

# ***Muswellbrook Shire Council***



## ***State of the Environment Report 2005/2006***



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## *State of the Environment Report*

*2005/2006*

This report has been prepared by the Environmental Services Department, Muswellbrook Shire Council to fulfil the requirements of the Local Government Act 1993.

The report is generally consistent with the regional SoE reporting template developed by Twyford Consulting for the Lower Hunter and Central Coast Regional Environmental Management Strategy (2003).

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# **1. Towards Sustainability**

**Management Plan Goal:** *To protect and improve the environment by developing an environmentally sustainable community, to achieve world best practice standards in the rehabilitation of mines and extractive industries, to promote wildlife corridors, to reduce mainstream flooding, to promote community participation in the determination of major developments and to enhance the quality and enjoyment of the environment for present and future generations*

## **1.1 Introduction**

### **The issue: What is sustainability?**

Ecologically Sustainable Development (ESD) principles are today an essential consideration in a facet of applications for the community, businesses and government. Essentially ESD involves the sustainable interaction with the environment so as to not compromise the ability for future generations to meet the needs of their society.

### **Monitoring progress toward ESD**

The completion of State of the Environment (SoE) Reports, provide ongoing updates of environmental indicators which are affected by the activities of government and the community. These indicators are used as a measure to assess the improvement or deterioration of the environment in relation to ongoing monitoring. This SoE Report for the Muswellbrook Shire aims to report on the effectiveness of the implementation of the key objectives of Council's Management Plan and the progress in moving towards sustainable outcomes.

### **Environmental & socioeconomic data**

SoE reporting in NSW focuses on the condition of natural systems, the pressures placed on them via human activities, and the actions or responses under way to minimise the impacts of such pressures. Through this Pressure – State – Response model, environmental and socioeconomic data is used to provide an indication of the state of the environment, pressures placed on it and the effectiveness (or not) of actions being implemented.

### **Approach taken with this SoE report**

This SoE Report (2005/2006) provides an assessment of the state of the environment in the Muswellbrook Shire for the financial reporting period from 1<sup>st</sup> July 2005 to 30<sup>th</sup> June 2006, in accordance with the Local Government Act 1993.

## **1.2 Key determinants**

The environment is influenced by a variety of factors or key determinants which can be divided into those originating from the physical environment and those originating from human activities. The interaction of these key determinants can therefore provide improvement or deterioration of the environment as a whole. The following report focuses on the predominant key determinants relating to the Muswellbrook Shire environment which are then interpreted as an indication to the health or state of the environment.

### **The physical environment**

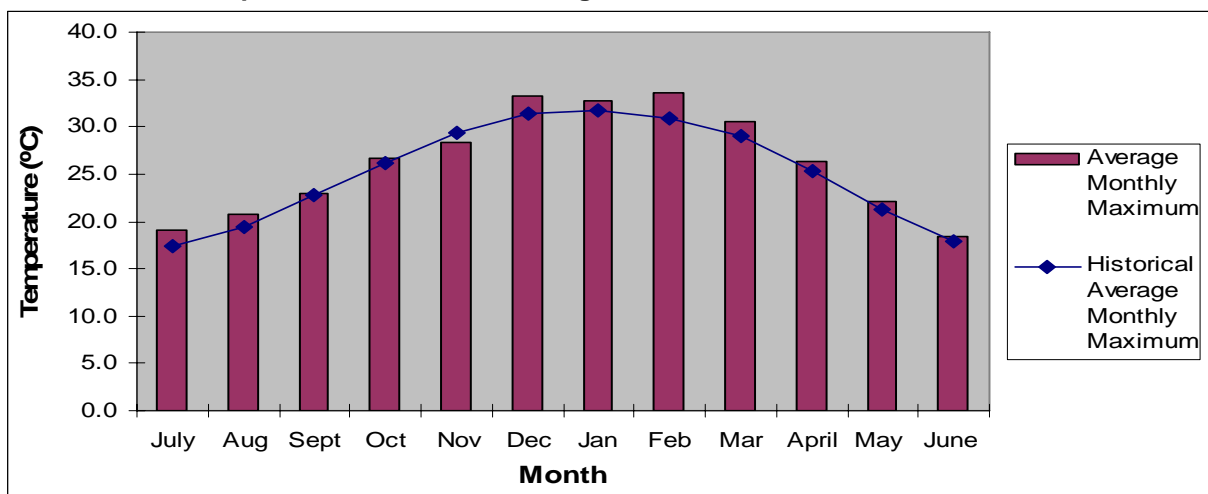
The climate of the Upper Hunter is characterised by warm dry summers and cool dry winters. Typically in summer, the weather is influenced by high pressure systems which alternate with low pressure systems every three to five days. Due to the continuing drought conditions that the Shire has been experiencing, this trend has been altered with reduced instances of 'southerly blusters'

bringing relief from the hot dry conditions. Similarly rainfall has been impacted producing lower than normal rainfall for the Upper Hunter.

During winter, the mid latitude westerlies and high pressure systems alternate with cold fronts. The prevailing winds are north-westerly and are created via cold air drainage flows associated with the terrain. Winter is drier than summer, with regular frosts and fogs occurring from mid – autumn to late spring.

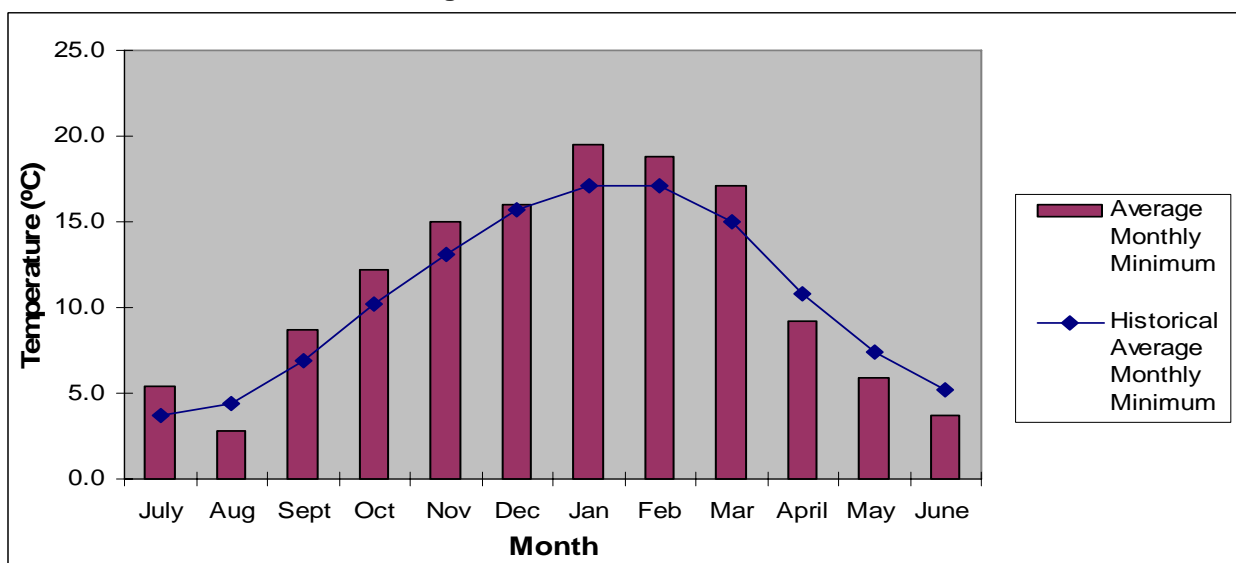
The temperature and rainfall data recorded at the Jerry’s Plains Post Office for 1<sup>st</sup> July 2005 to 30<sup>th</sup> June 2006 period are detailed below. Figures 1.1 and 1.2 represent the maximum and minimum monthly temperature respectively. Figure 1.3 details the total monthly rainfall with historical average totals.

**Figure 1.1**  
**Indicator: Average Maximum Monthly Temperatures for July 2005 to June 2006 compared with historical averages**



Source: Bureau of Meteorology, 2006

**Figure 1.2**  
**Indicator: Average Minimum Monthly Temperature for July 2005 to June 2006 compared with historical averages**

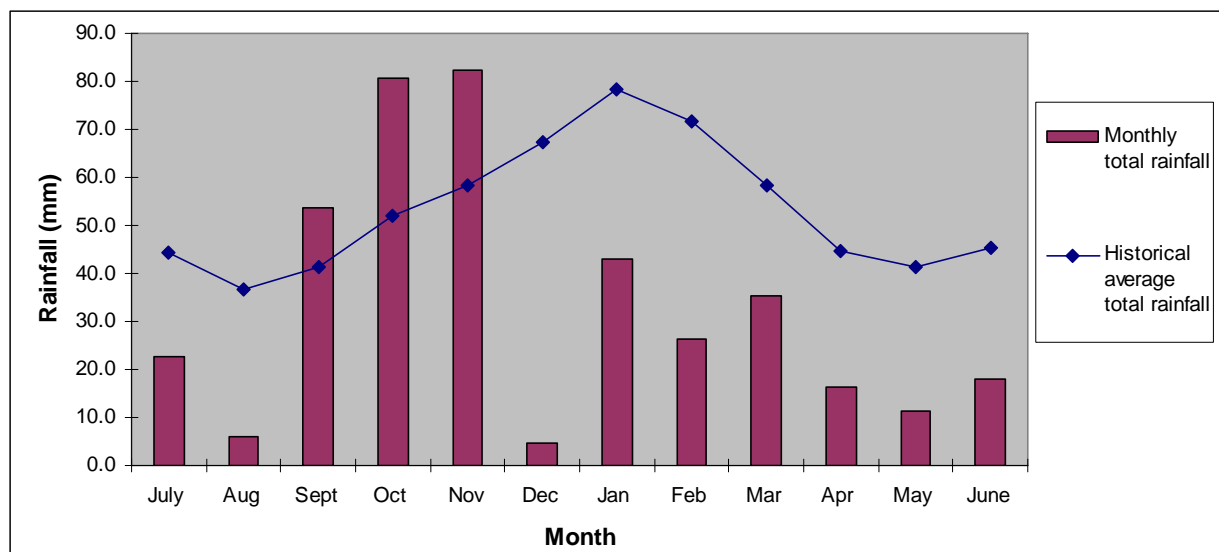


Source: Bureau of Meteorology, 2006

As shown by the Figures 1.1 and 1.2 the average temperatures received during the reporting period follow a similar trend as the historical data collected by the Bureau of Meteorology since 1884.

**Figure 1.3**

**Indicator: Total Monthly Rainfall for July 2005 to June 2006 compared with historical monthly average total rainfall**



Source: Bureau of Meteorology, 2006

The rainfall data represented by Figure 1.3 shows a significant variation from the rainfall trend indicated by the historical averages. As the region is currently suffering prolonged drought conditions the lower than normal rainfall received during the first half of 2006 will exacerbate the dry conditions currently evident in the Muswellbrook Shire.

### **The human environment - population & resource consumption**

Activities of human society have a significant impact on the environment predominantly through the consumption of natural resources, the production of goods and waste production. The following report discusses indicators which are interpreted to gauge the affects that human activities have on the environment within the Muswellbrook Shire.

The last census released in 2001 recorded the Muswellbrook Shire population as 14,796. When comparing this to the information collected by the previous census in 1996, the population of Muswellbrook had experienced a decline in numbers.

### **Economic profile and economic development**

The economy of Muswellbrook is dominated by industry (for example mining and support industries) and agricultural activities (for example dairy farming, crop farming, cattle, horse breeding and viticulture). The expansion of the industrial sector of Muswellbrook has attracted a number of developments within the Shire including residential and industrial subdivisions including the following:

- **Blackhill Tourist Development (DA 146/2002)**  
This application is for the development of land surrounding the old Blackhill Service Station. The application was approved by Council in 2003 and the developer commenced construction of the Villa/cabin section of the development in January 2006. This section of the development consists of 30 villas and 10 cabins and should be completed by December 2006.
- **Muswellbrook Fair (DA 408/2004)**  
This development is located on Rutherford Road, adjacent to the existing Bilo complex. The application was approved by Council in 2005 and construction of the development commenced in

December 2005. The site is nearing completion with some businesses opening prior to Christmas 06, the remainder will be commencing in the new year 2007.

- **Northview Estate (DA 358/2004)**

This development is located on the northern side of Muswellbrook. Council approved a fifty (50) lot subdivision which involved the extension of Queen Street. The subdivision consisted of two stages, Stage one consisted of 10 rural residential lots and 13 residential lots. Stage two consisted of twenty-five (25) residential lots. These stages are currently under construction.

The Applicant has recently lodged an application for Stage three of the development. This stage comprises a total of forty-seven (47) lots, consisting of seven (7) Rural residential lots and forty (40) residential lots. This application is currently being assessed by Council officers.

- **Eastbrook Estate – Masterplan (DA 263/2004)**

The subject site is located adjacent to the New England Highway heading south of Muswellbrook. The applicant, being ACOR Consultants has received approval for a Masterplan which comprises of 1189 residential lots. The applicant has completed stages one (1) to six (6), which have now been registered with the Lands Title Office. Stages seven (7) to nine (9) have been constructed and are yet to be registered with the Lands Title Office. The remaining lots to be developed are approximately 966 residential lots.

- **St Mary's Estate (DA 237/2002, DA 392/2005 and DA 393/2005)**

The area that will be developed fronts the Skellatar Stock Route and Osborn Avenue. This land was originally owned by the Catholic Church. The Church has since sold the land for development. The applicant has received approval for the construction of 147 residential lots in seven stages. The applicant has completed the construction of Stage One and Stage Two (A). However, these lots have not been registered with the Lands Title Office. The applicant has commenced construction of Stage Two (B) which involves the extension of Osborn Avenue.

- **Woodlands Ridge (DA 112/2003)**

Woodlands Ridge Estate is located off Muscle Creek Road, which is south of Muswellbrook. The subdivision was approved by Council in 2004 which comprised of 58 rural residential lots. The applicant has completed the construction of Stage three which comprised of 23 lots. Council has released the Linen Plan for the subdivision which is now being registered with the Lands Title Office. The applicant has not commenced on Stage four, which is the last stage of the Estate.

- **Almond Street (DA 258/2005)**

The applicant was seeking approval for fifty (50) residential lots at the corner of Bell and Almond Street, Denman. Council issued approval for Stage one which comprises of twenty-one (21) residential lots. At this stage, the applicant does not have approval to commence construction of the subdivision.

- **Extension of Glen Munro (DA 266/2005)**

Council lodged an application for the extension of Glen Munro Road, which is located in the Thomas Mitchell Industrial Estate. The application was approved in 2005 for the extension of Glen Munro Road and comprised of 22 industrial lots. The applicant has commenced construction on this application.

- **Muswellbrook Industrial Park (DA 238/2005)**

This application was lodged by Caverstock and is located adjacent to Energy Australia on Thomas Mitchell Drive. The development was for the construction of twenty-five (25) industrial lots and a new road off Thomas Mitchell Drive. The application has been approved and the applicant has lodged a Construction Certificate. The Construction Certificate has not been issued.

## 1.3. Implementing ESD

### Environmental project funding

During the 2005/2006 reporting period a number of organisations and individuals have received funding from a range of bodies for the completion of environmental projects. Muswellbrook Shire Council has been the recipient of some funding for the installation of a solar power system via a rebate from DEUS, and the receipt of funding for the annual Enviro Youth Forum which promotes environmental careers and projects to local high school students. The funding of the Enviro Youth Forum by local industries was introduced in 2006 which received a stronger than anticipated response from local mining and electricity companies.

**Figure 1.4**

**Indicator: Environmental Funding received for Muswellbrook Shire 2005/2006  
(Including regional environmental funding)**

Group / Individual	Project Description	Funding body	Amount Received
Upper Hunter Weeds Authority	Noxious plant control in the Upper Hunter Region	NSW Dept Primary Industries (DPI)	\$5,290
Upper Hunter Weeds Authority	Noxious weed control in the Upper Hunter Region	Upper Hunter Shire, Muswellbrook and Singleton Councils	\$28,281
Muswellbrook Council	Enviro Youth Forum 6 <sup>th</sup> April 2006	Muswellbrook, Singleton and Upper Hunter Councils, Muswellbrook and Singleton Community Services, Bengalla Mining Co, Mount Arthur Coal, Anglo Coal- Dartbrook, Muswellbrook Coal and Macquarie Generation	\$4350
Muswellbrook Council	Photovoltaic system installed as a representative system through the DEUS rebate program	Department of Energy, Utilities and Sustainability (DEUS)	\$7920 rebate
UHRRI	UHRRI Project Implementation		~ \$1.77 Million*
Small Projects-community	10 Small Project Grants for on ground works	Catchment Management Authority (CMA)	~ \$55,684
Large Projects-community	11 larger projects for on ground works – targeting soils, salinity, vegetation and riparian management	Catchment Management Authority (CMA)	~ \$568,460

\* Note: Funding for UHRRI projects comes from a range of sources to be spent over a number of years on the UHRRI project Information received from Upper Hunter Weeds Authority, Muswellbrook Council and the Catchment Management Authority. Note: that all environmental funding obtained by businesses is not included.

The community becomes involved in environmental projects via a variety of avenues. When Council proposes to establish an environmental project a process of consultation is undertaken with a variety of community groups and representatives.

### The Council's Role

Local Government has legislative responsibilities under a number of Acts relating to environmental matters including the *Local Government Act*, the *Environmental Planning and Assessment Act* and the *Protection of the Environment Operations Act*. Through the enforcement of the respective pieces of

legislation Council is obliged to address breaches utilising the tools identified by the Act and as relevant to the offence.

The dominant tools to address environmental matters are infringement notices, clean up notices and prevention notices issued under the *Protection of the Environment Operations Act*. These notices may be issued to address matters relating to water, air, noise and odour pollution which are deemed to be an offence under the Act. The number of infringement and clean up and prevention notices are listed below.

**Figure 1.5**

<b>Indicator:</b>	<b>Number of Penalty Infringement Notices issued in relation to the Protection of the Environment Operations Act, 2005/2006</b>
Number issued 2005/2006:	5

**Figure 1.6**

<b>Indicator:</b>	<b>Number of Clean Up and Prevention Notices issued in relation to the Protection of the Environment Operations Act, 2005/2006</b>
Number issued 2005/2006:	0

During the reporting period Council's authorised officers issued a number of Penalty Infringement Notices for a variety of offences including repeat and significant offences.

