

2010

# Climate Change Action Plan

Central Coast Council

*"...The Council appreciates that we must act now to reduce greenhouse pollution to avoid the worst impacts of climate change and to protect our regions long-term prosperity, environment and way of life. The Council also appreciates that we must act now to adapt to the impacts of climate change ..."*



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## Introduction

Scientific consensus is greater than ever before that global warming is happening, and that the predominant cause of this warming is the production of greenhouse gases from human activities (CSIRO, 2007).

Preparing Central Coast for the unavoidable impacts of climate change is imperative. Australia's climate is clearly changing and increasing temperatures, sea level rise, changing rainfall patterns and more frequent and intense extreme climatic events are likely (AGO,2007).

As a coastal community, Central Coast must plan for the impacts of climate change. Risks of inundation in low-lying areas and accelerated coastal erosion are particular concerns (Department of Climate Change, 2009). Given the uncertainties, but high probability that the sea level will continue to rise over the long term, it is important for the Council to determine how it will beneficially use coastal areas while recognising the long term planning need to protect, accommodate or retreat as sea levels rise.

The Central Coast Council recognises the importance of committing to the long term and strategic considerations of climate change and has included 'The Environment and Sustainable Infrastructure' as one of the five directions in the Strategic Plan 2009–2014. To achieve this strategic direction, the plan includes the following strategies and key actions:

*“...Contribute to the preservation of the natural environment ...*

- *Investigate and plan for the effects of climate change on the local area;*
- *Implement suitable climate change adaptation and/or mitigation strategies...”.*

Along with the Strategic Plan, the Council's environmental policy (appendix 1) is central to the Council providing a holistic and creative approach to sustainability. This policy commits

the Council to incorporating the principles of sustainability and best practice environmental management into its management systems and decision making processes, to ensure the sound management as well as the protection and development of the natural and built environment. Responding to the impacts of climate change is a large part of this.

The Council appreciates that we must act now to reduce greenhouse pollution to avoid the worst impacts of climate change and to protect our regions long-term prosperity, environment and way of life. The Council also appreciates that we must act now to adapt to the impacts of climate change we are already experiencing.

### *Why we are developing an action plan*

Central Coast Council is committed to providing the necessary leadership and direction to tackle the causes and impacts of climate change.

Climate variability is not new. Systems have been responding to variations in climate for centuries. The elements of surprise and flexibility of responses means that the widest possible range of plausible futures should be considered. Climate change offers opportunities as well as risk and multiple approaches and responses should be accommodated (CCC,2009).

As a first step in its response to climate change, the Council has adopted this Climate Change Action Plan. The plan outlines that the Council's response to climate change will involve a dual approach:

1. Management and reduction of greenhouse gas emissions (*mitigation*);
2. Making adjustments to existing activities and practices so that vulnerability to potential impacts associated with climate change can be reduced or opportunities realised (*adaptation*).

## Climate Change in Tasmania & Central Coast

There have been many changes in our climate over the past 50 years. Over most of Tasmania, average temperatures have increased by 0.8–1.0°C in line with the Australian average, with minimum temperatures increasing more than maximum temperatures. Rainfall has declined in most of the settled areas of Tasmania over the same period, with a decline of up to 20mm per decade in the North–West and South–East. There have been increases of 5–15 mm per decade in parts of the south–west (Tasmanian Climate Change Office, 2008).

Current science suggests that by 2030 Tasmania is likely to become warmer, with more hot days and fewer cold nights. Winters are likely to be warmer, with a significant reduction of snow cover in alpine areas (up to 40%), and the potential for an increase in flash flooding. Annual maximum temperatures are expected to increase in the North–East by 0.33% by 2040, with generally warmer minimum temperatures in winter and late spring/early summer across the State with a magnitude of about 1% (Tasmanian Climate Change Office, 2008).

Rainfall patterns are expected to change across Tasmania, increasing by 7–11% in the West and central areas and decreasing by approximately 8% in the North–East by 2040. By 2030, Tasmania’s coastal areas are also expected to be affected by a rising sea level and more frequent severe storm surges. These events are likely to result in coastal inundation and erosion, as well as damage to infrastructure, coastal biodiversity, aquaculture production and tourism (Tasmanian Climate Change Office, 2008).

Temperature and sea level rise are the only components of climate change of high relevance to the coastal zone, for which well developed quantified scenarios are available. There is high uncertainty in both the modelling and future scenarios for sea level rise. There is also high uncertainty in quantifying changes to

atmospheric circulation, storm intensity and frequency, which are also of high importance to the coastal zone. Ongoing monitoring of credible climate change projections is needed, together with monitoring of local processes such as water level and beach change (CCC, 2009).

The most recent scenarios for sea level rise are presented in the Department of Climate Change’s 2009 report *Climate change risks to Australia’s coasts: a First pass National Assessment*. The report states that the CSIRO has developed three simple scenarios for sea-level rise (relative to 1990), at three time-steps across the 21<sup>st</sup> Century (Table 1).

***Scenario 1 (B1)** considers sea-level rise in the context of a global agreement that brings about dramatic reductions in global emissions. This scenario represents sea-level rise that is likely to be unavoidable.*

***Scenario 2 (A1FI)** represents the upper end of the IPCC AR4 ‘A1FI’ projections and is in line with recent global emissions and observations of sea-level rise.*

***Scenario 3 (High end)** considers the possible high-end risk identified in AR4 and includes some new evidence on icesheet dynamics published since 2006 and after AR4.*

Year	Scenario 1 (B1)	Scenario 2 (A1FI)	Scenario 3 (High end)
2030	0.132	0.146	0.200
2070	0.333	0.471	0.700
2100	0.496	0.819	1.100

Table 1: Three global sea-level rise scenarios, 2030–2100 (metres)

The report then goes on to state that “very recent research also suggests that a 1.1 metre scenario by the end of the century may not reflect the upper end of potential risk, and that risk assessments could be informed by a higher level” (DCC, 2009 p.27).

Coastal areas in Tasmania already have some exposure to storm surge, erosion and other natural hazards without the compounding effects of climate change. Inundation analysis



suggests that between 8,700 and 11,600 residential buildings in Tasmania may be at risk of inundation from a sea level rise of 1.1 metres and storm tide associated with a 1-in-100 year storm event. Of these buildings 50% are located in the municipal areas of **Central Coast**, Waratah/Wynyard, Clarence and Break O'Day (DCC, 2009).

The Department of Climate Change (2009) states that 16% of the existing building stock in **Central Coast** may be at risk of inundation with the high end sea level rise risk scenario. The report provides images of Ulverstone (Figures 1 and 2) in 2009 with simulated inundation from a sea-level rise of 1.1 metres and a 1-in-100 year storm surge. Notably, however, these images are not suitable for decision making purposes.



Figure 1: Ulverstone without inundation



Figure 2: Ulverstone with simulated inundation

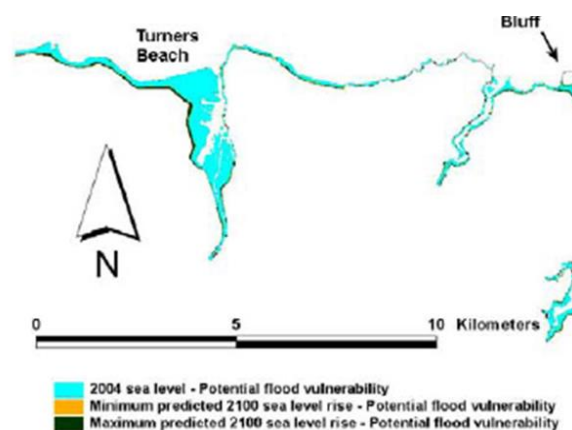
In 2008 the Council engaged Geomorphologic Consultants to undertake a site specific coastal vulnerability assessment of the Ulverstone

Showgrounds and Wharf sites. This assessment adopted a rise in sea level of 0.8 metres by 2100 and a maximum 100 year storm surge by 2100 of 2.667 metres. This is consistent with the CSIRO's scenario 2, but is less than the high end scenario of 1.1 metres which is adopted for the simulated inundation illustrated in Figure 2.

The consultants report concluded that *“under current climatic conditions the existing storm tide model suggests that the properties will not be subject to inundation for the 100 year ‘storm surge event’. The effects of climate change on tidal flooding means that inundation of the low lying show grounds should be expected for the 100 year storm surge event for the maximum 2100 scenario ... this would inundate the show grounds and may just reach the floor level of the indoor sports complex (2.643 AHD). Surrounding areas of West Ulverstone would also be inundated. The effect of this inundation would be minor damage to property but not necessarily loss of life as the inundation would be shallow and the flooding would not be sufficient to cause the collapse of any buildings”*. Notably, the report states that *“the worst case scenario could be argued to have a likelihood of far less than 1% Annual Exceedance Probability (AEP)”*.

