

state of the **ENVIRONMENT** report 2007



KIAMA MUNICIPAL COUNCIL
your council, your community



cover design Micki van der Voort



Executive Summary

A 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 supplementary report for the period 1 July 2006 - 30 June 2007.

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 a chapter called *Sustainable Communities*, which includes Headline Sustainability Indicators, measuring progress towards sustainability, and details the actions of Council to protect and enhance environment and promote healthy lifestyles. The final chapter, *Summary of Existing and Potential Future Activities*, provides an outline of all potential strategies that are identified within each theme chapter, placed within the framework of Council's Strategic Goals.

During the 2006-2007 reporting period, Council has undertaken a number of initiatives that address issues identified within the previous SoE Reports, which are summarised below for each environmental theme.

Land

- Council continued the review of the *Local Environmental Plan 1996*, and carried out a community participation process with residents of Kiama Municipality aimed at developing a new Local Environment Plan to be implemented during 2008-2009, subject to Council and State Government approval and gazettal.

Water

- A monthly Water Monitoring Program of 12 sites across the Municipality was conducted throughout the year.
- Council's top eleven water using facilities have shown a saving of 23,476 kL/yr in water consumption, when compared to the 2002-2003 baseline figures. This is a fantastic achievement, and is a testament to the positive actions that have been adopted through the *Water Savings Action Plan*.
- Council continued work on two projects within the Minnamurra Estuary - bank stabilisation work as part of the NSW Estuary Program and stormwater pollutant control and riparian management from a grant obtained through the Southern Rivers Catchment Management Authority.
- Council continued the implementation of the *Water Saving Action Plan* for its operations, focusing on the high water using facilities. This included the installation of data loggers to monitor Council's top eleven water using facilities. Water tanks were installed in Council buildings such as the Council Administration Building, Council Depot, Waste Depot, and throughout

Council's Holiday Parks. Retrofitting of showerheads and taps, was also undertaken throughout Council reserves.

- Ongoing educational and participational projects including focussing of Clean Up Australia Day 2007 on the Minnamurra River and its surrounds.
- Council supported the Jamberoo Valley, Kendalls Beach, Lands Edge, and Gerringong and Gerroa Streamwatch Water Monitoring Networks.

Noise

- Council continued to address noise pollution under the *Protection of the Environment Operations Act 1997*.

Biodiversity

- Rehabilitation projects were continued at Spring Creek Wetlands and Jerrara Dam.
- The Roadside Vegetation Management Plan, which was funded from the Roads and Traffic Authority Roadside Environment Committee via the Southern Rivers Catchment Management Authority, was completed and is being implemented. The primary objective of the plan is to protect the good quality remnant vegetation and to identify areas for revegetation and corridor enhancement.
- A training workshop for Landcare and Bushcare Groups and interested individuals was conducted on the topic of 'Communications Toolkit Training'. This was undertaken in partnership with the Shoalhaven Bushcare Group and supported by funding from the Southern Rivers Catchment Management Authority.
- Council supported Kiama High School year 10 students, as they undertook tree planting programs throughout Kiama Municipality as part of National Tree Day celebrations.

Waste

- A total of 53.6% of all waste received at the Minnamurra Waste and Recycling Depot was reused or recycled. This is a decrease of 3.2% from previous years figures due to the Minnamurra Waste and Recycling changing its operations in October 2006, which included the closure of its Reuse Store and Revolve Recycling Centre.
- Due to Occupational Health and Safety requirements, Council decided to change its current green waste collection system from bundles and bags to a 240 litre bin system. The green waste bins feature a lime green lid and were

delivered, with an associated information kit to all residents in the urban area in September, 2006. From September 2006 – June 2007 a total of 1,699 tonnes was recovered from kerbside collection; an increase of 26.34% to previous year's results.

- Council received a “Keep Australia Beautiful – Waste Minimisation Award”, in recognition of the introduction of a 240L fortnightly Recycling Bin, the Conversion of Old Bins into a Reuseable Product and for the development of “Responsible Waste Kits” Holiday Accommodation Properties.
- Council supported the Annual Clean Up Australia Day, Schools Clean Up Australia Day and 8 Council staff participated in Business Clean Up Day cleaning up the surrounding areas of Council's Administration Building and Black Beach.
- Council participated in a Public Place Recycling Trial program at the Kiama Sporting Complex achieving a total average of 6,000litres (378kg) of recyclables being recovered from this site over a 3 month period.
- Council was successful in receiving \$18,000 grant funding from the Butt Littering Trust to conduct a cigarette butt littering program within the Kiama CBD during summer 2007 period.
- A review of the waste and recycling system at Council offices was conducted resulting in 3 in 1 under desk bins installed at each workstation in January 2007. The introduction of this system, has seen a 50% increase in recycling as well as a reduction in daily cleaning time of forty to sixty minutes each day.
- Council supported Cards 4 Planet Ark program, Return of Used Medicines campaign and Clean Up Australia's Mobile Phone campaign.

Air

- Council completed Milestone 2 of the Cities for Climate Protection Program – setting Emissions Reduction Goals for both Council operations and the community.
- Council staff embraced the usage of E10 fuel in the Council fleet vehicles.

Heritage

- The Kiama Heritage Review Project continued as part of the development of a new Local Environment Plan. This involved the review of the current listing of Heritage buildings and sites and the identification of additional buildings to be considered for future Heritage listing.

Sustainability

- Kiama Council's Environment and Health Team celebrated World Environment Day 2007 with a Climate Change pack delivered to each of our five primary schools. Each pack contained books about recycling, composting, green gardening and climate change. They also contained science kits, environmental games, and two fruit trees for each school playground.
- The One STOP CLIMATE CHANGE Shop, held as part of World Environment Day 2007 celebrations, proved to be a huge success. The shop was filled with practical and innovative ideas and products to address Climate Change, and was supported by several local businesses promoting sustainability.
- Three Urban Sustainability Grants were obtained from the NSW Environmental Trust to support and promote sustainable living practices on both a united regional scale and at a local municipal level. These included the Sustainable Illawarra Project, Business Treading Lightly and Sustainable Kiama Grants.
- The Indian Myna Bird control program continued its implementation. A University of Wollongong Honours student was co-sponsored with Shoalhaven Council to provide greater insight into habitat and behavioural patterns, which will lead to a more targeted approach to the trapping program.
- The Kiama Public Health Plan was implemented, including projects such as Good Sports, Smoke Free Sporting Grounds, and various environmental projects.

During this reporting period, the Headline Sustainability Indicators showed varying trends. Beach water quality was excellent, with 100% compliance with the relevant guidelines. River and Estuary Water Quality, showed the value for Secondary was fairly consistent, but the values for Primary Recreation and Ecosystem Health were moving away from their sustainable zones.

Waste to landfill per capita has decreased, and is well within the sustainable zone. The number of days with a medium air quality index was higher than the last reporting period, with both the Albion Park and Wollongong Air Quality Monitoring Stations moving away from the sustainable zone.

Table of Contents

Executive Summary	1
Table of Contents	6
List of Maps	9
List of Figures.....	9
Chapter 1: Introduction	10
1.1 Kiama Municipality	10
1.2 Relevant Council Strategic Goals.....	10
1.3 State of the Environment Reporting	11
Chapter 2: Land	13
2.1 State.....	13
2.1.1 Landuse Planning	13
2.2 Pressures.....	14
2.2.1 Development	14
2.2.2 Acid Sulfate Soils	14
2.2.3 Erosion and Sedimentation	17
2.2.4 Contaminated Land	17
2.3 Responses	17
2.3.1 Landuse Planning Initiatives	17
2.3.2 Draft Illawarra Regional Strategy.....	18
2.3.3 BASIX – The Building Sustainability Index	20
2.3.4 Acid Sulfate Soils	20
2.3.5 Erosion and Sedimentation	20
2.3.6 Contaminated Land	21
2.4 Potential Future Activities.....	22
Chapter 3: Water	24
3.1 State.....	24
3.1.1 Council Water Monitoring Program.....	24
3.1.2 Monitoring at Council Waste Disposal Depots.....	31
3.1.3 Sydney Water Streamwatch Water Monitoring	31
3.1.4 Beachwatch Monitoring	31
3.1.5 Water Consumption.....	35
3.2 Pressures.....	37
3.2.1 Stormwater Runoff	37
3.2.2 Sewerage Treatment Plants	38
3.2.3 On-site Sewage Management Systems	39
3.3 Responses	39
3.3.1 Development Control for Water Quality and Water Conservation.....	39
3.3.2 Enforcement	39
3.3.3 Stormwater Management Plan.....	40
3.3.4 Crooked River Estuary Management Plan	41
3.3.5 Minnamurra River Estuary Management Plan	42
3.3.6 On-site Sewage Management System.....	44
3.3.7 Water Sensitive Urban Design Policy	44
3.3.8 Water Saving Action Plans.....	45
3.3.9 Sydney Water Corporation’s WaterFix Program	46
3.4 Potential Future Activities.....	46
Chapter 4: Noise.....	49
4.1 State.....	49
4.2 Pressures.....	50
4.2.1 Road and Rail Noise	50
4.2.2 Industrial and Commercial Noise	50
4.2.3 Residential Noise	51
4.3 Responses	51
4.3.1 Development Control	51

4.3.2	Enforcement	51
4.1	Potential Future Activities	52
Chapter 5: Biodiversity		53
5.1	State.....	53
5.1.1	Ecosystem Diversity - Ecological Communities	53
5.1.2	Species Diversity - Flora	53
5.1.3	Species Diversity - Fauna.....	58
5.1.4	Wetlands.....	59
5.2	Pressures.....	60
5.2.1	Key Threatening Processes.....	60
5.2.2	Weeds	61
5.2.3	Bushfire	65
5.2.4	Tree Lopping or Removal	65
5.2.5	Road Crossings as Fish Barriers	65
5.3	Responses	66
5.3.1	Development Control	66
5.3.2	Threatened Species Recovery Plans	67
5.3.3	<i>Native Vegetation Act 2003</i>	67
5.3.4	Supply of Trees	68
5.3.5	Roadside Vegetation Management Plan	68
5.3.6	Training Workshops – Communications Toolkit Training.....	68
5.3.7	Council Rehabilitation Projects	68
5.3.8	Other Rehabilitation Projects in the Kiama Municipality.....	68
5.4	Potential Future Activities.....	71
Chapter 6: Waste		73
6.1	State.....	73
6.2	Pressures.....	73
6.2.1	Pressures from Waste Generation.....	73
6.2.2	Pressures from Waste Management	75
6.2.3	Illegal Waste Disposal.....	75
6.3	Responses.....	76
6.3.1	Development Control	76
6.3.3	Benefits of Recycling	78
6.4.1	Holiday Accommodation “Responsible Waste Kits”	83
6.4.2	Clean Up Australia Day.....	84
6.4.3	Planet Ark “Cards for Planet Ark” Christmas Card Recycling Program.....	85
6.4.4	Land and Sea – Plastic Free.....	85
6.4.5	The Kiama Pelican Story Project.....	86
6.4.6	Butt Bins.....	86
6.5	Potential Future Activities.....	86
Chapter 7: Air		88
7.1	State.....	88
7.1.1	Local and Regional Air Quality.....	88
7.1.2	Global Air Quality	90
7.2	Pressures.....	92
7.3	Responses	93
7.3.1	Local Air Quality Management Plan	93
7.3.2	Cities for Climate Protection Program	94
7.3.3	Development Control	94
7.3.4	Enforcement	94
7.3.5	Cycleways	95
7.4	Potential Future Activities.....	95
Chapter 8: Heritage		97
8.1	State.....	97
8.1.1	Aboriginal Heritage	97
8.1.2	Non-Aboriginal Heritage	97
8.2	Pressures.....	100
8.3	Responses	100
8.3.1	Heritage Adviser.....	100

8.3.2	Development Approval Process	100
8.3.3	Heritage Projects	100
8.4	Potential Future Activities	101
Chapter 9: Sustainable Communities		102
9.1	Headline Sustainability Indicators.....	102
9.1.1	Headline Sustainability Indicator – Beach Water Quality	103
9.1.2	Headline Sustainability Indicator – River and Estuary Water Quality	103
9.1.3	Headline Sustainability Indicator – Waste	104
9.1.4	Headline Sustainability Indicator – Air Quality	105
9.2	Sustainability Strategies	106
9.2.1	Urban Sustainability Grants	106
	Sustainable Illawarra Grant	107
9.2.2	Celebrating World Environment Day with our Primary Schools	107
9.2.3	One STOP CLIMATE CHANGE Shop	108
9.2.4	Jamberoo Indian Myna Control Project.....	109
9.2.5	Kiama Public Health Plan 2005-2008 Healthy Communities Town, Country and Coast .	110
9.2.6	Awards Received.....	112
9.2.7	Southern Rivers Catchment Management Authority	114
9.3	Potential Future Activities	115
Chapter 10: Summary of Existing and Potential Future Activities.		117
List of Abbreviations		135
References		136

List of Tables

Table 1: Local Environmental Plan 1996 Zones	13
Table 2: Guidelines Against Which Water Quality Data is Assessed	25
Table 3: Rates of Compliance with the ANZECC Guidelines 2000.....	27
Table 4: Compliance and Ranking of Kiama Beaches for Summer 2006–2007	32
Table 5: Streamwatch Community Monitoring Results 2006-2007	33
Table 5: Streamwatch Community Monitoring Results 2006-2007	34
Table 6: Dam Water Storage Levels.....	35
Table 7: Water Consumption by Property Type in the Kiama Municipality	35
Table 8: Top Water Using Council Properties 2006-2007	36
Table 9: Sewerage Treatment Plants in the Kiama Municipality	38
Table 10: Sewage Overflows/Bypasses in the Bombo Sewage Treatment Plant Catchment Area (Whittaker, G, 2007 pers comm.)	39
Table 11: Complaints relating to Water Pollution (Council and the DECC)	40
Table 12: Number of Households Participating in Sydney Water Corporation Programs	46
Table 13: Complaints relating to Noise Pollution	49
Table 14: Hours of Restricted Use of Certain Equipment	52
Table 15: Endangered Ecological Communities in the Kiama Municipality.....	54
Table 16: Threatened Flora Species	54
Table 17: Threatened Fauna Species	58
Table 18: Key Threatening Processes.....	60
Table 19: Noxious Weeds in the Illawarra District Noxious Weeds Authority Control Area	63
Table 20: Waste Received, Recycled and Disposed of in Landfill 1999-2007.....	74
Table 21: Tonnes Reused, Recycled or Disposed to Landfill - Building and Construction Waste	76
Table 22: Regional Pollution Index at Albion Park Monitoring Station	89
Table 23: Regional Pollution Index at Wollongong Monitoring Station	89
Table 24: Complaints relating to Air Pollution to Council and the DEC	90
Table 25: Vehicle Registration in the Kiama Municipality 1998-2005.....	92
Table 26: Fires in the Kiama and Shellharbour Local Government Areas during 2001-2005	93
Table 27: Aboriginal Heritage Information Management System Record for the Kiama Municipality .	97
Table 28: Kiama Municipality Heritage Items and Listings.....	98

List of Maps

Map 1: Kiama Local Government Area	10
Map 2: Potential Acid Sulfate Soils.....	15
Map 3: Erosion Prone Land in the Kiama Municipality	16
Map 4: Natural Drainage Network, Catchments and Water Sampling Sites	26
Map 5: Compliance of Water Quality with ANZECC Guidelines 2000 for Ecosystem Health, Primary Recreation and Secondary Recreation Values	30
Map 6: Vegetation Communities	55
Map 7: Endangered Ecological Communities	56
Map 8: Core Conservation Areas Identified by Kevin Mills (2006)	57

List of Figures

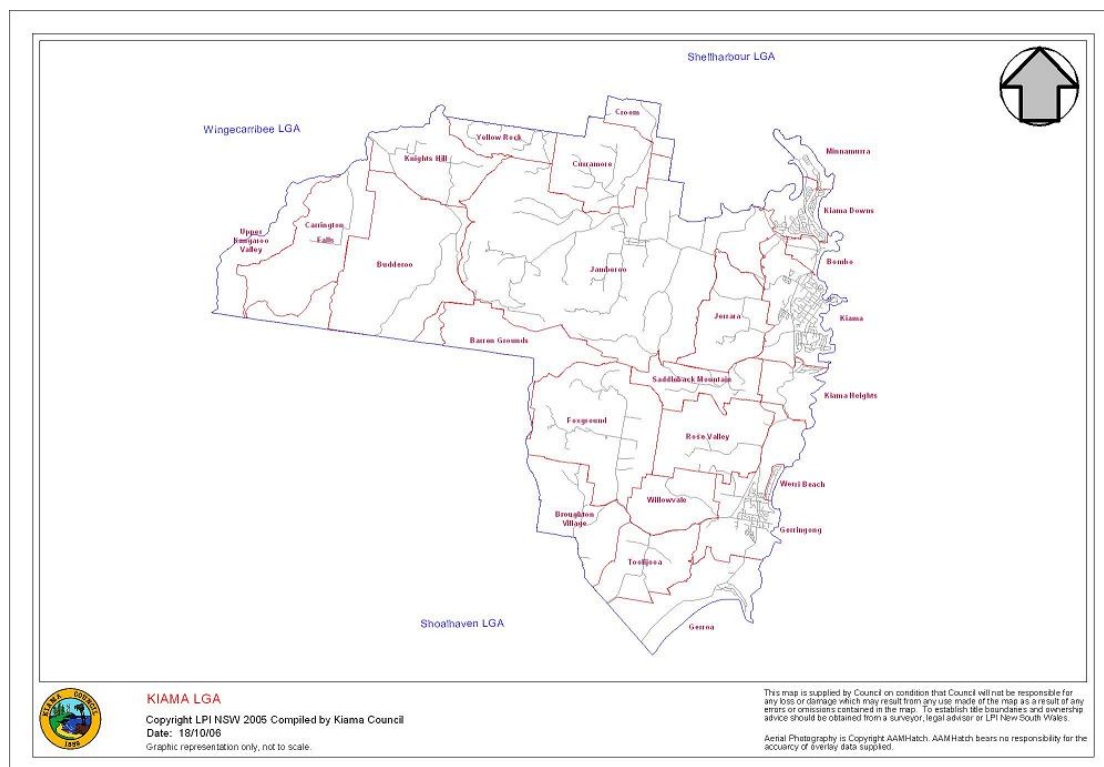
Figure 1: Development Approvals for Residential Dwellings, Commercial and Industrial Activities..	14
Figure 3: Range of Enterococci Levels at Illawarra Beaches During Summer 2006-2007	32
Figure 4: Total water consumption for Kiama Municipal Council 1986-2007.....	36
Figure 5: Noise Complaints within the Kiama Municipality	50
Figure 6: Waste Recycled/Reused and Disposed to Landfill 1999-2007	75
Figure 7: Regional Pollution Index – Percentage of Readings Low, Medium and High for Albion Park and Wollongong	89
Figure 8: Council Greenhouse Emissions 2002 and Forecasted Emissions 2010	91
Figure 9: Community Greenhouse Emissions 1996 and Forecasted Emissions 2010	91
Figure 10: Headline Sustainability Indicator – Beach Water Quality	103
Figure 11: Headline Sustainability Indicator – River and Estuary Water Quality.....	104
Figure 12: Headline Sustainability Indicator – Waste	105
Figure 13: Headline Sustainability Indicator – Air Quality	106

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 is shown in Map 1.

The Australian Bureau of Statistics indicated that the estimated resident population figure for the Kiama Municipality at 30th June 2006, was 20,382 people. It is estimated that the population will increase to 21,384 in 2009 and 23,115 in 2019. Although there has been a constant increase in population in the area in the past, the percentage of population growth has declined over the last 20 years, with only 6.3% growth between 1996 and 2001 (Kiama Municipal Council, 2004a).



Map 1: Kiama Local Government Area

1.2 Relevant Council Strategic Goals

Kiama Municipal Council's *Management Plan 2007-2010* (Kiama Municipal Council, 2007a) outlines Council's Strategic Goals, in the following six areas: Sustainable Environment; Quality Facilities, Services and Infrastructure; Community Cohesion and Wellbeing; A Vibrant and Diverse Economy; Good Governance; and Sound Financial and Resource Management. The specific goals for Sustainable Environment

and Community Cohesion and Wellbeing are outlined due to their particular relevance to this report.

Sustainable Environment

Council's goal is that "*Kiama will have high quality natural, rural, town and village environments and landscapes sustained and enhanced for the present and the future*".

Kiama Municipal Council will:

- Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments;
- Control and plan development of our built environment for the wellbeing of the community;
- Manage and reduce the environmental impacts of all activities on air, water and land systems;
- Promote environmental awareness through educational programs; and
- Provide leadership by demonstrating environmental excellence in all Council activities and policies.

Community Cohesion and Wellbeing

Council's goal is that the "*community will have an enhanced quality of life and that it will have promoted access, equity and social justice*".

Kiama Municipal Council will:

- Contribute to the health, safety and well being of the community;
- Involve the community and relevant stakeholders to plan, develop and facilitate access to services and resources;
- Promote awareness and understanding of cultural diversity;
- Recognise and support the value of cultural heritage; and
- Value and promote creativity in the community.

1.3 State of the Environment Reporting

A State of the Environment Report for the Kiama Municipality is prepared for each financial year as a statutory requirement of the *Local Government Act 1993*. The report details the condition of, and pressures on, the local environment and outlines the current and potential future responses to the identified issues. A comprehensive report is prepared every four (4) years, within 12 months of the election of any new Council. Supplementary reports are prepared for the other years, to update the information provided in the previous comprehensive report. This report is a supplementary report for the period 1 July 2006 - 30 June 2007.

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 four (4) 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;
- Potential Future Activities - identifies possible actions that Council could undertake to address the identified issues.

Chapter 9: Sustainable Communities includes Headline Sustainability Indicators, to measure 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.

A new chapter has been included in this SoE Report - *Chapter 10: Summary of Existing and Potential Future Activities*. This Chapter provides a summary of existing future activities identified in the Management Plan 2007-2010 and potential future activities. These activities are also listed at the end of each relevant theme chapter. The potential future activities are outlined according to the relevant Council Strategic Goals to enable simple insertion into Council's Management Plan 2007-2010.

This report can be read in conjunction with previous Kiama Municipal Council *State of the Environment* Reports, the *New South Wales State of the Environment Report 2003* (Department of Environment and Conservation, 2003) and the *Australian State of the Environment 2001 Report* (Environment Australia, 2001).

Chapter 2: Land

2.1 State

2.1.1 Landuse Planning

The existing Kiama *Local Environmental Plan* (LEP) 1996 is the main instrument used by council for land-use planning and development decisions. The LEP is currently being reviewed, with an updated plan to be developed and gazetted during 2008. The LEP provides landuse zones that indicate what is permitted or restricted within certain areas of land and what conditions apply. Table 1 lists the zones and the area of land to which they apply.

Table 1: Local Environmental Plan 1996 Zones

Zone	Area in hectares (% of total area)
Rural	8560.3 (33.2)
1a Rural A	8560.3
Residential	789.4 (3.06)
2a Residential A	727.2
Residential Land subject to Sydney Water	26.4
2b Residential B	35.8
Business	31.7 (0.12)
3a General Business	23.3
3b Special Business (Heritage)	2.3
3c Neighbourhood Business	2.0
3d Business (Tourist related)	4.2
Industrial	105.0 (0.41)
4b Extractive Industrial	83.0
4c Light Industrial	22.1
Special Uses	150.0 (0.58)
5a Special Uses	53.0
5b Special Uses (railways etc.)	97.0
Recreation	387.1(1.50)
6a Existing Recreation	357.8611
6b Private Recreation	29.2
6c Proposed Recreation	0.1
Rural Environmental Protection	10495.3 (40.7)
7b Rural Environmental Protection Zone – Estuarine Wetlands	361.2
7b1 Rural Environmental Protection Zone – Wetlands Buffer	13.5
7d Rural Environmental Protection Zone – Scenic	1309.9
7e Rural Environmental Protection Zone – Hinterland	8524.1
7f Rural Environmental Protection Zone –Foreshore Protection	265.9
7l Rural Environmental Protection Zone - General	20.8
National Park	4931.7 (19.1)
8a National Parks	4931.7
Roads	209.9 (0.81)
9a Proposed Arterial Road	9.2
Arterial Road	200.7
Deferred	97.4 (0.38)
Deferred Zone	97.4
Total	25758.1 (100)

Environmental Protection Zones are designed to manage and protect environmental assets such as scenic areas, foreshores and wetlands, and these zones carry certain development restrictions.

An overlay to the zones is the areas classified as High Conservation Value. The LEP describes the objectives of such areas and what is permissible within the areas. High Conservation Areas occur on approximately 26% of the Municipality.

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

2.2.1 Development

Figure 1 shows the number of development approvals that Council granted for residential dwellings and for commercial and industrial activities from 1999-2007.

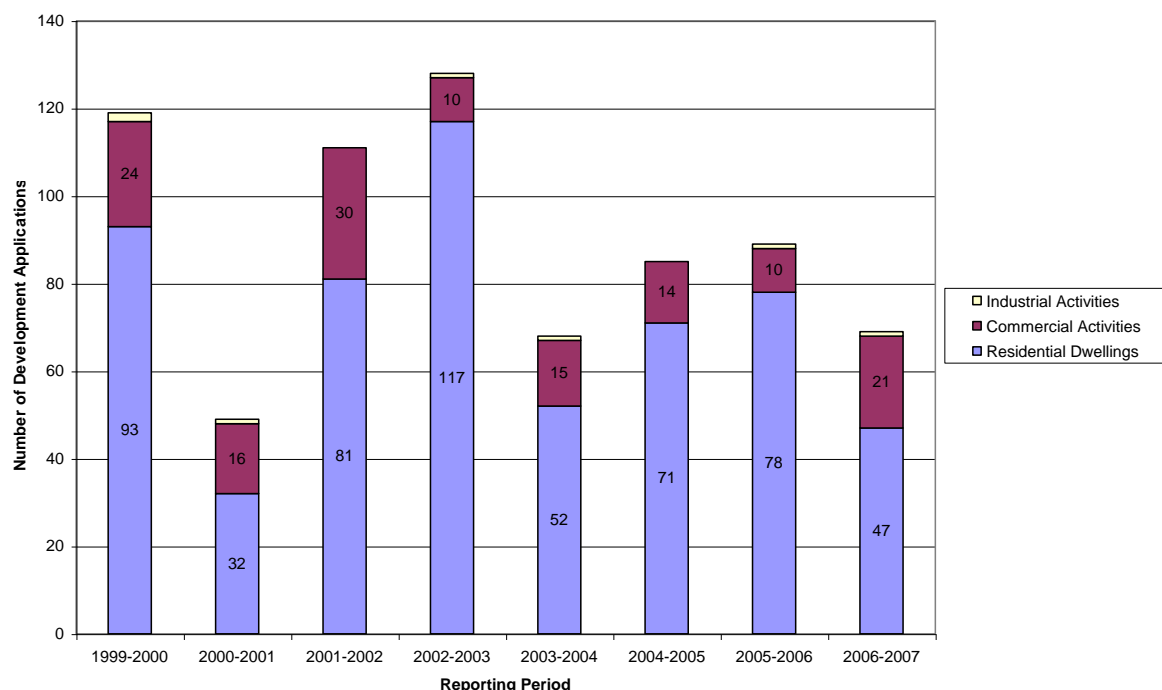
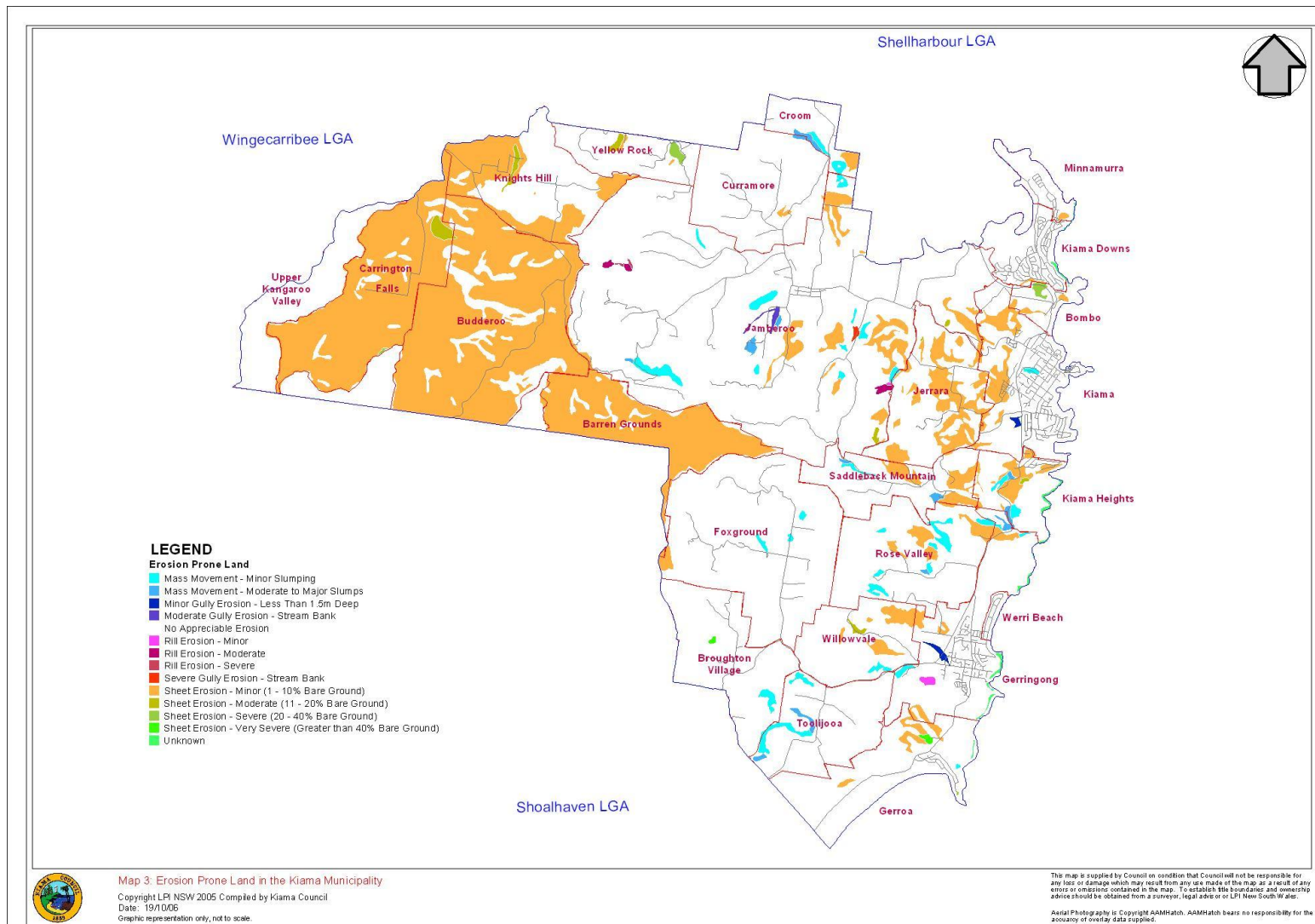


Figure 1: Development Approvals for Residential Dwellings, Commercial and Industrial Activities

2.2.2 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 major constraint to any 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), as shown in Map 2.