### **The Environmental Impact of Council Activities**

The role of local government includes the provision of facilities and services to the community and local businesses such as construction and maintenance of roads, recreational areas, drainage, and water and sewer infrastructure. Council also holds a responsibility for the regulation of activities such as events, developments, businesses, community matters and natural ecosystems.

Through the carrying out of Council's roles and activities, resources are consumed including energy (electricity and fuels), water, stationary, chemicals (for example herbicides, oils and fertilisers) and building products. The use of resources by Council is detailed further by the report.

### **Measures implemented by Council during the reporting period 2005/2006**

Council has implemented a number of programs during the reporting period to ensure that all operations are conducted in a sustainable manner, including:

- Ongoing energy and water efficiency programs including energy audits of Council buildings and lighting and showerhead retrofits to reduce energy and water use
- Involvement of Council's Sustainability Committee in the retrofitting and improvements to Council facilities
- Waste recycling program to ensure recyclables are separated from the waste stream
- Introduction of a worm farm at the Council Administration Building to remove food waste from the waste stream
- Investigations into the use of energy resources by Council activities, such as the vehicle fleet and the heating / cooling efficiency of the administration building
- Involvement in the CCP Plus program to further the efforts achieved by Council through the CCP Program

## **Regional Environmental Programs- Hunter & Central Coast Regional Environmental Management Strategy (HCCREMS)**

The Hunter and Central Coast Regional Environmental Management Strategy (HCCREMS) is a collaborative initiative currently being implemented by the 14 Councils of the Hunter, Central and Lower North Coast regions of NSW.

Initiated in 1993, HCCREMS was developed to:

- Provide a framework for coordinated action by Councils in relation to key environmental management issues impacting on the region
- Facilitate an integrated regional approach by actively encouraging greater cooperation between member Councils, government authorities, community, and industry groups.
- Address those natural resource issues that are best managed at a regional scale (eg biodiversity conservation, and water and air quality management are key issues which require a broad management approach that transcends arbitrary institutional boundaries)

### **Summary of Regional Program Initiatives:**

#### **1. WATER**

##### **Background**

The Regional Water Program has been developed to mainstream urban Integrated Water Cycle Management (IWCM) throughout the Hunter, Central Coast and Lower North Coast Region. The program sits within the broader framework of the HCR-CMA's Catchment Action Plan (CAP), providing the primary vehicle through which improved sustainable urban water management will be realised. The objective of the program is to raise the profile of sustainable water management to:

- Mainstream water sensitive urban design policy and practices
- Progress an urban water cycle approach to management programs and practises in Councils
- Promote innovation and best practise

Consultation with the 14 HCCREMS member Councils and the undertaking of a needs analysis in respect to the implementation of urban Integrated Water Cycle Management (IWCM) practices has identified the following challenges and opportunities to the implementation of urban IWCM practices throughout the region:

##### **Challenges-**

- Limited budgets to implement urban IWCM concepts, particularly for retro-fitting existing urban areas and maintenance of existing structures;
- Relatively few demonstration sites in the region, particularly of broad-scale WSUD implementation, and certain stormwater treatment devices;
- Lack of IWCM plans or strategies to promote whole of water management across all council departments (although IWCM Plans currently being developed by some councils may overcome this);
- Limited reflection of urban IWCM concepts in existing Local Environmental Plans (LEP's);
- Inertia in moving away from traditional stormwater management infrastructure by design and planning staff in some councils;
- Community preferences for traditional stormwater management infrastructure, such as kerb and guttering, combined with a lack of understanding of how new urban IWCM concepts work;
- Separate drivers and accountabilities between councils and water supply authorities;
- Limited time availability by council staff due to day to day work pressures;
- The variety of circumstances faced by councils due to geographic, climatic, demographic and socio-economic factors; and
- On-going proper operation and maintenance of BASIX rainwater and stormwater elements by residential owners.

#### Opportunities-

- Good in-principle acceptance of urban IWCM across the region, including implementation of at least some urban IWCM measures by all councils;
- Presence of committed staff in each council with some notable “champions” in some, but not all councils;
- General community awareness of water supply and pollution issues;
- Revision of Local Environmental Plans (LEPs) to match the new Department of Planning standard template;
- The resources available in the existing HCCREMS [www.urbanwater.info](http://www.urbanwater.info) web site;
- Urban IWCM resource material developed for the Region, including the Model Planning Provisions and the Water Smart Practice Notes;
- Availability of low cost good quality modelling tools from a number of sources on the web;
- Generally favourable implementation of BASIX by councils and developers;
- Monitoring data for receiving water bodies, such as Lake Macquarie, and for some stormwater treatment devices;
- Highly qualified university based researchers within the region;
- Financial resources available via council Stormwater Levees; and
- Hunter-Central Rivers Catchment Action Plan (CAP).

#### Program Activities

Key activities being implemented by HCCREMS under the Regional Water Program include:

- i) Promoting Water Sensitive Urban Design (WSUD) adoption in local government planning instruments.
- ii) Developing a register of and promoting demonstration sites around the region to demonstrate WSUD and urban IWCM.
- iii) Providing linkages between key stakeholders, including local and State government, CMA and industry.
- iv) Researching investment opportunities and assisting stakeholder with preparing applications for assistance in the meeting the project’s objectives.
- v) Promoting the [www.urbanwater.info](http://www.urbanwater.info) website as tailored support package for councils and others working with urban IWCM.
- vi) Incorporating WSUD/IWCM into Development Control Plans (DCPs) and other relevant planning instruments.
- vii) Increasing the capacity of council staff to design, implement, monitor and maintain urban IWCM policies and practices in their Local Government Areas (LGAs).
- viii) Improving the capacity of developers and consultants to implement WSUD/IWCM in their proposals.
- ix) Increasing the extent of more sustainable urban design form in the region.
- x) Reducing equivalent stormwater discharge volumes and pollutants from new urban developments and reducing downstream impacts.

## 2. WEEDS

### Background

The establishment and spread of noxious and environmental weeds throughout the region has significant and detrimental implications for the extent and condition of natural biodiversity, the health and condition of waterways and resources, agricultural productivity, and the amenity of natural, urban and rural landscapes. The Regional Weeds Program recognises that a strategic and collaborative, cross boundary, co-operative and consistent regional approach to weed management is required in order to effectively manage and control existing infestations of noxious and environmental weeds, and importantly, to prevent the establishment and spread of new weed incursions in the region. During 2006 the Regional Weeds Program adopted a projects based approach, with the focus of the program being on identifying and implementing discrete, strategic project goals on an annual basis.

### Amendments to the *NSW Noxious Weeds Act*

Changes to the *Noxious Weed Act 1993* came into effect on 1<sup>st</sup> March 2006. Key changes and implications for the region arising from these amendments include:

- i) All previously listed noxious weeds have been transferred to five new classes of noxious weeds. These classes replace the previous W1-W4 system. These new weed classes are outlined in the table below. Classes 1, 2 & 5 are notifiable weeds, meaning their sale and movement is restricted and new incursions must be notified to the Local Control Authority.

Amended Weed Classes under the Revised <i>NSW Noxious Weeds Act</i>		
Class	Title	Control measures
1	State prohibited weeds	The plant must be eradicated from the land and the land kept free of the plant
2	Regionally prohibited weeds	The plant must be eradicated from the land and the land kept free of the plant
3	Regionally controlled weeds	The plant must be fully and continuously suppressed and destroyed
4	Locally controlled weeds	The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority
5	Restricted plants	The requirements in the <i>Noxious Weeds Act 1993</i> for a notifiable weed must be complied with

- ii) An important new weed class for Local Governments is Class 4. These weeds are plants that pose a threat to primary production, the environment or human health, are widely distributed in an area and are likely to spread within the area or to another area. Class 4 is intended to provide for enforceable control where necessary on a local or regional basis. In accordance with the Act, councils are required to prepare and publish Weed Control Plans for Class 4 noxious weeds. It is a requirement of the Act that these Class 4 Control Plans be formally adopted by Council in order for them to be legally enforceable.
- iii) Weeds previously listed under the *Seeds Act 1982* have now been transferred into the *Noxious Weeds Act*. In addition to this, the declaration of the twenty Weeds of National Significance and a variety of new noxious weeds has raised the total number of weeds declared noxious in the region.
- iv) The new legislation includes new powers that make the owner, as well as the occupier of land responsible for the management and control of noxious weeds. Under the previous Act, Weed Control Notices could only be issued to occupiers. This made the ongoing enforcement of Weed Control Notices problematic in situations where the land was regularly subject to changing leasees.
- v) The amended legislation provides increased ministerial powers to ensure councils are carrying out their functions under the Act. Under this provision the minister may appoint an Administrator to oversee councils' noxious weed control functions at the expense of the council. Under this provision the minister may make such an order if he/she considers that "...the Local Control Authority has failed to comply with or carry into effect or enforce the provisions of the Act".

### Program Activities

- i) **Wollombi Salvinia Project**  
HCCREMS have received funds from the Hunter Central Rivers Catchment Management Authority (CMA) to be paid as incentives to landholders who enter into agreements to manage Salvinia on their properties in line with the regional Salvinia Weed Management Strategy. This management approach is designed to ensure that infestations are strategically cleared from the top of the

catchment down, in a fixed period of time, without any being left behind to reinfest controlled areas.

Greencorp and Conservation Volunteers Australia have also been engaged on the project to assist landholder's resource the management of *Salvinia* on their properties. This includes the construction and installation of containment booms and the manual removal of *Salvinia* from small, isolated infestations. Monitoring of the Biocontrol release sites also continued through the year, with the population remaining active.

ii) Data Collation & Mapping

Considerable local weed infestation data has been provided to HCCREMS for incorporation into the regional weeds database. The database now holds records of around 9000 weeds occurrences across the region and has been designed to receive data from councils on a regular basis. The regional distribution of many of the most important weed species can now be mapped and knowledge gaps more readily identified. This data will allow a more strategic approach to weeds management including:

- a. Informing weed risk assessments;
- b. Identifying areas at particular risk of invasion by weed species;
- c. Identifying outlying infestations on which to focus control efforts; and
- d. Providing more detailed analysis of the paths and vectors of spread for many weed species.

Training programs have also increased the capacity of Weeds Officers throughout the region to collect, analyse and manage weeds data in a standardised way. This will improve the quality and consistency of weeds data being collected across the region and improve the ability of Weeds Officers to use this data for strategic weed management planning.

iii) Planning and Policy

A review of the Regional Alligator Weed Management Plan and Protocols for Alligator was commenced during the year by a working group of the Alligator Weed Taskforce.

### **3. BIODIVERSITY**

#### **Background**

The Regional Biodiversity Program aims to protect the natural biological diversity of the Hunter, Central Coast and Lower North Coast Region. Key methods by which it seeks to achieve this include undertaking regional scale biodiversity data collection and mapping, enhancing the integration of biodiversity information into current and future land use planning processes, and providing educational programs and a range of policy tools to member councils.

#### **Program Activities**

1. Regional Vegetation Mapping Project

Three new reports have been completed on behalf of the Hunter-Central Rivers Catchment Management Authority (CMA). These studies include:

- i) The SPOT5 Pilot Study, which tests the utility of SPOT5 satellite data for vegetation mapping in the region.
- ii) Regionally Significant Vegetation (RSV) in the Central Coast, including the identification of vegetation that meet a range of conservation criteria (criteria for determining RSV are included in Attachment 1), and a sub-regional scale vegetation classification that identifies 58 vegetation communities within Gosford, Wyong and Lake Macquarie local government areas (a list of these vegetation communities and a summary of their conservation significance is included in Attachment 2).
- iii) Vegetation Survey and Mapping within the Hunter, Central and Lower North Coast Region of NSW. This work included detailed surveys at 314 sites that represent poorly sampled

environments, rapid surveys at 922 sites distributed broadly throughout the region, and maps of extant vegetation and broad vegetation descriptions for 3.9 million hectares.

Project outputs include:

- Vegetation community mapping for the Central Coast (pre-clearing and extant coverages);
- GIS layers for regionally significant vegetation in the Central Coast
- Mosaic of SPOT5 imagery for the Hunter Central Rivers Catchment Area;
- Vegetation cover mapping for the Hunter and Central Coast Vegetation formation mapping for the Hunter and Central Coast;
- Systematic vegetation survey data for 314 sites located within priority areas of the Hunter and Central Coast region;
- Rapid vegetation survey data for 922 sites in the Hunter and Central Coast region;
- Digital photo library comprising over 2000 individual photos taken at each survey site (both rapid and systematic surveys);
- Project reports for the SPOT5 Satellite Imagery Pilot Study, Vegetation of Regional Significance on the NSW Central Coast, and Vegetation Survey and Mapping of the Hunter Central Rivers Catchment.

These information products form the baseline data needed to progress the next stage of vegetation mapping in the HCRCMA area, namely catchment-wide vegetation community surveys and mapping.

## 2. LGA Profiles – Threatened Species

Threatened species profiles for each LGA have been prepared and are included in Attachment 3. These profiles have been compiled from the Atlas of NSW Wildlife, and include all records up until the 20 July 2006.

## 3. Roadside Environment Project

In collaboration with its member councils, the Roadside Environment Committee and Hunter Central Rivers Catchment Management Authority, HCCREMS is developing a Regional Roadside Environmental Management Strategy. The objectives of the project are to:

- Map the region's roads and categorise them in relation to tenure, management responsibility, type and status (sealed, unsealed)
- Audit, collect, record and map all existing information to assist in the identification of roadside environment values (eg biodiversity, heritage, cultural values)
- Survey, assess and map high quality/priority areas for biodiversity conservation and improved management. Special areas of interest include highly erodible soils (HES) and gravel roads near drainage lines.
- Design and develop management guidelines for each conservation category.
- Design and develop training programs for outdoor staff and managers responsible for roadside maintenance. These programs will include key result areas for staff as part of their regular training updates.
- Design and develop a regional monitoring and reporting program centrally managed and annually reported on by Hunter Councils

Roadside environments have a range of ecological, economic, social and heritage values. Roadsides make up about 5% of the total land in NSW, which, when combined with travelling stock routes and reserves, is almost equivalent to the total area of National Parks in New South Wales (7%). Roadsides are defined as *“that area adjacent to the road and extending to a maximum distance of 20m for the edge of the road surface but specifically excluding areas of private landholders within this proximity”*.

#### **4. CLIMATE CHANGE**

Australia will face some degree of climate change over the next 30 to 50 years irrespective of global or local efforts to reduce greenhouse gas emissions. The International Panel on Climate Change (IPCC) has concluded that some level of climate change is inevitable irrespective of emission reduction strategies, and that adaptation is now a necessary strategy to complement emission mitigation efforts (Commonwealth of Australia 2005).

While effective action to reduce greenhouse gas emissions requires a co-ordinated global response, adaptation can be effectively advanced at a local scale. As such, HCCREMS has received funding to undertake a project to ascertain the likely local impacts of climate change in the Hunter, Central Coast and Lower North Coast Region, and to work with local government, industry groups and land use sectors to develop and implement specific climate change adaptation strategies. Implementation of the project will commence 2006/2007.

The objectives of the project include:

- i) Obtain regionally and locally specific information via research, data collation and modelling, of how climate change will impact on various industries including Agriculture (dairy, viticulture, aquaculture, and poultry), tourism, water resources, human settlements and infrastructure.
- ii) Raise awareness and understanding of the causes, impacts and inhibitors of climate change on the community, natural resources and various industry sectors on a regional scale.
- iii) Raise awareness of the potential adaptive capacity of the region's community, government and industry sectors to adjust to climate change.
- iv) Facilitate the linking of established regional industry, community and government groups into partner organisations so as to develop and implement effective climate change adaptation strategies to ensure that impacts are mitigated, negated or capitalised upon.

#### **5. ENVIRONMENTAL EDUCATION**

A key role of HCCREMS is to facilitate collaboration and resource sharing amongst member councils. Opportunities exist in the area of environmental education to enhance the level of resource sharing that is occurring between Councils and to deliver consistent and united environmental education programs across the region.

HCCREMS has received \$45,725 from the Catchment Management Authority to implement an education campaign that aims to improve the environmental / sustainability management practices of Rural Residential landowners throughout the region. Specific objectives of the project include:

- i) Provide detailed, yet easily read and understood information and workshops, tailored specifically to rural residential land management issues;
- ii) Increase knowledge of rural residential land owners of key regional environmental issues, and ways in which Councils and the community can practically contribute to addressing them;
- iii) Increase the skills of rural residential land owners in the areas of waste management, water management and conservation, biodiversity and habitat improvement and understanding relevant legislation;
- iv) Assist rural residential land owners to realise that they have the capacity to live in a more sustainable fashion by taking advantage of their land space;
- v) Instil in the owners of rural residential land the values of existing bushland areas and the benefits of adopting sustainable living practices.

The project which will be undertaken during 2006/2007 and will include media awareness, a series of hands on workshops, presentations and seminars, field days at demonstration sites, development of a resources kit for landowners and encouraging landowners to establish their own network to provide support and momentum to continue the project.

## Community Involvement - Participation in environmental programs

A number of environmental events and programs are held throughout the year which attracts a number of community members to participate. Figure 1.7 details the level of community participation in a range of environmental programs undertaken throughout 2005/2006, with a comparison to the number in 2004/2005, 2003/2004 and 2002/2003 for each event.

The information detailed by Figure 1.7 indicates a slight reduction in participant numbers across most environmental events. The reason for this drop in numbers is unclear however the level of advertising may be increased for future events to counter this trend.

**Figure 1.7**

**Indicator: Participation in Environmental Programs, Muswellbrook Shire 2005/2006**

Event	Numbers participating 2005/2006	Numbers participating 2004/2005	Numbers participating 2003/2004	Numbers participating 2002/2003
National Tree Day	10	10	41	62
Clean Up Australia Day	57	60	87	51
Upper Hunter Enviro Youth Forum	120	140	97	87

## 1.4. Future directions in environmental reporting

Environmental matters relevant to the Muswellbrook Shire will continue to be reported in the annual State of the Environment Report which assesses the overall state of the Muswellbrook environment using specific quantifiable indicators. To complete the reporting obligation in the future the SoE template produced by HCCREMS will be utilised to maintain consistency across the region.

