An ORDINARY MEETING of LISMORE CITY COUNCIL will be held at the COUNCIL CHAMBERS, 43 Oliver Avenue, Goonellabah on Tuesday, 10 May 2011 at 6.00pm.

Attachments Excluded From Agenda

Paul G O'Sullivan
General Manager

3 May 2011

Attachments

12.3 Integrated Waste and Resource Recovery Strategy

Attachment 1: 2011 Integrated Waste and Resource Recovery Strategy 3

12.4 Richmond River Estuary Study and Coastal Zone Management Plan

Attachment 1: Richmond River Estuary Summary Document 33

LISMORE CITY COUNCIL
Northern Rivers Waste

Integrated Waste and Resource Recovery Strategy

2011

northern rivers waste

lismore city council

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Executive Summary

Lismore City Council has had a significant focus on waste and recycling since 1990. Council has an extensive range of waste management and recycling programs that has lead to a diversion from landfill rate of over 50%.

Since 1990 waste production in Lismore Local Government Area has continued to increase and there has been a growing awareness of the impact of waste production on the environment. At the same time emerging technologies and resource markets have enabled more items to be reused and recycled.

There has been a realisation that in order to improve diversion from landfill and meet the New South Wales Government Waste Avoidance and Resource Recovery (WARR) targets that new infrastructure intensive programs need to be implemented.

This strategy seeks to build on existing waste management and recycling programs to enhance diversion from landfill, educational opportunities, and on building local capacity for long term waste management.

1. Introduction

Lismore City Council has demonstrated an overriding community goal of better waste management. This has become increasingly important with the push for environmental sustainability and the need to address climate change. Research has shown that Australia's per capita municipal waste disposal rate is one of the highest in the developed world and that community waste management is a substantial and growing item for councils and local communities.

With this in mind, this strategy is designed to establish sustainable waste management practices, encourage consideration of waste as a valuable resource and enable measures to be put into place that are efficient in resource management and effective in resource recovery.

1.1 Council's Vision, Mission and Values

Vision

Lismore: A great place to live and work.

Mission

To work with the community to maintain Lismore as the regional centre in a healthy rural setting.

Values

Community
We, in partnership with the community, respond to needs and aspirations in a caring, fair and accountable manner through the provision of quality services.

Staff and Councillors
We value and support our Staff and Councillors to achieve excellence and recognise the contribution of each person to the team. We respect the importance of family life to all.

Governments
We encourage an open, productive relationship with all spheres of government and other organisations in the best interests of our community.

Customers and Suppliers
We conduct our business with integrity and respect, ensuring consistency and accountability in all our dealings.

Visitors
We encourage visitors to treat our natural, social and cultural environment with respect.

Environment
We conserve, enhance and develop our environment in an equitable and sustainable manner, acting as custodians for future generations.

Council's Community Strategic Plan includes a strategic community priority of integrated waste cycle Management with the desired outcome:

"That Lismore minimises waste to landfill by reducing, reusing and recycling".

The Community Strategic Plan outlines that Lismore City Council has been successful in diverting large volumes of waste from landfill but identifies the need for more work.

1.2 The need for a future strategy

The Integrated Waste and Resource Recovery Strategy for Lismore outlines the context for and principles of the Council's strategic vision for waste management and resource recovery over the next five to ten years, and links to a detailed action plan. The action plan contains the detail of how the Strategy will be delivered, and will be updated on an annual basis.

The Integrated Waste Minimisation and Management Strategy for Lismore was adopted in 2002 and guided waste management until 2005. Since 2005 Council has continued to implement numerous programs and systems to improve waste management and resource recovery.

During the last five years there has been a significant change both in State and Federal strategy for waste management and in the nature of the regulatory regime and targets being applied to waste.

The new Integrated Waste and Resource Recovery Strategy pulls all these programs and systems together and paves a long term path for the management of waste within Lismore.

1.3 Scope of the strategy

This Strategy focuses on the three main waste streams - municipal, commercial, and construction and demolition waste. This presents a holistic option for the wastes produced within Lismore.

The need for strategic planning in waste management is highlighted through Federal and State Government legislation and policy. The Integrated Waste and Resource Recovery Strategy reflects the objective of the New South Wales Waste Avoidance and Resource Recovery (WARR) Act 2001: 'to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development'.

The *Reducing Waste: Implementation Strategy 2011-2015* was developed following a comprehensive review of waste strategy and policy in NSW, chaired by Mr David Richmond AO, and the release of a draft Strategy for consultation in December 2010.

The Implementation Strategy has been developed in consultation with industry and local government and was supported by a broad cross section of stakeholders. It covers a large range of initiatives that seek to ensure that NSW will have a viable and mature recycling industry. It is essentially about making it easier for households and businesses to recycle, increase investment in waste and recycling infrastructure, reduce littering and illegal dumping, and increase producer responsibility for problem wastes.

1.4 Objective of this Integrated Waste and Resource Recovery Strategy

The overall objective of the Integrated Waste and Resource Recovery Strategy is to set a road map for the future of waste management in Lismore and considers issues such as technology change, environmental protection, social responsibly, commercial service focus, political change and regulatory change.

Core areas the Strategy will focus on include:

- Municipal collection
- Commercial collection
- Construction and demolition waste management
- Resource recovery programs
- Waste sorting, processing and potential energy recovery
- Education and waste minimisation.

1.5 Development of the Integrated Waste and Resource Recovery Strategy

It has become clear to Lismore City Council that in order to achieve significant increases in diversion from landfill an investment must be made in technology to support this diversion. At the same time the existing recycling programs must be maintained, new programs should be introduced when identified and improvements in efficiency and systems and maintaining promotion and education are also important.

1.6 Research to Date

Since 2008 a significant amount of research has been undertaken by Council's waste management staff regarding waste management and recycling practices implemented across the globe. This research has lead to the introduction of new programs such as polystyrene and fluorescent lighting recycling.

This research program can be defined as:

- Information sourced from conferences, industry journals, associations and web sites.
- Discussions with industry groups and technology providers.
- Inclusion of Management in the WARR Strategy discussion.
- In late 2010 Council called for registrations of interest for suitable companies to provide information on various waste and recycling sorting and energy recovery options. The evaluation of the information provided has resulted in a proposed way forward for waste management and resource recovery in Lismore.

2 Background

2.1 Lismore City Council

Lismore is a mixed urban and rural community at the heart of the Northern Rivers. The city is situated on the Wilsons River and covers an area of 1,290 square kilometres. As at the 2006 census, the Lismore population was 44,225.

Befitting a regional centre of its size, Lismore has excellent medical, professional and educational facilities. It is also a major centre for the arts, sport and cultural activities, as well as offering a high standard and wide variety of shopping and leisure opportunities. As the home of Southern Cross University's main campus, Lismore attracts residents and students from across Australia and overseas.

Nimbin, Bexhill, Clunes, Dunoon, Northern Woodburn, The Channon and Wyrallah are the main villages located within the Lismore City Council area.

The demographic of the Council comprise of the following characteristics:

- The Lismore population at the 2006 census was 44,225. Our population increased by 1.89% between the 2001 and 2006 censuses.
- Of the population 61.2% live in the urban area, 34.6% in rural areas and 4.2% in surrounding villages.
- Lismore's population is expected to continue to grow over the next 10 years.
- A higher proportion of people aged 15-29 live in Lismore than elsewhere on the North Coast. This can be attributed to the presence of key educational institutions, including Southern Cross University.
- People aged over 65 comprise 14% of our population.
- The greatest percentage increase in our population over the past 10 years has been among those aged 45 years and above.
- Of the dwellings in Lismore 84% are single detached dwellings.
- The average household size is 2.5 persons and has been declining over the past 10 years.
- Single-person households represent 25% of all households. This number has increased over the past 10 years and is predicted to continue to rise.