Map 3: Erosion Prone Land in the Kiama Municipality

2.2.3 Erosion and Sedimentation

Erosion, caused by either wind or water, is common in areas that have been cleared of vegetation, are on steep slopes, or are close to waterways. Soil erosion by water also causes the additional problem of sedimentation of waterways, as soils are washed into creeks and stormwater drains during rain. Wind erosion is of particular concern within sand dune and beach environments. Areas of erosion prone land are shown in Map 3.

2.2.4 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. A list of activities that have the potential to cause land contamination can be found in Council's *Development Control Plan No. 37 – Contaminated Land*.

2.3 Responses

2.3.1 Landuse Planning Initiatives

Work continued on the Kiama Local Environmental Plan (LEP) Review project during the year with the aim of exhibiting the draft Kiama LEP by the end of 2007.

The preparation of the draft LEP is being assisted by a multidisciplinary consultant team having skills in biodiversity, social planning, urban design and heritage.

Major tasks carried out during the year by Strategic Planning staff and the LEP Review team of consultants included:

- Rural land analysis and refinement of zone delineation mapping for rural and environmental protection zones
- Urban design analysis and strategy formulation for areas targeted for change and improvement
- Development of new place based development control provisions for incorporation in the draft LEP and place based DCPs
- Review of population and housing needs and collaboration with the urban design consultants on how to achieve the appropriate mix and quantity of housing for the next 15 years
- Development of biodiversity and environmental control provisions to be incorporated in the draft LEP
- Review of heritage items recommended for listing arising from the 2002 Simpson Dawbin Heritage Review project to narrow down the final heritage item list for adoption in the draft LEP.

A series of Kiama LEP “Editorial Meetings” were convened to allow Councillors to have a more active role in the development of the LEP strategy and to be briefed by staff and consultants engaged in the project on key issues (such as housing needs, housing affordability, and place planning and urban improvement) and discussion of detailed work-in-progress by staff and the consultants. These meetings included briefings, bus tours of urban and rural areas with the consultant team and staff ,and

associated facilitated discussion on the following issues:

- Population forecasts and housing needs including for low to moderate income groups, people with disabilities and seniors
- urban design strategy including localities best suited to increase population densities, suggestions for improving urban infrastructure to enable more accessible, walkable neighbourhoods, and improved simpler development control provisions for all residential and business neighbourhoods
- review of the 2002 Simpson Dawbin Heritage Study recommendations for local heritage items by the Heritage Adviser
- rural planning initiatives and new zoning proposals for rural land and sensitive environmental lands important for their natural habitat values and biodiversity.

The above work on the preparation of the draft Kiama LEP is well advanced and the strategic planning staff aim to submit the preliminary final draft Kiama LEP to Council in the third quarter of 2007. This will enable Council to seek approval from the Department of Planning to exhibit the final draft LEP either in late 2007 or early 2008.

No Development Control Plans (DCPs) were developed or adopted during the period. The strategic planning project priority was directed to the review of the Kiama LEP.

2.3.2 Draft 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 within these priority areas (Department of Planning, 2006):

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*; 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*.

Water, Energy and Waste:

- Councils to identify and zone land for wastewater treatment/recycling, energy, waste avoidance and resource recovery infrastructure;
- Councils 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
- Councils will encourage 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 will be reviewed;
- LEPs will include provisions to protect the character of towns and villages and adjoining cultural and natural landscapes; and
- Councils will review adequacy of cultural heritage studies with local Aboriginal representatives and the DEC when preparing new LEPs.

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).

Kiama Municipal Council has recommended in a submission to the Department of Planning that this corridor should be modified to incorporate an extension of the regional habitat corridor following the escarpment through the Shellharbour and Kiama Local Government areas and extending into the Shoalhaven Local Government area. In addition, Council has recommended that a second indicative habitat corridor should also be considered along the Minnamurra River Valley and its wetland. It was suggested that a more thorough study on regional climate change impacts should be prepared for inclusion in the first 5 year review of the Illawarra Regional Strategy, using the Kiama Region's report prepared for Kiama Council by the CSIRO in 2005 as a guide (see Chapter 7: Air for more information on this report).

2.3.3 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 1 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 1 October 2006, BASIX will apply to residential alterations and additions, which are valued at \$100,000 or more (from 1 July 2007, the value drops 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 1 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 and garden irrigation systems.
- 3A Rated toilet suites
- 3A rated shower heads
- Floor and ceiling insulation
- Using compact fluorescent light globes
- Native vegetation to landscape areas
- Shading to windows
- Solar hot water systems
- Appropriate aspect for suitable solar aspect

2.3.4 Acid Sulfate Soils

The Kiama LEP 1996 addresses acid sulfate soils, with a requirement that certain types of development within acid sulfate soils prone areas require development consent. A soils assessment and preparation of a management plan is also required.

There were no development applications within acid sulfate soils area identified within the LEP amendment during the last five reporting periods (there was one during 2001-2002).

2.3.5 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*. During the reporting period, there were two

cautions were issued at building sites for inappropriate sediment controls (three were issued in 2005-2006, two were issued in 2004-2005, four during 2003-2004, two during 2002-2003 and three during 2001-2002).

Some vegetation clearing requires consent from Council under the *Tree Preservation Order*. Some developments that involve vegetation clearing or that are near waterways require approval from the NSW Department of Natural Resources (DNR). There were 6 such developments requiring DNR approval during the reporting period.

2.3.6 Contaminated Land

All land that is likely to have a significant risk of harm to the environment and human health must be registered with the NSW Department of Environment and Climate Change.

All development applications and re-zonings must consider whether the land in question has been subject to a potentially contaminating activity, in accordance with *Development Control Plan No. 37 – Contaminated Land*. If after investigation, it is found that the land is contaminated, it must be remediated prior to further development.

Council also places conditions on development approvals to ensure measures are taken to minimise the likelihood of contamination from 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 the *Protection of the Environment Operations Act 1997*.

During the 2006/07 reporting period Council adopted a Pesticides Notification Plan that was prepared in accordance with the requirements of the Pesticides Amendment (Notification) Regulation 2005.

The aim of this Plan is to meet the community's general right to know about pesticide applications made to public places. The Plan allows members of the community to take action to avoid contact with pesticides, if they wish. It does not mean that the community is at any great risk or harm from pesticides and ensures that pesticides that are applied at public places is undertaken in a safe, responsible manner, without harm to the community or the environment.

The Pesticides Notification Plan applies to public reserves, parks and gardens, playgrounds, sporting fields and ovals, road verges, laneways and pathways, drains and easements, golf courses (owned or controlled by Council), Caravan/Holiday Parks, cemeteries and swimming pool grounds.

2.3.7 Contaminated Land Management

During the reporting period additional site investigations were undertaken as required for the development of a rehabilitation plan for the former Gasworks site in Shoalhaven Street, Kiama. A rehabilitation plan will be required to be completed and submitted to the Department of Environment and Climate Change.

2.4 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (including *Kiama Local Environmental Plan* Review - investigate biodiversity certification, review riparian lands and Areas of High Conservation, incorporate heritage);
- *Protection of the Environment Operations Act* implementation;
- Community Lands Management:
 - Prepare and review Plans of Management for the following reserves: West Kiama Reserves, Elambra Reserve Riparian Corridor, Turpentine Reserve, Spring Creek Wetlands and Jerrara Dam Arboretum;
 - Implement works under various Plans of Management including: Kiama Harbour Jetty; Blowhole Point Redevelopment; and Sanctuary Place Quarry Redevelopment;
- Strategic Town and Rural Planning – Exhibit and adopt Kiama Local Environmental Plan for urban and rural lands;
- Strategic Town and Rural Planning – Prepare, exhibit and adopt a single *Development Control Plan* for the Local Government Area with place-based provisions for Kiama, Gerringong/Gerroa, Jamberoo and Minnamurra. Include *Public Health Plan* recommendations and Safer by Design principles;
- Environmental Assessment - Assess all Council works activities under Part 4 and Part 5 of the EP and A Act as required;
- Contaminated Lands Management – Finalise site investigation and rehabilitation plan, and pursue grant funding, for the Gasworks site in Shoalhaven St, Kiama;
- Implement the *Pesticide Notification Plan* (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes);

Potential Future Activities Beyond 2007-2008

(H – High Priority, M - Medium Priority, L – Low Priority)

- Ongoing implementation of the *Pesticide Notification Plan* (2008/2009 and 2009/2010) (H);

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2007/2008 and 2008/2009) (H);
- *Protection of the Environment Operations Act* implementation (2007/2008 and 2008/2009) (H);
- Prepare and review Plans of Management for the following reserves: West Kiama Reserves (5) (2007/2008) (H);
- Develop new *Development Control Plans* for the Kiama Municipality (2008/2009) (H);
- Assess all Council works activities under Part 4 and Part 5 of the *EP and A Act* as required (2007/2008 and 2008/2009) (H);
- Commence review of Kiama *Local Environmental Plan* 2006 to be completed 2008-2009 (H).
- Develop an Environmental Assessment Program, involving inspections of commercial and industrial premises and assisting the operators to meet their environmental obligations through educational material and advice. This will be incorporated as part of the regional Business Treading Lightly sustainable regional grant (H);
- Prepare and review Plans of Management for the following reserves: Neighbourhood Parks, Baileys Island, Turpentine Reserve, and Nobles Estate – Werri Headland (2008/2009) (M);

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 are shown on Map 4.

Water Quality Monitoring has been undertaken in several catchments and beaches within the last 12 months.

3.1.1 Council Water Monitoring Program

Council has been implementing a Water Monitoring Program since July 2003 to gain a monthly snapshot of surface water quality across the Municipality. The aim of the program is to provide data for inclusion in SoE Reports and to identify any pollution hotspots that need attention.

The program involves monthly monitoring of 12 sites in most catchments for a series of parameters. Dissolved oxygen, conductivity, salinity, pH and temperature are measured by on site using a field monitor and faecal coliforms, enterococci, total phosphorus, total nitrogen, chlorophyll “A” (only from January 2004), are analysed at a National Association of Testing Authorities accredited laboratory.

The 12 sites are shown on Map 4 and include:

- four sites in Minnamurra River (including one site in Rocklow Creek);
- two sites in Spring Creek;
- one site in the un-named creek draining to Kendalls Beach;
- one site in Munna Munnora Creek;
- two sites in Werri Lagoon; and
- two sites in Crooked River.

The results of the both the field monitor and laboratory analysis are used to determine the percentage of sample days that comply with the *Australian and New Zealand Environment Conservation Council (ANZECC) Water Quality Guidelines 2000* (Australian and New Zealand Environment Conservation Council, 2000). The *ANZECC Guidelines 2000* provide default guidelines against which to assess water quality data. ANZECC advises that the Guidelines provide a framework for recognising and protecting water quality for the full range of existing environmental values but should be tailored for local conditions (Australian and New Zealand Environment Conservation Council, 2000). It is envisaged that Council will develop its own guidelines in the future, when more baseline data is available. In the meantime, the default ANZECC guideline values are used.

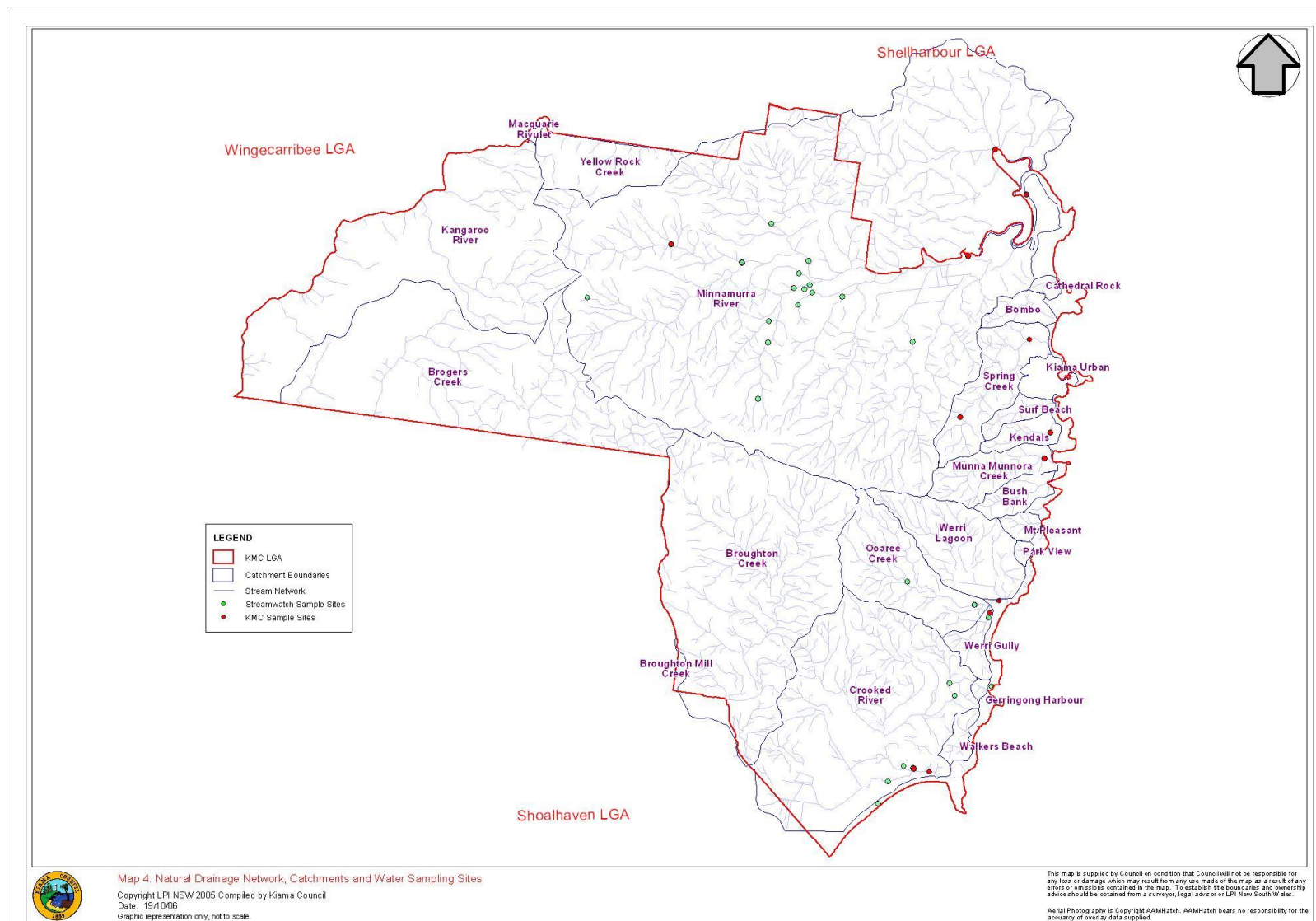
The values against which the results are assessed are outlined below, including which parameters are used for each assessment:

- **Ecosystem Health Values:** The *ANZECC Guidelines 2000* objective for protection of aquatic ecosystems is to maintain and enhance the ‘ecological integrity’ of freshwater and marine ecosystems, including biological diversity, relative abundance and ecological processes (Australian and New Zealand Environment Conservation Council, 2000). For assessment in this program, the laboratory analysed parameters of total nitrogen, total phosphorus and chlorophyll “A” (only from January 2004) are used, along with the field tested conductivity, dissolved oxygen, pH and turbidity. The parameters are assessed against the guidelines shown in Table 2.
- **Primary Recreation Values:** The *ANZECC Guidelines 2000* state that “water used for primary contact activities, such as swimming, bathing and other direct water-contact sports, should be sufficiently free from faecal contamination, pathogenic organisms and other hazards (e.g. poor visibility or toxic chemicals) to protect the health and safety of the user” (Australian and New Zealand Environment Conservation Council, 2000). For assessment in this program, the laboratory analysed parameters of faecal coliforms and enterococci are used, along with the field tested pH, turbidity and temperature. The parameters are assessed against the following guidelines shown in Table 2.

Table 2: Guidelines Against Which Water Quality Data is Assessed

Parameter	Ecosystem Health Criteria	Primary Recreation Criteria	Secondary Recreation Criteria
Total Nitrogen	<0.3mg/L (Estuary) <0.35mg/L (River)	-	-
Total Phosphorus	<0.03mg/L (Estuary) <0.025mg/L (River)	-	-
Chlorophyll “A”	<0.004mg/L (Estuary) <0.005mg/L (River)	-	-
Faecal Coliforms	-	150 faecal coliform organisms/100 mL (minimum of five samples taken at regular intervals not exceeding one month, with four out of five samples containing less than 600 organisms/100 mL)*	1000 faecal coliform organisms/100 mL (minimum of five samples taken at regular intervals not exceeding one month, with four out of five samples containing less than 4000 organisms/100 mL)*
Enterococci	-	35 enterococci organisms/100 mL (maximum number in any one sample: 60–100 organisms/100 mL)	230 enterococci organisms/100 mL (maximum number in any one sample: 450–700 organisms/100 mL)
Conductivity	0.125-2.2 mS/cm (River only)		
Dissolved Oxygen	80-110 % sat (Estuary) 85-110 % sat (River)		
pH	7.0-8.5 (Estuary) 6.5-8.0 (River)	5.0-9.0	
Turbidity	0.5-10 NTU (Estuary) 6-50 NTU (River)	0.5-10	
Temperature		15-35 degrees	

*This program only samples once a month, but these guidelines are still followed.



Map 4: Natural Drainage Network, Catchments and Water Sampling Sites

- **Secondary Recreation Values:** The *ANZECC Guidelines 2000* state that secondary recreation is when “water [is] used for secondary contact activities, such as boating and fishing” (Australian and New Zealand Environment Conservation Council, 2000). For assessment in this program, the laboratory analysed parameters of faecal coliforms and enterococci are used, assessed against the guidelines shown in Table 2.

The compliance of the 2006-2007 results with the criteria for ecosystem health, primary recreation and secondary recreation values is shown in both Table 3 and Map 5.

Table 3: Rates of Compliance with the ANZECC Guidelines 2000
(Australian and New Zealand Environment Conservation Council, 2000)

	Compliance (% of sample days)		
	Ecosystem Health	Primary Recreation	Secondary Recreation
M1 - Minnamurra River 1	8.33 ↓	25.0 •	100 •
M2 - Minnamurra River 2	0.00 ↓	33.3 •	91.7 ↓
M3 - Minnamurra River 3	16.7 ↓	58.3 ↓	100 •
R1- Rocklow Creek	0.00 •	16.7 ↓	100 •
S1 - Spring Creek 1	8.33 ↓	41.7 ↓	100 •
S2 - Spring Creek 2	0.00 ↓	66.7 ↑	100 •
K1 - Kendalls Beach Creek	8.33 •	16.7 ↓	83.3 ↓
Mu1 - Munna Munnora Creek	0.00 ↓	16.7 ↓	83.3 ↓
W1- Werri Lagoon 1	0.00 ↓	41.7 ↓	100 •
W2 - Werri Lagoon 2	0.00 ↓	50.0 ↓	91.7 ↓
C1 - Crooked River 1	16.7 ↓	50.0 ↓	100 •
C2 - Crooked River 2	41.7 ↑	41.7 ↓	100 •

0-24% compliance in red, 25-49% compliance in yellow, 50-74% compliance in green;
and 75-100% compliance in blue

↑ higher percentage of compliance than 2005-2006, ↓ lower percentage of compliance than 2005-2006

• same percentage of compliance as 2005-2006

The twelve sites sampled throughout the 2006 - 2007 period showed a significant decline in water quality in comparison to last years figures. Crooked River 2 was the site that showed the best water quality on sample days. A full outline of water quality in each catchment is shown below.

- **Minnamurra River Catchment**

Four sites are sampled within the Minnamurra River catchment. All of the sites complied 100% with secondary recreation values, but did not comply as often with primary recreation and ecosystem health values.

Minnamurra River 3, which is located in the estuary section of river, achieved the highest level of compliance for both ecosystem health (16.7%) and primary recreation values (58.3%). These results were still however, a decline in water quality than the previous period. Minnamurra River 1, which is located just below the Minnamurra Rainforest National Park, showed a large decline in ecosystem health from last years figure of 33.3% compliance to 8.33% for this reporting period. The compliance level for primary recreation (25.0%) remained stable with last years figure.

The remaining sites in the Minnamurra catchment both had poor water quality. Minnamurra River 2 achieved 0% for ecosystem health, which was a further decrease from last year. The primary recreation figure (33.3% compliance) was the same as last year, however the secondary recreation figure showed a small decline. Rocklow Creek 1 has remained consistent in its ecosystem health (0%) and secondary recreation (100%) compliance values, but has declined to 16.7% compliance for the primary recreation value. These results were all generally lower than the previous reporting period.

- Spring Creek Catchment

Two sites are sampled within the Spring Creek Catchment, in the upper catchment in the rural area of Jerrara and in the wetlands of the lower catchment, which also drains a small urban area. Both sites complied 100% of sample days with secondary recreation values.

Spring Creek 1 showed a slight decline for primary recreation when compared to the previous reporting period, from 50% in 2005-2006 to 41.7.0% this period. The value for Spring Creek 2 however, showed a significant increase to 66.7% compliance. The values for ecosystem health were quite poor, both declining to 8.33% compliance for Spring Creek 1, and for Spring Creek 2, a decline from 25% to 0% compliance.

- Kiama Catchments Draining to the Ocean

The site called Kendalls Beach Creek is an unnamed creek draining to Kendalls Beach, located in Bonaira Reserve. This creek drains a predominantly urban catchment and had a consistently low compliance for ecosystem health values (8.33%), (which was the same as the previous reporting period), and lower primary recreation (16.7%) and secondary recreation (83.3%) values than previously.

Munna Munnora Creek drains rural land as well as some urban areas and a caravan park, draining to Easts Beach. This site showed a decline in compliance rates, for both ecosystem health (0%), and significantly lower again, for primary recreation (16.7%). Both Kendalls Beach Creek and Munna Munnora Creek had only 83.3% compliance for secondary recreation.

- Werri Lagoon Catchment

Both sample sites in this catchment are located within Werri Lagoon, with drains both rural and urban areas. Werri Lagoon 1 and 2 had zero compliance rates for ecosystem health, which was a decline from the previous reporting period. Both sites also had lower compliance levels for primary recreation than last period (41.7% and 50% respectively). Werri Lagoon 1 received 100% compliance for secondary recreation, whereas Werri Lagoon 2, decreased this year to only 91.7% compliance.

- Crooked River Catchment

Both sample sites in this catchment are located in the estuary area, draining rural and urban areas. Crooked River 1 had a lower compliance level for ecosystem health than the previous reporting period, from 25.0% to 16.7%. Crooked River 2 however,

showed an increase in compliance from 16.7 % to 41.7%. Both Crooked River 1 and Crooked River 2, showed some decline in their primary recreation compliance levels from last years reporting period, from 75.0% to 50% and 66.7% to 41.7% respectively. Both sites achieved 100% compliance for secondary recreation.

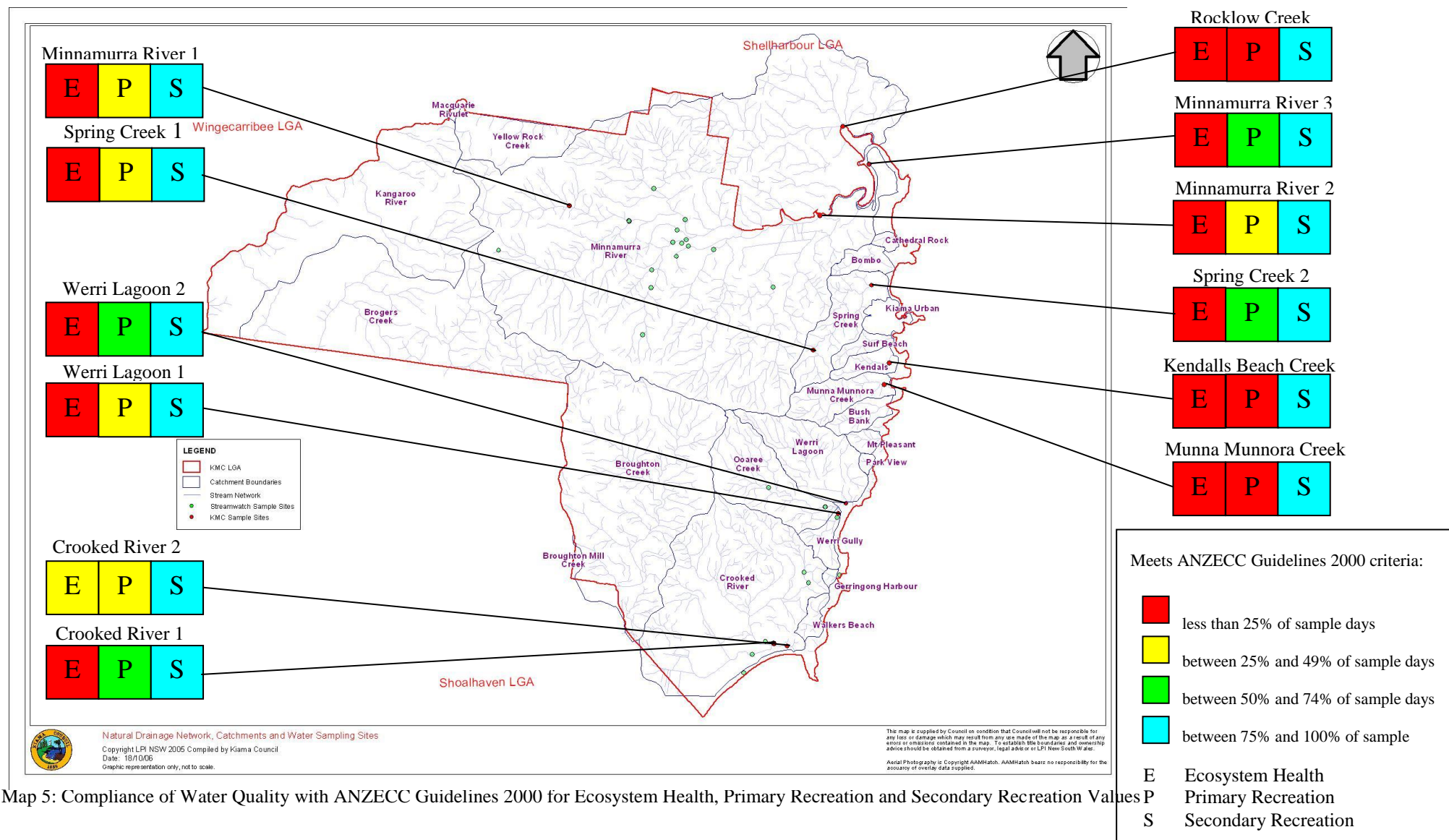
Discussion

Variations in water quality can be the result of factors due to naturally occurring environmental, and/or human influences.

Variance in dissolved oxygen and pH may be affected by whether the sample has been taken under standing or flowing water conditions. These may vary during the month according to whether rainfall has occurred, or if the river mouth is open, closed, or influenced by tidal fluctuation.

Algal growth can also play a role in pH values, with the photosynthesis of bacteria during the day causing the water to be slightly more acidic. Also during drought conditions, creek levels can lower and an influx of groundwater as baseflow may occur, which can also have an affect on the DO and pH. levels.

Nutrient pollutant levels will also vary due to the impacts of both point and diffuse sources within the catchment, such as fertiliser use, agricultural activities, wildlife, sewerage sources and landfill sites. Raised levels of bacteriological/faecal results may be due to leakages from septics/sewer into the coastal sand aquifer, or abundant bird life in the vicinity of the sampling. (Parisotto, D 2007)



3.1.2 Monitoring at Council Waste Disposal Depots

Council undertakes quarterly groundwater and surface water monitoring in and around its Waste Disposal Depot at Minnamurra and the site of the former Gerroa Waste Disposal Depot which is currently being remediated. This monitoring is being conducted in accordance with NSW Department of Environment and Climate Change Licences. 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.

3.1.3 Sydney Water Streamwatch Water Monitoring

Landcare Illawarra, Sydney Water Streamwatch and Council have formed a partnership to involve residents in water testing in the many catchments in the Kiama Municipality. There were over 30 participants from 4 separate networks, including the Jamberoo Valley, Kendalls Beach, Lands Edge, and Gerringong and Gerroa Streamwatch Water Monitoring Networks. Testing was undertaken at 30 different sites during 2006-2007. The participants collected 135 sets of data and these results are summarised in Table 5. The sampling sites are shown on Map 4. More information can be found at www.streamwatch.org.au.



Photo 1: Gerringong Gerroa Community Streamwatch

3.1.4 Beachwatch Monitoring

Sydney Water Corporation and the Department of Environment and Conservation undertake monitoring of beach water quality at Boyd's Jones, Bombo, Surf and Werri Beaches under the Beachwatch Program. From 1999-2007, most beaches monitored in the Kiama Municipality have generally recorded 100% compliance with Beachwatch criteria for both faecal coliforms and enterococci (note: only faecal coliforms are measured at Surf Beach). The compliance for 2006-2007 is shown in

Table 4, including the ranking of each beach in relation to the 18 Illawarra beaches that are sampled.

Table 4: Compliance and Ranking of Kiama Beaches for Summer 2006–2007
(Source: Department of Environment and Climate Change, 2007a)

Site	Compliance (%)		Overall ranking (out of 15)
	Faecal Coliforms	Enterococci	
Boyd's Jones Beach	100	100	1
Bombo Beach	100	100	1
Surf Beach, Kiama	100	100	1
Werri Beach	100	100	1

Figures 2 and 3 show the range of bacteria levels at all Illawarra Beaches during summer 2006-2007. These results show that the beaches of the Kiama Municipality are among the cleanest in the Illawarra.

