



KIAMA
MUNICIPAL
COUNCIL

State of the **ENVIRONMENT** Report 2009-2012

Executive Summary

The Kiama Council operates within the context of short to medium term concerns regarding: water security, drought, air quality, climate change, flora and fauna protection, waste management, population and tourism growth, transport congestion, land availability and degradation, pollution and energy consumption. These are major environmental issues facing Council and its community now and into the future.

The State of the Environment (SoE) Report for the Kiama Municipality is prepared for each financial year as a statutory requirement of the *Local Government Act 1993*. This report is a 4 year comprehensive report for the period 1st July 2009 – 30th June 2012. It contains information, achievements, data and trends for the 2011-12 financial years and for the previous three reporting periods.

Each chapter of the report details the condition of, and pressures on the local environment. It also outlines the current and potential future responses to the identified environmental issues.

The report contains a chapter for each of the following environment themes: *Land, Water, Noise, Biodiversity, Waste, Air* and *Cultural Heritage*.

There is also an additional chapter called *Sustainable Communities*. This outlines details of the Council and community actions undertaken to protect and enhance the environment and promote healthy lifestyles.

Appendix A of the SoE outlines strategies to be implemented during 2012-2013 and these have been incorporated into Council's previously adopted Operational Plan.

Appendix B of the SoE report identifies potential strategies for each theme chapter which have been linked to Council's Strategic Goals. These will be considered by Council in the future development of its upcoming Delivery and Operational Plans. As environmental goals form part of the integrated planning and reporting process, this and future SoE Reports will be linked to the suite of plans associated with the integrated planning process.

Future State of the Environment Reports will be linked to these plans and will be the main reporting document.

Part of the SoE Report requires the development and implementation of sustainability indicators for all of the theme areas to be reported on. No formal adopted state wide set of sustainability indicators have been adopted. There are a number of tools to measure sustainability however these remain limited in their application due to complexity, variation of results and subjectivity interpretation.

For the purpose of measuring progress towards sustainability, the NSW Beachwatch Water Quality Criteria and the waste reduction to landfill target of 66% (baseline year 2003) have been used. Also Council previously adopted a water consumption reduction target of 25% (baseline year of 2003) for its highest top 10 sites has been used.

It is proposed that a revised and updated set of sustainability indicators will be developed by Council for consideration as part of Council's 4 year Delivery Plan. This will take into consideration any adopted state wide sustainability indicators or targets.

Kiama Council operates within the context of short to medium term concerns regarding: water security, drought, air quality, climate change, flora and fauna protection, waste management, population and tourism growth, transport congestion, land availability and degradation, pollution and energy consumption. These are major environmental issues facing Council and its community now and into the future.

Environmental management is a continuous and incremental process for Councils. While Councils' efforts are ongoing and responsive as our knowledge of environmental issues develop, some environmental outcomes may only become evident after long periods of time.

An assessment of Council's previous budgets was undertaken to determine the estimated total expenditure spent by Council including grant funding on services, programs and actions to protect, improve, maintain the quality of the natural and built environment and inform and encourage community involvement has been reported.

This has been estimated at approximately \$25,114,338 for the past four years. This expenditure consists of salaries, actions such as enforcement as well as the implementation of strategic planning policies and procedures across a range of areas including: Waste management and recycling, biodiversity enhancement, environmental protection, water/energy conservation, sustainability education, heritage and strategic planning.

During the 2009-2012 reporting period Council, in conjunction with other government and non government organisations and the community have undertaken a number of initiatives that address issues identified within the previous SoE Reports. These are summarised below for each environmental theme:

Land

- Consultation and preparation and gazettal of *Local Environment Plan 2011* and adoption of *Kiama Urban Strategy 2011* and *Kiama Development Control Plan 2012*

Water

- Reviewed Water Saving Action Plan 2012
- Jointly funded and completed Black Beach/Hindmarsh Park stormwater reuse scheme, installing 300,000 litre capacity water storage tank to provide treated stormwater for irrigation
- Reduced Council's total water consumption by 30.8% at its top 10 sites
- Commenced Flood Mapping for Surf Beach catchment area in Kiama

- Commenced review of On-site Sewage Management Facilities Operational and Approval Guidelines and continued inspection program
- Council supported the Jamberoo Valley, Kendall's Beach, Lands Edge, Werri Lagoon CVA and Gerringong and Gerroa Streamwatch Water Monitoring Networks

Noise

- Council continued to address noise pollution under the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Noise Control) 2008*

Biodiversity

- Illawarra Biodiversity Strategy and Local Action Plan 2010 was developed and adopted
- Secured funding for the Minnamurra River Riverside Drive, road and bank stabilization project
- Advised and assisted work of various Landcare Groups throughout the Municipality
- Continued rehabilitation projects, maintenance and development of bushland reserves at Bonaira Native Gardens, Spring Creek and Jerrara Dam and at other Council sites
- Secured 3 year funding from NSW Government in 2011 for implementation of the Weeds Action Program and NSW Invasive Species Plan within the Kiama LGA
- Supported and secured funding for the Seven Mile Beach Landcare weed eradication and rehabilitation project
- Implemented feral rabbit control programs at Gerringong and Werri Beach
- Assisted with the implementation of Southern Councils Group Commonwealth grant funded "Eastern Australia Boneseed Eradication and Containment" project
- 4,000 trees planted in Municipality at annual Kiama High School National Tree Days

Waste

- Achieved a landfill waste reduction target of 61%
- Total tonnes recycled from domestic rural commercial premises and public places over the past four years equates to 29,067.05 tonnes which amounts to 41,154 kg of CO²

- Eighty five tonnes of electronic waste has been collected and recycled to date at Council's E-Cycle events
- Coordinated annual cleanup Australia day campaign and events such as; Clean Up Australia Day, Project Aware including sites such as Kiama Harbour and Minnamurra River.
- Since 2009 there has been a 386% increase in the number of illegal dumping incidents reported and investigated. This has resulted from dramatic increases that have occurred in tip fees and illegal dumping will continue to be a major issue in the future
- Development and implementation of The Illegal Dumping and Litter Reduction Strategy in 2011
- Implemented recycling programs for the recovery of Unwanted Medicines, Printer cartridges, mobile phones and light globes which have collected approximately 883.3kg to date
- Implemented new recycling collection services at Holiday Parks and selected public places
- Conducted composting, worm farming and Bokashi bucket workshops annually
- Conducted Two Second Hand Saturday annually involving more than 2,500 participants
- Continuation of drumMuster program at the Minnamurra Recycling Depot has seen 3532 drums collected to date
- Littering from Cars enforcement and education program has been conducted annually. A total of 4 people have been issued a Penalty Infringement Notice, 130 people have been approached and 15 verbal cautions have been given to date

Air

- The Regional Air Quality Index (RAQI) set by the National Environment Protection Measure states that any figure above 100 indicates poor air quality. During the 2011/2012 reporting period, the RAQI count exceeded 100 in the Illawarra region on four occasions (EPA 2012). This result shows an improvement of 71% in occurrences of poor (or worse than poor) air quality in the Illawarra since 2009
- Completed Cities for Climate Change Milestone 3 Greenhouse Local Action Plan
- Installed above-ground 'biodiesel' tank at Council's Works Depot for running plant, equipment, operational and corporate fleet vehicles

Heritage

- Review and update Heritage items for inclusion in Schedule 5 of the Kiama LEP 2011
- Select key projects from the past four years

Sustainable Communities

- Reduced Council's total energy consumption by 3% at its top 10 sites
- Beach water quality was excellent with Jones, Bombo, Seven Mile Beach, Surf and Warri Beach showing 100% compliance with the relevant guidelines
- 5,000 residents and visitors attended annual World Environment Day, including FutureFest Illawarra, Sustainability Expos and Kiama Community Garden Open Day
- Workshops, events, and programs relating to sustainability were conducted by the grant funded Sustainable Illawarra Project and the Sustainable Kiama Communities Project
- The Kiama Public Health Plan was adopted
- Developed and adopted 'green' policies and guidelines for Council operations including Health and Sustainability Policy, Green Vehicle Fleet Strategy, Sustainable Events, and Sustainable Procurement Guidelines
- Installed energy savings initiatives on Council owned buildings, including 10kW photovoltaic solar power system and power factor correction unit on Council's Administration Building
- Completed Climate Change Risk assessment & Adaptation Action Plan

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<http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>

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Chapter 1: Introduction

1.1 Kiama Municipality

The Municipality of Kiama is located on the south coast of New South Wales bordered by the Local Government Areas of Shellharbour, Shoalhaven and Wingecarribee. The area has a diverse range of physical environments, including beaches, rainforests and rural landscapes that attract a large tourist base each year. The Kiama Municipality can be seen at this fix link:

<http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>

The Australian Bureau of Statistics indicated that the estimated resident population figure for the Kiama Municipality as at June 30th 2011 was 21,139 people. It is estimated that the population will increase to 23,380 in 2021. There has been a population increase of 1.29% in the area since 2010 (Australian Bureau of Statistics, 2011).

1.2 Relevant Council Strategic Goals

Kiama Municipal Council's *Community Strategic Plan 2011-2021* (Kiama Municipal Council, 2011) outlines Council's Strategic Goals, in the following four areas: Community; Environment; Economy; and Civic Leadership. This document outlines the vision and mission statement as well as the principles important to the Council.

Vision:

A Municipality working together for a healthy, sustainable and caring community.

Mission:

Kiama Council will work to create a Municipality that has a healthy vibrant lifestyle, beautiful environment and harmonious, connected and resilient community.

Principles:

- Values the commitment of the community to our local region
- Recognises the value of the areas rural and coastal lifestyle
- Will strive to maintain the natural beauty of the environment
- Will plan for sustainability
- Will build on the strengths of the community to create a Municipality that is a vibrant place to live, work, and enjoy

The specific goals for Environment are outlined due to their particular relevance to this report.

Environment

Council's goal's are:

E1 - The long term integrity and biodiversity of the natural environment is protected

E2 - The productive use of rural land is maintained, acknowledging the land's contribution to the economy and lifestyle of the area

E3 - Building and cultural heritage is recognised and maintained

E4 - Development is sustainable and resilient to change

1.3 State of the Environment Reporting

A comprehensive State of the Environment Report for the Kiama Municipality is required to be prepared under the provisions of the *Local Government Act 1993* every four (4) years, within 12 months of the election of any new Council. The report details the condition of, and pressures on the local environment and outlines the current and potential future responses to the identified issues. Previously supplementary reports were required to be prepared for other years. This report is a comprehensive report for the period 1st July 2009 – 30th June 2012 and contains information from previous SoE supplementary reports.

The broad aims and objectives of the State of the Environment Report are to:

- Educate and inform the community, Council, Government and industry about the condition of our environment;
- Assess the progress towards achieving environmental goals and standards;
- Assess the progress towards achieving ecologically sustainable development; and
- Identify important environmental issues.

This report includes chapters which addresses each of the following environmental themes, as required by the *Local Government Act 1993*:

- Land;
- Water;
- Noise;
- Biodiversity;
- Waste;
- Air; and
- Heritage (Aboriginal and Non-Aboriginal)

Each of these theme chapters contains (3) sections:

- State - outlines the condition of the environmental theme;
- Pressures - outlines the human and natural pressures on the environmental theme;

- Responses - includes the relevant local actions of Council, other levels of Government and the community, that address the environmental theme; and

Chapter 9: Sustainable Communities measures the progress towards sustainability, and details the current strategies of Council to address sustainability within the Municipality, including both strategies to protect the environment and promote healthy communities. It also includes details on those activities and programs that cover a range of themes and are consequently not included in a single theme chapter.

Chapter 10: Summary of Existing Activities. This Chapter provides a summary of existing activities identified in the Management Plan 2009-2012.

The potential future activities are outlined according to the relevant Council Strategic Goals to enable simple assessment against Council's Community Strategic Plan 2011-2021. The future activities for the next financial year (2012-2013) can be found in Appendix A, and the future activities for the next four years (2012-2016) can be found in Appendix B, these will be considered as part of the development of the delivery plan to be considered and adopted by Council.

Chapter 2: Land

2.1 State

2.1.1 Land-Use Planning

The new Kiama *Local Environmental Plan* (LEP) 2011 is the main instrument used by Council for land-use planning and development decisions. The LEP provides land use zones that indicate what is permitted or prohibited within certain areas of land and what development conditions apply. Table 1 lists the zones and the area of land to which they apply.

Table 1: Local Environmental Plan 2012 Zones

Zone	Area (Ha)
Industrial	
IN2 Light Industrial	3.58
IN4 Working Waterfront	1.11
Business	
B1 Neighbourhood Centre	2.47
B2 Local Centre	33.16
B7 Business Par006B	16.42
Deferred Material	
DM	0.53
Environmental Protection	
E1 National Parks and Nature Reserves	5385.63
E2 Environmental Conservation	5461.01
E3 Environmental Management	4137.72
Residential	
R2 Low Density	710.20
R3 Medium Density	71.93
R5 Large Lot	37.52
Recreation	
RE1 Public	342.25
RE2 Private	27.38
Rural	
RU1 Primary Production	2382.29
RU2 Rural Landscape	6825.42
Special Purposes	
SP2 Infrastructure	446.81
Total	25885.43

Environmental Protection Zones are designed to manage and protect environmental assets such as scenic areas, foreshores and wetlands.

An additional overlay as part of the LEP 2011 is areas of Terrestrial biodiversity and Riparian land and Watercourses. The LEP describes the objectives of such areas and what is permissible within these areas.

There are three National Parks/Nature Reserves within the Municipality, namely Seven Mile Beach National Park, Budderoo National Park and Barren Grounds Nature Reserve.

2.2 Pressures

Development

Figure 1 shows the number of development approvals that Council granted for residential dwellings and for commercial and industrial activities as well as the number of Complying Development Consents for Dwellings within Kiama LGA over the past four years. Complying Development is small scale, low impact development that can be approved without a merit assessment. The process for complying development is usually quicker and cheaper than the development application process.

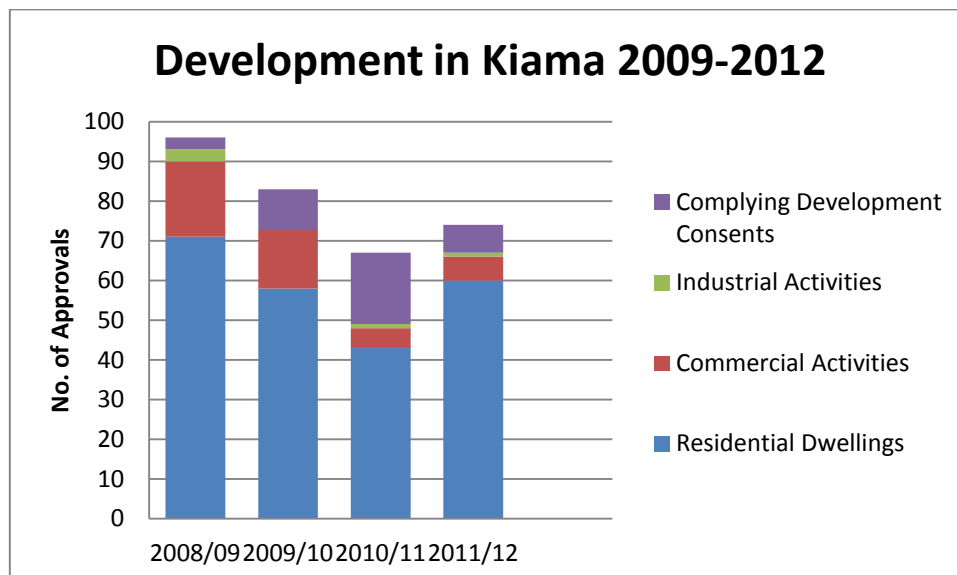


Figure 1: Development Approvals for Residential Dwellings, Commercial and Industrial Activities

Acid Sulfate Soils

A number of locations in the Kiama Municipality have been identified and mapped by the NSW Government as potential acid sulfate soil prone area. Disturbance or exposure of acid sulfate soil can occur as a result of excavation or drainage. Such soils are a constraint to activity or development that involves disturbance of the soil. Potential acid sulphate soils may be found around Minnamurra River and Floodplain, Spring Creek Wetland area, Werri Lagoon and Ooaree Creek Floodplain, Crooked River and Blue Angle Creek (including wetland areas). See link for map of *Potential Acid Sulfate Soil* <http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>

Contaminated Land

When land that has previously been used for industrial, commercial or rural purposes is reclaimed for more sensitive uses, such as housing, there is the risk that the land may be contaminated. The degree to which the land has been contaminated as a result of the former activity must be determined and any necessary remediation should be carried out. Chapter 10 of Kiama DCP 2012 contains information to assist in the management of land contamination.

Amendments to the *Contaminated Land Management Regulation 2008* commenced on 1st July 2009. These changes prescribe certain matters to be included in section 149 (2) planning certificates, and have revised Department of Environment, Climate Change & Water Guidelines on the duty to report contamination and significantly contaminated land, as specified under this Act.

2.3 Responses

2.3.1 Land Use Planning Initiatives

Council adopted the new Kiama Local Environmental Plan (LEP) 2011; it was gazetted on the 16th of December 2011.

Purpose of LEP 2011

The purpose of LEP 2011 is to act as the principal planning instrument for the Kiama Municipality.

The maps included in the LEP include:

- Land Application
- Land Zoning
- Lot Size
- Heritage
- Terrestrial Biodiversity
- Riparian Land and Watercourses Map
- Floor Space Ratio
- Foreshore Building Line
- Acid Sulfate Soils
- Heritage of Buildings
- Land Reservation Acquisition
- Additional Permitted Uses

Aims of LEP 2011

This Plan aims to make local environmental planning provisions for land in Kiama in accordance with the relevant standard environmental planning instrument under section 33A of the Act.

The particular aims of this Plan are as follows:

- Provide planning controls for the Kiama area to achieve ecologically sustainable development principles while recognising the economic, environmental and social impacts and risks associated with climate change,
- Maintain, protect and improve the natural environment including native vegetation, endangered ecological communities, natural habitat corridors, riparian land, groundwater dependent ecosystems and wetlands for their biodiversity values,
- Conserve and protect the area's water resources, groundwater, waterways, and water quality for their biodiversity, ecological, health and recreational values,
- Protect agricultural land and restrict its fragmentation for purposes other than primary production,
- Protect and enhance the coastal and rural character of Kiama's rural towns, neighbourhoods and villages, and the characteristic scenic landscapes that contribute to its liveability and identity,
- Consolidate future population growth and medium density housing primarily in locations near shops and public transport,
- Cater for housing choice including affordable rental housing, affordable housing for first home buyers and housing for the aged and disabled and independent seniors,
- Protect and maintain land used or to be used for employment in rural and urban areas,
- Promote and co-ordinate the orderly and economic use and development of land,
- Maintain, protect and enhance environmentally sensitive land for its biodiversity and ecological values,
- Protect Kiama's cultural heritage.

2.3.2 Development Control Plan (DCP) 2012

As part of the adoption of LEP 2011 all existing individual development control plans previously adopted by Council are required to be reviewed and incorporated into a single DCP for the Kiama Municipality.

A new draft DCP was proposed in this reporting period and placed on public record. This document will be considered for adoption by Council in first quarter of 2012-2013 reporting period.

Purpose of the DCP 2012

Previously there were 39 separate DCP's in existence; these have now been consolidated into one document.

The new DCP comprises of a number of chapters dealing with many aspects of development including:

- Forms of Development - such as low density residential, medium density development
- Site specific controls - these are additional controls relating to specific sites
- Associated development requirements – such as landscaping, car parking and waste management.

Objectives of the DCP 2012

- To provide detailed development controls which support the Kiama Local Environmental Plan 2011
- To ensure future development responds positively to the qualities of the site and the character of the surrounding locality
- To ensure that development does not detract from the natural, cultural and agricultural values of the Kiama Local Government Area
- To promote development that is sustainable, appropriately designed for the climate and adaptable
- To promote development that is accessible and adaptable to meet the existing and future needs of all residents
- To ensure appropriate information is submitted with Development Applications to ensure a timely assessment process.
- To ensure that development contributes to the quality of the natural and built environments
- To ensure development is of a high design standard and energy efficient.
- To promote development that encourages liveable, safe and sustainable living and working environments
- To promote development that adds to the character of Kiama and assists in promoting a liveable, sustainable environment

2.3.3 Kiama Urban Strategy 2011/12

Adopted by Council at its meeting of the 20 September 2011, the Urban Strategy considers urban infill and urban expansion opportunities and options as well as green field sights and makes recommendations as to an appropriate approach for the development of the Kiama Local Government Area. The Department of Planning and Infrastructure (DoPI) requires Council's local urban strategy to reflect the housing mix identified in the Illawarra Regional Strategy.

The two principal components of the Plan cover:

- Rural and Environmental planning aimed at maintaining and protecting agricultural land and the ecologically sensitive natural environment and,
- Urban infill/expansion options to cater for future population and their housing needs.

2.3.4 Illawarra Regional Strategy

The Department of Planning has adopted the *Illawarra Regional Strategy*, outlining the region's new housing, employment growth, natural resources and cultural heritage over the next 25 years. The Strategy includes actions to address the natural environment, natural hazards, water, energy and waste, rural landscape and rural communities and cultural heritage.

The following outlines some example actions that Council is taking, within these priority areas.

The Natural Environment:

- conservation of *Melaleuca amillaris* (Tall Shrubland) in the Shellharbour/Kiama hard rock resource area;
- offsetting the loss of native vegetation;
- identification of significant aquatic habitat and riparian buffers to be included in LEPs;
- incorporation of water sensitive urban design principles in developments;
- incorporation of the *Strategic Assessment of Riparian Corridors* into planning; and
- zoning of *SEPP 14 Coastal Wetlands* and *SEPP 26 Littoral Rainforests* areas as environmental conservation.

Natural Hazards:

- Councils to conduct flood investigations with regard to the risks of climate change and prepare *Floodplain Management Plans*. Flood Management planning will be undertaken over a three year period commencing 2010/2011, subject to availability of grant funds; and
- LEPs to make provision for adequate setbacks in areas of coastal-erosion risk and ocean-based inundation in accordance with *Coastal Zone Management Plans*. Coastal Management planning will commence in the 2012/2013 financial year, subject to grant funding.

Water, Energy and Waste:

- Council to identify and zone land for wastewater treatment/recycling, energy, waste avoidance and resource recovery infrastructure;
- Council will encourage reduction in demand for potable water in new subdivisions and encourage water and energy conservation measures in new commercial and industrial developments;
- Locally generated and/or renewable energy projects will be supported; and
- Council has implemented a Waste Minimisation Chapter in DCP 2012 which encourages waste avoidance and resource recovery in demolition and building work.

Rural Landscape and Rural Communities:

- No new residential or rural residential zones will be supported on rural land unless part of an agreed structure plan or settlement strategy; and

- Location of non-compatible uses in core productive agricultural areas shall be limited.

Cultural Heritage:

- Statutory heritage lists have been reviewed and an updated schedule endorsed in LEP 2011;
- The LEP will include provisions to protect the cultural heritage items within towns and villages and adjoining cultural; and
- Council will review adequacy of cultural heritage studies with local Aboriginal representatives and the Office of Environment and Heritage (OEH) when preparing new LEPs for green fields residential estates.

The Strategy identifies indicative habitat corridors that could potentially be enhanced, including a Regional Corridor based on the Department of Environment and Conservation's *Illawarra Escarpment Plan* (Department of Planning, 2006).

2.3.5 BASIX – The Building Sustainability Index

The Building Sustainability Index (BASIX) was developed by the Department of Planning, and is a web-based planning tool for Councils and proponents of residential dwellings to assess the potential performance of their development against a set of sustainability indices, currently including energy conservation and water conservation.

Since 1st October 2005, BASIX has applied to all new dwellings, meaning that development applications for new dwellings in the Kiama Municipality require the submission of a BASIX certificate. From 1st October 2006, BASIX was also applied to residential alterations and additions valued at \$100,000 or more (from 1st July 2007, the value dropped to \$50,000) and where a swimming pool (or pool and spa) with a capacity greater than 40,000 litres is being installed (NSW Department of Planning - a). A required target must be achieved for water conservation and energy conservation. The water conservation target is 40 and the energy conservation target was previously 25, but from 1st July 2006, the energy target varied according to type and location of the dwelling. In the Kiama Municipality, it increased to 40 for detached and semi-detached buildings (and less for buildings with 3 or more stories) (NSW Department of Planning - b). These ratings can be achieved through design choices such as:

- Rainwater tanks connected to toilet, laundry and/or garden irrigation systems;
- 3A -5A rated showerheads, toilets, taps & fittings;
- Floor and ceiling insulation;
- Using compact fluorescent light globes;
- Native vegetation to landscape areas;

- Shading to windows;
- Solar, heat pump or high efficiency gas hot water systems;
- Appropriate aspect for suitable solar access;
- Alternative energy systems such as photovoltaic
- Performance glazing to large glazed areas / poorly oriented areas;
- Ceiling fans, evaporative coolers or high efficiency air conditioning; and
- Efficient pool pumps.

Table 2: Number of BASIX certificates issued 2009-2012

	2008/09	2009/10	2010/11	2011/12
BASIX certificates	108	153	122	126

Council also incorporates a Water Sensitive Urban Design (WSUD) program into its planning, projects and policies, which is about working with communities to ensure the planning, design, construction and retrofitting of urbanised landscapes, are more sensitive to the natural water cycle.

2.3.6 Acid Sulfate Soils

The Kiama LEP 2011 addresses acid sulfate soils, with a requirement that certain types of development within acid sulfate soils prone areas require development consent. The LEP provisions outline when a soils assessment and preparation of a management plan will be required.

There were no development applications within acid sulfate soil areas identified within the LEP amendment during the last four reporting periods.

2.3.7 Erosion and Sedimentation

Council places conditions on development approvals to ensure measures are taken to minimise erosion and sedimentation. Council's Environmental Health Officers and Ranger Services Officers investigate complaints received relating to erosion and sedimentation. Clean Up Notices, Prevention Notices or Penalty Infringement Notices for water pollution offences may be issued by these officers under the *Protection of the Environment Operations Act 1997*. Table 3 shows the history of verbal and written sediment control cautions issued by Kiama Council since 2009.

Table 3: Kiama Council Sediment Control Cautions 2009-2012

	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012
Sediment Control cautions (KMC)	35	30	28	30

*This figure is calculated using 50% of the footing inspections – based on site topography, conducted in each financial year (C.Fuller, G.Joseph 2012)

2.3.8 Contaminated Land

All land that is likely to have a significant impact to the environment and human health must be registered with the NSW Environment Protection Authority.

All development applications and re-zonings must consider whether the land in question has been subject to a potentially contaminating activity, in accordance with SEPP 55 and *Chapter 10 of Kiama DCP 2012*. Remediation must occur, if after investigation, it is found that the land is significantly contaminated.

Council also places conditions on new development approvals to ensure measures are taken to minimise the likelihood of contamination from future potentially contaminating activities.

Council's Environmental Health Officer and Ranger Services Officers also investigate complaints received relating potentially contaminating activities and may issue Prevention Notices or Penalty Infringement Notices under

It is proposed that during the next reporting period a new contaminated land policy will be developed for consideration and adoption by Council. This will identify sites where previous land use may have contributed to the site being contaminated.

2.3.9 Council Plans of Management

During the reporting period Council developed and reviewed Plans of Management for Council operational and community land and land specified under the provisions of the Local Government Act these included:

- Kiama Coastal Walking Track;
- Cemetery Management Guidelines;
- Werri Headland Boat Harbour Reserve Amended; and
- Bonaira Playing Field Amended

Chapter 3: Water

3.1 State

The Kiama Municipality has a number of river and creek systems that are part of large catchments, such as the Macquarie Rivulet, Minnamurra River, Werri Lagoon, Crooked River and Shoalhaven River catchments, as well as numerous small streams draining directly to the ocean. These rivers and catchments can be seen in this link <http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>

3.1.1 Monitoring at Council Waste Disposal Depots

Council undertakes quarterly groundwater and surface water monitoring in and around its previous Waste Disposal Depot at Minnamurra and at the site of the former Gerroa Waste Disposal Depot which have been remediated. This monitoring is being conducted in accordance with Environmental Protection Agency licence requirements. The aim of this monitoring is to identify any impacts that the facilities may have on the surrounding waterways so that remediation can be undertaken if necessary. During the reporting period the ground water located at the Gerroa site has significantly improved and is nearing the background levels as specified in the Australian and New Zealand guidelines for Fresh and Marine Water Quality 2000.

3.1.2 Sydney Water Streamwatch Water Monitoring

Previously Landcare Illawarra, Sydney Water Streamwatch and Council had formed a partnership to involve residents in water testing in the many catchments in the Kiama Municipality. Previously there were over 30 participants, from 5 separate networks, including the Jamberoo Valley, Kendall's Beach, Lands Edge, Gerringong – Gerroa, and Werri Lagoon Streamwatch Water Monitoring Networks. However due to recent budget cuts this program is no longer operational, this is a gap that needs to be addressed in conjunction with state government and relevant organisations.