2.2 What is Waste?

Waste is defined under the *Protection of the Environment Operations Act*, 1997 as:

a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or

b) any discarded, rejected, unwanted, surplus or abandoned substance, or

c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, reprocessing, recovery or purification by a separate operation from that which produced the substance, or

d) any substance prescribed by the regulations to be waste for the purposes of this Act.

A substance is not precluded from being waste for the purposes of this Act merely because it can be reprocessed, re-used or recycled.

2.3 Waste Hierarchy

The *Waste Avoidance and Resource Recovery Act*, 2001 contains a definition of the waste hierarchy, encompassing three levels of resource management:

- Avoiding (unnecessary resource consumption);
- Recovering resources (including re-use, reprocessing, recycling, energy recovery); and
- Disposal (the last resort).

Environmental, social and financial benefits reduce in this order.

Waste avoidance and minimisation delivers the most benefits to society, while disposal delivers few benefits. The waste minimisation and management hierarchy is often displayed as in Figure 1.

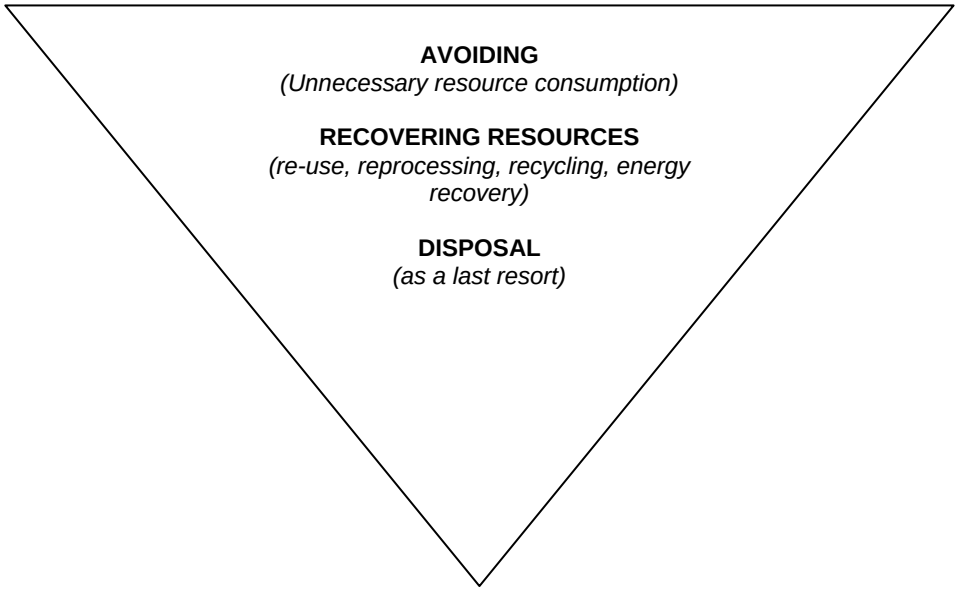

Figure 1: The Waste Minimisation and Management Hierarchy

2.4 New South Wales Legislative Framework for Waste

Achieving a reduction in waste generation and turning waste into recoverable resources is a priority for NSW. To meet this challenge a framework for reducing waste and making better use of resources was introduced. This is known as the Waste Strategy or WARR Strategy. The NSW Waste Avoidance and Resource Recovery Strategy 2003 was a first for Australia.

The NSW Waste Avoidance and Resource Recovery Strategy 2003, has now been superseded by the NSW Waste Avoidance and Resource Recovery Strategy 2007.

The WARR Strategy sets out waste diversion targets for NSW councils to be achieved by 2014. These targets are a key driver of NSW councils' waste reduction efforts. These are:

- An increase in recycling of municipal waste from baseline 26% to 66% in 2014
- Increased recycling of commercial and industrial waste from baseline 28% to 63% in 2014

- Increased recycling of construction and demolition waste from baseline 65% to 76% in 2014

The Waste Avoidance and Resource Recovery Progress Report provides an annual update on the State's progress towards the recycling targets and other result areas established in the NSW Waste Avoidance and Resource Recovery Strategy in 2003.

The NSW government acknowledges in its strategy documentation that waste avoidance and resource recovery can make a strong contribution to preserving the natural environment.

Since the Strategy targets were set, NSW councils have been reported as improving recycling in municipal and construction waste. Performance has not been reported as being as strong in the commercial and industrial sector and this remains a priority for action for the NSW government. In this regard support has been provided to improve and expand recycling infrastructure and to establish best practice for collection and recycling systems, contracts and community access to information. Resources, training and information have been developed and delivered for local councils, industry, culturally and linguistically diverse communities and schools.

The NSW Government's waste and environment levy continues to be one of the most powerful measures for driving improvement. Its application has also been expanded to cover more of the high population growth areas in NSW. These new areas are administered across geographical regions of NSW. These are the Sydney Metropolitan area (SMA), the extended Regulated Area (ERA) which covers the Central, Hunter and Illawarra regions; the Regional Regulated Areas (RRA) covers the remaining areas of NSW and applies to the Lismore City Council area.

In 2010 the NSW Minister for the Environment commissioned a review of the Waste Avoidance and Resource Recovery (WARR) Strategy and policy. An Implementation Strategy has been developed in consultation with industry and local government and was supported by a broad cross section of stakeholders. It covers a large range of initiatives that seek to ensure that NSW will have a viable and mature recycling industry. It is essentially about making it easier for households and businesses to recycle, increase investment in waste and recycling infrastructure, reduce littering and illegal dumping, and increase producer responsibility for problem wastes.

Key initiatives of the implementation plan include:

- the development with local government of best practice waste collection services (using a 3-bin system) to be applied across urban and major regional centres NSW;
- establishing expert panels to provide DECCW with independent advice on complex resource recovery by 1 July 2011;
- establishing a regular high level forum with government, industry, local government and environment groups to review and optimise waste policy and program settings;
- encouraging large businesses to establish onsite separation and recovery systems;
- improving planning controls to improve waste facilities in developments;
- improving source separation and collection of waste from commercial and retail premises, by assisting local government in this task and implementing best collection systems;
- extending kerbside recycling collections to small businesses in residential areas;
- strongly pursuing extended producer responsibility programs for key problem wastes at a national level as is being proposed for e-waste;
- reducing litter and combating illegal dumping by implementing a new litter education campaign and conducting high profile waste regulation enforcement campaigns;
- refocussing existing waste spending to enhance waste infrastructure including the expansion of local collection centres and subsidising problem waste removal.

2.5 History of Waste Management in Lismore

Lismore City Council has a proud history of waste management beginning in the late 1990s when Council took over kerbside waste collection within Lismore. In 2001 Council introduced an organics waste collection and worked in partnership with Tryton Waste Services to develop the largest worm farm in the southern hemisphere.

Kerbside recyclable collections were not introduced at that time as it was not seen to be economically viable and the volume of recyclables that could be collected was underestimated. This led to Lismore City Council introducing recyclable drop off centres.

The recycling drop-off centres were strategically located around the City with the aim of diverting recyclables from landfill. The recycling drop-off centres were operated by contractors and the costs of operating these centres blew out to over $500,000 per annum. It was found the drop-off centres were becoming ineffective and were suffering vandalism, contamination and recyclable type limitations.