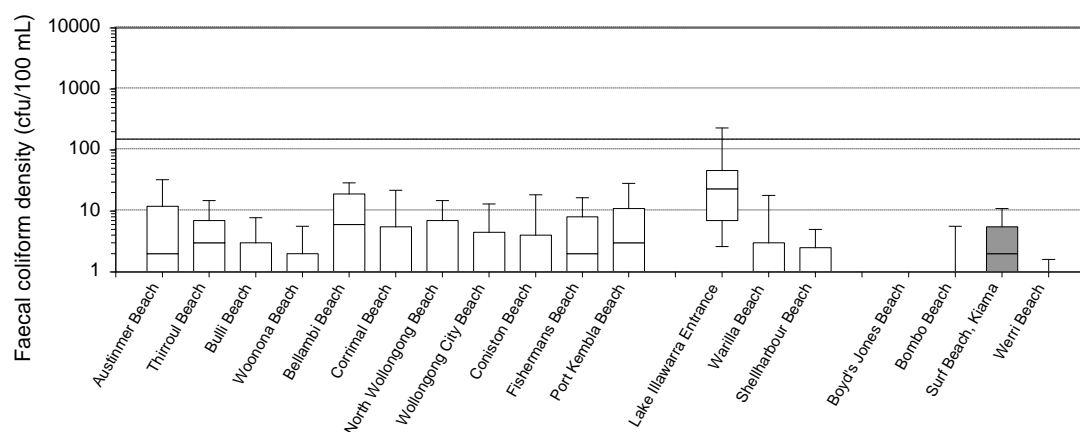


Figure 2: Range of Faecal Coliform Levels at Illawarra Beaches During Summer 2006-2007
(Source: Department of Environment and Climate Change, 2007a)

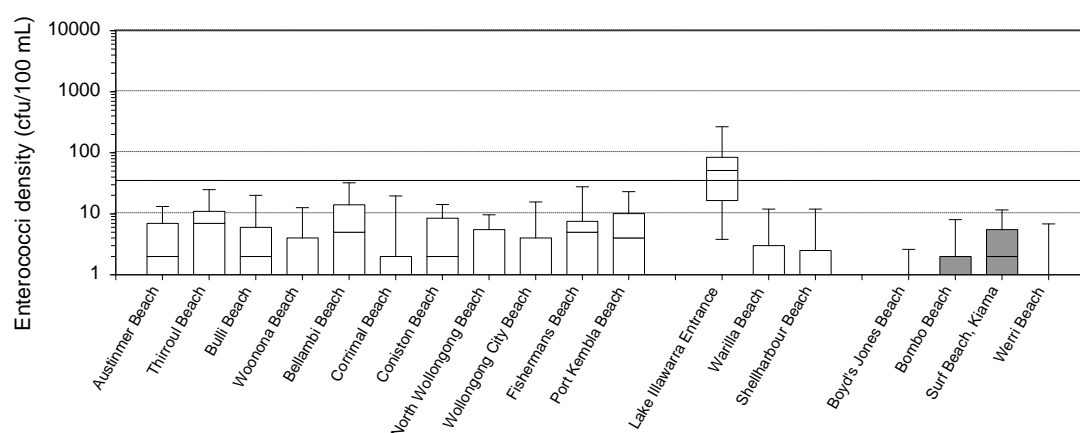


Figure 3: Range of Enterococci Levels at Illawarra Beaches During Summer 2006-2007
(Source: Department of Environment and Climate Change, 2007b)

Table 5: Streamwatch Community Monitoring Results 2006-2007									
Table shows % of results within ANZECC Water Quality Guidelines.									
0-24% red (very poor), 25-49% yellow (poor), 50-74% green (fair), 75-100% blue (good-excellent).									
(Source: Kilian, M. Sydney Water, 2007)									
Streamwatch Group	Testing Sites						Water Quality Parameters		
		DO	pH	Turb	EC	AP	Faecal Coliform Bacteria		
							Drinking (0 CFU/100ml)	Primary (150 CFU/100mL)	Secondary (1000 CFU/100mL)
Jamberoo Community Streamwatch Group (including Jamberoo Golf Course)	Colyers Creek @ Jamberoo Rd	50	100	100	100	0	50	100	100
	Frogs Hollow between 1 st and 18 th holes	25	50	100	75	0	0	100	100
	Hyams Creek @ Causeway	25	75	100	100	0	0	75	100
	Hyams Creek @ Wooden Bridge, Wyalla Rd	100	100	100	100	0	0	25	100
	Jamberoo Creek @ 6 th Tee	67	100	100	67	0	0	0	100
	Jamberoo Creek above town	25	75	100	75	0	0	100	100
	Jerrara Dam	0	100	100	100	0	0	100	100
	Minnamurra River @ Golf Course	40	60	80	100	20	0	80	100
	Minnamurra River @	75	100	100	100	100	25	88	100
	Byrnes Run Property								
	Stumps Creek, 16 th Hole Dam	33	33	100	66	0	0	33	100
	Turpentine Creek @ Nth Curramore Rd	0	20	90	30	50	30	70	80
	Upper Minnamurra 296	36	100	100	100	82	9	91	91
Gerringong & Gerroa Community Streamwatch Group	Blue Angle Creek @ Seven Mile Beach Caravan Park	0	83	100	NA	50	0	50	100
	Crooked River upstream of Gerroa Shores Caravan Park	0	66	100	NA	0	0	100	100
	Gerringong Boat Harbour Ocean Baths	0	90	100	NA	70	30	100	100
	Ooaree Creek @ Fern Street	20	70	90	NA	30	30	60	90
	Seven Mile Beach @ old tip site	0	90	100	NA	50	30	100	100
	Union Creek @ Parkes Street	0	14	57	57	0	14	100	100

Table 5: Streamwatch Community Monitoring Results 2006-2007									
Table shows % of results within ANZECC Water Quality Guidelines.									
0-24% red (very poor), 25-49% yellow (poor), 50-74% green (fair), 75-100% blue (good-excellent).									
(Source: Kilian, M. Sydney Water, 2007)									
Streamwatch Group	Testing Sites						Water Quality Parameters		
		DO	pH	Turb	EC	AP	Faecal Coliform Bacteria		
							Drinking (0 CFU/100ml)	Primary (150 CFU/100mL)	Secondary (1000 CFU/100mL)
	Union Creek below Elambra Estate	0	25	100	75	25	0	100	100
	Rose Valley Creek @ Rose Valley Road 2.3km west of princess highway	14	71	100	86	29	29	86	100
	Werri Lagoon at 115 Renfrew Road	38	88	100	NA	25	0	0	100
Kendalls Beach, Kiama Community Streamwatch Group	Bonaira Creek Lagoon @ South end of beach	100	80	100	NA	60	0	40	80
	Bonaira Creek in Bonaira Reserve	100	100	100	0	100	0	100	100
	Minnamurra River Tributary in wetlands near Thornett Way, Kiama Downs	36	46	91	NA	27	9	36	82
	Rocklow Creek near Minnamurra junction	0	0	100	NA	50	0	100	100
	Rocklow Creek near Princess Highway	0	86	100	NA	0	0	29	86
Lands Edge - Coastal Interpretation	Minnamurra River - Jamberoo	0	66	100	NA	66	100	100	100
	Minnamurra River - Princes Hwy	0	50	100	NA	50	100	100	100
	Minnamurra River - Rainforest	50	50	100	100	50	100	100	100

3.1.5 Water Consumption

Due to the drought conditions over the past few years, Sydney Water Corporation introduced Level 1 mandatory water restrictions in October 2003, Level 2 mandatory restrictions in June 2004 and Level 3 mandatory restrictions in June 2005. Despite these restrictions, the lack of rainfall has resulted in dam water storage levels in the Sydney Water Catchment decreasing from 67.4% in November 2002 to 53.1% at the end of this reporting period in June 2007 (Sydney Water Corporation – a).

Table 6: Dam Water Storage Levels
(Source: Sydney Water Corporation – a)

Date	Dam Water Storage Levels
November 2002 (Voluntary water restrictions introduced)	67.4%
October 2003 (Level 1 mandatory water restrictions introduced)	59.0%
End of June 2004 (Level 2 mandatory restrictions introduced 1 June)	47.9%
End of June 2005 (Level 3 mandatory restrictions introduced 1 June)	38.3%
End of June 2006	41.8%
End of June 2007	53.1%

Water consumption in the Kiama Municipality by property type is shown in Table 7. Residents in the Kiama Municipality used less water, when compared to areas in the Sydney Water region – using only 162,000 litres per household annually, which is a saving of 8000 litres from last year's figure of 170,000 litres. The Sydney wide annual average consumption for households was 222,000 litres (Casimir, S 2007).

Water consumption for Council's operations is shown in Figure 4. The amount of water consumed by the top 11 water using facilities is shown in Table 8. These facilities consumed almost 70% of the total volume of water in the baseline year of 2002-2003 (determined for the Water Saving Action Plans) and have specific action plans to address this water use in the adopted Water Saving Action Plans (see Section 3.3.8 for more information).

Table 7: Water Consumption by Property Type in the Kiama Municipality
(Source: Casimir, S. 2007)

Property Type	Total Consumption (kilolitres)	Average (kilolitres)
Commercial	277,736	1,111
Houses	1,066,850	162
Units/Flats	128,286	95
Industrial	7,757	298
Other	131,068	604
Total	1,611,697	2270

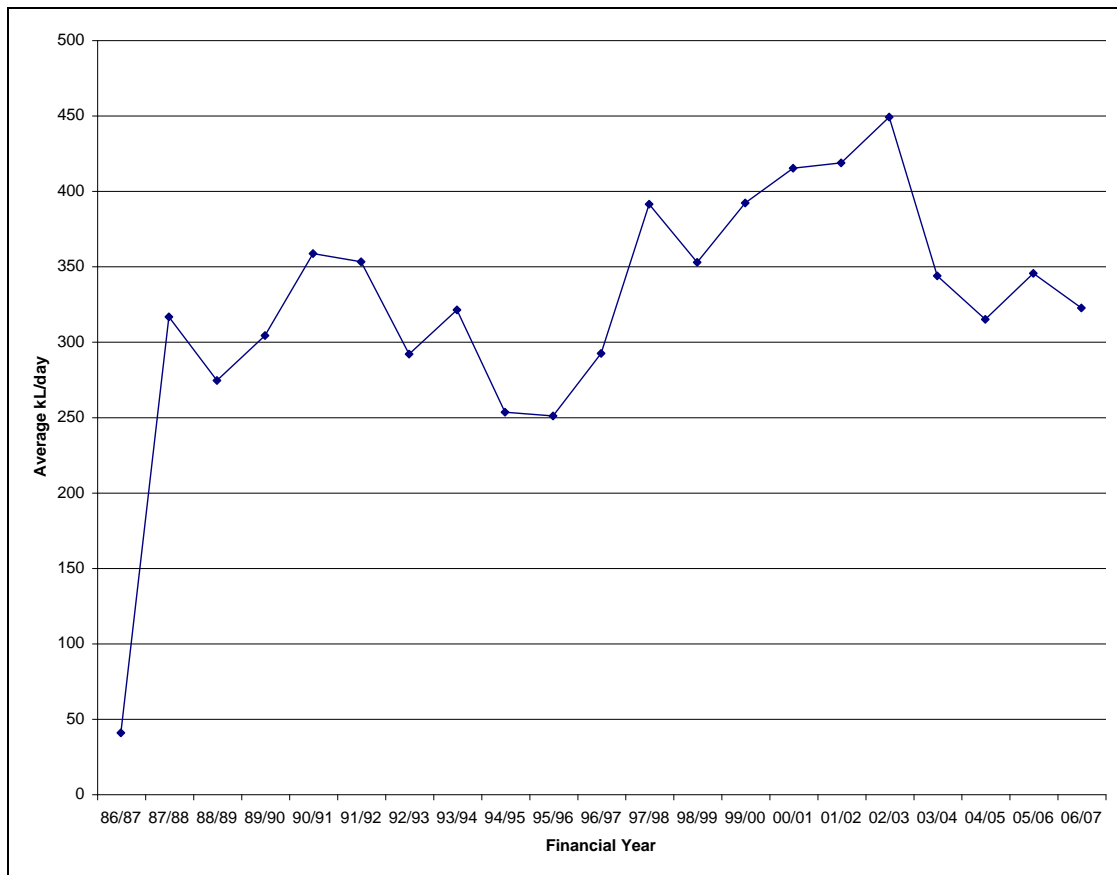


Figure 4: Total water consumption for Kiama Municipal Council 1986-2007
(Source: Casimir, S. 2007)

Table 8: Top Water Using Council Properties 2006-2007

Source: Water Saving Action Plans (Kiama Municipal Council, 2006 and Planet Footprint Oct 2007)

Rank	Site	Water Consumption (kL/yr)	
		2002-2003	2006-2007
1	Seven Mile Beach Holiday Park*	22,468	10,308
2	Werri Beach Holiday Park	15,856	10,267
3	Blue Haven Retirement Village (Nursing home and hostel)	11,158	11,236
4	Kiama Leisure Centre*	11,121	17,601
5	Surf Beach Holiday Park	11,092	8339
6	Kiama Sports Complex	8,815	1465
7	Kiama Harbour Holiday Cabins	8,231	5878
8	Blue Haven Retirement Village	8,028	10,949
9	Kendall's Holiday Park	7,911	11,257
10	Kiama Showground	7,088	2602
11	Kiama Council Works Depot	3,938	2328
Total		115,706	92,230

The comparison of these properties is testament to the Water Savings Action Plan that Council has been implementing. A saving of 23476 kL/yr in comparison to the 2002-2003 figures is a fantastic achievement. This has been due to several measures including:

- ❖ Installation of rainwater tanks at Council Works and Waste Depots, and Holiday Parks;
- ❖ Retrofitting of showerheads and handbasin taps in Council Reserves;

- ❖ Fixing of leaks detected by data loggers, that have been installed on the water meters of these properties

The exception to this is the Kendall's Beach Holiday Park, where an increase in water consumption can be attributed to an increase in the number of cabins, which have now replaced areas that were previously campsites.

Also, Stage 5 of the Blue Haven Retirement Village is now complete & incorporates rainwater reuse for toilet flushing.

The high usage figures for the Kiama Leisure Centre were due to a leak, that was detected by the data loggers that were installed on the meter. The leak has since been fixed, and the water consumption has decreased by approximately 5917 kL.

The restrictions placed on the watering of playing fields, have also contributed greatly to the declining consumption rates.

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, 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 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 sewerage 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 9).

The Jamberoo Sewage Scheme is now complete and properties have begun to connect to the scheme. Construction of this scheme has involved property works including the installation of collection tanks, construction of the township's reticulation system, construction of a sewage pumping station in Jerrara Road, construction of the eight kilometre transfer main linking the system to the Bombo STP and construction of a bio-solids tanks and mechanical works at the Bombo STP.

Table 9: Sewerage Treatment Plants in the Kiama Municipality
(Source: Sydney Water Corporation - b)

Treatment plant	Treatment level	Discharge (ML/day)	Equivalent estimated population	Discharge location
Gerringong-Gerroa	Tertiary (additional Phosphorus removal & ozonation, microfiltration, activated carbon & disinfection)	0.7	11,000	Reused for on-site agricultural irrigation. Excess is discharged to sand dune systems, once sand dunes reach capacity excess is discharged to Crooked River.
Bombo	Secondary & denitrification & disinfection	3.6	13,300	Shoreline -Headland north of Bombo Beach.

Sydney Water is encouraging remaining property owners who have not already connected, to connect to the sewerage system as quickly as possible to realise the environmental and public health benefits of the scheme. To date, more than 92 per cent of property owners have connected to the scheme.

Sewerage overflows, and bypasses of one or more process units, in the sewerage system can 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 effect depends on the volume and frequency of the overflows. Dry weather overflows also may 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 - c). Sydney Water Corporation is required to notify Council when any dry or wet weather overflows or bypasses occurs leading to the discharge of untreated or partially treated effluent. There were nine wet weather overflows at the Bombo STP compared to six for the previous reporting period (see Table 10). Council has not been notified of any overflows in the new Gerringong-Gerroa Sewerage Scheme since it commenced in 2002.

Table 10: Sewage Overflows/Bypasses in the Bombo Sewage Treatment Plant Catchment Area (Whittaker, G, 2007 pers comm.)

Year	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Wet Weather Overflows	8	4	2	10	6	9
Dry Weather Overflows	-	3	9	3	5	5
Total	8	7	11	12	11	14

3.2.3 On-site Sewage Management Systems

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

There are approximately 861 systems currently operating in the Municipality. When systems are not maintained or operated correctly, this can result in untreated effluent entering drains and waterways. Council has been implementing a program of OSSMS inspections (see below in Section 3.3.6) 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 for industrial and commercial activities to ensure water pollution is minimised or prevented and to promote stormwater reuse. From 1 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%. More information about BASIX can be found in Chapter 2: Land.

Some developments that involve vegetation clearing or that are near waterways require approval from the NSW Department of Environment and Climate Change. There were 6 developments that required such approval during the reporting period (there were 4 during the 2005-2006 period, 14 during 2004-2005, 28 during 2003-2004, 22 during 2002-2003 and five during 2001-2002).

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 and Climate Change 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 11. The number of complaints recorded during the last reporting period was significantly lower than in previous years.

Table 11: Complaints relating to Water Pollution (Council and the DECC)

Type of Complaint	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Water pollution complaints to DEC	14	9	6	7	10	11	16	6
Spill complaints to DEC	-	-	2	-	1	4	1	3
Water Pollution Complaints to Council	9	5	4	23	18	43	28	4
Total Water Pollution Complaints	23	14	12	30	29	58	45	13

During the reporting period, two cautions were issued at building sites for inappropriate sediment controls (three were issued in 2005-2006, two during 2004-2005, four during 2003-2004, two during 2002-2003 and three during 2001-2002).

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 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;
- Mitigation of stormwater impacts from current developments: all catchments.

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

- ✓ design work for structural measures for Surf Beach was completed;
- ✓ a program to investigate measures required to prevent pollution from slipway boat maintenance and boat refuelling was initiated;
- ✓ stormwater education campaign was developed as part of the *Stormwater pollutant control and riparian management in the Minnamurra Estuary* project (see Section 3.3.5 for more information); and
- ✓ a monitoring program of waterways to determine water quality was conducted (see Sections 3.1.1, 3.1.3 and 3.1.4 for more information).
- ✓ bank stabilisation work was undertaken along the foreshores of the Minnamurra River.

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.

The issues were grouped into management areas within the Estuary Management Plan, for which certain objectives were determined. The management areas are outlined below (for the full list of actions, please refer to CREMP – Kiama Municipal Council, 2003b):

- Water Quality;
- Nature Conservation;
- Sedimentation;
- Entrance Conditions and Flooding;
- Foreshore Access;
- Public Infrastructure; and
- Cultural Heritage.

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

- ✓ A *Water Sensitive Urban Design Policy* was adopted and implemented to incorporate water sensitive urban design for new urban areas (see Section 3.3.7 for more information);
- ✓ Streamwatch Community Monitoring was promoted and supported (see Section 3.1.3 for more information);
- ✓ Landcare projects conducted by volunteers were supported, including Streamwatch monitoring, feral animal eradication project, and Conservation Volunteers Australia projects (see Sections 3.1.3 and 5.3.8 for more information); and

- ✓ As part of the LEP review, riparian corridor management is being included and the inclusion of the Crooked River Estuary as a 'sensitive' environment is being considered, along with other areas throughout the Municipality.

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.

The plan includes seven main management issues which are outlined below (for the full list of actions, please refer to MREMP – Panayotou, 2003):

- Riverbank erosion and sedimentation;
- Water quality;
- Conservation;
- Road transport corridors;
- Entrance Stability;
- Land use management; and
- Recreation.

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

- ✓ *Bank Stabilisation Project* - During the reporting period, Council was successful in obtaining a grant from the NSW Estuary Management Program from the Department of Environment and Climate Change, and \$20000 from the Southern Rivers Catchment Management Authority to undertake further bank stabilisation works adjacent to the Charles Avenue Reserve, which has been identified as a high priority project in the Estuary Management Plan. Council has also contributed \$20000 of its own funds towards this work. The project was a continuation of previous works in the area and involved stabilising the toe of the bank using large rocks, reshaping the bank and planting with low growing native plants. The stabilisation works are now completed in that part of the estuary.
- ✓ *Stormwater pollutant control and riparian management in the Minnamurra Estuary* - Council was also successful in obtaining a \$19,830 from the Southern Rivers Catchment Management Authority's Coastal Protection Program - Estuary and Coastal Lakes Incentives. This estuary project is currently underway and will address the following:
 - Control of storm water pollutants including sediment, which are reaching the Minnamurra Estuary via the residential catchment of Charles Avenue, Minnamurra; and
 - Removal of weeds and replanting with riparian species at the Minnamurra boat ramp reserve on the South Eastern shore at Riverside Drive and on the Southern Headland at John Oates Reserve, Charles Avenue.

This will be achieved through:

- Placement of 6 enviropods at stormwater drains along Charles Avenue Minnamurra to trap pollutants including sediment;
- Weed management, planting and protection of mangroves and riparian species on South East shore at Riverside Drive, Minnamurra and southern headland at John Oates Reserve, Charles Avenue; and
- Stormwater education targeting builders and developers and residents in lower Minnamurra catchment.

✓ *Stormwater Pollutant and Riparian Management in the Minnamurra Estuary (Stage 2 Grant)* – Council was again successful in obtaining a second grant of \$11,800 from the Southern Rivers Catchment Management Authority's Coastal Protection Program - Estuary and Coastal Lakes Incentives. This estuary project is currently underway and will address the following:

- Protection of the mangroves and riparian species in the vicinity of Trevethan Reserve and the Minnamurra boat ramp, Riverside Drive, Minnamurra.

This will be achieved through:

- A clean up of the mangrove area around Trevethan Reserve, Riverside Drive, Minnamurra, as part of Cleanup Australia Day 2007;
- Community education and involvement, via a local newsletter and the formation of a community based environment group;
- Weeding and replanting of mangroves at the Minnamurra boat ramp at Trevethan Reserve, Riverside Drive, Minnamurra; and the
- Installation of bollards at the Minnamurra boat ramp at Trevethan Reserve, Riverside Drive, Minnamurra, to restrict vehicle access into mangrove area.

Previously,

✓ *Geomorphology of the Minnamurra River Estuary* - This project was undertaken by University of Wollongong PhD student Kate Panayotou, due to a need for sediment quality and quantity data was identified as part of the *Minnamurra River Estuary Management Study and Plan*. The overall findings were:

- As estuaries evolve there is a reduction in accommodation space and channels become confined and intertidal environments become more extensive;
- The reason why the estuary has acceptable trace metal concentrations is that the estuary has good tidal flushing;
- Dominant force in the estuary has changed from wave processes to tidal and fluvial processes;
- Estuary entrance is still influenced by all three processes and undergoes cyclical change of gradual pattern of accretion and erosion. However, the estuary mouth is highly unlikely to close as it is protected by Minnamurra

Headland and Stack Island and influenced by processes dominant enough to maintain entrance opening;

- Patterns and rates of sedimentation over 8000 years provided context for contemporary changes and management;
- Sedimentation rates are higher now but 90% of the estuary is infilled therefore approximately 90% of sediment load is bypassing and not depositing in the estuary; and
- Despite drought conditions the Minnamurra River estuary has remained open lending support to fact that wave-dominated estuaries can change into river-dominated status.

- ✓ As part of the LEP review, the revision of the ‘environmental protection’ and ‘high conservation area’ zoning classifications using vegetation mapping is being investigated.

3.3.6 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 on-site sewage management systems that operate in the Municipality have been risk classified based on their 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 *On-Site 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 on-site sewage management;
- Encourage and support land holders in adopting a sustainable approach through best practice on-site 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).

During the 2006/2007 reporting period, 348 On Site Sewage Management Systems were inspected. Of these, 327 were satisfactory, whilst 21 required remediation.

3.3.7 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*.

3.3.8 Water Saving Action Plans

As a requirement of the New South Wales Government's *Metropolitan Water Plan - Meeting the Challenges - Securing Sydney's Water Future*, which was released in October 2004, all Councils are required to prepare a *Water Saving Action Plan* for their operations, focusing on the high water using facilities.

During the reporting period, Council's plan was adopted by the NSW Department of Energy, Utilities and Sustainability for approval.

The Plan includes separate *Water Saving Action Plan* for the current 11 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;
- Kendalls Beach Holiday Park;
- Kiama Showground; and
- Kiama Works Depot.

There is also a section that outlines strategies that can be investigated and/or applied across the whole of Council's operations and facilities, including both structural and educational strategies.

A Water Conservation Reduction Target of 40% reduction by 2010 has been set, based on baseline consumption of the financial year 2002-2003. A Water Conservation Working Party has been established involving relevant staff to oversee the implementation and monitoring of the Action Plans.

During the reporting period, the following actions were implemented or commenced:

- ❖ Metering of the highest usage sites to detect leakages;
- ❖ All the taps / showers etc in all Council Reserves were fitted with water saving shower heads , push button taps, or appropriate water saving devices;
- ❖ Water tanks installed at Council Works Depot;
- ❖ Water tanks installed at Minnamurra Waste Depot;
- ❖ Literature in the cabins and amenities blocks, asking visitors to please inform the Holiday Park management of any leaks;

- ❖ Portable water tank mounted to the back of a trailer, which is filled with rainwater and can be used for the watering of gardens or washing down of cabins;
- ❖ Stage 5 of Blue Haven is now complete & incorporates rainwater reuse for toilet flushing.

3.3.9 Sydney Water Corporation's WaterFix Program

Sydney Water Corporation launched the Residential Retrofit Program in 2000, offering householders the opportunity to have a qualified plumber install water-efficient fittings and fixtures in their homes and repair minor leaks. In 2006, the program was re-launched under a new name, WaterFix, offering an enhanced range of water efficient products for new participants.

Program evaluations have shown that participating households save an average of 20,900 litres of water per year. Table 12 shows the number of participants in these programs since they commenced. The table also shows the number of participants in Sydney Water Corporation's other water saving programs: Do It Yourself kits, rainwater tank rebates, and washing machine rebates.

Table 12: Number of Households Participating in Sydney Water Corporation Programs
(Source: Gregory, J. 2007)

Program	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	Total
DIY Kits	0	0	0			452	115	134	701
RainWater Tank Rebate	0	0	0	8	29	147	280	240	704
Washing Machine Rebate	0	0	0	2	34		39	245	320
WaterFix	1123	115	547	21	284	39	278	260	2668
Total	1123	115	547	31	347	638	712	879	4393

3.4 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (including review of the Stormwater Management Plan, Minnamurra stormwater pollutant control and riparian management project, water quality monitoring);
- *Protection of the Environment Operations Act* implementation;
- *Stormwater Management Plan* - Install gross pollutant trap in the Surf Beach catchment at Farmer Street;
- *Stormwater Management Plan* – Continue to implement water saving and water quality facilities at Council Works Depot;

- *Minnamurra River Estuary Management Plan* – continue to implement strategies in respect to stormwater pollution control;
- Sewer Connection Program - Finalise the connection of all Council and/or private properties to the sewer in Gerringong and Jamberoo;
- Participate in and promote Sydney Water Corporation Wet Weather Overflow Abatement Program. (2008-2009 and 2009- 2010) (M);
- Implement educational programs and activities supported by Council in relation to aquatic systems;
- Implement the Water Savings Action Plan.

Potential Future Activities Beyond 2006-2007

(H – High Priority, M - Medium Priority, L – Low Priority)

- Ongoing implementation of the *Water Savings Action Plan* (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes);
- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2008/2009 and 2009/2010) (H).
- *Protection of the Environment Operations Act* implementation (2008/2009 and 2009/2010) (H).
- Complete the construction of the Surf Beach Catchment Stormwater Management Plan (2008/2009) (H).
- Implement water saving and water quality facilities at Council Works Depot (2008/2009) (H).
- Minnamurra River Estuary Management Plan - Carry out bank stabilisation work (2008/2009 and 2009/2010) (H).
- Develop an Environmental Sustainability Assessment Program, involving inspections of commercial and industrial premises and assisting the operators to meet their environmental obligations through educational material and advice. This will be incorporated as part of the regional Business Treading Lightly sustainable regional grant (2008-2009 and 2009-2010) (H);
- Implement Hindmarsh Park and Black Beach Stormwater Irrigation Reuse Scheme grant project (2008-2009) (H)
- Seek funding for the continuation of the *Minnamurra Bank Stabilisation Project* (H);

- Continue to implement a Clean Waters Program, including involvement of community volunteers, and addressing stormwater education and water quality issues, building on the Minnamurra Estuary Project (H);
- Seek funding assistance for priority water conservation projects (H);
- Undertake investigations of flood risk and coastal hazards associated with potential climate change and prepare a *Floodplain and Coastal Hazard Management Plan* (M);
- Install litter traps in Jamberoo, Minnamurra and Kiama townships and undertake accompanying educational projects as part of the Clean Waters Program (M);
- Seek funding for stage 3 of the *Stormwater pollutant control and riparian management in the Minnamurra Estuary* Project (M);
- Further promote participation of schools, community groups and residents in the Streamwatch program, including further catchments in the Kiama Municipality (M).

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 5.

The most common environmental issue that Council and the Department of Environment and Climate Change are contacted about is noise. The main noise pollution issue that Council is contacted about is barking dogs.

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

Type of Complaint	1999 - 2000	2000 - 2001	2001 - 2002	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007
Industrial Noise Complaints to the DEC	6	2	11	9	15	19	13	8
Rail Noise Complaints to RailCorp	0	1	0	0	-	3	0	
Industrial Noise Complaints to Council	1	3	3	17*	5	0	0	0
Commercial Noise Complaints to Council	2	-	1		6	7	7	5
Residential Noise Complaints to Council	7	9	10		3	23	11	8
Construction Noise Complaints to Council **	-	-	-		6	5	2	3
Council Plant Vehicle Noise to Council **	-	-	-		6	3	1	4
Animal Noise complaints to Council	63	63	45	37	27	32	31	49
Total Noise Complaints	79	78	70	63	68	92	65	77

*The breakdown of complaints to Council (ie industrial, commercial, residential) was not available for this reporting period.

** This category of complaints was not recorded separately in earlier reporting periods.

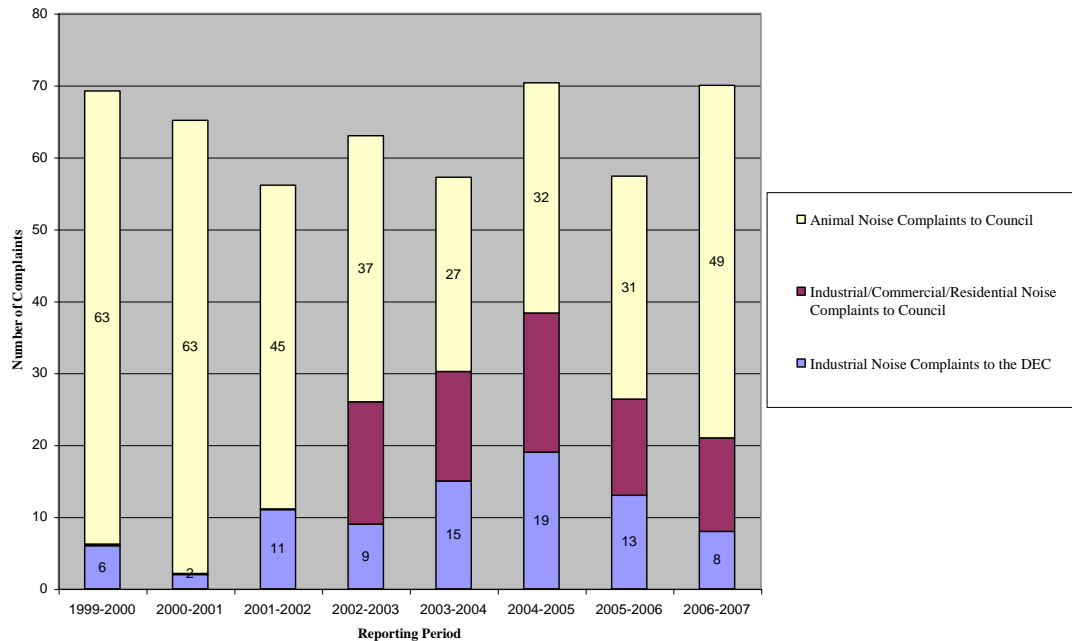


Figure 5: Noise Complaints within the Kiama Municipality

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, Gainsborough, 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.