## 2. Human Settlements

### 2.1. At a glance

#### (a) Summary of state, pressure and response

Issue	Summary (status)
<b><u>Population &amp; settlement patterns:</u></b>	
State	<ul style="list-style-type: none"> <li>• Decrease in population in the Shire from 1996 – 2001.</li> <li>• Two main urban areas of Muswellbrook and Denman</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Continued economic growth placing pressure on the environment</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Review of Muswellbrook LEP</li> <li>• Review and Implementation of DCP's etc</li> <li>• Mine Rehabilitation Synoptic Plan</li> <li>• Bushfire prone land planning</li> </ul>
<b><u>Drinking water quality:</u></b>	
State	<ul style="list-style-type: none"> <li>• Water consumption increasing</li> <li>• Water quality of drinking water</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Water quality concerns</li> <li>• Climatic variations (drought)</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Hunter River Salinity Trading Scheme</li> <li>• Effluent reuse schemes</li> <li>• Water efficiency measures (including the Water Campaign)</li> <li>• Council's Sustainability Committee</li> <li>• HCCREMS Regional Projects</li> <li>• BASIX</li> </ul>
<b><u>Energy:</u></b>	
State	<ul style="list-style-type: none"> <li>• High consumption of energy resources obtained primarily from coal fired power stations</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Requirement for energy by everyday activities</li> <li>• Large scale industries using significant amounts of energy</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Cities for climate protection</li> <li>• Greenhouse reduction strategy</li> <li>• Energy efficient initiatives within Council</li> <li>• BASIX</li> </ul>
<b><u>Transport:</u></b>	
State	<ul style="list-style-type: none"> <li>• Large number of vehicles in the Shire</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Limitation of available public transport systems in the Shire</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Bicycle / walkway development</li> <li>• Cities for Climate Protection</li> <li>• Council initiatives</li> </ul>
<b><u>Waste management:</u></b>	
State	<ul style="list-style-type: none"> <li>• Excessive consumption of products and resources resulting in increased waste generation</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Unsustainable use of resources and materials, discarding of old material</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Compost Production</li> <li>• Clean Up Australia Day</li> <li>• Drum Muster and ChemClear Programs</li> </ul>

<b>Noise:</b>	
State	<ul style="list-style-type: none"> <li>• Noise complaints received from the community</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Increasing industrial developments in close proximity to urban centres</li> <li>• Neighbourhood noise sources an issue of concern</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Complaints Protocol</li> <li>• Noise Guide for Local Government</li> <li>• NSW Industrial Noise Policy</li> <li>• Noise Monitoring Programs</li> </ul>
<b>Community Lands:</b>	
State	<ul style="list-style-type: none"> <li>• Areas of open space under threat from urban encroachment</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Increase in urban, industrial and commercial developments threatening open space areas</li> <li>• Illegal dumping polluting open space areas</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Management of open space</li> <li>• Requirement for open space in new residential subdivisions as detailed by DCP's</li> </ul>

## 2.2. Population & settlement patterns

**Management Plan Goal:** *Attempt to ensure that residents continue to have access to community services when needed; Provide opportunities for disadvantaged residents of Muswellbrook to improve their well being; Improve links between community services and the Aboriginal Community. To provide facilities commensurate with community needs and the ability of Council to provide, maintain and operate.*

### Introduction

Local Government has a responsibility to supply infrastructure and resources to the local community that live and work within the defined local government area. This obligation includes the provision of community and recreation facilities, roads, potable water, sewerage supply and treatment, electricity and waste disposal. The following section includes details of the Muswellbrook Shire population, economy and Council's approach to supplying goods and services to the local community.

#### 1. What are the issues for sustainability? And how are they changing? (state)

##### Settlement Patterns in the Muswellbrook Shire

The most recent population census was undertaken in 2001 which indicated that actual population figures for the Muswellbrook Shire since 1986 had encountered a gradual increase in population up until 1996. Between 1996 and 2001, the population declined from 15,562 at a rate of -1.0% to a total population figure of 14,796.

The majority of the Muswellbrook Shire population reside in the centres of Muswellbrook and Denman. Since the colonisation of the Muswellbrook Shire, activities of human settlement have included areas of large scale clearing, extensive use of natural resources and development of urban centres.

#### 2. Why is it happening? (driving forces, pressure)

##### Growth in the Muswellbrook Economy

Growth of the economy in Muswellbrook has continued over past years contrary to the decline in population numbers. Figure 2.1 provides a breakdown of development application types for the 2005/2006 period. A decline of total development applications received was experienced during the 2005/2006 reporting period compared to the 2004/2005 period. This reduction in development applications is not considered to be significant and indicates the continued progression of economic growth within the Muswellbrook Shire.

**Figure 2.1**

**Indicator: Development Applications Received by Muswellbrook Council for the 2005/2006 reporting period compared to the 2004/2005 reporting period.**

Application Type	DA's Received		DA's Cancelled / Refused	
	2005/2006	2004/2005	2005/2006	2004/2005
Home Improvement	207	231	2	1
New Dwellings	77	87	2	1
Rural	37	60	1	-
Commercial	45	51	3	1
Industrial	20	15	-	-
Subdivisions	35	29	-	-
Coal Mining	1	-	-	-
Section 96 Amendments	41	35	5	-
Demolitions	10	2	-	-
Public Works	-	3	-	1
Signage	9	-	-	-
Boundary Adjustments	2	3	-	-
Tourism	1	5	-	-
Rezoning	-	3	-	-
Extractive Industries (excluding coal mining)	1	1	1	-
<b>Total Development applications</b>	<b>486</b>	<b>525</b>	<b>14</b>	<b>4</b>

Information received from the Department of Environment and Conservation 2006

### 3. What are the responses and how effective are they? (response)

Development planning strategies are implemented by Council to manage developments so that they are consistent with surrounding land uses and are developed in a sustainable manner. The following projects and strategies are currently utilised to produce sustainable development across the Shire:

#### **Muswellbrook Local Environmental Plan – under review**

The review of the existing Muswellbrook Local Environmental Plan (LEP) 1985 is continuing with the document nearing completion. Since the completion of the 2004/2005 State of the Environment Report, the NSW Department of Planning has introduced a template regarding the production of the LEP. Muswellbrook Council's LEP currently under review has been revised to be consistent with this template and the requirements of the Department of Planning.

#### **Development Control Plans**

Council has previously adopted 19 Development Control Plans (DCP's) which provide guidance and policy advice for developments throughout the Shire. Council has been directed by the NSW Department of Planning to amalgamate these DCP's into a single guidance document which can be implemented for all applicable parcels of land and developments within the Shire. This process has commenced and is expected to be achieved during the next reporting period and will incorporate development strategies for Denman and South Muswellbrook.

#### **Synoptic Plan – Integrated Landscapes for Mine site Rehabilitation**

The purpose of the Synoptic Plan is to provide a basis for development of a long term integrated strategy regarding the rehabilitation of mine sites. The Synoptic Plan provides information on the current practices and trends in mine rehabilitation; regional initiatives in vegetation management; emerging environmental issues and their implications on mine rehabilitation; a comprehensive

analysis of mine rehabilitation plans; principles for an integrated approach towards landscape management for the coalfield.

### **Planning for Bushfire Protection**

A Bushfire Prone Land map has been supplied by the Rural Fire Service as a tool for the assessment of development applications under the Integrated Development Approvals process pursuant to Section 90 of the Environmental Planning and Assessment Act, and in conjunction with the Planning for Bushfire Protection Guidelines.

## **4. What more could be done? (future directions)**

### **Council Action**

The review and amalgamation of Development Control Plans (DCP's) will further the Council's achievements towards sustainable development. This in conjunction with the adoption of other development strategies such as Integrated Water Cycle Management, Water Sensitive Urban Design, the Local Environment Plan and location specific plans will improve Council's performance in sustainable development and settlement patterns.

### **BASIX**

The BASIX (Building and Sustainability Index) program is a NSW Government initiative which commenced on the 1<sup>st</sup> July 2005 which ensures that new homes are designed and built to use less water and energy. At the commencement of the program new residential dwellings are to be designed and built to use 40% less drinking-quality water and produce 25% less greenhouse gas emissions than average NSW homes of the same type. As at the 1<sup>st</sup> July 2006, the adopted target for energy reductions was increased to 40%.

## **2.3 Drinking water quality and consumption**

**Management Plan Goal:** *To provide environmentally sustainable Water and Sewerage services that- are customer orientated, meet present and future needs, are efficient and cost- effective and follow best practice management.*

## **1. What are the issues for sustainability? And how are they changing? (state)**

The quality of drinking water is managed through the implementation of Drinking Water Quality Guidelines (NHMRC & ARMCANZ) to ensure strict standards are met before water can be deemed suitable for consumption. Muswellbrook Shire Council as the water authority undertakes the ownership, operation and management of three (3) water supply systems which operate within the towns of Muswellbrook, Denman and Sandy Hollow. An augmentation is scheduled to be undertaken during the next reporting period to improve the quality of the potable water available from the Denman water supply.

### **Monitoring the Quality of Drinking Water**

In accordance with statutory guidelines, Council undertakes bacterial, pesticide, physical and chemical analysis of potable water samples in waters sourced for drinking water purposes. Figure 2.2 details the compliance of water samples as per the NHMRC 2000 Drinking Water Guidelines and as compared to the 2004/2005 reporting period.

**Figure 2.2**

**Indicator: Percentage Compliance with NHMRC Drinking Water Guidelines 2005/2006**

Parameter / Type	Period 2005/2006			Period 2004/2005		
	Muswellbrook	Denman	Sandy Hollow	Muswellbrook	Denman	Sandy Hollow
<b>Water Consumption (ML)</b>	<b>2583</b>	<b>248</b>	<b>35</b>	<b>2349</b>	<b>265</b>	<b>30</b>
<b>Physical and Chemical:</b>						
Physical	99%	67%	47%	99.6%	65%	47%
Chemical	99%	99%	94%	98%	94%	89%
<b>Key Characteristics:</b>						
Turbidity	98%	2%	91%	98%	0%	73%
pH	98%	41%	91%	100%	70%	69%
Colour	100%	100%	100%	100%	100%	100%
<b>Microbiological:</b>						
E. coli	100%	98%	99%	100%	96%	99%
Total coliforms	100%	98%	96%	100%	96%	93%

Non compliances of Muswellbrook Shire water samples compared to the drinking water guidelines are generally as a result of high turbidity of the water in the Hunter River (caused predominantly by low water flows), unsoftened water sources and low chlorine levels.

### Current Water Consumption

As indicated in Figure 2.3 below, water consumption within the Muswellbrook Shire continues to steadily increase with drought conditions having a significant impact. The increased consumption of water resources is of concern as the population of the Shire is not reported to be increasing at the same rate indicating that per capita consumption may be escalating. This can be better assessed following the release of the 2006 census data for the Shire which will be reported for the next period 2006/2007.

**Figure 2.3**

**Indicator: Total potable water consumption (ML) of the Muswellbrook Shire**

1992/93	1993/94	1994/95	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
1,610	1,847	1,855	2,196	2,277	1,845	2,076	2,150	2,624	2,644	2,866

## 2. Why is it happening? (driving forces, pressure)

### Climatic Variations

The consumption of water resources is significantly influenced by variations in climatic conditions. During periods of high rainfall water consumption generally drops, whilst during periods of drought water consumption usually increases. The Upper Hunter region is experiencing continued drought conditions which result in reduced water resources available for consumption.

Sustainable usage of water resources is a major focus for the Muswellbrook Council and community requiring efficient use of water resources including recycling and reduction initiatives. Through the implementation of the Water Campaign, BASIX and introduction of the Integrated Water Cycle Management Strategy the consumption of water is envisaged to become more sustainable.

## Water Quality Issues

Water quality and availability significantly affects the ability of Council to supply suitable drinking water within existing infrastructure restrictions. There have been ongoing problems with the supply of suitable drinking water for the residents of Denman. This in part is due to the water sourced from bores being high in manganese and iron. This causes substantial deposits of iron, manganese and bacteria in the pipe network. These deposits slough off at regular intervals causing dirty water to be distributed to residents. The augmentation of the Denman water supply is expected to improve the quality of the potable water supplied by the system.

### 3. What are the responses and how effective are they? (response)

#### Hunter River Salinity Trading Scheme

The Hunter River Salinity Trading Scheme (HRSTS) was established by the Dept of Environment and Conservation (DEC) to regulate the discharge of saline mine water into the Hunter River. The scheme has been effective in reducing associated pollutants from being discharged in times of low flow and has improved the efficiency of water usage on mine sites.

#### Effluent Reuse Scheme

Council has established effluent reuse agreements with Mt Arthur Coal, Muswellbrook Golf Course and Denman Golf Course to utilise reclaimed water for irrigation, dust suppression and coal washing purposes. The scheme has reduced the need for the golf courses and the mine to pump water from the river to meet their water needs and reduces the treated effluent being discharged into the Hunter River. During the reporting period 100% of all treated effluent was reused through this scheme. Figure 2.4 below details the quantities supplied to each receiver of treated effluent for reuse.

Figure 2.4

Indicator:	Volume of Treated Effluent Reused 2005/2006
Mt Arthur Coal:	648 ML
Muswellbrook Golf Club:	158 ML
Denman Golf Club:	92 ML

Note that the reuse of effluent at Mt Arthur Coal January – June 2006 is based on 5 year averages due to meter failure.

#### Water Campaign

The Water Campaign was developed by the International Council for Local Environmental Initiatives (ICLEI) which assists local governments to identify and evaluate current water resource management at the corporate, community and catchment levels. By joining the campaign, Council has undertaken a commitment to develop and implement water saving programs thus improving the consumption and quality of water. Council has previously completed Milestone 1 of the campaign and is currently undertaking Milestone 2 through the development of the Integrated Water Cycle Management Strategy (IWCM).

#### Sustainability Committee

The Sustainability Committee was established by Muswellbrook Council to assist with the implementation of sustainable outcomes for the Shire, including water efficiency measures. This Committee consisting of community representatives, Councillors and Council staff is currently overseeing Council's progress through the Milestones of the Water Campaign and assisting in the development of Council water saving initiatives.

## **Hunter & Central Coast Regional Environmental Management Strategy (HCCREMS)**

The Regional Water Program has been developed by Hunter Councils to mainstream urban Integrated Water Cycle Management (IWCM) throughout the Hunter, Central Coast and Lower North Coast Region. The program sits within the broader framework of the HCR-CMA's Catchment Action Plan (CAP), providing the primary vehicle through which improved sustainable urban water management will be realised. The objective of the program is to raise the profile of sustainable water management to:

- Mainstream water sensitive urban design policy and practices
- Progress an urban water cycle approach to management programs and practises in Councils
- Promote innovation and best practise

## **BASIX**

The implementation of BASIX (Building Sustainability Index) requires that all new dwellings achieve reductions in energy and water use. BASIX came into effect during the 2005/2006 reporting period which will effectively reduce the consumption of water resources by making dwellings more sustainable. Though the program commenced on the 1<sup>st</sup> July 2005, no notable reduction has yet been recorded via the consumption of water resources due possibly to dated population figures and the time delay experienced by developers and home owners between the approval and construction of homes.

## **4. What more could be done? (future directions)**

### **Water Campaign**

Council needs to continue to be committed to the Water Campaign and the ongoing progress through Milestones 1 – 5. Reduction goals for both Council and the community need to be set and a Reduction Strategy needs to be prepared and adopted by Council.

### **Educational Programs**

Educational programs for specific sectors of the community have been developed and implemented to raise community awareness about water efficiency issues and actions which can be taken to reduce water use. For example educational information was distributed to business owners during the 2005/2006 period to improve awareness of the sustainable use of water such as for cleaning paths. To achieve a reduction in per capita consumption Council needs to continue this program including consultation with the community. Such educational programs may be linked to Council's progression through the Water Campaign Milestones.

### **IWCM and WSUD**

With the completion of the Integrated Water Cycle Management Plan (IWCM) and Plans which incorporate Water Sensitive Urban Design (WSUD), the ability to manage water resources and plan the built environment to incorporate water efficiency principles would be achievable. The IWCM is expected to be finalised and implemented during the next reporting period 2006/2007.

### **Water Restrictions**

Council has the opportunity to impose water restrictions which formally reduce the consumption of water by the community and businesses within the Shire. Council has established a tier system of Levels 1 to 3 with increasing water restrictions as resources continue to decrease.

During the reporting period Council imposed water restrictions on water uses in Denman only for a period of 28 days due to excessive resource use and low quality performance of the water source. To achieve further reductions in water consumption the imposition of water restrictions across the Shire would achieve stronger results.

## 2.4 Energy

**Management Plan Goal:** To complete the Greenhouse Milestone Program; and to reduce reliance on energy consumption

### 1. What are the issues for sustainability? And how are they changing? (state)

Energy production in NSW is primarily through the combustion of fossil fuels (such as coal), however the use of natural gas, petroleum products, solar and wind energy are becoming more widely utilised. The majority of NSW' electricity supply is produced by coal fired power stations which are a major source of greenhouse gas emissions (carbon dioxide, methane and nitrous oxide), oxides of nitrogen, sulphur dioxide and particle emissions. This production of energy is highly inefficient due to the amount of energy lost in the conversion, and is therefore considered unsustainable.

Figure 2.5 below details the amount of energy resources consumed and respective greenhouse gas emissions produced by Council operations through its administrative, development and regulatory activities during 2005/2006.

**Figure 2.5**

**Indicator: Energy Use by Council by Type and Equivalent Tonnes of Carbon Dioxide Emitted 2005/2006**

Emissions Inventory						
Fuel/process	Quantity Used 2005/2006		Emissions 2005/2006 – Tonnes CO <sub>2</sub> -e	Quantity Used 2004/2005		Emissions 2004/2005 – Tonnes CO <sub>2</sub> -e
Electricity	4,370,000	kWh	4260.75	4,799,808	kWh	4857.5
Natural Gas (non-transport)	0	GJ	0	0	GJ	0.0
LPG - (non-transport)	469	L	0.75	801	L	1.1
<b>Petroleum Products</b>						
Petrol/Gasoline	75.92	kL	189.80	99.1	kL	248.0
Automotive Diesel Oil	108.13	kL	291.96	96.1	kL	259.0
LPG - transport	11.74	kL	18.79	13.9	kL	22.0
<b>Net Emissions</b>					<b>5387.6</b>	

\* The net CO<sub>2</sub>-e emissions are calculated using the emission factors listed by the Australian Greenhouse Office in the 'AGO Factors and Methods Handbook'.