As part of the review and development of the Southern Rivers Catchment Action Plan, consideration will be given for water quality and biological monitoring of selected waterways within Kiama Municipality. These include health assessment of Minnamurra Estuary, Crooked River Estuary, and Werri Lagoon.

Streamwatch water testing results were reported in previous State of the Environment Reports

3.1.3 Beachwatch Monitoring

Sydney Water Corporation and the OEH undertake monitoring of beach water quality at 4 beaches across the Kiama Municipality including Boyd's/Jones Beach, Bombo Beach, Surf Beach and Werri Beach. Recreational water quality is no longer reported as percentage compliance based on microbial data, but as Beach Suitability Grades. The Beach Suitability Grades can either be Very Good, Good, Fair, Poor or Very Poor. Definitions for these classifications can be found at www.environment.nsw.gov.au/beach/beachclassification.htm.

The Beach Suitability Grades are determined from a Sanitary Inspection of the swimming site and an assessment of the Microbial Water Quality. The Sanitary Inspection is a qualitative assessment undertaken to identify all sources of faecal contamination that could affect the swimming location and assess the risk to public health posed by these sources. The microbial water quality assessment is determined by calculating the 95th percentile of enterococci water quality data. More detailed information regarding water quality guidelines is available at www.environment.nsw.gov.au/beach/thewaterqualityguidelines.htm.

The Beach Suitability Grades for Kiama Council swimming sites for the past four years are shown in Table 4 Below:

Table 4: Compliance for Kiama Beaches 2009-2012

Swimming Sites	Beach Suitability Grades			
	2008/2009	2009/2010	2010/2011	2011/2012
Boyd's/Jones Beach	Very Good	Very Good	Very Good	Very Good
Bombo Beach	Very Good	Good	Good	Good
Surf Beach	Very Good	Good	Good	Good
Werri Beach	Very Good	Very Good	Good	Very Good
Seven Mile Beach	Not tested	Not tested	Not tested	Very Good

All Kiama ocean beaches were classified as Very Good or Good. Beaches classified as Very Good means they generally have excellent microbial water quality and very few potential sources of faecal pollution. Water is considered suitable for swimming almost all of the time. Beaches classified as Good means they generally have good water quality and are considered safe for swimming most of the time. These sites have some potential pollution sources which are generally triggered after rainfall.

3.1.4 Water Consumption

Council Water Consumption

According to Sydney Water Council is now using less water now than in the early 1990's (Figure 2), despite an increase in population of over 4000.

However, Council's total water consumption for the 2011/12 year was 104 644 kL, which is a 16.7% increase from the 2010/11 year. The top 10 water consuming facilities consumption is shown in Table 5 compared with the 2002/03 baseline year for the WSAP.

Council has continued use of online automated data loggers at the 5 Council holiday parks and the Kiama Leisure Centre. These data loggers monitor water consumption on a 24 hour, 365 days a year basis, and give facilities managers the information required to determine base flows and as a result, leaks by automatically sending emails to managers when base flow limits are exceeded.

During the 2011/12 reporting period, the automatic data loggers have been extremely effective in picking up leakage flows and enabling Council facilities to identify water wastage as it happens. All facilities have managed to have extended periods of time without leakage flow through their meters; however due to the nature of the sites, ongoing monitoring is required. There were a number of major leaks detected at Council's sites during the 2011/12 reporting period, these ranged in size from different sites with the maximum reaching 95 kiloliters per day.

Water consumption in the Kiama Municipality by property type from 2009-2012 is shown in Table 5.

Water consumption for Council's operations for the period 1990 - 2012 is shown in Figure 2. The amount of water consumed by the top 10 water using facilities is shown in Table 6. These facilities consumed over 75% of the total volume of water in the baseline year of 2011/2012 and have specific action plans to address this water use in the adopted Water Saving Action Plans (see Section 3.3.9 for more information).

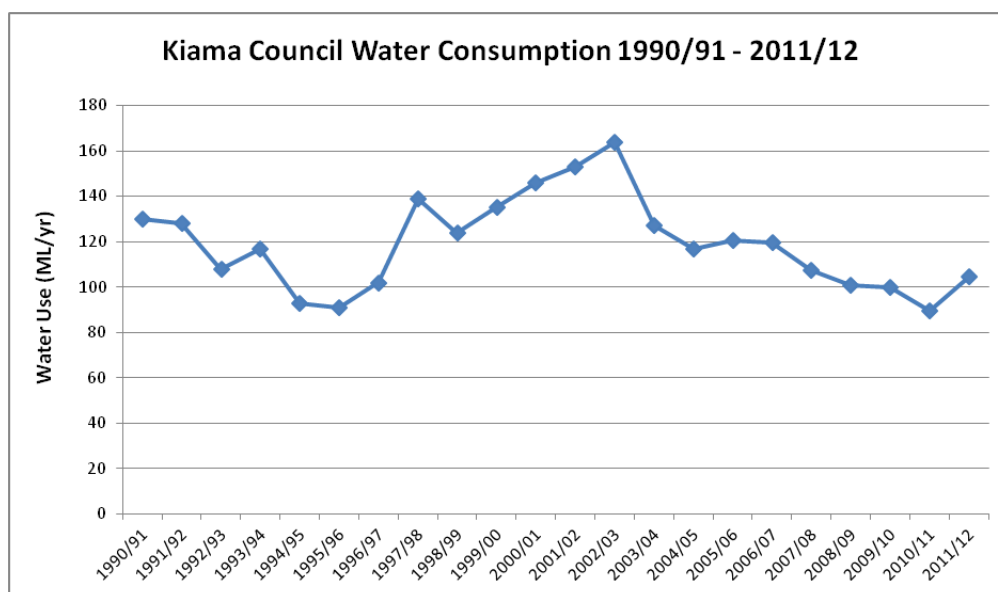


Figure 2: Total water consumption for Kiama Municipal Council 1990-2012

(Source: Sydney Water Corporation c, 2009, Planet Footprint August 2012)

Table 5: Top Water Using Council Properties 2009-2012

Source: Water Saving Action Plans (Kiama Municipal Council 2012 and Planet Footprint June 2012)

Rank	Site	Water Consumption (kL/yr)			
		2008-2009	2009-2010	2010-2011	2011-2012
1	Seven Mile Beach Holiday Park	11,912	13,278	10,710	11,835
2	Werri Beach Holiday Park	9,527	7,688	7,176	8,405
3	Blue Haven Retirement Village (Nursing home and hostel)	8,042	8,973	8,276	9,315
4	Kiama Leisure Centre	7,097	7,632	7,605	8,971
5	Surf Beach Holiday Park	9,380	8,030	6,903	8,038
6	Kiama Sports Complex	542	1,422	1,968	5,521
7	Kiama Harbour Holiday Cabins	5,723	5,831	5,310	5,812
8	Blue Haven Independent Living	12,867	11,844	12,469	11,525
9	Kendall's Holiday Park	10,493	12,589	6,651	8,624
10	Kiama Showground	2,512	2,483	2,316	1,944
Total		72,072	81,998	70,513	79,990

The increases seen in the top 10 water using Council properties can be attributed to the inability to detect the origin of several significant leakages; some of the sites do not have automatic data loggers and as a result were unable to detect the leakage for a long period of time. Also there has been the addition of two new cabins at Seven Mile Beach each of which have two new bathrooms and one has a third toilet and the installation of 2 new cabins and showers at Kendall's Holiday Park.

There has been a 30.8% reduction or 35,716 kL in the amount of water consumption for the 2011/12 reporting period in comparison to baseline year in 2002/03. The ongoing water savings for these properties is testament to the Water Savings Action Plan (WSAP) that Council has been implementing. The key measures undertaken this reporting period include:

- Fixing of leaks detected by online automated data loggers, that have been installed on the water meters at Council's Holiday Parks and Kiama Leisure Centre;
- Upgrade of outdated 11L single flush and 4.5/9 L dual flush cisterns with water saving 3/6L cisterns;
- Installation of rainwater tanks at Kiama Works Depot, Kiama Pavilion and Blue Haven Independent Living;

Community Water Consumption

Dam water storage levels in the Sydney Water Catchment have increased from 76.4% at the previous reporting period (end of June 2011); to 96.6% at the end of this reporting period in June 2012 (see Table 6). The Water Wise rules require that:

- All hoses must now have a trigger nozzles;
- Watering is allowed before 10am and after 4pm;

- No hosing of hard surfaces such as paths and driveways, washing vehicles is allowed; and
- Fire hoses must only be used for fire fighting activities only

Table 6: Dam Water Storage Levels
(Source: Sydney Catchment Authority 2012)

Date	Dam Water Storage Levels
End of June 2009	61.4%
End of June 2010	57.6%
End of June 2011	76.4%
End of June 2012	96.6%

Table 7 indicates the water consumption figures by property type within the Kiama Municipality for the past four financial years. Over the past four years there have been increasing trends in the amount of water used in Commercial and Industrial properties no information is available to identify why this increase has occurred.

Table 7: Water Consumption by Property Type in the Kiama Municipality
(Source: Sydney Water Corporation c, 2012)

Property Type	Total Consumption 08/09(kilolitres)	Total Consumption 09/10(kilolitres)	Total Consumption 10/11(kilolitres)	Total Consumption 11/12(kilolitres)
Commercial	284,678	266,411	269,722	352,343
Houses	1,048,777	1,060,292	1,016,653	1,028,150
Units/Flats	136,779	128,552	147,229	138,798
Industrial	6,791	5,956	5,873	7,694
Other	113,571	122,717	132,472	78,965
Total	1,590,596	1,583,928	1,571,949	1,605,950

3.2 Pressures

Water quality can be affected by drought conditions, stormwater runoff from roads and residential, industrial, commercial and agricultural activities, as well sewerage overflows and on-site sewerage systems.

3.2.1 Stormwater Runoff

The urban stormwater system has been constructed to carry rainwater that falls on hard surfaces in urban areas to the local waterway. Similarly, rain falling in rural areas will naturally drain to the local waterway. This runoff can carry a range of pollutants, which impact on local water quality and aquatic life.

All different types of land uses within the Municipality can have an impact upon water quality through stormwater runoff. These include:

- Residential land uses - stormwater runoff from residential properties and within recreational areas such as parks and playing fields can include litter, detergents from activities such as washing the car, garden fertilisers, paints, sediment and dog faeces;

- Industrial and commercial activities - runoff from car parking areas, forecourts of premises and within loading docks can include litter, oils from vehicles, detergents and chemical spills;
- Construction activities - runoff from building sites may contain soil and sediments as well as building products such as concrete slurry and material fragments;
- Agricultural activities - runoff may contain sediments, animal faeces, fertiliser and chemicals used in agricultural activities;
- Roads – runoff may contain litter, oils and sediments, and there is the potential for chemical or fuel spills.

3.2.2 Sewerage Treatment Plants

Provision of a reticulated sewerage system is the responsibility of Sydney Water Corporation. There are two Sewage Treatment Plants (STPs) in the Kiama Municipality, at Bombo and Gerroa (details shown in Table 8).

Kiama/Jamberoo Sewerage Scheme

The Bombo STP services the townships of Minnamurra, Kiama Downs, Kiama, Kiama Heights and Jamberoo. The system involves secondary treatment including denitrification and disinfection prior to ocean outfall. There is currently no data available that outlines the quantity of treated water which discharges via ocean outfall from this STP.

Sewage overflows, and bypasses of one or more process units, in the sewerage system can however potentially occur during wet weather, caused by flows that exceed the capacity of the system. Overflows result in untreated or partially treated effluent being discharged into waterways or the ocean. The extent of their impact depends on the volume and frequency of the overflows.

Dry weather overflows may also occur, usually due to blockages and/or damage to the sewerage infrastructure by tree roots or debris, pump failure at a pumping station or power failure at a treatment plant (Sydney Water Corporation).

Sydney Water Corporation is required to notify Council when any dry or wet weather overflows or bypasses occur leading to the discharge of untreated or partially treated effluent.

There were eleven wet weather overflows at the Bombo STP compared to twelve for the previous reporting period (see Table 8).

Table 8: Sewage Overflows/Bypasses in the Bombo Sewage Treatment Plant Catchment Area (Barr, G, pers comm, 2012.)

	2008/09	2009/10	2010/11	2011/12
Wet Weather Overflows	6	7	12	11
Dry Weather Overflows	-	11	7	0
Total	6	18	19	11

During wet weather overflows partially treated sewage discharges into the ocean off Bombo Headland. Some of the treated effluent from the Bombo STP is used for irrigation purposes at Kiama Golf Club. Approximately 39135kL has been re-used on this site in the last reporting period.

The Golf Club is currently in the process of installing a flow meter on the discharge line of the irrigation pump to monitor the exact usage of water on the golf course, this information can be compared to the amount of water delivered to the Golf Club from Sydney water to calculate the amount of potential water loss through evaporation from the storage dam.

Previous studies have been undertaken by Sydney Water Corporation regarding the use of treated effluent for agricultural purposes on dairy farms in the Jamberoo Valley. However due to the high capital cost for installation of an agricultural re-use system, ongoing maintenance and operational issues the proposal was not implemented.

Gerringong Gerroa Sewerage Scheme

The Gerroa STP services the urban areas of the townships including Gerringong and Gerroa. Veolia Water designed and built a sewerage network, sewage treatment plant and effluent refuse system in 2002. The plant treats sewage using tertiary filtration, ozone, biologically activated carbon, micro-filtration and ultra-violet disinfection.

The scheme is designed to reuse 80 percent or more of the treated effluent in local dairy farm irrigation or onsite at the STP. Table 12 outlines the megalitres reused by farms and the sewerage treatment plants from 2009-2012. The results show a major decrease in irrigation farm reuse from 2010-2012 this can be explained by a local farmer retiring and the extremely wet weather conditions during that two year period. The results also indicate an increase in the reuse at Sewage Treatment Plant (STP) and on gardens which is due to the area around the STP being extended to irrigate as well as a more concerted effort to manage reuse due to the farmer decreasing his usage.

Table 9: Effluent (ML) reused from 2009-2012

	2008/09	2009/10	2010/11	2011/12
Irrigation Farm (Aorangi Farm)	110.959	141.375	13.452	22.623
STP Grounds and Gardens	123.528	101.812	105.249	220.578
Total ML treated	234.487	243.187	118.701	243.201

Council has been notified by Gerringong-Gerroa Sewerage Scheme of one Wet weather overflow at Discovery Caravan Park pumping station Gerroa in February 2012, which had an estimated discharge of 11,000L.

3.2.3 On-site Sewage Management Facilities

There is the potential for effluent to enter the waterways from the onsite sewage management facilities (OSMF) that are still operating within the Municipality. These systems are used to treat and dispose of 'black water' (toilet waste) and/or 'grey water' (from showers, sinks and washing machines) in areas where a reticulated sewerage service is not available.

There are approximately 916 OSMFs currently operating in the Municipality, of which 185 are considered high risk and 731 low risks. When systems are not maintained or operated correctly, this can result in untreated effluent discharging on land and may eventually enter waterways. Council has been implementing a program of OSMF inspections (see below in Section 3.3.7) to determine if each system is operating correctly and identify any possible risks to human health and the environment.

3.3 Responses

3.3.1 Development Control for Water Quality and Water Conservation

Development control conditions are placed on development approvals to ensure water pollution is minimised or prevented and to promote stormwater reuse. From 1st July 2005 the Building Sustainability Index (BASIX) came into effect in the Kiama Municipality. BASIX is a web-based planning tool for Councils and proponents of residential dwellings to assess the potential performance of their development against a set of sustainability indices, including water conservation and stormwater. For water, a BASIX rating of 40 for water conservation applies, potentially reducing potable water consumption by 40%. During the reporting period 126 BASIX certificates were issued. More information about BASIX can be found in Chapter 2: Land.

3.3.2 Enforcement

Council's Environmental Health Officers and Ranger Services Officers investigate complaints received by Council relating to water pollution, and the Department of Environment, Climate Change & Water investigates complaints regarding water pollution from scheduled premises and activities. Clean Up Notices, Prevention Notices or Penalty Infringement Notices for water pollution offences may be issued by these officers under the *Protection of the Environment Operations Act 1997*. The number of complaints received is shown in Table 10. The numbers of complaints recorded in this financial year are lower than the previous three reporting periods.

Table 10: Complaints relating to Water Pollution (Council and the EPA 2012)

Type of Complaint	2008-09	2009-10	2010-11	2011-12
Water pollution complaints to EPA	5	5	5	8
Spill complaints to EPA	0	0	4	0
Water Pollution Complaints to Council	20	16	17	8
Total Water Pollution Complaints	25	21	26	16

3.3.3 Stormwater Management Plan

Kiama Municipal Council reviewed its *Stormwater Management Plan* (SMP) in 2003 in accordance with the requirements of Section 12 of the *Protection of the Environment Administration Act 1991*. The SMP has the following purposes:

- To satisfy the requirements of Kiama Council under Section 12 of the *Protection of the Environment Administration Act 1991*;
- To establish a framework to guide current and future stormwater management planning in the Kiama Local Government Area;
- To collate and concisely present the most relevant information that will aid informed stormwater management for the Kiama Local Government Area; and
- To suggest actions that will minimise environmental impacts from stormwater runoff.

There are a range of strategies contained within the reviewed SMP, within seven sections (for the full list of actions, please refer to SMP – Kiama Municipal Council, 2003a):

- Mitigation of future stormwater impacts;
- Mitigation of stormwater impacts from current developments: Minnamurra/Kiama Downs Stormwater Catchment;
- Mitigation of stormwater impacts from current developments: Kiama Stormwater Catchment;
- Mitigation of stormwater impacts from current developments: Gerringong-Werri Stormwater Catchment;
- Mitigation of stormwater impacts from current developments: Jamberoo Stormwater Catchment;
- Mitigation of stormwater impacts from current developments: Gerroa stormwater catchment; and
- Mitigation of stormwater impacts from current developments: all catchments.

The major achievements are shown below. For a full list of strategies implemented, please refer to previous SoE Reports:

- Ongoing maintenance of litter baskets and gross pollution traps
- Approximately 24,000 doggie bags were distributed during the 2011/2012 reporting period; and

- Mechanical street sweeping is undertaken in all urban areas of the Kiama Municipality on a quarterly basis, with the commercial town centres of Kiama being swept daily and the Gerringong and Jamberoo townships swept twice per week. Approximately 1,252 tonnes of litter has been collected by street sweeping services since 2009

In 2012 Council developed a Drainage and Stormwater factsheet which outlines resident's and Council's responsibilities in terms of monitoring and controlling drainage and stormwater. It also provides tips on how to reduce stormwater runoff from properties. This factsheet can be found on Council's website.

Council resolved that its existing Stormwater Management Plan will be reviewed. This will be undertaken in the next reporting period.

3.3.4 Crooked River Estuary Management Plan

The *Crooked River Estuary Management Plan* (CREMP) was prepared in 2003. The Plan provides a comprehensive and integrated set of strategies to restore, protect and conserve the natural resources of Crooked River estuary and to ensure its use is ecologically sustainable in the long term.

This plan has to be reviewed; during the reporting period grant funding was applied for the review the CREMP to include emerging issues such as climate change and its associated impacts. It is proposed that subject to funding this will be progressed 2012-2013 reporting period.

The major achievements that occurred within 2009-2012 are shown below:

- Streamwatch Community Monitoring was promoted and supported (see Section 3.1.2 for more information);
- Landcare projects conducted by volunteers were supported, including Streamwatch monitoring, feral animal eradication project, and Conservation Volunteers Australia projects (see Section 5.3.11 for more information); and
- The Riparian Corridor Management was included as a 'sensitive' environment

In 2012 there was a major fish kill at Blue Angle Creek in Gerroa; this was investigated by the EPA who confirmed the cause resulted from acid sulphate soil discharge. This matter will be addressed by the development of a management plan in consultation with the EPA and affected land owners.

3.3.5 Minnamurra River Estuary Management Plan

The *Minnamurra River Estuary Management Plan* (MREMP) aims to achieve a coordinated approach to management, implementation and monitoring so as to preserve, enhance and develop in a sustainable manner the ecological, scenic, agricultural, mineral resource, tourism and recreational values of the estuary. This plan has to be reviewed; during the reporting period grant funding was applied for the review the

MREMP. It is proposed that subject to funding this will be progressed 2012-2013 reporting period.

The major achievements within 2011-2012 are shown below:

- Completion of the River bank restoration through Minnamurra bends, Riverside Drive Kiama Downs
- In June 2012 the *Journal of Wetlands Ecology and Management* published a preliminary study of a small stand of mangrove and salt marsh ecosystems occurring on the banks of the Minnamurra River estuary in southern New South Wales. The study includes measuring elevation change and accretion, mapping of wetland communities, and modelling of their potential response to sea-level rise.

The research includes empirical measurements of sedimentation at sites in both mangrove and salt marsh vegetation using the surface elevation table-marker horizon technique.

The study concludes that the coastal wetlands at Minnamurra are highly vulnerable to future sea-level rise; each model showed a significant loss of salt marsh in the next 40 years. Climate change policy and management will need to address the issue of sea-level rise and minimise its effects if the future loss of mangrove and salt marsh ecosystems is to be prevented.

3.3.6 Ecosystem Health Monitoring Program (EHMP)

The Southern Rivers Catchment Management Authority developed an EHMP in 2008 which utilises a range of physical, chemical and ecological indicators to measure ecosystem health. Ecological indicators are scientific measures (parameters or values) that can be used to assess the ecological status and trends in the health of ecosystems and their component parts. The monitoring program for ecological indicators comprises repeated spatial and temporal measurements of the variable in a defined way. Comparison of this set of repeated measurements with a benchmark set or condition provides the basis for detecting change and hence allowing trend analysis.

Useful ecological indicators inform the scientific community, decision makers, and the public about the overall state of an ecosystem and how it may be changing due to anthropogenic and other pressures. The information collected in the EHMP is used to advise local Councils, CMAs and land managers on areas of declining estuary health, report on the effects of different land uses and evaluate the effectiveness of management actions aimed at improving and protecting aquatic ecosystems.

Those areas included in the EHMP relating to Kiama LGA include; Crooked River, Minnamurra River and Werri Lagoon, see Table 11 for the 2006 vulnerability classification of each based on the forested catchment and the current land use.

Table 11: Management Classifications of Estuaries 2006

	Vulnerability based on fully forested catchment	Vulnerability based on current land use
Crooked River	Moderately High	Moderately High
Minnamurra River	Medium	Medium
Werri Lagoon	High	High

Data was also collected on the amount of Total Suspended Solids, Phosphorous and Nitrogen in these estuaries, with all three of the above mentioned estuaries receiving a 'Fair' rating. Since 2006 no further studies have been conducted to ascertain the health of the estuaries. This is a gap in the management process of these estuaries that needs to be addressed by Council and other Local Government Authorities.

3.3.7 On-site Sewage Management System Program

The management of domestic waste water and sewage is important for the health of the community and for the natural environment. All OSMFs that operate in the Municipality have been risk classified based on a number of criteria, including performance, maintenance, proximity to water ways, soil types and flood risk.

Council inspects each risk category accordingly to ensure they are operating effectively and have no adverse impacts on human health or the environment.

Council adopted an *Onsite Sewage Management Strategy* in October 2004. The purpose of this Strategy is to:

- Protect and enhance the quality of public health and the long term environment of the Kiama Municipality by pursuing best practice in onsite sewage management;
- Encourage and support land holders in adopting a sustainable approach through best practice onsite sewage management and recycling of waste water; and
- To establish and notify of a monitoring regime aimed at auditing all systems, refining the risk assessment scheme, and a systems enhancement program (Kiama Municipal Council, 2004b).

The existing strategy is currently under revision, with a new Onsite Sewage Management Guideline being developed as a support document for Council's Development Control Plan (DCP), 2012. The review will reinforce Council's role in regulating onsite sewage management, the inspection process, enforcement, community responsibilities, legislative changes and integration with other Council practices and policies.

The Sydney Catchment Authority prepared and released recommended practice requirements for designing and installing onsite waste water systems located in Sydney drinking water catchment areas. These requirements are to be applied to new systems and any upgrading of existing systems located in Kiama LGA.

Table 12 lists the number of satisfactory and defective OSMF inspections carried out from 2009-2012. During the 2011/2012 reporting period, 410 On Site Sewage

Management Systems were inspected. Of these, 345 were satisfactory, whilst 65 required remediation

Table 12: OSSM inspections 2009-2012

	2008/09	2009/10	2010/11	2011/12
Satisfactory	252	242	210	345
Defective	20	31	54	65
Total inspected	272	273	264	410

Reasons for the increase in the number of defective systems detected since 2008/09 can be attributed to the increase in the number of inspections carried out during 2011/12, lack of system maintenance and wet weather conditions experienced in the past two reporting periods.

3.3.8 Water Sensitive Urban Design Policy

Water Sensitive Urban Design aims to incorporate principles such as stormwater source control, stormwater and wastewater re-use, potable water demand reduction and the utilisation of natural flow paths and drainage measures with pervious surfaces.

Council has developed a *Water Sensitive Urban Design Policy* for urban and rural development to ensure that building design and development incorporates effective water and soil management measures to implement such principles. It includes good stormwater management principles and encourages rainwater harvesting and reuse to reduce reliance on potable water supply. This policy was adopted by Council in July 2005 and provides an important linkage to the *Development Control Plan No. 32 – Kiama Development Code* and the *Stormwater Management Plan*. This policy will be reviewed and incorporated into the new Kiama DCP 2012.

3.3.9 Water Saving Action Plans

As a requirement of the 2011/12 Waste and Sustainability Improvement Performance (WaSIP) Payments, Council was required to prepare a Water Savings Action Plan (WSAP), which identifies Council's top 10 water-using sites and helps deliver water savings in a practical, effective and flexible way. The report was prepared under the framework of the NSW Government Local Council Guide for Water Efficiency Plans. The 2012 WSAP was an update of Council's original WSAP, which was implemented in 2006.

During the 2011/2012 reporting period, Council's plan was adopted by the NSW Office of Environment and Heritage (OEH) for approval. The Plan includes separate *Water Saving Action Plans* for the current 10 sites that have the highest water usage:

- Seven Mile Beach Holiday Park;
- Werri Beach Holiday Park;
- Blue Haven Nursing Home and Hostel;

- Kiama Leisure Centre;
- Surf Beach Holiday Park;
- Kiama Sports Complex;
- Kiama Harbour Cabins;
- Blue Haven Retirement Village;
- Kendall's Beach Holiday Park;
- Kiama Showground; and
- Kiama Works Depot.

Annual water consumption for these sites is shown in Table 5.

Analysis of the water consumption data indicated that the top 10 water users represent 6% of all sites metered and account for over 75% of the total volume of water used by all Council operations during this period.

The strategy underpinning the identification of Council's top 10 water using sites is to focus water conservation at these sites in order to maximise the impact of water conservation measures on Council's overall water consumption. These Water Savings Action Plans deal with each of the sites in detail. This includes:

- defining baseline water usage data for each site so that performance over time can be measured,
- detailing each sites' recent historical and current water use,
- identifying water using activities and the relative contribution of those activities to the total water use for each site,
- identifying initiatives already underway at each site, and
- providing action plans to further improve water conservation for each site.

Water savings actions completed 2008-2012

Since the original WSAP was implemented in 2006, Council has reduced its overall water consumption by 25%. Major initiatives that were undertaken at various sites which contributed to this reduction include:

- Fixing of leaks detected by online automated data loggers, that have been installed on the water meters at Council's Holiday Parks and Kiama Leisure Centre;
- Upgrade of outdated 11L single flush and 4.5/9 L dual flush cisterns with water saving 3/6L cisterns;
- Installation of rainwater tanks at Kiama Works Depot, Kiama Pavilion and Blue Haven Independent Living;

A recent review of water saving action plans has recommended the installation of online water consumption monitoring for other high water usage sites. As part of Council's Asset Management Program a scheduled inspection program will be developed and implemented to check for water leakage at other Council facilities that do not have online monitoring. Please refer to Appendix A for further details.

3.3.10 Sydney Water Corporation's WaterFix Program

The WaterFix program offered householders the opportunity to have a qualified plumber install water-efficient fittings and fixtures in their homes and repair minor leaks. These programs were designed and implemented to save water due to dam levels being at 41.8% in 2006, since then dam levels have increased to 96.6% in June 2012; because of this there has been a decrease in funding from Sydney Water resulting in the program no longer being subsidised.