While there was a noise impact during the construction of the North Kiama Bypass, the road is complete and it will result in noise reduction within the Minnamurra, Gainsborough and Kiama Downs areas.

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 5, noise from residential sources is the most common noise complaint in the Kiama Municipality, including barking dogs (the most common), 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 may also 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. The *NSW Environmental Criteria for Road Traffic Noise* includes criteria for assessing road traffic noise from road developments (Department of Environment and Conservation, 2004).

4.3.2 Enforcement

Council's Environmental Health Officers and Rangers investigate complaints received by Council relating to noise pollution, and the Department of Environment and Conservation 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 2000. 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.

In June and July 2007, the Department of Environment and Climate Change NSW (DECC) sought community comment on the proposed Protection of the Environment Operations (Noise Control) Regulation 2007. The aim of the review is to update the Regulation and provide simple, straightforward and enforceable noise controls that match community expectations.

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 no Nuisance Dog Orders for barking dogs issued within the reporting period.

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 14). There are also restrictions on car and house alarms (Department of Environment and Conservation, 2004).

Table 14: Hours of Restricted Use of Certain Equipment
(adapted from Tables 4 and 6, Department of Environment and Conservation, 2004).

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)	Between midnight and 8.00 am on any day
Air conditioners (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

4.1 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- *Protection of the Environment Operations Act* implementation.

Potential Future Activities Beyond 2007-2008

(H – High Priority, M - Medium Priority, L – Low Priority)

- *Protection of the Environment Operations Act* implementation (2008/2009 and 2009/2010) (H);
- Incorporate noise attenuation design requirements in the review of Development Control Plans (H);
- Implement an education program to further address noise from barking dogs and other noise sources (M);

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

Vegetation mapping of the Kiama Local Government Area was undertaken by Kevin Mills and Associates during 2003-2004. The maps have since been digitised and included in Council's Geographic Information System. Accompanying the mapping was the report *The Natural Vegetation in the Municipality of Kiama New South Wales* (Kevin Mills and Associates, 2006a). The vegetation communities are shown in Map 6.

Under the NSW *Threatened Species Conservation Act 1995*, Kiama Local Government Area is identified as containing the Endangered Ecological Communities listed in Table 15, which is adapted from the vegetation report (Kevin Mills and Associates, 2006a). These communities are shown in Map 7. Map 8 shows the Core Conservation Areas identified by Kevin Mills in the vegetation report.

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).

5.1.2 Species Diversity - Flora

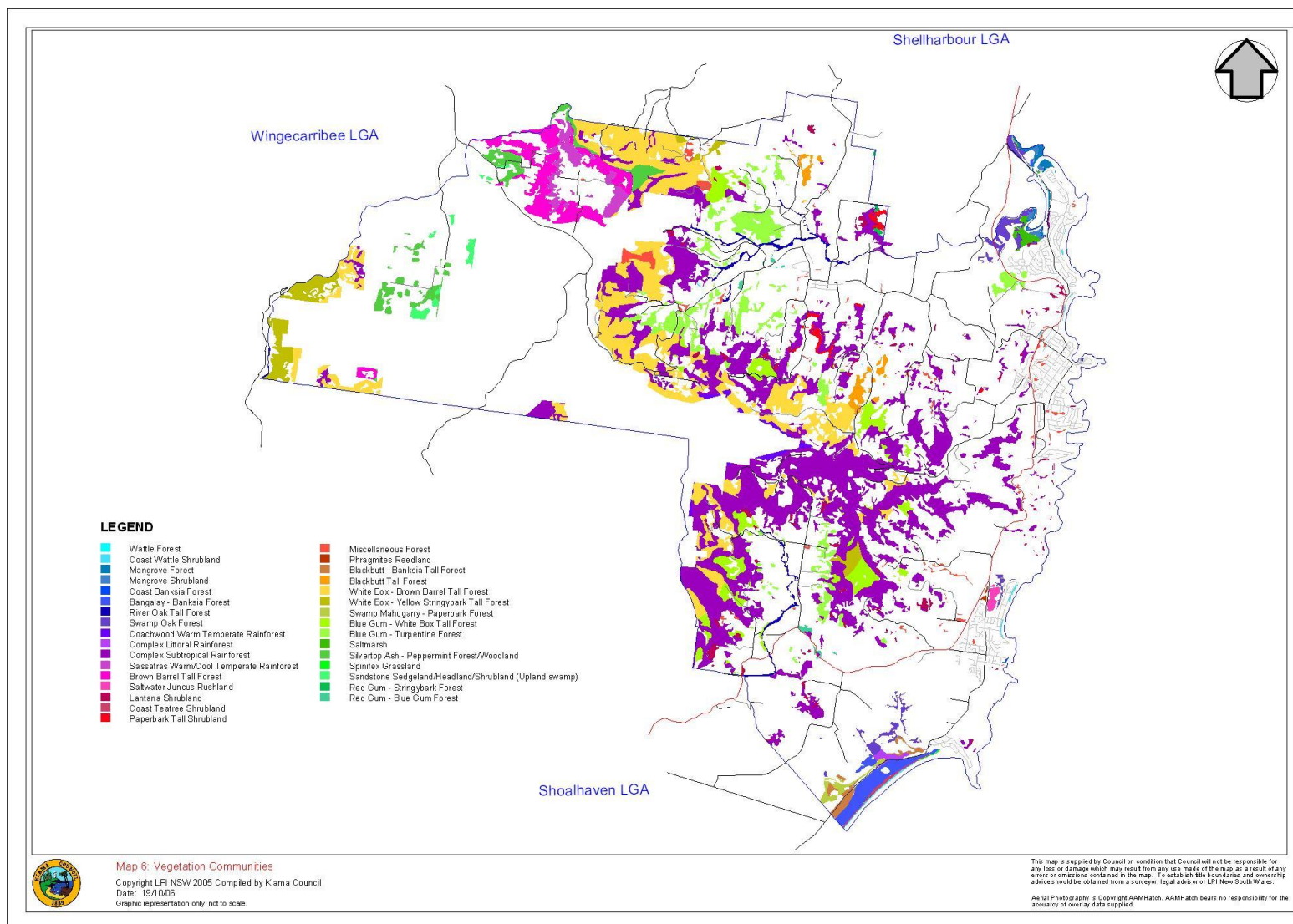
According to the Atlas of NSW Wildlife (Department of Environment and Climate Change - a), there are 284 known flora species within the Kiama Local Government Area. The Atlas of NSW Wildlife indicates that eight plant species within the Kiama Local Government Area are listed as threatened species in 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
(Kevin Mills and Associates, 2006)

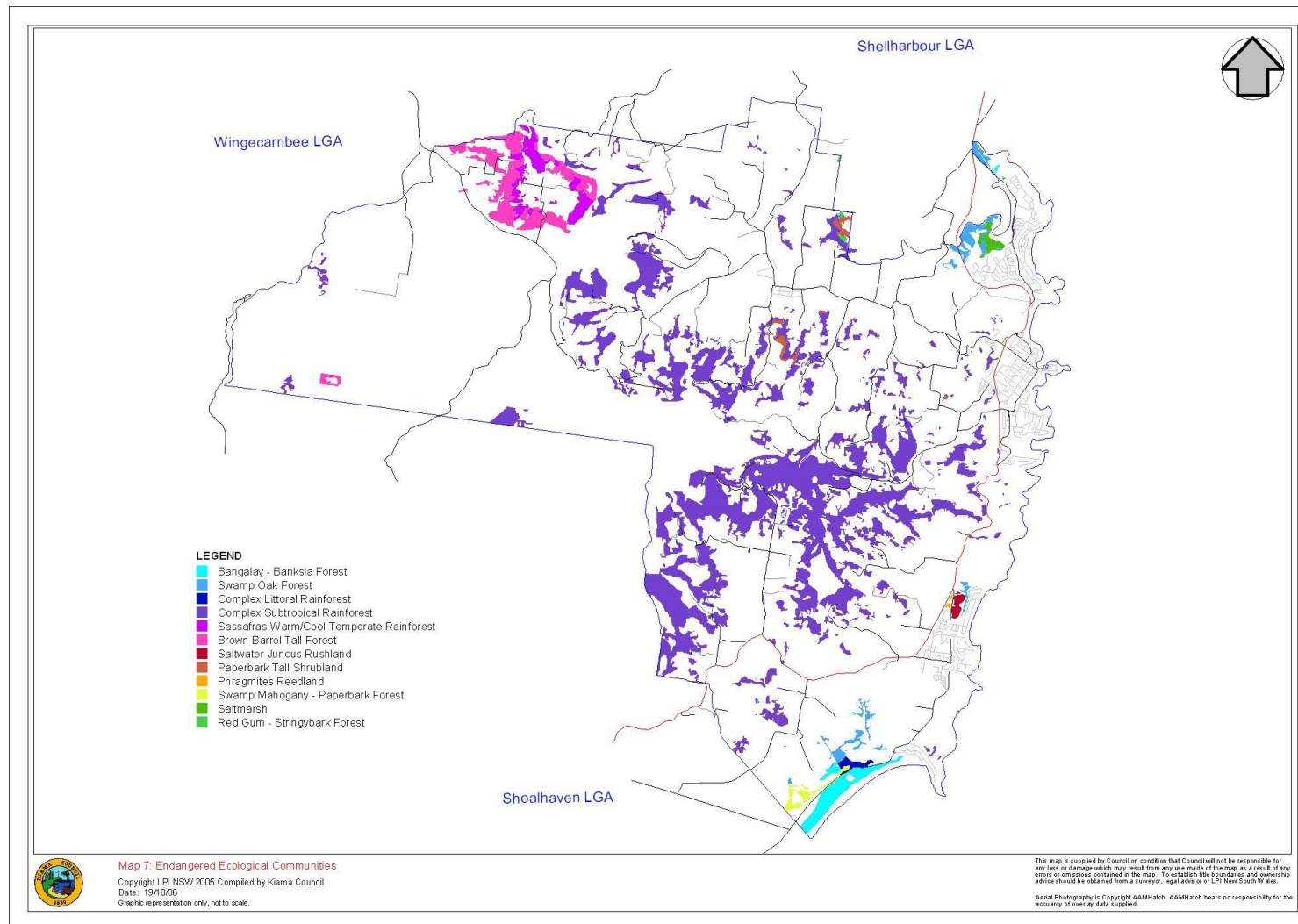
Endangered Ecological Community	Kiama Vegetation Map Equivalent	Site Example in Kiama
Rainforests		
Robertson Rainforest	1.7 Sassafras Warm/Cool Temperate Rainforest (DOR-WRF)	Knights Hill area
Illawarra Sub-Tropical Rainforest	1.1 Complex Subtropical Rainforest (COM-SRF)	Extensive on escarpment slopes
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
Shrublands		
<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

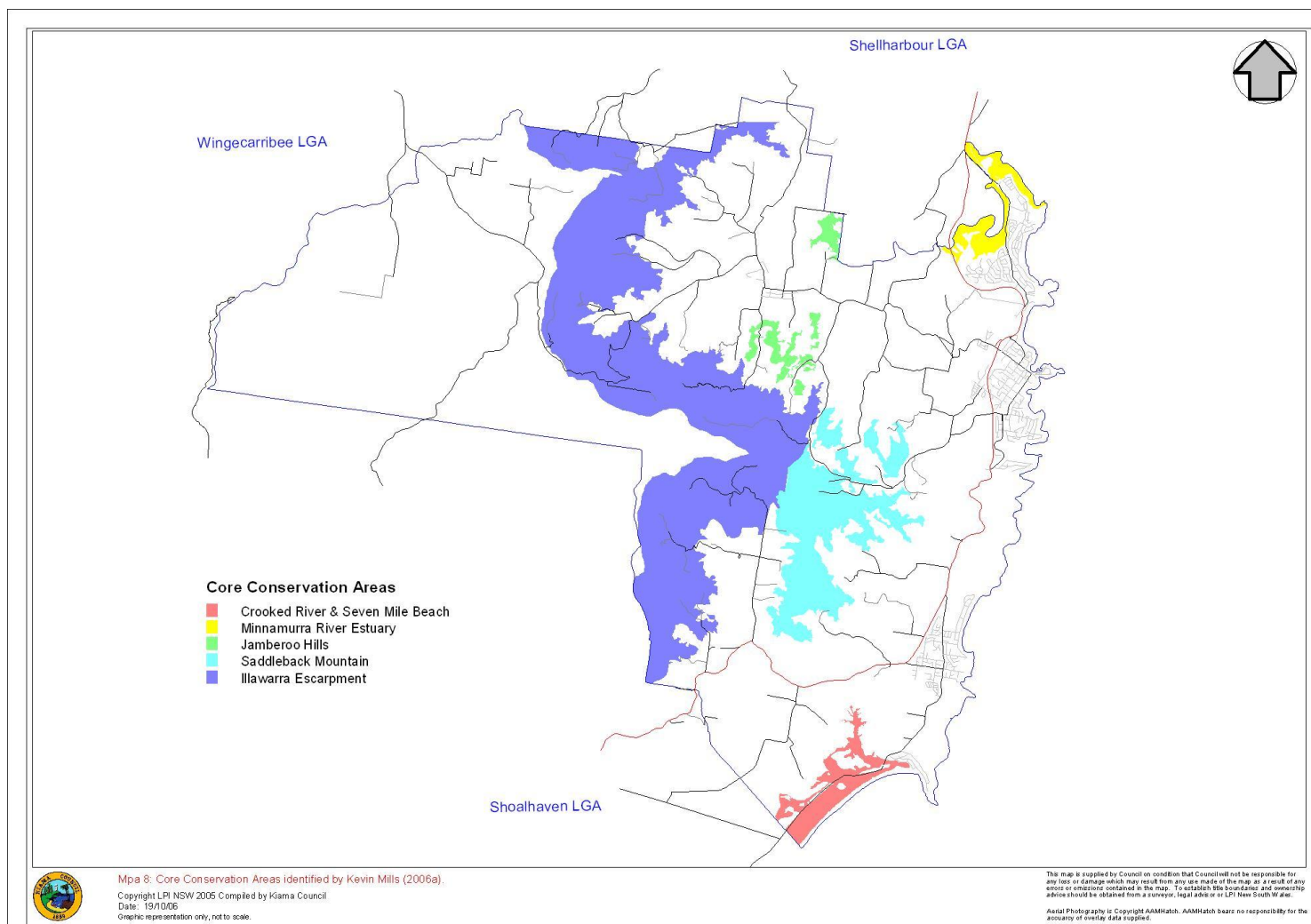
Common Name	Species Scientific Name	Legal Status TSC Act 1995	Legal Status EPBC Act 1999
White Flowered Wax Plant	<i>Cynanchum elegans</i>	Endangered	Endangered
Illawarra Irene	<i>Irenepharsus trypherus</i>	Endangered	Endangered
Not known	<i>Pterostylis pulchella</i>	Vulnerable	Vulnerable
Carrington Falls Grevillea	<i>Grevillea rivularis</i>	Endangered	Endangered
Illawarra Zieria	<i>Zieria granulata</i>	Endangered	Endangered
Pink Rice-flower	<i>Pimelea spicata</i>	Endangered	Endangered
Illawarra Socketwood	<i>Daphnandra sp.C</i>	Endangered	Endangered
Carrington Falls Pomaderris	<i>Pomaderris walshii</i>	Critically Endangered	Critically Endangered



Map 6. Vegetation Communities



Map 7: Endangered Ecological Communities



Map 8: Core Conservation Areas Identified by Kevin Mills (2006)

5.1.3 Species Diversity - Fauna

According to the report *The Fauna of Kiama: Municipality of Kiama, South Coast, New South Wales* (Kevin Mills and Associates, 2006b), which compiled lists of fauna from a variety of sources, there are 496 species occurring in the Municipality, including mammals, birds, frogs, reptiles and freshwater and estuarine fish.

The Atlas of NSW Wildlife indicates that 36 animal species 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). Some of these animal species are also listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). An additional 23 threatened species have been listed by Kevin Mills and Associates Pty Limited (2006b) which have not been identified in the Atlas as occurring in the Municipality. These additional species include threatened fish (listed under the *Fish Management Act 1994*), some marine mammals and oceanic birds, and species that have only been recorded a small number of times. All of these species are shown in Table 17.

Table 17: Threatened Fauna Species

Common Name	Species Scientific Name	Legal Status TSC Act 1995	Legal Status EPBC Act 1999	Source
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 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	# ^
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Vulnerable	Vulnerable	# ^
Large-footed Myotis	<i>Myotis adversus</i>	Vulnerable		#
Long-nosed Potoroo	<i>Potorous tridactylus</i>	Vulnerable	Vulnerable	# ^
Southern Brown Bandicoot	<i>Isodon obesulus</i>	Endangered	Endangered	# ^
Southern Right Whale	<i>Eubalaena australis</i>	Vulnerable		#
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered	# ^
Yellow-bellied Glider	<i>Petaurus australis</i>	Vulnerable		# ^
Yellow-bellied Sheathtail 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	# ^
Red-crowned Toadlet	<i>Pseudophryne australis</i>	Vulnerable		# ^
Threatened Fish				
Grey Nurse Shark	<i>Carcharias taurus</i>	Endangered*	Critically Endangered	#
Great White Shark	<i>Carcharodon carcharias</i>	Vulnerable	Vulnerable	#

^ Listed in the NSW Atlas of NSW Wildlife (DECC)

Listed in Kevin Mills and Associates (2006b)

* Status under the NSW *Fish Management Act 1994* (DPI)

Table 17: Threatened Fauna Species (continued)

Common Name	Species Scientific Name	Legal Status TSC Act 1995	Legal Status EPBC Act 1999	Source
Threatened Terrestrial Birds				
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Vulnerable		# ^
Barking Owl	<i>Ninox connivens</i>	Vulnerable		# ^
Black Bittern	<i>Ixobrychus flavicollis</i>	Vulnerable		# ^
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Endangered		# ^
Eastern Bristlebird	<i>Dasyornis brachypterus</i>	Endangered	Endangered	# ^
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable		# ^
Ground Parrot	<i>Pezoporus wallicus</i>	Vulnerable		# ^
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable		#
Olive Whistler	<i>Pachycephala olivacea</i>	Vulnerable		# ^
Osprey	<i>Pandion haliaetus</i>	Vulnerable	Listed migratory species	#
Pied Oystercatcher	<i>Haematopus longirostris</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		#
Sooty Owl	<i>Tyto tenebricosa</i>	Vulnerable		# ^
Sooty Oystercatcher	<i>Haematopus fuliginosus</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		#
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable		# ^
Threatened Oceanic Birds				
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		#
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		#
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		#

^ Listed in the NSW Atlas of NSW Wildlife (DECC)

Listed in Kevin Mills and Associates Pty Limited (2006b)

* Status under the NSW Fish Management Act 1994 (DPI)

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 Sedgeland, Fresh Juncus Rushland and Cambungi Reedland are found around farm dams and sometimes across low-lying floodplains (Kevin Mills and Associates Pty Limited, 2006a).

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 and weed invasions.

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 18, with those processes that have been newly listed during the reporting period identified with an asterisk (Department of Environment and Climate Change - b, Department of Primary Industries - a and Department of Environment and Heritage).

Table 18: 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 longwall 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
Exotic Vines and Scramblers	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)	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

* processes newly listed during 2006-2007

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'.

During the reporting period, the Illawarra District 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:

- Eleven (11) Regional Management Plans were endorsed - Serrated Tussock, St Johns Wort, Lantana, Lantana (Biocontrol), Aquatic Noxious Weeds, African Lovegrass, Bitou Bush, Giant Parramatta Grass, Groundsel Bush, Gorse and Blackberry. All plans were funded as requested except for St Johns Wort, African Lovegrass and Blackberry.

- Local Weed Control Programs for private landholders and government agencies have continued to be given high priority with 113 property inspections being undertaken over the past 12 months within the Kiama LGA.
- 2 Nurseries and aquaria outlets were also inspected over the past year.
- The two (2) major water catchments, namely Crooked River and Minnamurra River were also inspected along their length to ensure no new (aquatic) weed incursions.
- Improved co-operation between stakeholders is being addressed through representation on four (4) regional committees.
- Education and publicity activities have continued to be given high priority through ongoing utilisation of the media and participation in community events. Two (2) displays were held over the last 12 months with three (3) media releases, one (1) talk to a staff training group, and three (3) electronic media interviews.
- Operational programs have continued to be maintained, expanding as time and resources permit, thereby complementing the inspectorial program and allowing the Authority to continue to lead by example.
- All Council lands previously known to be infested with Class 2 weeds[^] were inspected at least twice by 30 April 2007. No Class 2 weeds were recorded on Council owned lands over the past 12 months.
- All Council lands with infestations of Class 3 weeds^{^^} were inspected and treated at least once over the last 12 months.
- 61% of all rural roads and 31% of public reserves were inspected and treated for one or more noxious weed by 30 June 2007. A further 7% of public reserves were inspected however no noxious weeds were identified. Two (2) non rural roads were also treated for noxious weed infestations.
- 14ha of heavy infested or otherwise inaccessible Bitou Bush at Werri Beach and Walkers Beach cliff line reserves were controlled by aerial spraying.
- Specifically, all Bitou Bush on Council controlled lands was inspected and treated by 30 October 2006. All known Gorse, Serrated Tussock, and Giant Parramatta Grass infestations were inspected and treated twice by 30 June 2007. Known St Johns Wort and African Lovegrass infestations were controlled by 30 November 2006.
- Vacant Crown Land funding of \$2,710.00 was received to undertake weed control work at Werri Beach and Walkers Beach cliff line reserves, and at Seven Mile Beach. An additional \$5,000.00 was received under the Defeating the Weed Menace program to control Lantana at Jerrara Dam arboretum

where it is impacting on the biodiversity of threatened species and communities at this site.

- All known new noxious weed incursions were inspected and treated by 30 June 2007.(Pomery, D 2007)

^ Class 2 weeds include Salvinia and Alligator Weed.

^^ Class 3 weeds include Giant Parramatta Grass, Gorse, Groundsel Bush, St Johns Wort, Mysore Thorn and Water Hyacinth.

Table 19: 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 subspecies rotunda</i>		4
Black knapweed	<i>Centaurea nigra</i>	A	1
Blackberry	<i>Rubus fruticosus (aggregare. species)</i>	A	4
Boneseed	<i>Chrysanthemoides monilifera subspecies monilifera</i>		4
Bridal creeper	<i>Asparagus asparagoides</i>	A	5
Broomrapes	<i>Orobanche 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 subspecies 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 (except native Species C. Australia, C. tasmanica and . Victoriana)</i>		5
East Indian hygrophila	<i>Hygrophila 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
Lantana	<i>Lantana species</i>	A	5
Long-leaf willow	<i>Ludwigia longifolia</i>	A	5
primrose			

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

Table 19: Noxious Weeds in the Illawarra District Noxious Weeds Authority Control Area (continued)

Common name	Scientific name	All of NSW Declaration	Category
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</i> and varieties (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</i> except <i>O. ficus-indica</i>	A	4
Red rice	<i>Oryza rufipogon</i>	A	5
Rhus tree	<i>Toxicodendron succedaneum</i>	A	4
Rubervine	<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>Picnemon 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>Limnocharis flava</i>	A	1
Yellow nutgrass	<i>Cyperus esculentus</i>	A	5

Class 1: State Prohibited Weeds;

A: All of New South Wales Declaration

Class 2: Regionally Prohibited Weeds;

Class 3: Regionally Controlled Weeds;

Class 4: Locally Controlled Weeds;

Class 5: Restricted Plants.

5.2.3 Bushfire

Bushfire is also a significant threat to biodiversity. According to the Kiama/Shellharbour District Rural Fire Service, there were 17 vegetation fires in the Kiama and Shellharbour areas within the reporting period, which was the same as last year and considerably less than previous years (17 in 2005-2006, 24 in 2004-2005, 62 in 2003-2004, 46 in 2002-2003, 154 in 2001-2002) (Bushby, D. 2007).

5.2.4 Tree Lopping or Removal

Removal of trees, or major portions of trees, can have major impacts on biodiversity. Tree lopping is prohibited 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* 1996. 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 480 permits issued to remove or lop trees, which is a similar amount to last year's 520 permits, but significantly less than the 560 issued in 2004-2005, the 750 issued in 2003-2004, and the 1150 issued in 2002-2003.

5.2.5 Road Crossings as Fish Barriers

The Department of Primary Industries (Conservation and Agriculture) has implemented an Environmental Trust Project: "*Reducing the Impact on Road Crossings on Aquatic Habitat in Coastal Waterways – Southern Rivers, NSW*" to identify and prioritise all road crossings that were acting as fish passage barriers within the Southern Rivers Catchment Management Authority area. This study assessed and prioritised barriers in terms of their impact on aquatic biodiversity, benefits should the structure be remediated and the ease of structure remediation (Department of Primary Industries, 2006).

The study identified Kiama Local Government Area as having 16 potential fish passage obstructions, including bridges, culverts and causeways. The study recommends that 10 of these should be remediated, including two high priority sites:

- Frys Creek at Minnamurra Falls Road which is a bridge/causeway – it recommends that the causeway be removed and the footings of the bridge be reinstated; and

- an unnamed tributary to Crooked River at the Princes Highway which is a culvert pipe – it is recommended a low flow channel and remove debris (Department of Primary Industries, 2006).

5.3 Responses

5.3.1 Development Control

Council's existing LEP 1996 provides for specific measures to control the impact of human activities upon local biodiversity within designated High Conservation Value Areas and land within Rural Environmental Zones 7b (Estuarine Wetlands), 7b1 (Wetland Buffer), 7d (Scenic), 7e (Hinterland), 7f (Foreshore Protection) and 7l (General). The LEP is currently being reviewed and is looking at more innovative planning controls to help protect the natural and built environment.

The NSW *Threatened Species Conservation Act 1995* provides for the protection of threatened species and their habitats, including threatened species of plants and animals and endangered 'populations' and 'ecological communities'.

The Schedules to the Act list the threatened species, populations and ecological communities and key threatening processes, as determined by a special Scientific Committee (see above in the Section 5.1: State for the threatened species and communities listed under this Act in the Kiama Local Government Area).

This legislation was reviewed in 2004 with the amendment aiming to establish better frameworks and processes so that landholders, developers, farmers, community groups and government agencies can more effectively contribute to protecting the State's biodiversity.

The Threatened Species Conservation Amendment Act 2004 puts greater emphasis on land-use planning which focuses on the protection and restoration of native vegetation and threatened species habitat and can allow Council LEPs to be certified under the Biodiversity Certification Program (Department of Environment and Conservation – c)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* focuses on 'matters of environmental significance' and puts in place an environmental assessment and approvals process (Australian and New Zealand Environment and Conservation Council, 2001). Matters of environmental significance include threatened animal and plant species and ecological communities, which are listed by the Commonwealth Minister for the Environment on the advice of a specialist committee (Department of Environment and Heritage).

Proposed developments in the Kiama Municipality that are likely to have a significant impact on matters of national environmental significance must be referred by the proponent to the Department of Environment and Heritage for Commonwealth approval in addition to a development approval by Council. Council is also obliged to refer an action that itself proposes to take if it is likely to have a significant impact on

matters of national environmental significance (Department of Environment and Heritage).

5.3.2 Threatened Species Recovery Plans

Council is a member of the Illawarra Regional Threatened Flora Recovery Team which is convened by the NSW Department of Environment and Climate Change. The Regional Recovery Team is developing and reviewing Recovery Plans for six threatened flora species within the Illawarra Region: Pink Rice-flower (*Pimelea spicata*), Illawarra Granulata (*Zieria granulata*), White Flowered Wax Plant (*Cynanchum elegans*), Illawarra Greenhood Orchid (*Pterostylis gibbosa*), Illawarra Socketwood (*Daphnandra Sp C*), and Illawarra Irene (*Irenepharsus trypherus*). During the reporting period, a Recovery Plan has been prepared for *Pimelea spicata*.

Previously, the NSW Department of Environment and Climate Change prepared and implemented Recovery Plans for listed threatened species, populations and ecological communities, and Threat Abatement Plans for key threatening processes. As the number of listed species, communities and processes increases, it was instead decided to prepare a *Priorities Action Statement* (PAS). The 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 www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_recovery_new. There are 19 recovery strategies listed in the draft PAS that refer to threatened species within the Kiama Local Government Area, including 272 priority actions (Department of Environment and Climate Change – d).

5.3.3 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 new system includes the use of a computer modelling program called the *PVP Developer*. The PVP Developer 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).

5.3.4 Supply of Trees

During the reporting period, Council had 4 plant sales and issued approximately 800 plants.

5.3.5 Roadside Vegetation Management Plan

During the reporting period, the Roadside Vegetation Plan was completed. Council had received funding from the Roads and Traffic Authority Roadside Environment Committee via the Southern Rivers Catchment Management Authority to assist with the preparation of this plan. The primary objective of the plan is 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. Training of all staff was undertaken, with maps and a summary of the document issued to specific staff.

5.3.6 Training Workshops – Communications Toolkit Training

Kiama Municipal Council, in partnership with the Shoalhaven Bushcare Group and supported by funding from the Southern Rivers Catchment Management Authority, ran a training workshop in April 2007. The topic was ‘Communications Toolkit Training’, and covered all areas of how to make Landcare and Bushcare groups more effective through communication skill development. The workshop was aimed at Landcare and Bushcare Groups, but all interested members of the community were welcome.

5.3.7 Council Rehabilitation Projects

Council Rehabilitation Projects

Council has continued to implement rehabilitation projects within parks, reserves and beaches within the Municipality. During the reporting period, bush regeneration and removal of noxious weeds was undertaken at Spring Creek Wetlands Reserve and at Jerrara Dam Reserve.