From the data represented in Figure 2.5 a reduction in the total quantity of energy resources and emissions have decreased from the last reporting period 2004/2005 to the current period 2005/2006. This is also consistent with the consumption figures reported the previous year 2003/2004. This trend is likely to have been a result of educational campaigns, vehicle down sizing and refit programs undertaken by Council during the reporting periods.

Figure 2.6 details the amount of energy consumed by the community (both residential and non residential) and the corresponding carbon dioxide emissions for the Muswellbrook Shire.

**Figure 2.6**

**Indicator: Electricity Usage, Muswellbrook Local Government Area 2005/2006**

<b>Emissions Inventory</b>						
<b>Fuel/process</b>	<b>Quantity Energy Used 2005/2006</b>		<b>Emissions 2005/2006 - Tonnes CO<sub>2</sub>-e</b>	<b>Quantity Energy Used 2004/2005</b>		<b>Emissions 2004/2005 - Tonnes CO<sub>2</sub>-e</b>
<i>Electricity:</i>						
Residential	84,123,000	kWh	82,019.9	83,542,301	kWh	88,053.6
Non Residential	306,965,000	kWh	299,290.9	308,992,464	kWh	325,677.9
<b>Net Emissions</b>	<b>381,310.8</b>			<b>413,731.5</b>		

\* Note that the emission figures are affected by revised emission factors listed by the Australian Greenhouse Office. This was due to a change in the mixture of fuel types reported, for example the increased usage of fuels which produce less CO<sub>2</sub> emissions than electricity produced by coal fired power stations.

**Figure 2.7**

<b>Indicator: Total number of customers using electricity in Muswellbrook Shire 2005/2006</b>	
Residential:	7246
Non Residential:	1302

Figures from Energy Australia 2006

The data represented in Figures 2.6 and 2.7 indicates that overall energy consumption has increased across the Shire. Please note that the respective carbon dioxide emissions are lower due to the revision of indexes by the Federal Government.

## 2. Why is it happening? (driving forces, pressure)

The consumption of energy resources is today a way of life being integral in the production of goods and services, transportation and the maintenance of a comfortable human environment.

From the information detailed in the Figures above, Council's consumption of energy has decreased, however the quantity of energy used by the community has increased. This may indicate that further educational and efficiency efforts are required in the public sector to reduce the amount of energy consumed.

## 3. What are the responses and how effective are they? (response)

In recent years Muswellbrook Council has made a concerted effort in reducing its energy use through the implementation of various programs such as:

- Involvement of Council in the Cities for Climate Protection Program and progression to the CCP Plus Program
- Undertaking of energy audits of the Council Administration Centre
- Down sizing of some Council vehicles from six (6) cylinder to four (4) cylinder vehicles
- Inclusion of a petrol/electric hybrid vehicle within Council's Fleet
- Use of dedicated LPG vehicles within Council's Works Fleet
- Retrofitting lighting within key Council Community Centres
- Installation of AAA rated shower heads within Council Community Centres
- Implementation of the Muswellbrook Shire Greenhouse Reduction Strategy
- BASIX- Building Sustainability Index

The programs listed above have produced effective reductions in Council's energy consumption which can be observed in Figure 2.5. Further efforts and program implementation is required to be focused within the community to enhance the progress towards sustainable use of energy resources within the Muswellbrook Shire.

#### 4. What more could be done? (future directions)

##### **Residential home audits**

The completion of energy and water audits in residential homes may potentially be provided in the future to reduce the consumption of resources within the home. The specifics of this program have not been devised however with the attainment of external funding this program may be made available for a reduced fee to members of the public.

##### **Educational Information**

Through the availability and distribution of educational material the community can become more aware of their energy use and how it can be easily reduced. A number of methods can be implemented to raise the community awareness of sustainable energy use such as displays, take home audits and tips, education packages and advertising.

##### **Distribution of climate change packs**

The distribution of climate change packs was very effective during the current reporting period 2005/2006 with the distribution of over 200 packs to Shire residents. The continuation of this program will further the goal of building community awareness and obtaining real reduction outcomes.

##### **Retrofitting council buildings**

Some works have been undertaken to improve the energy efficiency of Council's Administration building, however further improvements would continue the achievements Council has made in reducing its consumption. These improvements could include:

- The continued replacement of fluorescent light tubes with tri-phosphorous fluorescents;
- Continued installation of compact fluorescents in lieu of standard light globes;
- Installation of sensor lighting;
- Installation of more light switches on timer units

## 2.5 Transport

**Management Plan Goal:** *To develop and implement transport infrastructure strategies that manage the movement of people and goods on roads and rail in a sustainable manner.*

#### 1. What are the issues for sustainability? And how are they changing? (state)

Transportation is a major use of energy resources with ever increasing research being dedicated to investigating more efficient methods which produce fewer emissions. Today, however motor vehicles are still predominantly powered via the combustion of petroleum fuels which contribute to air pollution through the emission of particulate matter, greenhouse gases and noxious fumes.

Figure 2.8 lists the numbers of vehicle registrations and fuel types within the Muswellbrook Shire, which indicates that the total number of vehicles registered with the RTA during 2005/2006 reporting period has significantly reduced from the previous years 2004/2005.

**Figure 2.8**

**Indicator: Vehicle registrations for the Muswellbrook Shire 2005/2006 compared to 2004/2005 reporting period**

Vehicle Type	2005/2006					2004/2005				
	Unleaded Petrol	Leaded Petrol	Diesel	LPG	Other/ unknown	Unleaded Petrol	Leaded Petrol	Diesel	LPG	Other/ unknown
Passenger	6414	363	476	51	4	7169	567	539	66	108
Bus	23	20	91	2	0	28	33	89	2	0
Motor homes	0	2	8	3	0	0	3	11	3	0
Motorcycle	433	77	0	1	2	414	74	0	0	3
Light Truck	1131	229	1409	51	20	1248	364	1537	54	39
Heavy Truck	3	10	336	1	4	4	14	364	1	8
Prime Mover	0	0	45	0	1	0	0	56	0	1
Plant vehicles	0	2	91	0	1	0	3	104	1	1
Trailer	-	-	-	-	3161	-	-	-	-	3551
Other vehicles	2	0	0	0	0	3	0	0	0	0
<b>Total Vehicles</b>	14467					16462				

Information obtained from RTA 2006

Figure 2.9 refers to the fuel consumption of Council vehicles during the reporting period 2005/2006. The data represented indicates a decrease in the amount of petrol (unleaded) used with a preference towards using diesel vehicles. Council has over a number of years downsized the vehicles within the fleet and has moved towards a preference for vehicles which use more energy efficient and less emission producing fuels such as diesel and LPG.

**Figure 2.9**

**Indicator: Council transport fuel usage and CO<sub>2</sub> emissions 2005/2006 compared to 2004/2005 reporting period**

Fuel	Quantity Used 2005/2006		Emissions 2005/2006 - Tonnes CO <sub>2</sub> -e	Quantity Used 2004/2005		Emissions 2004/2005 - Tonnes CO <sub>2</sub> -e
<b>Petroleum Products</b>						
Petrol/Gasoline	75.92	kL	189.80	99.1	kL	248.0
Automotive Diesel Oil	108.13	kL	291.96	96.1	kL	259.0
LPG - transport	11.74	kL	18.79	13.9	kL	22.0
<b>Net Transport Emissions</b>	<b>500.55</b>			<b>529.00</b>		

\* The net CO<sub>2</sub>-e emissions are calculated using the emission factors listed by the Australian Greenhouse Office in the 'AGO Factors and Methods Handbook'.

## 2. Why is it happening? (Driving forces, pressure)

The typical Australian township is generally a cluster of settlements which are spread sparsely across the landscape making the linkage by public transport an extremely difficult task. As characterised in the Muswellbrook Shire is the spread of the population across the area from Muswellbrook to Denman, Wybong, McGullys Gap and Sandy Hollow. This spread of settlements requires a reliance on private transport to link residents to essential infrastructure and services.

### 3. What are the responses and how effective are they? (response)

#### Bicycle Plan - Cycleway / Walkway development

Within the urban area of Muswellbrook and Denman, Council has made efforts to introduce infrastructure which promotes the use of sustainable transportation. As public transport is not a viable solution, Council continues to expand the development of cycle ways which encourage the use of bicycles to provide low cost, sustainable transport. The information detailed by Figure 2.10 presents the works undertaken during the reporting period as detailed by Council's Bicycle Plan. The work regarding the cycleway infrastructure is continuing.

Figure 2.10

Indicator: Public cycleway construction in Muswellbrook Shire 2005/2006	
Total length of cycleway constructed:	1.8km
Total cost of cycleway construction:	\$450,000

#### Cities for Climate Protection – Transport Matters

Council continues to assess and alter its vehicle fleet to those which produce fewer emissions and use more sustainable energy resources.

### 4. What more could be done? (future directions)

#### Council Vehicle Fleet

Council will continue to review the vehicles within its fleet and, where appropriate, incorporate energy efficient vehicles and / or smaller size vehicles which use less fuel and produce fewer emissions.

#### Cycleway / Walkway Development

Council will continue to implement the Bicycle Plan which has aims to develop cycle ways which link the urban areas of the Shire.

## 2.6 Waste Management

**Management Plan Goal:** *To achieve a self funding, environmentally sound waste management service; Ensure sewerage system is able to cater for future requirements; Reuse 100% of effluent in Muswellbrook and Denman excluding peak wet weather conditions*

### 1. What are the issues for sustainability? And how are they changing? (state)

Waste management is an essential function that Council provides its community. The sustainable disposal of waste products has therefore become a major focus of resources for all local governments. The typical method of bulk waste disposal is through the placement of materials into large landfill cells, however this method is becoming increasingly less sustainable as communities expand escalating demand for land.

Muswellbrook Council provides a waste disposal service to the population of the Shire through waste and recyclable collection systems within urban areas. To facilitate this Council administers the Muswellbrook Waste Depot and the Denman Transfer Station which collect and receive the waste products of the Shire.

During the reporting period the Council has been developing an improved domestic waste collection service through the development of a triple bin system which involves the separation and collection of three main domestic waste streams from members of the public. These three waste streams are divided into green wastes, domestic wastes and recyclables. These streams are divided and placed into bins which enhances the ability for Council to separate, handle and dispose or reuse the waste types. Through the introduction and implementation of this system during the next reporting period, Council aims to reduce the amount of waste to landfill and improve the recycling or reuse of materials.

Figure 2.11 details the amount of recyclables collected and diverted from landfill during the 2005/2006 period compared to that of the 2004/2005.

**Figure 2.11**

**Indicator: Total Waste Recycled by Type (ie paper, aluminium, plastics etc)**

<b>Product</b>	<b>Amount Recycled 2005/2006 (tonnes)</b>	<b>Amount Recycled 2004/2005 (tonnes)</b>
Paper	488	426
Glass	187	176
Plastic	36	30
Aluminium Cans	7	5
Steel	8	9
<b>Total Recycled</b>	<b>726</b>	<b>646</b>

Previous years have seen a downturn in the quantities of materials recycled within the Muswellbrook Shire however during the 2005/2006 period this trend has altered with an increase in tonnages recycled. The cause of this is not known however an increased community focus on recycling may be a contributor due to the lead up to the introduction and implementation of Council's improved waste collection and disposal service.

As per the requirements of the environmental protection licence issued by the Department of Environment & Conservation, the Muswellbrook Waste facility is required to implement an approved monitoring program. This monitoring program involves periodical monitoring of groundwater, landfill cell leachate and gas emissions. For the reporting period 1<sup>st</sup> July 2005 to the 30<sup>th</sup> June 2006 all reporting guidelines were adhered to. The existing landfill facility in Muswellbrook is projected to have the capacity to receive waste material for a period of over ten years.

## 2. Why is it happening? (Driving forces, pressure)

The disposal of waste produced by the consumption of products and resources is of concern as the demand for land and economic growth continues. Whilst technologies have been directed towards the recovery, treatment and reuse of waste streams, the over consumption of goods and resources places considerable pressures on the environment and its capacity to receive waste materials.

Figure 2.12 details the quantity of material disposed of and the types of sources received by the Shire landfill site located at Muswellbrook. As indicated by the Figure most waste material was received from the domestic/ municipal sector.

**Figure 2.12**

<b>Indicator:</b>	<b>Total Waste disposed of into Muswellbrook Landfill by Source (ie domestic/ municipal, commercial/ industrial)</b>	
Total Waste disposed during reporting period:		16,285 m <sup>3</sup>
Percentage total waste domestic/ municipal:		69%
Percentage total waste commercial/ industrial:		31%

### 3. What are the responses and how effective are they? (response)

A range of programs have been developed and implemented to minimise and educate the public on the impact of waste on the environment. These schemes include:

#### **Drum Muster Program**

The Drum Muster Program was run throughout the Shire during the reporting period which involved the collection of empty agricultural chemical drums which were deposited at the Denman Transfer Station and the Muswellbrook Waste Depot for collection and disposal.

**Figure 2.13**

<b>Indicator:</b>	<b>Quantity of empty chemical containers collected Drum Muster 2005/2006</b>	
Muswellbrook Waste Facility:		219 containers
Denman Transfer Station:		2225 containers

#### **Chem Clear Program**

The Chem Clear program was held on the 9<sup>th</sup> January 2006 which was managed by Agsafe Limited and funded by the agricultural chemical industry. The program was organised in conjunction with Muswellbrook Council to appropriately dispose of unwanted rural chemicals from members of the public. Figure 2.14 lists the number of respondents and the quantities disposed. Though the figures represented below do not indicate a very successful event the continued involvement in the program and improved advertisement of the program may improve the response. For future occasions Council may be more involved in the promotion and organisation of the event.

**Figure 2.14**

<b>Indicator:</b>	<b>Chem Clear Program 2005/2006</b>	
Quantities disposed:		641.5 kg
Number of respondents:		5

#### **Compost Production**

In the past greenwaste has been mulched at the Muswellbrook Waste Facility and transported to the Muswellbrook Sewage Treatment Plant where it was combined with solid effluent waste to create compost. This process was under review during the reporting period so no compost was produced during this time. Therefore the information listed below is only concerning the production of greenwaste mulch which is available at the Muswellbrook Waste Facility.



becoming more accustomed to noise; complaints to Council aren't seen as resolving the problem; members of the community are contacting the mine hotlines directly.

Another potential source of noise emissions are from public entertainment premises which can on the surrounding community. Each premises with an entertainment licence is reviewed each year by Council and if appropriate granted ongoing approval. Figure 2.10 lists the number of public entertainment licences approved during the reporting period from 1<sup>st</sup> July 2005 to 30<sup>th</sup> June 2006. Though entertainment premises may create noise issues for the community, no complaints received by Council were regarding public entertainment.

**Figure 2.17**

<b>Indicator:</b>	<b>Number of Premises with Public Entertainment Licences 2005/2006</b>
Number of premises:	22

## 2. Why is it happening? (driving forces, pressure)

Typical sources of noise complaints in the Muswellbrook Shire are:

- Industrial noise, including noise associated with blasting – particularly if the noise source is located relatively close to urban areas
- Road traffic noise
- Rail noise
- Domestic pets
- Air conditioners
- Lawn mowers, tools etc
- Noisy neighbours

As can be seen in Figure 2.16, the majority of noise related complaints received by Council relate to residential noise sources, such as pets, power tools, swimming pool pumps, air conditioners etc.

## 3. What are the responses and how effective are they? (response)

Noise issues are managed by Council through the continued implementation of a number of tools, which include:

- **Complaints Protocol**- enables Council to adequately deal with and monitor complaints
- **Noise Guide for Local Government** - Council undertakes responses to noise complaints and their management as per the recommendations of the Noise Guide for Local Government
- **NSW Industrial Noise Policy** - used in the management of noise emissions and the determination of noise limits for operations.
- **Noise Monitoring** - as per specific approvals all mining operations are required to monitor and manage the level of noise emissions. Also as per the approvals this data and interpretations are to be reported to Council on a regular basis.

## 4. What more could be done? (future directions)

Council must remain vigilant in the management of noise and the impact emissions have on the community. Noise impacts need to be assessed at the various stages of development including planning, industry design, construction and the ongoing management of the facility.

## 2.8 Community Lands

**Management Plan Goal:** *To provide facilities commensurate with community needs and the ability of Council to provide, maintain and operate. To foster diversity of activities and services provided to the Muswellbrook Shire community, in the interest of fulfilling recognised social, sporting and recreational needs.*

### 1. What are the issues for sustainability? And how are they changing? (state)

Community lands, often referred to as open space, are typically areas of the urban landscape devoted to recreational parks, reserves, gardens, and other open spaces, such as nature strips. Open space areas provide numerous social, cultural, economic and environmental benefits for the community including recreational opportunities, contributing to the aesthetics of the environment, improving air quality, enhancing biodiversity, and performing water retention functions.

### 2. Why is it happening? (driving forces, pressure)

Open space areas are constantly under threat due to the expansion of human settlement and the constant need for more land to accommodate this expansion.

### 3. What are the responses and how effective are they? (response)

#### **Management Plans**

Under the Local Government Act, all councils in NSW must classify open space areas and develop management plans with the community for their ongoing use and maintenance.

#### **New Subdivision Areas**

Council ensures that new residential subdivisions in the Shire contain adequate open space areas for the population that will eventually reside in the area.

### 4. What more could be done? (future directions)

#### **Subdivision DCP**

Council is currently reviewing all Development Control Plans which should include the assessment of the Subdivision DCP to successfully provide adequate open spaces for the population of the area.

#### **Management of open spaces**

Adequate maintenance programs must be implemented to ensure the aesthetic value and biodiversity is maintained, such as through controlling weed infestations and protecting threatened species occurring in the areas.