Earlier reports on climate change such as Sharples (2004; 2006) have highlighted that in addition to West Ulverstone, localities such as Turners Beach are all likely to be impacted by the effects of climate change and sea level rise (figure 3).

Figure 3 – Turners Beach



## Current Responses

*International*

The international community has recognised that climate change presents a significant risk to human society. To further understand and address this risk, many organisations and response processes have been established including the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC).

A major outcome of the UNFCCC was the development of the Kyoto Protocol which commits many of the world's developed nations to emission reductions over the timeframe of 2008–2012. The Protocol has now been enacted but is unlikely to significantly impact global greenhouse gas emission levels over the time period due to the exclusion of the United States and concession arrangements for developing nations. Negotiations for a post-Kyoto Protocol are ongoing with the most recent round of discussions occurring at the December 2009 United Nations (UN) Copenhagen climate conference. The Copenhagen conference failed to establish a legally binding agreement with targets or a timetable to cut greenhouse gases. Rather, it established a non-binding Accord which was merely “noted” by the UN meeting, and which sets out the range of emission reduction promises that developed and



developing countries have made with a view to reducing global emissions so as to hold the increase in global temperature below 2°C. Under the Accord, developed countries will finance a \$10 billion a year, three year program starting in 2010 to fund developing nations' projects to deal with drought, flood and other impacts of climate change. It also set a "goal" of mobilizing \$100 billion a year by 2020 for the same purposes. The next round of discussions will occur in Mexico City in December 2010.

The IPCC is a scientific body responsible for increasing global understanding of climate change, its causes, impacts and solutions. The latest report from the IPCC in 2007 used its strongest language yet to state that climate change is human induced. It painted an extremely grim outlook for the world unless immediate action is taken to reduce greenhouse gas emissions.

Global leaders on climate change have included the European Union, particularly Scandinavian countries and the United Kingdom. The European Union has had an emissions trading scheme in place for several years and has set significant reduction targets. Climate change action in the United States (world's largest producer of greenhouse gases) slowed at the National level during the Bush Administration but individual states, such as California, demonstrated significant leadership in setting ambitious greenhouse gas reduction targets and backing them with tough policy and regulation. President Obama has identified climate change as a priority issue and has signalled significant action to reduce emissions in the future.

At an international level the economic case for early action on climate change was made by Sir Nicholas Stern in 2006 in the *Stern Review on the Economics of Climate Change* report where the key message was “*the benefits of strong, early action on climate change outweigh the costs* (Stern, 2006).



## National

Climate change came to the forefront in Australia in 2007 when it became a prominent election issue. After winning the election one of the first actions of the new Labour Government was to ratify the Kyoto Protocol. This means that Australia has accepted the Protocol's target of limiting Australia to an 8% increase in emissions above 1990 levels by 2012. This target is likely to be met but only due to a land use and forestry clause within the Protocol. Australia's actual emissions have significantly increased since 1990.

The Federal Government's response to the threat of climate change is based on three pillars:

- Reducing Australia's greenhouse gas emissions,
- Adapting to the impacts of climate change that can't be avoided, and
- Helping to shape a global solution.

The key mechanism which the Federal Government proposes to reduce Australia's greenhouse gas emissions in the Carbon Pollution Reduction Scheme (CPRS). The Government released its White Paper on the CPRS in December 2008. Within this document the Government proposes an unconditional greenhouse gas reduction target of 5% on 2000 levels by 2020. It also proposes that this target is increased to a maximum 25% reduction if strong international agreement is reached on climate change. These targets are proposed in the context of achieving a 60% reduction in greenhouse gas emissions by 2050.

The CPRS includes the implementation of an emissions trading scheme (ETS) which would see a financial value being placed on greenhouse gas emissions by large emitters. This trading scheme effectively creates a price signal on carbon and is expected to increase the costs of many goods and services, but particularly electricity and gas and over time petrol.



At a National level the case for early action on climate change was made by the *Garnaut Review on Climate Change* in 2008 which determined that the costs of inaction far outweigh the costs of action (Garnaut, 2008).

## State

In 2006 the State Government commissioned a report on coastal locations that would be vulnerable to the effects of climate change and sea level rise, based on the maximum and minimum predicted sea level rise for 2100. The Sharples Report (2006), as it became known, identified areas such as Turners Beach, and recommended upgraded mapping work, policy responses for development in vulnerable areas, specific assessments and modelling, and shoreline monitoring.

The climate change landscape changed further in 2006 when the Tasmanian Government released the *Draft Climate Change Strategy* for public comment. Since then, the Tasmanian Climate Change Office has been established in the Department of Premier and Cabinet and the *Climate Change (State Action) Act 2008* ('the Act') has been gazetted. This Act legislates a target for Tasmania to reduce its greenhouse emissions to at least **60% below 1990 levels by 2050**. This represents a target of 4.6 Mt CO<sub>2</sub>e, or around 49% below Tasmania's emissions in 2007. Achieving this target will require significant emission reductions across all sectors of the Tasmanian economy (Tasmanian Government, 2009). Additionally, the Tasmanian Climate Change Action Council was established under the Act to provide

independent advice to the Premier in climate change issues affecting Tasmania.

The Tasmanian Government's current response to climate change is outlined in the **Framework for Action on Climate Change**. The Framework establishes four key objectives:

1. Reducing our greenhouse gas emissions to at least 60% below 1990 levels by 2050,
2. Adapting to the changes in our climate that are occurring now and will continue to occur,
3. Capturing the new social, economic and environmental opportunities that climate change will present, and
4. Demonstrating national and international leadership as a model low-carbon economy and contribute to global climate change solutions.

In February 2010 the Tasmanian Government released the Wedges Report to identify and quantify greenhouse gas emission reduction opportunities for the State and their costs.

According to the report, on the back of continuing economic and population growth, emissions of greenhouse gases from Tasmania are projected to grow. Under reference case assumptions, with no further policies implemented to reduce emissions, the projection is for emissions to grow from 9.3 Mt CO<sub>2</sub>e in 2009 to 12.8 Mt CO<sub>2</sub>e in 2050. Imports of electricity to meet Tasmanian demand are projected to add another 11.3 Mt CO<sub>2</sub>e to emissions from the mainland. Under the Tasmania legislated target of 60% below 1990 levels, the target level of emissions in 2050 is 4.6 Mt CO<sub>2</sub>e. Thus, around 8.2 Mt CO<sub>2</sub>e of abatement is required by 2050 to achieve the target, if direct emissions in Tasmania are only considered. If Tasmania's contribution to mainland emissions is also considered as part of the target, then an additional 11.3 Mt CO<sub>2</sub>e (19.5 Mt CO<sub>2</sub>e in total)

of abatement would be required to be achieved in Tasmania (Tasmanian Government, 2010).

Three sources of emissions are projected in the Wedges Report:

- 1) Emissions for activities undertaken in Tasmania (Tasmanian emissions);
- 2) Emissions from electricity generated on the mainland and imported into Tasmania (imported mainland emissions).
- 3) Emissions avoided on the mainland from low or zero emission electricity generated in Tasmania and exported to the mainland (avoided mainland emissions) (Tasmanian Government, 2009)

The abatement options identified in this study should be sufficient for Tasmania to reach its target levels in 2050, as long as the options are developed as assumed. The abatement options examined in detail can be grouped as follows:

- Energy: Renewable energy – wind, solar thermal and solar PV, geothermal, biomass, wave and tidal, energy efficiency options, fuel switching from coal to gas, biomass or geothermal resources, cogeneration of heat and power using natural gas or biomass, substitution of biofuels for liquid fossil fuels in the manufacturing and commercial sectors.
- Transport: Switching to low emission vehicles, switching to biofuels as a fuel, improved vehicle fuel efficiency, improved freight efficiency, travel demand management and improved urban design, and air transport measures.
- Industrial processes: Aluminium industry measures (inert anodes), cement industry measures (limestone substitution, substitution of raw materials, substitution of cementitious materials, use of Tec-Kiln technologies), carbon capture and storage and substitution of biochar for coal as a reductant.