5.3.8 Other Rehabilitation Projects in the Kiama Municipality

Community Rehabilitation Projects

Many community groups have undertaken a range of rehabilitation projects throughout the Municipality. These active environmental groups, include Bombo Headland Landcare, Bombo Outlook Landcare, Byrne’s Run Landcare, Foxground Landcare, Gerroa Environment Protection Society, Jamberoo Mountain Landcare,

Jamberoo Valley / Minnamurra River Landcare, Minnamurra Environment Group, Seven Mile Beach Dunecare, Spring Creek Environment Group, Upper Minnamurra Rivercare, Wallaby Hill Landcare, Wallace Creek Landcare and Werri Beach Dunecare.

Feral Animal Control – Landcare Illawarra Project

Landcare Illawarra has been working on a Feral Animal Control Program with funding from the National Landcare Program. The program has covered a large portion of the Municipality including Foxground, Toolijooa, Broughton Village, Gerroa, Gerringong and surrounds. The aim of the program was to implement humane and effective methods of controlling feral animals, including trapping, shooting and baiting.

From the period of May 2005 to the end of October 2006, 136 landholders were involved in a Pest Animal Control Program that covered 3126 hectares. During this period 171 fox, 7 deer, 19 goats and 1 feral cat were culled. Some 45 landholders conducted a further cull using recreational hunters, which covered another 2894 hectares. This saw the eradication of 148 foxes, 2 deer, 38 goats and 10 feral cats. There were 37 landholders that did not participate, leaving an area of 848 hectares which was not managed for pest control. (Mathie, B 2007)

Assistance from Kiama Council's Ranger Services and GIS staff was much appreciated.

The program will be continued in the Jamberoo area in future years by the Moss Vale Rural Lands Protection Board.

Foxground Landcare Group – Madeira Vine Eradication

The Foxground Landcare Group has had the eradication of Madeira Vine in their sights for the past couple of years. With funding obtained from the Environmental Trust Grants extending into 2007, they will continue their agenda of making Foxground, a Madeira Vine free zone. (Mathie, B 2007)

Gerringong Gerroa Community Engagement Project – Landcare Illawarra Project

Landcare Illawarra has developed a project that encourages resources, including labour, to be shared through a local Landcare network. The Gerringong Gerroa Community Engagement Project includes partners Landcare Illawarra, Council, Southern Rivers Catchment Management Authority, Berry Primary School, Kiama Primary and High Schools, Boolarng-Nangamai Aboriginal Studio, Gerringong Garden Club, Kiama Community Services Association and Ratepayers Association, Werri Beach Dunecare, Gerringong Lions Club, Gerringong Community Streamwatch Conservation Volunteers Australia, and Kiama Council. These partners share resources between themselves and with individuals for many environmental projects.

Some of the work undertaken this year by this energetic and diverse group, included an Expo, seed collection activities, a seed propagation workshop, educational material

including a Rainforest Restoration Information Pack, and a Seed Collecting Calender. The contact for this group is Mike Swanson on 4256 9599. (Plunkett-Cole, N, 2007)

Revive Werri Lagoon – Conservation Volunteers Project

At this critical time of drought, dwindling water resources and increasing awareness of the impact of climate change, the role of wetlands to our environment has never been more important. Revive our Wetlands is the largest national wetlands revival program in Australia, developed by Conservation Volunteers Australia and BHP Billiton. Here in the Kiama Municipality, Revive our Wetlands has undertaken significant conservation work at Werri Lagoon.

Werri Lagoon at the northern end of Werri Beach, Gerringong, comprises an extensive lowland swamp and estuarine lagoon covering an area of 46 hectares. The catchment of the lagoon is mainly farmland, with some urban areas around the southern side. Werri Lagoon is protected under SEPP 14 (wetlands of State significance) and includes an area of Coastal Saltmarsh adjoining the Western boundary of the lagoon which has been declared as an endangered ecological community under the Threatened Species Conservation Act 1995 (NSW).

Working in partnership with the Southern Rivers Catchment Management Authority, the Werri Beach Dunecare Group, Kiama Municipal Council, local farmers and residents, Revive our Wetlands has facilitated over 350 volunteer days working in the Werri Lagoon catchment during the last year. The work undertaken has included planting of over 500 native plants, Streamwatch water quality monitoring, removal of over 1ha of invasive weeds, seed collection and photopoint monitoring, every second Wednesday and the first Saturday of each month.

Over the next year, the Revive our Wetlands program will expand to include the planting of 6000 native plants along the banks of Ooaree Creek and wetland education opportunities for local primary and secondary schools either within the classroom or onsite at Werri Lagoon. To get involved or for more information, go to www.conservationvolunteers.com.au, email wollongong@cva.org.au or phone 02 42289246. (Byrne, J, 2007)



Photo 2. Community tree planting at the mouth of Werri Lagoon.

5.4 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (including Threatened Species Recovery Plan actions);
- Tree Preservation - Assess applications for tree removal or pruning in accordance with Council's *Tree Preservation Order*;
- Noxious Weed Management - Provide funding for the operation of the IDNWA;
- Noxious Weed Management - Control noxious weeds through the implementation of the IDNWA Programs;
- Ensure the ongoing implementation of the *Roadside Vegetation Management Plan*.
- Implement educational programs and activities supported by Council in relation to biodiversity;
- Community Lands - Continue the development of educational reserve sites at: Spring Creek Wetlands, Jerrara Dam Arboretum and Bonaira Native Gardens.

Potential Future Activities Beyond 2008-2009

(H – High Priority, M - Medium Priority, L – Low Priority)

- Ongoing implementation of the *Roadside Vegetation Management Plan*. (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes);
- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2008/2009 and 2009/2010) (H);
- Tree Preservation - Assess applications for tree removal or pruning in accordance with Council's *Tree Preservation Order* (2008/2009 and 2009/2010) (H);
- Noxious Weed Management - Provide funding for the operation of the IDNWA (2008/2009 and 2009/2010) (H);
- Noxious Weed Management - Control noxious weeds through the implementation of the IDNWA Programs(2008/2009 and 2009/2010) (H);
- Review and implement the relevant recovery strategies listed in the Department of Environment and Climate Change's draft *Priority Action Statement* that refer to threatened species and threatening processes on Community Land (H);
- Community Lands - Continue the development of educational reserve sites at: Spring Creek Wetlands, Jerrara Dam Arboretum, and Bonaira Native Gardens (2008/2009 and 2009/2010)) (M).
- Support and participate in Landcare Illawarra, Conservation Volunteers Australia and Southern River Catchment Management Authority projects within the Kiama Municipality (M);
- Undertake education programs on biodiversity issues including riparian management and threatened species (M);
- Where possible, provide plants, promotion and/or funding to landholders and schools to undertake bush regeneration projects (L);
- Undertake a survey of regeneration works that are being undertaken on private land (L);
- Conduct workshops for Community Groups and interested residents on appropriate topics such as backyard biodiversity, propagation and indigenous sites (L).

Chapter 6: Waste

6.1 State

Kiama Municipal Council operates the Minnamurra Waste Disposal and Recycling Centre. The facility includes a Materials Recovery Facility for the sorting of recyclable materials from the domestic recycling collection service and a Revolve Recycling Centre incorporating green waste mulching and compost processing scrap metal, waste paper, oils and glass recycling and a second hand good reuse centre. Putrescible waste is now disposed of at Shellharbour City Council's Dunmore Waste Disposal Depot.

Rehabilitation works at the Minnamurra Waste Disposal facility were completed during the reporting period in accordance with the Closure Plan prepared for the site. This included reshaping of the site, application of the clay liner, gas collection system and commencement of grass seeding at the site.

Rehabilitation works have been completed at the site of the previous Gerroa Waste Disposal Depot with ongoing maintenance including weeding, mowing, watering and planting continuing during the reporting period

Southern Councils commissioned a regional facilities and services report for the Council areas from Wollongong to Bega. This report was adopted by Kiama Council and will involve the investigation and establishment of regional facilities for organics and residual waste treatment.

During the next reporting period, expressions of interest will be sort for treatment options and facilities for green waste and or residual waste.

6.2 Pressures

6.2.1 Pressures from Waste Generation

The amount and type of waste generated by the community places pressure on the available landfill space. Both population growth and 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 reuse facilities.

The estimated total waste generated during the reporting period was 10 744.7 tonnes, of which 5487.05 tonnes, or 51.06%, was recycled.

This figure is lower than previous reporting periods, as it does not include waste from residents of the Kiama municipality, that is now taken and disposed of at the Shellharbour City Council waste facility. This data is not available.

The other matters that have contributed to these variations include:

- ❖ The closure of the Minnamurra Revolve Recycling Centre and Secondhand Goods Reuse Centre and only small loads of green waste and sorted recyclables are now being accepted at Kiama Council's Waste Facility.

- ❖ All small loads of household and commercial waste were diverted to the Shellharbour City Council waste facility.

During the 2006-2007 reporting period, the total waste disposed of at the Shellharbour City Council facility was 5257.65 tonnes made up of the following:

❖ Urban/Rural garbage collection services	3 618T
❖ Streets/Parks/Reserves/Commercial Waste	807.01T
❖ Litter/Waste collection from Footpaths/Parks/Reserves	53.72T
❖ Urban Kerbside Clean Up Waste	<u>271.45T</u>
	4750.18T

During the reporting period, 5487.05 tonnes of materials were recycled at the Minnamurra Waste and Recycling Facility consisting of the following types and tonnages:

❖ Commercial Recycling	370.34T
❖ Kerbside Recycling	2129.69T
❖ Rural Recycling	108.54T
❖ Drop Off Centre Recycling	16.27T
❖ Steel	273.21T
❖ Green Waste Drop Off	890.0T
❖ Green Waste Kerbside Collection	<u>1699.0T</u>

During the 2006-2007 period, 10,744.70 tonnes of waste was received, including 5487.05 tonnes at the Minnamurra Depot and 5257.65 tonnes transferred to Shellharbour City Council Waste Disposal Depot. The amount of waste that was recycled/reused or sent to landfill is shown in Table 20 and Figure 6. The proportion of waste that was recycled or reused decreased somewhat to 51.1%.

Table 20: Waste Received, Recycled and Disposed of in Landfill 1999-2007

Year	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Total tonnage of waste received	29,531.26	24,247.22	39,900.57	29,004.55	16,196.88	17,538.49	10,744.70
Total tonnage recycled or reused (% recycled)	18,845.75 (63.8)	13,962.44 (57.6)	27,479.93 (68.9)	19,154.74 (66.0)	9,488.61 (58.6)	9,958.51 (56.8)	5487.05 (51.1%)
Total tonnage sent to landfill (% to landfill)	10,686 (36.2)	10,285 (42.4)	12,420.64 (31.1)	9,849.81 (34.0)	6,708.61 (41.4)	7579.95 (43.2)	5257.65 (48.9%)

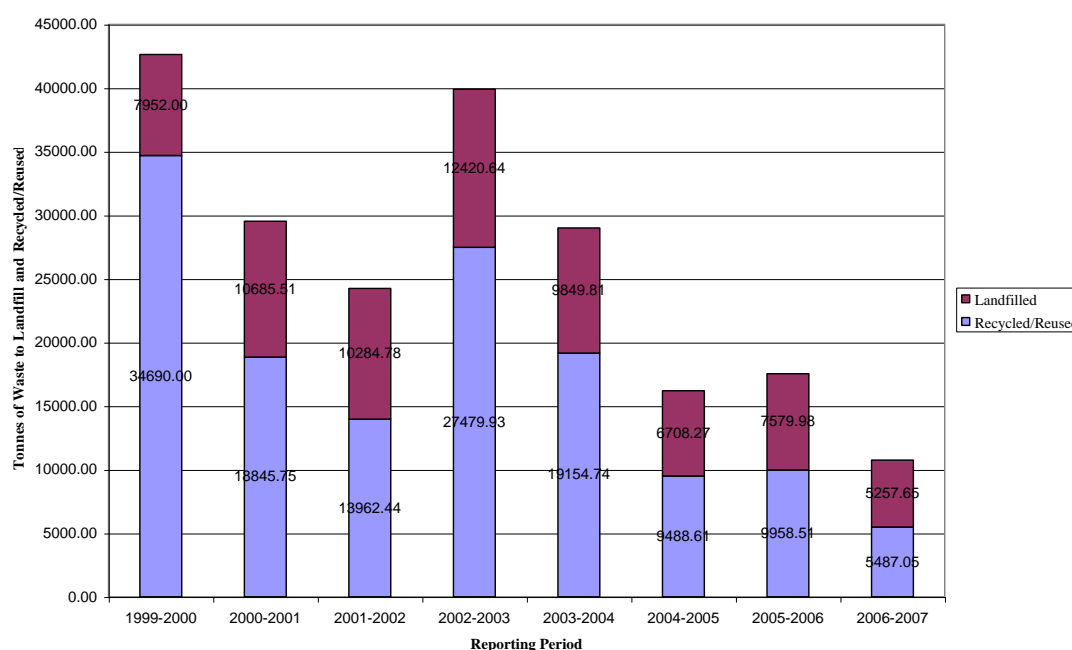


Figure 6: Waste Recycled/Reused and Disposed to Landfill 1999-2007

The materials that are recycled or reused included greenwaste, soil, paper and cardboard, bricks, concrete, tiles, steel, waste oil, timber offcuts, glass, secondhand goods and all materials collected in the domestic weekly recycling collection.

6.2.2 Pressures from Waste Management

The Minnamurra, and the former Gerroa, Waste Depots are located within sensitive areas close to wetlands and beaches and there are potential impacts such as ground water contamination, odour, greenhouse gas emissions, weeds, noise, and feral animals as a result of the operation of the facilities. The closure of these facilities involves comprehensive rehabilitation and ongoing maintenance of the sites.

6.2.3 Illegal Waste Disposal

Illegal dumping of waste such as building and demolition waste, greenwaste, 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.

During the reporting period, Council investigated nineteen littering and eleven illegal dumping complaints.

6.3 Responses

6.3.1 Development Control

The *Development Control Plan (DCP) No 25 - Planning For Less Waste* was adopted by Council in March 2004. The DCP focuses on the building and demolition industries and aims to reduce the demand for waste disposal facilities in Kiama Municipality. The objectives of the plan are:

- to maximise reuse and recycling of building and construction materials and minimise disposal of materials;
- to encourage selective and/ or complete deconstruction of buildings rather than outright demolition;
- to facilitate improved project planning and management with the aim of delivering efficient use of resources, efficient building techniques and minimisation of waste;
- to encourage demolition, construction and subdivision techniques which minimise waste; and
- to foster the principles of Ecologically Sustainable Development.

Development applications must include a Waste Minimisation and Management Plan, and a Waste Compliance Certificate is required to be submitted as a condition of consent outlining quantities of materials reused, recycled or disposed.

During the reporting period, statistics were recorded regarding building and construction waste from the 90 finalised 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 3694.516 tonnes. Of this 1008.248 tonnes (27.29%) was reused or recycled and 2686.268 tonnes (72.71%) was disposed to landfill including asbestos.

This represents a much lower rate of recycling and reuse, when compared to the previous reporting period. These figures only cover developments over \$5,000 and do not include exempt development.

Table 21: Tonnes Reused, Recycled or Disposed to Landfill - Building and Construction Waste

Material Type and Fate	Total Tonnage
On-site Reused Timber	9.65
On-site Reused Bricks	9.61
On-site Reused Fill	160.002
On-site Reused Green Waste	5.4
Off-site Recycled Timber	5.591
Off-site Recycled Bricks	146.96
Off-site Recycled Concrete	98.11
Off-site Recycled Fill	512.33
Off-site Recycled Green Waste	7.78
Off-site Recycled Metals	3.51
Off-site Recycled Plaster Board	9.745
Off-site Recycled Other	39.56
Disposed to Landfill	2679.548
Disposed Contaminated Material - "Asbestos"	6.72
TOTAL ON-SITE REUSED	184.662
TOTAL OFF-SITE RECYCLED	823.586
TOTAL DISPOSED	2686.268

6.3.2 Introduction of new green waste bin service

Due to Occupational Health and Safety requirements, Kiama Municipal Council decided to change its current green waste collection system from bundles and bags to a 240 litre bin system.

The new green waste service commenced in October 2006 and is collected on a fortnightly basis on the alternate week to the recycling.

With the delivery of the new green waste bin a Green Waste Information Kit was provided contained within an environmentally friendly car litter bag. The kit contained:

- “What CAN and CANNOT be placed in your Green Waste Bin” sticker. This replaced the pages in the current Waste and Recycling Guide.



Waste and Recycling Guide



**Page to replace with enclosed
sticker**

- Changes to the Minnamurra Waste and Recycling Depot. As the landfill site at Minnamurra has reached capacity, from 9 October, 2006, the Minnamurra Waste and Recycling Depot will only accept green waste, recyclable materials, scrap steel, scrap metal and waste oil. All other materials will need to be taken to the Dunmore Resource Recovery Centre, Shellharbour.
- A guide showing the required 300mm distance between your bins for collection.
- Where does your Recycling Go? This provides information on what happens to your recyclables. We have also included some handy waste tips. Please take the time to read through this brochure and adopt these tips in your home.

6.3.3 Benefits of Recycling

The total amount of recyclables collected by Council from the urban and rural residential sector for 2006-2007 was 2,238.23 tonnes. This represents a 4.24% increase on the 2005-2006 figure of 2147.16 tonnes.

A further 659.82 tonnes of recyclable materials were recycled from commercial premises (370.34 tonnes) and 289.48 tonnes including scrap steel (273.21 tonnes) was recycled at the Minnamurra Waste and Recycling Centre.

A total of 2589 tonnes of green waste was diverted from landfill. 1,699 tonnes of green waste was collected from the fortnightly urban kerbside service and a further 890 tonnes was received at the Minnamurra Green Waste Recycling Centre.

When the total recycled tonnage figure is entered into the Department of Environment and Conservation's *Environmental Benefits of Recycling Calculator* (Department of Environment and Climate Change, 2006 - 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 5487.05 tonnes of total waste recycled, this equates to:

- 15,121 m³ of landfill space saved;
- 2,755 tonnes CO² equivalent total greenhouse benefits;
- 662 cars being removed from the road;
- 91,383 gigajoules of energy savings;
- 4230 households' annual electricity requirements;
- 90,884 megalitres of water savings (36 Olympic swimming pools or 1,652 backyard swimming pools).

For 2589 tonnes of green waste diverted from landfill this equates to:

- 7,135 m³ of landfill space saved;
- 1300 tonnes CO² equivalent total greenhouse benefits;
- 312 cars being removed from the road;
- 43,118 gigajoules of energy savings;
- 2000 households' annual electricity requirements;
- 42,883 megalitres of water savings (17 Olympic swimming pools or 780 backyard swimming pools).

6.3.4 Kiama's recycling program Highly Commended at Keep Australia Beautiful Awards

Kiama Council was Highly Commended at the Keep Australia Beautiful Tidy Towns Awards held on Friday, November 3, 2006 in Singleton.

Kiama Municipal Council won the highest award allocated to the 2007 category of Waste Minimisation for its Recycling Programs and Services.

Kiama's submission was based upon Council's Waste Minimisation Program, which incorporates three complimentary components:

1. The introduction of a 240L fortnightly recycling service to replace the old "divided bin" system;
2. The conversion of decommissioned divided bins into reusable products such as water tanks and compost units and;
3. The creation of "Responsible Waste Kits" for rental holiday accommodation.

The benefits of Council's Waste Minimisation programs include:

- An increase in collected recyclables;
- A decrease in waste going to landfill;
- Improved awareness through educational materials;
- Increased composting and water reuse due to conversion of old bins;
- Less organics to waste;
- Increased partnerships with local business groups and holidaymakers.

These innovative programs have been very successful and the excellent range of supporting printed materials have played an important role in encouraging community participation. Uptake has been estimated at 98% further demonstrating the success of the programs with excellent outcomes across all aspects of the strategy. The Keep Australia Beautiful Awards are a great opportunity to raise awareness about pressing environmental issues.

The Award recognizes Council's work in the area of Waste Minimization and the emphasis that Kiama Council places on environmental responsibilities.

6.3.5 Public Place Recycling Trail

As part of Kiama Municipal Council's initiative to further reduce waste going to landfill, Council joined forces with the Department of Environment and Conservation and the Australian Food and Grocery Council Packaging Stewardship to conduct a public place recycling trail at the Kiama Sporting Complex.

"Don't Waste Our Sportsgrounds" campaign, commenced November, 2006 as part of National Recycling Week.

The trail saw the installation of recycling bins as a permanent fixture. A total of four permanent bin banks within the sporting grounds and one permanent bin bank located to left of the main entry into the Kiama Leisure Centre were installed. A bin bank comprises of 1 x 240L yellow lidded recycling bin and 1 x 240L red lidded garbage bin for non-recyclables/waste.

In addition, *for canteen use only*, Council provided one 240L red top garbage bin for waste AND two 240L yellow top recycling bins for paper and cardboard only. These were positioned behind the back door of the canteen, under the stair well.

To cater for periods of large crowds ie. Carnivals, two sets of bins (consisting of a 240L yellow lid recycling bin and a 240L garbage bin) were provided. These spare mobile units can be positioned within the grounds in areas deemed necessary. When not in use, the bins were then stored under the stair well located at the back of the canteen.

As part of the campaign, signage was clearly displayed on the bins identifying what can and cannot be recycled with additional signage displayed on the kiosk walls.

All of the bins are serviced by Kiama Municipal Council as part of its existing waste services.

Council sought the assistance of the sporting clubs who use this sporting facility in complying with the new recycling facilities. This involved:

- Recycling all aluminium cans, plastic and glass drink bottles/milk containers and cardboard boxes.
- Clean up litter at the end of the game.
- Advertising the NEW recycling bins and litter clean ups through your newsletter, and at the game, over the P.A. system.
- For canteen staff, using the two small bins installed within the kiosk – one for recycling and one for garbage and ensure these are emptied into the appropriate 240L bins located at the back of the canteen at the end of the day.

To ascertain the success of this campaign, regular waste audits have been conducted by Council throughout the summer season. The audits provided the necessary information to identify problems or areas for improvement, support education and communication with users of the sporting grounds and to provide positive feedback on recycling achievements.

In March 2007, a waste audit was conducted results showed, on average, a total of 6,000litres (378kg) of recyclables were recovered from this site over a 3 month period.

As a result of the success Kiama Municipal Council received from this trail, Council is keen to further this program to other key sporting areas within the municipality.

6.3.6 \$18,500 grant funding received to conduct Butt Littering Program

This project was as a result of Kiama Council's recent successful submission for funding to the independent Butt Littering Trust. Council was one of nine successful submissions to the Trust, which will see a total of \$309,000 invested in addressing the problem nationwide during summer 2007.

Kiama Council's received \$18,500 grant funding to conduct a Butt Littering Program within the Kiama CBD. The program was broken into two phases:

Phase 1:

The outdoor dining sections of restaurants, cafes, pubs and clubs were identified as key hot spots for smokers. To control the amount of cigarette butt litter that is discarded inappropriately within these areas, Council spearheading an intensive butt littering campaign within the Kiama CBD during January – March 2007.

100% of the food outlets that cater for outdoor dining implemented the program; in total 20 establishments. Each of these establishments received a comprehensive tool kit to assist in keeping Kiama "Butt Free". The kit included:

- Serviettes with the “Keep Kiama Butt Free”. Butt It, Then Bin It message
- Coasters with the “Keep Kiama Butt Free”. Butt It, Then Bin It message
- Windproof ashtray with the “Keep Kiama Butt Free”. Butt It, Then Bin It message
- Long handled dustpan and broom with the “Keep Kiama Butt Free”. Butt It, Then Bin It message
- Door mat (measuring 88cm x 48cm) with the “Keep Kiama Butt Free”. Butt It, Then Bin It message
- Posters for displaying in your establishment’s window
- A supply of personal ashtrays to give away to patrons



Other components of this campaign included:

- Installation of additional permanent ash bins within the Kiama CBD
- Comprehensive media coverage with radio and print

Phase II to be conducted November-December 2007

Installation of inscribed pavers with the “Kiama Butt Free” message at each of the identified smokers seating area.



- Working with Council holiday parks and Surf Lifesaving Clubs staff to distribute giveaways to the general public during holiday period
- Conducting face to face surveys with the general public frequenting local beaches and within the Kiama CBD to further promote the “Kiama Butt Free” message with personal ashtray/car freshener giveaways during holiday period

The Butt Littering Project 2007, was proudly supported by the Kiama & District Chamber of Commerce.

6.3.7 Review of Council Administration Offices recycling facilities

In January, 2007, due to the recent office re-design, the current paper recycling system within the Administration Building, Old ANZ Building and Library was reviewed with an aim to improve its efficiency.

The paper recycling system consisted of 6 x 210L green Sulo bins located randomly throughout the offices. These were used by office staff who either placed paper/cardboard products within these bins on a daily basis or by staff who collected materials in an open wire basket (issued to staff when the program was introduced a few years ago) and empty the contents into the 120L bins on a weekly basis.

An audit of the offices was conducted and the following improvements were implemented:

STAGE 1 - OFFICE

1. Replaced ALL of the 6 x 120L green Sulo bins and replaced with 9 x 80L green Sulo bins within the Administration Building. (The current recycling system in the Old Administration Building will remain). By reducing the size of the bins, it reduced any risk to injury for our cleaners who empty the bins on a daily basis. The bins are wheeled out to the back of the building for emptying into the paper waste bin. To make it easier for the cleaners to wheel the bins, we recommended that ramps be built between the steps leading out to the back of the building. The bins will be clearly labelled with paper/cardboard only stickers visible from at least 5 metres away.
2. Replaced all under desk waste bins and recycling paper wire baskets with a three in one under desk bin.



The red inner compartment will be changed to yellow and is used for recyclable materials ie. Bottles, cans, tetra paks. The larger black outer bin accumulates, clean flat paper for efficient weekly collection. The black hanging basket attachment is for all other waste ie. Non-recyclables. This easily detaches for emptying.

The introduction of the 3 in 1 under desk bin, has seen a dramatic 50% increase in recycling as well as a reduction in daily cleaning time of forty to sixty minutes each day, when comparing previous cleaning methods and waste and recycling systems.

Each employee is responsible for emptying the recycled office paper compartment and the recycling compartment of their under desk bin into the appropriate bins located within the office and/or kitchen on a needs basis.

The cleaners are responsible for emptying the non-recyclable materials and replacing the compostable bin liner on a needs basis. As a back-up at the end of the week, the cleaners check the bins to ensure they are properly cleared so the office is left completely clean over the weekend.

STAGE 2 - KITCHEN

Bins in kitchen/lunch room were replaced with a two-bin system. One for all recyclables ie. Paper, cardboard, milk bottles, cans, plastics displaying mobius loop 1-7 inclusive etc. The other for garbage.

Bins located at the back of the Administration building were clearly labelled with relevant bin labels to ensure material was discarded in the appropriate bin. The large skip bin was also labelled to cater for paper and cardboard only.

A system for composting organic waste was trialled using organic waste generated from the Council Administration lunch room. The Bokashi Bucket uses an organic fermentation process to recycle all domestic kitchen waste into valuable soil conditioner. The success of the trial will determine whether Council will sell this item to residents of the municipality in an effort to further reduce waste going to landfill.



6.4 Ongoing Waste Projects

6.4.1 Holiday Accommodation “Responsible Waste Kits”

It was identified there were several waste issues associated with holiday accommodation properties within the Kiama municipality. Predominately, the issues were:

- there was insufficient garbage bin capacity for peak holiday periods;
- full bins were not being placed out for collection on designated collection days;
- and bins were not returned to property when emptied.

The ongoing program aims to:

- Increase visitors awareness about the need to recycle;
- Encourage visitors to effectively recycle using the system correctly;
- Put the onus back onto the property owner to ensure correct size bin for the property to cover peak holiday periods; and

- Inform the real estate agents of their responsibility in managing the bins for these properties.

In consultation with the local real estate agents, a comprehensive “Responsible Waste Kit” was developed for each of the holiday accommodation properties consisting of a Waste and Recycling Calendar (magnetised), a “What to Recycle?” A3 poster (magnetised), Recycle Bin Sticker to be placed on the top of the lid of the yellow recycling bin, and a “No Junk Mail” sticker, to be placed on the property’s letter box to prevent unwanted junk mail spilling onto the property. The reduction of junk mail also gives the appearance that the property is occupied. Also included was “Kiamasphere” Key Tag which can be attached to the property’s keys as reminder to tenants to – Avoid, Reduce, Reuse and Recycle!

6.4.2 Clean Up Australia Day

The annual Clean Up Australia Day was held on Sunday 4 March 2007. The event attracted approximately 1500 participants with 25 sites registered. Overall, 1.5 tonnes of rubbish was collected which was a 75% decrease from the previous year’s figures. This indicates that the Kiama municipality is a cleaner place to live!

For Clean Up Australia Day 2007, Kiama Council focussed on the Minnamurra River and its surrounds. This was the first time the Minnamurra River had hosted a Clean Up Australia event. Council chose to hold a dive on the river to ascertain its status after a the Minnamurra River Estuary Rehabilitation project commenced in October 2006.

More than 30 volunteer divers from Windang Dive and Spearfishing, took to the water to clean up the river. Council also sought the assistance of Minnamurra and Kiama Downs residents to help with the clean up process. Each volunteer who registered on the day, received an environmentally themed show bag and went into the draw to receive some great prizes including compost bins, worm farm, Neco Home Assessment and a 1,000 litre rainwater tank.

The target areas on land were the boat ramp – (from the Minnamurra bridge easterly towards the railway bridge) and along the river (western side of Riverside Drive from Federal Avenue to Minnamurra Bridge - excluding the roadside from the Minnamurra Bends to Gainsborough).

The divers reported the river to be in excellent condition with items such as beer bottles, litter trapped in the mangroves and some car parts comprising most of the .5 tonnes of rubbish collected.



Photo 3. Andrew Coberlein and David King lug a truck tyre from the bed of the Minnamurra River into a boat at Clean Up Australia day.

Business Clean Up Day was held on Wednesday, 7th March, 2007 and it was the second year Kiama Municipal Council elected to form a group to become involved in this event. The area nominated for clean up was behind the Council Administration Building, surrounding streets and Black Beach

The 10 staff members who volunteered for the event collected a total of 15 bags (220kgs) over a total area of approximately 1.5km. Items collected included food packaging, plastic bags and cans.

Schools Clean Up Australia Day was held on Friday 2 March, 2006 with all primary schools participating in cleaning up areas directly surrounding the schools premises.

6.4.3 Planet Ark “Cards for Planet Ark” Christmas Card Recycling Program

From Boxing Day till the end of January, Kiama Municipal Council supported the Planet Ark “Cards 4 Planet Ark” Christmas Card Recycling Program. This program was promoted through the Kiama Independent newspaper, informing residents on how they could recycle their unwanted cards and envelopes by obtaining free “Cards 4 Planet Ark” postage-paid recycling envelopes from Australia Post or from Council’s Administration building. These envelopes could then be posted free at any post box or placed in the specially marked Planet Ark recycling bins located in all Coles Supermarkets.