At the same time a significant portion of the household waste stream consisted of recyclables, as it was easier to put these in the waste bin than travel to the recyclable drop off centres to recycle them. Annual waste audit data indicated that approximately 23% of the waste bin in the domestic sector was recyclable and so a significant amount of recyclable diversion was possible.

With the Lismore landfill filling up and massive increase in the amount Council was spending on waste management contractors and the operational costs of the recycling drop off centres, plus increasing community pressure to introduce kerbside recycling, Lismore City Council undertook an extensive review of its waste management systems in early 2006. The review included auditing of the waste streams and the drop off centre recyclables to determine potential recyclable volumes.

A proposal went to Council in April 2006 to introduce kerbside recycling with the purchase of a recycling truck and employment of a driver. This was approved and the kerbside recycling service was rolled out in July 2006.

There was much debate at Council regarding the fate of the recyclable drop off centres and it was resolved to retain two of the centres for the use of rural residents and for Lismore City Council to operate them. The two drop off centres are located at Brewster Street in the Lismore Central Business District and at the Nimbin Waste Transfer Station. This program involved the purchase of a recyclable skip truck and the employment of a driver.

The new kerbside recycling service saw the roll out of over 10,000 recycling wheelie bins, changing the bin lids on all waste and organics bins to match the new colour code system and the placement of stickers on all bins to reflect the new collection system. The recycling bins were introduced as 240 litre wheelie bins and the waste bins were changed from 240 litres to 140 litres, while the organics bins were changed from 140 litres to 240 litres.

The frequency in the collection of waste was also changed in this new kerbside system, where it was changed from a weekly pickup to a fortnightly pickup.

In late 2006 a trial commenced of kerbside recycling in a rural area, which was highly successful. This later lead to the introduction of kerbside recycling to all rural areas in January 2007.

In conjunction with the roll out of the kerbside recyclables collection a comprehensive education program was developed. The program was called “Red, Yellow, Green - Lets Keep it Clean!” and focused on the now 3 bin kerbside waste collection system. With the red lidded bin being for waste, the green lidded bin being for organics and the yellow lidded bin being for recyclables. The education program involved the production of a brochure, the repainting of the collection trucks, new

signage, new logos, updated website and the introduction of a contamination management program. This system has now become the Department of Environment, Climate Change and Water standard collection system for New South Wales.

Council introduced a bin rejection system to enable the management of recyclable and organics contamination. This involved the issuing by the collection truck drivers of bin rejection stickers on bins that contained contaminates. When a resident receives a bin rejection sticker they are sent a letter outlining the rejection and how to remedy the problem. Once a resident receives three rejection stickers their service (either organics or recyclables) is withdrawn for a period of time and Council staff works with the resident to address the problem.

In 2006 Council took over the control of the Revolve Centre, which is a second hand shop selling pre-loved goods collected from the landfill or dropped off at the waste facility. Previously the Centre was operated by contractors and cost Council significant funds to operate. With Council taking over the operation of the Centre, it was easier to assess the total volume of diversion from landfill to the Centre, employ an additional staff member and reduce operating costs, to where the shop now turns a small profit.

During the period from 2005 to 2010 Council identified gaps in its recycling services and this lead to the introduction of new recycling options for residents, including, dry cell batteries, fluorescent tubes and bulbs, tyre collection and recycling, polystyrene recycling, electronic waste recycling, construction and demolition waste recycling and household hazardous waste disposal. This period also saw Council take over the processing and composting of the kerbside organics and green waste at the waste facility. Previously this was done by Tryton Waste Services who operate the worm farm.

In 2008 Council opened the resource recovery facility (RRF) to increase the amount of waste diversion from landfill. The RRF is a sorting facility where waste brought into the site by the public and waste contractors is sorted to increase diversion. The sorting is done by the public themselves for lower charges or by Council staff for a higher charge. In 2008 Council also changed the name of the Wyrallah Road Landfill to the Lismore Recycling and Recovery Centre to better reflect the emerging role of the site from waste management to resource recovery.

The program has worked towards diverting additional recyclables from landfill, finding a cheaper alternative to the recyclable drop off centre system, modifying the integrated kerbside collection system to include recyclable collections for both urban and rural areas, introduce additional recycling and waste diversion services to improve overall waste diversion and provide a supporting education program that encourages service efficiency and uptake.

The result has been a fully integrated waste service that has resulted in an increase in the amount of waste diverted from landfill. Every cubic metre of waste disposed to landfill has a cost associated to it, including environmental, social and economic costs.

It will cost a significant sum of money to commission another landfill when the current site is full. Therefore it is important to reduce the amount of waste going to landfill right now to extend the life of the current landfill site by a number of years.

2.6 Waste Production Today

The Lismore Recycling and Recovery Centre receives waste from a number of sources including routine garbage collection (organic, recycling and garbage), commercial and industrial material and self haul material brought in on trailers, utilities and trucks. All waste brought to the facility can be categorised as either ‘landfill’ or ‘diverted’. The diverted component is recovered and reprocessed (or recycled) through various processes.

In 2009/2010 the Lismore City Council population produced 45,008 tonne of waste with 51% of this being recovered and recycled in some way. The diversion from landfill achieved in Lismore has been increasing annually for a number of years and is due to a commitment by the community to recycle and the extensive recycling and education programs implemented by Council. The waste produced and amounts diverted from landfill overtime can be seen in Table 1.

On average each person in Lismore produces just over 977 kilograms of waste each year, 500 of which is recovered and recycled, with 477 kilograms going to landfill.

Table 1: Waste and recycling trends 2001 to 2010.

INDICATOR	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10
Total volume of waste managed at the Lismore waste facility	29,293	32,140	33,902	35,653	35,280	38,145	42,464	41,739	45,008
Total Volume (tonne) of waste disposed to landfill	20,513	22,456	23,038	24,797	23,544	23,981	24,915	22,814	22,008
Tonne landfilled per capita	0.48	0.52	0.54	0.58	0.54	0.52	0.56	0.52	0.48
Total Volume (tonne) of waste diverted from landfill	8,780	9,684	10,864	10,856	11,736	15,351	17,549	18,925	23,080
Percentage of total waste diverted from landfill	30	30	32	30	33	39	41	45	51

The following data is based on the 2006 kerbside waste audit. A new audit is being completed in 2011 and will provide more up to date waste stream information. This strategy will be updated using the 2011 waste audit data when it becomes available.

Figure 1 shows the composition of the total waste stream. It indicates that over half of the waste is organic and compostable and a further 18% is paper. The collection frequency of different kerbside bins is based on this audit data.