- Agriculture: Production efficiencies, fertiliser and soil management, gut microorganism management.
- Forestry and land use change: New forests, increased biosequestration in existing forests, and reversion of agricultural lands to native vegetation states.
- Waste: Flaring, waste to energy (including biofuels and biochar production), landfill emissions energy recovery and utilisation, wastewater emissions energy recovery and utilisation (Tasmanian Government, 2009).
- Ensuring appropriate local resources and arrangements are in place to provide disaster relief and recovery services to communities,
- Representing community interests in disaster management to other levels of government and contributing to Decision-making processes, and
- Participating in post disaster assessment and analysis” (CCC, 2009).

In March 2006 the Local Government Association of Tasmania (LGAT) established the Local Government Climate Reference Group. The primary focus of the reference group at that time was to:

## Local Government

Much of the response to climate change involves the prevention or management of situations in which property damage and risk to life and health may arise (ie emergency management). In 2003, the Council of Australian Governments (COAG) endorsed the contemporary roles and responsibilities of all three spheres of government with respect to emergency management. The Australian Local Government Association also adopted this position. In summary, it was agreed that “...local government’s principal roles and responsibilities are:

- Identify the needs of councils to improve the capacity to address potential climate change and sea level rise impacts at the local scale,
- Identify and share current activities undertaken by councils in relation to planning for climate change and sea level rise impacts,
- Identify existing research, projects and activities relating to climate change that are of interest to councils,
- Provide a Local Government perspective to other climate change initiatives, particularly those undertaken at other levels of government, and
- Inform a Local Government policy position on climate change and sea level rise.
- Ensuring all requisite local disaster planning and preparedness measures are undertaken,
- Ensuring an adequate local disaster response capability is in place, including local volunteer resources,
- Undertaking cost-effective measures to mitigate the effects of natural disasters on local communities, including routinely conducting disaster risk assessments,
- Systematically taking proper account of risk assessments in land use planning to reduce hazard risk,
- Undertaking public education and awareness, and ensuring appropriate local disaster warnings are provided,

In August 2008 the LGAT General Management Committee endorsed the Climate Change Work Plan, which outlines a series of actions for the LGAT and Local Council’s in Tasmania to assist in combating the social, economic and environmental impacts of climate change on their communities (LGAT, 2008).

In 2009 the LGAT engaged Planet Footprint to provide organisation greenhouse gas footprint reports for Tasmanian local Councils. The reports include annual energy mix, energy

consumption, total energy changes and energy greenhouse emissions.

## Greenhouse Gas Emissions

The first step in developing a successful Climate Change Action Plan is to be able to measure the greenhouse gas emissions that are produced by activities in Central Coast.

### Tasmania's emissions

The Intergovernmental Panel on Climate Change has estimated total global greenhouse gas emissions in 2004 at 49 gigatonnes (billion tonnes) of carbon-dioxide equivalent (CO<sub>2</sub>-e). In 2006 Australia emitted 576 megatonnes (million tonnes) CO<sub>2</sub>-e. This is less than 1.5% of total global greenhouse gas emissions. In 2006, Tasmania emitted about 8.5 million tonnes of greenhouse gases into the atmosphere. Most of Tasmania's emissions came from transport, agriculture, manufacturing and construction (see Chart below).

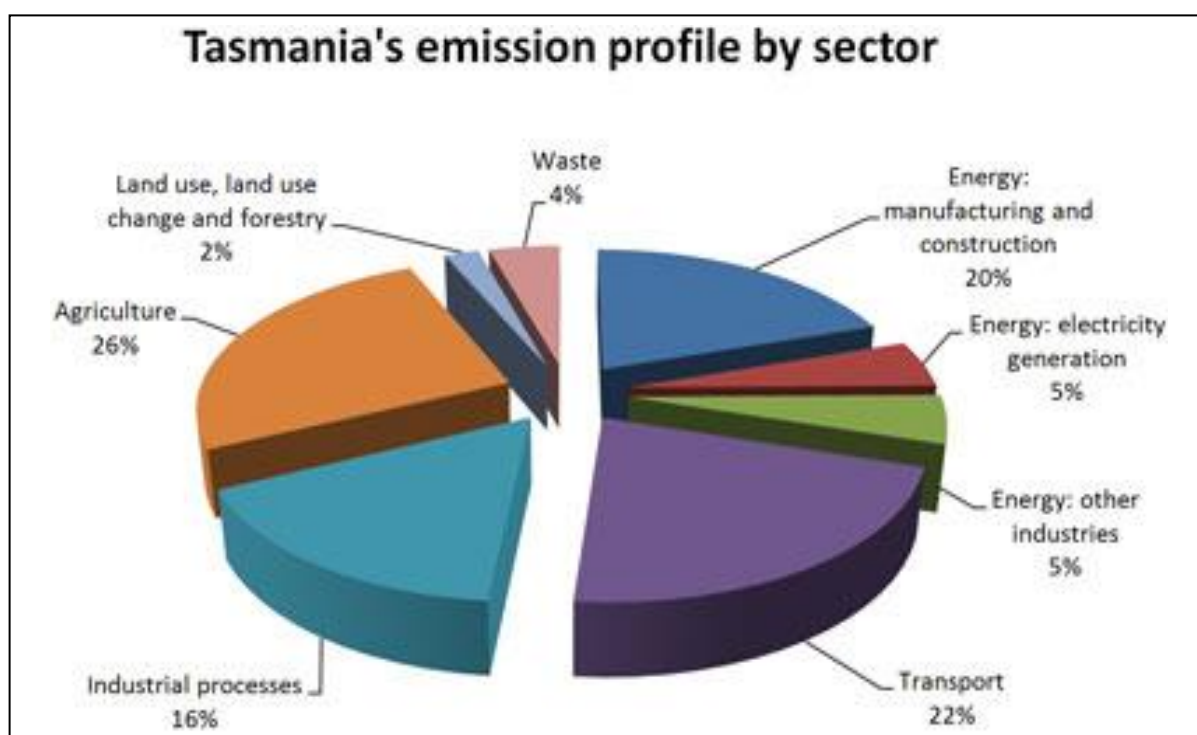
To date there has not been any specific studies undertaken to estimate greenhouse gas emissions which are produced by activities in Central Coast. The most significant sources of greenhouse gas emissions arising from activities in Central Coast would be split into two groups:

#### Carbon dioxide (CO<sub>2</sub>) emissions from:

- Housing, caused by electricity consumption,
- Businesses and public organisations by electricity and gas combustion, as well as other fuels, and
- Traffic/transport, arising from burning fossil fuels by vehicles using Central Coast's road network.

#### Methane emissions from:

- Landfill, estimated from tonnes of domestic waste sent to landfill each year, and
- Agriculture (livestock).



As part of the Climate Change Action Plan it would be beneficial to undertake a benchmarking project to quantify the greenhouse gas emission from Central Coast. Such a project would enable the Council to understand the current situation as well as the impacts of anticipated development, and trends in consumption. This would then facilitate the setting of specific reduction targets.

Notably, it is estimated that the average Australian is responsible for the emission of 21 tonnes of greenhouse gas emissions each year when both direct and indirect emissions are considered.

### Central Coast Council Emissions



In early 2009 the Council commenced working with Planet Footprint to produce an organisation footprint report. Planet Footprint is a subscription-based service that independently monitors and reports on the energy, fleet, waste and greenhouse performance of Councils. The report has established that the Council's total greenhouse emissions from all sources, including energy emissions from buildings, energy emissions from street lighting, vehicle fleet emissions and waste emissions, is as follows (also see figure 1):

- 2008/09 – **1,069** tonnes CO<sub>2</sub>(e)
- 2007/08 – **1,068** tonnes CO<sub>2</sub>(e)
- 2006/07 – **1,097** tonnes CO<sub>2</sub>(e)
- 2005/06 – **946** tonnes CO<sub>2</sub>(e)

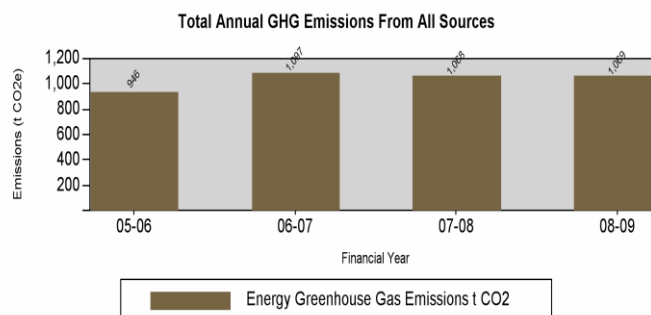


Figure 1: Council's total annual greenhouse gas emissions

Of the Council's sources of greenhouse gas emissions (figure 2), the vehicle fleet accounts for 74 % of the total emissions, with energy from Council buildings accounting for 13% and street lighting 13% also. Waste generation accounts for 0.31% (shown in figure 2 as 0%) of the Council's total greenhouse gas emissions. It should be noted that the waste does not include the municipal areas domestic waste stream, but relates merely to the waste generated by Council activities in the administration centre, childcare centres, depot (etc).