3.3.11 Waste and Sustainability Improvement Payments Program (WaSIP) 2011/12

The following programs have been conducted in accordance with the WaSIP requirements for 2011/12: (For more information please refer to section 6.3.3)

- Council installed a 22,000 litre rainwater tank at its main Administration Building, capturing water from the roof to be used for irrigation and flushing of toilets. Its prominent position at the front of the building on Manning Street aims to encourage members of the community to take the same initiative in their homes and workplaces
- Council continues to monitor the top 11 Water Consuming sites in Kiama LGA Refer to Table 7 for the past four year's consumption
- Fitting of flow restrictors and low flow showerheads in Council facilities and amenities

Chapter 4: Noise

Noise may be generally defined as unwanted or offensive sound, which can cause annoyance and affect sleep patterns and can therefore have an impact on our health. The *Protection of the Environment Operations Act 1997* defines offensive noise as:

“Noise, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstance is above a specified level or is considered (or is likely) to be harmful or interfere unreasonably with the comfort of a person who is outside the premises.”

The gradual increase in background noise caused by the cumulative effect of increasing number of noise sources and/or increasing density of development can also be a concern.

4.1 State

Council monitors noise pollution in the local environment through the documentation of the nature and type of noise complaints received. These complaints are shown below in Table 13 and Figure 3.

The most common environmental issue that Council and the NSW Environment Protection Authority are contacted about is noise. Residential noise is the main noise pollution issue that Council is contacted.

Table 13: Complaints relating to Noise Pollution (Rail Infrastructure Corporation, Council and the EPA)

Type of Complaint	2008-2009	2009-2010	2010-2011	2011-2012
Industrial Noise Complaints to the EPA	1	8	3	7
Rail Noise Complaints to RailCorp	0	0	0	4
Industrial Noise Complaints to Council	0	5	10	0
Commercial Noise Complaints to Council	0	12	19	16
Residential Noise Complaints to Council	14	12	19	20
Construction Noise Complaints to Council **	4	1	3	2
Council Plant Vehicle Noise to Council **	1	3	0	1
Animal Noise complaints to Council	45	56	42	57
Total Noise Complaints	65	84	96	107

There has been a 60% increase in noise complaints since 2009 which is mainly attributed to animal and residential noise.

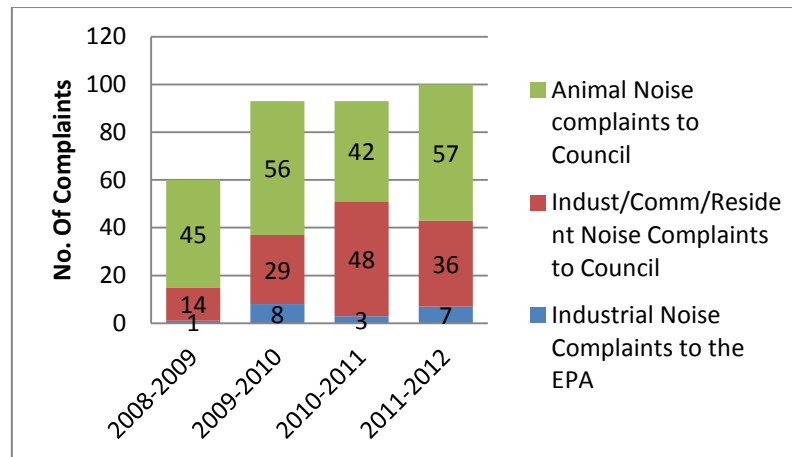


Figure 3: Noise Complaints within the Kiama Municipality

4.2 Pressures

4.2.1 Road and Rail Noise

Road noise is likely to increase as traffic levels increase and the amount residential development near to main roads and railways grows. Currently, residential areas in Minnamurra, Kiama Downs, Kiama, South Kiama, Gerringong and Gerroa are close to main roads and parts of the residential areas of Minnamurra, Kiama Downs, Kiama, South Kiama and Gerringong are near to the railway line.

The *NSW Road Noise Policy* replaced the *Environmental criteria for road traffic noise* (ECRTN) on 1 July 2011. One of the new assessment criterion introduced is the relative increase criterion. This criterion aims to prevent significant increases in noise from road projects in quiet areas. Victoria and many states in the USA recommend additional action when significant increases in road traffic noise of 10–15 decibels are expected. This new criterion requires noise mitigation measures to be further considered when a road project would increase existing road traffic noise levels by 12 decibels, which is more than a doubling of loudness in quiet areas.

<http://www.environment.nsw.gov.au/noise/nswrnprovs.htm>

RailCorp is undertaking three Pollution Reduction Programs, all of which relate to noise. Details of these programs are contained in RailCorp's Environment Protection Licence 12208, which is available at:

http://www.railcorp.info/community/rail_noise/freight

In 2010 Roads and Maritime Services upgraded the Princess Highway between Hothersal Street & David Smith Place in Kiama. As a result of this upgrade noise pollution in this area would most likely increase both during construction and after completion.

4.2.2 Industrial and Commercial Noise

Kiama Municipality does not have a large area devoted to industrial activities, however where residential areas adjoin industrial areas, there is the potential for impacts from

noise of operations. Business, or commercial, areas constitute only a small portion of Kiama Municipality, but can be a source of offensive noise, mainly from air conditioning and deliveries during early hours.

4.2.3 Residential Noise

As shown in Table 13 and Figure 3, noise from residential sources is the most common noise complaint in the Kiama Municipality, including barking dogs, music, garbage and recycling services, building construction and lawn mowing and gardening activities. With a growing population, increased development and new residential block sizes generally being smaller than the traditional block, it is expected that the amount of noise complaints in residential areas to grow.

4.3 Responses

4.3.1 Development Control

Development control conditions are placed on development approvals for industrial and commercial activities to ensure noise pollution is minimised or prevented. For industrial premises the *NSW Industrial Noise Policy* applies, providing guidelines for large industrial developments, including guidance on measuring and assessing noise from small commercial and industrial premises regulated by Councils. *NSW Road Noise Policy* includes criteria for assessing road traffic noise from road developments (EPA 2012).

The new DCP 2012 also has control requirements relating to mitigating noise from new development and the Kiama Bypass. Noise control measures associated with the Kiama Bypass include:

- The design of houses (regardless of type) must be designed to limit the exposure of habitable rooms to excessive noise levels.
- Acoustic measures such as double glazing etc may be required to satisfy amenity issues.
- Council may require applications for housing adjacent to the Bypass to be accompanied by an acoustic report recommending design measures to be incorporated in the construction of that housing to minimise noise exposure to acceptable levels.
- Consent conditions will be applied as part of the development assessment process to mitigate adverse noise from the construction and operation of the development when completed

4.3.2 Enforcement

Council's Environmental Health Officers and Rangers investigate complaints received by Council relating to noise pollution, and the EPA investigates complaints regarding noise pollution from scheduled premises, under the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Noise Control) Regulation 2008*. The Police also have jurisdiction over noise pollution and can address complaints relating to residential noise sources such as car sound systems, car and house alarms and noisy neighbours.

Nuisance Dog Orders can be issued under the *Companion Animals Act 1998* when the noise is the result of a dog, requiring the owner to prevent the behaviour causing the noise problem. There were two Nuisance Dog Orders for barking dogs issued during 2011-2012.

Within residential areas, restrictions on some domestic noise sources exist, such as power tools, swimming pool pumps, musical instruments, amplified sound equipment, domestic air conditioners and vehicles. These noise sources have restricted hours of operation and even outside the restricted hours, additional restrictions can be placed on their use if they cause offensive noise (see Table 13). There are also restrictions on car and house alarms. Information on these restrictions can be found on the EPA website at: <http://www.environment.nsw.gov.au/resources/noise/0870infoarticles.pdf>

Table 14: Hours of Restricted Use of Certain Equipment

(adapted from Tables 4.5 and 4.6, Department of Environment, Climate Change & Water, 2010).

Type of noise	Times during which restrictions apply
Power tools and swimming/spa pool pumps (POEO (Noise Control) Regulation, clause 50)	Before 8.00 am or after 8.00 pm on Sundays and public holidays Before 7.00 am or after 8.00 pm on any other day
Musical instruments and electrically-amplified sound equipment (POEO (Noise Control) Regulation, clause 51)	Before 8.00 am or after midnight on any Friday, Saturday or day immediately before a public holiday Before 8.00 am or after 10.00 pm on any other day
Air conditioners and heat pump hot water systems (POEO (Noise Control) Regulation, clause 52)	Before 8.00 am or after 10.00 pm on weekends or public holidays Before 7.00 am or after 10.00 pm on any other day
Motor vehicle used on residential premises (except when entering or leaving) (POEO (Noise Control) Regulation, cl. 15) Refrigeration unit fitted to a motor vehicle (POEO (Noise Control) Regulation, cl. 16)	Before 8.00 am or after 8.00 pm on any Saturday, Sunday or public holiday Before 7.00 am or after 8.00 pm on any other day

4.3.3 Roads and Maritime Services

In response to the Princess Highway upgrade at Kiama bends a Traffic Noise Monitoring and Modelling Assessment was undertaken in May 2010. The noise modelling found 23 properties where noise levels meet or exceed the Noise Abatement Program (NAP) noise criteria. A range of noise mitigation options are available to the properties affected including property alterations after consultation with the RMS.

Chapter 5: Biodiversity

Biodiversity is the variety of all life forms – the different plants, animals and micro-organisms, the genes they contain and the ecosystems of which they form a part.

5.1 State

5.1.1 Ecosystem Diversity - Ecological Communities

Under the NSW *Threatened Species Conservation Act 1995*, Kiama Local Government Area is identified as containing the Endangered Ecological Communities listed in Table 14, which is adapted from the vegetation report (Kevin Mills and Associates, 2006a). These communities and the Core Conservation Areas can be seen on the maps shown in this link: <http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>

Littoral Rainforest is also protected under *State Environmental Planning Policy (SEPP) No. 26 – Littoral Rainforests*, which identifies and makes provision for the protection of littoral (coastal) rainforest in New South Wales. SEPP No. 26 identifies patches of littoral rainforest near the Crooked River, Gerroa. Two stands, nos. 175J and 175K, occur between the Seven Mile Beach Road and Blue Angle Creek. Three small adjacent stands, no. 175A, are identified on the headland above Shelly Beach, north of Gerroa. However, the community behind Seven Mile Beach is actually much more extensive than mapped in SEPP No. 26 (Kevin Mills and Associates, 2006a).

State Environmental Planning Policy No 14 - Coastal Wetlands identifies and makes provision for the protection of coastal wetlands in New South Wales. Wetlands along the Minnamurra River, Spring Creek in Kiama and Ooaree Creek in Rose Valley, are identified in the Policy, but none are identified on the Crooked River, even though the river contains wetlands (Kevin Mills and Associates, 2006a).

A *NSW Biodiversity Strategy 2010–2015* has been developed which outlines key objectives, actions and targets to direct investment in biodiversity conservation. This document includes:

- prioritisation of state-scale investment for terrestrial ecosystems across 6% of New South Wales to coordinate and target investment and effort in biodiversity
- an action to deliver transparent prioritisation of threatened species recovery programs between species and locations to maximise return for effort
- greater focus on biodiversity in urban settlement planning processes to minimise impacts on biodiversity and to offset unavoidable impacts using secure, well-targeted offsetting mechanisms
- support for existing efforts to build connections between Aboriginal people and Country, and for cultural biodiversity-related business, employment and training opportunities for Aboriginal people
- support for non-government, government and catchment management authorities (CMAs) conservation partnerships like the Great Eastern Ranges Initiative
- continued focus on existing programs such as reserve expansion and management, invasive pest and weed control and a range of programs underway to ensure the health and sustainability of our rivers and wetlands

- Ongoing support for the range of sustainability programs currently implemented by rural landholders including sustainable grazing, rehabilitation and riparian management and soil erosion strategies.

The Strategy aims to address the following objectives:

- Provide a co-ordinated and regional approach to biodiversity conservation so as to maximise knowledge sharing and efficient use of resources between the Illawarra Councils;
- Identify biodiversity priorities to guide the Illawarra Councils and other land managers in future decisions and planning;
- Encourage and promote the conservation of biodiversity across the Illawarra;
- Identify and manage threats to biodiversity across the Illawarra;
- Improve understanding of biodiversity values of the Illawarra;
- Identify anticipated threats to biodiversity from climate change;
- Improve community awareness, and encourage and support community participation in biodiversity conservation; and
- Contribute to the achievement of targets defined by the Australian Biodiversity Conservation Strategy 2010-2020, NSW State Plan, NSW Biodiversity Strategy, Southern Rivers CMA Catchment Action Plan, Illawarra Regional Strategy, and the NSW Threatened Species Priorities Action Statements

5.1.2 Species Diversity - Flora

According to the Atlas of NSW Wildlife (EPA), there are 961 known native flora species within the Kiama Local Government Area. The Atlas of NSW Wildlife indicates that twelve plant species recorded within the Kiama Local Government Area are listed as threatened species in Schedules 1 and 2 of the NSW *Threatened Species Conservation Act 1995* (TSC Act 1995), as shown in Table 16. These plant species are also listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).

Table 15: Endangered Ecological Communities in the Kiama Municipality (EPA)

Endangered Ecological Community	Kiama Vegetation Map Equivalent	Site Example in Kiama
Rainforests		
Robertson Rainforest	1.7 Sassafras Warm/Cool Temperate Rainforest (DOR-WRF)	Knights Hill area
Illawarra Sub-Tropical Rainforest	1.1 Complex Subtropical Rainforest (COM-SRF)	Extensive on escarpment slopes
Littoral Rainforest	1.2 Complex Littoral Rainforest (COM-LRF) 1.6 Simple Littoral Rainforest (SIM-LRF)	Seven Mile Beach Area
Eucalypt Forest/Woodlands		
Illawarra Lowland Grassy Woodlands	2.7 Red Gum – Blue Gum Forest (TER-SAC) 2.8 Red Gum – Stringybark Forest (TER-EUG)	Hills northeast Jamberoo
Robertson Basalt Tall Open Forest	2.11 Brown Barrel Tall Forest (FAS-CYP)	Knights Hill area
Bangalay Sand Forest	2.9 Bangalay – Banksia Forest (BOT-BAN)	Seven Mile Beach, Minnamurra River area

Shrub lands		
<i>Melaleuca armillaris</i> Tall Shrubland	5.1 Paperbark Tall Shrubland (MEL-ARM)	Hill tops around Jamberoo
Wetlands (Fresh and Saline)		
Freshwater Wetlands on Coastal Floodplains	6.4 Spike-rush Sedgeland (ELE-SOG) 7.3 Phragmites Reedland (PHR-RDL)	North of Gerringong, Spring Creek
Coastal Saltmarsh	7.4 Saltmarsh (SAR-SUA) 7.5 Saltwater Juncus Rushland (JUN-SAL)	Around Minnamurra River, Crooked River, Werri Lagoon
Swamp Sclerophyll Forest on Coastal Floodplains	2.9 Bangalay – Banksia Forest (BOT-BAN) (possibly in part) 6.1 Swamp Mahogany – Paperbark Forest (ROB-MEL)	Crooked River Area
Swamp Oak Floodplain Forest	4.2 Swamp Oak Forest (CAS-GLA)	Minnamurra River, Crooked River, Werri Lagoon
Grasslands		
<i>Themeda</i> grassland on seacliffs and coastal headlands	8.2 Kangaroo Grass Grassland (THM-GRL)	Minnamurra Point and Black Head (Gerroa)

Table 16: Threatened Flora Species listed in the Atlas of NSW Wildlife for Kiama LGA

Common Name	Species Scientific Name	Legal Status TSC Act 1995	Legal Status EPBC Act 1999
White Flowered Wax Plant	<i>Cynanchum elegans</i>	Endangered	Endangered
Illawarra Irene	<i>Irenepharsus trypherus</i>	Endangered	Endangered
Lesser Creeping Fern	<i>Arthropteris palisotii</i>	Endangered	
Illawarra Socketwood	<i>Daphnandra</i> sp. C <i>Illawarra</i>	Endangered	Endangered
Waterfall greenhood	<i>Pterostylis pulchella</i>	Vulnerable	Vulnerable
Kangaloon Sun Orchid	<i>Thelymitra</i> sp. <i>Kangaloon</i>	Endangered	Critically Endangered
Carrington Falls Pomaderris	<i>Pomaderris walshii</i>	Endangered	
Carrington Falls Grevillea	<i>Grevillea rivularis</i>	Endangered	Endangered
Deane's Boronia	<i>Boronia deanei</i>	Vulnerable	Vulnerable
Illawarra Zieria	<i>Zieria granulata</i>	Endangered	Endangered
Spiked Rice-flower	<i>Pimelea spicata</i>	Endangered	Endangered
	<i>Solanum celatum</i>	Endangered	

5.1.3 Species Diversity - Fauna

The Atlas of NSW Wildlife indicates there are 511 animal species occurring in the Municipality, including mammals, birds, frogs, reptiles and freshwater and estuarine fish. Of these 99 are listed as threatened species in Schedules 1 and 2 of the NSW *Threatened Species Conservation Act 1995* (TSC Act 1995). Some of these animal species are also listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999), these can be seen in Table 17.

Table 17: Threatened Fauna Species listed in the Atlas of NSW Wildlife for Kiama LGA

Common Name	Species Scientific Name	Legal Status TSC Act 1995	Legal Status EPBC Act 1999
Threatened Mammals			
Australo-African Fur-seal	<i>Arctocephalus pusillus</i>	Vulnerable	
Eastern Bent-wing Bat	<i>Miniopterus schreibersii</i>	Vulnerable	Conservation Dependent
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable	
Eastern Freetail Bat	<i>Mormopterus norfolkensis</i>	Vulnerable	
Eastern Pygmy Possum	<i>Cercartetus nanus</i>	Vulnerable	
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	Vulnerable	
Grey Headed Flying Fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable
Humpback Whale	<i>Megaptera novaeangliae</i>	Vulnerable	Listed migratory species
Koala	<i>Phascolarctos cinereus</i>	Vulnerable	
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Vulnerable	
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	
Long-nosed Potoroo	<i>Potorous tridactylus</i>	Vulnerable	Vulnerable
Southern Brown Bandicoot	<i>Isodon obesulus</i>	Endangered	Endangered
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered
Yellow-bellied Glider	<i>Petaurus australis</i>	Vulnerable	
Yellow-bellied Sheath-tail Bat	<i>Saccolaimus flaviventris</i>	Vulnerable	
Threatened Amphibians			
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	Vulnerable	Vulnerable
Green and Golden Bell Frog	<i>Litoria aurea</i>	Endangered	Vulnerable
Littlejohn's Tree Frog	<i>Litoria littlejohni</i>	Vulnerable	Vulnerable
Stuttering Frog	<i>Mixophyes balbus</i>	Vulnerable	Vulnerable
Red-crowned Toadlet	<i>Pseudophryne australis</i>	Endangered	
Threatened Reptilians			
Green Turtle	<i>Chelonia mydas</i>	Vulnerable	Vulnerable
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	Vulnerable	
Broad-headed Snake	<i>Hoplocephalus bungaroides</i>	Endangered	Vulnerable

Table 18: Threatened Fauna Species (continued)

Common Name	Species Scientific Name	Legal Status TSC Act 1995	Legal Status EPBC Act 1999
Threatened Terrestrial Birds			
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Vulnerable	
Australian Painted Snipe	<i>Rostratula australis</i>	Endangered	Vulnerable
Barking Owl	<i>Ninox connivens</i>	Vulnerable	
Black Bittern	<i>Ixobrychus flavicollis</i>	Vulnerable	
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Endangered	
Black-tailed Godwit	<i>Limosa limosa</i>	Vulnerable	
Blue-billed Duck	<i>Oxyura australis</i>	Vulnerable	
Broad-billed Sandpiper	<i>Limicola falcinellus</i>		
Bush Stone Curlew	<i>Burhinus grallarius</i>	Endangered	Endangered
Beach Stone-curlew	<i>Esacus magnirostris</i>	Endangered	
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable	
Comb-crested Jacana	<i>Irediparra gallinacea</i>	Vulnerable	
Eastern Bristlebird	<i>Dasyornis brachypterus</i>	Endangered	Endangered
Eastern Ground Parrot	<i>Pezoporus wallicus</i>	Vulnerable	
Eastern Osprey	<i>Pandion cristatus</i>	Vulnerable	
Flame Robin	<i>Petroica phoenicea</i>	Vulnerable	
Freckled Duck	<i>Stictonetta naevosa</i>		

Gang Gang Cockatoo	<i>Callocephalon fimbriatum</i>	Vulnerable	
Great Knot	<i>Calidris tenuirostris</i>	Vulnerable	
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable	
Greater Sand-plover	<i>Charadrius leschenaultii</i>	Vulnerable	
Ground Parrot	<i>Pezoporus wallicus</i>	Vulnerable	
Hooded Plover	<i>Thinornis rubricollis</i>	Endangered	
Lesser Sand-plover	<i>Charadrius mongolus</i>	Vulnerable	
Little Eagle	<i>Hieraaetus morphnoides</i>	Vulnerable	
Little Lorikeet	<i>Glossopsitta pusilla</i>	Vulnerable	
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	
Olive Whistler	<i>Pachycephala olivacea</i>	Vulnerable	
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	Endangered	Endangered
Osprey	<i>Pandion haliaetus</i>	Vulnerable	Listed migratory species
Pied Oystercatcher	<i>Haematopus longirostris</i>	Vulnerable	
Pink Robin	<i>Petroica rodinogaster</i>	Vulnerable	
Powerful Owl	<i>Ninox strenua</i>	Vulnerable	
Regent Honeyeater	<i>Xanthomyza phrygia</i>	Endangered	Endangered
Rose-crowned fruit-Dove	<i>Ptilinopus regina</i>	Vulnerable	
Sanderling	<i>Calidris alba</i>	Vulnerable	
Scarlet Robin	<i>Petroica boodang</i>	Vulnerable	
Sooty Owl	<i>Tyto tenebricosa</i>	Vulnerable	
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	Vulnerable	
Spotted Harrier	<i>Circus assimilis</i>	Vulnerable	
Square-tailed Kite	<i>Lophoictinia isura</i>	Vulnerable	
Swift Parrot	<i>Lathamus discolor</i>	Endangered	Endangered
Superb Fruit-Dove	<i>Ptilinopus superbus</i>	Vulnerable	
Terek Sandpiper	<i>Xenus cinereus</i>	Vulnerable	
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable	
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable	
White-fronted Chat	<i>Epthianura albifrons</i>	Vulnerable	
White Tern	<i>Gygis alba</i>	Vulnerable	
Threatened Oceanic Birds			
Antipodean Albatross	<i>Diomedea antipodensis</i>	Vulnerable	Vulnerable
Black-browed Albatross	<i>Thalassarche melanophrys</i>	Vulnerable	Vulnerable
Black-winged Petrel	<i>Pterodroma nigripennis</i>	Vulnerable	
Flesh-footed Shearwater	<i>Puffinus carneipes</i>	Vulnerable	
Gibson's Albatross	<i>Diomedea gibsoni</i>	Vulnerable	
Gould's Petrel	<i>Pterodroma leucoptera</i>	Vulnerable	Endangered
Grey Ternlet	<i>Procelsterna cerulea</i>	Vulnerable	
Kermadec Petrel	<i>Pterodroma neglecta</i>	Vulnerable	Vulnerable
Little Shearwater	<i>Puffinus assimilis</i>	Vulnerable	
Little Tern	<i>Little Tern</i>	Endangered	
Masked Booby	<i>Sula dactylatra</i>	Vulnerable	
Northern Giant-Petrel	<i>Macronectes halli</i>	Vulnerable	Vulnerable
Providence Petrel	<i>Pterodroma solandri</i>	Vulnerable	
Red-tailed Tropicbird	<i>Phaethon rubricauda</i>	Vulnerable	
Sooty Albatross	<i>Phoebastria fusca</i>	Vulnerable	Vulnerable
Sooty Tern	<i>Sterna fuscata</i>	Vulnerable	
Southern Giant-Petrel	<i>Macronectes giganteus</i>	Vulnerable	Endangered
Shy Albatross	<i>Thalassarche cauta</i>	Vulnerable	Vulnerable
White-bellied Storm-Petrel	<i>Fregetta grallaria</i>	Vulnerable	Vulnerable
Wandering Albatross	<i>Diomedea exulans</i>	Endangered	Vulnerable
White Tern	<i>Gygis alba</i>	Vulnerable	

5.1.4 Wetlands

According to the report *The Natural Vegetation in the Municipality of Kiama New South Wales*, the Minnamurra River contains the saline wetland communities of Mangrove Forest, Mangrove Shrubland, Saltmarsh and Saltwater Juncus Rushland. Crooked River contains Swamp Mahogany-Paperbark Forest and Saltmarsh. Werri Lagoon contains Phragmites Reedland and Saltwater Juncus Rushland. The freshwater wetlands of Spike-rush Sedge land, Fresh Juncus Rushland and Cambungi Reedland are found around farm dams and sometimes across low-lying floodplains (Kevin Mills and Associates Pty Limited, 2006a).

The Kevin Mills and Associates reports (2006), '*The Natural Vegetation of the Municipality of Kiama, New South Wales*', and '*The Fauna of Kiama: Municipality of Kiama, South Coast, New South Wales Final Report*', are both available on the Kiama Municipal Council website.

5.2 Pressures

The main threats for both flora and fauna are habitat loss and fragmentation due to vegetation clearing, predation by feral and domestic animals, inappropriate fire regimes, overgrazing of habitat areas by stock, disturbance of stream banks, pollution, weed invasions and climate change.

5.2.1 Key Threatening Processes

The NSW *Threatened Species Conservation Act 1995* defines a threatening process as "a process that threatened, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities", and lists Key Threatening Processes in Schedule 3 of the legislation. The NSW *Fisheries Management Act 1994* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* also list key threatening processes. These processes are listed in Table 19 (EPA).

Table 19: Key Threatening Processes

Listed Under the NSW *Threatened Species Conservation Act 1995*, the NSW *Fisheries Management Act 1994* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Key Threatening Process	Legislation
Alteration of habitat following subsidence due to long wall mining	TSC Act
Alteration to the natural flow regimes of rivers, streams and their floodplains and wetlands	TSC Act
Anthropogenic Climate Change	TSC Act
Bush Rock Removal (as defined and described in the final determination of the Scientific Committee to list the threatening process)	TSC Act
Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the threatening process)	TSC Act
Competition and grazing by the feral European Rabbit <i>Oryctolagus cuniculus</i> (L.)	TSC Act
Competition and habitat degradation by Feral Goats, <i>Capra hircus</i> Linnaeus 1958	TSC Act
Competition from feral honeybees <i>Apis mellifera</i> L.	TSC Act
Death or injury to marine species following capture in shark control programs on ocean beaches	TSC Act
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments	TSC Act
Invasion and establishment of exotic vines and scramblers	TSC Act
Forest Eucalypt dieback associated with over abundant psyllids and bell miners	TSC Act
Herbivory and environmental degradation caused by feral deer	TSC Act

High frequency fire resulting in the disruption of life cycle processes in plants and animal and loss of vegetation structure and composition	TSC Act
Importation of Red Imported Fire Ants <i>Solenopsis invicta</i>	TSC Act
Infection by Psittacine Ciroviral (beak and feather) Disease affecting endangered psittacine species and populations	TSC Act
Infection of native plants by <i>Phytophthora cinnamomi</i>	TSC Act
Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis	TSC Act
Invasion and establishment of the Cane Toad	TSC Act
Invasion of native plant communities by exotic perennial grasses	TSC Act
Invasion, establishment and spread of Lantana (<i>Lantana camara</i> L. sens. Lat)	TSC Act
Invasion and establishment of Scotch Broom (<i>Cytisus scoparius</i>)	TSC Act
Invasion of native plant communities by <i>Chrysanthemoides monilifera</i> (Bitou Bush and boneseed)	TSC Act
Invasion of the yellow crazy ant	TSC Act
Introduction of the Large Earth Bumblebee, <i>Bombus terrestris</i> (L.)	TSC Act
Loss and/or degradation of sites used for hill-topping (mating) by butterflies	TSC Act
Loss of Hollow-bearing Trees	TSC Act
Predation by European Red Fox <i>Vulpes Vulpes</i> (Linnaeus, 1758)	TSC Act
Predation by <i>Gambusia holbrooki</i> Gerard, 1859 (Plague Minnow or Mosquito Fish)	TSC Act
Predation by the Feral Cat, <i>Felis catus</i> (Linnaeus, 1758)	TSC Act
Predation by the ship rat <i>Rattus rattus</i> on Lord Howe Island	TSC Act
Predation, habitat degradation, competition and disease transmission by Feral Pigs (<i>Sus scrofa</i>)	TSC Act
Predation and hybridisation of feral dogs (<i>Canus lupus familiaris</i>)	TSC Act
Removal of dead wood and dead trees	TSC Act
Degradation of native riparian vegetation along NSW river courses	FM Act
Hook and line fishing in areas important for the survival of threatened fish species	FM Act
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams	FM Act
Introduction of fish to waters within a river catchment outside their natural range	FM Act
Introduction of non-indigenous fish and marine vegetation to coastal waters of NSW	FM Act
Removal of large woody debris from NSW rivers and streams	FM Act

5.2.2 Weeds

Under the NSW *Noxious Weeds Act 1993*, weeds can be declared noxious. Many plants can be classed as weeds, however, only those plants that have a detrimental effect or cause serious economic loss to agriculture or the environment, and providing there is a reasonable and enforceable means of control, are considered as candidates for declaration as noxious weeds. There are currently 86 weeds declared noxious in the Illawarra District Noxious Weeds Authority (IDNWA) control area, which includes Kiama, Shellharbour and Wollongong Local Government Areas (Department of Primary Industries - b). These are shown in Table 19. According to the *Noxious Weeds Act 1993*, noxious weeds are classified using the following classes:

- Class 1: noxious weeds are plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent;
- Class 2: noxious weeds are plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent;

- Class 3: noxious weeds are plants that pose a serious threat to primary production or the environment of an area to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area;
- Class 4: noxious weeds are plants that pose a threat to primary production, the environment or human health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area; and
- Class 5: noxious weeds are plants that are likely, by their sale or the sale of their seeds or movement within the State or an area of the State, to spread in the State or outside the State.