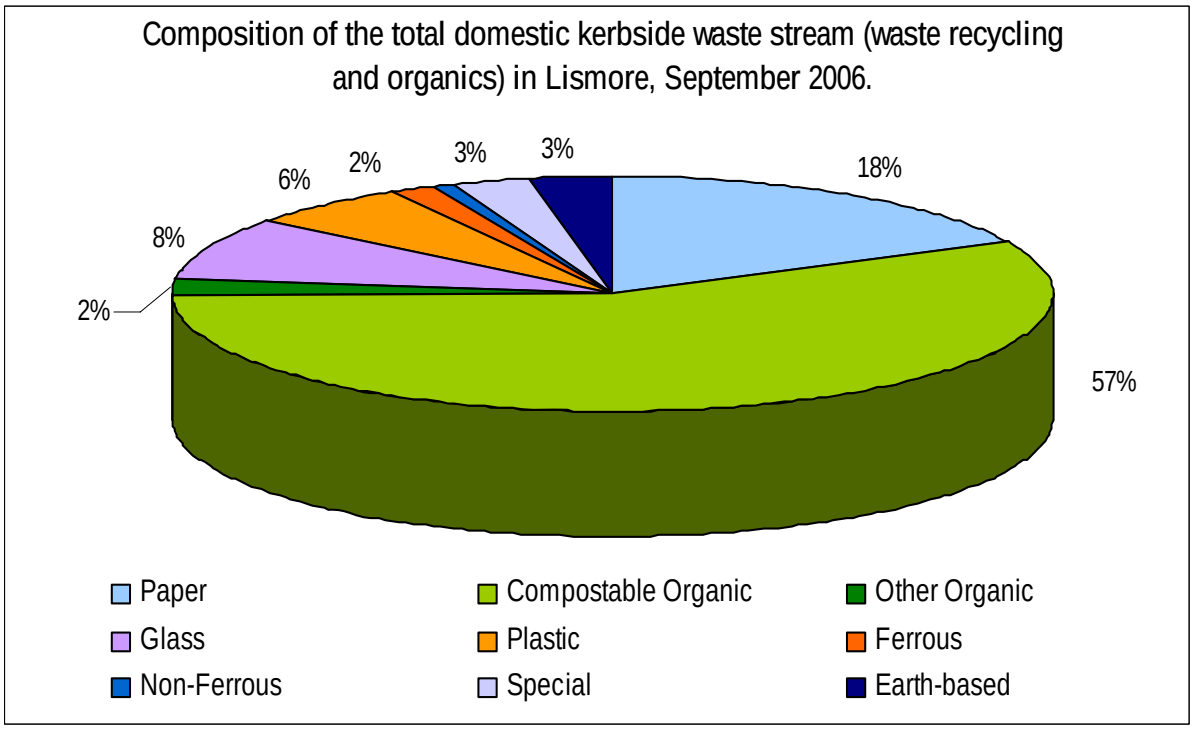

Figure 1: Composition of the total domestic kerbside waste stream in Lismore, 2006

Figure 2 shows the breakdown of the waste stream only. It indicates that 17% of the total waste stream is recyclable containers and 20% is paper. This means a significant quantity of recyclable material is still going to landfill. The data shows that a focus on the in house recovery of organic material is required.

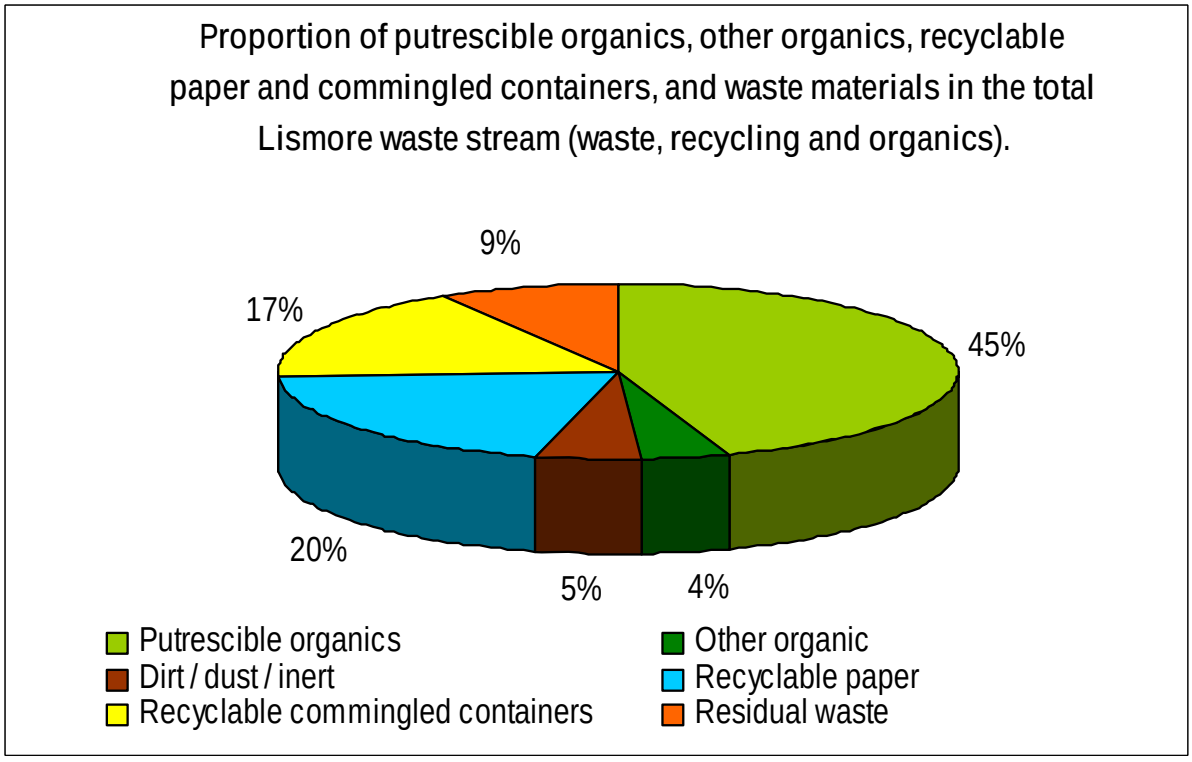

Figure 2: Proportion of putrescibles organics, other organics, recyclable paper and comingled containers and waste materials in the total Lismore waste stream, 2006

Figure 3 shows the composition of the waste diverted from landfill in 2008/2009. A total of 18,925 tonne of waste was diverted from landfill and recycled. The main recycling kept from landfill was organics and green waste, which includes the kerbside organics and self haul green waste.

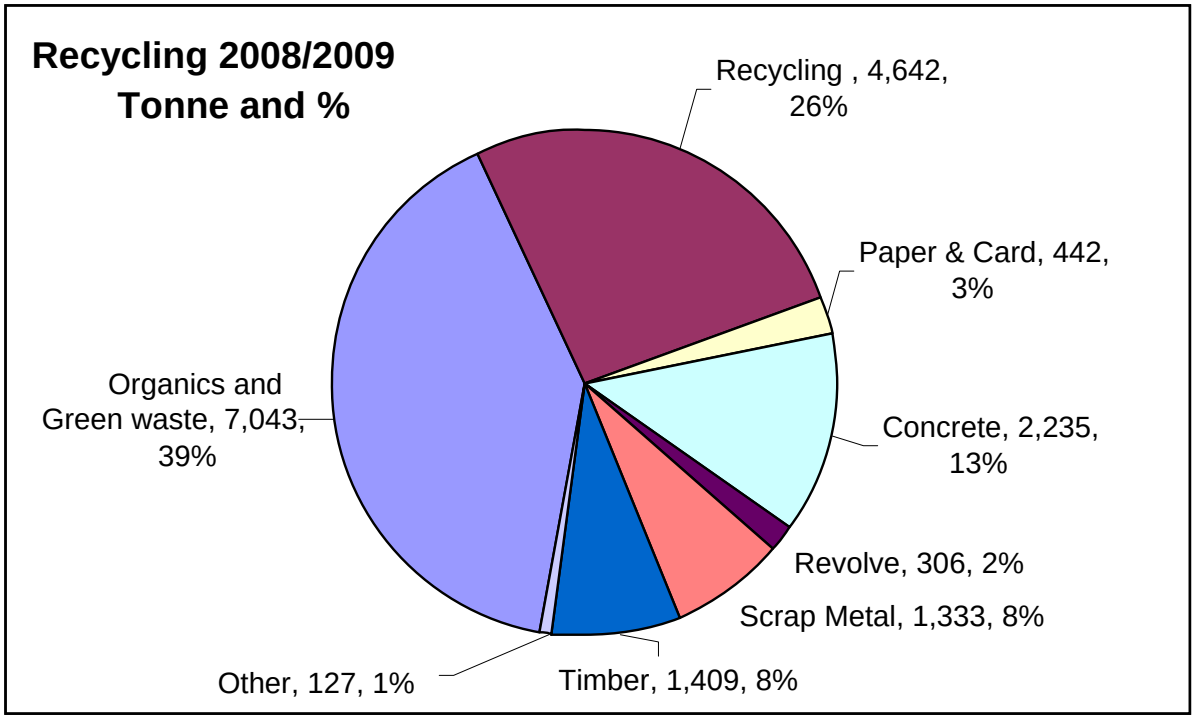

Figure 3: The breakdown of the components of the total recycling stream in 2008/2009