## Human Settlements: Responses developed for consideration in the development of Council's Management Plan.

Responses	Action to date	New action for Council's consideration
<b><u>Population &amp; settlement patterns:</u></b>	<ul style="list-style-type: none"> <li>• Review of the Muswellbrook LEP and Development Control Plans</li> <li>• Implementation of DCP's for environmental controls of development (Erosion and Sediment control, contaminated lands, Trade Waste</li> <li>• Consideration of Synoptic Plan – Integrated Landscapes for Minesite Rehabilitation in development assessment for mining developments</li> <li>• Planning for Bushfire Protection provisions in development assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Development and implementation of policies and strategies to include:                             <ul style="list-style-type: none"> <li>○ Water sensitive urban design, Integrated Water Cycle Management and energy efficiency measures (such as the draft regional Subdivision DCP)</li> </ul> </li> <li>• Implementation of BASIX</li> </ul>
<b><u>Drinking water quality:</u></b>	<ul style="list-style-type: none"> <li>• Implementation of Hunter River Salinity Trading Scheme amongst industry</li> <li>• Effluent Reuse Scheme – recycle 100% of effluent</li> <li>• Water Campaign – Milestone 2</li> <li>• Sustainability Committee to oversee Council's progress in sustainability matters</li> <li>• Implementation of HCCREMS regional projects</li> </ul>	<ul style="list-style-type: none"> <li>• Water Campaign – set reduction goals and develop and implement Water Reduction Strategy</li> <li>• Enforce water restrictions</li> <li>• Investigate incentive schemes for water efficiency</li> <li>• Completion and implementation of the Integrated Water Cycle Management Strategy</li> <li>• Implementation of BASIX</li> </ul>
<b><u>Energy:</u></b>	<ul style="list-style-type: none"> <li>• Council energy efficiency initiatives</li> <li>• The Cities for Climate Protection Program and progression to the CCP Plus Program</li> <li>• Implementation of Greenhouse Reduction Strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Residential home audits</li> <li>• Further investigate retrofitting of Council buildings</li> <li>• Implement energy efficiency educational programs</li> <li>• Distribute climate change packs to community</li> <li>• BASIX Program</li> </ul>
<b><u>Transport:</u></b>	<ul style="list-style-type: none"> <li>• Implementation of the bicycle / walkway plan</li> <li>• Council initiatives</li> <li>• CCP Program- transport matters</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to review vehicles in Council's fleet</li> <li>• Continue the development of bicycle paths / walkways throughout the urban areas.</li> </ul>
<b><u>Waste management:</u></b>	<ul style="list-style-type: none"> <li>• Participation in Drummuster and ChemClear programs</li> <li>• Production of compost using green waste and solid STP waste</li> <li>• Clean Up Australia Day</li> <li>• Recycling programs at Council facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Review of waste management contract for waste depot and introduction of triple bin system</li> </ul>
<b><u>Noise:</u></b>	<ul style="list-style-type: none"> <li>• Implementation of Council's Complaints Protocol</li> <li>• Noise Guide for Local Government</li> <li>• Implementation of NSW Industrial Noise Policy</li> <li>• Monitoring of industrial noise</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure noise impacts are assessed in the planning stages of developments.</li> </ul>
<b><u>Community open space:</u></b>	<ul style="list-style-type: none"> <li>• Management Plans being prepared for community lands</li> </ul>	<ul style="list-style-type: none"> <li>• Proper maintenance of open space</li> <li>• Inclusion if Subdivision DCP currently under review</li> </ul>

### 3. Land

#### 3.1 At a glance

<b>Issue</b>	<b>Summary (status)</b>
<b><u>Land-use changes:</u></b> State	<ul style="list-style-type: none"> <li>• Land degradation has altered the chemical, biotic and hydrological balances in the landscape</li> <li>• Soil erosion</li> <li>• Land contamination</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Urban development and encroachment</li> <li>• Industrial development</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Review of the Muswellbrook LEP</li> <li>• Native Vegetation Clearing approvals – Dept Natural Resources</li> <li>• Subdivision DCP review</li> </ul>
<b><u>Soil erosion:</u></b> State	<ul style="list-style-type: none"> <li>• Soil erosion of land, rivers and creeks occurs from the motion of wind, water and mechanical means degrading the quality of the environment</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Inappropriate agricultural land use practices</li> <li>• Urban development and expansion</li> <li>• Removal of vegetation</li> <li>• industry</li> <li>• Agriculture</li> <li>• pests</li> <li>• Bushfires</li> <li>• Droughts</li> <li>• Floods</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Enforcement of Erosion and Sediment Control Regional Policy and Code of Practice (DCP 9)</li> <li>• Complaints protocol</li> </ul>
<b><u>Induced soil salinity:</u></b> State	<ul style="list-style-type: none"> <li>• Increasing salinity levels in waterways</li> <li>• Increasing areas affected by dryland salinity</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Removal of native vegetation cover</li> <li>• Heavy industry – potential discharge of saline waters</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Hunter River Salinity Trading Scheme</li> </ul>
<b><u>Chemical contamination:</u></b> State	<ul style="list-style-type: none"> <li>• Land contamination increasingly become an issue of concern – threatens human health and the environment</li> <li>• There are a large range of land uses that have the potential to result in land contamination if not managed appropriately</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Increase demand for land resulting in proposals to rezone / change land use activities</li> </ul>
Response	<ul style="list-style-type: none"> <li>• DCP 10: Determination of Rezoning and Development Applications involving contaminated land</li> <li>• Contaminated Sites Register</li> <li>• Identification of contamination issues on 149 Certificates</li> </ul>

## 3.2 Land-use changes

**Management Plan Goal:** To ensure an adequate supply of residential and industrial land in the Shire; To effectively manage and maintain Council owned property.

### 1. What are the issues for sustainability? And how are they changing? (state)

Large scale clearing by humans has occurred in Australia since settlement in 1788. This activity has produced large areas which have become environmentally degraded due to lack of vegetation cover and applied landuses. The most significant threats to the preservation of land within the Muswellbrook Shire include:

- the clearing of native vegetation
- soil erosion and water pollution
- urban development and the encroachment of settlements into non-urban lands
- soil acidification
- soil nutrient decline
- salinity
- land contamination

### 2. Why is it happening? (Driving forces, pressure)

The clearing of land in Australia has typically occurred for the purposes of agriculture, development and access. This clearing leaves opportunity for the bare soil to be eroded, affected by salt deposits, depletion of nutrients and the accumulation of contaminants through land uses.

### 3. What are the responses and how effective are they? (response)

#### **Review of the Muswellbrook LEP**

Council is currently reviewing the Muswellbrook Local Environment Plan (LEP) adopted in 1985. The review includes an assessment of current land uses to develop a strategic plan to ensure that future development is appropriately regulated.

#### **Native Vegetation Clearing Approvals – Department of Natural Resources**

Approval from the Department of Natural Resources (DNR) under the Native Vegetation Act 2003 is required for the clearing of land containing native or remnant vegetation. During the reporting period no applications were received by the DNR for the clearing of areas relevant to the Native Vegetation Act. The Hunter Central Rivers Catchment Management Authority has been allocated the task of regulating the clearing of land under the Native Vegetation Act. This involves a process of application assessment, commitment to offsets and ongoing agreements under a Property Vegetation Plan agreed to by the CMA and the property owner.

#### **Revision of the Subdivision DCP**

Council is currently undertaking the revision and culmination of all DCP's which will include an assessment of the Subdivision DCP. Specific issues involving the sensitivity to the design of the subdivision and the protection of vegetation will be included in this assessment.

### 4. What more could be done? (future directions)

The inclusion of strategic planning in the assessment of development proposals and land uses is essential to the sustainable use of land within the Shire. Through the revision of the LEP and the

Subdivision DCP which regulate development and land uses this process can be undertaken within the guidelines of adopted Environmental Planning Instruments. The implementation of these guides and the improvement in vegetation mapping will assist in the sustainable planning of developments within the Shire.

### 3.3 Soil erosion

**Management Plan Goal:** *To improve the environmental status and knowledge of the community*

#### 1. What are the issues for sustainability? And how are they changing? (state)

Wind, water and mechanical soil erosion in Australia has produced areas which are degraded and devoid of vegetation. Land uses and activities have further exacerbated this issue which affect the ground surface via altered soil hydrology, disturbed ground cover and earthworks. The erosion of soil sediment and nutrients flow downstream and can be deposited into drainage systems, water courses and water bodies. The increase in sediments and nutrient loads within water bodies can produce environmental issues including siltation, turbidity of water, altered marine habitats and water chemistry.

**Figure 3.1**

**Indicator: Number of complaints regarding soil erosion matters received by Council during the reporting period 2005/2006**

Number of complaint: 2

Council as regulator is conscious of matters regarding the minimisation of soil erosion. This involves the monitoring and regulation of developments which may contribute to the erosion of sediment into water courses and bodies. To enforce this Council includes the requirement to install and maintain sediment and erosion control devices for all development involving the disturbance of land. As indicated in Figure 3.1 above Council has received few complaints from the community regarding the erosion of soil which may be due to the ongoing monitoring of areas of concern.

#### 2. Why is it happening? (driving forces, pressure)

Soil erosion within the Muswellbrook Shire can be impacted by a variety of factors including:

- inappropriate agricultural land use practices
- introduction of exotic pest species
- urban development and expansion
- removal of native vegetation
- grazing
- industry
- bushfires
- droughts
- floods

The Upper Hunter region is currently experiencing an extended period of drought conditions much like most of western NSW. This extensive period of dry climatic conditions has significantly contributed to the erosion of soil particularly through wind erosion. As detailed in Section 4.3

airborne particulate matter is the subject of several complaints received from the community excluding the number of dust complaints referred to the mines surrounding the area.

### 3. What are the responses and how effective are they? (response)

#### **Erosion and Sediment Control Regional Policy and Code of Practice (DCP 9)**

The Erosion and Sediment Control Regional Policy and Code of Practice which was adopted by Council in 1999, is currently undergoing a review as per requirements of the Department of Planning. This DCP provides a management tool for the implementation in regards to developments, land uses, open space and infrastructure construction. All development practices which disturb the soil profile are required to comply with this DCP as detailed by a standard consent condition applied to all developments.

#### **Complaints Protocol**

Council has developed and adopted a complaints protocol to address and monitor complaints received regarding matters concerning the mines and quarries located in the area. Dust and air quality complaints are a major focus of the matters referred to Council with each complaint addressed and recorded individually.

### 4. What more could be done? (future directions)

Council's monitoring of development erosion controls will continue along with the implementation of the reviewed DCP which will address sediment pollution at the source. This activity in addition to educational programs focusing on the community and businesses will further address the issue of soil erosion within the Shire.

## 3.4 Induced soil salinity (including sodic soils)

*Management Plan Goal: To improve the environmental status and knowledge of the community*

### 1. What are the issues for sustainability? And how are they changing? (state)

Land use practices which alter the soil vegetation cover and hydrology have the ability to increase the salinity of the soil. Often caused by a rise in groundwater, land salt deposits can cause a variety of environmental problems including the alteration of marine habitats, the inability for vegetation to survive in salt rich soils and the reduction in productivity of large tracts of land.

### 2. Why is it happening? (driving forces, pressure)

The geomorphology of the Hunter River catchment includes a large proportion of salt bearing sedimentary rocks and soils, and surface and underground drainage from this contributes natural salinity to the river. Human activities such as industry, mining, power generation and agriculture also impact the level of salinity in the Hunter River.

### 3. What are the responses and how effective are they? (response)

#### **Hunter River Salinity Trading Scheme**

The Hunter River Salinity Trading Scheme is an ongoing program which was developed in response to the need to control saline water discharges into the Hunter River by the NSW Department of Land and Water Conservation, the Environment Protection Authority and with the cooperation of other interested organisations. This scheme is an initiative which aims to reduce the level of salt in the river through the management of discharge events from industry to periods of high flow to reduce the impact of saline water.

The scheme aims to maintain salinity levels in the Hunter River in particular at Denman below 600 Electrical Conductivity (EC) and 900EC at Glennies Creek/ Hunter River Junction at Singleton. The program works via a method of discharge 'credits' which determine the level of discharge of each industry participating in the scheme.

### 4. What more could be done? (future directions)

Priority areas of salinity impact need to be adequately identified and managed, with funding made available to assist in the implementation of appropriate rehabilitation measures.

## 3.5 Contaminated land

*Management Plan Goal: To improve the environmental status and knowledge of the community*

### 1. What are the issues for sustainability? And how are they changing? (state)

The contamination of land can be caused through a variety of means however it generally involves the accumulation of nutrients or chemicals within the soil produced from land use activities. The main concern relating to contaminated land is its potential for immediate or long term adverse impacts on human health and the environment. The leaching of contaminants into soils and nearby ground or surface waters, as well as their direct uptake by plants and animals are some of the main environmental impacts associated with these sites.

Council has an obligation under the Contaminated Land Management Act and State Environmental Planning Policy 55 (SEPP 55) to assess the potential for contamination to be evident on parcels of land the subject of development applications. Therefore when Council considers a development application an assessment of previous land uses is undertaken to consider the potential for contaminants to be present.

### 2. Why is it happening? (Driving forces, pressure)

The ever increasing demand for land resources to accommodate economic and population growth has heightened the importance of land use planning and contamination assessment in recent years. In this regard Council manages a number of sites each year through the process of investigation, remediation and ongoing management to permit the sites redevelopment.

Figure 3.2 details the number of development applications concerning activities which are potentially contaminating. The applications included are predominantly regarding industrial and commercial land uses. Figure 3.3 indicates that no industrial or commercial contaminated sites were rezoned for residential purposes.

**Figure 3.2**

<b>Indicator:</b>	<b>Number of Development Applications for potentially contaminating activities 2005/2006</b>
Number of development applications:	29

**Figure 3.3**

<b>Indicator:</b>	<b>Number of industrial or commercial contaminated sites rezoned to residential during the 2005/2006 reporting period</b>
Number of sites:	0

**3. What are the responses and how effective are they? (response)**

**Determination of Rezoning and Development Applications involving Contaminated Land (DCP 10)**

As per the direction from the Department of Planning, Council is undertaking a review of all adopted DCP's which will be assembled into a single guideline document. The review of DCP 10 'Determination of Rezoning and Development Applications involving Contaminated Land' will include legislative requirements in regards to the investigation, assessment and remediation of contaminated sites.

**Contaminated Sites Register**

Council has developed a Contaminated Sites Register which identifies sites throughout the Shire which may be potentially contaminated as a result of past land uses. This register ensures sites are identified prior to any redevelopment being undertaken.

**Contamination Issues on 149 Certificates**

Council identifies land which may be potentially contaminated on all Section 149 Planning Certificates issued. This ensures that potential contamination issues are detailed up front and demonstrates Council's duty of care regarding contamination issues.

**4. What more could be done? (future directions)**

Educational programs regarding the impact of industry and various land uses on the environment, in particular on soil, would assist in the reduction of contaminated land and the extent of rehabilitation works. The Department of Environment & Conservation has a number of courses proposed to assist businesses and organisations address contamination matters in regards to specific activities for example golf courses.

**Land: Responses developed for consideration in the development of Council's Management Plan.**

<b>Responses</b>	<b>Action to date</b>	<b>New action for Council's consideration</b>
<u>Land-use changes:</u>	<ul style="list-style-type: none"> <li>• Review of the Muswellbrook LEP</li> <li>• HCCREMS programs – remnant vegetation mapping</li> <li>• Review of Subdivision DCP</li> </ul>	<ul style="list-style-type: none"> <li>• Improve land management practices</li> </ul>
<u>Soil erosion:</u>	<ul style="list-style-type: none"> <li>• Erosion and Sediment Control Policy and Code of Practice</li> <li>• Complaints Protocol</li> </ul>	<ul style="list-style-type: none"> <li>• Improve land management practices</li> <li>• Council ongoing monitoring of development sites</li> </ul>
<u>Induced soil salinity:</u>	<ul style="list-style-type: none"> <li>• Hunter River Salinity Trading Scheme</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of priority areas with appropriate allocation of funding from the NSW government to implement appropriate remediation measures</li> </ul>
<u>Chemical contamination:</u>	<ul style="list-style-type: none"> <li>• DCP 10: Determination of Rezoning and Development Applications involving Contaminated Land</li> <li>• Contaminated Sites Register</li> <li>• Identification of contamination issues on 149 Certificates</li> </ul>	<ul style="list-style-type: none"> <li>• Educational programs</li> </ul>

## 4. Atmosphere (air)

### 4.1 At a glance

Issue	Summary (status)
<p><b><u>The enhanced greenhouse effect:</u></b> State</p>	<ul style="list-style-type: none"> <li>Enhanced greenhouse effect –ongoing emission of greenhouse gases and clearing of vegetation</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>Land clearing</li> <li>Emission of recognised greenhouse gases</li> </ul>
Response	<ul style="list-style-type: none"> <li>Council to continue to review efficiency initiatives</li> <li>Cities for Climate Protection Program and CCP Plus Program</li> <li>Implementation Muswellbrook Greenhouse Reduction Strategy</li> <li>Construction of bicycle / walkways</li> <li>BASIX</li> </ul>
<p><b><u>Air quality:</u></b> State</p>	<ul style="list-style-type: none"> <li>Air pollution as a result of both human induced and natural processes</li> <li>Council's PM<sub>2.5</sub> monitoring program indicates particulate matter (less than 2.5 micrograms) has been relatively steady over the last few years and is below the USEPA criteria and the proposed NEPM goal</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>Natural factors such as droughts and bushfires can cause particulate emissions</li> <li>Human factors such as the combustion of fuels, industry, motor vehicles and agriculture</li> </ul>
Response	<ul style="list-style-type: none"> <li>Woodsmoke Reduction Program</li> <li>ANSTO Air Monitoring Program</li> <li>Protection of the Environment (Control of Burning) Regulation</li> <li>Industrial Site Monitoring</li> </ul>
<p><b><u>Odour:</u></b> State</p>	<ul style="list-style-type: none"> <li>Odour complaints continuing to be lodged with Council</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>Odour emissions from a variety of sources</li> </ul>
Response	<ul style="list-style-type: none"> <li>Complaints Protocol</li> <li>Protection of the Environment Operations Act</li> <li>Local Government Act</li> </ul>

## 4.2 The Enhanced Greenhouse Effect

**Management Plan Goal:** to complete the Greenhouse Milestone Program; to reduce reliance on energy consumption

### 1. What are the issues for sustainability? And how are they changing? (state)

#### The Enhanced Greenhouse Effect

The enhanced greenhouse effect involves the trapping of energy within the earth's atmosphere by gases which increase the temperature of the atmosphere and reduces the ability for the earth to expel heat. The anthropogenic emission of greenhouse gases exacerbates the natural heating of the earth and atmosphere causing environmental and climatic impacts. Human activities such as power generation, motor vehicles, industrial emissions, vegetation burning, agriculture and waste decomposition all emit gases which contribute to the enhanced greenhouse effect.