All cards collected are then made into new packaging or ‘SAFE’ toilet tissue. This recycling process saves trees and dramatically reduces waste. The program was also promoted to all staff within the Council Administration Offices.

6.4.4 Land and Sea – Plastic Free

The *Land and Sea – Plastic Free Program* builds on the Kiama Pelican Story Project and aims to actively involve all sectors of the community, including visitors, in ongoing programs to promote the use of alternatives to plastic shopping bags. A sub-

committee of the Tidy Towns Committee was formed, including representatives from Council, the Tidy Towns Committee, Kiama and District Chamber of Commerce, Kiama Independent and Kiama Markets. The *Land and Sea – Plastic Free Strategy* has been prepared and endorsed by the Plastic Bag Free Committee. This strategy includes several programs for implementation by the relevant organisations, such as surveys of businesses and community, acknowledgment of retailers using alternatives, community presentations, Kiama Markets plastic bag free days and promotional activities as part of Council and community events.

6.4.5 The Kiama Pelican Story Project

The Kiama Tourist Information Centre at Kiama Harbour, encourages visitors to our area to stay ‘plastic bag free’ by continuing to sell the Pelican calico bags as an alternative for \$2 per bag.

6.4.6 Butt Bins

The Kiama Tidy Towns Committee and Council have continued to promote the proper disposal of cigarette butts by providing free ‘Butt Bins’ at the Council Administration Building and Depot, Kiama Visitors Centre, various shops throughout the Municipality and at several Council events. The ‘Butt Bins’ are made of recycled film canisters and beer bottle tops.

6.5 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (including Clean Up Australia Day participation);
- Complete Waste Depot rehabilitation at Gerroa and continue closure plan maintenance at Minnamurra Tip;
- Continue to operate Minnamurra Recycling and Green Waste Facility operations;
- Assist with the implementation of Business Treading Lightly Grant;
- Assist with the development of the Illawarra Regional Sustainability Roadmap;
- Implementation of Sustainable Kiama Communities Project (waste minimisation, composting, worm farming etc);
- Trial public place and sporting grounds recycling system;
- Implement waste recycling to all Council offices and administration centre;
- Develop *Hire of Council Facilities Waste and Recycling Policy*

- Waste and Recycling Collection Services, Policies and Programs.

Potential Future Activities Beyond 2007-2008

(H – High Priority, M - Medium Priority, L – Low Priority)

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2007/2008 and 2008/2009) (H);
- Participate in regional expressions of interest and tender for regional residual and organics alternative waste treatment facility (H);
- Monitor both Gerroa and Minnamurra Tip sites in accordance with closure plan requirements (2007/2008 and 2008/2009) (H);
- Prepare tenders for external garbage and recycling contracts (H);
- Review commercial garbage and recycling services to ensure operators have sufficient waste services in place (H);
- Develop *Special Events Waste and Recycling Policy* (H);
- Investigate the feasibility of a Composting Facility to be located at the Minnamurra Site, including food waste collection, hydroponic growth area, community food garden and education facility (M);
- Review Resident Clean Up Collection Program, including consideration of alternatives such as a tipping voucher system (M).

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. These are described in more detail in Council's *Local Air Quality Management Plan* (Kiama Municipal Council, 2001).

The Department of Environment and Climate Change 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 two monitoring stations within the Illawarra Region, at Albion Park and Wollongong.

One of the measurements recorded at these stations is the Regional Pollution Index (RPI), which is based on a combination of visibility and concentrations of ozone, nitrogen dioxide and fine particulates. An index above 50 is considered high, compared to the *National Environment Protection Measure for Ambient Air Quality* (Air NEPM). The RPI is recorded twice daily. The morning report is issued at 9.30am and covers from 3pm the previous afternoon to 6am that morning. The afternoon report is issued at 4pm and covers the 6am to 3pm period.

The number of low, medium and high reports for the morning and afternoon for both stations are shown in Tables 22 and 23 and the percentage of low, medium and high reports is shown in Figure 7. Over 89% of readings at both sites have been in the “low” range for every year reported in the SoE.

During this reporting period, the proportion of Regional Pollution Index readings at Albion Park and Wollongong in the “medium” range were greater than the two previous reporting periods. More information and figures regarding these readings are shown in Chapter 9: Sustainable Communities.

Table 22: Regional Pollution Index at Albion Park Monitoring Station

Year (Jul-Jun)	Morning Report (3pm-6am)			Afternoon Report (6am-3pm)		
	Low <25	Medium 25-49	High >50	Low <25	Medium 25-49	High >50
1999/2000	350	15	1	343	23	0
2000/2001	325	29	3	320	31	1
2001/2002	330	14	4	316	21	6
2002/2003*	213	9	7	212	10	8
2003-2004	334	11	2	329	15	2
2004-2005*	184	8	0	179	9	1
2005-2006*	130	9	0	136	6	0
2006-2007	336	29	0	336	26	3

* Albion Park Monitoring Station was not in operation from 25 June 2002 to 11 November 2002 and from 20 January 2005 8 January 2006.

Table 23: Regional Pollution Index at Wollongong Monitoring Station

Year (Jul-Jun)	Morning Report (3pm-6am)			Afternoon Report (6am-3pm)		
	Low <25	Medium 25-49	High >50	Low <25	Medium 25-49	High >50
1999/2000	346	19	1	353	12	1
2000/2001	331	27	1	326	29	0
2001/2002	340	17	5	329	24	8
2002/2003	330	22	8	328	21	9
2003-2004	331	16	3	333	20	0
2004-2005	329	23	1	332	17	1
2005-2006	329	32	0	328	29	0
2006-2007	326	38	1	329	35	1

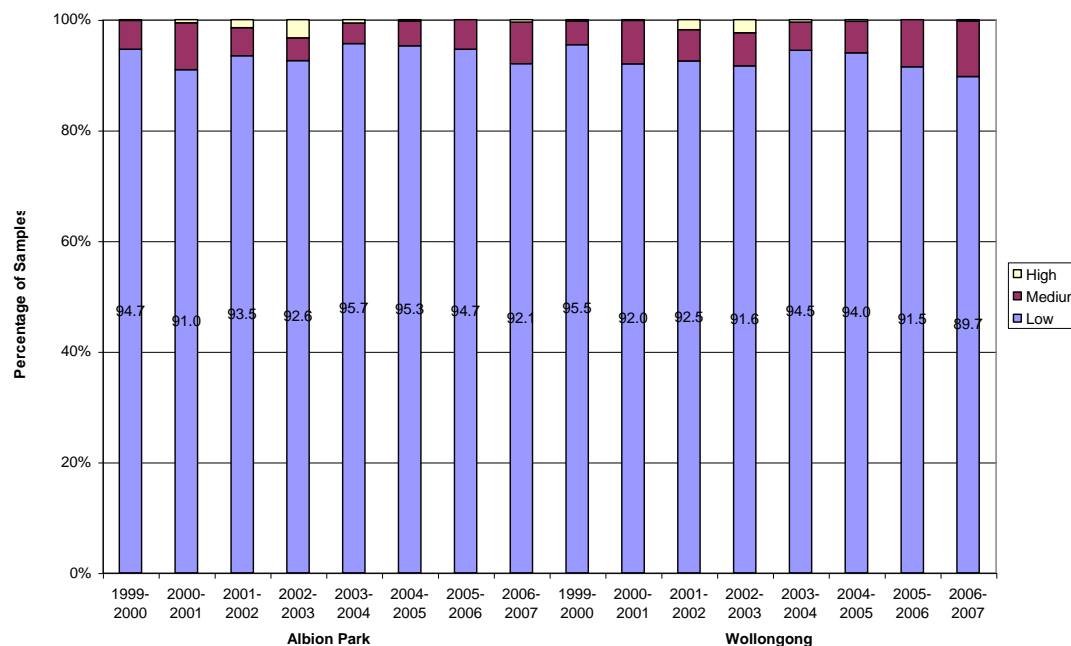


Figure 7: Regional Pollution Index – Percentage of Readings Low, Medium and High for Albion Park and Wollongong

The number of complaints relating to air pollution is shown in Table 24. The number of complaints remains consistent with the last reporting period.

Table 24: Complaints relating to Air Pollution to Council and the DEC

Type of Complaint	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Burning Complaints to Council	5	6	15*	6	5	4	3
Commercial Complaints to Council	-	1		-	-	-	2
Dust Complaints to Council	-	1		4	-	-	4
Odour Complaints to Council	-	-		4	6	6	2
Odour Complaints to DEC	-	4	-	-	-	-	
Industrial Air Complaints to DEC	2	4	5	21	7	1	1**
Other Air Complaints to DEC	-	2	-	-	1	-	
Total Air Complaints	7	18	20	35	19	11	12

*The breakdown of complaints to Council (ie burning, commercial, building sites, odour) was not available for the 2002-2003 reporting period

** The breakdown of complaints to DECC was not available for the 2006-2007 reporting period.

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 review of 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 hotspells, 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).

According to a greenhouse gas inventory of the year 2001-2002 conducted as part of the Cities for Climate Protection Program (CCP™) in 2004, the dominant source of greenhouse gas emissions from Council's operations is from Council owned buildings, which contributed 42.9% of emissions. Contributions from the other Council sources included vehicle fleet (21.1%), waste (14.7%) and streetlights (11.3%) (shown in Figure 8). The dominant sources of emissions from the Municipality as a whole in the inventory year of 1996 was from the residential sector (32.7%) and the transportation sector (31.6%). Contributions from the other sources were industrial (13.5%) and waste (11.4%) and commercial (10.8%) (shown in Figure 9).

If Council and the community do not act to reduce these emissions, it is predicted that by 2010, emissions in the Kiama Municipality will increase 47.4%, with the greatest growth in emissions predicted to occur in the transportation, residential, and commercial sectors.

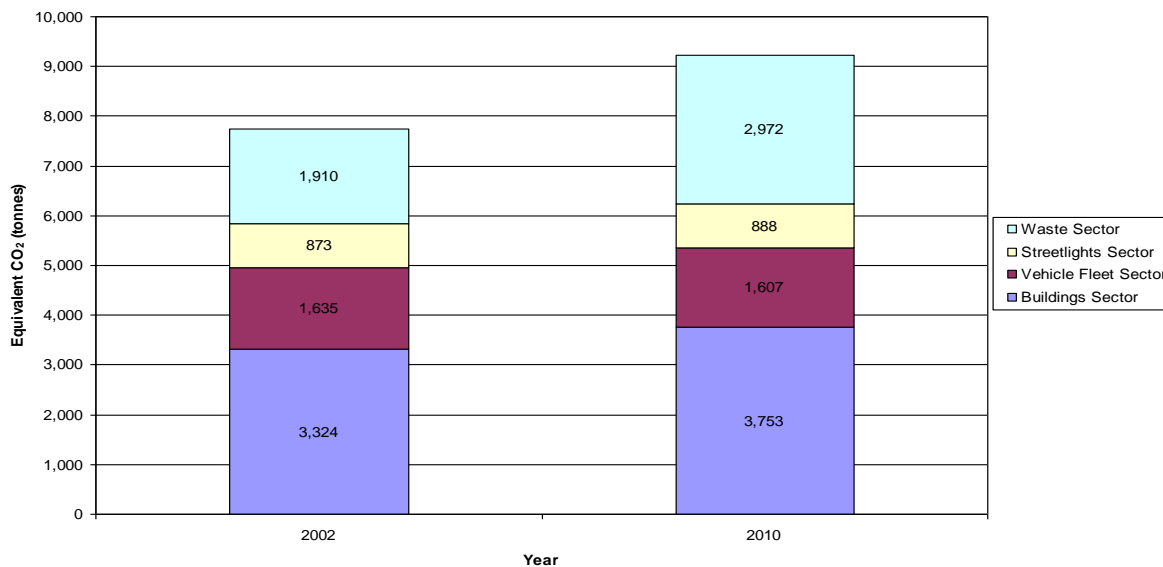


Figure 8: Council Greenhouse Emissions 2002 and Forecasted Emissions 2010

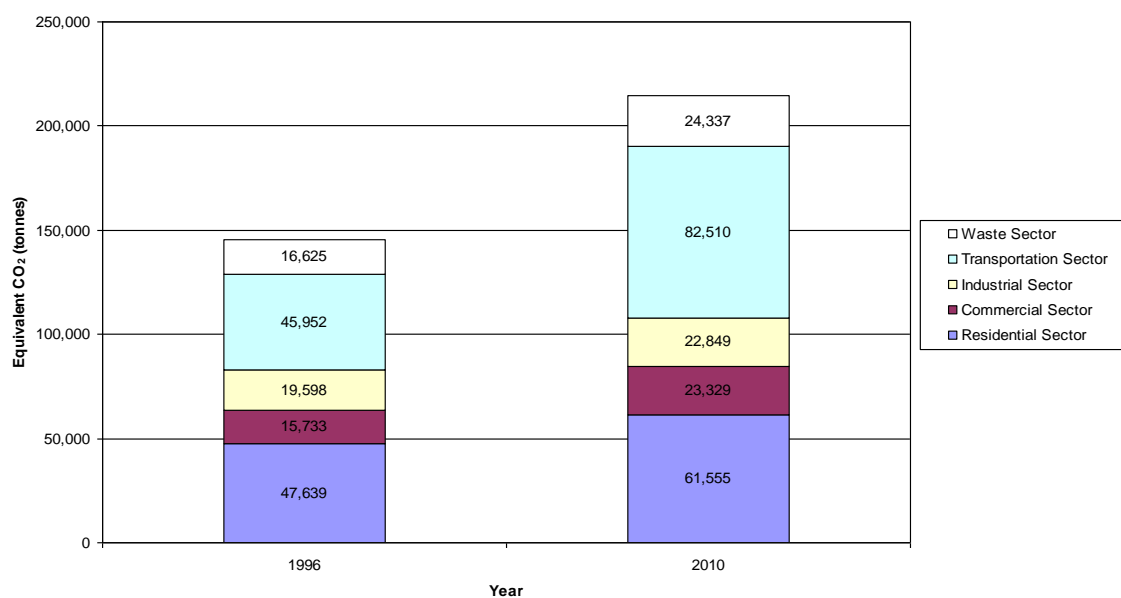


Figure 9: Community Greenhouse Emissions 1996 and Forecasted Emissions 2010

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 2003 Annual Average Daily Traffic recorded on the Princes Highway at Bombo (station 07.804) was 29,713, which is increase of 945 from the 2000 figure of 28,768 (Roads and Traffic Authority, 2004). A large proportion of this figure would be through traffic. The latest figure on vehicle registrations in the Kiama Municipality show that in 2006, there were 17,440 vehicles registered, which was an increase of 819 vehicles since 2004 (Roads and Traffic Authority, 2005 and 2006). This has been the largest increase since this data has been reported in the SoE (see Table 25).

Table 25: Vehicle Registration in the Kiama Municipality 1998-2005
(Roads and Traffic Authority, 1999, 2000, 2001, 2002, 2003, 2004a, 2005, 2006)

Year	Number of Vehicles	Increase since previous year	Increase since previous year
1998	13,918		-
1999	14,374	456	3.3%
2000	14,774	400	2.8%
2001	15,099	325	2.2%
2002	15,588	489	3.2%
2003	16,012	424	2.7%
2004	16,411	399	2.4%
2005	16,621	210	1.3%
2006	17,440	819	4.7%
Total increase 1998-2006	3,522		22.6%
Average Annual Increase	440.3		2.8%

According to the Roads and Traffic Authority Local Government Area Vehicle Registrations report (Roads and Traffic Authority, 2005), as of 30 June 2006, 68.3% of registered vehicles in the Kiama Municipality were fuelled by unleaded petrol, 3.5% by leaded petrol, 7.9% by diesel, and only 1.5% by LPG or LPG/petrol and 0.6% by other fuel types (or unknown).

Bushfire and hazard reduction burns also place pressure on the air quality. According to the Department of Environment and Conservation (2003), bushfires are responsible for most of the occasions which high levels of particle pollution are recorded. This is supported by the majority of Regional Pollution Index readings that are “high” being recorded during the November to March.

The number of fires within the Kiama Local Government Area is shown below in Table 26. There were slightly less fires during the last reporting period than compared to 2005-2006.

Table 26: Fires in the Kiama and Shellharbour Local Government Areas during 2001-2005
(Hegde, R. 2007)

Type of Incident Subdivision Name	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	Total Incidents
Fires and Explosions:Other	1	3	0	0	0	0	0	0	0	0	4
Building Fires	10	11	3	3	13	10	11	2	8	5	76
Fires in buildings confined to non- combustible containers	0	0	4	16	4	5	5	3	3	3	43
Special structure fires	0	0	2	5	7	9	0	3	7	12	45
Outside storage fires	16	14	3	2	2	1	0	0	0	0	38
Mobile property type fires	5	9	6	8	12	3	6	4	11	3	67
Vegetation and other outside fires	35	18	11	42	23	13	21	5	27	28	223
Small vegetation fire	0	0	1	1	2	0	0	1	1	0	6
Outside rubbish fire	8	5	5	9	6	12	19	20	21	19	124
Explosions not as a result of fire	0	1	0	0	0	0	0	0	1	0	2
Total	75	61	35	86	69	53	62	38	79	70	628

7.3 Responses

7.3.1 Local Air Quality Management Plan

Council adopted the Kiama Municipal Council *Local Air Quality Management Plan* (LAQMP) in 2001. Kiama Municipality, through the LAQMP, is committed to establishing and maintaining clean air for its community. The LAQMP sets out broad strategies that will assist Council to achieve its environmental goals (Kiama Municipal Council, 2001).

There are a range of strategies contained within the LAQMP, falling under seven overall objectives as outlined below:

- Implement a local and regional approach to air quality management;
- Educate, inform and involve the Community in air quality and its management;
- To improve energy efficiency within the Council area;
- To reduce the impact of air pollution for vehicle emissions;
- To reduce air pollution from industry and other sources;
- To monitor the impacts of air quality within the Municipality; and
- To encourage and undertake activities that will have positive impacts of air quality (Kiama Municipal Council, 2001).

No major actions were implemented during the reporting period and a review of this plan will be included in the development of a Cities for Climate Protection Local

Action Plan during 2007-2008 (see section 7.3.2). For a detailed list of actions implemented previously, refer to SoE Report 2004 (Kiama Municipal Council, 2004).

It should be noted however, that in October 2006, the Kiama Council's Fleet of vehicles began using **E10 ethanol blended fuel**. In the 06/07 reporting period, Council vehicles used 51,662 litres of E10 fuel.

7.3.2 Cities for Climate Protection Program

In 2003, Council has joined the international greenhouse gas reduction program called the Cities for Climate Protection (CCP™) Program. The CCP™ program is aimed at assisting local Councils to deal with greenhouse gas issues within their locality. Milestone 1 of the CCP™ Program was completed in 2004. The process provided valuable baseline data of both Council and Community greenhouse gas emissions and forecasts of estimated emissions in 2010 if no pro-active action is taken (see Section 7.1.2 for results of the Milestone 1 Inventory).

In November 2005, Council achieved Milestone 2, which involved committing to greenhouse gas emission targets of 15% for community emissions and 20% for council emissions by 2010. Milestone 3, presently being undertaken, involves developing a Local Action Plan to work towards these targets and subsequent milestones involve implementing the plan and monitoring to evaluate what has been achieved.

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 1 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 Department of Environment and Conservation 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, 2005b). The priorities for proposed cycleway projects have also been reviewed and are listed below in the preferred order of implementation:

- Minnamurra River Crossing;
- Spring Creek underpass at Princes Highway (Completed June 07);
- Gainsborough to Jamberoo Stage 1, Gainsborough Chase Reserve to Swamp Road;
- Fern Street to Miller Street via pathway across Millers Flat;
- Crooked River Road, Crooked River to Municipal boundary;
- Pacific Avenue, Stage I, Surf Club to Moore St (Completed November 06);
- Pacific Avenue Stage II Moore Street to Werri Street;
- Kiama to Gerringong via Princes Highway;
- Gainsborough to Jamberoo Stage 2, Swamp Road to Jamberoo (Kiama Municipal Council, 2005b).

7.4 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (including Cities for Climate Change Milestone 3 – action plan development);
- *Protection of the Environment Operations Act* implementation;
- Implement educational programs and activities supported by Council in relation to air;
- Provide Coastal Walking Track from Kiama Heights to Werri Lagoon;
- Undertake detailed design of shared pathway from Gainsborough to Swamp Road via the Billabong.

Potential Future Activities Beyond 2007-2008

(H – High Priority, M - Medium Priority, L – Low Priority)

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2008/2009 and 2009/2010) (H);
- *Protection of the Environment Operations Act* implementation (2008/2009 and 2009/2010) (H);

- Cities for Climate Change Milestone 3 – action plan development and seek funding for priority projects (H)
- Develop an Environmental Sustainability Assessment Program, involving inspections of commercial and industrial premises and assisting the operators to meet their environmental obligations through educational material and advice. This will be incorporated as part of the regional Business Treading Lightly sustainable regional grant (2008-2009 and 2009-2010) (H);
- Construct Stage 2 of shared pathway Pacific Avenue, Warri Beach (2007/2008) (H);
- Construct Stage 2 shared pathway Crooked River Road (2007/2008 and 2008/2009) (H);
- Construct shared pathway Fern Street Omega to Miller Street (2008/2009) (M).

Chapter 8: Heritage

8.1 State

8.1.1 Aboriginal Heritage

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

The Department of Environment and Conservation maintains a register of identified Aboriginal Heritage sites throughout the state. A search of this register, the Aboriginal Heritage Information Management System, has shown that 60 known Aboriginal sites are currently recorded in the Kiama Municipality and within these sites, 97 site features were recorded, as shown in Table 27 (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 27: 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 DEC.

In addition to the above records, the Australian Heritage Commission has one site listed as an indigenous place, located in Jamberoo, but the register does not have any specific details on the site. The Heritage Council is required under the *Heritage Act 1977* to keep a register, known as the State Heritage Register, of both European and Aboriginal places of significance.

8.1.2 Non-Aboriginal Heritage

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

Items of National significance are listed in the Australian Heritage Commission's Register of the National Estate. Items of State significance are listed in the NSW State Heritage Register. Items of regional significance are listed in Schedule 1 of the *Illawarra Regional Environmental Plan No. 1* (1986) and amendments, as well as *Illawarra Regional Environmental Plan No 2 – Jamberoo Valley 1987*.

Items currently considered to be of local heritage significance are listed in Schedule 2 of Kiama's *Local Environmental Plan* 1996. The following table lists heritage items in the Kiama Municipality identified in each of these registers.

Table 28: Kiama Municipality Heritage Items and Listings

Item	Location	Listing
Bombo Headland quarry geological site	Bombo	AHC(R), SHR, REP No.1, LEP
Jamberoo Valley	Jamberoo	AHC(I)
Hartwell House and Coachhouse	Farmer St, Kiama	AHC(R), REP No.1, LEP
Former Infants School	Minnamurra & Shoalhaven Streets, Kiama	AHC(R), REP No.1, LEP
Scots Presbyterian Church (surrounding land and Norfolk Pines)	Shoalhaven Street, Kiama	AHC(R), SHR, REP No.1, LEP
Terrace Houses	24-40 Collins St, Kiama	SHR, REP No.1, LEP
Terrace Houses	42-44 Collins St, Kiama	SHR, REP No.1, LEP
Cottages	3a,3, 2-10 Collins Lane, Kiama	REP No.1, LEP,
Masonic Temple	46 Collins St, Kiama	SHR, REP No.1, LEP
Manning Street Group -Former CBC Bank (No.18) -Westpac Bank (Bank of NSW) (No 32) -Uniting Church (No. 48) -Grand Hotel (No. 49) -ANZ Bank includes stables, rear garden and fences (No 33) -Council Chambers, Pine Trees at rear -Post Office grounds and Pine trees (No 11)	Manning St Kiama	REP No.1, LEP CBC Bank - SHR Westpac Bank - AHC(R)
Kiama Government Building Group -Post Office and Buildings -Courthouse, grounds and trees -Police Station -Police Station Residence	Cnr Manning and Terralong St, Kiama	REP No.1, LEP Post office - AHC(R), SHR Courthouse - AHC(I) Police Station - AHC(R)
Mount Vernon	64 Bong Bong St, Kiama	AHC(I), REP No.1, LEP
Blowhole Point (Lighthouse, Ice Factory and Wharf)		REP No.1, LEP Lighthouse – AHC(R)
Cottages	43 & 38 Bong Bong St, Kiama	REP No.1, LEP, Number 43 - AHC(I)
Cottage	34 Bong Bong St	AHC(I)
Anglican Christ Church	Kiama	AHC(I), REP No.1, LEP
Public School	Churchill St, Jamberoo	AHC(R), REP No.1, LEP
Culwalla	Main Rd, 2km east of Jamberoo	SHR, REP No.1, LEP,
Minnamurra House	Minnamurra Lane, Jamberoo	AHC(R), REP No.1, LEP
Terragong House and home paddock	Jamberoo	AHC(R), REP No.1, LEP
Site of Woodstock Sawmill, Piggery, Cooperage and Butter Factory	Robertson Rd, Jamberoo	REP No.1, LEP
Dry Stone Walls	Jamberoo, Foxground, Kiama areas	AHC(I), REP No.1
Anglican Church of the Resurrection	Jamberoo	REP No.1, LEP
St Stephen's Presbyterian Church	Allowrie St, Jamberoo	AHC(I), SHR, REP No.1, LEP,
St Mathew's Roman Catholic Church	Jamberoo	AHC(I), REP No. 1, LEP
Remains of Steam Flour Mill, Bush Bank	Princes Highway, Kiama	AHC(R), REP No.1, LEP

Table 20: Kiama Municipality Heritage items and Listings (continued)

Item	Location	Listing
Alne Bank and Stone Barn	Rose Valley	AHC(R), REP No.1, LEP
Renfrew Park	Princes Hwy, Gerringong	REP No.1, LEP
Black Head palaeontological site	Gerroa	AHC(R), REP No.1, LEP
Commercial Hotel	Allowrie St, Jamberoo	REP No.2, LEP
Frederick's Store	Allowrie St, Jamberoo	AHC(I), REP No.2, LEP
Church of England Cemetery	Tate's Hill Jamberoo	REP No.2, LEP
O'Marra's Grave, Roman Catholic Burial Ground	Jamberoo Mountain Rd	REP No.2, LEP
Kellys Cottage (also known as Minnamurra Huts)	Minnamurra Falls Rd, Jamberoo	AHC(I), REP No.2, LEP
Park Mount	Jerrara Road, Jamberoo	AHC(R), REP No.2, LEP
Former Jamberoo Dairy Factory	Factory Lane, Jamberoo	REP No.2, LEP
Antique Shop	Allowrie St, Jamberoo	REP No.2, LEP
Colewood	Mountain Rd, Druewalla, Jamberoo	REP No.2, LEP
Former Wesleyan Parsonage	Macquarie St, Jamberoo	REP No.2, LEP
Kinross Cemetery	Minnamurra Lane, Jamberoo	REP No.2, LEP
Gundarimba	Minnamurra Lane & Allowrie St, Jamberoo	REP No.2, LEP
Roman Catholic Church graveyard	Chappel St, Jamberoo	REP No.2, LEP
Aughinvar	117 Manning St Kiama	AHC(I)
Catholic Presbytery	Manning St, Kiama	AHC(I)
Dalmeny	72 Shoalhaven St, Kiama	AHC(I)
Uniting Church	Bridges St Gerringong	AHC(I)
Uniting Church	28 Fern St Gerringong	AHC(I)
Former Pilot Station Residence	49-1249 Terralong St Kiama	AHC(I)
Coach House Art Gallery	Farmer St, Kiama	AHC(I)
Barren Grounds Nature Reserve	Jamberoo Mountain Rd Jamberoo	AHC(R)
Gerroa Littoral Rainforest	Gerroa	AHC(R)
Kiama Blowhole and Surrounds	Terralong St Kiama	AHC(R)
Little Blowhole Geological Site	Tingira Cr Kiama	AHC(R)
Seven Mile Beach National Park	Gerroa Road Shoalhaven Heads	AHC(R)
Westley Park Headland	Attunga Ave Kiama	AHC(I)
Bombo Railway Station Group	Bombo	SHR
Kiama Rail Underbridge over Princes Hwy	Terralong Street, Kiama	SHR
Kiama Railway Station Group	Kiama	SHR
Kiama Reservoir (WS0231)	Irvine Street Kiama	SHR
Kiama Reservoir (WS0232)	Irvine Street Kiama	SHR
Uniting Church Hall and Cemetery	Jamberoo	LEP
Cottage	Browns Lane, Jamberoo	LEP
St Mary's Church	Fern & Jupiter St, Gerringong	LEP
Weatherboard Cottage	127 Terralong St Kiama	LEP
Weatherboard Cottage	2-4 Railway Pde Kiama	LEP
Barroul House	Bonaira St Kiama	LEP
Formerly Grans Fudge	132 Terralong St, Kiama	LEP
Kendall House	Saddleback Mountain Rd	LEP
3, 3a Central Park	Hindmarsh Park	LEP

AHC (R) - National Estate Register listed as registered place

AHC (I) - National Estate Register listed as indicative place

SHR – NSW State Heritage Register

REP No.1 - Illawarra Regional Environmental Plan No.1

REP No.2 - Illawarra Regional Environmental Plan No.2 - Jamberoo Valley

LEP - Kiama Local Environmental Plan 1996

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, Aboriginal Heritage Studies have been conducted for the Gerringong Cemetery Extension and the Illawarra Fly Developments. Other recent studies were carried out for the Gerringong Headland Kiama LEP (Amendment No. 40) and Elambra Estate, Gerringong sites.

8.3.3 Heritage Projects

- Kiama Heritage Review Project commenced in November 1998 and was carried out with the aid of a grant from the NSW Heritage Office. The project was assisted by a heritage consultant, with research completed in 2002-2003 for some 250 items (including currently listed items in the Kiama LEP). The exhibition of a draft LEP to update heritage provisions and heritage listings was intended to occur in the second half of 2004 subject to the prior approval of the NSW Heritage Office and the Department of Planning.

However, a need to further review the heritage inventory compiled, the commencement of the Kiama LEP Review project in June 2004, and planning system reforms in 2005-2006 have caused delays to the completion of this project. The final list of items recommended to be added to the Kiama LEP heritage schedule will be incorporated in the Kiama LEP Review, for consideration by Council in 2007.

- Council resolved in June 2000 to prepare a visual landscape study of the Kiama area. Its purpose would be to provide a landscape database to assist future planning and the assessment of development applications. The study will also examine cultural landscapes (including the area's dry stone walls) as this matter was not able to be properly investigated in the Kiama Heritage Review. This study was programmed for 2004/2005 but visual and cultural landscape issues will now be dealt with as part of the Kiama LEP Review.

