activities within mapped acid sulfate soils zones.	Immediate	High	Subject to normal budget expenditure	Asset Services
3.2	Develop management plans where acid sulfate soils have been identified.	Immediate	High	Subject to normal budget expenditure	Asset Services
3.3	Ensure that acid sulfate soils are considered in the development application process.	Immediate	High	Subject to costs in kind	Development Services
3.4	Continue to consider the impacts of the floodplain on new developments.	Immediate	High	Subject to normal budget expenditure	Development Services
3.5	Adopt and implement erosion and sediment control guidelines/policies.	Short	High	Subject to normal budget expenditure	Development Services
3.6	Ensure that acid sulfate soils information maps in the Geographic Information System (GIS) are maintained and updated.	Short	Medium	Subject to costs in kind	Asset Services
3.7	Continue to provide training to staff on acid sulfate soils.	Immediate	Low	Subject to normal budget expenditure	Asset Services
3.8	Apply to Fire Emergency Services Authority (FESA) of Western Australia for grant funding to implement community education programs related to flood management.	Immediate	Low	Part of \$32,000 Grant + in kind support	Community Development
3.9	Continue with soil erosion and revegetation and stabilisation programs.	Immediate	High	Subject to normal budget expenditure; Subject to funding	Asset Services

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
3.10	Continue with drainage water quality monitoring programs.	Immediate	High	Subject to normal budget expenditure; Subject to funding	Asset Services
3.11	Continue to progressively implement water sensitive design across Council operations.	Short	High	Subject to normal budget expenditure; Subject to funding	Asset Services
3.12	Apply for funding for foreshore protection infrastructure as funding opportunities arise.	Ongoing	High	Subject costs in kind to	Asset Services
3.13	Provide educational information to the community through local publications (eg. Bassendean Briefings).	Ongoing	Low	Subject costs in kind; Subject to funding	Asset Services
3.14	Incorporate CC policy effects related to foreshore areas into Local Planning Policies	Ongoing	High	Subject costs in kind to	Development Services
3.15	Undertake feasibility study to determine best locations for the water harvesting and water quality improvement practices.	Medium	High	Subject to normal budget expenditure; Subject to funding	Asset Services
3.16	Review the updated flood risk data through the Bassendean Local Emergency Management Committee (BLEMC) and conduct a desktop simulation of a flood within the Town of Bassendean.	Short	Low	~ \$2,000 + Subject to normal budget expenditure	Community Development

Priority Risk Area 4 – Increase in Bushfire and Urban Fire events

Bushfire and urban fire events have the potential to take lives and destroy infrastructure and property. Risks to the Town include injury to residents in the local areas, damage to infrastructure and facilities and disruption to services.

Bushfire and urban fire events create higher costs through loss and damage of both public and private infrastructure, loss of natural vegetation and the loss of the significant community and Local Government investment in environmental management.

Bushfires and urban fires also create significant environmental impacts, including loss of vegetation, loss or displacement of fauna, erosion, sedimentation of watercourses, air pollution which can impact on health and the release of greenhouse gases.

The bulk of scientific evidence argues that the magnitude and intensity of bushfires and urban fires is expected to rise as a result of climate change. The Town needs to plan and prepare for this increase in bushfires, including the need for increased management and prevention activities.

Objective(s)

- Undertake appropriate planning and management activities to ensure the Town and its residents are prepared in the event of a bushfire.

#	Action Required	Timeframe	Risk Level	Budget (<i>subject to funding, subject to costs in kind, subject to normal budget expenditure</i>)	Responsible Department
4.1	Provide information to residents through Bassendean Briefings and the Town's website on actions they can take to prevent and prepare for bushfires.	Ongoing	Low	Subject to normal budget expenditure	Ranger Services
4.2	Conduct regular Bassendean Local Emergency Management recovery exercise and training to ensure all relevant staff are familiar with the process.	Short	Low	~\$5,000 (training) Subject to normal budget expenditure	Community Development
4.3	Continue prior to any fire events assisting community to be self reliant.	Ongoing	Medium	Subject to normal operational budget expenditure	Community Development

Priority Risk Area 5 – Water Decline and Reduced Water Quality

With the current water shortage in Perth, water conservation is now a high profile issue. With consumption ever increasing and the unreliability of supply due to climatic changes (increased temperatures and decreased rainfall), water availability and water quality will be a continuing challenge to the Town and its communities.