3 Current Waste Management and Resource Recovery Programs

3.1 Current Operations

The management of waste operations within Lismore City Council is undertaken by a Council business unit called "Northern Rivers Waste". Northern Rivers Waste was established in 2001 with the following aims:

- To reduce the quantity of waste going to landfill by 60%, based on 1990 levels.
- Improving the quality of waste services to urban and rural areas, and to increase these services.
- Implementing an organics recovery service.
- Start a resource buy-back centre at the Wyrallah Road site.
- Beginning to competitively tender for contracts outside the Lismore Local Government Area.

Today Northern Rivers Waste is responsible for municipal waste collection, waste education, operation of the Lismore Recycling and Recovery Centre, waste collection in the Lismore Central Business District, provision of community waste education, operations of the Nimbin Waste Transfer Station and the Brewster Street Recycling Drop-off Centre and collection of public place recycling and waste. Recently Northern Rivers Waste has expanded its commercial waste collection to include a number of different bin sizes, collection frequencies and collection streams.

3.2 Sources of Waste

Lismore City Council manages the collection of municipal waste from both urban and rural residents. In addition Council operates a commercial waste collection service for local businesses.

The following figure provides a summary of the breakdown of the waste managed for each waste stream at the Lismore Recycling and Recovery Centre in 2009/2010. The data in the graph does not include waste and recyclables collected by other waste contractors in Lismore City Council and exported out of the area.

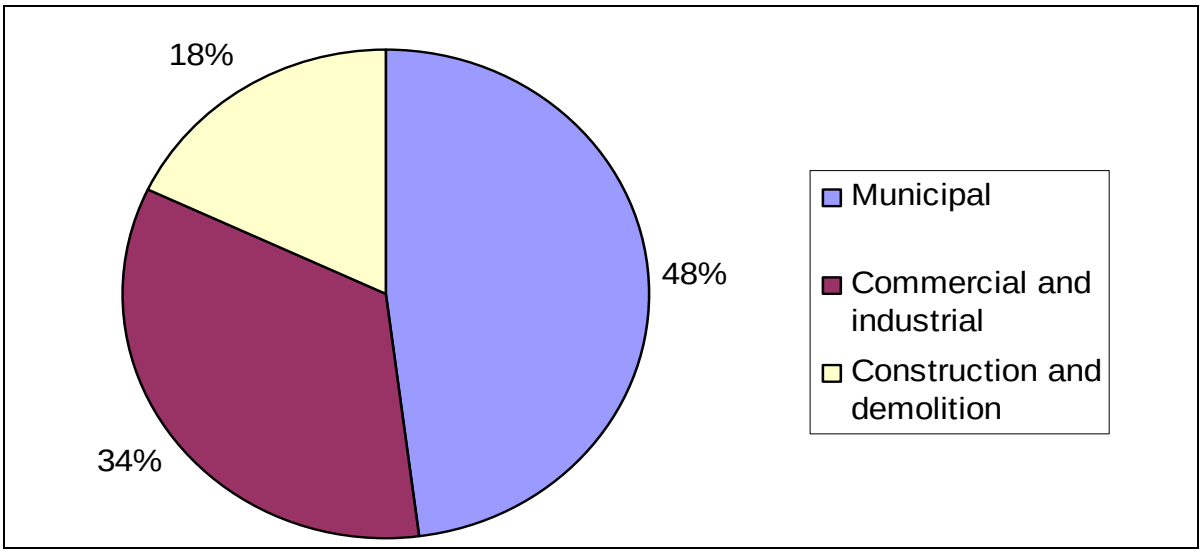

Figure 7: Waste composition by source received at the Lismore Recycling and Recovery Centre 2009/2010

The table below lists the main components of the three waste streams and the diversion target for each.

Table 2: Typical waste streams

Municipal (66% diversion target)	Commercial and Industrial (63% diversion target)	Construction and Demolition (76% diversion target)
Residual mixed waste	Paper and cardboard	Residual waste
Co-mingled recyclables	Co-mingled recyclables	Timber
Organic waste (green waste and kitchen organics)	Polystyrene and pallet wrap	Steel and other metals
Household hazardous waste	Chemicals and hazardous items including fluorescent lighting	Concrete and rubble including bricks, tiles, stone
Electronic waste	Residual waste	Clean fill
	Metals and scrap	Contaminated soil
	Organic waste (green waste, kitchen organics and timber)	Asbestos
	Electronic waste	Fines

3.3 Waste Streams

Lismore City Council keeps data on the three main waste streams being municipal, commercial and industrial and construction and demolition.

3.3.1 Municipal Waste

Lismore City Council is the exclusive waste collection operator for municipal waste services in the Lismore City Council area. In 2009/2010 21,693 tonne of municipal waste was managed by Council.

The kerbside municipal waste can be broken down into the following streams (2009/2010):

- Residual kerbside waste 5,707 tonne
- Co-mingled recyclables 3,965 tonne
- Kerbside organics (food and green waste) 4,560 tonne

Self haul waste is sorted in the Resource Recovery Facility and recyclables including steel, timber, concrete and rubble, hazardous chemicals, household items, electronic waste are recovered.

3.3.2 Commercial and Industrial Waste

Council offers a range of commercial waste services and runs in competition with other waste contractors within the area. In 2009/2010 15,298 tonne of commercial waste was managed by Lismore City Council and consisted of:

- Residual kerbside commercial waste 1,082 tonne
- Residual waste from commercial contractors 7,806 tonne
- Self haul commercial waste 1,552 tonne
- Self haul recyclables and green waste 2,224 tonne
- Kerbside organics 760 tonne
- Kerbside co-mingled recyclables 138 tonne
- Commercial chemicals 7 tonne

3.3.3 Construction and Demolition Waste

Council accepts construction and demolition waste at the Lismore Recycling and Recovery Centre but does not offer a collection service. Weighbridge prices for construction and demolition waste reflect the different values and costs of processing of the waste streams. Specific pricing exists for timber, concrete and rubble, steel, clean fill, contaminated soil, asbestos and contaminated construction and demolition waste.

In 2009/2010 8,097 tonne of construction and demolition waste was managed by Lismore City Council, with 6,452 being recovered and recycled.

3.4 Waste Services

3.4.1 Waste Collection

Lismore City Council has a waste collection fleet consisting of:

- Four McDonald Johnson side load compactors
- Two Superior Pak side load compactors
- One rear loading compactor
- One hook truck for waste skips

Council offers collection services for municipal, commercial and industrial customers.

Municipal Waste Collection Service

The late 1990s saw Lismore City Council take over municipal waste collection from contractors and commencement of day labour. The first waste collection was a fortnightly 240 litre waste bin and a weekly 140 litre organics (food and green waste) bin. This service operated until 2006 at which time kerbside recycling was introduced and saw the collection service change to weekly 240 litre organics bin, a fortnightly 140 litre waste bin and a fortnightly 240 litre recycling bin.