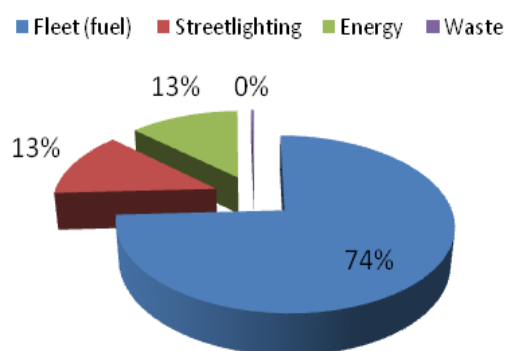


Figure 2: Council emissions by source

The percentage change over time of the Council's of greenhouse gas emissions is illustrated in figure 3. A couple of notable occurrences are demonstrated in this figure. Firstly, in the 4<sup>th</sup> quarter of 2005/06 there is an appreciable increase in the greenhouse gas emissions associated with the Council's energy and street lighting usage. This increase is a direct result of the Basslink becoming operational. Secondly, that the energy emissions fluctuate throughout each year as a result of seasonal influences such as heating and cooling requirements of buildings.



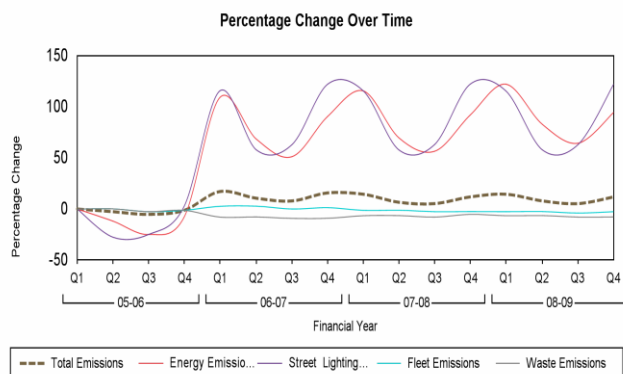


Figure 3: Council's greenhouse gas emissions percentage change over time

### Council Vehicle Fleet Emissions



Emissions from vehicles is a significant source of greenhouse gas in Central Coast

The Council's vehicle fleet comprising mostly sedans, trucks and plant account for the majority of the Council's greenhouse gas emissions.

The greenhouse gas emissions from the vehicle fleet are as follows (also see figure 4):

- 2008/09 – **803** tonnes CO<sub>2</sub>(e)
- 2007/08 – **808** tonnes CO<sub>2</sub>(e)
- 2006/07 – **840** tonnes CO<sub>2</sub>(e)
- 2005/06 – **817** tonnes CO<sub>2</sub>(e)

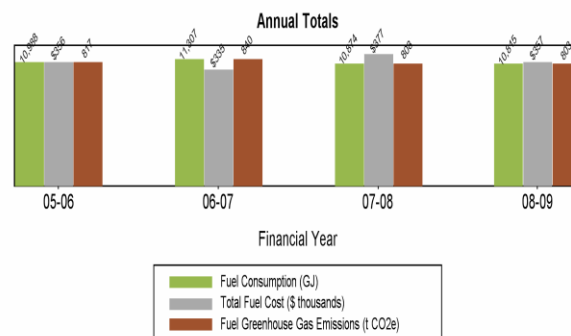


Figure 4: Council Fuel consumption data

As illustrated in figure 5, the Council's vehicle fleet emissions emanate predominantly from Diesel usage, with unleaded petrol accounting for around one third of the overall fleet emissions.

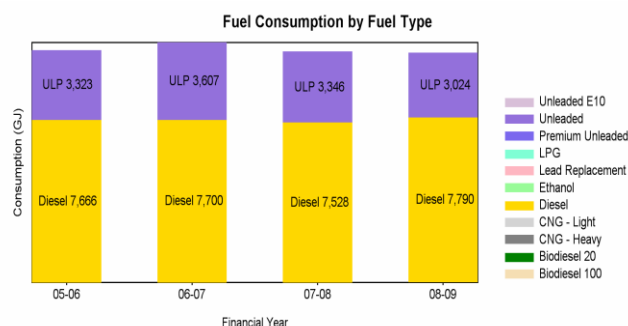


Figure 5: Council Fuel consumption data by fuel type

### Council Building Emissions

The greenhouse gas emissions from the Council's building assets is as follows (also see figure 6):

- 2008/09 – **131** tonnes CO<sub>2</sub>(e)
- 2007/08 – **126** tonnes CO<sub>2</sub>(e)
- 2006/07 – **123** tonnes CO<sub>2</sub>(e)
- 2005/06 – **61** tonnes CO<sub>2</sub>(e)

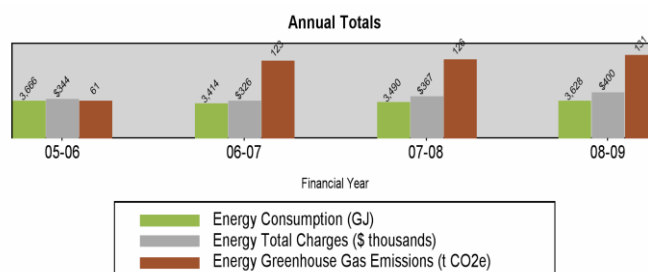


Figure 6: Council Building Emissions

## The Action Plan

This section outlines the actions that will begin to reduce Central Coast Council's carbon emissions towards the State target of 60% below 1990 levels by 2050 as set by the *Climate Change (State Action) Act 2008*. Further, it outlines the adaptation actions to existing activities and practices so that vulnerability to potential impacts associated with climate change can be reduced or opportunities realised.

### *Council's role in managing & reducing greenhouse gas emissions (Mitigation)*

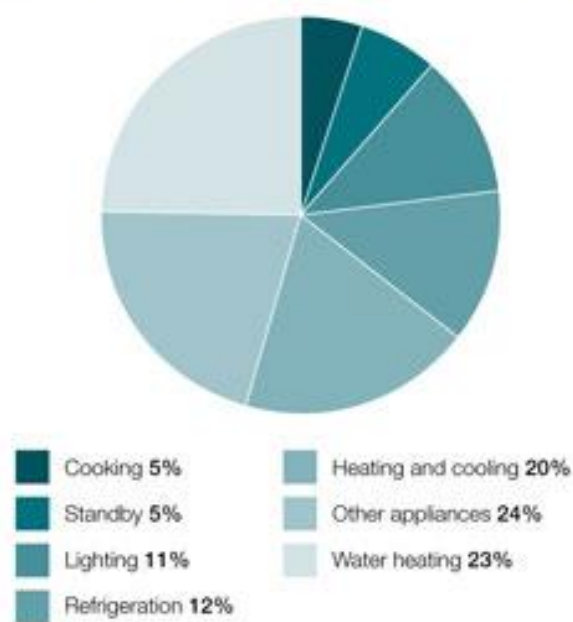
Council's role in community climate action extends to:

- Managing Council's own carbon footprint and leading by example (through the Central Coast Climate Change Action Plan);
- Influencing the behaviour of individuals, households, businesses and organisations on how they manage their carbon footprint through:
  - Providing both general and targeted services and programs,
  - Developing and brokering partnerships with other organisations (including businesses, community organisations and other government agencies) to provide products, services and programs,
  - Advocating for change of policies, laws and programs that will enable Central Coast's local community to reduce its carbon footprint, and
  - Building community engagement and networking opportunities around climate change action.