The consequences of reduced rainfall and declining groundwater tables include higher costs for managing natural water features in parks and reserves such as creek-lines and lakes/wetlands. These costs may include management of botulism outbreaks at more locations and over longer periods than currently, replacement or re-establishment of vegetation lost through changing hydrology, higher costs for monitoring vegetation and for analysing and responding to observed changes.

Reduced water quality leading to illness and disease is also a concern with consequences such as increased prices and increased competition for water. This may also have an impact on public health programs and result in more demands on the Town’s environmental health officers.

The Town is addressing water consumption and water quality issues by participating in the Water Campaign™ Program, an initiative of the International Council for Local Environmental Initiatives. The Campaign provides a framework for Councils to improve their water management and influence the community’s water management.

Objective(s)

- To decrease the Town’s water use and improve water quality through appropriate management activities.
- To encourage the community to undertake appropriate water conservation activities.

#	Action Required	Timeframe	Risk Level	Budget <i>(subject to funding, subject to costs in kind, subject to normal budget expenditure)</i>	Responsible Department
5.1	Continue to be involved in Continuous Local Authorities Group (CLAG) discussions and implement recommendations.	Ongoing	High	Subject to normal budget expenditure	Development Services
5.2	Continue participation in the Water Campaign™.	Ongoing	High	Subject to normal budget expenditure; Subject to funding	Asset Services/EMRC
5.3	Ensure that the Town’s watering regimes continue to meet State guidelines.	Ongoing	Medium	Subject to cost in kind	Asset Services

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
5.4	Develop policies for water conservation, including the promotion of water tanks, and directing run-off to landscaping areas, etc.	Ongoing	Medium	Subject to normal budget expenditure	Development Services
5.5	Continue to promote the use of low water use plants.	Ongoing	Medium	Subject to normal budget expenditure	Development Services; Asset Services
5.6	Implement the Water Conservation Plan for the management of Groundwater in the Town of Bassendean.	Ongoing	Low	Subject to normal budget expenditure; Subject to funding	Asset Services
5.7	Continue implementation of the 'Plants to Residents' program.	Ongoing	Low	Subject to normal budget expenditure	Asset Services
5.8	Continue to hold waterwise seminars for the community.	Ongoing	Low	Subject to normal budget expenditure	Asset Services
5.9	Continue funding of the drain water sampling programs.	Ongoing	High	Subject to normal budget expenditure; Subject to funding	Asset Services
5.10	Continue to provide educational articles on sustainable water management in local publications.	Medium	Low	Subject to normal budget expenditure; Subject to cost in kind	Asset Services

Priority Risk Area 6 – Greenhouse Gas Emissions and Related Air Pollution

The mitigation of greenhouse gases is an important component of climate change adaptation. The Town has successfully been reducing its emissions through participation in the Cities for Climate Protection program.

Significant achievements have included the purchase of 50% of the energy for the Town’s street lights from Green Power and since 2004 the Town has participated in a ‘Green fleet’ program to offset the CO₂ emissions produced by Council vehicles and as a result at least 17 native trees are planted for each car per year.

However, the Town recognises that it needs to continue to build on the significant progress it has already achieved. The Town also has a clear role to play in educating and facilitating the community to reduce its greenhouse gas emissions and to create a greater awareness and understanding of air quality issues.

Objective(s)

- To reduce the Town’s greenhouse gas emissions by undertaking appropriate energy management practices including the use of alternative energies.
- To improve the community’s awareness and understanding of greenhouse gas and air quality issues.