A noxious weed that is classified as a Class 1, 2 or 5 noxious weed is referred to as a 'notifiable' weed'.

5.2.3 Bushfire

Bushfire is also a significant threat to biodiversity. According to the Kiama/Shellharbour District Rural Fire Service, there were 15 vegetation fires in the Kiama and Shellharbour areas within the reporting period, which was more than the 6 in the 2010/11 reporting period (Bushby, D. 2012).

5.2.4 Tree Lopping or Removal

Removal of trees, or major portions of trees, can have major impacts on biodiversity. Tree lopping requires approval under Council's *Tree Preservation Order*. This Order states that no tree, specified by the Order, shall be ring-barked, cut-down, topped or lopped, injured or removed without prior Council approval and is dependent on its size and/or land zone under the *Local Environmental Plan 2011*. However, Council will approve for a tree to be lopped or removed if there is a concern for safety.

During the reporting period, there were 271 permits issued to remove or prune trees. This was less than the 358 permits in 2010/11.

5.2.5 Feral Rabbit Control Program

Council together with Cumberland Livestock Health & Pest Authority & Feral Solutions, are working together to contain feral rabbit numbers in response to community concerns & evidence of the environment impacts caused by feral rabbits. Council has determined to implement measures to control the rabbit population in the Warri Beach area.

5.3 Responses

5.3.1 LEP

Clauses in LEP included

Aims of Plan Cl 1.2 (2)

To maintain, protect and improve the natural environment including native vegetation, endangered ecological communities, natural habitat corridors, riparian land, groundwater dependent ecosystems and wetlands for their biodiversity values, and to conserve and protect the area's water resources, groundwater, waterways, and water quality for their biodiversity, ecological, health and recreational values,

Preservation of Trees or Vegetation Cl 5.9

Provides controls for the preservation of trees or vegetation within the Kiama LGA. Certain development and activities are permitted with consent or prohibited.

- (1) The objective of this clause is to preserve the amenity of the area, including biodiversity values, through the preservation of trees and other vegetation.
- (2) This clause applies to species or kinds of trees or other vegetation that are prescribed for the purposes of this clause by a development control plan made by the Council.
- (3) A person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any tree or other vegetation to which any such development control plan applies without the authority conferred by a development consent, or a permit granted by the Council.

Terrestrial Biodiversity Cl 6.4

- (1) The objective of this clause is to maintain terrestrial biodiversity by protecting native fauna and flora, protecting the ecological processes necessary for their continued existence, and encouraging the conservation and recovery of native fauna and flora and their habitats.
- (2) This clause applies to land identified as "Biodiversity land" on the Terrestrial Biodiversity Map, which can be found at this link: <http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>
- (3) Before determining a development application for development on land to which this clause applies, the consent authority must consider whether or not the development is likely to have; any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, or impact on the habitat elements providing connectivity on the land.

This would be considered under the EP&A Act 1979 Heads of Consideration for environmental impacts. In order to aid interpretation and locate affected properties Council has developed a map identifying affected properties.

This map is known as the Terrestrial Biodiversity Map under KMC LEP2011.

Riparian Land and Watercourses Cl 6.5

- (1) The objective of this clause is to protect and maintain the following: water quality within watercourses, the stability of the bed and banks of watercourses, aquatic riparian habitats, and ecological processes within watercourses and riparian areas.
- (2) This clause applies to land identified as “Category 1 watercourse”, “Category 2 watercourse” or “Category 3 watercourse” on the Riparian Land and Watercourses Map (<http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#>) or land that is within:
 - (i) 40 metres from the top of the bank of a Category 1 watercourse, or
 - (ii) 20 metres from the top of the bank of a Category 2 watercourse, or
 - (iii) 10 metres from the top of the bank of a Category 3 watercourse
- (3) Before determining a development application to carry out development on land to which this clause applies, the consent authority must consider whether or not the development is likely to have any adverse impact on; the water quality and flows within the watercourse, aquatic and riparian species, habitats and ecosystems of the watercourse, the stability of the bed and banks of the watercourse, the free passage of fish and other aquatic organisms within or along the watercourse, any future rehabilitation of the watercourse and its riparian areas, or is likely to increase water extraction from the watercourse.
- (4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or if that impact cannot be minimised—the development will be managed to mitigate that impact.

The LEP 2011 has established Environment Protection Zones specific to selected land within the Kiama LGA. These zones include:

E1 – National Parks and Natural Reserves which enables the management and appropriate use of land that is reserved under the *National Parks and Wildlife Act 1974* or that is acquired under Part 11 of that Act, enables uses authorised under the *National Parks and Wildlife Act 1974* and identifies land that is to be reserved under the *National Parks and Wildlife Act 1974* to protect the environmental significance of that land.

E2 – Environmental Conservation is to protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values; prevent development that could destroy, damage or otherwise have an adverse effect on those values and ensure adequate environmental buffers are provided, maintained or rehabilitated in the vicinity of high ecological value areas and waterways.

E3 – Environmental Management is to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values; provide for a limited range of development that does not have an adverse effect on those values and allows limited types of agriculture subject to effective environmental safeguards and sound land management practices.

5.3.2 Development Control

Chapter 3 of Kiama DCP 2012 (Preservation and Management of Trees and Vegetation) replaces Councils previous Tree Preservation Order. This chapter prohibits the ring barking, cutting down, top lop, removal, injure or wilful destruction of any tree or other vegetation without development consent or a permit from Council.

During 2011-2012 action was taken in the land and environment court relating to tree damage, located in Cathedral Rocks Reserve. This resulted in a local resident being found guilty of tree damage and being in breach of Councils Tree Preservation Order. This resulted in a fine and court costs totalling \$28,000.

5.3.3 Feral Rabbit Control Program

The Feral Rabbit Control Program was implemented from September to October 2011

5.3.4 Threatened Species and Communities

Kiama LEP 2011 maps areas of terrestrial biodiversity in the Kiama Local Government Area, which can be seen at this link:
<http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=680#> **and aims to protect native fauna and flora, protect the ecological processes necessary for their continued existence and encourage the conservation and recovery of native fauna and flora and their habitats. The *Threatened Species Conservation Act 1995* identifies and categorises threatened species, populations and ecological communities.**

One of the functions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) is in the conservation of biodiversity through the identification and listing of a species, population and ecological communities being threatened.

For a list of the threatened flora species listed in *Threatened Species Conservation Act 1995* that have been identified in the Kiama LGA, please refer to Table 16 and 17. Some of these species are also listed as threatened under the Commonwealth *EPBC Act 1995*.

Development that is likely to have an impact on threatened species and communities may also require the approval of State and Federal Government departments.

5.3.5 Illawarra Noxious Weeds Authority

From 2009 the Illawarra Noxious Weeds Authority representing the Local Government area of Kiama, has continued to develop and implement an active noxious weed control program throughout the Kiama Municipal Council area including:

- Local weed control programs for private landholders and government agencies with 110 property inspections for the 2011/12 reporting period. All nurseries and aquaria outlets were also inspected;
- All infestations of Class 2 and Class 3 noxious weeds on private lands were inspected and control treatments implemented by 30 June 2012.
- All Class 4 weeds on private land were strategically targeted for control within the Kiama LGA according to local action plan guidelines;
- Five section 18A Notices and one Section 18 Notice were issued;
- All Council lands with infestations of Class 3 weeds were inspected and treated by 30 June 2012;
- All Bitou bush on Council controlled lands was inspected and treated by 1 November 2011. 13ha was aerially sprayed at Walkers Beach, Gerringong. (incl. 8ha private)
- All African love grass and Serrated tussock infestations were treated by 30 November 2011;
- Five alert weeds – Glory lily, Spiny burr grass, Sea Spurge, Coolatai grass and Montpellier broom were identified and controlled throughout the Kiama LGA.;
- The two major water catchments, namely Crooked River and Minnamurra River were inspected along their length to ensure there were no new aquatic weed incursions
- 402km of rural roads and 78ha of public reserves were inspected and treated for one or more noxious weeds by 30 June 2012.
- Education and publicity activities have continued to be given high priority through ongoing utilisation of the media and participation in community events. One (1) display and one field presentation was held over the last 12 months with three (3) media releases and one newsletter article written. The IDNWA website was established at www.idnwa.com.au
- SRCMA Regional Weeds Strategy finalised and endorsed. Rapid Response and New Incursion Plans developed. Pesticide Notification Plan updated and endorsed (2012-17).

- Improved cooperation between stakeholders is being addressed through representation on 4 regional committees, 1 national committee and a subcommittee of the NSW Noxious Weeds Advisory Committee (NWAC);and
- Kiama Council funding of \$30,686.00 was supported by NSW State Government funding (NSW DPI) of \$26,292.00 for noxious weed control in the Kiama LGA.

Table 20: Noxious Weeds in the Illawarra District Noxious Weeds Authority Control Area

Common name	Scientific name	All of NSW Declaration	Category
African boxthorn	<i>Lycium ferocissimum</i>		4
African feathergrass	<i>Pennisetum macrourum</i>	A	5
African love grass	<i>Eragrostis curvula</i>		4
African turnipweed	<i>Sisymbrium runcinatum</i>	A	5
African turnipweed	<i>Sisymbrium thellungii</i>	A	5
Alligator weed	<i>Alternanthera philoxeroides</i>		2
Anchored water hyacinth	<i>Eichhornia azurea</i>	A	1
Annual ragweed	<i>Ambrosia artemisiifolia</i>	A	5
Arrowhead	<i>Sagittaria montevidensis</i>	A	5
Artichoke thistle	<i>Cynara cardunculus</i>	A	5
Athel tree	<i>Tamarix aphylla</i>	A	5
Bear Skin Fescue	<i>Festuca gautieri</i>	A	5
Bitou bush	<i>Chrysanthemoides monilifera subsp. rotunda</i>		4
Black knapweed	<i>Centaurea nigra</i>	A	1
Blackberry	<i>Rubus fruticosus (aggregare. species)</i>	A	4
Boneseed	<i>Chrysanthemoides monilifera subsp. monilifera</i>		4
Bridal creeper	<i>Asparagus asparagoides</i>	A	5
Broomrapes	<i>Orobancha spp.</i>	A	1
Burr ragweed	<i>Ambrosia confertiflora</i>	A	5
Cabomba	<i>Cabomba caroliniana</i>	A	5
Cayenne snakeweed	<i>Stachytarpheta cayennensis</i>	A	5
Chilean needle grass	<i>Nassella neesiana</i>		4
Chinese violet	<i>Asystasia gangetica subsp. micrantha</i>	A	1
Clockweed	<i>Gaura lindheimeri</i>	A	5
Clockweed	<i>Gaura parviflora</i>	A	5
Corn sowthistle	<i>Sonchus arvensis</i>	A	5
Dodder	<i>Cuscuta species</i> (except native <i>Species C. Australia, C. tasmanica</i> and <i>. Victoriana</i>)		5
East Indian hygrophylla	<i>Hygrophylla polysperma</i>	A	1
English broom	<i>Cytisus scoparius</i>		See Scotch broom
Espartillo	<i>Achnatherum brachychaetum</i>	A	5
Eurasian water milfoil	<i>Myriophyllum spicatum</i>	A	1
Fine-bristled burr grass	<i>Cenchrus brownii</i>	A	5
Fountain grass	<i>Pennisetum setaceum</i>	A	5
Gallon's curse	<i>Cenchrus biflorus</i>	A	5
Giant Parramatta grass	<i>Sporobolus fertilis</i>		3
Glaucous starthistle	<i>Carthamus glaucus</i>	A	5
Golden thistle	<i>Scolymus hispanicus</i>	A	5
Gorse	<i>Ulex europaeus</i>		3
Groundsel bush	<i>Baccharis halimifolia</i>		3
Harrisia cactus	<i>Harrisia spp.</i>	A	4
Hawkweed	<i>Hieracium spp.</i>	A	1
Horsetail	<i>Equisetum spp.</i>	A	1

Hymenachne	<i>Hymenachne amplexicaulis</i>	A	1
Karoo thorn	<i>Acacia karroo</i>	A	1
Kochia	<i>Kochia scoparia</i>	A	1
Lagarosiphon	<i>Lagarosiphon major</i>	A	1
Lantana	<i>Lantana species</i>		4
Common name	Scientific name	All of NSW Declaration	Category
Lantana	<i>Lantana species</i>	A	5
Long-leaf willow primrose	<i>Ludwigia longifolia</i>	A	5
Mexican feather grass	<i>Nassella tenuissima</i>	A	1
Mexican poppy	<i>Argemone mexicana</i>	A	5
Miconia	<i>Miconia spp.</i>	A	1
Mimosa	<i>Mimosa pigra</i>	A	1
Mossman River grass	<i>Cenchrus echinatus</i>	A	5
Mysore thorn	<i>Caesalpinia decapetala</i>		3
Onion grass	<i>Romulea species</i> (includes all <i>Romulea</i> species and varieties except <i>R. rosea</i> var. <i>australis</i>)	A	5
Oxalis	<i>Oxalis species and varieties</i> (includes all <i>Oxalis</i> species and varieties except the native species <i>O. chnoodes</i> , <i>O. exilis</i> , <i>O. perennans</i> , <i>O. radicata</i> , <i>O. rubens</i> , and <i>O. thompsoniae</i>)	A	5
Pampas grass	<i>Cortaderia spp.</i>		4
Parthenium weed	<i>Parthenium hysterophorus</i>	A	1
Pond apple	<i>Annona glabra</i>	A	1
Prickly acacia	<i>Acacia nilotica</i>	A	1
Prickly pear	<i>Cylindropuntia species</i>	A	4
Prickly pear	<i>Opuntia species except O. ficus-indica</i>	A	4
Red rice	<i>Oryza rufipogon</i>	A	5
Rhus tree	<i>Toxicodendron succedaneum</i>	A	4
Rubbervine	<i>Cryptostegia grandiflora</i>	A	1
Sagittaria	<i>Sagittaria platyphylla</i>	A	5
Salvinia	<i>Salvinia molesta</i>		2
Sand oat	<i>Avena strigosa</i>	A	5
Scotch broom	<i>Cytisus scoparius</i>		4
Senegal tea plant	<i>Gymnocoronis spilanthoides</i>	A	1
Serrated tussock	<i>Nassella trichotoma</i>		4
Siam weed	<i>Chromolaena odorata</i>	A	1
Smooth-stemmed turnip	<i>Brassica barrelieri subspecies oxyrrhina</i>	A	5
Soldier thistle	<i>Picnomon acarna</i>	A	5
Spotted knapweed	<i>Centaurea maculosa</i>	A	1
St John's wort	<i>Hypericum perforatum</i>		3
Texas blueweed	<i>Helianthus ciliaris</i>	A	5
Water caltrop	<i>Trapa species</i>	A	1
Water hyacinth	<i>Eichhornia crassipes</i>		3
Water lettuce	<i>Pistia stratiotes</i>	A	1
Water soldier	<i>Stratiotes aloides</i>	A	1
Willows	<i>Salix spp.</i> (includes all <i>Salix</i> species except <i>S. babylonica</i> , <i>S. x reichardtii</i> , <i>S. x calodendron</i>)		5
Witchweed	<i>Striga species</i> (includes all <i>Striga</i> species except native species and <i>Striga parviflora</i>)	A	1
Yellow burrhead	<i>Limncharis flava</i>	A	1
Yellow nutgrass	<i>Cyperus esculentus</i>	A	5

Class 1: State Prohibited Weeds;
Class 2: Regionally Prohibited Weeds;
Class 3: Regionally Controlled Weeds;
Class 4: Locally Controlled Weeds;
Class 5: Restricted Plants.
A: All of New South Wales Declaration

5.3.6 Threatened Species Recovery Plans

There are Recovery Plans for three threatened flora species within the Kiama LGA: *Daphnandra sp.c.Illawarra*, *Zieria granulata* and *Pimelea spicata*. There are also three Recovery Plans for fauna species within the Illawarra: *Southern Brown bandicoot*, *Bush stone curlew* and *Goulds petrel*.

The *Priorities Action Statement* (PAS) combines strategic reform with specialist recovery and threat abatement actions. Under each strategy, actions are listed which aim to recover each threatened species and abate each threat. These are further categorised into high, medium and low priority actions (The Department of Environment and Conservation, 2006). The PAS can be searched online by type of species, threatening process or by geographic areas at http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/pas_lga.aspx. There is also 1 priority action listed in the PAS that refers to a threatened species within the Kiama Local Government Area (Environmental Protection Agency).

During the 2011-2012 reporting period Themeda Grassland on Seacliffs and Coastal Headlands Endangered Ecological Community was found at Kaleula Headland. Following the recommendations of EPA, Council drafted amendments to the Kaleula Headland and Marsden Reserve Plan of Management to reflect the changes needed to protect the grassland.

5.3.7 Native Vegetation Act 2003

The *Native Vegetation Act 2003* aims to end broad scale clearing, to protect the health of our land, rivers and wildlife. The Act gives power to local Catchment Management Authorities to make decisions about how to best manage native vegetation. The system is based on voluntary agreements between landholders and Catchment Management Authorities called Property Vegetation Plans (PVPs).

The PVP Developer is a computer modelling program weighs up the positive and negative aspects of different management plans and activities, allowing farmers to make practical decisions based on the best scientific information available. Experts from the local Catchment Management Authority use this tool and their professional judgement when assessing clearing proposals. Farmers are then eligible for funds to help with conservation initiatives such as revegetation plans, salinity strategies and soil erosion control (NSW Government, 2005).

5.3.8 Supply of Trees

Council continued to supply trees free of charge to ratepayers at the local Kiama produce market. Council again participated in National Tree Day and National Schools Tree Day by donating trees to local groups for planting. Trees were supplied to Kiama

Downs Children Centre, Minnamurra Lions Club and others. National Schools Tree Day students from Kiama High School planted trees at Bombo Headland, Seven Mile Beach Reserve and other location.

From 2009 to 2012 Council has issued approximately 3000 trees to residents. National Tree Day Activities with Kiama High School has continued to take place annually since 2010. For Council sites at Trevethan Reserve and Gerroa Waste Depot there has been over 2,000 trees, shrubs and grasses planted. Other sites within the Municipality included Seven Mile Beach, Rose Valley, Little Blowhole, Minnamurra Rainforest Centre, and Bombo Headland. These sites were supported by Conservation Volunteers Australia, local landholders, Landcare Illawarra and environment groups, lions club, Department of Lands and National Parks and Wildlife Service

5.3.9 Roadside Vegetation Management Plan

With funding received from the Roads and Traffic Authority Roadside Environment Committee via the Southern Rivers Catchment Management Authority, Council adopted a Roadside Vegetation Management Plan. The primary objective of the plan was to protect the good quality remnant vegetation and to identify areas for revegetation and corridor enhancement.

Development of the plan required vegetation surveys and an assessment of the existing roadside vegetation to determine areas of low, medium and high quality conservation value and also threatened species. The assessment was done generally in accordance with the guidelines produced by the NSW Roadside Environment Committee. The management plan developed from the surveys and guidelines will then determine the future management of the roadside vegetation.

Staff has continued with the practice of consulting the mapping before any roadside works were undertaken and maintained the roadsides in accordance with the plan. A grant was received from Environmental Trust through Local Government and Shires Associations for Privet and woody weed control on the lower section of Jamberoo Mountain Road. The work to improve the roadside vegetation flora will continue through to February 2013.

5.3.10 South Coast Communities Sea Spurge Control (SCCSC) Project

The funding for South Coast Communities Sea Spurge Control project has been completed.

The SCCSC project aimed to establish a containment line for Sea Spurge (*Euphorbia paralias*) as it moves northward along the NSW coast. Local indigenous communities, coastal volunteer groups, local, state and federal government agencies will all work cooperatively to establish a containment line beyond which all infestations will be eliminated and implement control measures to bring remaining infestations to manageable levels.

Currently there is only one known infestation of sea spurge within the Kiama LGA, located at Walkers beach Gerroa near the northern containment line, this is monitored and controlled annually in line with the Bitou program.

5.3.11 Council Rehabilitation Projects

Council has continued to implement rehabilitation projects within parks, reserves and beaches within the Municipality. During the 2009-2012 reporting period, the following projects were undertaken:

- Spring Creek Wetlands: Continued removal of major infestation of Madeira vine around Jamberoo Road pond and replanting of native species, 'species of interest' labelling in Bonaira Native Gardens and Spring Creek Reserve has been started, plus on-going planting to increase biodiversity elsewhere in reserve;
- Jerrara dam: Lantana clearing and replanting with native species. Implementation of the Recovery plan for *Zieria granulata* & *Daphnandra micrantha*, on-going planting to increase biodiversity elsewhere in reserve;
- In 2010 Council received \$11,593 in grant funding for vine weed eradication and revegetation at Rocklow Creek and Minnamurra River, this has continued through to 2012.
- In 2010 Council received a \$39,000 'Caring for our Coast' grant for the Seven Mile Beach reserve which has since seen the removal of weeds including asparagus fern and weeds of national significance (WONS). Re-planting of tea tree shrub land.
- The Illawarra Biodiversity and Local Food Strategy for Climate Change project provided grant money for on ground restoration works at priority biodiversity sites within the three local government areas. Kiama Council used its \$25,000 funding for restoration works and protection of threatened species *Zieria granulata* at Jerrara Dam Arboretum. For more information on the grant please see Section 9.4
- Ongoing maintenance and revegetation of Spring Creek Wetlands, Bonaira Native Garden, Stead Reserve and Russel East Park
- In 2009 there was a creation of a new reserve between Kiama and Gerringong, for the Kiama coastal walking track, Council completed the Coastal Walking Track, fencing off 6km of coastline and providing safe access for the public in 2010
- Sanctuary Place Quarry tree planting and picnic table installation
- Kaleula Headland restoration and vegetation survey of *Themeda* grassland on sea cliffs and headlands Endangered Ecological Community
- West Kiama riparian corridor additional planting and weed removal

- Union Creek riparian corridor weeding and replanting after construction works
- The bank stabilisation works on the Minnamurra River bends was completed in 2011
- Minnamurra Riverside Drive embankment weeding of Asparagus and other vine weeds. Revegetation of a section with local tree species. Minnamurra Mangrove seeding. As a result of the engineering works to stabilise the road areas were seeded with over 4000 mangrove trees to establish and reconnect the mangrove corridor along the riverbank.
- The Southern Councils Group has received Commonwealth Government funding under the Caring for Our Country Program for “Eastern Australia Boneseed Eradication and Containment”. The funding is \$157,520 for the period October 2011 to 30 June 2013.
- The Boneseed eradication and containment project will work with a diverse network of collaborators across NSW and Eastern Victoria to eradicate 50 known infestations of Boneseed, establish a containment line on the NSW border and remove future threat of Bitou Bush and Boneseed hybridisation. Boneseed is a Weed of National significance that negatively impacts biodiversity in Australia. Boneseed has potential to invade major regions of New South Wales, however it is currently an emerging threat and the few outlier populations are considered eradicable.

Boneseed is one of the worst weeds in Australia because of its environmental impacts, invasive ability and serious potential to spread.

Boneseed, a South African Shrub, was introduced to Australia as a garden plant in the late 1800s. The fast growing, aggressive plant has no natural enemies in Australia, and it has spread from gardens to become a damaging environmental weed.

Boneseed invades native bushland and forms dense thickets that smother native plants and prevent revegetation. In NSW, boneseed threatens endangered plants and ecological communities, such as the Eastern Suburbs Banksia Scrub, and many more are at risk if boneseed continues to spread.

Boneseed reproduces by seeds that are spread into bushland by birds, rabbits, foxes, livestock and other animals. Plants produce enormous amounts of seed (up to 50,000 per plant!) that germinate readily.

The Southern Councils Group will work with the community, member Council weeds officers and a number of other Councils across the South Western parts of NSW and the East Gippsland Shire Council to eradicate known infestations.

- The Weeds Action Program has been funded for 3 years from 2011 by the NSW Government to target the outcomes in the NSW Invasive Species Plan. The Weeds Action Program aims, among other things, to:

- Identify and manage high risk weeds species and entry pathways;
- Develop and implement early weed detection capabilities;
- Assist in the timely detection of new weed incursions;
- Effect a quick response to eradicate or contain new weeds; identify and prioritise weed management programs where the benefits are the greatest; and
- Provide effective and targeted on-ground weed control.

Outcomes sought under the Southern Councils Group Weeds Action program include improved management of high risk pathways and improved regional coordination of weed management. To achieve these outcomes it will be important to work closely with stakeholders

Resources for weeds management are limited and are directed to priority weeds to achieve the best value for money. Category A and B weeds are subject to the highest priority for control with the ultimate goal of prevention or eradication. (Category A weeds are those that are not currently present but would present a threat if they occurred. Category B weeds are present with limited or low distribution and would pose a threat if their presence were to increase.) Category C and D weeds (wide spread weeds) will be targeted to reduce impacts with control prioritized in areas where benefits will be greatest. Weed category lists for each sub-region are set out in the Southern Rivers Regional Weed Management Strategy.

- **GROW LOCAL: Illawarra Native Garden Guide** is a full colour booklet, developed by the Illawarra Council's as part of the Food and Biodiversity Grant to promote and encourage the use of local native plants in landscaping across the Illawarra. Free copies of this booklet are available on Council's website:
 - It includes geographic zones to help guide species selection based on where you live
 - It includes tips on garden design and maintenance
 - It includes tips on edible local native plants, and plants for fire prone areas
- **GROW LOCAL Illawarra Edible Garden Guide** developed by the Illawarra Council's as part of the Food and Biodiversity Grant as a contribution to the growing sustainable food movement. It's designed to share ideas and inspiration for growing food successfully in urban areas of the Illawarra. Free copies of this booklet are available on Council's website:
 - It includes advice on planting, pruning, feeding and harvesting time for edible plants that can be grown in the Illawarra
 - Advice on garden design and maintenance
 - Includes comprehensive species lists

- The Illawarra Bushland Database provides public access to a large number of flora surveys across the Illawarra. This website is a fantastic tool to support the good work of our Landcare and Bush care volunteers, private land managers, ecologists, or anyone interested or involved in managing our local bushland.

The Illawarra Councils have partnered together to review their data and update the database with flora survey information collected over the past decade. We have also taken this opportunity to completely rebuild the website, to improve on its original (2000) design. It has been redesigned to enable users to be able to search on a number of different search terms, such as by suburb, or by species.

The original database held 420 flora survey sites, a further 240 sites have been added.

5.3.12 Community, Volunteer & Landcare Rehabilitation Projects

Landcare, Conservation Volunteers Australia and other community organisations play an important role in rehabilitation and revegetation activities and capacity building and awareness of natural resource management issues in the community within not only the Kiama LGA, but across all of Australia.

The Kiama Municipality has 12 active Landcare groups including:

Gainsborough Chase Minnamurra Wetland Landcare
Bombo Headland Landcare
Little Blowhole Landcare
Werri Beach Dune care
Gerringong-Gerroa Landcare liaison network
Upper Minnamurra River care
Wallaces Creek Landcare
Jamberoo Mountain Landcare
Cedar Ridge Landcare
Seven Mile Beach Landcare
Kaleula Headland Landcare
Foxground Landcare

Landcare Illawarra has supported a number of projects in the Kiama LGA during 2009-2012 reporting period, these include:

- In stream works and erosion control/bank stability at Foxground
- In stream works, erosion control/bank stability, weed control, stock exclusion and revegetation works at Jamberoo
- 4,800 native rainforest and woodland species planted.. 15 sites in the Kiama LGA, through the Illawarra Woodland and Rainforest project
- Rainforest restoration project on Jamberoo dairy property funded by a community action grant

- Coastal Landcare and Bushland Regeneration training project, building volunteer's knowledge and skills. Four Kiama Landcare groups have been trained over 6 months by a professional bush regenerator
- 7 days of bush regeneration on a range of private properties and Landcare sites in the Kiama LGA with Conservation Volunteers Australia (approximately 252 volunteer hours)
- Coastal plant identification workshop at Killalea and Minnamurra spit
- Foxground Landcare group is ongoing and has been awarded money for a unique project entitled 'Surveying and monitoring Spotted Quolls in Foxground NSW' from the World Wildlife Fund's Threatened Species Network Community Grant in the sum of \$14 819. The group work on a labor exchange program, new members must attend at least five working bees before their property will be included in the work plan. This project has also released dung beetles on a number of properties in the Foxground area, funded by a community action grant.