Greenhouse gases which absorb heat energy include water vapour, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), ozone (O<sub>3</sub>), nitrous oxide (N<sub>2</sub>O) and halocarbons. The greenhouse gases absorb the reradiated heat within the lower atmosphere inhibiting the ability for the earth to remove any excess heat into the upper layers of the atmosphere, producing a phenomenon know as global warming.

#### Impact on the Environment

The heating of the earth's atmosphere through the accumulation of greenhouse gases is thought to have a significant impact on climate and the environment. The effects of global warming are slowly becoming more apparent to the population through the increase in 'natural' occurrences such as long periods of drought, tsunamis, cyclones, flooding, storms, the melting of the ice caps and changes to landscapes. These episodes in turn affect the ability for the population to produce food, resources and materials thus having socio- economic impacts.

### 2. Why is it happening? (driving forces, pressure)

The activities of human society contributes large quantities of green house gases to the atmosphere, in particular the combustion of fossil fuels for electricity generation, which is still the predominant source of electricity within Australia. Figures 4.1 and 4.2 detail the amount of greenhouse gases emitted from the fuel and electricity consumption of Council operations and community electricity consumption respectively.

**Figure 4.1**

Indicator	Total amount of greenhouse gases emitted (carbon dioxide equivalent), by Council operations (electricity, gas, fuel usage), 2005/2006
Total amount CO <sub>2</sub> equivalent emitted:	4,260.75 tonnes

\* Total includes emissions generated from electricity, gas and fuel usage - refer to Section 1.8 for specific information

**Figure 4.2**

Indicator	Total amount of greenhouse gases emitted (carbon dioxide equivalent), for the Muswellbrook Shire Community (electricity use only), 2005/2006
Total amount CO <sub>2</sub> equivalent emitted:	381,310.8 tonnes

\* Total includes emissions generated from electricity use only. Does not include emissions from community fuel and gas use etc - refer to Section 2.4 for specific information. Information received from Energy Australia 2006

### 3. What are the responses and how effective are they? (response)

Section 2.4 includes actions currently being implemented by Council to reduce the consumption of energy resources and address the issue of the enhanced greenhouse effect and global warming. In summary, the programs being implemented include:

- Involvement of Council in the Cities for Climate Protection Program and progression to the CCP Plus Program
- Undertaking of energy audits of the Council Administration Centre
- Down sizing of some Council vehicles from six (6) cylinder to four (4) cylinder vehicles
- Inclusion of a petrol/electric hybrid vehicle within Council's Fleet
- Use of dedicated LPG vehicles within Council's Works Fleet
- Retrofitting lighting within key Council Community Centres
- Installation of AAA rated shower heads within Council Community Centres
- Implementation of the Muswellbrook Shire Greenhouse Reduction Strategy
- Implementation of the BASIX (Building Sustainability Index) Program

### 4. What more could be done? (future directions)

As listed in Section 2.4 Council proposes future initiatives to reduce the consumption and improve efficiency of energy use. These actions include:

- Retrofitting of Council buildings
- Distribution of educational information
- Introduce residential home audits
- Continue the distribution of climate change packs
- Continue to downsize council vehicle fleet / purchase energy efficient vehicles
- Continue to implement cycleway / walkway development

## 4.3 Air quality

**Management Plan Goal:** To reduce pollution levels

### 1. What are the issues for sustainability? And how are they changing? (state)

Air quality is affected by a range of pollutants which include natural and anthropogenic sources. The most significant pollutants of air are gaseous emissions (predominantly produced through industrial and vehicle emissions) and particulate matter (produced through agriculture, sea salt, industry, wind erosion, combustion and land clearing).

#### Air Quality Monitoring Program

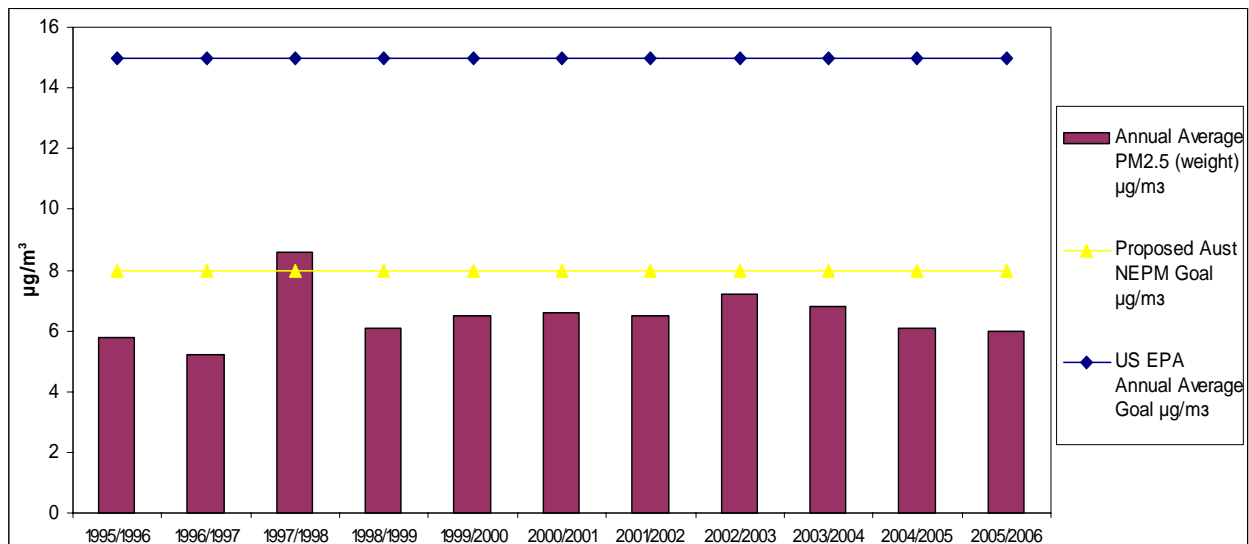
Council participates in a PM<sub>2.5</sub> air quality monitoring program in collaboration with the Australian Nuclear Science and Technology Organisation (ANSTO). The program has been in place since 1996 and tests particulate matter less than 2.5 micrograms in size for a 24 hour period twice weekly. The air sampling unit is positioned behind the Water Treatment Plant in Scott Street, Muswellbrook.

The ANSTO program studies the elemental composition of fine particles in the atmosphere by assessing the total weight of particles and a breakdown of the main elements within the sample. The results of the tests are compared with USEPA standards and the proposed National Environment Protection Measures (NEPM) which have not yet been formally endorsed.

Figure 4.3 details the annual average PM<sub>2.5</sub> sampled for the 2005/2006 period compared with previous years. It indicates that particulate matter (PM<sub>2.5</sub>) in the Muswellbrook atmosphere is consistently lower than the proposed NEPM limit (8µg/m<sup>3</sup>) and the established US EPA average limit (15µg/m<sup>3</sup>).

**Figure 4.3**

**Indicator: Particulate Matter (<2.5 µg/m3) Emissions, Muswellbrook Shire 1995 - 2006**



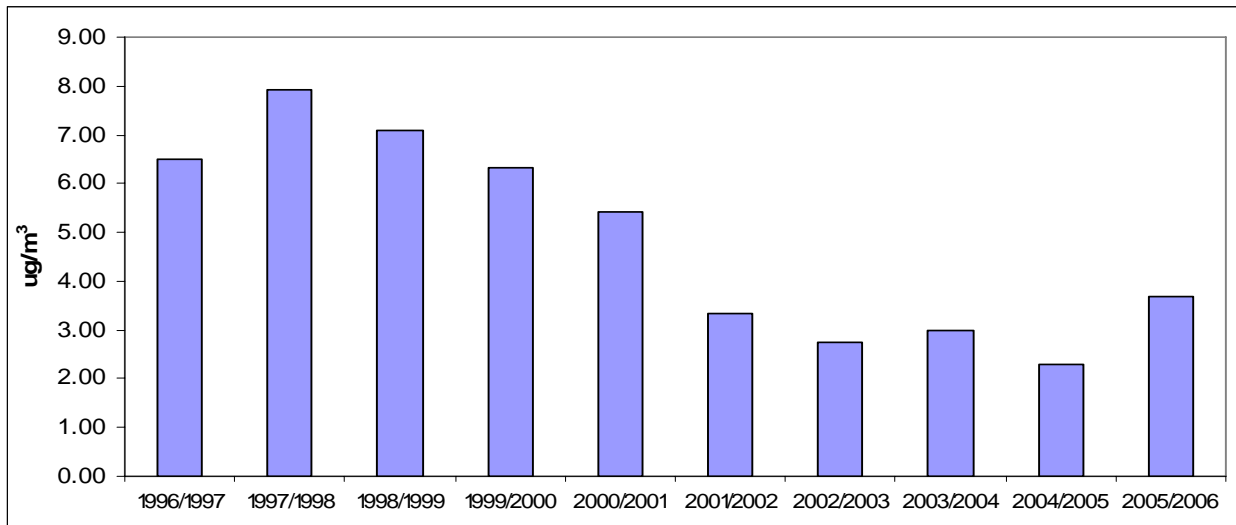
Information obtained via the air sampling program in association with ANSTO 2006

\* Note that the high levels of PM<sub>2.5</sub> sampled in 1997/1998 are result of severe regional bushfires in late 1997.

Figure 4.4 details the results of the samples taken for the air sampling program regarding lead levels in the atmosphere. The results indicate a consistent decrease of lead levels within the atmosphere since 1996 to 2005. The lead results for the 2005/2006 period indicate that this pollutant type has increased since 2004/2005. The source of this increase is not known however as lead fuels have been phased out for some time the most likely source is from industrial emissions.

**Figure 4.4**

**Indicator: Lead Emissions, Muswellbrook 1996 - 2006**



Information obtained via the air sampling program in association with ANSTO 2006

Figure 4.5 details the number of air quality complaints received by Council during the reporting period. The majority of the complaints received were regarding visible dust emissions produced by a number of sources including developments, mines, industry and agriculture.

**Figure 4.5**

**Indicator: Number of Air Quality Complaints received by Council, 2005/2006**

Number of Air Quality Complaints: 19

## 2. Why is it happening? (driving forces, pressure)

Air pollution within the Muswellbrook area is primarily attributed to sources such as coal extraction, power generation, industrial emissions, developments, sea salt, motor vehicles and agriculture. The persistent drought conditions further increases the ability for soil particles to be eroded by wind which contribute to the particulate matter in the atmosphere. As indicated by Figure 4.3, bushfires can also have a significant impact on particulate matter through the emission of soot and ash particles, as shown by the 1997/1998 results.

## 3. What are the responses and how effective are they? (response)

### Woodsmoke Reduction Program

The Woodsmoke Reduction Program was originally a regional initiative developed by HCCREMS, which focused on the education and enforcement of reducing the instances of smoky chimneys producing localised air pollution. Excessively smoky chimneys are produced by poorly maintained or operated wood heaters and stoves.

During the reporting period the Woodsmoke Reduction Program was not funded however inspections were still undertaken and complaints received addressed. Those chimneys deemed to

be smoking excessively were followed up with letters and educational material detailing how to maintain and use a wood heater efficiently.

The data recorded during the program is detailed below in Figure 4.6.

**Figure 4.6**

**Indicator: Number of smoky chimney complaints and those found to be smoking excessively 2005/2006**

Number of smoky chimney complaints	Number of smoky chimney inspections conducted	Number of excessively smoky chimneys (Education pack sent to resident)
4	8	4

### **ANSTO Air Monitoring Program**

As detailed above, Council undertakes PM<sub>2.5</sub> monitoring in Muswellbrook on a weekly basis. This program samples and assesses the quantity and types of particulates contained in Muswellbrook's atmosphere.

### **Protection of the Environment Operations (Control of Burning) Regulation**

Under the Protection of the Environment Operations (Control of Burning) Regulation, backyard burning is banned in urban areas throughout the Shire. Approvals can be obtained with conditions in place for the burning of material in rural areas. The Regulation also prohibits burning in the open of certain items such as coated wire and tyres.

### **Industrial Air Sampling Programs**

Many industries such as coal mines undertake air sampling programs as per requirements of the specific approvals to assess the volume and extent of particulate matter leaving the site. The number of industries which undertake these monitoring programs provides a large amount of information regarding air particulates.

## **4. What more could be done? (future directions)**

### **Woodsmoke Reduction Program**

Council should continue the implementation of the Woodsmoke Reduction Program where possible during the winter season. No future funding of the program is anticipated so the inspection of excessively smoky chimneys and distribution of educational material is undertaken by Council to address complaints and increase community awareness of the matter.

## 4.4 Odour

There is no current management plan objective, policy or goals.

### 1. What are the issues for sustainability? And how are they changing? (state)

Issues relating to the emission of offensive odours are predominantly regulated by Council. As the quantification of an offensive odour is subjective to the receptor Council is therefore presented with enforcement issues. Matters raised concerning odours considered to be offensive are addressed by Council on an individual basis. The numbers of odour complaints received by Council during the 2005/2006 period are detailed below in Figure 4.7.

Figure 4.7

<b>Indicator: Number of Odour Complaints received by Council, 2005/2006</b>	
Number of Odour Complaints:	5

### 2. Why is it happening? (Driving forces, pressure)

The emission of odours can be produced by a variety of sources such as agriculture, industries, businesses, vehicles, domestic animals, wastewater treatment systems, sewer breaches and residences.

### 3. What are the responses and how effective are they? (response)

#### Complaints Protocol

Council has adopted a Complaints Protocol which details the procedure for the receipt and resolution of complaints received. The protocol ensures that matters reported by the community are adequately dealt with in a timely and objective manner and that the details are recorded for monitoring purposes.

#### Protection of the Environment Operations Act 1997

The POEO Act provides legislative framework for a range of environmental issues including odours. Under the POEO Act it is an offence for the operator of any facility to cause air pollution, including odour, through failure to maintain or operate equipment or to deal with materials in a proper and efficient manner.

#### Local Government Act

The Local Government Act contains provisions for the management of public nuisances under which Council can take action against odours.

### 4. What more could be done? (future directions)

Council is currently reviewing all DCP's and the LEP relevant to the Shire which will enhance strategic planning within the area. The emission of odours from specific sources such as industry and agriculture can therefore be managed by planning land uses so as to reduce the potential impact on the neighbouring community.

**Atmosphere: Responses developed for consideration in the development of Council's Management Plan.**

<b>Responses</b>	<b>Action to date</b>	<b>New action for Council's consideration</b>
<u>The enhanced greenhouse effect:</u>	<ul style="list-style-type: none"> <li>• Review of Council vehicle fleet</li> <li>• Cities for Climate Protection Program and CCP Plus program</li> <li>• Implementation of Muswellbrook Greenhouse Reduction Strategy</li> <li>• Energy Audit of Administration Centre</li> <li>• Review of DCP for Subdivision</li> <li>• Construction of bicycle / walkways</li> <li>• NSW Government strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate retrofitting of council buildings</li> <li>• Develop and implement educational programs</li> <li>• Introduction of residential home audits</li> <li>• Continue to review the Council vehicle fleet and initiatives</li> <li>• Continue to implement bicycle / walkway development</li> <li>• Continue distribution of Climate Change Packs to community</li> <li>• Implementation of BASIX Program</li> </ul>
<u>Air quality:</u>	<ul style="list-style-type: none"> <li>• Woodsmoke Reduction Program</li> <li>• ANSTO Air Monitoring Program</li> <li>• Protection of the Environment (Control of Burning) Regulation</li> <li>• Industrial Site Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Continue air monitoring program</li> <li>• Continue Woodsmoke Reduction program annually</li> </ul>
<u>Odour:</u>	<ul style="list-style-type: none"> <li>• Complaints Protocol</li> <li>• Protection of the Environment Operations Act</li> <li>• Local Government Act</li> </ul>	<ul style="list-style-type: none"> <li>• Council review of DCP's and LEP to strategically plan land use activities</li> </ul>

## 5. Water

### 5.1 At a glance

Issue	Summary (status)
<p><b><u>Freshwater ecosystem health</u></b></p> <p>State</p>	<ul style="list-style-type: none"> <li>• Freshwater ecosystems in a degraded state</li> <li>• Floodplain vegetation cleared</li> <li>• Streamflow affected due to regulation of the Hunter River</li> <li>• Increase demand for water</li> <li>• Salt, nutrients and bacteria accumulating in water courses</li> <li>• Drought conditions limiting available water</li> </ul>
<p>Pressure</p>	<ul style="list-style-type: none"> <li>• Land use impacts from agriculture, clearing of native vegetation, runoff of sediments, on site sewerage management systems</li> <li>• Urban impacts – increasing urbanisation, stormwater containing pollutants</li> <li>• Current drought conditions</li> </ul>
<p>Response</p>	<ul style="list-style-type: none"> <li>• Water Quality Monitoring program</li> <li>• Effluent Reuse Schemes</li> <li>• Distribution of Climate Change Packs</li> <li>• Auditing program for On-Site Sewerage Management Systems</li> <li>• Trade Waste Approvals</li> <li>• Upper Hunter River Rehabilitation Initiative</li> <li>• Hunter River Salinity Trading Scheme</li> <li>• Upper Hunter Water Quality Working Group</li> <li>• Business Education</li> </ul>
<p><b><u>Surface water extraction / water consumption:</u></b></p> <p>State</p>	<ul style="list-style-type: none"> <li>• Increase demand for water resources – rate of extraction not sustainable</li> <li>• Current drought conditions</li> </ul>
<p>Pressure</p>	<ul style="list-style-type: none"> <li>• Agricultural and industrial demand for water</li> <li>• Potable water demand in urban areas</li> </ul>
<p>Response</p>	<ul style="list-style-type: none"> <li>• Effluent Reuse Scheme</li> <li>• Water Campaign (water efficiency measures)</li> <li>• HCCREMS programs</li> <li>• Sustainability Committee</li> <li>• BASIX Program</li> </ul>
<p><b><u>Groundwater issues:</u></b></p> <p>State</p>	<ul style="list-style-type: none"> <li>• Increasing use of groundwater resources particularly to supplement potable water in response to limited surface water</li> <li>• Over extraction can result in a decrease of the amount of water available to other groundwater dependent ecosystems; altered water quality; reduced amount of groundwater available for future use</li> </ul>
<p>Pressure</p>	<ul style="list-style-type: none"> <li>• Climatic variations</li> <li>• Limited surface waters due to drought conditions</li> <li>• Increased demand for water and over allocation of surface waters</li> <li>• Increasing pressure from agriculture, urban developments and industry</li> <li>• Inappropriate management of on-site sewerage management systems</li> <li>• Contamination as a result of diffuse and point source pollution</li> </ul>

## 5.2 Freshwater ecosystem health

**Management Plan Goal:** To provide environmentally sustainable Water and Sewerage services that- are customer orientated, meet present and future needs, are efficient and cost- effective and follow best practice management; Safeguard the reticulation system from possible contamination; reduce water demand to sustainable levels; augment existing capacity to meet increasing demand.