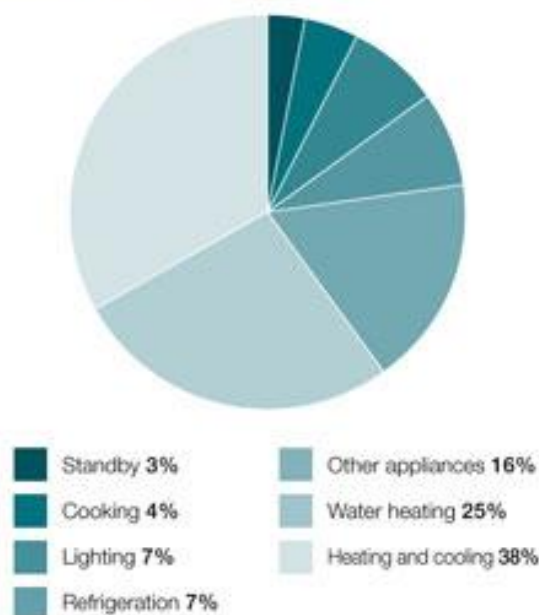
It is well established that greenhouse gas emissions from household energy use can be significantly reduced through use of more efficient appliances and energy conservation measures. Indeed, minimising demand for energy through conservation and efficiency is the most cost effective means of reducing operational and environmental costs for all

home owners and tenants. The following charts provide an estimate of the break-down of energy use and greenhouse gas emissions from homes to illustrate areas in which reductions in energy use can be readily achieved.

Greenhouse gas emissions from home energy use (Baseline Energy Estimates, 2008)



Home energy use (Baseline Energy Estimates, 2008)



In the 2007/08 Measures Evaluation Report for the Cities for Climate Protection Program in Australia, it was reported that over 20% of councils undertook actions to raise residents' awareness of climate change and what they can do about it. Actions included distributing information, holding community expos, promoting Greenpower and government renewable-energy rebates, running courses and workshops, and promoting local businesses that provide sustainability services. Additionally, more than 15% of councils reported providing residents with free or subsidised equipment such as energy-efficient light globes and water-efficient showerheads. Many of these actions were in partnership with private companies. Several councils, such as the Hobart City Council, now offer rebates for installing solar hot water, while some councils have also been encouraging residents to build more sustainable homes. Actions in this area include sustainable demonstration homes, requiring residents to assess the energy efficiency of projects when applying for building or planning permits, and lobbying state government to increase the minimum energy-efficiency requirements for housing (ICLEI, 2009).

### Council's climate change adaptation role

Adaptation to climate change, as a means of maximising gains and minimising losses, is becoming increasingly recognised as important for Australia. Adaptation must be considered alongside mitigation measures, especially in relation to long-term planning of infrastructure. While consideration must still be given to reducing greenhouse gas emissions to limit the extent and severity of climate change, it is also important to develop adaptation strategies that lessen the adverse impacts of climate change on the environment, society and the economy (AGO, 2007).

Successful coastal management adaptation will usually combine elements of retreat, accommodate and protect. For erosion, hard protection (in the form of seawalls) and soft

protection (through sand nourishment, supplemented and groynes) are generally technically feasible for sea level rise scenarios to 2100. For inundation there are fewer options, but some reduction in flooding may be achieved by flood barriers and substantial reduction in risk through hazard reduction and emergency planning (CCC, 2009).

Practical adaptive responses include:

- Land Use Planning Controls,
- A development freeze in some locations,
- Physical works such as seawalls, groynes, dune management or sand nourishment, offshore breakwater and/or surfing reefs, temporary or permanent flood barriers, reconstruction of public infrastructure (ie. roads) above flood levels,
- Detailed emergency management and evacuation planning, with hazard reduction requirements for affected properties,
- Providing community education and information to improve awareness and ability to cope,
- Ongoing monitoring, analysis and review of findings,
- Additional data collection or studies, and
- A timeframe for review (CCC, 2009).

### Land Use Planning Controls

The Central Coast Planning Scheme 2005 ('the Scheme') imposes coastal vulnerability controls over all new development which is located in identified areas which are at risk to impacts from sea level rise. The purpose of the Schemes Coastal and Riparian Schedule is to:

*"...ensure that use or development in a coastal or riparian location:*

- a) Is not adversely affected by sea level rise, storm surge, shoreline recession or flooding; and*
- b) Respects the aesthetic, environmental and recreational values of the locality"* (CCC,2008).

However, establishing controls for new development does not address the developing

risk for existing properties. As it currently stands, Council has no clear statutory obligations to protect established private property that becomes at risk from changed conditions, provided the original approval for the development was consistent with the then prevailing planning scheme and that the Scheme was prepared with due regard to the known circumstances at that time (CCC, 2009).

With the philosophy of an adaptive approach with multiple interventions, it is unnecessary to construct protective works now for high sea level rise in 2100, particularly if the provision to upgrade is incorporated in the design. It is prudent, however, to cover a range of sea level rise scenarios for future planning, as most of the present day risk is due to inadequate past planning and risk assessment (CCC, 2009).

### Managing Council Assets

Council is responsible for managing its own assets in coastal areas that may be subject to climate change risks. Many of these assets are located in coastal areas for good reason. Council assets potentially at risk include:

- **Roads, bridges, pathways and car parks and associated signage, street lighting and the like** – some are located in coastal areas to serve coastal development and access to beaches and other coastal areas for the wider community
- **Stormwater pipes, outlets and treatment facilities** – Many are located on the coast to allow maximum use of gravity feed
- **Parks, gardens, beaches, surf clubs, recreation and sports fields, change rooms, toilets and other amenities** – many are in coastal areas because the coastal plains provide the large, level areas required (CCC, 2009).

In some cases, relocation is possible and desirable, as facilities reach the end of their service life. In other cases these assets will need to be maintained or even extended to serve coastal communities which remaining

serviceable in spite of climate change impacts (CCC, 2009).

The most effective action would be mitigation of global greenhouse gas emissions, bringing the outcome from the high scenario that we are currently tracking to the medium or lower scenarios. Given the potential impacts that may be unavoidable and areas of present day risk, it is considered necessary to investigate and assess localities and infrastructure in Central Coast which may be vulnerable to coastal hazards, both at present and due to sea level rise in the future. Utilising the Sharples Report (2006) as a basis, Council has undertaken a preliminary indicative mapping exercise to identify Assets at risk from the effects of climate change 4, 5, 6 and 7). The approximate current assets identified in the preliminary mapping as at risk are as follows:

Assets	Total Value	% 'at risk' from Climate Change
Buildings	\$65M	32%
Roads	\$135.5M	9%
Drainage	\$ 40M	12.5%
Footpaths	\$ 23.8M	21%
Recreation	\$10.9M	41%

As the boundary of the proposed maximum sea level rise obtained from the Sharples Report (2006) is rudimentary and these maps are very general in nature, there is a real need to build diverse information/knowledge bases that will support adaptation processes and assess the degree to which the assets are affected. A scientific and technical risk assessment of climate change impacts in Central Coast needs to be undertaken along with an analysis of the risk perception in the community to assure the communities acceptance to measures taken to address the risk. Measures need to address both the scientifically assessed and the perceived risk (CCC, 2009)

## Climate Change Risk Assessment for Central Coast

In early 2009 the Council undertook a risk assessment in order to identify particular risks and possible adaptation actions associated with climate change in Central Coast. The risk assessment was facilitated by the Cradle Coast Authority and Climate Risk Pty Ltd. and involved workshops with key Council staff.

The Council's approach to risk management is based on Australian Standard *AS/NZS 4360 Risk Management* and is enshrined in the Risk Management Policy (appendix 2). Using this approach the most significant risks due to climate change have been identified, including, sea level rise, increased rainfall, increased stormwater runoff, emissions trading, population increase and waste management (Cradle Coast authority, 2009). These risks are outlined in Appendix 3. This climate change action plan has been developed to address these risks.

## Implementation of the Climate Change Action Plan

The climate change actions that Central Coast Council will implement or investigate to reduce its own greenhouse gas emissions and to assist the community to reduce its emissions are detailed in the following section of this plan. Adaptation actions that the Council will implement or investigate to lessen the adverse impacts of climate change on Central Coast's environment, society and economy are also detailed

This Climate Change Action plan will adopt the status of a related plan to the Council's Strategic Plan 2009–2014. Implementation of the actions proposed in the plan will occur through the Council's annual planning process, which determines the initiatives and actions that will be funded each year to achieve the strategic objectives specified in the Strategic Plan.