Council is currently investigating the roll out of 360 litre wheelie bins for recycling.

Commercial and Industrial Waste Collection Service

Since the late 1990s Council has offered commercial waste and organics collection services in the Central Business District of Lismore, including up to a five day a week service. Limited commercial waste services were also offered to other commercial businesses but only as a weekly collection.

Since 2008 Council has offered an expanding commercial service to businesses within Lismore. This has included larger 660 litre and 1,100 litre bulk bins and collections for paper and cardboard, co-mingled recyclables and polystyrene and plastic wrap. The bulk bins are collected using a specialised rear loader collection truck.

3.4.2 Lismore Recycling and Recovery Centre

The Lismore Recycling and Recovery Centre (formally the Wyrallah Road Waste Facility) was opened in the 1960s as a landfill site for Lismore. A large area of the site has already been land filled but the site does have capacity for a number of future landfill cells. The Lismore Recycling and Recovery Centre is the centre of Council's waste operations and comprises of the following:

- ***Resource Recovery Facility (RRF)***

  The RRF opened in 2008 and was built to increase waste sorting and so diversion from landfill. The RRF has a section for the self sorting of waste and replaces the need for the public to visit the tip face to dispose of their waste.

- ***Lismore Revolve Centre***

  The Revolve Centre is a buy back shop that is very popular with local residents and has a throughput of 400 tonnes of goods each year.

- ***Landfill***

  The existing landfill Cell 1 has been operational since 1990 and is expected to be full by 2014. A plan is underway to develop another cell, Cell 2, which has planning approval subject to successful liner and leachate collection plans.

- ***Lismore Rainforest Botanic Gardens***

  Since the early 2000s Council has been working with a group of volunteers called the Friends of the Lismore Rainforest Botanic Gardens to rehabilitate the waste facility and surrounding areas through the establishment of a botanic gardens.

- ***Organic Waste Processing Facility (Tryton Vermiculture Facility)***

Lismore City Council was the first council in Australia to introduce a kerbside collection for co-mingled food and green waste. To accompany this collection a composting and vermiculture facility was constructed under contact by Tryton Waste Services. The contract with Tryton Waste Services expires in 2012 and plans are underway for the future of organics management in Lismore.

3.4.3 Nimbin Waste Transfer Station

The Nimbin Waste Transfer Station was established to provide a waste drop off service for the residents of the Nimbin District. The Transfer Station provides a drop off for mixed waste, co-mingled recycling, paper and cardboard and steel. Fees do apply for the disposal of waste.

3.4.4 Brewster Street Recycling Drop Off Centre

Council operates a special drop off centre for paper and cardboard, co-mingled recyclables and polystyrene and plastic wrap adjacent to Lismore Shopping Square. Originally established as a drop off for recyclables for rural residents the drop off centre is now also frequented by local businesses and visitors from neighbouring Council areas.

3.4.5 Resource Recovery Collection Station Network

A comprehensive network of resource recovery collection stations has been established across the Lismore City Council area. Two types of stations have been developed. The first type is for fluorescent lighting products and the second type is for household batteries, smoke detectors, x-rays, printer cartridges, corks, reading glasses and mobile phones and accessories. These collection stations have been installed in Council buildings, community buildings and in selected local businesses. An additional 20 type two collection stations are located at primary schools within the Council areas.

4 Future Waste Projections

4.1 Population Growth Projections

The current life of landfill Cell 1 and the proposed landfill Cell 2 are based on present day rates of landfill. It is not expected the waste tonnages generated in Lismore will remain static over coming years. In order to understand the potential growth in waste production it is necessary to understand population growth projections.

In 2007, Lismore Council Area had a population of 44,668 (*ABS Regional Population Growth Australia 2006-07*). This represents an increase of 443 over the previous year – a growth of 1.3%. The population of Lismore is expected to rise by 21.4% in the next 15 years to 53,680 people.

The estimate of growth in population for Lismore City Council over the 2007 – 2025 period is presented in Figure 4. The estimated growth pattern is based on a annual population increase of 1.1%.

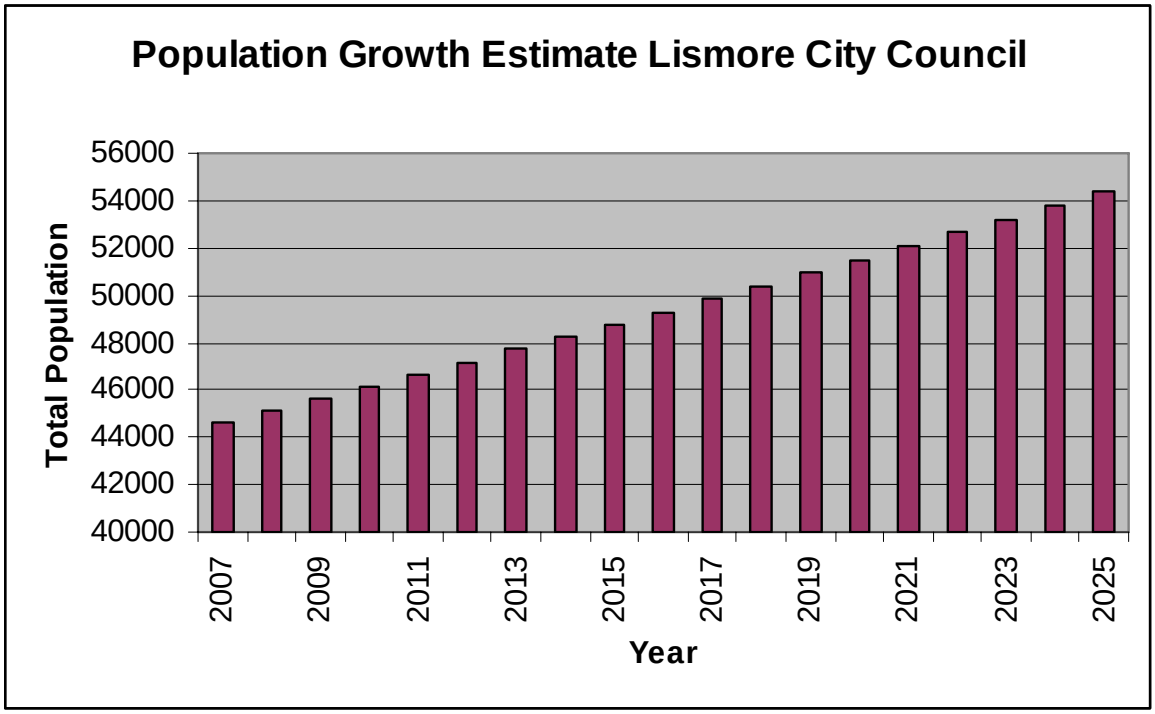

Figure 4: Population growth estimate for the Lismore City Council

4.2 Waste Generation Projections

The total tonnage of waste managed by Lismore City Council in 2009/2010 was 45,088 tonnes (plus 2,890 tonnes of contaminated soil). This figure includes collection of waste and recycling from municipal and commercial premises and self haul municipal, commercial and construction and demolition wastes and recycling. Based on this total tonnage the average waste production per person in Lismore City Council is 977 kilograms per annum. This average waste production equates to 2.6 kilograms per person per day.

In 2009/2010 Lismore City Council diverted 51% of the total waste managed from landfill, with 49% being land filled. This equates to 477 kilograms of waste disposed in landfill per person.

Assuming there is a correlation between population growth and waste generation it has been projected that annual waste production in Lismore will exceed 50,000 tonne by 2015/2016 and exceed 60,000 tonne by 2019/2020. Figure 5 shows the trend in waste production over time based on population increase.