Members also work to remove weed species such as Madeira, Lantana, Croften, Mistflower, Cape Ivy, Trad and Fleabane. Revegetation activities are also carried out as well as encouraging natural regeneration

- Little Blowhole Landcare in partnership with Boolarng Nangamai Aboriginal Art and Culture Studio were successful in 2012 with a \$30 000 12 month bush regeneration project which employs aboriginal people in the community to carry out environmental restoration activities at the Little Blowhole in Kiama. This group was also successful in obtaining funding under the Caring for our Country Community Coast care Grants. Activities have included an interpretive walkway, expanded revegetation and weed eradication
- Gerringong Gerroa Community Engagement Project is ongoing and encourages resources, including labour, to be shared through a local Landcare network.
- Gainsborough Chase Wetlands Landcare Group is ongoing and works on a site owned by the Baptist Church which contains Endangered Ecological Communities and SEPP 14 wetlands. The group partners with Conservation Volunteers Australia to work on weed control, revegetation and restoration at the site
- Bombo Headland Landcare Group recently received \$11,600 from the Australian Government to create a healthy self sustaining area of native coastal bush land by removing weeds and establishing some 2,320 native plants to reduce erosion
- Werri Beach Dune care Group has received funding under the Caring for our Country Community Coast Care grant which allows for basic coastal vegetation to be planted and restored, including *Banksia integrifolia*, *Leptospermum laevigatum*, *Westringia fruticosa*, *Correa alba*, and *Myoporum acuminatum*.

Weed species being tackled include Morning Glory, Green Cestrum, Madeira Vine, Kikuyu, Glory Lily

- Seven Mile Beach Restoration Landcare Group were successful in getting grant funding of \$42,250 with an additional \$30,000 from Council to control asparagus and other keystone weeds in the northern section of the reserve. This completed the primary weeding of the reserve. Work will continue in this reserve to suppress the weeds.

Chapter 6: Waste

6.1 State

Kiama Municipal Council operates the Minnamurra Waste and Recycling Centre. This facility is used for the receipt of garden organics from urban collection services, and drop off material from residents and commercial yard maintenance businesses. This material is mulched and partly composted onsite.

The facility is also used for the receipt of recyclable materials from commercial and residential premises that are collected or brought directly to the site by individuals. This material is then transported to a Material Recoveries Facility for processing.

Council does not operate its own landfill site with the previous landfills at Minnamurra and Gerroa being closed and remediated. All waste now goes to the Dunmore Landfill operated by Shellharbour City Council.

Post closure water quality monitoring and ongoing maintenance is still undertaken at Council's former landfill sites and annual reports are required to be submitted to the Environmental Protection Authority in accordance with licence requirements.

As part of the Waste and Sustainability Improvement Program Council prepared and adopted a Strategic Waste Action Plan for facilities and services. The main strategies include processing residual waste and food organics at an Alternative Waste and Organics Treatment facility, the introduction of a food waste and garden organics collection service and new services to increase the recovery of recyclable materials from residential and commercial premises.

6.2 Pressures

6.2.1 Pressures from Waste Generation

The volume and type of waste generated by the community places pressure on both available landfill space and processing facilities. Both population growth and the behaviour contribute to this ongoing pressure. There is therefore a need to reduce the amount of waste going to landfill, through waste avoidance and recycling and the development of alternative reuse, waste and organics treatment facilities.

For 2011-2012 the estimated total waste (green waste, putrescibles and recycling) generated was 11,845.67 tonnes, of which 7,435.24 tonnes, or 60.96%, was recycled, (see 9.1.2 for Waste Indicators). Figure 6 shows a comparison with the previous four years.

This figure is a decrease of 0.7% compared with the 2010/2011 figures. The decrease can be attributed to Council no longer providing commercial recycling services to certain premises. These services are now provided by contractors and no data is available on the tonnages of recyclables collected within the Kiama LGA.

Also during 2010/11 there was major wind storm damaged which resulted in an extra 510.85 tonnes of green waste being received and processed. If this same amount was

received for the 2011/12 reporting period, the total percentage recycled and diverted from landfill would equate to 61.47%.

Recent waste audits indicate that certain residents are depositing builders waste, e-waste and other materials in the domestic garbage bins. This could be attributed to the increasing costs of waste disposal.

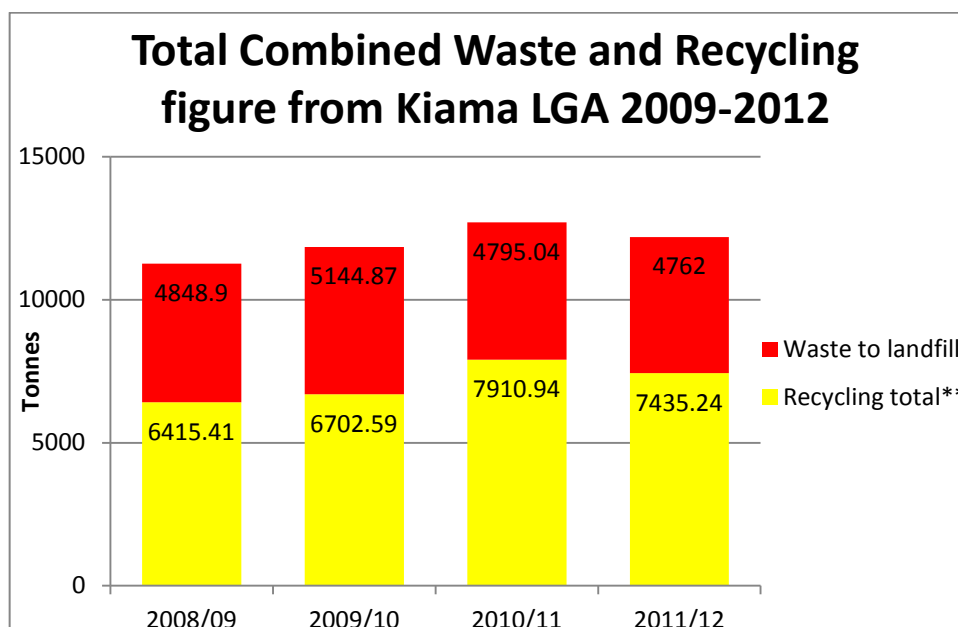


Figure 4: Waste Recycled/Reused and Disposed to landfill 2009 to 2012

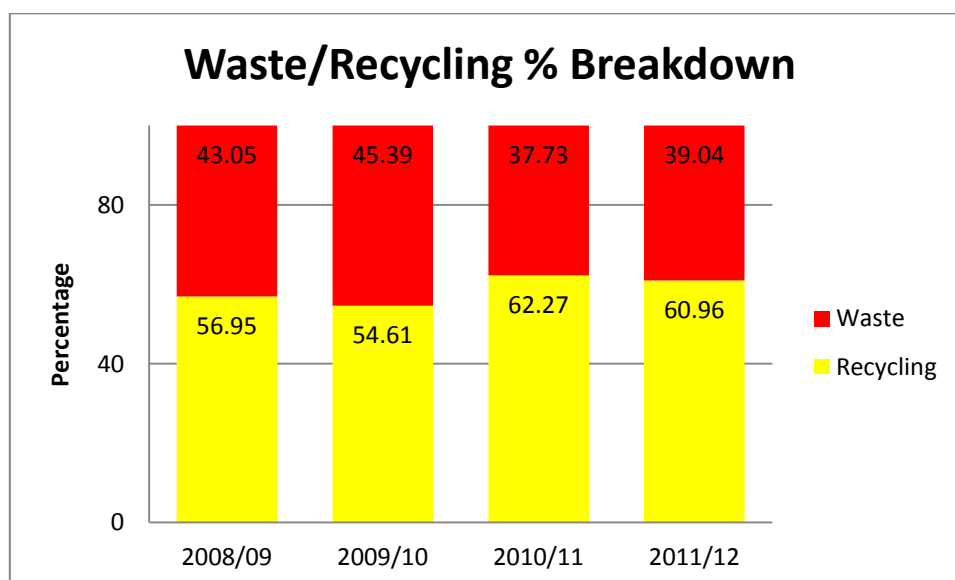


Figure 5: Percentage breakdown waste recycled/disposed to landfill 2009 to 2012

Waste

During the 2011/2012 reporting period, the total waste disposed of at the Shellharbour City Council facility was 4,762.00 tonnes (see table 20 for figures from the last 4 years) made up of the following:

• Urban/Rural garbage collection service	3,980.68
• Streets/Parks/Reserves/Commercial waste	547.93
• Litter/Waste collection from Footpaths/Parks/Reserves	49.94
• Urban Kerbside Clean Up Waste	183.45

Table 21: Total (tonnage) waste disposed of at the Shellharbour City Council facility 2009-2012

	2008/09	2009/10	2010/11	2011/12
Urban/Rural garbage collection service	3,496.50	3,723.03	3,963.90	3,980.68
Streets/Parks/Reserves/Commercial waste	1,110.00	1,140.23	572.95	547.93
Litter/Waste collection from Footpaths/ Parks/ Reserves	37.60	108.61	52.28	49.94
Urban Kerbside Clean Up Waste	205.80	173.00	205.91	183.45
Total	4,849.90	5,144.87	4,795.04	4,762

*It is noted data for streets, parks, reserves, commercial waste for the reporting from 2010 onwards was significantly less. This may be attributed to the Municipality outsourcing a large section of their commercial recycling collection services.

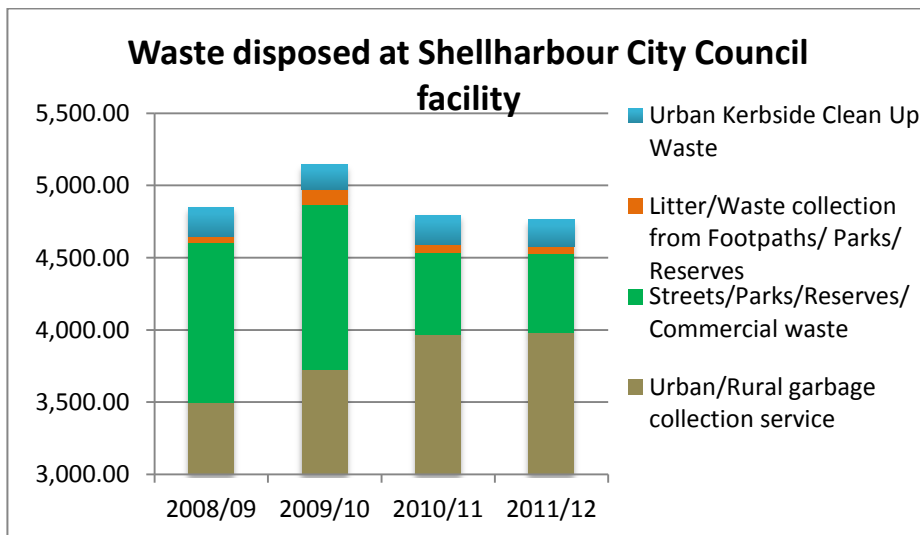


Figure 6: Waste disposed of at Shellharbour City Council

During the reporting period there were 83 new services (0.81% increase) added to the urban and rural collection services, 71 urban and 12 rural compared to the previous reporting period.

Since 2009 there has been an increase of 393 urban collection services and 64 new rural services in the Kiama LGA. This equates to a 5.4% increase in the total number of services provided since 2009.

During the 2011/12 reporting period there has been an overall reduction in the amount of waste going to landfill by 33tonnes compared to the previous reporting period. When comparing these results with those obtained in 2008/09 a reduction of 87.9tonnes has been achieved despite a 5.4% increase in new urban and rural collection services.

Recycling

During the reporting period, 7,435.24 tonnes of materials was recycled at the Minnamurra Waste and Recycling Facility (see table 21 below for figures from the last 4 years), consisting of the following types and tonnages:

Table 22: Total (tonnes) materials recycled at the Minnamurra Waste and Recycling facility 2009-2012

	2008/09	2009/10	2010/11	2011/12
Commercial Recycling Collection Service	390.09	379.18	393.4	302.48
Commercial Drop Off Recycling	36.20	39.37	15.74	49.21
Drop Off Centre Recycling residential	36.20	39.37	15.75	49.21
Streets/Parks/Reserves recycling	na	na	43.71	33.60
Kerbside Recycling	2,224.00	2,278.70	2,335.89	2,293.81
Rural Recycling	116.05	137.53	146.85	124.02
Steel	170.57	98.53	178.00	145.00
Green Waste Drop Off	1,014.66	818.42	1,623.78	878.00
Green Waste Kerbside Collection	2,259.76	2,401.84	2,898.08	2,874.00
Kerbside Clean up Steel	81.61	97.19	62.96	94.32
Street Sweeper waste	280.00	412.46	560.82	537.14
E-waste	na	na	37.50	48.57
Recycled Oil	na	na	3.60	3.00
Batteries	na	na	4.00	3.00
Total	6,609.14	6,702.59	8,320.08	7,435.24

*It is noted data for drop off centre recycling and kerbside for the 2010/11 reporting period is significantly less. This may be attributed to the increase in the number of commercial services taken up in this reporting period as well as the introduction of the weekly recycling service over the Dec/Jan holiday period for residents within the urban area.

*No separate data was available for the quantities of oil and batteries that were recycled from 2008-2010

* No e-waste collection services were provided for the reporting periods from 2008-2010

6.2.2 Pressures from Waste Management

The former Minnamurra and Gerroa landfill operations are located within sensitive areas close to wetlands and beaches and there are potential impacts such as ground water contamination, greenhouse gas emissions and weeds. As a result of this there are

ongoing maintenance and monitoring at both sites as a requirement of the licence closure plan conditions.

The Federal Carbon Tax and the State Waste Levy have resulted in higher costs for disposing of waste. This has resulted in significant increases being applied to the domestic waste management charge paid by residents. As a result of the higher disposal costs there has been an increase in the amount of illegal dumping of waste incidents reported.

6.2.3 Illegal Waste Disposal

Illegal dumping of waste such as building and demolition waste, green waste, household items, household rubbish, abandoned cars, and general litter has an impact on both visual amenity and the natural environment. Environmental impacts include reduced water quality, threats to biodiversity through weed and pest invasion, and the risk of soil contamination.

Table 22 lists the total illegal dumping and penalty notices issued from 2009-2012. During 2011/2012, Council investigated ninety littering and illegal dumping complaints.

Table 23: Illegal dumping incidents and penalty notices figures 2009-2012

	2008/09	2009/10	2010/11	2011/12
Illegal dumping incidents	36	52	93	175
Penalty infringement notices	0	6	5	5

Since 2009 there has been a 386% increase in the number of illegal dumping incidents reported and investigated. This can be directly attributed to the increasing costs of waste disposal.

There are significant costs for Council associated with clean up and disposal of illegal waste in situations where the person responsible cannot be determined. This also places a significant impact on the local environment from potential land and water contamination as well as impacts to the local biodiversity.

6.3 Responses

6.3.1 Development Control

Chapter 11 of the new DCP 2012 contains Council's requirements for waste minimisation, management and recycling for all development within the Kiama Municipality. It specifies the objectives and Controls that are required to be addressed when designing, planning, demolishing and constructing development in order to incorporate best practice waste and recycling management into all stages of the development.

All applications for development, including subdivision, demolition, construction and the ongoing use of a site or premises, must be accompanied by a Statement of Environmental Effects (SEE).

This SEE is to include a Site Waste Minimisation and Management Plan (SWMMP) as the central document of compliance with the new DCP requirements.

During the reporting period, statistics were recorded regarding building and construction waste from the 383 development and complying development applications that were required to submit Waste Minimisation and Management Plans. The total estimate tonnage of waste disposed of, recycled or reused on or off the construction sites was 2,912.85 tonnes. Of this 2,069.20 tonnes (71%) was reused or recycled and 843.65 tonnes (29%) was disposed to landfill including asbestos.

This represents a decrease of 12% in the amount of materials recycled when compared to the previous reporting period. These figures only cover developments over \$5,000 and do not include exempt development (see Table 23).

Table 24: Tonnes Reused, Recycled or Disposed to Landfill - Building and Construction Waste

Material Type (method of recycling/disposing or reuse)	Total Tonnage			
	2009	2010	2011	2012
On-site Reused Timber	9.65	19.59	16.28	20.86
On-site Reused Bricks	9.61	33.56	24.36	70.65
On-site Reused Fill	160.002	809.81	395.86	1023.95
On-site Reused Green Waste	5.4	15.61	6.50	26.23
Off-site Recycled Timber	5.591	97.24	45.72	36.27
Off-site Recycled Bricks	146.96	167.32	113.19	153.30
Off-site Recycled Concrete	98.11	1024.92	153.17	271.29
Off-site Recycled Fill	512.33	2319.93	1405.69	341.25
Off-site Recycled Green Waste	7.78	26.83	9.10	28.59
Off-site Recycled Metals	3.51	16.42	26.08	34.57
Off-site Recycled Plaster Board	9.745	13.59	11.84	27.87
Off-site Recycled Other	141.555	15.21	109.26	23.17
Disposed to Landfill	1173.595	674.562	819.02	800.28
Disposed Contaminated Material - "Asbestos"	18.99	37.27	32.96	43.37
TOTAL ON-SITE REUSED	184.662	878.57	443.00	1152.89
TOTAL OFF-SITE RECYCLED	925.581	3681.46	1874.05	916.31
TOTAL RECYCLED	1110.243	4560.03	2317.05	2069.20
TOTAL DISPOSED	1192.585	711.832	851.98	843.65
TOTAL	2302.828	5271.862	3169.03	2912.85

6.3.2 The Illegal Dumping and Litter Reduction Strategy

In 2011 Council prepared and adopted an Integrated Litter and Illegal Dumping Plan with actions addressing prevention, infrastructure, education, enforcement, policies and advocacy, and data monitoring. This was required as part of the State Government Waste and Sustainability Improvement Performance payment program.

The objectives of this strategy include:

- To monitor incidents, locations and actions
- To raise awareness, educate and inform the community about illegal dumping and its impacts, costs, consequences and community action.
- To reduce incidents of illegal dumping detection, enforcement and prevention
- To provide infrastructure and services to minimise illegal dumping
- To provide infrastructure and services to minimise illegal dumping
- To develop and implement policies and advocate for legislation change

Strategies and actions contained in the Litter & Illegal Dumping Integrated Plan will be incorporated into Council's Annual Operational Plans and will be funded as part of Council's Annual Budget Estimates or via external funding such as grants, Waste & Sustainability Performance Payments or partnerships.

Kiama Council Litter and Illegal Dumping Actions 2011/12

Education and Awareness

- Supported Schools Clean Up Australia Day 2012 with 1,400 students participating across the Municipality
- Supported Clean Up Australia Day 2012, with 11 sites cleaned up by 150 volunteers. 0.7 tonnes of waste and .5 tonnes of recyclables collected
- 2012/14 Waste and Recycling Calendars printed and distributed to all households with details of the Second Hand Saturday waste avoidance events, recycling and green waste requirements
- Continued the promotion of the NSW Government's Fridge Buyback Program
- Recognised and promoted 'Asbestos Week'
- Annual recycling program implemented again in Council's holiday parks over the summer holiday period.
- Set up and promoted Council first "Illegal Dumping" hotline.
- Produced and placed warning bin stickers on all public litter bins.
- Produced and placed warning plaques on all parks and reserves naming signs.
- Educational material was distributed to the carnival operators at the Kiama Show 2012 aimed at reducing waste and litter

- Continued to promote and implement Mobile Muster, Drum Muster and Cartridges for Planet Ark free recycling programs and Household Chemical Clean Up Collections.
- Implemented a free battery recycling program within the municipality.

Detection, Enforcement and Prevention

- Streamlined Council's in house illegal dumping and littering reporting system to ensure it is in line with the State Government's system.
- Council's Ranger Services investigated 175 Illegal dumping complaints, made up as follows:
 - 6 general littering issues
 - 6 Builders waste issues
 - Commercial waste issues
 - Hazardous material
 - 61 illegal dumping issues emanating from households
 - litter issues emanating from vehicles
 - 92 other litter/illegal dumping issues
 - Penalty Infringement Notices were issued (5 for discarding litter from a vehicle, 2 for discarding litter from an individual)

Infrastructure and Services

- Provided an E-waste collection event, in partnership with Renewable Recyclers, whereby a total of 48 tonnes of recyclable material was collected.
- Double bin enclosures are being trialled at two locations along Terralong Street. It is proposed that these new bins will replace the existing 20 year old street litter bins within the Kiama, Gerringong and Jamberoo CBD.
- Weekly recycling service provided over the summer holidays period to cater for the increase in population and increase in volume of recyclables
- Supported the Drum Muster program with 1240 drums collected
- Two annual Second Hand Saturday waste avoidance events were undertaken, providing the community with an event to swap, trade and sell unwanted household items
- The total tonnage of street sweepings collected during this period was 398 tonnes. This indicated a 29% decrease compared to the previous years. It should be noted that the majority of street sweepings is leaf litter and soil with litter making up a small component.
- Litter patrols conducting during this period resulted in a total 49.94 tonnes being collected. This represented an increase of 2.04 tonnes or 0.04% compared to the previous years.
- There are 211 public place waste bins and 55 recycling bins located in various streets, parks and reserves within the municipality. These were serviced on a daily or twice daily schedule depending upon season. Approximately 596 tonnes of waste

from the street waste bins and approximately 52 tonnes of recyclable material were collected from the public place recycling bins.

- Litter clean up of roads within the rural area of Jamberoo was undertaken twice and twice again in the Foxground areas during this period.
- Continue to install cigarette ashbins in known hotspots and include these in the existing service schedule. There are currently 72 ash bins installed in various locations within the municipality.
- Continue to provide car litter bags to Kiama Tourist Office and Council managed holiday parks for distribution to holiday makers. It was estimated that 2,500 bags were distributed during this period.
- Installed 1 Enviro Pod (gross drain pollutant traps) in Stage 7A of Kiama Council's Elambra Estate and included in the servicing schedule.
- Household Kerbside Clean Up Collection conducted twice throughout this period, totalling 278 tonnes of material being collected.

Policies and Advocacy

- Reviewed the current household clean up collections and considered several alternate options including and on-call service. Determination of a new service to commence in 2012/13.
- The Demolition of Buildings Containing Asbestos Policy was adopted in August 2011.
- For alfresco dining establishments, a smoke free policy has been introduced to new and updated licences. This will minimise cigarette butt litter in these areas.

6.3.3 Waste and Sustainability Improvement Performance Payments (WaSIP)

The Local Council Waste and Sustainability Improvement Payments (WaSIP) commenced in 2009-10 to assist Councils invest in additional actions and programs that improve resource recovery and sustainability outcomes across their local government areas. The Waste and Sustainability Improvement Scheme is described in Part 5A of the Protection of the Environment Operations (Waste) Regulation 2005.

In October 2011, regulatory amendments streamlined the funding arrangements for Councils so that a single pool of funds is allocated annually to eligible Councils in the SMA, ERA and RRA in proportion to their population.

To be eligible to receive a Waste and Sustainability Improvement Payment, Councils in the regulated area are required to commit to meeting both the ongoing and current year's WaSIP Standards. The WaSIP Standards are progressively updated in consultation with an Advisory Group and the Local Government and Shires Associations.

In August each year, Councils can apply for a Waste and Sustainability Improvement Payment by sending EPA a WaSIP Certificate signed by their General Manager. The Certificate commits the Council to:

- Complying with the WaSIP Guidelines

- Investing the payments in actions and programs to improve waste and environmental sustainability outcomes based on local priorities
- Providing an action table that details the waste and sustainability actions that will be delivered as a result of receiving the payments
- Providing a financial report on the waste and sustainability outcomes achieved

Table 25: Total WaSIP payments received and Section 88 payments made by Council scheme 2009-2012

Financial Year	WaSIP Payment \$	Total Section 88 Levy payments made by Council \$
2008/09	48,056.35	203,052
2009/10	79,616.36	257,112
2010/11	102,523.51	311,632
2011/12	116,960.14	426,162
WaSIP Total	247,156.36	1,197,958

WaSIP Initiatives 2011/12

The following programs were carried out in accordance with the WaSIP guidelines:

- Illegal Dumping Hotspot monitoring (\$5,000) these funds will be used for surveillance of known illegal dumping sites
- Targeted litter reduction program (\$15,000) was conducted through the installation of signage in litter hotspots and increased patrols with support rangers to identify and educate offenders

WaSIP Initiatives 2009-2011

- Kiama Community Garden – establishment of a compost facility and a plant propagation green house(\$7000)
- Council Holiday Parks Source Separation Policy and Recycling Program (\$18,000)
- Lamp Recycling Program (\$2,000)
- Second Hand Saturday – 8 events (\$6,489)
- Planning for Less Waste DCP guidelines (\$5,000)
- Sustainable Events and Council Facilities Hire Policy (\$3,000)
- Sportsgrounds Recycling Infrastructure Upgrade (\$15,000)
- Trial Public Place Recycling Program (\$20,000)

6.3.4 Gerroa and Minnamurra Waste Depots

Council has engaged Earth2Water Pty Ltd to provide quarterly groundwater and surface water monitoring report for the Gerroa Waste Disposal Depot (GWDD) and the Minnamurra Waste Disposal Depot (MWDD). Landfill operations at both of these waste disposal depots have ceased and closure plan requirements have been implemented. The objective of monitoring is to assess the potential impact of the GWDD and MWDD on local surface and groundwater systems. The groundwater quality at GWDD has improved dramatically and is nearing recommended guidelines. There is a downward

trend occurring at the MWDD due to natural processes including increased levels of rainwater reaching the aquifer.

6.3.5 Benefits of Recycling

The total amount of recyclables collected by Council from the urban and rural residential sector for 2011/2012 was 7,435.24 tonnes. This represents a decrease of 6.02% on the 2010/2011 figure of 7,910.94 tonnes.

A further 49.21 tonnes of recyclable materials were recycled from commercial premises (15.74 tonnes 2010/11) and 33.60 tonnes including drop off recycling (15.75 tonnes), scrap steel (145 tonnes) and kerbside steel cleanup (94.32) was recycled at the Minnamurra Waste and Recycling Centre.

A total of 3,752.00 tonnes of green waste was diverted from landfill. 2,874 tonnes of green waste was collected from the fortnightly urban kerbside service and a further 878 tonnes was received at the Minnamurra Green Waste Recycling Centre.

When the total recycled tonnage figure is entered into the EPA, *Environmental Benefits of Recycling Calculator* (Environmental Protection Agency - e), it shows that this amount of recycling has the following benefits with regard to landfill space, greenhouse gases and energy and water savings.

For the 7,435.24 tonnes of total waste recycled, this equates to:

- 19,521 m³ of landfill space saved;
- 3,534 tonnes CO₂ equivalent total greenhouse benefits;
- 849 cars being removed from the road;
- 117,973 gigajoules of energy savings;
- 546 households' annual electricity requirements; and
- 1017,330 mega litres of water savings (47 Olympic swimming pools or 2133 backyard swimming pools).

For 3,750 tonnes of green waste diverted from landfill, using the National Greenhouse Accounts factor of 1.3 tonnes equivalent CO₂ per tonne of green waste, this equates to:

- 4,877.76 tonnes of CO₂ equivalents

6.3.5	New	Waste	Initiatives	2011-2012
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Recycling revisited!

In an attempt to increase recycling from households, a recycling information brochure was designed and distributed to all household in June 2011. The brochure provided details of what can and cannot be recycled and was designed with a magnet so that it

can be displayed in the kitchen for future reference. Results from Council's November 2011 waste and recycling audit showed that the type of recyclable materials found in the recycling bin was a similar to those found in the November 2008 audit.



Battery Recycling Program

In February 2012, Kiama Council introduced a Battery Recycling Program for its residents. Specially marked bins were located within the Kiama Library and the Minnamurra Recycling Depot for residents to dispose of their unwanted dry cell batteries in a safe and environmentally friendly manner. This program was also established in the Council Administration Building and Stores Depot for staff and this was supported by little battery bins for office desks that were distributed to all staff to assist with the collection of the batteries.



6.3.6 Ongoing Waste Initiatives

- Mobile Phone Recycling Program. During 2011/12, a total of 14kgs of mobile phones and accessories were collected and recycled.



- The Return Unwanted Medicines (RUM) Project continued to be promoted. No data is available on the quantities of unwanted and outdated medicines collected in the Kiama LGA
- School Clean Up Australia Campaign – 1,400 students participate annually
- Clean Up Australia Day – approx 16 sites cleaned up annually, approx 250 volunteers annually, 4.57 tonnes of waste and 2.98 tonnes of recyclables collected to date. Kiama Council participated in Business Clean Up Day for the past four years
- Second Hand Saturday conducted has been conducted (2 events annually) with the number of sites registered for the day ranging from 76-102 over the past four years and approximately 2,500 attendees annually.