#	Action Required	Timeframe	Risk Level	Budget (<i>subject to funding, subject to costs in kind, subject to normal budget expenditure</i>)	Responsible Department
6.1	Continue participation in the carbon reduction program.	Ongoing	High	~\$11,000 Subject to normal budget expenditure	Asset Services
6.2	Continue to purchase 'Green Power' (renewable energy).	Ongoing	High	~\$ Subject to normal budget expenditure	Asset Services
6.3	Continue supporting programs to achieve energy and emission reductions (eg ACEr & Perth Solar City).	Ongoing	Medium	ACEr ~\$3,500, Solar City Program ~\$16,500 Subject to normal budget expenditure	Asset Services/EMRC
6.4	Provide a link from the Town’s website to the Department of Health’s health warnings & smog alerts.	Short	Medium	Subject to costs in kind	Development Services

#	Action Required	Timeframe	Risk Level	Budget (<i>subject to funding, subject to costs in kind, subject to normal budget expenditure</i>)	Responsible Department
6.5	Provide information and education on energy conservation and efficiency to the community.	Short	Medium	Brochure ~\$5,000 Education ~\$3,000 Subject to normal budget and staff to costs in kind	Asset Services
6.6	Install energy efficient equipment in all new Town facilities and consider retrofitting in existing Town facilities where possible.	Ongoing	Medium	~\$20,000 for Admin Building Subject to normal budget expenditure	Asset Services
6.7	Improve the Town's public building design by incorporating a 6 star Building Code of Australia rating requirement, or higher as adopted, in any new buildings.	Medium	Medium	Subject to costs in kind	Development Services
6.8	Continue to allocate funding to progressively implementing the Town of Bassendean Street Tree Master Plan which will encourage walking & cycling instead of car usage (OCM2 - 10/09/11)	Ongoing	Medium	~\$65,000/ year includes average of 180 trees & watering. Subject to additional budget	Asset Services

Priority Risk Area 7 – Loss of Ecosystems and Provision of Public Open Space

The Town's natural ecosystems are already under stress and climate change will add further pressures. Natural ecosystems are important to all aspects of life as they provide ecosystem services essential for life as well as supporting regional industries and economies.

Reduced rainfall and changed temperature regimes may result in local native species being unable to breed or survive in their current habitats. Failure to build resilience into our natural ecosystems and help them to adapt to climate change will result in far reaching consequences with many animal and plant species being lost forever.

The protection and rehabilitation of the Town's remaining bushland areas is of high priority and is currently being achieved through the co-ordination and implementation of the:

- Town's Operational Plan for Natural Areas;
- Town's Environmental Plan; and
- Collective Local Biodiversity Strategy.

An important aspect of protecting the Town's bushland is encouraging the community to 'plant local' – and this is achieved through public education and through the annual 'plants to residents' scheme which provides subsidised plants to residents every year towards the start of the winter rains.

A healthy natural environment is also essential for the health and well being of local communities by providing recreational opportunities. Climate change presents a real challenge for maintaining the current level of provision and amenity of sporting, recreational and leisure facilities.

The Town is required to balance finite resources against the community's expectations for increasing access to high quality public open spaces while also complying with a range of statutory obligations being placed upon them by State and Federal agencies relating to aspects of public open space provision. Falling groundwater levels and reduced groundwater allocations, increasing evaporation and urban expansion are also set to present a significant challenge for governance, policy development and management concerning the ongoing provision of irrigated sports grounds, public open spaces, verges and medians.

Objective(s)

- Engage, facilitate and support the community in the protection and rehabilitation of local ecosystems.
- Provide public open space that meets the community's needs and reflects the local ecosystems and environmental conditions.
- Continue and improve the Town's biodiversity and ecosystem protection and enhancement activities.