## Central Coast Council Climate Change Mitigation Actions

Action	Description	Timeframe	Estimated Cost	Responsibility
COUNCIL MITIGATION ACTIONS				
Climate Change Funding	Identify opportunities for Federal or State Government funding to implement the Central Coast Council climate change mitigation actions.	Ongoing	Within current budget	SMT
Carbon Audit	Continue participation in the Planet Footprint program to monitor and report on the Council's Greenhouse gas emissions from energy usage in buildings and street lighting, fleet and waste production	Ongoing	\$5,000 annually subject to funding	Development & Regulatory Services
Establish emission reduction targets	Establish emission reduction targets for both the Council and the community which integrates with the State Government's target	2010/2011	Within current budgets	General Manager / Council
Audit of Council Buildings	Undertake a sustainability assessment of all existing buildings to: <ul style="list-style-type: none"> <li>Reduce lighting and equipment loads</li> <li>Optimise the design of cooling systems to provide best energy efficiency under higher temperature loads</li> <li>Identify opportunities to retrofit existing buildings with additional insulation materials and efficient and effective cooling systems</li> <li>Implement identified sustainability recommendations subject to available funding</li> </ul>	2011/2012 to 2013/2014	\$10,000 per year over 3 years subject to funding	Engineering Services
Building Design	Design Council buildings and building additions that minimise the amount of energy consumption and which allow for ease of future adaptation e.g. have the ability for significant amounts of shade to be added or removed from a façade	Ongoing	Within current budget	Engineering Services
Vehicle Fleet review	Undertake a review of the Council's vehicle/plant selection procedures to ensure that increased consideration is given to the purchase of lower emission vehicles and plant. This process must also consider the changeover cost of fleet.	2010/2011	Within current budget	Engineering Services
Employee car pooling system	Investigate the formalisation of a car pooling system for Council staff travelling to and from the workplace.	2010/2011	Within current budget	General Management

Action	Description	Timeframe	Estimated Cost	Responsibility
COMMUNITY MITIGATION ACTIONS				
Benchmarking Project	Undertake a benchmarking project to quantify the greenhouse gas emissions produced within the Central Coast Municipal area. Alternatively, it may be practicable to work in partnership with the State Government to quantify Central Coast greenhouse gas emissions, based on modelling.	2011–2012	\$5,000 subject to funding	Development & Regulatory Services
Local Builders Forum	Organise a forum for local builders to consider the building of an energy efficient demonstration home in Central Coast.	2010–2011	Within current budgets	Development & Regulatory Services
Sustainable Transport	Develop a sustainable transport strategy in partnership with key stakeholders which considers issues including: <ul style="list-style-type: none"> <li>▪ Maximising the use of public transport;</li> <li>▪ Reduction of commuter travel between work and home;</li> <li>▪ alternative forms of transport such as bicycles and walking and</li> <li>▪ minimising vehicular transportation of food (etc)</li> </ul>	2013/2014	\$10,000 subject to funding	Development & Regulatory Services  Engineering Services
Household sustainable audits	Train appropriate staff and work with the Cradle Coast Authorities Household Sustainability Assessment program.	2009/2010 and then ongoing	Within current budget	Development & Regulatory Services / Engineering Services
Waste Management	Undertake a review of the Central Coast's waste management facilities and practices	2010/2011	Within current budget	Engineering Services
	Continue to work with the Cradle Coast Waste Management Group to increase community education and reduce waste generation by reducing overall consumption	Ongoing	Within current budget	Development & Regulatory Services
	Continue to work with Dulverton Waste Management (DWM) to implement the DWM Strategic Plan 2009–2004. Specifically:  'Strategy 2: Seek to divert material from landfill in order to extend the landfill life and to reduce the future implications of greenhouse gas emissions (by) <ul style="list-style-type: none"> <li>▪ Coordinating the Regional Recycling program to maximise recycling rates along the Coast.</li> <li>▪ Developing the capacity of the Dulverton Organics Recycling Facility by investigating sustainable markets for composted materials and engaging with bulk producers of organic waste.</li> </ul>	Ongoing	Within current budget	Development & Regulatory Services / General Management

Action	Description	Timeframe	Estimated Cost	Responsibility
	<ul style="list-style-type: none"> <li>Examining the practical and economic feasibility of commercial and domestic food waste and garden organics separation at source for collection and composting'</li> </ul> <p>Additionally, DWM is seeking to reduce landfill gas emissions through actions such as gas capture.</p>			
Rebate for solar hot water	Investigate the feasibility of offering rebates for the installation of solar hot water systems in Central Coast homes.	2011/12	TBD	General Management
Increase community education through the Council's webpage	Develop and maintain a 'sustainability' section on the Council's webpage to provide information and links on climate change, energy efficiency domestic reuse and recycling of waste materials(etc)	2010/11 and then ongoing	Within current budget	Corporate and Community Services

### Central Coast Council Climate Change Adaptation Actions

Action	Description	Timeframe	Estimated Cost	Responsibility
Climate Change Funding	Identify opportunities for Federal or State Government funding to implement the Central Coast Council climate change adaptation actions.	Ongoing	Within current budget	SMT
Scientific & Technical climate change risk assessment of Central Coast	<p>Undertake a scientific and technical risk assessment of climate change impacts on coastal areas in Central Coast, including impacts on the community and Council infrastructure, assets and coastal open space. This assessment should be undertaken along with an analysis of the risk perception in the community to assure the communities acceptance to measures taken to address the risk. Measures need to address both the scientifically assessed and the perceived risk</p> <p>NOTE: It would be preferable for such an assessment to be undertaken for the Cradle Coast region, rather than simply Central Coast. This should be explored through the LGAT, Cradle Coast Authority and other North West Council's.</p>	2011/2012 – 2014/2015	\$100,000 subject to external funding	Engineering Services / Senior Management Team

<b>Stormwater Management Plan</b>	Develop a stormwater management plan that addresses: <ul style="list-style-type: none"> <li>• potential flooding risks;</li> <li>• potential locally appropriate alternative uses of stormwater;</li> <li>• system constraints to ensure that the system is designed to prevent overflow events from wetter than normal weather, based on climate change scenarios</li> </ul>	2011/2012	\$20,000 subject to funding	Engineering Services
<b>Planning Controls</b>	Work with the Regional Planning Initiative to incorporate coastal vulnerability provisions into the Planning Scheme which is based on the current climate change science.	2010/2011	Within current budget	Development & Regulatory Services
	Review the Planning Scheme to ensure that it encourages an appropriate mix of housing types and size in residential areas	2012/2013	Within current budget	Development & Regulatory Services
	Undertake a review in conjunction with Cradle Mountain Water to ensure that infrastructure capacity in Central Coast is proportionate to demand.	2015/2016	\$10,000	Engineering Services
<b>Emergency Management Plan</b>	Ensure that the Council's emergency management plan is in accordance with current available information (i.e. local flooding risks, local bushfire risks (etc)	2010/2011	Within current budget	Engineering Services
<b>Shade Audit</b>	Conduct a shade audit of Central Coast to determine the adequacy of existing shade and to determine if there is a need for more.	2012/2013	\$10,000 subject to funding	Engineering Services

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# Environmental Policy

## POLICY OVERVIEW

The Central Coast Council is committed to its Strategic Plan vision of 'leading a growing and innovative community, valuing our culture and natural resources'. To assist in achieving this vision the Council has established sustainability as one of the four platforms for the future of Central Coast in the Strategic Framework for Settlement and Investment. The sustainability platform strategically positions Council to take a holistic and creative approach to sustainability, based on a deep appreciation of biophysical, social and economic resources, their values and their interrelationships.

## POLICY

Central Coast Council will incorporate the principles of sustainability into our business and management systems and decision making processes, to ensure the sound management, protection and development of the natural and built environment.



To achieve this we will:

- Comply with and where practical, exceed the requirements of relevant legislation, policies and standards to continually improve our environmental performance;
- Provide clear and consistent guidelines to employees and contractors on best practice environmental management;
- Support and implement waste reduction, reuse and recycling programs;
- Reduce resource consumption, and greenhouse gas emissions, including energy and fuel use;
- Give purchase preference, where feasible, to reusable, recycled and environmentally friendly products;
- Prevent pollution at its source and continually improve Council's response to pollution impacts to minimise their impact and occurrence;
- Identify the concerns of the community regarding environmental issues and respond to information received;
- Adequately resource the implementation of the policy; and
- Undertake annual State of the Environment reporting.

Through the implementation of this policy, the Council aims to be a leader and champion of sustainability and environmental best practice and will continue to inform our community on initiatives and strategies to be adopted and review our environmental performance regularly.

Mike Downie  
*MAYOR*

Sandra Ayton  
*GENERAL MANAGER*

## RISK MANAGEMENT POLICY

The Central Coast Council is committed to the management of the risks under its control and responsibility, in order to maintain and enhance the quality of life of its employees, residents and visitors.