- Participated in regional mattress recycling program, a total of 147 mattresses have been collected to date
- Home Composting Education has continued to be promoted through the Kiama/ Kiamasphere website and at community events. Council has sold 412 Bokashi Buckets to Kiama Municipality residents since 2009
- Fridge Buyback Program, 313 fridges had been collected since 2009 from the Kiama Municipality, ranking Kiama 12th out of 52 participating Councils in NSW



- Asbestos Week has been promoted annually
- “Cartridges 4 Planet Ark” since 2003 a total of 395.09kg has been diverted from landfill



- Lamp Recycling Program for fluorescent tubes and CFLs. Since 2007 488kg of globes have been collected and recycled, diverting approximately 198,559 mg of mercury from landfill. During 2011-2012 this program was changed and restricted to residential premises only
- dRum Muster Program allows for the collection and recycling of empty, cleaned nonreturnable crop production and on farm animal health containers. To date a total of 3532 drums have been collected
- Littering from Cars enforcement and education program has been conducted annually. A total of 4 people have been issued a Penalty Infringement Notice, 130 people have been approached and 15 verbal cautions have been given to date
- E-Waste Recycling, 2 e-cycle events were conducted during 2010/11. A total of 85.2 tonnes of electronic waste has been collected for recycling



- Holiday Parks Recycling Program provides comprehensive education campaigns, improved signage and provision of containers to encourage recycling in Council owned holiday parks. A trial program to separate food organics and composting using Ezy Tumbler Composting Bins was also conducted at Seven Mile Beach Holiday Park
- Household Chemical Clean Out Collection program is held four times a year within the Illawarra/Shoalhaven, this program was promoted by Council
- Weekly Residential Recycling Service, Dec-Jan. An additional seven services have been undertaken during this period. This has resulted in an average of an additional 118 tonnes of recyclables collected each year. This equates to a 9.7% increase compared to 2008.
- **Waste Service Performance Improvement Program** The OEH developed this program to assist Councils in the regulated area to invest in improvements in waste avoidance, resource recovery, waste management and improvements in environmental sustainability. To be eligible for the 2010/11 payment, Councils needed to conduct a waste audit on a random sample of materials placed in mobile garbage bins (MGB's) at the kerbside by urban tenements within the municipality and to report on the findings. Kiama Municipal Council's waste audit was conducted by the Waste Business Unit in October 2011. The overall unrecovered MGB recyclable material has reduced from 2.99kg per household in the 2008 audit to 1.79kg in 2011.

6.3.7 Waste Initiatives 2009-2011

- Responsible Waste recycling Kit was developed and distributed to holiday properties to promote source separation and awareness of materials that can be recycled
- Project Aware Kiama Harbour Cleanup 2009. Volunteer divers from Windang Dive and Spearfishing Club conducted a litter clean up of Kiama Harbour and

Minnamurra River resulting in combined total of 20 cubic metres or (1 tonne) of waste being collected



- Young Artists Recycled Art Competition 2010, over 250 entries were received as part of World Environment Day
- Salvation Army's Winter Clothing Appeal, Kiama Council staff collected a total of 31 bags of clothing to be donated
- National Recycling Week, Op Shop Bus Tours (Sustainable Illawarra Program) was conducted between August 2008 and June 2010. A total of 184 residents attended these tours



- Trial Public Place Recycling Program Dec 2009 – Jan 2010 (Sustainable Illawarra Program) was implemented in Hindmarsh Park and Coronation Park Kiama; this was extended to Pacific Avenue and Werri Beach. A total of 21.12 tonnes of recyclable materials was recovered with less than 10% contamination
- Lifeline Big Book Fair Collection Program, A total of 3388 books were collected over the 4 week period from drop off points

- Illegal dumping Street Litter Bins Education Program was conducted aimed at commercial premises
- Litter Education Campaign erected a *“Welcome to Kiama, From the Mountains to the Sea, please keep our town litter free”* sign to promote proper disposal of litter
- Environmental Poster Competition was run as part of World Environment Day
- Love Food Hate Waste Program was adopted and implemented to encourage residents to reuse leftovers from meals
- Scarecrow Sculpture Competition was conducted as part of World Environment Day 2011. The scarecrows were then placed in the Kiama Community Garden



- E-Waste Education Material, developed and produced educational material on e-waste recycling to be used by other regional Councils
- Kiama Show 2011 Waste wise Event, developed educational material and implemented recycling at this event

Chapter 7: Air

Air pollution is the presence of chemicals in the atmosphere in quantities and duration that are harmful to human health and the environment, including the climate. The air quality of the Kiama Municipality can be affected by local, regional and global sources and is therefore an issue that crosses local Council boundaries.

7.1 State

7.1.1 Local and Regional Air Quality

There are a range of sources of air pollution that have an impact on local and regional air quality such as motor vehicles, fire, solid fuel heaters, industrial and commercial emissions and agricultural activities. These sources produce pollutants that can include lead, particulate matter, carbon monoxide, odour, sulphur dioxide, nitrogen oxides, photochemical smog and ozone. According to the Office of Environment and Heritage (OEH) photochemical smog and particle pollution (brown haze) are currently the most concerning pollutants in the Illawarra.

The EPA monitors the air quality throughout the Greater Metropolitan Region from Newcastle to Albion Park. There are currently no monitoring stations within the Kiama Municipality. There are three monitoring stations within the Illawarra Region, at Albion Park, Kembla Grange and Wollongong.

The Regional Air Quality Index (RAQI) is based on the five criteria pollutants; Ozone, Nitrogen dioxide, Carbon monoxide, Sulfur dioxide and Particulates PM10 and PM2.5 (as per national standards) plus visibility (as per a standard set by NSW).

The RAQI combines all the daily data from the three monitoring stations in the Illawarra and uses the highest reading for the calculations. Table 26 outlines those results from 2009-2012. The National Environment Protection Measure (NEPM) or NSW standards are:

VERY GOOD	GOOD	FAIR	POOR	VERY POOR	HAZARDOUS
0-33	34-66	67-99	100-149	150-199	200+

An AQI of 100 corresponds to the relevant NEPM standard for criteria pollutants or the relevant NSW standard for visibility. Hence, when the AQI is reported as UNHEALTHY or VERY UNHEALTHY it indicates that the determining pollutant levels have reached or exceeded the relevant standard or goal. (EPA website accessed August 2012 <http://www.environment.nsw.gov.au/AQMS/aboutaqi.htm>)

Table 26: Air pollution indicator RAQI readings for Illawarra region 2009-2012

NEPM Category	No. of days 2008/09	No. of days 2009/10	No of days 2010/11	No of days 2011/12
Very Good	29	50	76	61
Good	277	263	264	255
Fair	45	39	21	46
Poor	8	9	4	4
Very Poor	2	1	0	0
Hazardous	4	3	0	0

During the 2011/2012 reporting period, the RAQI count exceeded 100 in the Illawarra region on four occasions (EPA 2012). This result shows an improvement of 71% in occurrences of poor or worse than poor air quality in the Illawarra since 2009.

EPA have a system where you can receive air quality updates via SMS or email (or both) to let the community know if the RAQI is over the recommended health levels. This is particularly useful for people with asthma, cystic fibrosis or other lung conditions, as it gives them the 'heads up', so they can make decisions about the amount of time they spend outdoors that day exercising etc. You can register for this free service at <http://www.environment.nsw.gov.au/aqms/subscribe.htm> (Salter, D. pers comm 2012)

Illawarra Regional Air Quality Index data for the 2011/12 reporting period is shown in Figure 7 and Figure 8 show a comparison of RAQI data for the last financial year and the past four financial years.

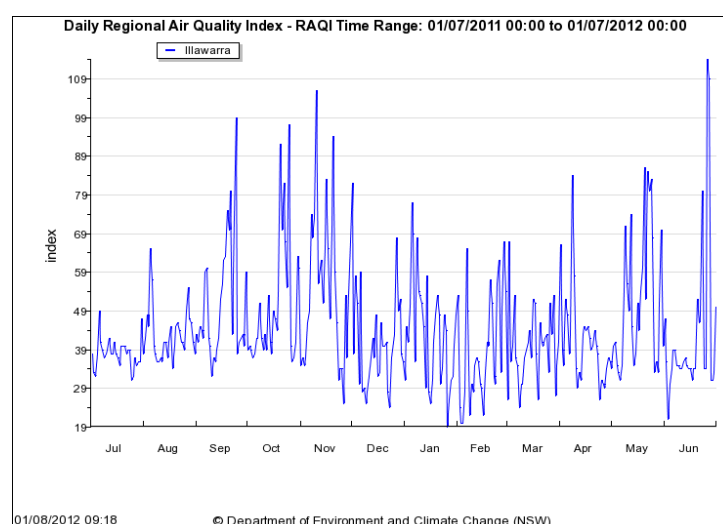


Figure 7: Regional Air Quality Index data for the Illawarra Region July 2011 to June 2012

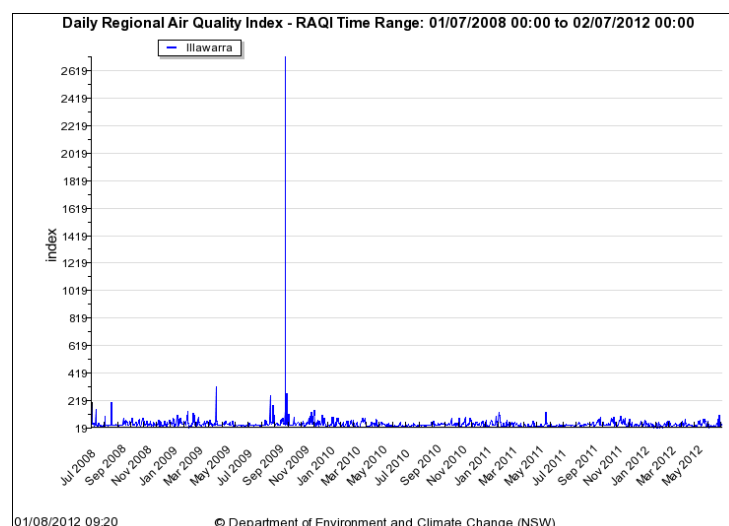


Figure 8: Comparison of Regional Air Quality Index for the Illawarra Region for the period July 2008 to June 2012.

The number of complaints relating to air pollution in the Kiama LGA is shown in Table 24. The total number of complaints has decreased since the last reporting period.

Table 27: Complaints relating to Air Pollution to Council and the EPA

Type of Complaint	2008-2009	2009-2010	2010-2011	2011-2012
Burning Complaints to Council	5	5	5	4
Commercial Complaints to Council	5	0	1	3
Dust Complaints to Council	0	0	2	0
Odour Complaints to Council	20	11	17	10
Air Complaints to EPA (ARA)	2	3	2	6
Total Air Complaints	32	19	27	23

7.1.2 Global Air Quality

There are two main global air quality issues: depletion of the ozone layer and the enhanced greenhouse effect. While stratospheric ozone concentrations have stabilised significantly since the 1980s and the concentration of ozone-depleting substances in the atmosphere is decreasing, the concentration of greenhouse gases in the atmosphere is still an urgent and significant problem, caused by activities such as the burning of fossil fuels (primarily oil, coal and natural gas) and land clearing.

The enhanced greenhouse effect is causing climate change globally and will have local impacts. According to a CSIRO study on the *Potential Impacts of Climate Change on the Kiama Local Government Area*, commissioned by Council as part of the Council's LEP, it is predicted that the following climate changes may occur in the Kiama area: increased temperatures, decreased rainfall, increased evaporation, more warm days and hot spells, fewer cool days and cool spells, changes to wind patterns, and an increase in the intensity and frequency of extreme daily rainfall events. Such changes are predicted

to have an impact on agriculture, water availability, biodiversity, bushfires, human health and infrastructure (CSIRO Australia, 2005).

During 2009/10 Council completed a Climate Change Adaptation Plan, objectives and other information are outlined in section 9.5.4

According to Planet Footprint Council has decreased the amount of Greenhouse Gas (GHG) emitted from its operations by 4.56% compared to the previous reporting period. The dominant source of emissions from Council’s operations in 2011/12 is from Council’s vehicle fleet which contributed (1,517 tonnes), others include Council owned buildings (479 tonnes), and streetlights (1,239 tonnes). The total amount of GHG emissions from waste collected in the Municipality is (5,238 tonnes).

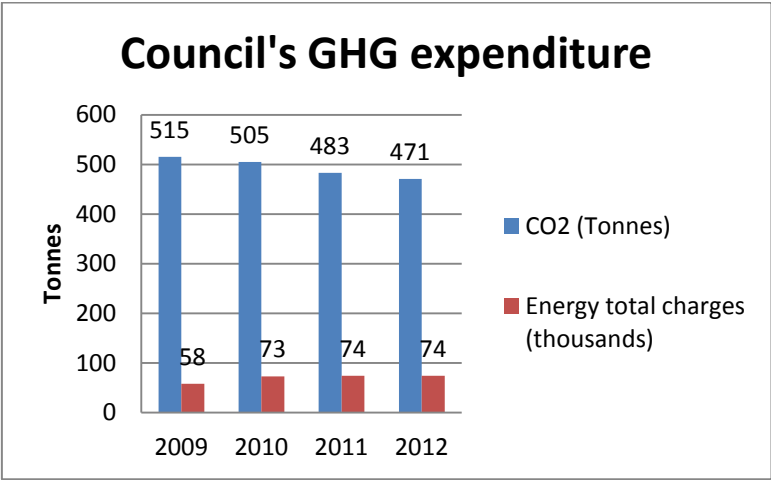


Figure 9: Council’s Greenhouse Gas expenditure 2009-2012

Council’s total energy charges have remained relatively constant over the four year period however the CO2 expenditure has shown a slight decreasing trend over the four years. This indicates that Council operations are slowly being replaced with more energy efficient processes.

7.2 Pressures

There is pressure on the air quality of the Kiama Municipality from a variety of activities and sources throughout the residential, commercial, industrial, rural and transport sectors. The activities that impact on air quality can include the use of solid fuel heaters, burning of household refuse, motor vehicle use, vegetation clearing, waste disposal, dust from unsealed roads and construction, energy consumption and direct emissions of chemicals or odour from industrial and rural activities. Fires also place pressure on local and regional air quality.

Emissions from motor vehicles are a major pressure on air quality. The latest figure on vehicle registrations in the Kiama Municipality show that in March 2012, there were 19,565 vehicles registered, which was an increase of 378 vehicles since 2011 (Roads and Traffic Authority, 2012) See Table 25.

Table 28: Vehicle Registration in the Kiama Municipality 2009-2012
(Roads and Traffic Authority, 2009- 2012)

Year	Number of Registered Vehicles	Number of Registered Trailers	Total Increase since previous year	% Increase since previous year
2009	15108	3364	606	3.2%
2010	15534	3479	541	2.8%
2011	15817	3608	412	2.1%
2012	15900	3665	140	0.7%
Total increase 2009-2012	1,093			5.6%
Average Annual Increase vehicles and trailers	424.8			2.2%

According to the Roads and Traffic Authority Local Government Area Vehicle Registrations report (Roads and Traffic Authority, 2012), as of 30th June 2012, 64.9% of fuelled vehicles in the Kiama Municipality were fuelled by unleaded petrol, 1.7% by leaded petrol, 12.1% by diesel, 2.2% by LPG or LPG/petrol and 0.5% by other fuel types (or unknown). The fuel consuming registered vehicles made up 81.3% of the total registered vehicles, the remaining 18.7% of registered vehicles was made up of trailers and non-fuel consuming vehicles.

Bushfire and hazard reduction burns also place pressure on local and regional air quality. According to the OEH bushfires are responsible for most of the occasions which high levels of particle pollution are recorded. The number of fires within the Kiama Local Government Area is shown in Table 26. For the past four years the number of fires overall has slightly decreased.

Table 29: Fires in the Kiama Local Government Area during 2009-2012
(Danaskos, H. 2012)

Type of Incident	2008/09	2009/10	2010/11	2011/12	Total Incidents
Undetermined	0	1	0	0	1
Building fires	4	6	2	5	17
Fires in buildings confined to non-combustible containers	1	7	3	3	14
Special structure fires	4	2	6	2	14
Mobile property type fires	4	3	6	8	21
Vegetation or other outside fires	8	20	17	4	49
Small vegetation fire	0	0	1	0	1
Outside rubbish fire	15	13	7	9	44
Heat related or electrical	6	2	5	5	18
Other hazardous materials	1	0	0	2	3
Miscellaneous hazardous situations	3	1	1	0	5
Total	46	55	49	38	190

7.3 Responses

7.3.1 Council's Fleet Management

Council currently has 58 passenger vehicles in the fleet. It is currently a 50/50 split between 6cyl and 4cyl. There are 28 light commercials (utilities) in the fleet and all 4cyl diesels are running on B50 Biodiesel. The remaining heavy vehicle fleet located at the works depot run on B50 Biodiesel and heavy vehicles located at the Waste depot run on B20 Biodiesel.

The following activities were carried out in accordance with Council's Fleet Management Policy:

- 17% of fleet cars purchased in the 2011-2012 financial year were diesel
- More than 300 tonnes of CO₂-e were abated in 2011-2012 through the use of biodiesel
- Average star rating for 2011-2012 is 3.6. This has increased from the average star rating of the 2010-2011 financial year of 3.3
- The parts washer uses biological agents to clean oil and grease off the parts from the workshop, and gets rid of harmful solvents and cleaning products out of the process
- Fleet Manager is developing an Environmental Management System in line with ISO14001 methodology for the Depot
- Fleet Manager maintains a professional network. Manger has attended one networking meeting the last financial year. (Fleet wise)
- Kiama Council is a partner in Fleet wise
- Induction lighting retrofit at Depot to decrease electricity emissions associated with infrastructure needed to service vehicles
- Water tanks have been installed and collected water is used to wash down vehicles

7.3.2 WaSIP Initiatives

A self-bunded above ground fuel tank was installed at Council's works depot to run all operational vehicles, plant, equipment and corporate fleet on B100 biodiesel. Currently B50 biodiesel is being utilised due to an issue with one type of truck not performing well on B100 biodiesel. The biodiesel company is communicating directly with the truck company to work through the issue



B100 Biodiesel fuel tank

7.3.3 Development Control

Development control conditions are placed on development approvals for industrial and commercial activities to ensure air pollution is minimised or prevented. From 1st July 2005 the Building Sustainability Index (BASIX) came into effect in the Kiama Municipality. BASIX is a web-based planning tool for Councils and proponents of residential dwellings to assess the potential performance of their development against a set of sustainability indices, including energy conservation. For energy, a BASIX rating of 25 for energy conservation will apply, potentially reducing greenhouse gases by 25%. This target increased in July 2006 to 40 for energy conservation, to achieve a 40% reduction in greenhouse gases. More information about BASIX can be found in Chapter 2: Land.

7.3.4 Enforcement

Council's Environmental Health Officers and Ranger Services Officers investigate complaints received by Council relating to air pollution. The EPA investigates complaints regarding air pollution from scheduled premises and activities and smoky vehicles. Notices or Penalty Infringement Notices for air pollution offences may be issued by these officers under the *Protection of the Environment Operations Act 1997*.

7.3.5 Cycleways

Cycleways promote physical activity as well as improved air quality through alternative transport options. On and off-road cycleways are shown in Council's *Cycleway Plan* which is a strategic plan incorporates engineering, educational and encouragement strategies and lists cycleway projects as priorities for implementation (Kiama Municipal Council, 2012).

The \$470,000 track connecting North Kiama to Jamberoo winds along beside the Minnamurra River billabong, starting at Henry Parkes Drive, with access to Swamp Road. The completed sections of cycleway for the reporting period include Gainsborough to Jamberoo Stage 1 which adds an extra 1.6 kilometres to the hilly

municipality's shared pathways, the cycleway now totals 9.3 kilometres in length, this is funded by the RTA as part of the handover of the former Princes Highway.

The priorities for proposed cycleway projects have also been reviewed and are listed below in the preferred order of implementation:

- Gainsborough to Jamberoo Stage 2, Swamp Road to Jamberoo (Kiama Municipal Council, 2005b);
- Fern Street to Miller Street via pathway across Millers Flat; and
- Crooked River Road, Crooked River to Municipal boundary;



Jamberoo Valley Cycleway

7.3.6 Kiama Council *No Burn* Policy

Council adopted a *No Burn* Policy within the Kiama Municipality. Under Part 2, Schedule 8 of the *Protection of the Environment Operations (Clean Air) regulation 2002*, and through authority delegated by the OEH, Kiama Council is required to regulate outdoor burning in the Municipality.

Council will only consider applications to burn piles of vegetation that relate to properties over one acre that perform agricultural operations, or for burning in accordance with the Bush Fire Hazard Reduction Certificate under the Bush Fire Act. The Council approval is only for permission to make pollution and is not a fire permit. During the Bush Fire Danger Period from 1st October to 31st of March, a permit must also be obtained from the Rural Fire Service, prior to any burning taking place.

Council will not consider applications to burn piles of vegetation from Urban (Residential) and Rural (Residential) areas. Rural residential is classified as a lot size of 1 acre or less.

Council is required to consider issuing an approval using Section (6G) 3 which states; before granting approval the local Council must take into account the following matters:

- The impact on local air quality and amenity;

- Feasibility of reuse, recycling or other alternative means of disposal; and
- Any opinions of the sector of the public likely to be affected by the proposed approval.

Kiama Council's Scheduling only allows for the burning of vegetation.

Table 30: Permission to Burn certificates issued 2009-2012

	2008/09	2009/10	2010/11	2011/12
Permission to burn certificates	133	88	64	112

The number of Permission to Burn and create smoke certificates is dependent upon various seasons and weather events that create the need for rural property owners to burn tree and vegetation debris from wind and flood events. This only applies to rural agricultural properties.

Chapter 8: Heritage

8.1 Heritage Listings

8.1.1 Aboriginal Heritage

In NSW Aboriginal places are administered under the *National Parks and Wildlife Act 1974*, *Heritage Act 1977*; and *Environmental Planning and Assessment Act 1979*.

The Environmental Protection Agency maintains a register of identified Aboriginal Heritage sites throughout the state, known as the Aboriginal Heritage Information Management System (AHIMS). There are 60 known Aboriginal sites currently recorded in the Kiama Municipality and within these sites, 97 site features were recorded, as shown in Table 29, see

<http://www.nationalparks.nsw.gov.au/npws.nsf/Content/What+information+can+you+obtain+from+AHIMS> for more information and limitations of this register.

Table 31: Aboriginal Heritage Information Management System Record for the Kiama Municipality

Site Feature	Number within Kiama Municipality
Aboriginal Ceremony and Dreaming	1
Art (Pigment or Engraved)	7
Artefact	41
Burial	1
Earth Mound	18
Grinding Groove	4
Potential Archaeological Deposit	3
Shell	19
Stone Arrangement	2
Modified Tree (Carved or Scarred)	1
TOTAL	97

All Aboriginal sites are protected under the *National Parks and Wildlife Act 1974*, regardless of their inclusion in the register, and it is an offence to damage or destroy them without the prior permission of the Director-General of the EPA.

The NSW Heritage Council is required under the *Heritage Act 1977* to keep a register, known as the State Heritage Register (SHR), of both Aboriginal and Non-Aboriginal places of significance. Listing on the SHR means that a place is protected and that the approval of the Heritage Council is required for any changes or demolitions.

At a national level, the EPA has one site listed in the Register of the National Estate as an Aboriginal place, located in Jamberoo, but the register does not have any specific details on the site. A new national heritage system commenced in 2004, and developed the National Heritage List, which records natural, Aboriginal and Non-Aboriginal places with outstanding heritage value to the nation. There are currently no Aboriginal sites in Kiama recorded in this register.

8.1.2 Non-Aboriginal Heritage

Non-Aboriginal Heritage inventories have been conducted in the Kiama Municipality in 1987, 1994 and 2000-2002.

Non-Aboriginal Heritage Items of national significance are listed by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) in the Register of the National Estate and National Heritage List. Items of State significance are listed in the NSW State Heritage Register. Items of regional significance are listed in State environmental planning policies (SEPPs). Schedule 5 of Local Environmental Plan 2011 contains KMC's listed Environmental Heritage items. The schedule contains both Heritage items and Archaeological items.

In the KMC area there are items of "Local" significance, "State" significance and "Commonwealth" significance. This schedule represents the culmination of a significant Heritage review process, and community consultation process. This process was undertaken as a part of the LEP review process which culminated in the publishing of Councils Local Environmental Plan 2011 in December 2011. Schedule 5 of the LEP can be seen at this link:

<http://www.legislation.nsw.gov.au/maintop/view/inforce/epi+680+2011+cd+0+>

8.2 Pressures

Aboriginal Heritage sites are under threat by activities such as land clearing and housing development, lack of management strategies for assessing the potential impacts of such activities, and the lack of identification of sites.

Non-Aboriginal Heritage items can become degraded through re-development, weather conditions, vandalism, general poor maintenance and lack of understanding.

8.3 Responses

8.3.1 Heritage Adviser

Council utilises the services of a consultant Heritage Adviser who promotes heritage conservation, educates and advises the community with regard to heritage conservation and provides specialist support and advice to Council on heritage planning and development control activities.

8.3.2 Development Approval Process

Council has statutory responsibilities under *the Environmental Planning & Assessment Act 1979*, the *Heritage Act 1977* and the *National Parks & Wildlife Act 1979* to consider the potential impacts of any development or planning proposal on items of natural and cultural heritage which includes Aboriginal and European cultural heritage.

During the reporting period no Aboriginal Heritage Studies have been conducted.

8.3.3 Heritage Projects

Council engaged Truman Zaniol & Associates, to review the *Kiama Heritage Review* recommendations and recommend those items that should be included in Schedule 5 of the Kiama LEP 2011.

The results of the Kiama Heritage Review process and consultation were subsequently incorporated in the Kiama Local Environmental Plan 2011.

Natural and Cultural Heritage Educational Signage

Federal grant infrastructure funding was provided for the supply and installation of natural and cultural Heritage educational signage along the coastal walking track from Minnamurra to Gerringong. This signage provides information for tourists on historical sites, buildings, events and unique natural and geological features within the Kiama LGA.

During 2011/12 signs were placed in Hindmarsh Park and Black Beach Reserve.



Storm Bay – Heritage sign

Heritage Trail Phone App

A phone application called the 'Kiama Library Tours' has been developed by Council to encourage locals and tourists to step back in time and take a walk around Kiama, learn about the history of some of the beautiful old buildings both past and present through words, photos and oral histories as well as listen to people's memories of living and working in the Municipality, from taking part in the local agricultural show in the 1940's to what happened when the circus come to town (iTunes Apple store 2012). This free 'app' is available from the following link: <http://itunes.apple.com/au/app/kiama-library-tours/id528232083?mt=8>

Kiama Family History Centre Projects 2009-2012

Printed Books

- Pioneers & Settlers in the Police District of Kiama Prior to 1920
- Death in Print – Deaths, Obituaries and Inquests as Reported in the Kiama Examiner & Kiama Independent 1859-1919 Part 1 A-L
- Death in Print – Deaths, Obituaries and Inquests as Reported in the Kiama Examiner & Kiama Independent 1859-1919 Part 1 M-Z

CD'S

- Index to Kiama Court Appearances as Reported in the Kiama Independent 1863-1903
- Index to the Illawarra Express & South Coast General Advertiser 1861-1862
- Index to Frank McCaffrey's History of the Illawarra and its Pioneers
- Bombo Public School Admissions Book 1914-1948 & Punishment Book 1930-1941
- Kiama Municipal Council Rates Books 1877-1890, 1898-1928 & 1932-1937
- Jamberoo Rates Books 1911-1954
- Kiama Infectious Diseases Register 1898-1925 & Kiama Family Payment List 1927

Ongoing Projects

- Kiama Settlers Project –When completed each family will have recorded the name of the immigrant vessel on which the family arrived, dates of marriage, list of births including dates, dates of death and places of burial.
- Gerringong Rates Books
- Gerringong Council Minutes Books
- Wollongong High School Admission Books 1917-1926
- Wollongong Gaol Admissions 1866-1898

Chapter 9: Sustainable Communities

This chapter presents the concept of sustainability and sustainable communities in the Kiama Municipality and is divided into two sections. The first section contains a set of measurable Key Sustainability Indicators and total expenditure on the environment spent by Council. The second section outlines the current strategies that Council is undertaking to move towards sustainability, including strategies to promote environmental protection and healthy communities.

Sustainability is often used as a substitute for the term Ecologically Sustainable Development (ESD), which involves the effective integration of economic, social and environmental considerations in decision-making processes. The principles of ESD include:

- The precautionary principle, namely that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- Intergenerational Equity, namely that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- Conservation of biological diversity and ecological integrity should be a fundamental consideration; and
- Improved valuation, pricing and incentive mechanisms, namely those environmental factors, should be included in the valuation of assets and services.

All of the pressures on the environment that are identified within the theme chapters have an impact on the overall sustainability of the Kiama Municipality. For sustainability to be achieved, these pressures must be counter-balanced by actions and technologies implemented throughout the community.