8.4 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (including Kiama Local Environmental Plan Review - incorporate heritage;
- Prepare, exhibit and adopt Kiama Local Environmental Plan for urban and rural lands;
- Review draft heritage list and provisions;
- Require applicants to provide assessment reports where areas of aboriginal heritage are potentially impacted;
- Require applicants to provide assessment reports where areas of European heritage and buildings are potentially impacted;
- Investigate cultural landscape for inclusion in Kiama LEP Review;
- Carry out stabilisation, maintenance and repair work on the Steam Flour Mill ruin, Bush Bank.

Potential Future Activities Beyond 2008-2009

(H – High Priority, M - Medium Priority, L – Low Priority)

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2008/2009 and 2009/2010) (H);
- Require applicants to provide assessment reports where areas of European heritage and buildings are potentially impacted (2008/2009 and 2009/2010) (H);
- Investigate cultural landscape for inclusion in Kiama LEP Review (2008/2009) (H);
- Undertake an Aboriginal Heritage Study, including identification of significant objects and places, with liaison with local Indigenous community (H).

Chapter 9: Sustainable Communities

This chapter presents the concept of sustainability and sustainable communities in the Kiama Municipality and is divided into three sections. The first section contains a set of measurable Headline Sustainability Indicators, which will assist Council and the community in following a sustainable path. The second section outlines the current strategies that Council is undertaking to move towards sustainability, including strategies to promote environmental protection and healthy communities. Similar to the theme chapters of this report, the final section lists possible future responses that Council could undertake to improve the sustainability of the community of the Kiama Municipality.

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 that environmental factors should be included in the valuation of assets and services.

9.1 Headline Sustainability Indicators

While each theme chapter presents extensive data that can be monitored over time, four Headline Sustainability Indicators are presented in this chapter, with the objective to chart the overall progress of Council and to measure the effectiveness of actions and technologies at achieving a more sustainable Municipality. 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.

Each indicator graph includes a sustainable zone, based on the data in the baseline year of 1999-2000. This 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 four Headline Sustainability Indicators, with the River and Estuary Water Quality Indicator being added this year, now that sufficient data has been collected.

9.1.1 Headline Sustainability Indicator – Beach Water Quality

This indicator, shown in Figure 10, utilises data obtained by the Department of Environment and Climate Change and Sydney Water Corporation in the Beachwatch Program, as reported in Chapter 3: Water. This program measures faecal coliform and enterococci levels at three of the Municipality’s beaches: Jones’ Beach, Bombo Beach and Werri Beach and measures only faecal coliform levels at Surf Beach.

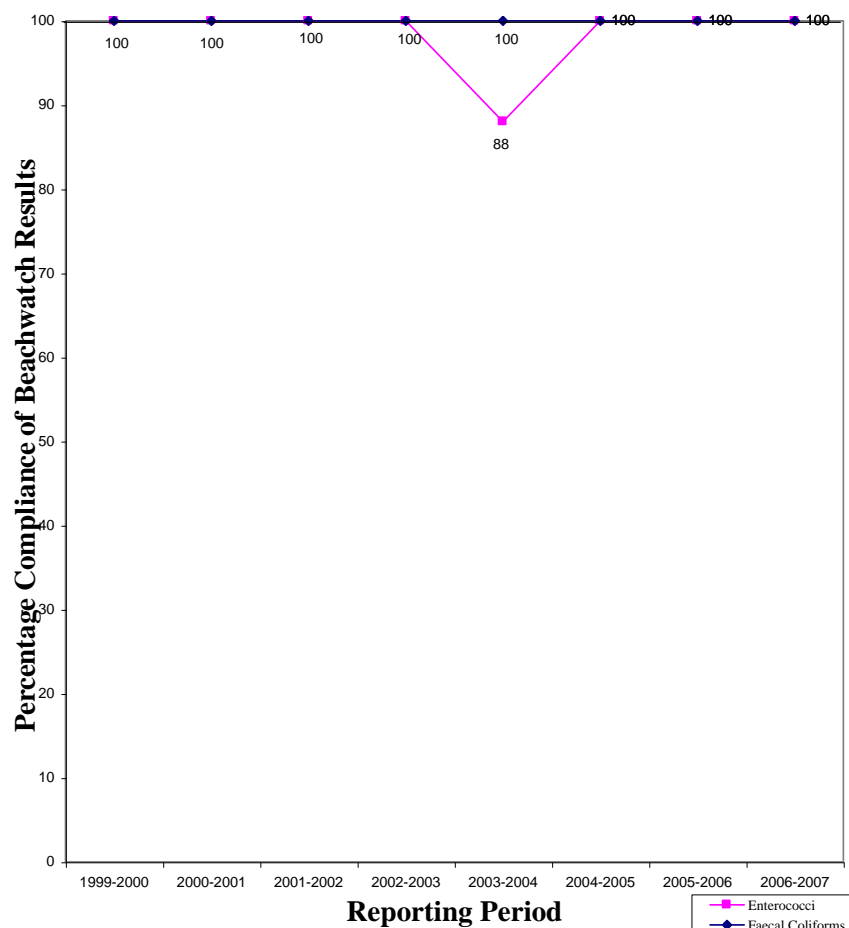


Figure 10: Headline Sustainability Indicator – Beach Water Quality

As the results in the baseline year of 1999-2000 were 100%, there is no zone of sustainability for this indicator. Sustainability is simply the line value of 100%, which was maintained in all previous reporting periods except 2003-2004. Both faecal coliform and enterococci levels complied with the guidelines 100% of days during this reporting period; therefore ‘sustainability’ has been achieved.

9.1.2 Headline Sustainability Indicator – River and Estuary Water Quality

This new indicator, shown in Figure 11, utilises data collected in Council’s Water Monitoring Program, which has been operating since July 2003. The data collected as part of this program is compared against the *Australian and New Zealand Environment Conservation Council (ANZECC) Water Quality Guidelines 2000* (Australian and New Zealand Environment Conservation Council, 2000) to determine the percentage of sample days that comply. The water quality results are compared

against the guidelines for secondary recreation, primary recreation, and ecosystem health values. This indicator presents the total number of samples, from all sample sites combined, that comply with the relevant guidelines. More information regarding this program and its data can be found in Chapter 3: Water.

The sustainable zone, as defined by the baseline data in 2003-2004 is 98.6% of days for secondary recreation values, 61.5% for primary recreation values and 18.4% for ecosystem health values. The value for secondary recreation decreased to 95.8%, while the primary recreation value and the value for ecosystem health, both moved continued to move further out of the sustainable zone.

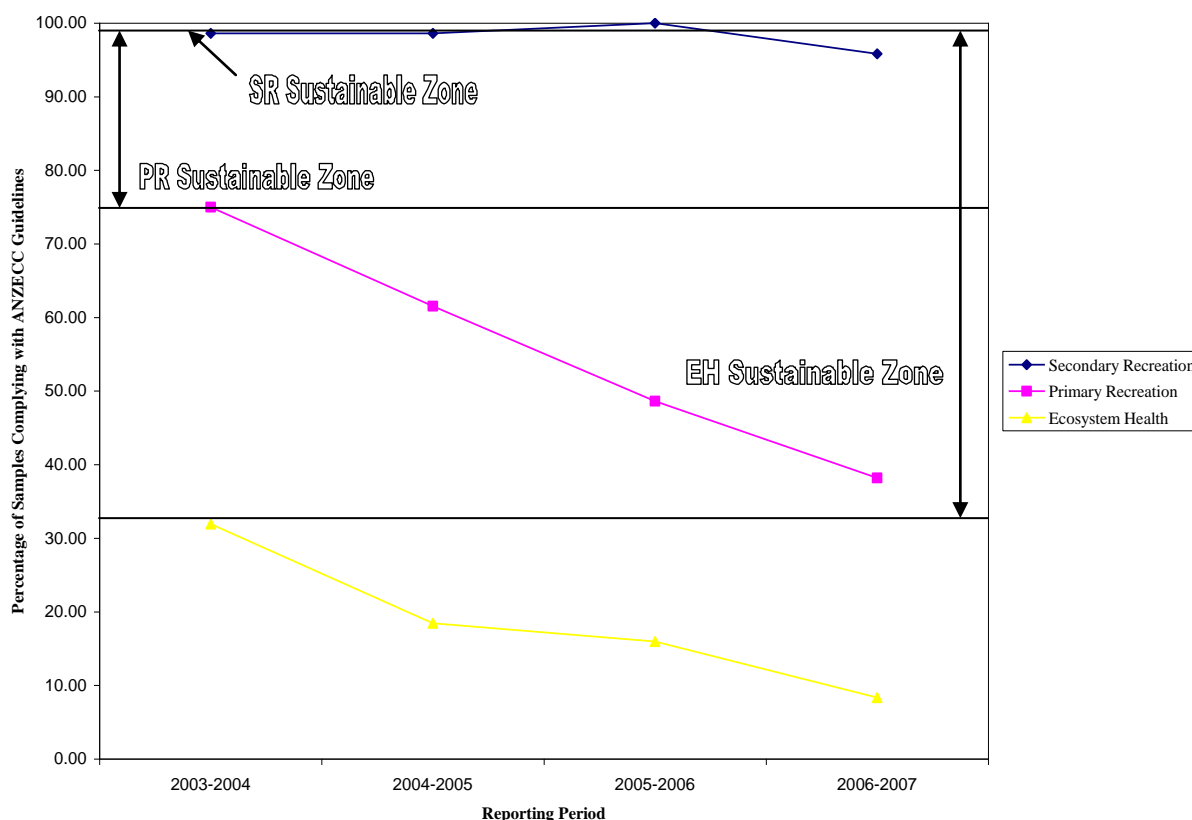


Figure 11: Headline Sustainability Indicator – River and Estuary Water Quality

9.1.3 Headline Sustainability Indicator – Waste

This indicator, shown in Figure 12, utilises data from the Minnamurra and Gerroa Waste Disposal Depots, as reported in Chapter 6: Waste. The indicator is based on the total tonnes of waste that went to landfill during the reporting period, divided by the estimated population of that year. The population figures are based on the population data until 2001, then the projected population for 2002 to 2006 (since the last reported census count), according to the *Kiama Social/Community Plan* (Kiama Municipal Council, 2004a) and the Australian Bureau of Statistics Census of Population and Housing.

The sustainable zone, as defined by the baseline data in 1999-2000, is any value below 0.41 tonnes per capita. This value was exceeded in previous reporting periods since the baseline year, but during the last three reporting period the value has fallen well within the sustainable zone. The reduction in waste received at the Minnamurra Waste and Recycling Depot during this time, is partly due to no loads over two tonnes being accepted. These are now being directed straight to the Shellharbour Waste Depot.

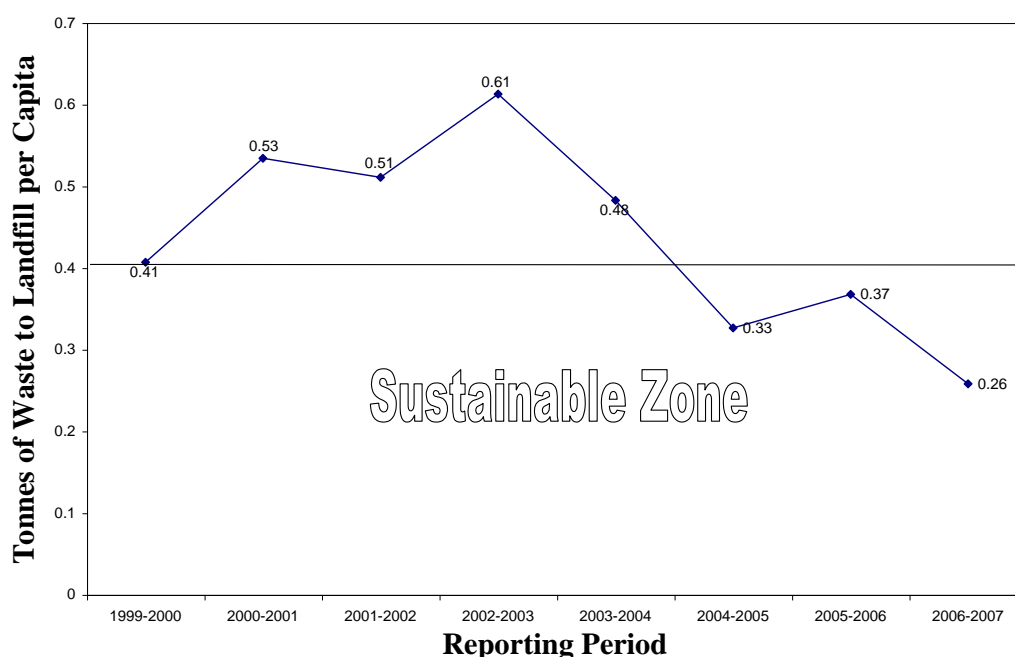


Figure 12: Headline Sustainability Indicator – Waste

9.1.4 Headline Sustainability Indicator – Air Quality

This indicator, shown in Figure 13, utilises data from the Department of Environment and Conservation’s Regional Air Monitoring Program as reported in Chapter 7: Air. As there are no air monitoring stations within the Kiama Municipality, data from the nearest stations at Albion Park and Wollongong were utilised. The graph relates to the percentage of samples obtained that were in the “low” category for each station, according to the Regional Pollution Index.

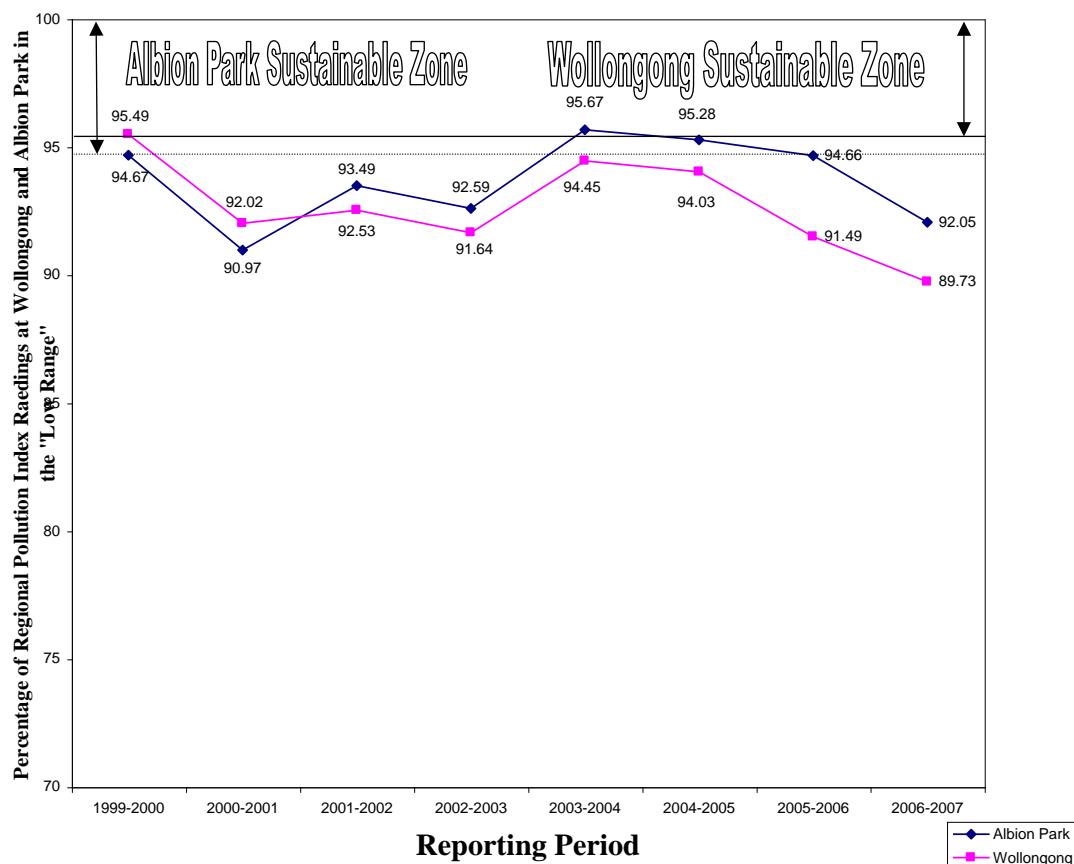


Figure 13: Headline Sustainability Indicator – Air Quality

The sustainable zones, as defined by the baseline data in 1999-2000, are any value above 94.67% for Albion Park and 95.49% for Wollongong. The values for both the Albion Park and Wollongong Stations are moving away from their sustainable zones.

It is hoped that there will be a time when all Headline Sustainability Indicators lie within their sustainable zones, meaning that the actions of Council and the community have resulted in less impact than the baseline year of 1999-2000. With increasing population in the area, this will be an ongoing challenge and will require sustainable living by all in the Kiama Municipality.

9.2 Sustainability Strategies

9.2.1 Urban Sustainability Grants

Kiama Council was successful in obtaining three Urban Sustainability Grants from the NSW Environmental Trust during the 2006-2007 reporting period. They are to be undertaken over a period of three years.

Sustainable Illawarra Grant

This grant for \$2 million dollars, is split between Wollongong, Kiama and Shellharbour Councils. It is broken into three components:

Illawarra Sustainability Roadmap - setting directions for sustainability

- Looks at how sustainable each Council's operations are;
- Determines actions, targets and indicators to improve sustainable Council operations;
- Includes staff training and mentoring, policy review etc

Water Sensitive Urban Design Project

- Stormwater harvesting and reuse at Hindmarsh Park and Blackbeach.
- Reducing potable water usage and pollution to receiving waters, and reusing it on Council parks and playing fields.

"Sustainability Begins At Home" Project

- Education on such things as "better buying", composting, permaculture, energy efficiency. It will include community workshops, discount vouchers on products etc

Sustainable Kiama Communities

This grant is aimed at mobilising the Kiama Community into living more sustainably, using the following strategies....

- Energy and water conservation through retrofitting, consumption monitoring.
- Recycling and reuse - composting, waste minimisation, home food gardens.
- Community co-operation with biodiversity and landcare projects.
- Stormwater pollution management – installation of drain gross pollutant traps.
- Sustainability Mapping
- Community and Business Partnerships

Business Treading Lightly

This grants is part of the Urban Sustainability Grants Program in conjunction with the Southern Councils Group, and is directed at

- Delivery of an integrated and targeted program to improve business sustainability across the SCG region.
- Businesses will be encouraged to implement Sustainability Plans that will lead to region endorsed accreditations.
- Larger businesses including Retirement Villages and Holiday accommodation.
- Sustainability requirements for business will be incorporated into Council policy providing for continuous improvement and program longevity.
- It will include addressing such issues as rainwater usage, stormwater management, reducing waste, packaging, retrofitting etc

9.2.2 Celebrating World Environment Day with our Primary Schools

Kiama Council's Environment and Health Team celebrated World Environment Day 2007 with some practical ideas to get the green message across to our youngest constituents. With the environment such a hot topic, and the threat of Climate Change

on everyone's mind, a Climate Change pack was delivered by the Mayor to each of our five primary schools. Each pack contained books about recycling, composting, green gardening and climate change. They also contained science kits on solar power and environmental learning games. However, it was the fruit trees for the school playground, a lemon and a mandarin, that caused the greatest excitement!



Photo 4. Children from Gerringong Public School with some of their Climate Change Pack

9.2.3 One STOP CLIMATE CHANGE Shop

On Saturday 23rd June 2007, there were no excuses in Kiama for not doing your bit towards halting Climate Change.

As part of Kiama Council's 2007 World Environment Day celebrations, a One STOP CLIMATE CHANGE Shop opened in the Old Kiama Fire Station. The shop was packed full of practical, inspirational and innovative ideas to encourage people to change some habits and be proactive about Climate Change.

Tackling the issue of transport included information on the LPG rebate, ethanol fuels, public transport timetables, and walking tracks. The displays of an electric bike, and a hybrid car were particularly popular.

The Sustainable Food section provided literature on food security, local producers, permaculture gardens, and inspired us to dig up some concrete and grow our own produce. Free recipes and seeds were given away, and a wonderful vegie barbeque of fresh local produce, further added flavour to the day.

The Bokashi home composting system, attracted a lot of attention in the Waste section. Biodegradable products and information about wormfarming, recycling and better buying was also available.

The Water and Energy Conservation At Home stand provided information on rebates on water tanks, solar panels, washing machines, dual flush toilets and the fridge buyback scheme. Low cost products that could be installed to save water, energy, (and money) were on display, along with some new energy saving gadgets to capture the imagination.

Biodiversity was catered for with information and contacts for local Landcare and Bushcare groups.

There were also several stalls down at the local produce markets, where businesses with bigger items including lighting, water tanks, solar panels, plus other interesting and useful products were on display and for sale. Many thanks to participating businesses NECO, FX Larkin, Tory Toyota, Zuma Bikes, Conservation Volunteers Australia, Enjo, Matildas Farmyard, and Autowasher Products in contributing to the success of the day.

The community feedback was very positive, with 270 people filling in a survey to enlighten us on what measures they were undertaking at home, and what they would like to know more about. This will be particularly useful in working out our targets for the new grant funding we have recently received.

The shop proved to be a resounding success, with an estimated 1500 to 2000 people visiting on the day.....proving that it is a step in the right direction that we all need to take!



Photo 5. Happy One STOP CLIMATE Change shoppers browsing the stalls.

9.2.4 Jamberoo Indian Myna Control Project

The Jamberoo Indian Myna Project was launched in October 2006. The project aims at reducing Indian Myna numbers in the Jamberoo area, through community awareness and education, and the trapping of the birds for humane pest control. A group of keen community members volunteered to co-ordinate the project. Funding was obtained from Landcare Illawarra through its National Landcare Program funding, to purchase four traps. Support from the Jamberoo Country Women's Association was also given.

A website was set up at <http://jamberoomynas.googlepages.com/> and an information brochure was produced and distributed within the Jamberoo locality. A

Coordinator's Operating Manual was also produced to accompany the traps, to ensure their safe, correct and humane use.

Although there has been considerable interest in the project, the trial results to date have been somewhat disappointing. It is hoped that with greater experience in using the traps, and the possibility of using additional different traps, there will be greater success in the forthcoming year.

In addition to providing support to the committee and the trapping program, Kiama Council in conjunction with Shoalhaven Council, has provided sponsorship to a Wollongong University Honours student, Kylie Reed, with her thesis "*Impact, habitat preference, and management of the Common Myna in Kiama and Shoalhaven Local Government Areas, NSW, Australia*". The thesis, due for finalisation in November 2007, should provide a greater insight into Indian Myna behaviour in our Municipality.

9.2.5 Kiama Public Health Plan 2005-2008 Healthy Communities Town, Country and Coast

The Kiama *Public Health Plan*, which was adopted in 2005, covers a broad range of issues, which Council believe interact to have an impact on the health of the residents and visitors, and the environment. The plan offers a balance between the practical and theoretical, with links that draw on international, national, state and regional research, policies and best practice. The Plan has the following overall aims:

- To improve the health, wellbeing and quality of life for all residents and visitors to the Kiama Municipality; and
- To improve, protect and enhance the environment for the benefit of present and future generations.

The Plan consists of the following sections and themes:

- Strengthening Community
 - Priority: Community Connections
 - Priority: Information Provision
 - Priority: Partnerships
 - Priority: Funding & Service Provision
 - Priority: Clean Water
 - Priority: Energy Efficiency
 - Priority: Sustainable Living
 - Priority: Biodiversity
 - Priority: Built Environment
 - Priority: Transport
 - Priority: Waste Management
- Supportive Social Environment For Health
 - Priority: Regulatory Functions
 - Priority: Food & Nutrition
 - Priority: Physical Activity
 - Priority: Cancer Awareness & Prevention
 - Priority: Safety & Injury
- Health Of Our Environment
 - Priority: Regulatory and Statutory

The major achievements of the *Public Health Plan* during the reporting period are outlined below. Many projects are detailed in other sections of this report and the relevant section reference is included.

- Strengthening Communities
 - ✓ Formed a partnership with Minnamurra Rotary and Kiama Tourism to conduct an Emergency Services Expo.
 - ✓ Commenced work on a New Residents Kit.
 - ✓ An events Calendar was established by Tourism Kiama.
 - ✓ Investigates and trialed Touch Screen technology.
 - ✓ Continued to lobby state government for additional health and police services.
- Supportive Social Environment For Health
 - ✓ Annual inspection and education programs were conducted on food premises, residential swimming pools, hairdressers and body piercing and tattooists.
 - ✓ Continued to implement the Good Sports project;
 - ✓ Continued to support the Breastfeeding Friendly Environments and Breastfeeding Awareness Week.
 - ✓ Implemented Smoke Free Sporting Grounds policy and presented Council work in this area at the national health promotion Conference.
 - ✓ Established 2 Just Walk It Walking groups.
 - ✓ Conducted research into community needs and options of Council recreation facilities and walking paths.
 - ✓ Conducted research monitoring usage of walking paths in Gerringong.
 - ✓ Established a Dog Agility Park.
 - ✓ Trialed and was subsequently donated an Electric Bicycle for staff use.
 - ✓ Continued to support the North Kiama Neighbourhood Centre Community Garden.
 - ✓ Formed a partnership with Gerringong Public School to establish a School Food Garden.
 - ✓ Formed a partnership with Wollongong and Shellharbour Council, NSW Police and NRMA to establish the Regional Crime Prevention Van.
 - ✓ Participated in the Cancer Leadership Committee and related research.
 - ✓ Completed and distributed the Surf Awareness brochure.
 - ✓ Commenced work on a map of walking paths in the Municipality.
- Health Of Our Environment
 - ✓ Participated in the regional Active Transport Hub.
 - ✓ Participated in the Healthy By Design Workshop.

- ✓ Continued to distribute Butt Bins through out the Municipality and also to complement the Smoke Free Sporting Grounds Policy.
- ✓ Implemented National Tree Day in conjunction with Kiama High School and Conservation Volunteers Australia.
- ✓ Relevant Environmental Management Plans (Stormwater and Estuary Management Plans) were implemented (see Chapter 3: Water for more information);
- ✓ The *Stormwater pollutant control and riparian management in the Minnamurra Estuary* Project continued to be implemented, with assistance from a grant from the SRCMA (see Chapter 3: Water for more information);
- ✓ The Streamwatch Networks in Jamberoo, Kiama, Gerringong and Gerroa were supported and data was obtained for this SoE report (see Chapter 3: Water for more information);
- ✓ Water Saving Action Plans for Council operations were implemented (see Chapter 3: Water for more information);
- ✓ Milestone 2 of the Cities for Climate Protection Program was implemented (see Chapter 7: Air for more information);
- ✓ The Plastic Bag Project (Land and Sea - Plastic Free) was continued (see Chapter 6: Waste for more information);
- ✓ The One STOP CLIMATE CHANGE Shop was held for World Environment Day 2007 (see this chapter for more information);
- ✓ Clean Up Australia Day was implemented in 2007 (see Chapter 6: Waste for more information).

9.2.6 Awards Received

The Kiama Municipality won several awards during the previous reporting period:

- **Keep Australia Beautiful Country Energy Tidy Towns Awards** - these awards recognise the valuable contribution of local communities in the preservation and restoration of the environment.
 - ✓ Population Category E Waste Minimisation Award
Highly Commended – Kiama
- **Keep Australia Beautiful Clean Beach Challenge Awards** - these awards provide recognition to people who care for their community and coastal environment.

Illawarra Regional Clean Beaches Awards

- ✓ Litter Prevention Award
Winner- Boyd Jones



- ✓ Community Action Award
Highly Commended- Werri Beach
- ✓ Natural Heritage Award
Highly Commended- Werri Beach

- **Streamwatch Awards 2006**

The Streamwatch Awards Ceremony demonstrates the strength of the program, the skills of the participants and the value of their contribution to the protection of our waterways.

- ✓ Water Quality Monitoring Award-Community Division
Highly Commended – Gerringong and Gerroa Community Streamwatch Group

- **Champions of the Catchment Awards 2006**

Winners of Southern Rivers CMA's inaugural Champions of the Catchment Awards were announced on 9 August 2007.

- ✓ Certificate 1 in Active Volunteering
Tony Thompson
Bryan Lessard
Sandra Vynes
- ✓ Young Landcarer of the Year
Stephanie Kerr
- ✓ Nature Conservation Award (Runner Up)
Australian Seabird Rescue South Coast

Other nominees for the Champions of the Catchment Awards included:

- ❖ Landcare Primary Producer Award – Barb Mathie (Foxground)
- ❖ Landcare Education Award – Pam Foreman (Illawarra Christian School)
- ❖ Coastcare Community Award – Bombo Headland Landcare
 - Werri Beach Dunecare
 - Rae Gallop, Gerringong Headland



Photo 6: Stephanie Kerr, Young Landcarer of the Year (left) and volunteers of Conservation Volunteers Australia conducting Streamwatch water quality monitoring activities at Ooaree Creek, Gerringong.

9.2.7 Southern Rivers Catchment Management Authority

The Southern Rivers Catchment Management Authority (SRCMA) plays a vital role in the management of south coast catchments from Stanwell Park in the North to the Victorian border, including the Snowy River.

SRCMA was established in 2004 by the NSW Government to ensure the protection and sustainable development of land, vegetation and water resources within the catchment. It answers directly to the Minister for Environment and Climate Change.

The SRCMA has strong partnerships in natural resource management, working closely with local communities, farmers and other land managers, Landcare, government agencies, local government, Aboriginal people, and industries within the catchment to achieve its goals.

Southern Councils Group, on behalf of Councils, and the Southern Rivers Catchment Management Authority (SRCMA) have signed a Memorandum of Understanding (MoU) to enable cooperation between Local Government and the Catchment Management Authority. The MoU seeks to establish clear working relationships with Councils that enables cooperative and coordinated pursuit of sustainable natural resource management.

During community consultations the issue that the CAP was too broad to be applicable at a sub-regional level was raised. To enable the community to see how the CAP targets will have local relevance, SRCMA identified the need to develop sub-regional plans. The drafts for the

sub-regional plans should be completed by December 2007, with consultation to Councils and the community occurring after this time. The sub-regional plans will identify and detail current and future local projects that meet the set targets of the CAP (Miners, B. 2007).

Kiama Council values the close links it has with the SRCMA and looks forward to engaging in future projects that benefit our local environment.

9.3 Potential Future Activities

Existing Future Activities in the Management Plan 2007-2010

- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received;
- Implement educational programs and activities supported by Council in relation to aquatic systems, air, biodiversity, and urban visual quality;
- To implement the programs/strategies of the Kiama Public Health Plan;
- Review and evaluate the Kiama *Public Health Plan*.