#	Action Required	Timeframe	Risk Level	Budget (<i>subject to funding, subject to costs in kind, subject to normal budget expenditure</i>)	Responsible Department
7.1	Implement the Strategic Bushland Weed Management Plan.	Ongoing	High	Subject to normal budget expenditure; Subject to funding	Asset Services
7.2	Review and implement the Bassendean Five Year Operational Bushland Management Plan and Biodiversity Strategy.	Short	Medium	Subject to normal budget expenditure; Subject to funding	Asset Services
7.3	Implement and promote via the Town's website the Streetscape Master Plan and the verge treatment guidelines to encourage the use of native ground covers and water wise verges.	Ongoing	Medium	Subject to costs in kind.	Asset Services
7.4	Continue with the 'Plants to Residents' program and community education program.	Ongoing	Medium	Subject to normal budget expenditure	Asset Services
7.5	Promote the 'Volunteer Bushcare Guide' and ensure that activities within bush areas are in accordance with rehabilitation requirements.	Ongoing	Low	Subject to costs in kind.	Asset Services
7.6	Consider climate change risks in the Town's biodiversity strategies and environment plans.	Short	High	Subject to costs in kind.	Asset Services
7.7	Ensure that ecosystem migration corridors are enhanced as part of the Council adopted Strategic Streetscape Plan.	Medium	High	Subject to normal budget expenditure.	Asset Services
7.8	Include a discussion on the protection of the natural habitat in the next review of the Local Planning Strategy.	Long	Medium	Subject to costs in kind.	Development Services;
7.9	Progressively provide formal access to the river foreshore to reduce environmental impact.	Ongoing	Medium	Subject to normal budget expenditure; Subject to funding	Asset Services
7.10	Provide training for relevant staff on environmental impact on ecosystems.	Ongoing	Low	Subject to normal budget expenditure	Asset Services

#	Action Required	Timeframe	Risk Level	Budget (<i>subject to funding, subject to costs in kind, subject to normal budget expenditure</i>)	Responsible Department
7.13	Assist volunteer groups in obtaining grant funding to undertake monitoring and rehabilitation activities in accordance with the 'Volunteer Bushcare Guide'.	Ongoing	Low	Subject to costs in kind.	Asset Services
7.14	Continue to provide educational articles on ecosystem impacts and the role of the ecosystem in local publications.	Ongoing	Low	Subject to costs in kind.	Asset Services

Priority Risk Area 8 – Decline in Population Health and Wellbeing

There is a growing recognition that climate change will have significant impacts on human health and populations. The increase in people suffering from disease and injury due to heatwaves and severe weather events, such as floods, fires and storms, will lead to ever increasing issues with mental health and stress and displaced and homeless people.

There may be an increased workload for the Town’s environmental health officers and management requirements to deal with potential health risks associated with changing climate. This includes an increased risk of vector, food and water borne disease as seasonal epidemics such as Ross River virus spreading south with changing climatic conditions; and increased injury levels sustained as a result of more frequent extreme weather conditions (e.g. floods, cyclones, gales).

There may be issues related to heat and sun exposure for individuals in public areas and community facilities. There may also be additional occupational health and safety concerns for staff, particularly for outdoor workers.

Displaced populations was identified as being a high risk to Local Government services and operations, with climate change possibly resulting in increased urban immigration on a regional, national and international level. Rising sea levels could see “climate refugees” relocate to Australia with consequences for the Town such as increased pressure for social services and social issues. Pressure to develop current undeveloped lands may also result with a need to meet increasing housing pressure.

Objective(s)

- To ensure that appropriate planning and policy mechanisms are in place to facilitate the management of increased health risks as a result of climate change.
- To ensure that appropriate policy, procedures and infrastructure are in place to protect the health and well-being of the Town’s staff and the community.

#	Action Required	Timeframe	Risk Level	Budget <i>(subject to funding, subject to costs in kind, subject to normal budget expenditure)</i>	Responsible Department
8.1	Review public event risk assessments to consider heat emergency issues.	Immediate	Extreme	Subject to staff in-kind costs & normal operational budget expenditure	Community Development
8.2	Review Occupational Health and Safety heat stress guidelines.	Immediate	Extreme	~ \$250 + in-kind support Subject to normal operational budget expenditure	Human Resources

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
8.3	Ensure that new Car Parking areas have shade trees in accordance with Council adopted TPS10 policy.	Immediate	Medium	Subject to costs in kind	Development Services
8.4	Research and list for budget consideration appropriate street furniture.	Short	Extreme	Subject to normal budget expenditure	Asset Services
8.5	Ensure new infrastructure designs reduce the opportunity for potential vector breeding sites.	Short	High	Subject to costs in kind; Subject to normal budget expenditure	Asset Services
8.6	Review and update the Local Emergency Management Plan to ensure known climate change impacts are considered and vulnerable groups are prepared.	Short	High	Subject to normal operational budget expenditure	Community Development
8.7	Provide shading within regional and district open spaces in accordance with the Town's adopted open space strategy.	Ongoing	Medium	~ \$10,000 pa to maintain District Open Space synthetic shade. Subject to normal budget expenditure	Recreation and Culture Services; Asset Services
8.8	Continue to promote the provision of awnings over footpaths within the Town Centre and shopping precincts.	Ongoing	Medium	Subject to costs in kind	Development Services
8.9	Review and update Health Local Laws in relation to mosquitoes where necessary.	Medium	Medium	Subject to normal budget expenditure	Development Services
8.10	Continue to provide educational articles on vector borne disease in local publications.	Short	Low	Subject to costs in kind	Development Services
8.11	Require health impact assessment for large scale residential developments in known vector breeding areas.	Medium	High	Subject to costs in kind	Development Services
8.10	Educate food businesses on the potential for increased risks associated with temperature control.	Medium	Low	Subject to costs in kind	Development Services