Although there are a number of tools to measure sustainability, they remain limited in their application by Council's as they are complex, inexact and subject to varying interpretation. There is no formally state wide adopted set of sustainability indicators for the purposes of SoE reporting and thus the move towards sustainability must be inferred from secondary sources.

For the purpose of this SoE report Waste and Beachwatch Headline Sustainability Indicators have been used in addition total expenditure spent on the environment by Council for the past four financial periods has been included.

9.1 Headline Sustainability Indicators

Each theme chapter presents extensive data that can be monitored over time, previously there were four Headline Sustainability Indicators to chart against, but due to lack of available data, Air Quality and River & Estuary Water Quality can no longer be assessed. The objective of these Indicators is to chart the overall progress of Council

and to measure the effectiveness of actions and technologies at achieving a more sustainable Municipality.

Each indicator graph includes a sustainable zone, based on the data in the baseline year of 1999-2000. The zone includes any result that indicates a similar or improved environment compared to the relevant baseline year. The graphs therefore indicate the move towards or away from the 'sustainable zone'.

There are currently two Headline Sustainable Indicators; Beach Water Quality and Waste.

9.1.1 Headline Sustainability Indicator – Beach Water Quality

This indicator utilises data obtained by the EPA and Sydney Water Corporation in the Beachwatch Program, as reported in Chapter 3: Water. This program measures faecal coliform and enterococci levels at five of the Municipality's beaches: Jones' Beach, Bombo Beach, Surf Beach, Werri Beach and Seven Mile Beach (2011-12 only).

The results indicate that since 2009 the baseline of 100% compliance has been maintained. However the results recorded only represent water quality for the specific period that was tested. There are periods during the year where no testing is undertaken.

9.1.2 Headline Sustainability Indicator – Waste

The NSW Waste Avoidance and Resource Recovery Strategy 2010 have set resource recovery targets, to be achieved by 2014, for three waste sectors: municipal, commercial and industrial (C&I) and construction and demolition (C&D).

By 2014, NSW aims to increase the recovery and use of secondary materials from the baseline figure collected in 2007 in three major waste streams as follows:

- Municipal waste – from a baseline of 26% to 66%
- Construction and demolition (C&D) waste – from a baseline of 65% to 76%
- Commercial and industrial (C&I) waste – from a baseline of 28% to 63%

Currently Council has reached:

- 59.80% for Municipal waste, 6.2% to target
- 71% for C&D waste, 5% to target
- *Data for C&I is not available as private contractors also collect this waste within the Kiama LGA

9.1.3 Total Expenditure on Environment by Council

The total environmental expenditure for the Kiama LGA for the past four reporting periods is approximately \$25,114,339. This has been broken down into two separate categories including Council's expenditure shown in table 32 and the amount received in grants from the State and Federal Governments shown in table 33.

Table 32 details the total expenditure on Environment by Council 2009-2012, which excludes funding provided to Southern Council Group for the IDNWA.

Table 32: Total Expenditure on Environment by Council 2009-2012

Area	Expenditure (\$)			
	2008/09	2009/10	2010/11	2011/12
Waste Management & Recycling	3,574,010	3,578,784	3,821,149	4,215,639
Biodiversity enhancement	533,624	709,387	771,644	892,372
Environmental protection enforcement (Rangers)	74,135	78,037	83,080	85,997
Water conservation	452,158	557,747	560,767	547,879
Sustainability Education	387,316	288,227	287,771	285,598.50
Strategic Planning	190,065	223,822	174,807	179,431
Heritage	22,317	21,046	23,383	37,638
Total	5,233,625	5,457,050	5,722,601	6,244,555

9.1.4 Total Environmental and Sustainability Grants

Table 33 details the total Environmental and Sustainability Grants received by Council 2009-2012.

Table 33: Total Environmental and Sustainability Grants 2009-2012

	Grants received (\$)			
	2008/09	2009/10	2010/11	2011/12
WaSIP	48,056	79,616	102,523	116,960
Biodiversity enhancement *including	101,823	79,238	189,903	86,425
Energy & Water conservation	22,355	333,333	0	43,460
Sustainability Education	166,633	193,384	278,706	191,808
Air Quality	105,000	884	205,638	109,524
Heritage	913	0	0	325
Total	444,780	686,455	776,770	548,502

In regards to Council's annual budget an average of 12.6% over the past four years has been spent in the Environmental management across all Council's functional areas. This equates to an average of \$6,267,093. Figure 10 outlines the percentage Council has spent on environmental management in the past four reporting periods.

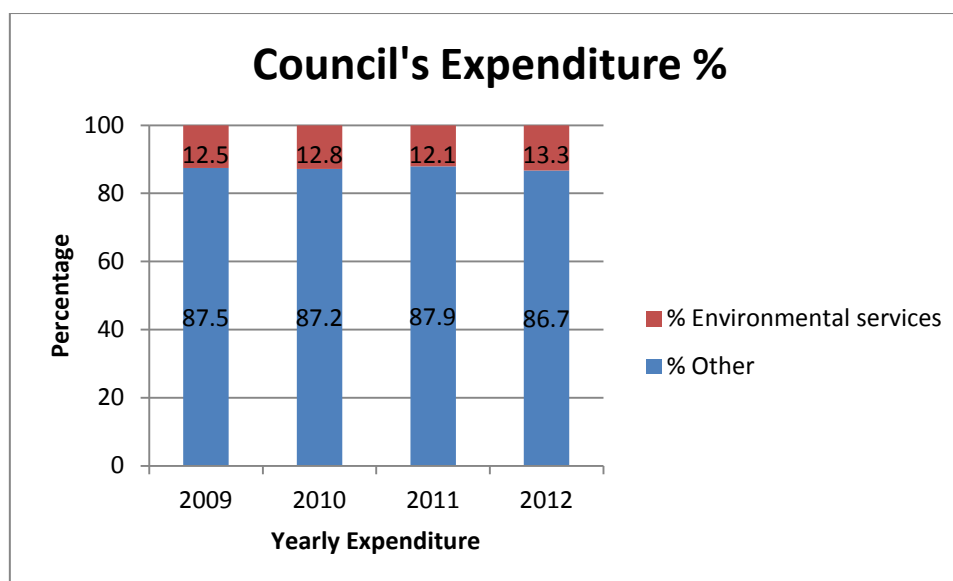


Figure 10: Council's environmental expenditure vs. other expenditure

9.2 Urban Sustainability Grants

Sustainability Community Education

Kiama Council was successful in obtaining three Urban Sustainability Grants from the NSW Environmental Trust. They were undertaken over the last three years.

Sustainable Illawarra Grant

Sustainable Illawarra was a joint sustainability initiative involving Wollongong, Shellharbour and Kiama Councils with \$2.2 million funding support from the NSW Governments Environmental Trust through the Urban Sustainability Program.

The project involved three separate project components - stormwater reuse projects, institutional change and community sustainability education. The project was implemented over three years from August 2007- 2010.

Key achievements for each of the project components were;

Community Education

- Sustainable Illawarra workshops, walks, tours and major event engaged 9,355 residents throughout the region with 76% of participants surveyed reporting a significant increase in their knowledge and confidence in utilising new skills e.g. How to keep chickens, Constructing a no-dig garden, pickling fruit, plant identification and energy/water conservation
- Participants shared knowledge and skills gained at these workshops with an average of seven others

- 28% of the population identified awareness of the Sustainable Illawarra project, with 63% of those residents identifying the project was helpful in supporting them to become more sustainable at home
- An estimated 30,495 tonnes of greenhouse gas emissions were saved by the installation of solar hot water systems through Sustainable Illawarra special offer vouchers, and 21,375 tonnes saved by the installation of solar power systems.
- 300 residents swapped 1,661 items at the Sustainable Illawarra clothes swap, resulting in 332.2 kilos of waste being diverted from landfill, 190,200 kilograms Co2 emissions and 3,170,000 litres of water being saved
- 153 households in the 'Super Challenge' program to implement behavioural and environmental change to reduce their carbon footprint. Survey results indicated that 62% of sustainability goals were achieved, and 32% of sustainability goals had been started
- 1,700 residents who subscribe to the Sustainable Illawarra e-newsletter 69% of website survey respondents found the e-newsletter was very helpful in 'keeping them up to date with local environmental activities and ideas of sustainable living at home
- The establishment of a Sustainable Illawarra website averaged 2,553 hits monthly. 61% of those surveyed found the website very helpful in 'keeping them up to date with local environmental activities and ideas of sustainable living at home.'
- Creating resources including a Sustainable Living Guide, Sustainable Shopping Guide and Permaculture Demonstration Garden

Institutional Change (Kiama specific)

- Adoption of the Regional Illawarra Sustainability Roadmap by the 3 Councils, and Action Plans developed specifically for each Council
- Approximately 28 organisational change actions have been progressed or completed at Kiama Council

Stormwater Reuse (Kiama specific)

- Installation of a 280,000 litre capacity underground stormwater collection tank for the irrigation of Black Beach and Hindmarsh Park in Kiama that saved approximately 3.36 million litres of potable water

Sustainable Illawarra Community Survey (Kiama specific)

Q - Awareness of Council Using Treated Stormwater to Water Lawns?

- 46% of 300 randomly selected Kiama residents identified awareness of the Black Beach and Hindmarsh project including 94% identifying it as ‘very important’ for Councils to collect and reuse stormwater for irrigating public areas
- The most commonly noted sources of awareness that Council uses stormwater to water lawns was via a newspaper article (38%), signage at the park (26%) and from a friend or family member (19%).

Q- Awareness of KiamaSphere?

- 10% of all Kiama respondents had visited the KiamaSphere website, whilst 34% were aware of the website but had not visited. Of the respondents who had visited KiamaSphere, the majority found the website to be ‘somewhat helpful’ (57%), whilst 33% found the website to be ‘very helpful’. Only 10% of respondents found the website to be ‘not helpful’
- Respondents aged 18-34 were significantly less likely to have visited the website than those aged 35- 54, whilst there was no statistically significant difference in visitation by gender. This would coincide with demographic data for the Kiama LGA which notes a higher than average population aged 35+

9.2.1 Other Council Sustainability Education 2011-12

Adoption of Kiama Municipal Council’s Sustainable Event Management Guidelines

Sustainable events management guide has been adopted by Council and are required to be implemented for major events such as Kiama Produce Markets, 2012 Future Fest Illawarra – Smart Living Expo and to the Kiama Show 2012.

Kiama Produce Markets

The monthly Kiama Produce Markets aim to support local farmers and food producers and to showcase what the Kiama Municipality has to offer. There are on average 40 regular stallholders and 2,500 attendees.

Kiama Show 2012

The Kiama Show is an annual two day event held in January. It brings together business, agriculture and the community and is held at the Kiama Pavilion and Showground. The show includes a large side show, a variety of food stalls and agricultural events including health and sustainable practices.

Future Fest Illawarra – Smart Living Expo

Illawarra Future Fest was held in June 2012 to celebrate World Environment Day. This was a partnership between Kiama Council, Regional Development Australia and Transition Towns Kiama and is attended by approximately 2,500 visitors annually.

The event consisted of the following activities:

- Smart Living Expo – an opportunity for local businesses and government agencies to showcase a range of products and services and educational programs aimed at helping residents live more sustainably. Some of the products, services and educational programs included solar, heat pump & gas hot water, Photovoltaic power, Climate Smart Challenge information, Landcare Illawarra, Green Box Regional Food Cooperative Ltd and the Kiama Community Garden etc
- Trash ‘n Treasure car boot sale
- Recycled Art Competition
- A series of lectures on sustainable living, gardening and landscaping
- Tree give away
- Cooking demonstration featuring sustainable food from local produce
- Dog agility show and companion animals education



World Environment Day 2012

Sustainable Choice

Key Council staff undertook Sustainable Choice training in 2011 to increase awareness of sustainable procurement issues and to improve knowledge to implement sustainable procurement processes in their departments.

Kiama Council Community Survey 2011

Council engaged IRIS Research to conduct a comprehensive telephone based survey of 531 among the area's residents. The results indicated that 70% of those surveyed used water saving devices, 53% have a vegetable patch, 51% composted, 38% had a water tank, 27% had solar hot water, 20% had solar panels, 18% used a worm farm and 10% had none of the above.

The three most prominent issues facing Kiama in the next 5-10 years are:

- Urban sprawl/over development
- Lack of parking
- Population growth

Environmental planning instruments and environmental planning policies such as the Kiama LEP 2011 and the Kiama Urban Strategy 2011 set planning controls and covers land use controls and takes into consideration future population growth and urban development.

9.3 Sustainable Kiama Communities Projects 2009-2011

The Sustainable Kiama Communities (SKC) project was undertaken from 2009-2011. The grant funded project was aimed at mobilising the Kiama Community into living more sustainably. The following projects and initiatives have been implemented project:

- A solar hot water information night, this was attended by over 100 residents and was supported by solar businesses and Jamberoo Future Care and involved a workshop on solar hot water systems and trade information. 45% of people surveyed installed solar hot water systems as a result of attending the night
- Photovoltaic Energy Generation workshop was conducted with local service clubs
- Bi monthly Sustainable Kiama newsletter was developed and distributed to 372 subscribers
- Residential Energy Monitoring Program involved 40 households that had energy monitoring meters installed in their meter boxes with the aim of measuring the effectiveness of these meters in helping people reduce their energy consumption
- Kiama/Shellharbour Solar Hot Water and Renewable Energy information expo was attended by more than 2,000 visitors. Workshops and trade information were provided on solar and renewable energy systems for hot water and power generation



Renewable Energy Expo, October 2010

- Development and adoption of a Health and Sustainability Policy and Green Vehicle Guidelines
- Other initiatives included under this project which have been previously reported include the; Weekly urban recycling trial, Lamp Recycling Program, Second Hand Saturday Waste Avoidance events and installation of water consumption automated data loggers

9.4 Commercial Community Sustainability Initiatives 2011-2012

Business Treading Lightly (BTL)

Business Treading Lightly is a business sustainability coaching and mentoring service for businesses in the Illawarra, Highlands, Shoalhaven, Eurobodalla and Bega Valley regions. Business Treading Lightly operates on a fee for service basis and is heavily subsidised by Shoalhaven City Council.

The project has been very successful in engaging and supporting businesses in the area to adopt sustainability actions to reduce energy, water and waste from their operations. During 2011 BTL played a lead role in supporting all 5 Kiama Coast Council Holiday Parks in achieving Silver Gumnut Accreditation through the Camping and Caravan Industry Association (CCIA).

NSW Climate Change Public Facilities Program

The Public Facilities program funded water and energy savings in public and community facilities in NSW. Community Savers projects - were funded up to \$40,000 for not-for-profit community organisations to undertake simple, low-cost water and energy saving upgrades in the facilities they use.

The following initiatives were carried out within Kiama's LGA:

Kiama Leagues Club Limited received \$24,600 to remove seven large electric storage hot water systems and replace them with five instantaneous gas hot water systems. The project is estimated to save 202 megawatt hours of electricity and 172 tonnes of greenhouse gas emissions in the first 10 years.

Kiama Preschool Inc received \$3,880 to upgrade existing lights with energy efficient models. The project is estimated to save 52 megawatt hours of energy and 55 tonnes of greenhouse gas emissions in the first 10 years.

Kiama Surf Life Saving Club received \$16,719 to install energy efficient lighting and replace west facing windows with new windows that reduce heat transmission by up to 70 percent. This is reducing power consumption and saving an estimated 73 megawatt hours of electricity and 78 tonnes of greenhouse gas emissions in the first 10 years

Illawarra Biodiversity and Local Food Strategy for Climate Change

The Illawarra Councils (Wollongong City Council, Kiama Municipal Council, and Shellharbour City Council) received a three year grant from the NSW Environmental

Trust to implement the *Illawarra Biodiversity and Local Food Strategy for Climate Change* project. A major deliverable of the biodiversity component of this project was to develop an Illawarra Biodiversity Strategy.

The Illawarra Biodiversity Strategy was adopted in 2010 which provides clear guidance to the allocation of internal and external funding to highest biodiversity value natural areas under Council care and control.

In consolidating large amounts of biodiversity data, the Illawarra Biodiversity Strategy enhances Council's ability to administer its obligations under the *Environmental Planning and Assessment Act 1979*, *Threatened Species Conservation Act 1995*; *Environment Protection and Biodiversity Conservation Act 1999*; and the *Native Vegetation Act 2003*.

The Illawarra Biodiversity Strategy aims to:

- Develop a coordinated regional approach to biodiversity conservation in order to maximise knowledge sharing, and efficient use of resources between the Illawarra Councils.
- Identify biodiversity priorities to guide the Illawarra Councils in future decision making and land use planning.
- Identify threats to biodiversity across the Illawarra.
- Improve community awareness, and encourage and support community participation in biodiversity conservation.
- Contribute to State and National natural resource management targets through implementation of a five year action plan.

The principal output of the Strategy is a regionally coordinated program of actions outlining how the Illawarra Councils can contribute to National and State natural resource management targets over the next five years. The project is concentrating on the two key areas of biodiversity and local food production and security. The following has been achieved to date:

- Local Food Strategy:

- Kiama Public School has continued to operate the Living Classroom Program training more teachers and volunteers to be involved and becoming self sufficient. The Classroom was officially launched in November 2011. The program has also developed a relationship with Kiama Community Garden (KCG) and volunteers from KCG are assisting teachers at the school.
- Over the last 12 months Kiama Community Garden has gone from strength to strength, expanding the crops grown at the site and continuing to develop the skills of participants. Additional on-ground works have included the installation of an additional rainwater tanks, pizza oven and pergola. The Garden partnered Slow Foods Saddleback and hosted a Brunch celebrating the produce of the garden and local area.



The Kiama Community Garden

- Workshops conducted this year include Cheese making, Starting a Backyard Veggie Patch and Backyard Chook Keeping. Funded by Kiama Council and the NSW Environment Trust.
- Council conducted a Community Garden Tour of gardens in City of Sydney and Eastern Suburbs.
- WASIP funding was provided to employ an Officer to develop a Community Gardens Policy. The Policy is due to be completed in July 2012.
- Through funding from the NSW Environment Trust 4 residents were selected to undertake a Permaculture Design Certificate. The residents, in return for the training, undertook a community project for a minimum of 30 hours. The 4 projects were:
 - The development of an Induction Kit for Kiama Community Garden.
 - The design of 2 Permaculture gardens in residences in the Municipality.
 - Supporting the school of the Municipality to develop food gardens.
 - Developing a series of DVDs on sustainable food projects in the Municipality.
- A Film Night was conducted at Gerringong Town hall, August 2011 which was attended by approximately 180 residents.

- The Hillside Project has continued through 2011-2012 to plant out edible species on the hill at Kiama Sporting Complex adjacent to the community garden. This project was undertaken in conjunction with TAFE students



Hillside Project before revegetation



Hillside Project after revegetation

- Biodiversity Strategy:

- Tenders were developed and assessed for the on-ground works to be undertaken at priority biodiversity sites as part of the project. On ground work was started at Jerrara Dam, Arboretum and Rocklow Creek rest stop
- 6 workshops for residents of the three Illawarra Councils have been conducted
- Summer Discovery coastal walks program in partnership with Conservation Volunteers Australia. 4 Walks were held in the Kiama Municipality in January and February 2011



Spring Creek Open Day October 2010

- The Illawarra Bushland Database was reviewed and updated to be completed in the 2011/12 reporting period.



Rocklow rest stop tree of heaven infestation before removal

9.5 Waste and Sustainability Improvement Payment Initiatives

9.5.1 Energy

The following initiatives were funded and implemented as part of the Waste and Sustainability Improvement Payment:

- Power Factor Correction equipment installed at the Council Administration Building
Power factor is the ratio between the kW and the kVA drawn by an electrical load where the KW is the actual load power and the kVA is the apparent load power. It is a measure of how effectively the current is being converted into useful work output and more particularly is a good indicator of the effect of the load current on the efficiency of the supply system.



Power Factor Correction System

- Solar Photovoltaic System

The Kiama Municipal Council Administration Building obtained \$60,000 to install a 10kW solar photovoltaic system (PV system). This occurred in May/June 2011 and started producing renewable energy for the building on 1st August 2011.

The PV system is expected to produce an estimated 15,060 kWh of electricity per annum, which is approximately 5% of the Administration Building's energy consumption. Over the next 30 years the system will produce approximately 451,800 kWh of electricity.

It is expected that the energy produced by the photovoltaic system will be fully utilised within the Council Administration building and there will be no exportation of electricity to the grid.

As of 26 July 2012 the PV System has produced: 15,274 kWh



Photovoltaic system on Council's Administration Building

- \$15,000 worth of Induction lighting has been installed at Council Depot and Stores with a bulb lifespan of approx 100,000hrs and an energy saving of up to 65% compared to traditional HID lights



New 80 Watt Induction High Bay Lighting

- Procuring and trialling 8 solar street lights (approx \$25,722) in Terralong Street Kiama which include a 40W solar panel, 2x12V maintenance free lead-acid batteries and 2x7W energy saving bulbs – which run 10hrs per day



Solar Street lights on Terralong St Kiama

- All white goods purchased across the organisation are assessed on their 'star' rating
- Low wattage energy efficient down light globes are in use throughout Councils Holiday Parks
- Council continues to enlist Planet Footprint to monitor the top 11 energy consuming sites within the Kiama LGA, see Table 31

- Preparation of Energy Saving Action Plans (2012) for Council top 11 energy user and the identification of potential actions to reduce energy consumption.

Table 34: Top 11 Energy Consuming sites in Kiama LGA

Facility	2008/09 Consumption (kWh)	2009/10 Consumption (kWh)	2010/11 Consumption (kWh)	2011/12 Consumption (kWh)
Kiama Leisure Centre	422,566	427,584	412,071	409,068
Blue Haven Independent Living	394,000	366,900	367,885	376,946
Kiama Council Chambers	363,611	356,388	339,444	318,333
Werri Beach Holiday Park	330,130	337,882	334,722	308,089
7 Mile Beach Holiday Park	374,444	331,944	321,666	355,378
Blue Haven Nursing Home/Hostel	322,860	323,382	321,009	309,168
Surf Beach Holiday Park	208,520	212,828	222,454	236,787
Kiama Library	172,198	181,770	171,117	172,602
Kendall's Beach Holiday Park	156,950	169,698	184,141	171,659
Kiama Showground Pavilion	121,111	135,000	144,444	114,166
Kiama Harbour Cabins	116,944	127,500	121,111	116,666
TOTAL kWh	2,983,334	2,970,876	2,940,064	2,888,862

Since 2009 the following sites have seen a reduction in their power consumption; Kiama Leisure Centre (3.2%), Blue Haven Independent Living (4.3%), Kiama Council Chambers (12.5%), Werri Beach Holiday Park (6.7%), 7 Mile Beach Holiday Park (5.6%), Blue Haven Nursing Home/Hostel (4.24%), Kiama Showground Pavilion (5.7%), Kiama Harbour Cabins (0.2%),

The following sites have seen an increase in their power consumption since 2009; Surf Beach Holiday Park (13.6%), Kiama Library (0.2%), Kendall's Beach Holiday Park (9.4%). This can be attributed to an increase in the number of cabins and therefore patronage at each of these holiday parks.

Some of the actions that have been implemented to further reduce energy consumption include; installation of solar and/or heat pump/gas hot water systems in Council's

Holiday Parks, energy efficient light globes, and more efficient appliances and alternate solar power systems.

9.5.2 Sustainable Purchasing

Council has incorporated a Sustainable Purchasing Policy which aims to use procurement actions to encourage and support local suppliers and support economic activity within the Municipality, where it is efficient to do so, while achieving the Council's overall 'value for money' objectives. This approach seeks to maximise overall community benefit for the Municipality. A review of the current Purchasing Policy is currently in the draft stages. The following is a list of initiatives that have taken place as a result of this policy:

- Introduction of an electronic Online Requisitions system (CIVICA OLR) and an eTendering Portal that has significantly reduced Council's paper based system. The system of procurement to payment is now 90% electronic-including invoicing from a majority of Council's current suppliers
- Utilising recycled oil in its workshop
- Utilising soy biodiesel in its plant equipment, waste services vehicles and utes
- Trialling more environmentally friendly cleaning chemicals and ensuring all chemicals trialled are testing through ChemWatch to assess supplier claims
- Trialling of 80% recycled content printing paper. As problems with 100% recycled printer paper occurred, Council has successfully trialled in certain sections of Council where applications are suitable, the 80% recycled paper.
- The use of polystyrophene drinking cups has been banned across the organisation. Fully renewable and compostable bio-cups and other environmental products have replaced polystyrophene.
- Kiama Council's supply manager requests that the major supplier of stationery and office products to Council include a 'green' alternative with every purchase request. Many more alternatives added to Council's major stationery supplier and "green" alternatives offered where applicable to their growing range.
- Procuring a bioremediation parts washer which replaces the previous solvent based parts washer.
- Introduction of Forest Stewardship Council (FSC) certified toilet tissue and hand towels as part of an environmentally responsible range across Council's 5 Holiday Parks, other commercial ventures and administration building.
- Sustainable Procurement training for purchasing staff

9.5.3 Sustainability

Funding of \$14,960 was provided to develop a Position Paper and Guidelines for the establishment of Community Gardens on Council land, which assessed community needs, interests and identified potential sites for community gardens

9.5.4 Climate Change

A Climate Change Adaptation Strategy Action Plan for Kiama Municipal Council and Climate Change Risk Assessment was adopted on the 28th July 2009, The Climate Change Adaptation Strategy and Action Plan (CCASAP) and Climate Change Risk Assessment have been prepared to provide a coordinated and regional approach to tackling the challenges which climate change will present. The purpose of the CCASAP is to provide guidance to Council on how to respond and adapt to climate change risks which have been identified as part of this project.

The main objectives of the strategy are to:

- Promote the cultural shift towards considering climate change risks in all Council's long term planning, financial management and operations;
- Utilise the Southern Councils Group as a vehicle to lobby to all levels of Government to support adaptation actions;
- Engage with the local community to increase awareness of climate change risks and encourage ownership of initiatives; and
- Build on existing links and relationships between all levels of Government, volunteer groups and organisations to deliver a consistent approach to adaptation.

Kiama Municipal Council identified a total of 74 risks across all functional areas, with approximately 85% classified as extreme or high.

Climate Change risks for the Environment within Kiama LGA are shown below:

- Increased bush fire risk to vegetation
- Habitat Loss due to drying of swamps and wetlands
- Loss of sub tidal/tidal habitats due to climate change and subsequent loss of biodiversity
- Increased weed infestation
- Increased stagnation of water bodies leading to algal blooms
- Reduction in water quality due to sedimentation and high flows carrying litter
- Increased leaching from contaminated sites

- Coastal erosion of beaches and dune system
- Increased erosion of wetlands and rivers due to higher flows

Please see appendix A.2 of the CCASAP for a full list of adaption actions for these risks.

It is anticipated that this Strategy will be reviewed every five years, or earlier as required by Council. Kiama Municipal Council will review progress to implement the Strategy, and will determine whether major changes in direction are required to take account of new information, new risks or other changing circumstances. The first review of the Strategy is anticipated to commence in 2014 and will be aligned with revision of each Council's corporate strategy.

The results and future strategies aimed at reducing the effects of Climate Change are identified in this report, which can be found at

<http://www.kiama.nsw.gov.au/environmental-services/pdf/Health-and-Environment-Section/Climate-Change-Risk-Assessment-July-2009-final.pdf>

9.5.5 Other WaSIP Initiatives

Other initiatives that have been funded and implemented as part of WaSIP are outlined in the relevant chapters including: Water, Waste and Air

9.6 Cities for Climate Protection Program

The Cities for Climate Protection Program assisted Councils to deal with greenhouse gas emissions issues within their locality and as a result of the program an action plan was developed which sets out ways for Council to reduce greenhouse gas emissions.

During 2011/2012 the CCPTM was discontinued by the federal government. There was however a number of projects completed during the 2009/2011 reporting period which would have had a direct impact on Council's greenhouse gas emissions including:

- Installation of a 10kW Photovoltaic Solar Power system on the Council Administration Building
- Power Factor Correction equipment installed at the Council Administration Building
- High Bay Lighting trial at the Council works Depot of induction lighting technology
- Photovoltaic kWh production
- High Bay Lighting project in terms of kWh savings

9.7 Sustainable Living Grants Program

The Sustainable Living Grants Program has been developed by Kiama Municipal Council to fund environmental and health projects within schools and the general community. Projects funded under this program assist in the improvement of the health

and wellbeing of the community and the natural environment of the Kiama Municipality.

The Sustainable Living Grants Program aims to:

- Promote and encourage participation of a wide range of members of the community in health and environmental projects that promote the sustainability of the Kiama Municipality;
- Strengthen partnerships between schools, the local community, business and Kiama Municipal Council;
- Increase awareness of local health and environmental issues facing the Kiama Municipality; and
- Assist schools, community groups and the wider community with the implementation of important local projects (or research) that promote sustainability and recognise the link between our health and the health of the environment.