This commitment extends to ensuring that the Council's operations do not place the local community at risk of injury, illness or property damage.

The Council's approach to risk management is based on Australian Standard *AS/NZS 4360 Risk Management*.

The Council will adopt a pro-active approach to the identification and treatment of hazards and risks.

### Accountability and authority

- The Senior Management Team is ultimately responsible for managing the Council's risk.
- All employees are responsible for managing risks in their area of control.

### Implementation

The Council implements this policy through:

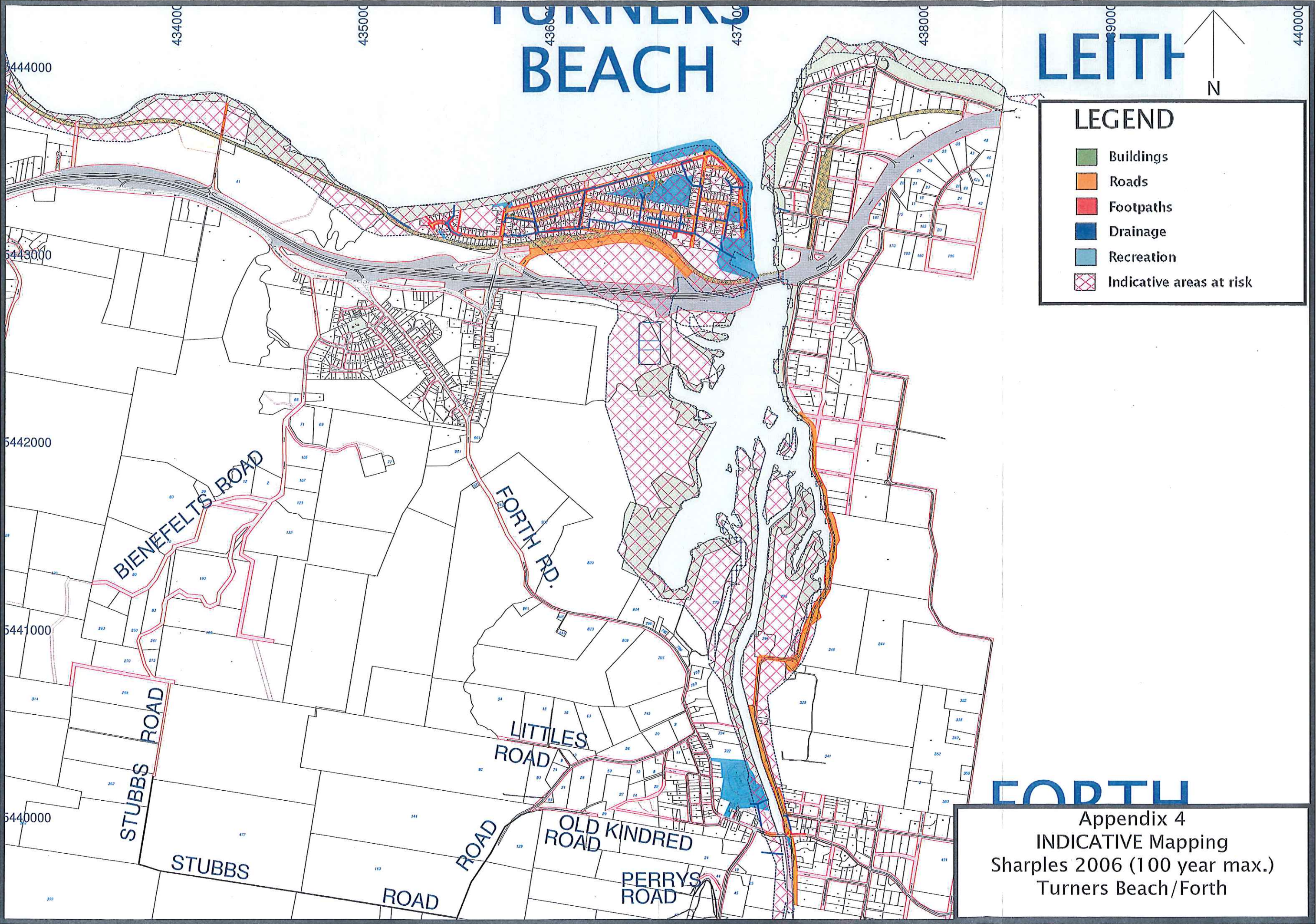
- gaining organisational support for risk management undertakings;
- providing the physical, financial and human resources required to effectively manage risk;
- raising awareness of risk management through communication and consultation;
- educating and training staff on good risk management practices;
- systematically identifying risks and developing and maintaining a prioritised risk register;
- determining the magnitude of, and prioritising, these risks;
- setting objectives and targets and developing ongoing strategies and action plans to address these risks; and
- monitoring, and periodically reviewing, the effectiveness of the risk management process and treatment measures.

## Appendix 3 – Climate Change Risk Assessment for Central Coast

Climate Change Risk	Possible Treatment Options	Data / info / skills needed
<b>TEMPERATURE</b>		
Vector Bourne Illness	Tactical response plans	Measures in place
	Coordination with State Health Department	Measures in place
Increased Operational costs	Identify operational priorities	Sufficient funding
	Incorporate Central Coast into the decision making process	Sound knowledge of Council processes
<b>SEA LEVEL RISE</b>		
Property loss from sea level rise and storm damage	Identify and armour	Mapping, cost analysis management plan
	Retreat and compensation	Mapping, cost analysis management plan
Asset loss from sea level rise and storm damage	Identify and armour	Mapping, cost analysis management plan
Loss of coastal reserves	Implement dune restoration programmes as appropriate	Management Plans
	Protect buffer vegetation in shore zones	State and Australian Government support
	Allow nature to take its course in certain cases	Cost analysis
<b>EMISSIONS TRADING SYSTEM</b>		
Increased cost of living	Facilitate a sustainable and efficient transport network	Sufficient funding
		Regional and State support
	Develop a sustainable transport policy	An audit of existing public transport networks
	Facilitate the grouping of essential services and provision of walking access	Good planning
	Examine the need to travel	Industry partners
Increased insurance costs	Facilitate people to use the internet as an alternative to travel	
	Council to work to enhance the Council's risk management processes	Sufficient funding
	Hold Discussions with the Council's insurer	Sufficient resources

Climate Change Risk	Possible Treatment Options	Data / info / skills needed
Carbon audit	<p>Participate in the Planet Footprint program</p> <p>Design Council buildings to allow for ease of future adaptation e.g. have the ability for significant amounts of shade to be added or removed from a façade</p> <p>Reduce lighting and equipment loads to reduce overheating</p> <p>Optimise the design of cooling systems to provide best energy efficiency under higher temperature operating loads</p> <p>Where appropriate, retrofit existing buildings with addition of insulation materials and efficient and effective cooling systems</p>	<p>Regional support</p> <p>Sufficient funding</p> <p>An audit of existing buildings</p> <p>Sufficient resources (including skilled workforce)</p>
Lack of political buy-in	<p>Strengthen the profile of climate change within Council and combine with the sustainability agenda</p> <p>Provide education/awareness</p>	<p>Climate change experts</p> <p>Educational resources</p>
Limited Public awareness	Investigate the appointment of a Climate Change Officer within the Cradle Coast region	<p>Educational resources</p> <p>Sufficient funding</p>
POPULATION CHANGE		
	Implement to Strategic Framework for Settlement and Investment through sound planning and an innovative works program	<p>Sufficient resources</p> <p>Action plans</p> <p>Sufficient funding</p>
WASTE MANAGEMENT		
	<p>Increase community education to reduce waste generation through both sustainable consumption and reducing overall consumption</p> <p>Maximise kerbside diversion of material from landfill through provision of high performance of high performance collection systems</p> <p>Encourage sorting of waste at source for household commercial and construction wastes and promote composting</p>	<p>Educational resources</p> <p>Regional support to provide economies of scale</p> <p>Sufficient funding</p> <p>Waste management industry experts</p>





TURNERS  
BEACH

LEITH

### LEGEND

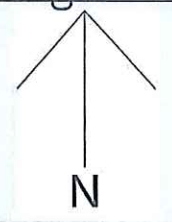
- Buildings
- Roads
- Footpaths
- Drainage
- Recreation
- Indicative areas at risk

FORTH


Appendix 4  
INDICATIVE Mapping  
Sharples 2006 (100 year max.)  
Turners Beach/Forth