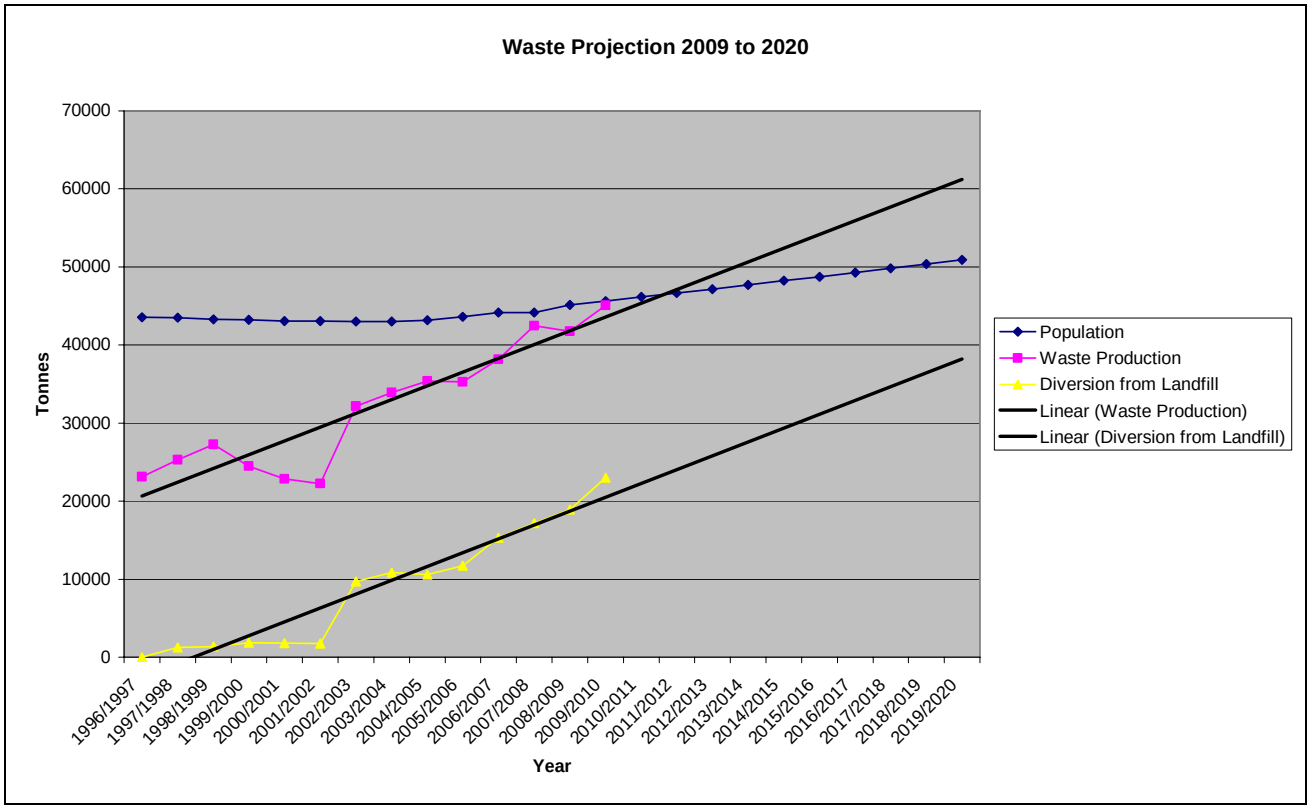

Figure 5: Future waste projections for Lismore City Council 2009 to 2020

4.3 Meeting Targets

The Lismore City Council waste management system is performing above the New South Wales average in terms of performance against waste diversion targets.

The WARR Strategy sets out waste diversion targets for NSW councils to be achieved by 2014. Below is a figure that illustrates how the diversion rates achieved by Lismore City Council compared to the State targets. Figure 6 shows the progress towards achieving the WARR targets.

It must be noted that the commercial and industrial stream contains data from an independent waste contractor, Richmond Waste. This data is important to consider as it reflects progress towards achieving the targets within the whole community. This data has been sourced from Northern Rivers Waste weighbridge data and from Richmond Waste.

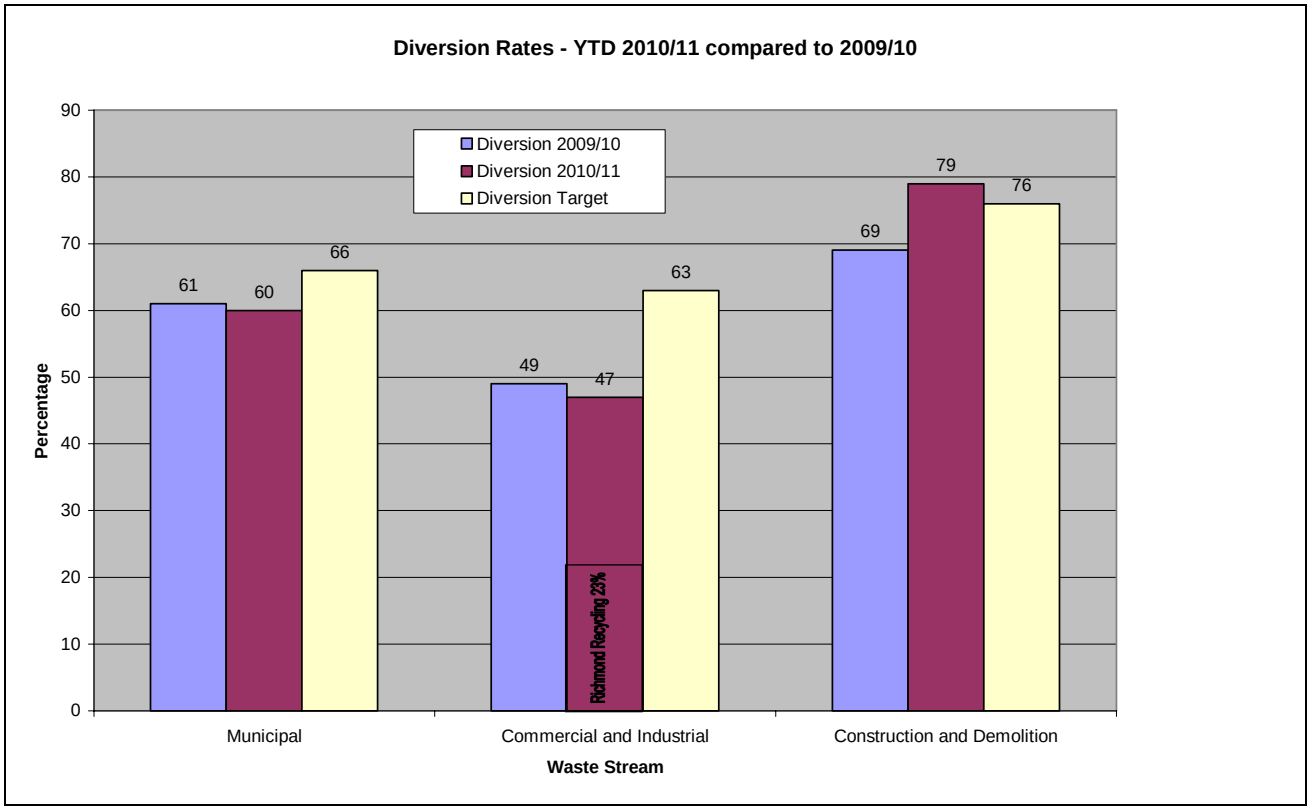

Figure 6: Diversion rate per waste stream compared to NSW State target

It is clear from the figure above that the diversion rates that the residents of Lismore are performing well in respect to municipal waste and construction and demolition waste diversion. More work is required to increase the diversion rate of commercial and industrial waste.