Priority Risk Area 9 – Economic Challenges and Opportunities

Apart from the obvious environmental and physical impacts of climate change, climate change will also impact on business, industry, employment and the cost of resources, creating both economic challenges and opportunities. The Town’s role in dealing with these challenges and opportunities is two-fold. Firstly, to maximise the efficiency of the Town’s operations so as to minimise the impact of rising resource costs. Secondly, to help its communities adapt to these new challenges and opportunities.

Increased resource costs will impact on many aspects of the Town’s operations and services, including energy costs, water costs, road construction, building construction and waste management. Not to mention, the costs of adapting to climate change and the participation in a potential carbon trading system. The Town’s residents will also be experiencing financial challenges from the increased costs of energy, water, fuel, food and services. It is important that the Town minimises any costs that it may have to pass on through increased rates and cost of services.

Business and industry within the Town may experience displacement due to climate change impacts. In addition, industries that require high inputs of carbon/energy and imported materials will be vulnerable, whereas industries requiring low levels of imports and carbon/energy will yield opportunities, such as service industries including health and education.

The growing role of Local Government in fostering economic development provides it with the mandate to support adaptation and innovation by existing industries. This will also facilitate a change in the industry mix to better match the altered climatic, economic and planning and regulatory conditions; and to attract new industries offering solutions to climate change. The Town has a competitive advantage given its inland location from vulnerable coastal conditions and the spread of existing residential, commercial and industrial areas. Employment self sufficiency and self containment rates are also much better than other corridors of Perth’s metropolitan area.

Objective(s)

- Reduce the need to pass increased resource costs onto the ratepayer by implementing a range of resource efficiency measures.

#	Action Required	Timeframe	Risk Level	Budget <i>(subject to funding, subject to costs in kind, subject to normal budget expenditure)</i>	Responsible Department
9.1	Conduct an audit of all Public Buildings to determine energy and water efficiency requirements.	Short	High	Subject to funding	Asset Services
9.2	Review Fleet Management Policy as improved energy use vehicle becomes available.	Ongoing	Medium	Subject to normal budget expenditure	Asset Services

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
9.3	Implement the recommendations of the audit of Public Buildings to improve water and energy efficiency.	Medium	High	Subject to funding; Subject to normal budget expenditure	Asset Services
9.4	Retrofit existing infrastructure to achieve energy and water efficiency for all assets.	Medium	High	Subject to funding; Subject to normal budget expenditure	Asset Services
9.5	Foster economic development to support adaptation and innovation by existing industries and to attract new industries offering solutions to climate change.	Medium	High	~\$1,000pa x 3yrs Subject to funding; Subject to normal budget expenditure	Economic Development Services
9.6	Investigate policies for local business to source staff from their local area.	Medium	Medium	~\$1,000 + resources to monitor local employment adverts	Economic Development Services
9.7	Promote and provide energy efficiency education to local businesses.	Medium	Medium	See 9.8	Economic Development Services; Asset Services/EMRC
9.8	Source funding to develop an energy auditing scheme for local businesses.	Medium	Medium	~\$10,000 Subject to funding; Subject to normal budget expenditure	Economic Development Services/EMRC
9.9	Investigate pedestrian and cycle access to commercial and public sites such as businesses, schools, shops and train stations that are located in the Town of Bassendean to improve sustainability.	Medium	Medium	~\$25,000 Subject grant funding and normal budget expenditure	Economic Development Services; Asset Services

Priority Risk Area 10 – Changing Leadership and Development Requirements

The Town's operations cover an extensive range of activities and an extremely large asset portfolio. It is inevitable that most of these activities and assets will be impacted by climate change. The decisions that will come with climate change adaptation will be unprecedented and the Town's decision makers will need to show both leadership and innovation.