### 1. What are the issues for sustainability? And how are they changing? (state)

Water resources within NSW and in particular the Upper Hunter region is currently a major focus for all members of the community and businesses. As the drought persists the water resources available for use are becoming increasingly depleted with a strong push for recycling and reuse technologies, improved water use efficiency and investigation into additional water sources such as groundwater.

Impacts of human activities such as agriculture, industry, goods production, development, settlement and recreation can be major contributors to poor water quality. As water becomes increasingly scarce the community and industries alike are identifying the need to become more water efficient.

Figure 5.1 details the results of the sampling program conducted by Council regarding identified locations on the Hunter River and its major tributaries within the Muswellbrook Shire.

**Figure 5.1**

**Indicator: Water Quality Guidelines and Mean Results of Water Sampling, Muswellbrook Shire 1<sup>st</sup> July 2005 to 30<sup>th</sup> June 2006 compared to 2004/2005 reporting period**

Site	2005/ 2006				2004/2005			
	Turbidity (ntu)	Salinity (µs/cm)	Faecal Coliforms	pH	Turbidity (ntu)	Salinity (µs/cm)	Faecal Coliforms	pH
Kayuga Bridge	24.1	303.2	1017.1	7.7	12.5	355.6	849.1	8.4
Ford Street Pump Station	20.2	318.8	1288.0	7.6	11.7	354.7	527.9	8.4
Hunter River between Mbk & Denman	20.0	348.6	382.6	7.6	27.6	396.4	150.9	8.3
Denman Pump Station	18.0	370.8	511.0	7.6	24.9	435.6	341.0	8.4
Muscle Creek	7.5	1436.8	608.4	7.2	13.3	1654.7	320.8	7.7
Hunter River – Aberdeen Golf Course	6.0	272.2	113.6	7.8	14.0	292.2	380.1	8.5
Hunter River – Broad Crossing Aberdeen	12.3	320.8	587.0	7.7	16.2	351.8	127.6	8.5

### Water Quality Guidelines (ANZECC/ARMCANZ)

Parameter	Lower Limit	Upper Limit
Turbidity (ntu)	5	50
Salinity (µs/cm)	280	1500
Faecal coliforms (cfu/100ml)	150	1000
pH	6.5	8.5

Though some of the averaged results indicate water quality exceedances most samples are within the guideline limits represented above.

## 2. Why is it happening? (Driving forces, pressure)

### Landuse Impacts

Poor water quality results can be as a result of a range of factors:

- Agriculture – sediment, stock effluent, pesticides/ herbicides, chemicals,
- Clearing of vegetation - particularly riparian vegetation, leads to bank erosion and runoff of sediment into the river system
- Industrial contamination of drainage lines, stormwater systems and water courses
- Runoff of sediments and pollutants from industrial / commercial developments
- Inefficient management of on site sewage treatment systems may lead to the runoff of effluent that has not been adequately treated.

### Urban Development Impacts

Urban developments have a significant impact on water quality through the following mechanisms:

- Increased urbanisation results in greater runoff from land which once would have infiltrated the ground.
- The extraction of water from natural water courses for human consumption is having a significant impact on the availability and quality of water. As urban developments spread over the landscape the demand for water is increasing placing considerable pressure on natural water resources and water supply infrastructure.
- Stormwater – transports pollutants from the catchment to its collecting waterway through natural drainage lines such as gullies and creeks and via stormwater infrastructure such as gutters, channels and drains. Pollutants in stormwater originate from a range of sources such as the clearing of vegetation in the catchment, litter, application of fertilisers, pesticides and herbicides, contaminated runoff from industrial / commercial premises, insufficient sediment and erosion controls, hosing of leaf litter and grass clippings into drains in urban areas, washing cars on the street.

Figure 5.2 details the quantity of material that Council operations have removed from gross pollutant traps installed to manage pollutants collected by stormwater.

**Figure 5.2**

<b>Indicator:</b>	<b>Quantity of material removed from stormwater gross pollutant traps</b>
Total quantity of material removed and disposed:	68.5 m <sup>3</sup>

\*Note that the quantities listed above are estimates only recorded at the time of waste removal

**Figure 5.3**

<b>Indicator:</b>	<b>Number of sewer overflows and surcharges</b>
Muswellbrook:	148
Denman:	26

Figure 5.3 details the number of sewer overflows and surcharges applicable to the reporting period. The reasons for the overflows or surcharges listed above include impacts from tree roots and foreign objects obstructing or damaging sewer pipework and pipe breaches.

### 3. What are the responses and how effective are they? (response)

There are a range of programs and actions which have been implemented by Council to identify and address freshwater ecosystem health issues. These programs include:

#### Water Quality Monitoring

Council undertakes a monthly water sampling program originally established in 1998, which samples the Hunter River and major tributaries such as Muscle Creek. A number of parameters are analysed in the program, including pH, phosphates, electrical conductivity (salinity), hardness, coliforms, nitrates, temperature and turbidity. Results are reported in the local newspaper indicating the health of the river in relation to the various uses, such as recreational, drinking, irrigation and stock watering. See Figure 5.1 for average sample results.

#### Effluent Reuse

Council has established effluent reuse programs for Muswellbrook and Denman sewerage treatment works. These programs have resulted in 100% of treated effluent from the Muswellbrook and Denman STP being reused at mine sites and golf courses, for irrigation and dust suppression purposes. This program addresses sustainable reuse of reclaimed water and prevents treated effluent from being discharged under licence into the Hunter River.

#### Distribution of Climate Change Packs

During the reporting period Council has been involved in the distribution of over 200 climate change packs to residents of the Shire. These packs include low flow shower heads and high efficiency light globes.

#### Audit Program for On Site Sewerage Management Systems

Council is continuing the audit program concerning onsite wastewater management systems to ensure the satisfactory performance of wastewater systems. This audit commenced during 1999 with the inspection and assessment of all of the registered systems nearing completion. Figure 5.6 details the performance of the systems registered and inspected to date.

**Figure 5.6**

**Indicator: Registered and Inspected On Site Sewerage Management Systems 2005/ 2006**

System Type	Number Compliant	Number Non-Compliant
AWTS	224	20
Septic	686	152
Modified Septic	18	2
Decommissioned	60	0
<b>Compliance status</b>	<b>988</b>	<b>174</b>

During the reporting period a total of 23 systems were approved and installed, which are detailed in Figure 5.3 below.

**Figure 5.7**

**Indicator: Wastewater system installation and operation applications 2005/2006**

System Type	Number
AWTS	22
Septic	1
Waterless Composting Toilets	0
<b>Compliance status</b>	<b>23</b>

## Trade Waste Approvals

Council continues to undertake an approval process for the issuing of Trade Waste Permits in accordance with DCP 14. The issuing of permits ensures that wastewater source control measures are installed and the amount of pollutants being discharged into the sewer is maintained at a minimum. The installation and operation of trade waste measures are essential to ensure that trade wastes are not disposed of inappropriately. Due to insufficient resources during the reporting period no new trade waste approvals were issued.

**Figure 5.8**

<b>Indicator: Number of Trade Waste Approvals provided during 2005/2006 reporting period</b>	
<b>Number of trade waste approvals:</b>	<b>0</b>

## Upper Hunter River Rehabilitation Initiative

The Upper Hunter River Rehabilitation Initiative (UHRRI) is a joint venture developed in association with Macquarie University, DIPNR and the Hunter-Central Rivers Catchment Management Authority with the support of a range of industry partners and community stakeholders. The aims of UHRRI are to experimentally rehabilitate an 8 kilometre stretch of the upper Hunter River near Muswellbrook (downstream of Keys Bridge) which involves revegetation to establish a self-sustaining, largely indigenous, riparian community on both sides of the river, together with the reinstatement of large woody debris instream.

## Hunter River Salinity Trading Scheme

Through the Hunter River Salinity Trading Scheme the level of saline emissions from industrial sources on the Hunter River are managed via a program to avoid discharges of saline water during periods of low flow. Section 3.4 details further information regarding the scheme.

## Upper Hunter Water Quality Working Group

The Upper Hunter Water Quality Working Group (UHWQWG) has been established in association with Upper Hunter Shire Council to conduct investigations and programs relevant to the quality of water in the Hunter River. The group is currently applying for additional funding to expand the sampling program of the Hunter River and its tributaries so that interpretations can be made regarding impacts of climatic and land use influences.

## Business Education

Educational material has been distributed regarding the deposition of pollutants into water systems from businesses. This information was in reference to the washing of materials from paved areas, gutters and driveways into the stormwater system. Alternative methods of cleaning were included which appeal to business owners to use water sustainably but to also ensure that unwanted materials are not washed into drains.

## 4. What more could be done? (future directions)

### Revegetation and Rehabilitation Programs

Continued efforts in obtaining funding from Government Departments should be undertaken by Council and various land holders and environmental groups, to carry out revegetation and rehabilitation projects to improve the health of the riparian vegetation and bank stability of the Hunter River and tributaries. Ongoing community group consultation can ensure that available funds are allocated in a strategic manner utilising the funds to maximum capacity.

## 5.3 Surface water extraction and water consumption

**Management Plan Goal:** To provide environmentally sustainable Water and Sewerage services that- are customer orientated, meet present and future needs, are efficient and cost- effective and follow best practice management.

### 1. What are the issues for sustainability? And how are they changing? (state)

The extraction and consumption of surface waters creates a significant impact on the quality and availability of resources in natural water courses. As the Upper Hunter region is currently enduring drought conditions the availability of water has become more scarce placing additional pressure on the limited resources available. In response to this the community, Council and businesses have become more focused on the efficient use and reuse of water supplies. Figure 2.3 details annual water consumption rates from 1992 until 2006. As indicated by Figure 2.3 consumption rates continue to increase within the Muswellbrook Shire representing a need to allocate further resources to reducing this consumption.

**Figure 2.3**

**Indicator: Total potable water consumption (ML) of the Muswellbrook Shire**

1992/93	1993/94	1994/95	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
1,610	1,847	1,855	2,196	2,277	1,845	2,076	2,150	2,624	2,644	2,866

The impacts of excessive water consumption and low water resource availability include:

- degraded water quality- increased turbidity and salinity
- reduced aquatic habitat
- reduced natural flooding of riparian zones and floodplains
- increase in algal blooms
- erosion of river channels
- degradation of wetland and marsh areas

### 2. Why is it happening? (driving forces, pressure)

Basically the main contributor to the over consumption of water is caused by a high demand by the local population and industries. As the local economy continues to expand the demand for more water places additional pressure on the already limited resources.

Section 2.3 details consumption patterns and information relevant to water usage within the Shire.

### 3. What are the responses and how effective are they? (response)

As detailed in Section 2.3 the responses being implemented by Council to address the issue of water consumption and quality include:

- Effluent Reuse Scheme
- Water Campaign (water efficiency measures)
- HCCREMS regional programs
- Sustainability Committee to assist in water sustainability measures
- BASIX the Building Sustainability Index requires the achievement of efficiency standards in regards to water and energy consumption

#### 4. What more could be done? (future directions)

Further actions available to Council and the community to limit the usage of water resources as detailed in Section 2.3 include:

- Water Campaign – set reduction goals and develop and implement Water Reduction Strategy
- Implementation of educational programs to raise community awareness
- Completion of the Integrated Water Cycle Management Plan to manage water resources
- Plans incorporating Water Sensitive Urban Design
- Impose wider water restrictions across the Shire to enforce reduced consumption of water

### 5.4 Groundwater issues

There is no current management plan objective, policy or goals.

#### 1. What are the issues for sustainability? And how are they changing? (state)

Approximately 11% of the water used in NSW for drinking, irrigation, watering stock and domestic and industrial purposes comes from groundwater sources. As surface water resources are becoming limited and demand is not sufficiently declining, the use of groundwater to supply water consumers is becoming more prevalent. In the Muswellbrook Shire both Denman and Sandy Hollow access groundwater as their main water supply. The extraction of this water from the groundwater is a current solution however without the recharge of the groundwater system from available water flows this resource is finite.

#### 2. Why is it happening? (driving forces, pressure)

The most significant impacts on groundwater resources relate to the availability and contamination of groundwater affected by the following factors:

- Climatic variations – during drought periods, the lack of surface water results in increased pressure on groundwater
- Increased demand for surface water and the allocation of available resources results in increased pressure on groundwater
- Increasing pressure from agriculture, urban developments and industry placing greater demands on water, resulting at times in the use of groundwater as a substitute water supply.
- Inappropriate management of on-site sewerage management systems impacting on groundwater quality
- Contamination as a result of diffuse (nitrates and pesticides from agricultural activities) and point sources of pollution (hydrocarbons from underground storage tanks, leachate from landfills, nitrates, pathogens, bacteria from onsite sewerage management systems, coal tars and ash from gas works etc).

### 3. What are the responses and how effective are they? (response)

#### **Water Management Act**

Groundwater resources are predominantly managed through the NSW State Government by the Department of Natural Resources who regulate the allocation of groundwater resources through the implementation of extraction licences and water sharing plans. Under the Water Management Act, all aquifers are required to be managed within their yield capacities. Groundwater sharing plans are being developed and implemented in areas of significant groundwater use or where groundwater requires protection. At present, there are no groundwater sharing plans in the Muswellbrook Shire.

### 4. What more could be done? (future directions)

#### **Water Reduction**

The current rate of consumption of water requires attention as the persistent drought limits the availability of both surface and groundwater resources. Without reducing the consumption of these resources the extensive pressures on both water types becomes increasing unsustainable. This current situation is expected to be further constrained as the local economy and population of the Muswellbrook Shire increases placing even further pressure on water resources and those ecosystems which require water to survive.

#### **BASIX**

Through the introduction of the Building Sustainability Index program, new developments are required to include water saving methods which achieve a water efficiency target of 40%. This program promotes the implementation of factors such as drought tolerant landscaping, rainwater tanks and water efficient devices, which contribute considerable savings in the consumption and demand for water.

**Water: Responses developed for consideration in the development of Council's Management Plan.**

Responses	Action to date	New action for Council's consideration
<u>Freshwater ecosystem health</u>	<ul style="list-style-type: none"> <li>• Water Quality Monitoring program</li> <li>• Effluent Reuse Schemes</li> <li>• Auditing program for On-Site Sewerage Management Systems</li> <li>• Trade Waste Approvals</li> <li>• Upper Hunter River Rehabilitation Initiative</li> <li>• Hunter River Salinity Trading Scheme</li> <li>• Upper Hunter Water Quality Working Group</li> <li>• Distribution of Climate Change Packs to community</li> </ul>	<ul style="list-style-type: none"> <li>• Revegetation / Rehabilitation Program</li> </ul>
Surface water extraction:	<ul style="list-style-type: none"> <li>• Effluent Reuse Scheme</li> <li>• Water Campaign (water efficiency measures)</li> <li>• HCCREMS Programs</li> <li>• Sustainability Committee to investigate Council Initiatives</li> </ul>	<ul style="list-style-type: none"> <li>• Water Campaign – progress through Milestones</li> <li>• Implementation of educational programs</li> <li>• Investigate incentive schemes for water efficiency</li> <li>• IWCM and WSUD</li> <li>• Water restrictions</li> <li>• BASIX</li> </ul>
Groundwater issues:	<ul style="list-style-type: none"> <li>• Water Management Act</li> </ul>	<ul style="list-style-type: none"> <li>• Water use reduction measures</li> <li>• BASIX</li> </ul>

## 6. Biodiversity

### 6.1 At a glance

issue	Summary (status)
<p><u>Terrestrial and aquatic ecosystems</u> State</p>	<ul style="list-style-type: none"> <li>• Limited native and remnant vegetation</li> <li>• Increasing number of threatened species listed by legislation</li> <li>• Noxious weed management</li> </ul>
<p>Pressure</p>	<ul style="list-style-type: none"> <li>• Key threatening processes</li> <li>• Inappropriate development</li> <li>• Land use changes</li> <li>• Urbanisation and encroachment</li> <li>• Fire management practices</li> <li>• Altered hydrology</li> <li>• Pollution</li> <li>• Salinity</li> </ul>
<p>Response</p>	<ul style="list-style-type: none"> <li>• Establishment of reserves and National Parks</li> <li>• Voluntary conservation agreements</li> <li>• Synoptic Plan – Integrated Landscapes for Mine site Rehabilitation</li> <li>• HCCREMS Programs</li> </ul>

## 6.2 Terrestrial and aquatic ecosystems (including native vegetation communities)

**Management Plan Goal:** To maintain natural vegetation corridors; control growth of noxious weeds within the Shire;

### 1. What are the issues for sustainability? And how are they changing? (state)

#### Remnant Vegetation

A program of remnant vegetation mapping has been undertaken by the Hunter Central Rivers Catchment Management Authority (HCRCMA) and Hunter Central Coast Regional Environmental Strategy (HCCREMS) through the Hunter Remnant Vegetation Project. Section 1.3 includes the report completed by HCCREMS which covers the specifics of the Hunter Remnant Vegetation Project.

The project within the Muswellbrook Shire mapped significant existing parcels of remnant vegetation located specifically within the National Parks, Nature Reserve and military bases. A high diversity of vegetation was recorded within the area exhibiting very few connecting corridors, though opportunities exist for the establishment of corridors to connect vegetation fragments. Figure 6.1 indicates the total areas of the local National Parks and Nature Reserves associated with the Muswellbrook Shire.

**Figure 6.1**

<b>Indicator: National Parks, Nature Reserves and State Conservation Areas in the Muswellbrook Shire</b>	
Total Area of Wollemi National Park:	4934.81 km <sup>2</sup>
Total Area of Goulburn National Park:	716.58 km <sup>2</sup>
Total Area of Manobalai Nature Reserve:	37.59 km <sup>2</sup>
No State Conservation Areas are in the Muswellbrook Shire	

Note that the total areas listed for the Wollemi and Goulburn National Parks are not entirely encompassed by the Muswellbrook Shire local government area.