Potential Future Activities Beyond 2008-2009

(H – High Priority, M - Medium Priority, L – Low Priority)

- To implement the programs/strategies of the Kiama *Public Health Plan* (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes);
- *Public Health Plan* Annual review reported in SoE Report (H);
- Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2008/2009 and 2009/2010) (H);
- Review the Kiama Public Health Plan (2008/2009) (H);
- Develop an Environmental Assessment Program, involving inspections of commercial and industrial premises and assisting the operators to meet their environmental obligations through educational material and advice. This action is included in this chapter to reiterate the importance of this issue for the land, water, noise and air themes (H);
- Develop programs to obtain additional data that can be used to measure the progress towards sustainability of Council and the community in the areas of biodiversity, noise, energy and water consumption and waste minimisation (H);
- Develop a program to map the above data on Council's Geographical Information System, where relevant (H);

- Undertake further surveys of community interest and participation in environmental issues and projects, based on the survey of residents in the Jamberoo area (M);
- Implement, or support the implementation, of projects identified in the above surveys (M);
- Implement the Sustainable Living Grants Program to fund community health, environmental and waste minimisation projects (M);
- Implement a range of appropriate Sustainable Living Workshops, for example Composting, Worm Farming, Waterwise Gardening, Energy and Water Conservation, Safe and Green Cleaning (M);
- Develop a “Greening the Office” Program for Council Administration building (M);
- Develop a program to recognise food shops adhering to good health, waste and environmental practices (L).

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 final section of each relevant Theme Chapter (Chapter 2-9) and are summarised below. The **existing** future activities are already planned for implementation in Council's Management Plan 2007-2010. The **potential** future activities have been identified for implementation in future years (after 2007-2008) in the Management Plan 2007-2010 or are new activities proposed based on issues raised in this SoE Report. The **potential** activities will be considered for inclusion in the Management Plan 2008-2011 or later, depending on level of priority. The activities are outlined according to the relevant Council Strategic Goal, in line with the format of Council's Management Plan.

GOAL: A SUSTAINABLE ENVIRONMENT

(1) OBJECTIVE: Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments

Program	Existing Activities 07/08	(KPI) 2007/2008	Potential Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 ENVIRONMENTAL PROTECTION AND MANAGEMENT				
	<ul style="list-style-type: none"> Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received. 	<ul style="list-style-type: none"> Stormwater Management Plan: <ul style="list-style-type: none"> Review of plan completed. Construct Surf Beach catchment infrastructure if funded. Report on sewerage overflows incidents and impacts. Estuary Management Plan: <ul style="list-style-type: none"> Minnamurra Bank Stabilisation. Monitor estuary water quality and report results. Implement stormwater pollutant control and riparian management project (grant funded). Jamberoo Community Environment Partnership Program: <ul style="list-style-type: none"> Develop and report on action plan. Kiama Local Environmental Plan Review: <ul style="list-style-type: none"> Investigate Biodiversity Certification. Review riparian lands and Areas of High Conservation. Incorporate heritage. 	<ul style="list-style-type: none"> Prepare and/or implement plans to improve the environment and report on activities undertaken and grants received (2008/2009 and 2009/2010) (H). Undertake investigations of flood risk and coastal hazards associated with potential climate change and prepare a Floodplain and Coastal Hazard Management Plans (M). Where possible, provide plants, promotion and/or funding to landholders and schools to undertake bush regeneration projects (L). Undertake a survey of regeneration works that are being undertaken on private land (L). Support and participate in Landcare Illawarra, Conservation Volunteers Australia and Southern River Catchment Management Authority projects within the Kiama Municipality (M). Implement Hindmarsh Park and Black Beach Stormwater Irrigation Reuse Scheme grant project (2008/2009) (H) 	<ul style="list-style-type: none"> Land, Water, Biodiversity, Waste, Air, Heritage, Sustainable Communities

GOAL: A SUSTAINABLE ENVIRONMENT

(1) OBJECTIVE: Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 <u>ENVIRONMENTAL PROTECTION AND MANAGEMENT</u> (cont'd)				
		<ul style="list-style-type: none"> Threatened Species Recovery Plan actions. Clean Up Australia Day participation. Cities for Climate Change Milestone 3 – action plan development. 	<ul style="list-style-type: none"> Undertake further surveys of community interest and participation in environmental issues and projects, based on the survey of residents in the Jamberoo area (M). Implement, or support the implementation, of projects identified in the above surveys (M). Cities for Climate Change Milestone 3 –action plan development and seek funding for priority projects (H). 	Land, Water, Biodiversity, Waste, Air, Sustainable Communities

GOAL: A SUSTAINABLE ENVIRONMENT

(1) OBJECTIVE: Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 <u>ENVIRONMENTAL PROTECTION AND MANAGEMENT</u> (cont'd)				
	<ul style="list-style-type: none"> Protection of the Environment Operations Act implementation. 	<ul style="list-style-type: none"> Report on Protection of the Environment Operations Act related complaints. 	<ul style="list-style-type: none"> Protection of the Environment Operations Act implementation (2008/2009 and 2009/2010) (H). Develop an Environmental Sustainability Assessment Program, involving inspections of commercial and industrial premises and assisting the operators to meet their environmental obligations through educational material and advice. This will be incorporated as part of the regional Business Treading Lightly sustainable regional grant (H). Develop a background noise level measurement program including representative sites for all landuse types (L). 	<ul style="list-style-type: none"> Land, Water, Noise, Air

GOAL: A SUSTAINABLE ENVIRONMENT

(1) OBJECTIVE: Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments

Program	Existing Activities 07/08	(KPI) 2007/2008	Potential Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 <u>ENVIRONMENTAL PROTECTION AND MANAGEMENT</u> (cont'd)				
	<ul style="list-style-type: none"> Prepare State of the Environment Report. 	<ul style="list-style-type: none"> Completion of Report within the statutory timeframe. 	<ul style="list-style-type: none"> Prepare State of the Environment Report (2008/2009 and 2009/2010) (H). Develop programs to obtain additional data that can be used to measure the progress towards sustainability of Council and the community in the areas of biodiversity, noise, energy and water consumption and waste minimisation (H). Develop a program to map the above data on Council's Geographical Information System, where relevant (H). 	<ul style="list-style-type: none"> All
Stormwater Management Plan	<ul style="list-style-type: none"> Install gross pollutant trap in the Surf Beach catchment at Farmer Street. Continue to implement water saving and water quality facilities at Council Works Depot. 	<ul style="list-style-type: none"> Farmer Street gross pollutant trap installed prior to July 2008. 	<ul style="list-style-type: none"> Complete the construction of the Surf Beach Catchment Stormwater Management Plan (2008/2009) (H). Continue to implement water saving and water quality facilities at Council Works Depot (2008/2009) (H). Install litter traps in remaining commercial centres and undertake accompanying educational projects as part of the Clean Waters Program (M). 	<ul style="list-style-type: none"> Water

GOAL: A SUSTAINABLE ENVIRONMENT

(1) OBJECTIVE: Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 <u>ENVIRONMENTAL PROTECTION AND MANAGEMENT</u> (cont'd)				
Minnamurra River Estuary Management Plan	<ul style="list-style-type: none"> Carry out bank stabilisation work. 	<ul style="list-style-type: none"> Bank stabilisation work carried out on time and within budget. 	<ul style="list-style-type: none"> Carry out bank stabilisation work 2008/2009 and 2009/2010) (H). Seek funding for the continuation of the <i>Minnamurra Bank Stabilisation</i> Project (H). Seek funding for stages 3 of the <i>Stormwater pollutant control and riparian management in the Minnamurra Estuary</i> Project (M). 	<ul style="list-style-type: none"> Water
Tree Preservation	<ul style="list-style-type: none"> Assess applications for tree removal or pruning in accordance with Council's Tree Preservation Order. 	<ul style="list-style-type: none"> All applications assessed within 2 weeks of receipt. Breaches recommended for prosecution reported to Council as per Council's Policy. 	<ul style="list-style-type: none"> Assess applications for tree removal or pruning in accordance with Council's Tree Preservation Order (2008/2009 and 2009/2010) (H). 	<ul style="list-style-type: none"> Biodiversity

GOAL: A SUSTAINABLE ENVIRONMENT

(1) OBJECTIVE: Protect, enhance, manage and monitor the area's landscapes, places of heritage significance, and natural environments

Program	Existing Activities 07/08	(KPI) 2007/2008	Potential Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 <u>ENVIRONMENTAL PROTECTION AND MANAGEMENT</u> (cont'd)				
Community Lands Management	<ul style="list-style-type: none"> • Prepare and review Plans of Management for the following reserves: <ul style="list-style-type: none"> - Spring Creek Wetlands - Jerrara Dam Arboretum • Implement works under various Plans of Management including: <ul style="list-style-type: none"> - Kiama Harbour Jetty - Blowhole Point Redevelopment - Sanctuary Place Quarry Redevelopment 	<ul style="list-style-type: none"> • Plans of Management prepared and adopted by Council prior to July 2008. • Works completed on time and within budget. 	<ul style="list-style-type: none"> • Prepare and review Plans of Management for the following reserves: <ul style="list-style-type: none"> - West Kiama Reserves (5) - (2007/2008) (H). • Prepare and review Plans of Management for the following reserves: <ul style="list-style-type: none"> - Neighbourhood Parks - Baileys Island - Turpentine Reserve - Nobles Estate – Werri Headland (2009/2010) (M). • Review and implement the relevant recovery strategies listed in the Department of Environment and Climate Change's draft Priority Action Statement that refer to threatened species and threatening processes on Community Land (H). 	<ul style="list-style-type: none"> • Land

GOAL: A SUSTAINABLE ENVIRONMENT

(2) OBJECTIVE : Control and plan development of our built environment for the wellbeing of the community

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 <u>STRATEGIC TOWN & RURAL PLANNING</u>				
	<ul style="list-style-type: none"> Prepare, exhibit and adopt Kiama Local Environmental Plan for urban and rural lands. 	<ul style="list-style-type: none"> Kiama Local Environmental Plan 2006 adopted. 	<ul style="list-style-type: none"> Commence review of Kiama Local Environmental Plan 2006 to be completed 2011 (2009/2010) (L). 	<ul style="list-style-type: none"> Land
	<ul style="list-style-type: none"> Prepare a single Development Control Plan for the Local Government Area with place-based provisions for Kiama, Gerringong/Gerroa, Jamberoo and Minnamurra. Include Public Health Plan recommendations and Safer by Design principles. 	<ul style="list-style-type: none"> Kiama Development Control Plan 2006 adopted. 	<ul style="list-style-type: none"> Monitor implementation of Development Control Plan (2009/2010) (H). Incorporate noise attenuation design requirements in the review of Development Control Plans (H). 	<ul style="list-style-type: none"> Land

GOAL: A SUSTAINABLE ENVIRONMENT

(3) OBJECTIVE : Manage and reduce the environmental impacts of all activities on air, water and land systems

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 ENVIRONMENTAL QUALITY				
Noxious Weed Management	<ul style="list-style-type: none"> Provide funding for the operation of the IDNWA. 	<ul style="list-style-type: none"> Funding provided 	<ul style="list-style-type: none"> Provide funding for the operation of the IDNWA (2008/2009 and 2009/2010) (H). 	<ul style="list-style-type: none"> Biodiversity
	<ul style="list-style-type: none"> Control noxious weeds through the implementation of the IDNWA Programs. 	<ul style="list-style-type: none"> Program completed and reported to Council. 	<ul style="list-style-type: none"> Control noxious weeds through the implementation of the IDNWA Programs (2008/2009 and 2009/2010) (H). 	<ul style="list-style-type: none"> Biodiversity
Roadside Vegetation Management Plan	<ul style="list-style-type: none"> Implement the recommendations of the Roadside Vegetation Management Plan. 	<ul style="list-style-type: none"> Staff briefed on the requirements of the Roadside Vegetation Management Plan and operational measures put in place to ensure compliance. 	<ul style="list-style-type: none"> Implement the recommendations of the Roadside Vegetation Management Plan (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes). 	<ul style="list-style-type: none"> Biodiversity
Environmental Assessment	<ul style="list-style-type: none"> Assess all Council works activities under Part 4 and Part 5 of the EP and A Act as required. 	<ul style="list-style-type: none"> Review of environmental factors prepared for all activities under Part 5. Development Applications submitted for all developments under Part 4. 	<ul style="list-style-type: none"> Assess all Council works activities under Part 4 and Part 5 of the EP and A Act as required (2008/2009 and 2009/2010) (H). 	<ul style="list-style-type: none"> Biodiversity
Contaminated Lands Management	<ul style="list-style-type: none"> Finalise site investigation and rehabilitation plan and pursue grant funding for Gasworks site in Shoalhaven St, Kiama. 	<ul style="list-style-type: none"> Plans prepared and works implemented to the satisfaction of the Department of Environment and Climate Change. 		<ul style="list-style-type: none"> Land

GOAL: A SUSTAINABLE ENVIRONMENT

(3) OBJECTIVE : Manage and reduce the environmental impacts of all activities on air, water and land systems

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
2.0 WASTE MANAGEMENT				
Waste	<ul style="list-style-type: none"> Waste Depot rehabilitation at Gerroa and continue closure plan maintenance at Minnamurra Tip. 	<ul style="list-style-type: none"> Monitor Gerroa Tip rehabilitation. Implement Minnamurra Closure Plan. 	<ul style="list-style-type: none"> Monitor both Gerroa and Minnamurra Tip rehabilitation outcome (2008/2009 and 2009/2010) (H). 	<ul style="list-style-type: none"> Waste
	<ul style="list-style-type: none"> Waste Depot operations. 	<ul style="list-style-type: none"> Prepare annual report to Department of Environment and Climate Change 		<ul style="list-style-type: none"> Waste
	<ul style="list-style-type: none"> Participate in industry inquiry and expressions of interest for Regional Residual Waste and Organics Treatment Facility. 	<ul style="list-style-type: none"> Industry inquiry undertaken December 2007. 	<ul style="list-style-type: none"> Participate in expressions of interest and tenders for Regional Residual Waste and Organics Treatment Facility (H) (2009/2010) 	<ul style="list-style-type: none"> Waste

GOAL: A SUSTAINABLE ENVIRONMENT

(3) OBJECTIVE : Manage and reduce the environmental impacts of all activities on air, water and land systems

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
2.0 <u>WASTE MANAGEMENT</u> (cont'd)				
	<ul style="list-style-type: none"> Waste and Recycling Collection Services, Policies and Programs. 	<ul style="list-style-type: none"> Services provided in accordance with schedule: <ul style="list-style-type: none"> waste; recycling; green waste; litter collection and street sweeping; programs undertaken. 	<ul style="list-style-type: none"> Review Resident Clean Up Collection Program, including consideration of alternatives such as a tipping voucher system (M). Review commercial garbage and recycling services to ensure operators have sufficient waste services in place (H). Trial public place recycling at nominated sporting grounds (H). Develop Special Events Waste and Recycling Policy (H). Develop Hire of Council Facilities Waste and Recycling Policy (H). Assist with the implementation of the three Urban Sustainability Grants. Implement waste recycling to all Council offices and administration centre. 	<ul style="list-style-type: none"> Waste

GOAL: A SUSTAINABLE ENVIRONMENT

(3) OBJECTIVE : Manage and reduce the environmental impacts of all activities on air, water and land systems

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
Sewer Connection Program	<ul style="list-style-type: none"> Finalise the connection of all Council properties to the sewer in Gerringong and Jamberoo. 	<ul style="list-style-type: none"> All Council properties connected to the sewer by July 2008. 		<ul style="list-style-type: none"> Water
	<ul style="list-style-type: none"> Implement sewerage connections, strategies, policies and programs. 	<ul style="list-style-type: none"> Connection policy - connect Council facilities to sewer. Report on private connections. Participate in and promote Sydney Water Corporation Wet Weather Overflow Abatement Program. On Site Sewerage Management: - Report on strategy implementation. 		<ul style="list-style-type: none"> Water

GOAL: A SUSTAINABLE ENVIRONMENT

(4) OBJECTIVE : Promote environmental awareness through educational programs

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 ENVIRONMENTAL EDUCATION				
	<ul style="list-style-type: none"> Implement programs and activities supported by Council in relation to: <ul style="list-style-type: none"> - aquatic systems; - air; - biodiversity; - urban visual quality. 	<ul style="list-style-type: none"> Stormwater Management Plan: <ul style="list-style-type: none"> - waste/recycling and litter reduction program. Estuary Management Plans: <ul style="list-style-type: none"> - Minnamurra Estuary Education Program. - Crooked River Estuary Management Plan. 	<ul style="list-style-type: none"> Further promote participation of schools, community groups and residents in the Streamwatch program, including further catchments in the Kiama township (M). Develop and implement a Clean Waters Program, including involvement of community volunteers, and addressing stormwater education and water quality issues, building on the Minnamurra Estuary Project (H). Develop an education program to further address noise from barking dogs and other noise sources (M). Conduct workshops for Community Groups and interested residents on appropriate topics such as backyard biodiversity, propagation and indigenous sites (L). Undertake education programs on biodiversity issues including riparian management and threatened species (M). 	<ul style="list-style-type: none"> Water, Noise, Biodiversity, Air, Heritage, Sustainable Communities

GOAL: A SUSTAINABLE ENVIRONMENT

(4) OBJECTIVE : Promote environmental awareness through educational programs

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 ENVIRONMENTAL EDUCATION (cont'd)				
			<ul style="list-style-type: none"> Implement the Sustainable Living Grants Program to fund community health, environmental and waste minimisation projects (M). Implement a range of appropriate Sustainable Living Workshops, for example Composting, Worm Farming, Waterwise Gardening, Energy and Water Conservation, Safe and Green Cleaning (M). Seek funding for cigarette butt litter program to be implemented during peak holiday periods (H). Develop a program to recognise food shops adhering to good health, waste and environmental practices (L). Develop a "Greening the Office" Program for Council Administration building (M). 	<ul style="list-style-type: none"> Water, Noise, Biodiversity, Air, Heritage, Sustainable Communities
Community Lands	<ul style="list-style-type: none"> Continue the development of educational reserve sites at: <ul style="list-style-type: none"> - Spring Creek Wetlands. - Jerrara Dam Arboretum. - Bonaira Native Gardens. 	<ul style="list-style-type: none"> Reserves developed in accordance with the Plan of Management 	<ul style="list-style-type: none"> Continue the development of educational reserve sites at: <ul style="list-style-type: none"> - Spring Creek Wetlands. - Jerrara Dam Arboretum. - Bonaira Native Gardens (2008/2009 and 2009/2010) (M). 	<ul style="list-style-type: none"> Land, Biodiversity

GOAL: A SUSTAINABLE ENVIRONMENT

(5) OBJECTIVE : Provide leadership by demonstrating environmental excellence in all Council activities and policies

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 SUSTAINABLE COUNCIL OPERATIONS				
	<ul style="list-style-type: none"> Prepare a Pesticide Notification Plan. 	<ul style="list-style-type: none"> Pesticide Notification Plan prepared by February 2007 Recommendations implemented. 	<ul style="list-style-type: none"> Implement the Pesticide Notification Plan (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes). 	<ul style="list-style-type: none"> Land
	<ul style="list-style-type: none"> Implement the Water Savings Action Plan. 	<ul style="list-style-type: none"> Ongoing implementation of the Water Savings Action Plan. 	<ul style="list-style-type: none"> Implement the Water Conservation Plan (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes). Seek funding assistance for priority water conservation projects (H). 	<ul style="list-style-type: none"> Water

GOAL: COMMUNITY COHESION AND WELLBEING

(1) OBJECTIVE : Contribute to the health, safety and wellbeing of the community

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 PUBLIC HEALTH AND SAFETY				
	<ul style="list-style-type: none"> To implement the programs/strategies of the Kiama Public Health Plan. 	<p><u>Strengthening Community</u></p> <ul style="list-style-type: none"> Projects developed and implementation commenced: <ul style="list-style-type: none"> Welcome Program for new residents Information Provision Partnerships Protocol External Funding investigation. <p><u>Supportive Social Environment For Health</u></p> <ul style="list-style-type: none"> Regulatory inspection and related education programs conducted. Projects developed and implemented: <ul style="list-style-type: none"> Community Gardens Obesity prevention Walk It Kiama Smoke Free Sporting Grounds Kiama Community Safety Project 	<ul style="list-style-type: none"> To implement the programs/strategies of the Kiama Public Health Plan (2008/2009 and 2009/2010) (H, M & L as per Plan timeframes). Develop programs to obtain additional data that can be used to measure the progress towards sustainability of Council and the community in areas of biodiversity, noise, energy and water consumption and waste minimisation (H), Develop a program to map the above data on Council's Geographical Information System, where relevant (H). 	<ul style="list-style-type: none"> Sustainable Communities

GOAL: COMMUNITY COHESION AND WELLBEING

(1) OBJECTIVE : Contribute to the health, safety and wellbeing of the community

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 PUBLIC HEALTH AND SAFETY (cont'd)				
	<ul style="list-style-type: none"> Review and evaluate the Kiama Public Health Plan 	<u>Health of the Environment:</u> <ul style="list-style-type: none"> Regulatory inspection and related education programs conducted. Projects developed and implemented: <ul style="list-style-type: none"> Clean Waters Cities For Climate Protection Sustainable Living strategies Biodiversity program Healthy By Design Waste Management/ Minimisation Program Annual review prepared. 	<ul style="list-style-type: none"> <i>See above Strategic Goal: A Sustainable Environment for strategies relevant to this section of the Health Plan.</i> Review and evaluate the Kiama Public Health Plan (2007/2008 and 2008/2009) (H). Public Health Plan Annual review reported in SoE Report (H). 	<ul style="list-style-type: none"> All All
Cycleways and Walkways Plan	<ul style="list-style-type: none"> Provide Coastal Walking Track from Kiama Heights to Werri Lagoon. Undertake detailed design of shared pathway from Gainsborough to Swamp Road via the Billabong Implement educational programs and activities supported by Council in relation to air quality. 	<ul style="list-style-type: none"> Works completed on time and within budget. Completion of design for shared pathway from Gainsborough to Swamp Road via the Billabong. 	<ul style="list-style-type: none"> Construct Stage 2 of shared pathway Pacific Avenue Werri Beach (2008/2009) (H). Construct Stage 2 shared pathway Crooked River Road (2008/2009 and 2009/2010) (H). Construct shared pathway Fern Street Omega to Miller Street (2009/2010) (M). 	<ul style="list-style-type: none"> Air

GOAL: COMMUNITY COHESION AND WELL BEING

(4) OBJECTIVE : Recognise and support the value of cultural heritage

Program	Existing Activities 07/08	(KPI) 2007/2008	<u>Potential</u> Future Activities Beyond 2007/2008 (Bolded activities already identified for later years in MP 07/08, H-high priority, M-medium priority, L-low priority)	Relevant SoE Chapter/s
1.0 HERITAGE				
	<ul style="list-style-type: none"> Review draft heritage list and provisions. 	<ul style="list-style-type: none"> Review completed. 	<ul style="list-style-type: none"> Undertake Aboriginal Heritage Study, including identification of significant objects and places, with liaison with local Indigenous community (H). 	<ul style="list-style-type: none"> Heritage
	<ul style="list-style-type: none"> Require applicants to provide assessment reports where areas of aboriginal heritage are potentially impacted. 	<ul style="list-style-type: none"> Number of reports prepared. 		<ul style="list-style-type: none"> Heritage
	<ul style="list-style-type: none"> Require applicants to provide assessment reports where areas of European heritage and buildings are potentially impacted. Investigate cultural landscape for inclusion in Kiama LEP Review. 	<ul style="list-style-type: none"> Number of reports prepared. Investigation report prepared. 	<ul style="list-style-type: none"> Require applicants to provide assessment reports where areas of European heritage and buildings are potentially impacted (2008/2009 and 2009/2010) (H). Investigate cultural landscape for inclusion in Kiama LEP Review (2008/2009)(H). 	<ul style="list-style-type: none"> Heritage
	<ul style="list-style-type: none"> Carry out stabilisation, maintenance and repair work on the Old Bushbank Mill. 	<ul style="list-style-type: none"> Work undertaken. 		<ul style="list-style-type: none"> Heritage

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
CCP™ – Cities for Climate Protection
CO₂ – Carbon Dioxide
CREMP – Crooked River Estuary Management Plan
CVA – Conservation Volunteers Australia
DCP – Development Control Plan
DEC – Department of Environment and Conservation
DNR – Department of Natural Resources
DO – Dissolved Oxygen
DPI – 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
LHF – Local Heritage Fund
MoU –Memorandum of Understanding
MREMP – Minnamurra River Estuary Management Plan
NRC –Natural Resources Commission
NSW – New South Wales
OSSMS – On-Site Sewage Management Systems
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*

References

Australian and New Zealand Environment Conservation Council (2000), *Revised Australian Water Quality Guidelines for Fresh and Marine Waters*, Australian and New Zealand Environment Conservation Council.

Bushby, D. (2007), email October 2007
<Donald.Bushby@rfs.nsw.gov.au>

Byrne, J (2006), email October 2007,
<jbyrne@cva.org.au>.

Casimir, S. (2007), October 2007,
<SAMUEL.CASIMIR@sydneywater.com.au>

CSIRO Australia (2005), *Potential Impacts of Climate Change on the Kiama Local Government Area*, CSIRO Australia.

Department of Environment and Conservation (2003), *NSW State of the Environment 2003*, Department of Environment and Conservation, Sydney.

Department of Environment and Conservation (2004), *Noise Guide for Local Government*, Department of Environment and Conservation, Sydney.

Department of Environment and Conservation, (2006a). *Introducing the Threatened Species Priorities Action Statement (PAS) Report accompanying exhibition of the draft PAS*, Department of Environment and Conservation, Sydney South.

Department of Environment and Climate Change (2007a) – *Beachwatch and Harbourwatch State of the Beaches*, Department of Environment and Climate Change, Sydney South.

Department of Environment and Climate Change - a,
www.wildlifeatlas.npws.nsw.gov.au. (accessed September 2007).

Department of Environment and Climate Change - b,
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_threats.aspx (accessed September 2007).

Department of Environment and Climate Change – c,
<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/legislation.aspx> (accessed September 2007).

Department of Environment and Climate Change – d,
www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_recovery_new. (accessed September 2007).

Department of Environment and Climate Change, 2006 - e,
http://www.environment.nsw.gov.au/resources/2006395_gov_benefitrecycalc.xls, (accessed November 2007).

Department of Environment and Heritage,
<http://www.deh.gov.au/biodiversity/threatened/index.html>, (accessed September 2007).

Department of Planning (2006), *Draft Illawarra Regional Strategy 2006-31*, Department of Planning.

Department of Planning - a, <http://sustainability.nsw.gov.au/information/about.jsp>, (accessed on 25 September 2006).

Department of Planning - b,
http://sustainability.nsw.gov.au/information/common/pdf/alts_adds_req/energy_fact_sheet.pdf, (accessed on 25 September 2006).

Department of Gregory, J. 2007) Industries (2006), *Reducing the Impact of Road Crossings on Aquatic Habitat in Coastal Waterways – Southern Rivers NSW, Report to the Environmental Trust*, Department of Primary Industries, Flemington, NSW.

Department of Primary Industries - a,
http://www.fisheries.nsw.gov.au/threatened_species/general/what_is_currently_listed (accessed October 2007).

Department of Primary Industries - b,
<http://www.dpi.nsw.gov.au/agriculture/noxweed>, (accessed October 2007).

Gregory, J. (October, 2007)
<JUDE.GREGORY@sydneywater.com.au>.

Kevin Mills and Associates (2006a), *The Natural Vegetation in the Municipality of Kiama New South Wales*, Kevin Mills and Associates, Jamberoo.

Kevin Mills and Associates (2006b), *The Fauna of Kiama: Municipality of Kiama, South Coast, New South Wales Final Report*, Kevin Mills and Associates, Jamberoo.

Kiama Municipal Council (2001), *Kiama Municipal Council Local Air Quality Management Plan*, Kiama Municipal Council, Kiama.

Kiama Municipal Council (2003a), *Stormwater Management Plan Review 2003*, Kiama Municipal Council, Kiama.

Kiama Municipal Council (2003b), *Crooked River Estuary Management Plan*, Kiama Municipal Council, Kiama.

Kiama Municipal Council (2004a), *Social/Community Plan 2004-2009*, Kiama Municipal Council, Kiama.

Kiama Municipal Council (2004b), *On-site Sewage Management Strategy*, Kiama Municipal Council

Kiama Municipal Council (2007a), *Kiama Municipal Council Management Plan 2007-2010*, Kiama Municipal Council

Kiama Municipal Council (2005b), *Kiama Cycleway Plan*, Kiama Municipal Council, Kiama.

Kiama Municipal Council (2006), *Draft Water Savings Action Plans*, Kiama Municipal Council, Kiama.

Kilian, M (2006), email, September 2007,
MYLISSA.KILIAN@sydneywater.com.au

New South Wales Government (2005), *A New Approach to Native Vegetation* brochure, New South Wales Government

New South Wales Government (undated), *BASIX Save money on your energy bills and water bills brochure*, New South Wales Government.

Panayotou, K (2003), *Minnamurra River Estuary Management Plan Review – May 2003*, Kiama Municipal Council.

Parisotto, D (2007), email November 2007
< earthh2o@tpg.com.au >

Planet Footprint Water Usage Report (October 2007)

Plunkett-Cole, N. Southern Rivers Catchment Management Authority, (October 2007)

Pomery, D. (2006), email, October 2007, <dpomery@tpg.com.au>

Roads and Traffic Authority (1999), *1998 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW

Roads and Traffic Authority (2000), *1999 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW

Roads and Traffic Authority (2001), *2000 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW

Roads and Traffic Authority (2002), *2001 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW

Roads and Traffic Authority (2003), *2002 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW

Roads and Traffic Authority (2004), *Traffic Volume Data for Southern Region 2003*, Roads and Traffic Authority Southern Region.

Roads and Traffic Authority (2004a), *2003 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW.

Roads and Traffic Authority (2005), *2004 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW.

Roads and Traffic Authority (2006), *2005 New South Wales Driver & Vehicles Statistics*, Roads and Traffic Authority of NSW, Haymarket NSW.

Roads and Traffic Authority (2006a), *New South Wales Local Government Area Vehicle Registrations 2005*, Roads and Traffic Authority of NSW, Haymarket NSW.

Roads and Traffic Authority (2007), *New South Wales Local Government Area Vehicle Registrations 2006*, Roads and Traffic Authority of NSW, Haymarket NSW.

Sydney Water Corporation – a,
<http://www.sydneywater.com.au/Publications/FactSheets/WeeklyDamLevels.pdf>, (accessed October 2007).

Sydney Water Corporation - b,
<http://www.sydneywater.com.au/OurSystemsAndOperations/WastewaterTreatmentPlants/Coastal.cfm> and
<http://www.sydneywater.com.au/OurSystemsAndOperations/WastewaterTreatmentPlants/Inland.cfm>, (accessed 28 August 2006).

Sydney Water Corporation - c,
<http://www.sydneywater.com.au/OurSystemsAndOperations/SewageOverflows/>, (accessed 28 August 2006).

Whittaker, G (2007) pers comm