In meeting the challenges that climate change will bring, the Town must be prepared to formally embed climate change into mainstream management and governance decision making. This means that climate change impacts and risks must be explicitly recognised and incorporated across all of the Town's plans and procedures.

A broader issue for climate change adaptation will be to understand the legal liabilities that all levels of government will be faced with. This will require clarification of issues and associated legal responsibilities such as disclaimers and insurance requirements to protect Local Government from litigation as a result of climate change events. Insurers will also need to be transparent on matters of indemnification in order to make a level playing field for all. Liability issues are an emerging concern, with the Climate Risk Group, an advisor to government and business, advising that developers and Local Governments may face risk litigation for negligence if they fail to factor climate change into planning.

In accordance with the LGIS experts' advice the Town of Bassendean due to anticipated climate change impacts may experience liability exposure and/or insurance cover implications in the following areas:

1. Property

- Buildings/infrastructure needs to be assessed and if necessary, added to the Property Schedule;
- There will be a number of specialist items that may be purchased for testing water quality, the Town needs to consider adding this equipment to the multi risks schedule;
- When making changes to or adding infrastructure, e.g. providing silt traps on drainage systems, it is important that the Town makes an informed decision taking into account additional risk exposures with the philosophy of taking "reasonable actions;"

2. Volunteers

- All formal volunteers who are registered with Council are covered by the Personal Accident/Travel policy. The cover for volunteers is limited to non refundable medical expenses (excluding gap cover), up to \$10,000 on any one claim and wages up to the limit selected by the Town. There are policy limitations on the age of the volunteers - currently 16 - 90, with a restriction of cover for volunteers aged 75 -90. (eg protection is also provided by the LGIS Liability Scheme for a volunteers negligence if a claim for third party property damage or personal injury occurs); Informal volunteers not registered with Council are not covered by Council's the Personal Accident/Travel policy
- If a group is volunteering then they will need to have their own Public Liability insurance cover and a copy of the current Certificate of Currency should be

presented to the Town annually. Any injury sustained by a volunteer of a group would not be covered by the Town's policies;

3. Fire fighting

- Fire Emergency Services Authority (FESA) is the Western Australia's leading fire hazard management agency. FESA is responsible for Emergency Management WA (EMWA), performs a critical role coordinating emergency services for a range of natural disasters and emergency incidents threatening life and property. It is the responsibility of FESA to ensure compliance with the Bush Fires Act 1954 and other laws and regulations.
- FESA supports the development of emergency management arrangements for Western Australia and the provision of quality advice and support on emergency management issues to key stakeholders. FESA has responsibility for:
 - State Emergency Management Committee
 - Emergency management policy and planning
 - Emergency management training and development
 - Mitigation
- No Town of Bassendean staff members or volunteers are to fight fires unless they have been appropriately trained by FESA to do so and the Town has in place appropriate insurance cover

4. Professional Indemnity

- Any review and/or changes to local laws including health local laws or town planning scheme and the subsequent advice, approvals and regulation of the changes may result in liability exposures;

5. Public Liability

- The implementation of some adaptation actions may result in additional risks with increased liability exposure for the Town i.e. ensuring that new car parking areas have shade trees, purchase of new street furniture, pedestrian and cycle access to business sites.

The Town has many active environmental groups working to restore and protect our significant environmental bushland and wetland areas. These groups participate in on-ground activities (tree planting, rubbish collection, weed control), research (flora and fauna surveys), educational programs and strategic natural resource planning. The participation and involvement of the community in the management, rehabilitation and protection of the natural environment is a key component in environmental management. The Town will need to continue to nurture and support this community participation as it will be an invaluable asset in climate change adaptation.

Objective(s)

- To build community and institutional capacity to meet the challenges of expected climate change impacts.
- To ensure the Town has a clear understanding of its legal responsibilities related to climate change and insurance.