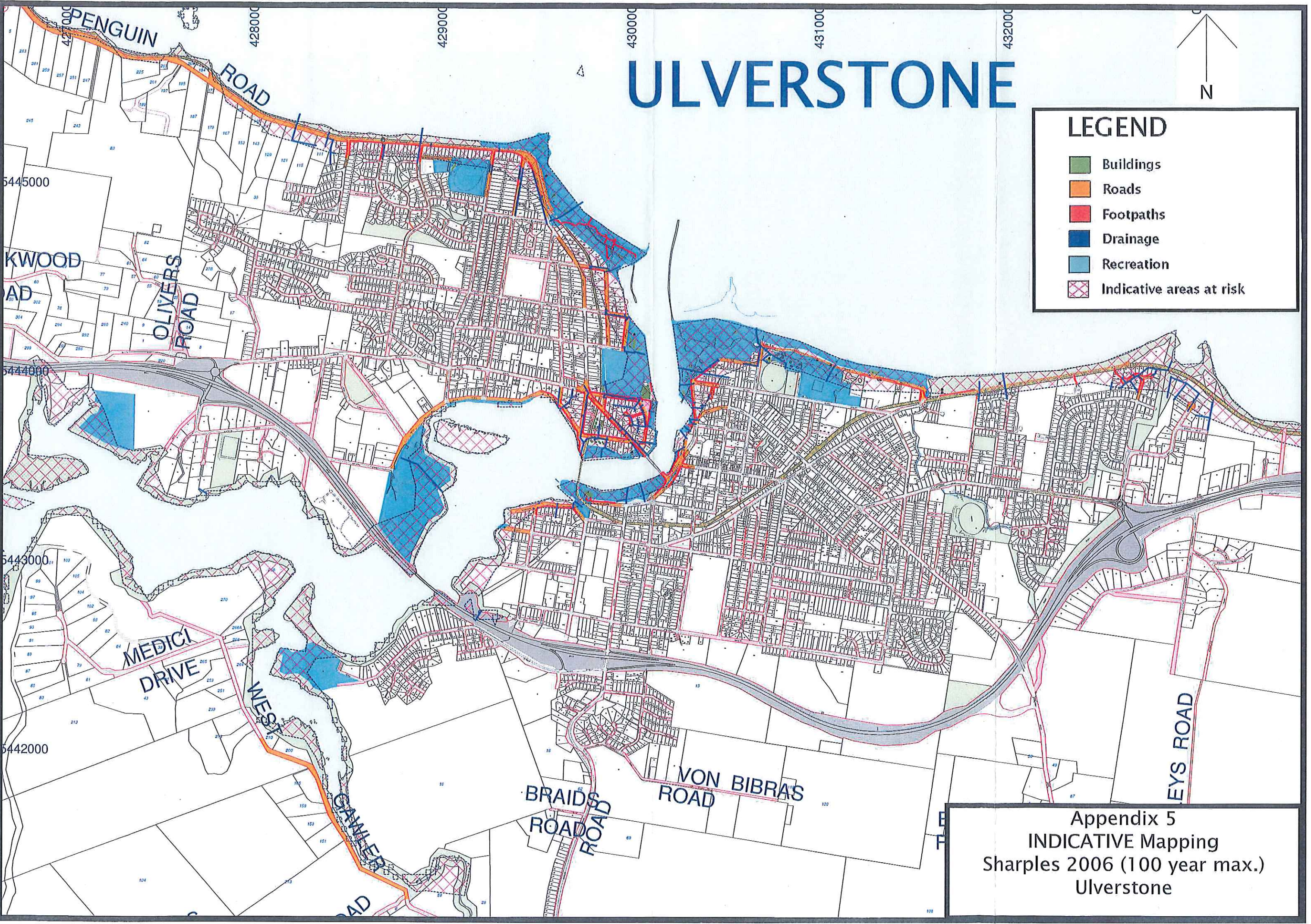


# ULVERSTONE



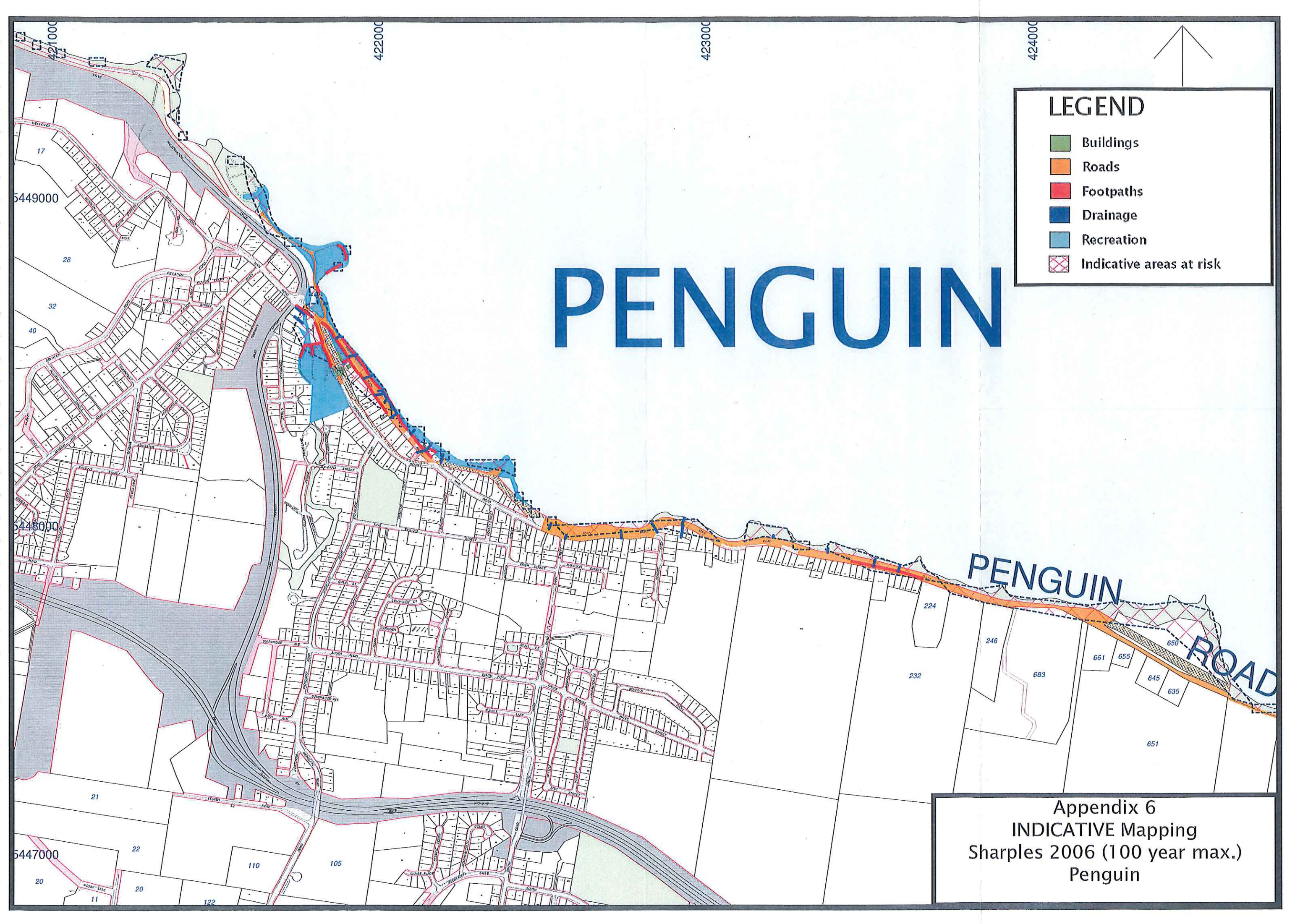
## LEGEND

-  Buildings
-  Roads
-  Footpaths
-  Drainage
-  Recreation
-  Indicative areas at risk



Appendix 5  
INDICATIVE Mapping  
Sharples 2006 (100 year max.)  
Ulverstone





## LEGEND

- Buildings
- Roads
- Footpaths
- Drainage
- Recreation
- Indicative areas at risk

# PENGUIN

## PENGUIN ROAD

Appendix 6  
INDICATIVE Mapping  
Sharples 2006 (100 year max.)  
Penguin



HEADS

LEGEND

- Buildings
- Roads
- Footpaths
- Drainage
- Recreation
- Indicative areas at risk

HOWTH  
SULPHUR  
CREEK

PRESERVE  
BAY

Appendix 7  
INDICATIVE Mapping  
Sharples 2006 (100 year max.)  
Sulphur Creek/Heybridge