Figure 6.2 lists the number of flora and fauna species listed by the NSW Wildlife Atlas for the Muswellbrook Local Government Area. The figures from the Wildlife Atlas reported last year listed a total of 565 flora species and 362 fauna species. The information represented in Figure 6.2 therefore indicates a significant increase in the number of flora species listed by State legislation and a marked increase in the number of fauna species.

**Figure 6.2**

**Indicator: Number of threatened species, populations and ecological communities as listed by NSW legislation for the Muswellbrook Shire**

Classification	Listing	Number of species
<b>FLORA</b>		
• Endangered	Endangered - TSC Act (E1)	3
• Endangered	Endangered - TSC Act (E2)	3
• Vulnerable	Vulnerable - TSC Act (V)	13
• Protected Plants	Protected - NPW Act (P13)	50
• Unprotected	Unprotected (U)	827
• Endangered Ecological Communities	EEC – TSC Act	6
<b>Total Number of Species recorded</b>		<b>902</b>
<b>FAUNA</b>		
• Endangered	Endangered - TSC Act (E1)	4
• Endangered populations	Endangered - TSC Act (E2)	1
• Endangered	Presumed Extinct - TSC Act (E4)	0
• Vulnerable	Vulnerable - TSC Act (V)	38
• Protected	Protected - NPW Act (P)	309
• Unprotected	Unprotected (U)	20
<b>Total Number of Species recorded</b>		<b>372</b>

Information obtained from the Department of Environment & Conservation 2006

## Weeds

The management of weed species can have a significant impact on the ability to enhance or maintain biodiversity and native species populations as they often out compete with the endemic vegetation. Weed management within the Muswellbrook Shire is undertaken by both Council and the Upper Hunter Weeds Authority.

The Weeds Authority operates under the Regional Weeds Program which encompasses a number of local government areas and focuses on species listed by legislation as noxious weeds. Council however manages weeds on a more local scale such as in road verges and open space areas.

During the reporting period the Upper Hunter Weeds Authority conducted weed eradication programs as detailed in Figure 6.3.

**Figure 6.3**

**Indicator: Upper Hunter Weeds Authority projects within the Upper Hunter Region 2005/2006**

Weeds Treated	Herbicides used	Herbicide Quantities used
African boxthorn	Grazon	2 L
Prickly pear	Brush off	40 gm
Tiger pear	Roundup	20 L
Blackberry	Garlon	5 L
Johnsons Grass		
Mother of Millions		
St Johns Wort		
Star thistle		
<b>Total Area Treated for projects of the Upper Hunter Weeds Authority</b>		<b>10725 sq/m</b>

Information obtained from the Upper Hunter Weeds Authority 2006

## 2. Why is it happening? (driving forces, pressure)

There are a range of factors threatening biodiversity. These include:

- Key threatening processes (as detailed in Schedule 3 of the Threatened Species Conservation Act 1995, including- alteration of flow regimes; alteration of habitat due to longwall mining; removal of dead wood and dead trees; anthropogenic climate change; bushrock removal; native vegetation clearing; competition and predation by introduced species; frequency of fires; infection by diseases)
- Inappropriate development
- Land use changes (resulting in land disturbance)
- Urbanisation and encroachment
- Fire management practices
- Altered hydrology
- Pollution
- Salinity

Approvals for the clearing of land are provided by the State Government under the Native Vegetation Act 2003 which is detailed by Figure 6.4. As indicated no approvals for clearing land under the Native Vegetation Act were granted during the reporting period.

**Figure 6.4**

**Indicator: Native Vegetation of the Muswellbrook Shire 2005/2006**

No approvals were allocated for clearing under the Native Vegetation Act 2003

Area of existing vegetation: 205,402 ha

Percentage of vegetation coverage for LGA: 60.33%

Information provided by the Catchment Management Authority 2006

Fire and hazard reduction activities also have a considerable impact on vegetation and biodiversity. Due to the continuing drought conditions in the Muswellbrook area the fire danger period was brought forward one month to commence on the 1<sup>st</sup> September 2005.

**Figure 6.5**

**Indicator: Hazard Reduction Activity and Fire Restrictions for Muswellbrook Shire, 2005/2006**

Area of Hazard Reduction Activity conducted by all agencies: 66 ha

Number days Total Fire Ban for Greater Hunter Fire Weather Area: 10

Number of incidents requiring response by Rural Fire Service: 86

Number of hazard reduction activities by all agencies: 6

Total area burnt by hazard reduction and fire events: 7852 ha

Information provided by Rural Fire Service 2006

### 3. What are the responses and how effective are they? (response)

#### **Reserves and National Parks**

The establishment of National Parks and Nature Reserves protects the level of biodiversity in specific areas from many of the threats (pressures) detailed above. Relevant to the Muswellbrook Shire, Wollemi National Park, Goulburn National Park and Manobalai Nature Reserve have been declared, protecting a large area of the shire from development and many other threats.

#### **Voluntary Conservation Agreements**

Council has in the past established Voluntary Conservation Agreements with developers to offset the protection and management of biodiversity in conjunction with development.

#### **Synoptic Plan – Integrated Landscapes for Mine site Rehabilitation**

As discussed in section 2.2, the Synoptic Plan is a strategic planning instrument for the future rehabilitation and management of mine sites within the Upper Hunter. The plan, aims for the protection of biodiversity through the development of corridors to provide linkages for wildlife through previously mined areas which will connect up with natural landscapes.

#### **Hunter & Central Coast Regional Environmental Management Strategy**

The HCCREMS group continues its focus on biodiversity conservation and management at a regional scale. A major vegetation mapping program has been undertaken throughout 2004 – 2005 with the following objectives for regional and sub-regional scale map outputs:

Hunter-Central Rivers Catchment Wide Vegetation Mapping:

- Vegetation Cover
- Vegetation Structure
- Vegetation Condition
- Systematic Vegetation Surveys in priority areas

Sub-regional Vegetation Mapping in the Central Coast

- Pre-1750 Vegetation Communities
- Extant Vegetation Communities at 1:16,000 Scale
- Regional Significant Vegetation

Catchment Wide Vegetation Mapping and Validation

- SPOT5 satellite imagery has been acquired for the study area.
- Preliminary classification of this imagery is being undertaken to stratify the landscape into formation level vegetation units. These units will be targeted by rapid surveys to assist the final classification in discerning vegetation cover and formation.
- Vegetation condition assessment is underway

The Mapping Projects were completed at the end of 2005. Section 1.3 includes the HCCREMS report detailing information relating to the vegetation mapping projects.

#### 4. What more could be done? (future directions)

##### Biodiversity Corridors

The establishment of vegetative corridors linking areas of native and remnant vegetation will improve the ability of fauna species to move across the landscape and for endemic flora species to colonise protected areas. Findings of the HCCREMS mapping project indicate that few corridors currently exist isolating areas of remnant vegetation. The investigation and identification of the issue within the Hunter has been undertaken to promote a focus on enhancing the existing remnant vegetation by providing linkages.

The ongoing implementation of the Mine Rehabilitation Synoptic Plan within the Hunter region will address the provision of corridors between mine sites which have been rehabilitated to other nearby vegetation. This process however is limited by the extended life of mine sites which can be over a period greater than 20 years.

<b>Biodiversity: Responses developed for consideration in the development of Council's Management Plan.</b>		
<b>Responses</b>	<b>Action to date</b>	<b>New action for Council's consideration</b>
<u>Terrestrial and aquatic ecosystems (including native vegetation communities)</u>	<ul style="list-style-type: none"> <li>• Establishment of reserves and National Parks</li> <li>• Voluntary conservation agreements</li> <li>• Synoptic Plan – Integrated Landscapes for Mine site Rehabilitation</li> <li>• HCCREMS Programs</li> </ul>	<ul style="list-style-type: none"> <li>• Biodiversity corridors</li> </ul>

## 7. Heritage

### 7.1 At a glance

Issue	Summary
<b><u>Aboriginal heritage:</u></b> State	<ul style="list-style-type: none"> <li>• A number of aboriginal sites and relics recorded in the Shire</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Increased development placing pressure on the sites, at times leading to the destruction of sites in accordance with approvals from NPWS</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Aboriginal Heritage Information Management System</li> <li>• National Parks and Wildlife Act – protection of sites and relics</li> <li>• Section 90 consent to destroy required to alter aboriginal sites / relics</li> </ul>
<b><u>Non-Aboriginal heritage:</u></b> State	<ul style="list-style-type: none"> <li>• A number of heritage items have been identified in the Shire</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Increasing developments, particularly industrial developments, placing pressure on heritage items, notably homesteads located within mining lease areas etc</li> <li>• Lack of maintenance resulting in many heritage items becoming dilapidated and run down</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Heritage Plans</li> <li>• Heritage Study Implementation</li> <li>• Engagement of Heritage Advisor</li> </ul>

## 7.2 Aboriginal heritage

**Management Plan Goal:** Establish an excellent Heritage assessment process; Improve Development Assessment Procedures and results.

### 1. What are the issues for sustainability? And how are they changing? (state)

Aboriginal Heritage relates to the association that the local Aboriginal community have with the landscape, sites and artefacts which have cultural significance. When assessing an application for a development, Council must consider the potential impacts it may have on aspects of Aboriginal Heritage. Therefore a process of consultation with the Aboriginal community is required by Council when an application has the potential to have an impact on Aboriginal Heritage. Additional to this process undertaken by developers, Council also consults with identified local Aboriginal groups by providing details of all developments received during a period. This provides an opportunity for local Aboriginal groups to become involved in a development which may affect items of cultural significance.

When artefacts or sites are identified through this process the Department of Environment & Conservation assesses the impact, provides the necessary licences and records the information. Below is a list of Aboriginal Heritage sites which have been added to the Department of Environment and Conservation's Aboriginal Heritage Information Management System (AHIMS) in 2005/2006.

**Figure 7.1**

**Indicator: Aboriginal Sites and Relics recorded in the Muswellbrook Shire during reporting period 1<sup>st</sup> July 2005 to 30<sup>th</sup> June 2006**

Site Type	Number of Features 2005/2006
Aboriginal Resource and Gathering	0
Aboriginal Ceremony and Dreaming	0
Art (pigment or engraved)	0
Artefact	7
Burial	0
Ceremonial Ring (stone or earth)	0
Conflict	0
Earth Mound	0
Fish Trap	0
Grinding Groove	0
Habitation Structure	0
Hearth	0
Non-Human Bone and Organic Matter	0
Ochre Quarry	0
Potential Archaeological Deposit	1
Shell	0
Stone Arrangement	0
Stone Quarry	0
Modified Tree (Carved or Scarred)	0
Water Hole	0
<b>Total Number of Features</b>	<b>8</b>

Information provided by the Department of Environment and Conservation 2006

The number of Aboriginal heritage sites allocated licences by the Department of Environment and Conservation to alter, destroy or damage during 2005/2006 is listed in Figure 7.2.

**Figure 7.2**

<b>Indicator:</b>	<b>Number of licences which permit activities in relation to Aboriginal heritage sites 2005/2006</b>
Licences:	29

Information provided by the Department of Environment and Conservation 2006

The number of development applications received by Council which have potential to impact on aspects of Aboriginal Heritage is detailed by Figure 7.3.

**Figure 7.3**

<b>Indicator:</b>	<b>Number of approvals that impact on Aboriginal Heritage sites</b>
Development Approvals:	3

## 2. Why is it happening? (Driving forces, pressure)

The loss of sites and relics which have heritage value can be caused by factors such as the increasing population, the spread of urban development, landuse changes, inappropriate land use, industrial development and changes to water flow regimes.

Apart from investigations undertaken in the development assessment process, there is a lack of knowledge and certainty in the location of aboriginal sites throughout the Shire. The majority of the sites identified have been as a result of systematic surveys undertaken as part of the environmental assessment for large developments within the Shire. Those reported to the Department of Environment & Conservation - NPWS are listed in the Aboriginal Heritage Information Management System (AHIMS) maintained by the department.

## 3. What are the responses and how effective are they? (response)

### **Aboriginal Heritage Information Management System (AHIMS)**

This is a database containing details of Aboriginal objects, places and other heritage values across NSW which have been reported to the Department of Environment & Conservation - NPWS. Note that this does not include a list of all artefacts and sites within an area, only those reported. AHIMS includes listings, recording cards and archaeological reports for relics, sites and values reported to the National Parks & Wildlife Service (NPWS).

### **National Parks and Wildlife Act**

The NPW Act protects all Aboriginal objects and Aboriginal places in NSW from destruction or disturbance without a permit approved under this Act. It is an offence to undertake any of the following activities without a permit:

- disturb or move an Aboriginal object
- excavate land for the purpose of discovering an Aboriginal object
- knowingly destroy, damage or deface an Aboriginal object or Aboriginal place
- knowingly cause or permit the destruction, damage or defacement of, an Aboriginal object or Aboriginal place.

A section 90 consent to destroy permit is required to be obtained from NPWS should a person wish to destroy an aboriginal object.

#### 4. What more could be done? (future directions)

Ongoing investigations into the location of sites and relics of Aboriginal significance should be undertaken to assist in the assessment of developments which may impact on these matters. Management plans should also be developed to manage those items or areas of particular significance to the Aboriginal community.

### 7.3 Non-Aboriginal heritage

**Management Plan Goal:** *Establish an excellent Heritage assessment process; Improve Development Assessment Procedures and results.*

#### 1. What are the issues for sustainability? And how are they changing? (state)

Muswellbrook has had an extensive history of European settlement so there are many sites and structures which have European Heritage value. The preservation of these sites and structures is therefore essential in preserving the regions history.

Figure 7.4 details the number of development approvals which may have a potential impact on non-Aboriginal heritage sites. Figure 7.5 indicates the number of sites which are listed by the Muswellbrook LEP as having non- Aboriginal (European) Heritage value. Figure 7.6 then lists the number of sites which have been lost or added to the Heritage Inventory maintained by Council.

**Figure 7.4**

<b>Indicator: Number of approvals during 2005/2006 which may impact on non- Aboriginal Heritage sites</b>	
Number of development approvals:	41

**Figure 7.5**

<b>Indicator: Total number of non- Aboriginal Heritage sites listed by the Muswellbrook Local Environmental Plan</b>	
Known Non- Aboriginal heritage sites LEP:	180
Potential Non- Aboriginal heritage sites LEP:	50

**Figure 7.6**

<b>Indicator: Number of non- Aboriginal heritage sites which have been added and lost from the Heritage Inventory 2005/2006</b>	
Number sites added:	0
Number sites lost:	2

## 2. Why is it happening? (driving forces, pressure)

The most significant impact on heritage items is caused by the inadequate management of the item which allows the destruction or damage to the building or article. The most common threat to heritage buildings is through the lack of maintenance allowing them to become derelict and possibly unsafe requiring expensive restoration works or even demolition.

A number of heritage homesteads in the Muswellbrook Shire are located in close proximity to open cut coal mining which is often subject to blasting vibrations. This may also, if not managed appropriately, result in a detrimental impact on the heritage item.

## 3. What are the responses and how effective are they? (response)

### Heritage Plans

Council is preparing a draft Heritage Local Environmental Plan and a Heritage Development Control Plan with the assistance of the Heritage Office, and Council's Heritage Committee (which incorporates Councillors, staff and members of the Muswellbrook Historical Society). To form the basis of the draft LEP amendment and draft DCP a detailed heritage study by EJE architects (Muswellbrook Shire Wide Heritage Study 1996) which has updated the information from the Hunter (Heritage) Regional Environmental Plan (1989) regarding each item has been completed.

Progress to date since Council resolved to undertake the draft LEP amendment has included the preparation of the document, followed by adoption by the Heritage Committee.

### Heritage Study Implementation

In terms of the above, Council uses the Hunter Regional Environmental Plan 1989 and Section 79(c) for assessment purposes under the Environmental Planning and Assessment Act. As Council has a draft Heritage LEP and DCP, items included in the draft lists are to be considered under Section 79(c) when determining a development application once the Draft LEP is publicly exhibited.

Any developments where heritage matters are apparent but the site is not listed in the Study, those matters are still to be considered and addressed in Section 79(c) of the Environmental Planning and Assessment Act, 1979, as stipulated by the Department of Urban Affairs and Planning.

### Engagement of a Heritage Advisor

Council will continue to engage a Heritage Advisor to visit Muswellbrook Shire once every two months to advise on matters to do with the preparation of the draft Heritage Development Control Plan. At each visit Council holds the Heritage Committee meetings to provide the Councillors and representatives of the Muswellbrook Family and Historical Society with the opportunity to discuss issues with the Heritage Advisor along with normal business items.

During the bi-monthly visits the Heritage Advisor inspects sites in relation to development applications, development proposals/queries and to provide the public with advice concerning heritage issues/matters. In the past year the Heritage Advisor has also been engaged to comment on Main Street Proposals for Denman and Muswellbrook, and on the rehabilitation and ongoing maintenance of local cemeteries.

#### 4. What more could be done? (future directions)

Council should encourage further investigations into the heritage significance of a number of sites throughout the Shire to gauge further information regarding heritage values. Also through the Heritage Committee and the DCP (once adopted), Council should promote the proper management of heritage items in the Muswellbrook Shire to ensure they are conserved for the future.

#### Heritage: Responses developed for consideration in the development of Council's Management Plan.

Responses	Action to date	New action for Council's consideration
<b><u>Aboriginal Heritage:</u></b>	<ul style="list-style-type: none"> <li>Aboriginal Heritage Information Management System</li> <li>National Parks and Wildlife Act</li> <li>Section 90 consent to destroy required to destroy aboriginal sites / relics</li> <li>Investigation of sites and artefacts during development assessment</li> </ul>	<ul style="list-style-type: none"> <li>Further research be undertaken where possible by relevant stakeholders into the location of aboriginal sites and relics not currently identified</li> </ul>
<b><u>Non-Aboriginal Heritage:</u></b>	<ul style="list-style-type: none"> <li>Heritage Plans</li> <li>Heritage Study Implementation</li> <li>Engagement of Heritage Advisor</li> </ul>	<ul style="list-style-type: none"> <li>Further research be undertaken where possible by relevant stakeholders into the heritage values of identified heritage items</li> </ul>