#	Action Required	Timeframe	Risk Level	Budget (subject to funding, subject to costs in kind, subject to normal budget expenditure)	Responsible Department
10.1	Continue to allocate funding to provide bush care training and education for volunteers.	Ongoing	Medium	Subject to normal budget expenditure	Asset Services
10.2	Continue to engage the community and seek their participation in volunteer groups.	Ongoing	Low	Subject to normal operational budget expenditure	Community Development; Asset Services
10.3	Establish an internal steering group to ensure the implementation of the Local Climate Change Adaptation Action Plan (LCCAAP).	Immediate	Low	Subject to costs in kind	Asset Services/ EMRC
10.4	Develop and deliver staff seminars with a focus on climate change (involve external experts).	Medium	High	Subject to normal budget expenditure; Subject to funding	Asset Services/ EMRC
10.5	Undertake community surveys and consultation to determine community knowledge, expectations and beliefs in the area of climate change.	Medium	High	Subject to and to form part of the bi-annual \$25,000 Community Satisfaction Survey	Community Development Services/ EMRC

Acronyms and Abbreviations

AS – Australian Standard
ASS – Acid Sulfate Soils
ATSE – Academy of Technological Sciences and Engineering
BCA – Building Code of Australia
BOM – Bureau of Meteorology
CCP – Cities for Climate Protection
CLAG - Co-ordinating Local Authorities Group
CPRS - Carbon Pollution Reduction Scheme
CSIRO – Commonwealth Scientific and Industrial Research Organisation
DEC – Department of Environment and Conservation
DIA – Department of Indigenous Affairs
DOH – Department of Health
DOHg – Department of Housing
DOW – Department of Water
DOP– Department of Planning
EMRC – Eastern Metropolitan Regional Council
EPA – Environmental Protection Authority
FESA – Fire and Emergency Services Authority
HCWA – Heritage Council of WA
IOCI - Indian Ocean Climate Initiative
IPCC - International Panel for Climate Change
LCCAAP - Local Climate Change Adaptation Action Plans
LGIS – Local Government Insurance Services
MRS – Metropolitan Regional Scheme
MRWA – Main Roads WA
NGERS - National Greenhouse and Energy Reporting System
PASS – Potential Acid Sulfate Soils
PER – Perth’s Eastern Region
PTA – Public Transport Authority
RCCAAP – Regional Climate Change Adaptation Action Plan
RAS – Regional Advocacy Strategy
RES – Regional Economic Strategy
RITS – Regional Integrated Transport Strategy
SHRMF – Swan and Helena River Management Framework
SRT – Swan River Trust
WALGA – WA Local Government Association
WAPC – WA Planning Commission
WC – Water Corporation
WP – Western Power
WQIP – Water Quality Improvement Plan

Glossary

Adaptation	Making adjustments to existing activities and practices so that vulnerability to potential impacts associated with climate change can be reduced or opportunities realised.
Adaptation Action	Specific tasks required to ensure that the adaptation measure is implemented.
Acid Sulfate Soil	A soil with naturally occurring sediments that contain sulfides that have or may have the potential to generate sulfuric acid when exposed to air.
Algal Bloom	The proliferation of either macroalgae (seaweed) or surface scum accumulation or brightly coloured water due to microalgae (phytoplankton).
Climate Change	A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
Disease Vectors	An organism that does not cause disease itself but that transmits infection by conveying pathogens from one host to another, serving as a route of transmission.
Peak Oil	The point in time when the maximum rate of global petroleum extraction is reached, after which the rate of production enters terminal decline.
Resilience	The ability of human or natural systems to withstand, recover from or adapt to significant pressures and stresses without losing their essential characteristics.
Riparian	The area of land bordering a waterway, where the structure, function and composition of the landscape are influenced by the waterway.

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PLEASE NOTE THAT FOR THE PURPOSES OF UPLOADING THIS DOCUMENT ONTO THE TOWN OF BASSENDEAN INTERNET THE ATTACHMENTS (PAGES 34 to 139) RELATING TO REGIONAL AND LOCAL CLIMATE CHANGE RISK ASSESSMENT AND ADAPTATION METHODOLOGY HAVE BEEN REMOVED.