The projects funded between 2009 and 2012 include:

- Dairy Youth Inc. – Jet and Emma Dairy Management Series project
- New shades on the umpire’s chairs were installed at the Jamberoo Tennis Club
- Kiama Public School – “Incredible Edibles”, Living Pantry
- Kiama Downs Childcare Centre – Our Natural Play Space Project
- St. Peter and Paul Primary School – Regeneration of Indigenous Garden
- The Green Box regional food co- operative design of logo and branding
- The Kiama Netball Association training resources for coaches and players
- Ss Peter and Pauls Catholic Primary School development of vegetable and herb garden
- Kiama Public School development of their soil building garden beds as part of the Living Classrooms program

9.8 Kiama Public Health Plan 2011-2017 Creating Environments for Health and Sustainable Living

In June 2011 the Kiama Health Plan 2011-2017 “Creating Environments for Health and Sustainable Living” was adopted. This Plan, like previous Health Plans, is principally designed to influence how sections of Council can work in partnership with other government, non government organisations and the community to develop a healthier

community within the Municipality. The full document can be seen here: <http://www.kiama.nsw.gov.au/environmental-services/kiama-public-health-plan.html>

Local Government has always been considered the level of government closest to the people and it has a lead role in community building. Local Government also has an important role in designing and developing the type of local environments that support and enhance health and wellbeing. Council sees the health of the local community as a shared responsibility in which they have a vital role to play.

The Kiama Health Plan 2011-2017 is primarily focused on strategies to promote health and wellbeing and disease prevention. The Plan identifies strategies to address priority issues. The Plan is divided into 4 sections, each including a number of priority issues. These are:

Strengthening Community

- Priority: Community Connections
- Priority: Information Provision
- Priority: Partnerships
- Priority: Funding and Service Provision

Supportive Social Environment for Health

- Priority: Regulatory Functions and Public Health
- Priority: Food and Nutrition
- Priority: Physical Activity
- Priority: Cancer Prevention and Awareness
- Priority: Community Safety

Health Economy

- Priority: Healthy Economy

Health of our Environment

- Priority: Regulatory and Statutory
- Priority: Natural Environment
- Priority: Built Environment
- Priority: Council Facilities and Operations
- Priority: Transport
- Priority: Waste Management

The strategies as outlined in the Kiama Public Health Plan have been incorporated in Council's Delivery and Operational Plans for implementation. The outcomes and achievements are outlined in Council's Annual Report.

9.9 Southern Rivers Catchment Management Authority (SRCMA)

Southern Rivers CMA is a locally based and managed organisation with a Board of local people, reporting directly to the NSW Minister for Primary Industries. It is a

statutory body established under the Catchment Management Authorities Act 2003 to facilitate and coordinate the management of natural resources in the Southern Rivers region.

SRCMA's responsibilities include involving local communities, farmers and other land managers, Landcare, government agencies, Aboriginal people, local government and industry in addressing the natural resource management issues facing the region. Through Southern Rivers CMA and its partnerships and programs, the NSW and Australian Governments provide funding for strategic on-ground works to help protect and restore natural resources across the landscape.

SRCMA, in consultation with local communities, farmers and other land managers, Landcare, government agencies, Aboriginal people, local government and industry, has developed a Catchment Action Plan (CAP) for the region. The CAP is a 10-year strategic plan built on previous work by Landcare, Catchment Management Committees, Catchment Management Boards, their partners and communities. It aims to meet local community issues, the standard and targets set by the NSW Natural Resources Commission and the funding requirements of the NSW and Australian Governments. It reflects the desired condition for natural resources of the region and outlines 10-year targets and actions to be achieved through collective effort to progressively move towards this condition.

To view the SRCMA CAP please visit:

http://www.southern.cma.nsw.gov.au/news_publications-plans_strategies.php

The SRCMA has undertaken the following projects within Kiama LGA during the 2011-2012 financial year, please see figure 10:

- Kiama Council Escarpment to the Sea projects was funded \$38,100 to improve the sub catchments; Fountain Creek, Turpentine Creek, Broughton Creek and Minnamurra Creek, the following is a collaborative list of actions taken:
 - 18.5 h/a of native vegetation enhanced
 - 4.5 h/a of Weeds of National Significance controlled
 - 4 h/a of other weeds controlled
 - 2157 plants via Landcare Illawarra
 - 1220m of fencing installed
- Kiama Council Farming for the Long Haul was funded \$15,649 to improve soil and vegetation at Minnamurra River:
 - 15.2 h/a of native vegetation enhanced
 - 6.76 h/a of Riparian vegetation enhanced
 - 4000m of fencing installed
 - 70 h/a of soil improvement
- Kiama Council caring for Illawarra Rivers projects completed the following at Minnamurra River:
 - 4.39 h/a of Riparian vegetation enhanced
 - 4300m of fencing installed
 - 1.859km of River bank stabilisation conducted

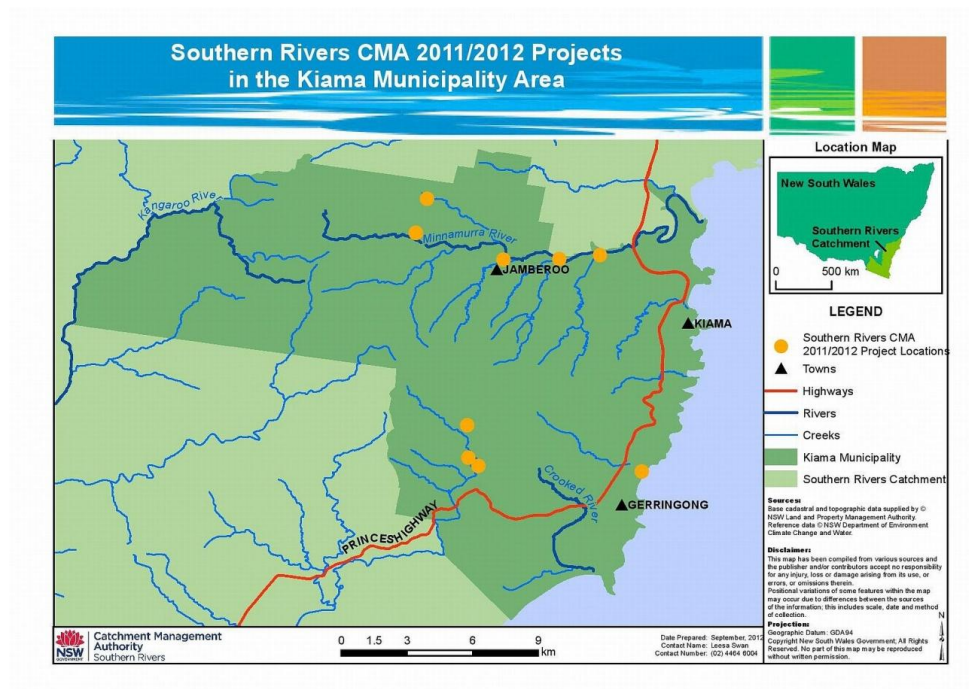


Figure 11: SRCMA projects within Kiama LGA

For more projects the SRCMA have been involved in please refer to Section 5.3.10 of this report. The SRCMA Plan is currently being reviewed and will contain strategies and actions in determined priority areas within Kiama LGA and the region.

9.10 Community Uptake of Sustainability NSW Government Rebates and Programs

Both the NSW State Government and the Australian Government have offered rebates and incentives to residents to promote the uptake of sustainable living initiatives and technologies. The breakdown of rebates by local government area has only been done for the NSW Government rebates, Table 30 are statistics for the Kiama LGA from 2009 to 2012: look for solar power systems in Kiama LGA check NSW and federal grants solar rebate scheme

Table 35: Breakdown of rebate programs in Kiama LGA 2010-2012

Rebate type	Number 2010	*As % of households in Kiama LGA	Number 2011	*As % of households in Kiama LGA	Number 2012	*As % of households in Kiama LGA
Rainwater tank	212	2.4%	249	2.84%	255	2.9%
Hot water system	936	10.7%	1,150	13.12%	1,184	13.5%
Ceiling insulation	103	1.2%	103	1.2%	103	1.2%
Washing machine	234	2.7%	247	2.81%	247	2.81%
Dual Flush Toilet			48	0.54%	68	0.77%

*Total households in Kiama 8,763 Source Australian Bureau of Statistics, 2006 Census of Population housing

Table 32 shows a slight increasing trend from 2009-2012 across all types of rebates taken up by residents. However the 'Hot water system' rebate has the highest percentage of use within households in the Kiama LGA at 13.5%, this indicates that more work could be done to promote the use of these government incentives.

During 2001-2012 a total of 684 premises or 7.8% of households, have installed solar panel systems in the Kiama LGA, with the output equalling 1452.6kW to date.

Chapter 10: Summary of Existing and Potential Future Activities

All of the existing and potential future activities that aim to address issues identified in this SoE Report are listed in the Appendix A and Appendix B. Appendix A outlines the potential activities for implementation in 2012-2013 and Appendix B outlines the potential future activities for implementation 2012-2016. The potential activities will be considered for inclusion in the 2012-2016 Delivery Program or later, depending on level of priority.

Appendix A - Future activities 2012-2013

The following future activities arise from the Operational Plan 2012-13, which have been based on the goals outlined in both the Delivery Program 2011-2013 and the Community Strategic Plan 2011-2021. These are broken up into the corresponding chapters from the SoE report.

Operational Plan - Civic Leadership Activities

CL2.1.1b State of the Environment reporting

- Annual SoE report completed

Land

Operational Plan - Environment

E2.1.1a Identify, research and where practical, implement in partnership diversified agricultural opportunities

- Implement LEP 2011 and DCP 2012 provisions for providing new agricultural activities

E3.2.1a Review, adopt and Implement the Urban Strategy

- Implement and review the Kiama Urban Strategy

E4.1.2a Amend Kiama LEP as necessary

- Amendments made to ensure plan remains current

E4.1.4 Development Control Plans and Strategic Planning

- Monitor implementation of the new DCP 2012 and recommend changes as appropriate

Operational Plan - Civic Leadership

CL1.1.1 Legislative compliance, Local Govt Act, Environmental Planning and Assessment Act and other legislation

- Participate in the review of the *Environmental Planning and Assessment Act 1979*

CL1.1.1a Issue Planning Certificates in accordance with Section 149 and maintain database

- Review of the 149 Certificates with respect to the degree of information included concerning known and/or potentially contaminated sites and update database

Water

Operational Plan – Community

C2.3.1c Implement requirements of the Local Government Act and Regulations specific to public health and safety

- Review and update the Onsite Sewage Management Facilities guideline
- Implement OSMF's inspections for high and low risk premises
- Investigate and action water pollution complaints

Operational Plan – Environment

E1.1.1 Enforce and comply with environmental legislation

- Participate in the review of the Southern Rivers Catchment Action Plan specific to water management and protection of ecosystems
- Implement coastal reforms in accordance with the Coastal Amendment Bill upon being gazetted

E1.3.2b Implement standards in the Waste and Sustainability Improvement Payments (WASIP) Program as required by the OEH

- Review the Crooked River Estuary Management Plan, subject to available funding
- Seek funding for priority water conservation projects as identified in the Water Savings Action Plan
- Implement projects as identified in the Water Savings Action Plan, subject to available funding

E1.4.1a Support water monitoring programs in the Municipality

- Investigate the option of water quality monitoring and invertebrate assessments being conducted by students in the Illawarra
- Supply groups with chemicals for testing kits for monitoring annually

Operational Plan – Civic Leadership

CL2.4.1b Monitor Council resource consumption

- Report Council's water and energy consumption in SoE

Noise

Operational Plan – Environment

E1.1.1 Enforce and comply with environmental legislation

- Continue to investigate and action noise complaints
- Implement development controls to minimise noise pollution from development sites and operations

Biodiversity

Operational Plan - Environment

E1.1.1 Enforce and comply with environmental legislation

- Participate in the review of the Southern Rivers Catchment Action Plan specific to biodiversity and land management issues

E1.1.1a Implement Management of Trees and Vegetation

- Implement Tree Preservation - Assess applications for tree removal or pruning in accordance with Chapter 3 - Preservation and Management of Trees and Vegetation of the DCP 2012 as well as Clause 5.9 of Kiama's LEP 2011
- Unauthorised vegetation clearing and tree removal investigated and legal action taken as required

E1.2.1a Implement tree planting activities

- Conduct four tree distribution days
- Conduct National Tree Day event (school and community)

E1.2.1b Promote understanding and awareness of biodiversity within the Municipality

- Conduct community workshops
- Conduct field day/ educational activity

E1.2.1c Promote local Landcare groups and initiatives

- Support and participate in Conservation Australia, Southern River Catchment Management Authority and Illawarra Landcare projects within the Kiama Municipality, including opportunities for educational programs on biodiversity issues
- Continue the develop of educational reserve sites at Jerrara Dam Arboretum and Bonaira Native Gardens

E1.2.1d Weed Management

- Provide funding for the operation of the IDNWA
- Continue to control noxious weeds through the implementation of the IDNWA programs
- Control weeds in priority sites in accordance with Local Weeds Management Plan

E1.2.1e Roadside Vegetation Management

- Continue implementation of the *Roadside Vegetation Management Plan*

E1.2.1f Community Land Plans of Management

- Implement re-vegetation and other actions identified in Plans of Management for Community lands
- Implement strategies to protect the Themeda Grassland at identified sites

E.1.2.1g Feral animal control

- Implement Rabbit Control Program in key identified areas subject to funding.

Civic Leadership

CL2.3.1b Provide learning & development opportunists for staff

- Provide education training on correct methods of assessment and treatment of trees adjacent to construction work

Waste

Operational Plan – Environment

E1.3.1 Collect and process waste and recycling material

- Develop and implement an e-waste recycling program
- Upgrade dry recyclables collection service
- Continue to increase and promote recycling services for printer cartridges, batteries, mobile phones, fridges, light globes, mattresses, unused medicines
- Continue to operate the Minnamurra Waste and Recycling Depot for receipt and composting of food waste, and garden organics and recovery of recyclable materials

E1.3.1a Provide domestic garbage, recycling, green waste and clean up collection services for urban and rural areas

- Conduct cleanup source separation trial within a collection Zone
- Conduct “drop-off” trial for free disposal of cleanup material at Minnamurra Waste and Recycling Depot
- Clean up operation and preferred arrangement determined and adopted

- Implement GO Recycling and GO Organics – Kitchen to Compost Revolution Trial Program in one collection zone

E1.3.1c Provide garbage and recycling collection services for Council and commercial services

- Expand public place recycling within the Municipality
- Continue to provide commercial recycling services

E1.3.1e Implement preferred business case option for alternative organic/waste processing system

- Prepare Business Case for alternative organics waste processing facility

E1.3.2b Implement standards in the WaSIP program as required by the OEH

- Implement strategies identified in the 2012/13 WaSIP Certificate
- Develop guidelines for Planning for less Waste DCP
- Complete composting and plant propagation areas at the Kiama Community Garden
- Implement sportsground recycling infrastructure upgrade
- Implement summer holiday recycling education program at Council's Holiday Parks
- Implement actions identified in the Illegal Dumping and Litter Reduction Strategy

E1.3.3 Comply with the Legislative requirements specific to waste management

- Continue to monitor Gerroa and Minnamurra Waste Disposal Depots to assess the potential impact on local surface and groundwater systems in accordance with closure plan requirements

E1.3.3b Undertake closure plan, rehabilitation and maintenance at Gerroa and Minnamurra Waste Depots

- Weed removal and site revegetation undertaken at Gerroa and Minnamurra Waste Depots as per scheduled works

E1.3.4d Undertake Street sweeping as per schedule

- Service delivery standard and schedule reviewed and adopted
- Street sweeping undertaken as per schedule

E1.4.1 Implement and support environmental and sustainability education programs and initiatives

- Conduct workshops, community education, media campaigns and web based activities regarding Go Recycling and GO Organics – Kitchen to Compost Revolution program

- Undertake annual garbage, recycling and green waste services audit and reporting in accordance with EPA audit guidelines
- Undertake capacity and composition audits of garbage, recycling and green waste services as part of the Go Recycling and GO Organics – Kitchen to Compost Revolution program and report outcomes to community

Air

Operational Plan – Community

C2.1.2c Provide and Promote Programs that encourage physical activity

- Implement Walk It Kiama Program Plan

C2.4.3 Provide and promote supportive environments which encourage active transport

- Cycleway - Fern Street to Miller Street via pathway across Millers Flat to be completed

C2.4.4b Provide input to Department of Transport Regional Transport Plan

- Provide evidence of input specific to issues located in Kiama Municipality

Operational Plan - Environment

E1.1.1b Implement Protection of the Environment Operations Act and Regulations

- Determine applications to create smoke pollution in accordance with Council's No Burn Policy
- Investigate and action air pollution and odour complaints

E1.4.1 Implement and support environmental and sustainability education programs and initiatives

- Develop education material to address point source air pollution issues
- Develop programs to promote active transport including cycling or walking to work, and carpooling

Heritage

Operational Plan – Environment

E3.1.1 Heritage Management

- Promote Kiama Heritage phone application

- Install Heritage trail signage at specific locations throughout the Municipality – Gerringong Boat Harbour
- Seek grant funding to create a book of WW1 soldiers from Kiama

E3.1.1a Implement Heritage Advisor program

- Obtain and assess where applicable Heritage reports for Development Applications including planning proposals in accordance with the LEP and Kiama Development Control Plan 2012

Operational Plan – Community

C1.2.1a Aboriginal Engagement Project Officer to develop engagement strategy as per funding grant

- Complete Aboriginal engagement strategy

Sustainable Community

Operational Plan – Community

C2.1.2b Implement programs and policies that address access to healthy and affordable food

- Community gardens policy developed, endorsed, operational and implemented
- Draft food and nutrition paper
- Community incorporation of the Kiama Community Garden
- Implement workshops on food production

Operational Plan - Environment

E1.4.1 Implement and support environmental and sustainability education programs and initiatives

- Host the 21st NSW Coastal Conference, bus tours and workshops

E1.4.1b Implement workshops, events and initiatives to provide residents with skills in sustainable living

- Conduct World Environment Day
- Continue production and distribution of sustainability newsletters
- Maintain Kiamasphere website
- Conduct sustainability workshops

E4.2.1 Identification of climate change impacts and hazards

- Preparation of digital terrain model
- Prepare and implement program for flood hazard assessment

- Prepare program for coastal hazard assessment

Operational Plan – Civic Leadership

CL2.4.1a Implement programs and policies relating to Council's resource consumption and sustainability

- Implement green fleet guidelines
- Develop procedures, guides and checklists to help staff better implement sustainable procurement within the organisation

CL2.4.1b Monitor Council resource consumption

- Report Council's water and energy consumption in SoE

CL2.4.3a Procurement systems and processes maintained

- Implement Council's Sustainable Purchasing Policy
- Continue to implement Sustainable Choice Purchasing and training
- Introduce TRIM electronic document management system

E1.3.2b Implement standards in the Waste and Sustainability Improvement Payments (WASIP) Program as required by the OEH

- Sustainable events and Council Hire Policy
- Complete energy audits for top 10 Council sites
- Develop sustainable event management guidelines

Appendix B – Future activities for consideration in Council’s Delivery Program 2013-2017

The following are future activities that may be considered by Council in the preparation of its Delivery Plan and Operational Plans for the period 2013-2017. These are broken up into the corresponding chapters from the SoE report.

Land

Delivery Program – Environment

E1.1 Protect and maintain environmentally significant natural areas on public and private land in a sustainable manner

E2.1 Promote sustainable land use and diversification of agricultural activity

- Implement Kiama LEP 2011 and Kiama DCP 2012 relating to new agricultural activities

E3.2 Maintain the separation and distinct nature of the towns and villages

- Implement Kiama Urban Strategy 2011

E4.1 Ensure the principles of sustainable development underpin our land uses and design of our buildings and subdivisions

- Kiama Development Control Plan 2012 chapters reviewed and updated
- Implement Kiama Urban Strategy 2011
- Implement 2021 State and Regional Strategic Plans

E4.3 Ensure the maximum multi-purpose use of our community’s buildings and facilities

- Review and update in accordance with legislation - Section 94 Developer Contributions Plans

Water

Delivery Program – Environment

E1.1 Protect and maintain environmentally significant natural areas on public and private land in a sustainable manner

- Implement Protection of the Environment Operations Act and Regulations specific to water pollution incidents
- Review and update Stormwater Management Plan
- Implement and review the Water Sensitive Urban Design Policy
- Implement recommended actions contained in the WSAP’s – site water audits, implement more data loggers, staff training, water saving appliances and fixtures/fittings, alternative water supplies
- Promote effluent water re-use initiatives from Bombo Sewage Treatment Plant

E1.5 Recognise and respond to predicted climate change impacts

- Engage with stakeholders to develop management strategies to address the impacts of climate change
- Review Minnamurra Estuary Management Plan
- Implement coastal reforms and applicable legislation
- Undertake flood studies
- Undertake Coastal Hazard Assessment and prepare management plan

Delivery Program – Community

C2.3 Recognise and promote community safety

- Implement OSMF's inspections and legislation to rectify defective systems

Noise

Delivery Program – Environment

E1.1 Protect and maintain environmentally significant natural areas on public and private land in a sustainable manner

- Implement Protection of the Environment Operations Act and Regulations specific to noise pollution incidents

C2.3 Recognise and promote community safety

- Enforce and comply with public health and safety legislation
- Provide community education on noise pollution control

Biodiversity

Delivery Program – Environment

E1.1 Protect and maintain environmentally significant natural areas on public and private land in a sustainable manner

- Implement Chapter 3 - Preservation and Management of Trees and Vegetation of the DCP 2012 and Kiama LEP 2011 – applications and enforcement action
- Review and update Chapter 3 - Preservation and Management of Trees and Vegetation of the DCP 2012
- Implement management plan works for Spring Creek, Jerrara Dam Arboretum, Seven Mile Beach Reserve and Bonaira Native Gardens

E.1.2 Maintain and enhance biodiversity on public and private land

- Implement tree planting activities – National Tree Day, Illawarra Landcare and Southern Rivers Catchment Management projects, implement Threatened Species Recovery Plan actions
- Promote understanding of biodiversity in the Municipality including workshops, field day activities

- Promote and implement local Landcare, Small Farms group and initiatives in conjunction with SRCMA, Landcare Illawarra, Southern Council's Group (IDNWA), Conservation Australia
- Implement biodiversity and strategy actions for community partnerships regional and local as identified in the Illawarra Biodiversity Strategy Action Plan
- Weed management – support and provide funding for IDNWA, review and implement programs: Regional Weeds Strategy, Noxious Weeds, Boneseed Eradication, Roadside Vegetation Management Plan, IDNWA Weed Control Policy and Management Plan and Monitoring, Evaluation, Reporting and Improvement Strategy (MERI), Southern Rivers Catchment Action Plan
- Investigate and implement WeedMap Pro or other GIS mapping systems subject to funding
- Community Land Plans of Management – implement bush regeneration, maintenance, and education strategies as identified, obtain capital funding from external sources – maintain areas in accordance with Council's Strategic Asset Management Plan
- Feral animal control – rabbit and fox control programs

Waste

Delivery Program – Environment

E1.1 Protect and maintain environmentally significant natural areas on public and private land in a sustainable manner

- Implement Protection of the Environment Operations Act and Regulations specific to waste and illegal dumping incidents
- Implement local and regional Illegal Dumping and Litter Reduction Strategy
- Comply with legislative requirements specific to waste management licences and closure plan requirements for Minnamurra and Gerroa Waste Depot's

E1.3 Minimise waste and manage it in an efficient and environmentally sensitive manner

- Provide garbage recycling, green waste and clean up collection services for urban, rural, commercial, industrial premises and Council facilities
- Process and/or dispose of garbage, recycling, commercial, Council and industrial waste including the mulching and composting of food waste and garden organics
- Investigate and/or establish an Alternative Waste and Organics Facility
- Operate the Minnamurra Waste and Recycling Facility
- Implement projects and policies to reduce waste, increase recycling and re-use of materials
- Research and establish an e-waste disposal facility
- Implement WaSIP Program as required by the OEHL specific to waste
- Expand public place recycling
- Install, maintain and service Gross Pollutant Traps in urban areas

Air

Delivery Program – Environment

E1.1 Protect and maintain environmentally significant natural areas on public and private land in a sustainable manner

- Implement Protection of the Environment Operations Act and Regulations specific to air incidents - No Burn Policy applications

Delivery Program – Community

C2.4 Encourage and support integrated, sustainable and innovative transport systems within and outside of the Municipality

- Progressively complete further sections of the Cycleway from North Kiama to Jamberoo in accordance with Council's Cycleway Plan
- Implement footpath and cycleway infrastructure program
- Develop and implement active transport programs – walk to work – Walk-it Kiama and Kiama Cycleway
- Provide & encourage active transport modes for Council staff activities – car pooling
- Promote clean air programs – car, tyre maintenance and active transport to tourists
- Support and implement Regional Transport Plan
- Provide a supportive environment which encourages cycling or walking short

Heritage

Delivery Program – Environment

E3.1 Maintain and where necessary restore our natural, rural and urban environments consistent with Heritage and legislative requirements and in recognition of their important synergy with community wellbeing

- Heritage management – implement Heritage advisor program and complete Heritage studies as required

E3.3 Consider Aboriginal culture and heritage as an integral component of all social and physical planning

- Oversee Aboriginal Heritage assessments for new planning proposals

Delivery Program – Community

C1.2 Acknowledge, foster and celebrate Aboriginal culture

- Implement identified programs to increase Council and the communities collaboration and cultural awareness of the Aboriginal community

Sustainable Community

Delivery Program – Environment

E1.3 Minimise waste and manage it in an efficient and environmentally sensitive manner

- Implement standards in the Waste and Sustainability Improvement Payments (WASIP) Program as required by the OEH

E1.4 Encourage the adoption within our community of sustainable lifestyle practices that support the environment

- Implement workshops, events and initiatives to provide residents with skills in sustainable living – World Environment Day, Sustainability workshops, Kiamasphere Newsletter/website

E1.5 Recognise and respond to predicted climate change impacts

- Implement regional/local strategies in the Climate Change Adaptation Plan
- Implement Energy Management Plans for Councils top 10 consumers – including alternative power sources
- Monitor Council's Energy consumption
- Implement regional and local strategies identified in the CCASAP

Delivery Program – Community

C2.1 Develop, maintain and advocate for infrastructure, facilities and opportunities that promote health and an active lifestyle for residents of all ages

- Implement and review the programs /strategies in the Kiama Public Health Plan – Strengthening Communities, Health Economy, Supportive Social Environments and Health and Health of our Environment
- Implement programs and policies that address access to healthy and affordable food - Community gardens, food and nutrition policy, community education and workshops

Delivery Program - Civil Leadership

CL2.4 Monitor and control resource consumption and minimise waste

- Implement programs and policies relating to Council's resource consumption and sustainability – Procurement Policy, Fleet and Events Management

List of Abbreviations

AHC – Australian Heritage Commission
ANZECC – Australian and New Zealand Environment Conservation Council
AP – Available Phosphorus
BASIX – Building Sustainability Index
CAP – Catchment Action Plan
CCASAP – Climate Change Adaptation Strategy Action Plan
CCP™ – Cities for Climate Protection
CO₂ – Carbon Dioxide
CREMP – Crooked River Estuary Management Plan
CVA – Conservation Volunteers Australia
DCP – Development Control Plan
EPA – Environmental Protection Authority
DO – Dissolved Oxygen
DOPI – Department of Primary Industries
EC – Electrical Conductivity
EP and A Act – *Environmental Planning and Assessment Act 1979*
EPBC Act 1999 or EPBC Act – *Environment Protection and Biodiversity Conservation Act 1999*
ESD – Ecologically Sustainable Development
FM Act 1994 or FM Act – *Fisheries Management Act 1994*
GIS – Geographical Information System
IREP – Illawarra Regional Environmental Plan
KMC – Kiama Municipal Council
LAQMP – Local Air Quality Management Plan
LEP – Local Environmental Plan
LGA – Local Government Area
MoU –Memorandum of Understanding
MREMP – Minnamurra River Estuary Management Plan
NEPM- National Environmental Protection Measure
NSW – New South Wales
OSSMS – On-Site Sewage Management Systems
OEH – Office of Environment and Heritage
PAS - Priorities Action Statement
POEO Act – *Protection of the Environment Operations Act 1997*
PVP – Property Vegetation Plan
REP – Regional Environmental Plan
RPI – Regional Pollution Index
RTA – Roads and Traffic Authority
SEPP – State Environmental Planning Policy
SHR – State Heritage Register
SMP – Stormwater Management Plan
SoE – State of the Environment
SRCMA – Southern Rivers Catchment Management Authority
STP – Sewerage Treatment Plant
SWC – Sydney Water Corporation
TSC Act 1995 or TSC Act – *Threatened Species Conservation Act 1995*

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