5 Planned Future Developments

In the last few years Lismore City Council has achieved impressive diversion (recycling) rates but it has become increasingly difficult to acquire additional diversion from landfill. Many new programs have been developed including the recycling of chemicals, polystyrene, household batteries, plasterboard, mattresses, x-rays, CDs and DVDs, mobile phones, corks, reading glasses and electronic waste but newer diversion opportunities are limited.

In order for Lismore City Council to increase diversion rates in the future significant large scale initiatives are required that incorporates new technologies that are expensive. Outlined below are a number of these projects. Some are essential and form part of normal operations but others are new programs that will offer significant increases in diversion from landfill.

In addition there will be a focus on rehabilitation of previous landfill area and the development of a new landfill cell.

These programs include:

5.1. Site Rehabilitation – Phytocapping
5.2. Landfill Cell 2
5.3. Waste and Recycling Sorting
5.4. Glass Crushing
5.5. Tunnel composting
5.6. Recycling Store
5.7. Environmental Education Centre
5.8. Nimbin Waste Transfer Station Redevelopment
5.9. Regional Developments

5.1 Site Rehabilitation – Phytocapping

Since 2007 Lismore City Council has been one of five trial sites Australia wide for the research program, Australian Alternative Cover Assessment Program (AACAP) conducted in collaboration with several Australian Universities.

Existing New South Wales State Government landfill guidelines outline comprehensive landfill capping and rehabilitation methodology of compacted clays, rubble and earth layers.

The AACAP program trialled phyto (or plant based) techniques and the concept of a ‘phytocap’ for modern landfills is now being increasingly considered in the United States and Australia. This involves placing a layer of soil over the landfill and planting it densely with site specific vegetation.

Percolation within the AACAP trial area has been recorded at less than 2% of precipitation for the three years of monitoring and has remained very low, despite above average rainfall, throughout 2010. The most recent data, February 2011, recorded percolation less than 1% of precipitation and reinforces the point that with the soil type used at Wyrallah Rd., a cap thickness of 1.3 m and a fully functioning vegetative cover, the hydraulic performance of a phytocap will meet the performance criteria required by Department of Environment of less than 5% .

Lismore City Council has applied to the Department to vary the existing landfill site license to enable phytocapping to be used as a landfill capping and rehabilitation technique. Using this method will save Council significant sums of money and allow for a biodiverse bushland to be developed in line with the plans for a botanic gardens at the Lismore Recycling and Recovery Centre site.

Consultants have been engaged to develop a phytocapping plan for the old landfill cells and for the existing Cell 1. It is planned in the first instance to phytocap old landfill areas and then phytocap the sloping edges of landfill Cell 1.

Soil for the phytocap will be sourced from the clean fill currently brought into the Recycling and Recovery Centre. Existing machinery will be used to level out the soil and make the planting pad. Local nurseries will be used to grow the native plants required for the phytocap.

Phytocapping costs in Summary:

Reduction in rehabilitation costs:	$2 million, normal landfill capping can cost up to $200,000 per hectare or $20 per square metre. Phytocapping will cost up to $10 per square metre – ½ of conventional capping
Urgency:	Site rehabilitation is a requirement under the landfill licence
Timeframe:	It is recommended to commence the phytocapping program once approval is received. Recommended to commence program in 2011/2012

5.2 Landfill Cell 2

Council has been using the existing landfill Cell 1 since approximately 1990. Cell 1 is reaching the end of its usable capacity. The Department of Environment has set a limit on the height of the existing cell and the cell is expected to be full some time in 2014.

As part of future planning for the landfill capacity in Lismore, approval was sought from Lismore City Council in1990 with a license issued by the Environmental Protection Authority for a new landfill cell. Pre approval for a new Cell 2 was given subject to an approved landfill and leachate system design being completed. Consultants were engaged in December 2010 to progress the designs for the landfill Cell 2 and leachate collection system and consultation is underway with the Department of Environment to finalise the designs and gain final approval.

Once final approval is acquired the construction of Cell 2 can commence. Construction is likely to take 6 to 12 months depending on final design and weather conditions and will include a combination clay and geo-membrane liner. The new Cell 2 is expected to have a landfill capacity of 25 to 35 years given the existing volumes sent to landfill each year. Any new program that results in diversion from landfill will increase the life of the landfill cell 2.

If the licence is not forthcoming Lismore will have to export waste to another landfill in the region or to Southern Queensland.

Landfill Cell 2: In Summary:

Establishment cost:	Estimated at around $5 million. Final cost will depend on the approved design parameters.
Urgency:	Urgent. The existing landfill Cell 1 is reaching capacity.

Timeframe: 1) Licence gained in 2011/12
2) Tenders called in the 2012 calendar year
3) Recommend commencement of works in 2012/13 financial year

5.3 Waste and Recycling Sorting

Audits of the waste streams managed by Lismore City Council show there are significant levels of recoverable and recyclable materials being land filled. Existing manual sorting of waste focuses on self-haul municipal waste and construction and demolition wastes but have not so far involved municipal kerbside waste and commercial waste.

Audits show many thousands of tonnes of recyclables can be recovered from the three waste streams:

- 1,232 tonne of co-mingled recyclables from commercial and industrial waste
- 836 tonne of co-mingled recyclables from municipal kerbside waste
- 766 tonne of co-mingled recyclables from self haul/construction and demolition waste
- 144 tonne of timber from municipal kerbside waste
- 120 tonne of timber from commercial and industrial waste
- 1,068 tonne of timber from self haul/ construction and demolition waste
- 2,200 tonne of green waste and organics from municipal kerbside waste
- 5,013 tonne of green waste and organics from commercial and industrial waste
- 582 tonne of green waste and organics from self haul/ construction and demolition

The audit data suggests that 11,961 tonne of material could be recovered from land filled waste and recycled. A realistic target is around 10,000 tonne.

In October 2010 Council called for registrations of interest from suitably qualified companies to provide information about the waste sorting infrastructure they can supply. Following on from this registration of interest a preliminary concept has been created that will use mechanisation and manual sorting to recover materials from the three waste streams with a smaller residual being sent to landfill.

This sorting plant will use a range of automated screens and manual picking lines to recover the recyclables. Outputs will include organics and green waste, timber, steel and other metals, concrete, polystyrene, co-mingled recyclables and other hazardous materials.

Such a facility would cost in the vicinity of $5 million including buildings, sorting equipment and mobile equipment.

Waste and Recycling Sorting costs in Summary:

Income: Potential sale of additional recyclables, including paper, polystyrene, glass, timber, steel and organics

Potential savings: Lower internal land filling fees – in 2010/11 the charge is $160 per tonne of waste from collections. Lower landfill levy payments – in 2010/11 is $20.40 per tonne, increasing to $80 per tonne in 2016/17 (potential cost of levy in 2015 is $1.7 million)

Infrastructure cost: Estimated at around $5 million

Urgency: With growing landfill levy charges there is immediate savings that can offset infrastructure costs. Additionally in order to meet NSW WARR targets by 2014 prudent action is required.

Timeframe: Recommend to undertake planning and tender process in 2011/12 and commence building in 2012/13.

5.4 Glass Crushing

In 2009/2010 Lismore City Council sent 2,010 tonne of glass bottles and jars to VISY Recycling on the Gold Coast as part of the co-mingled kerbside recycling stream. This volume includes glass collected from Lismore and Richmond Valley.

Research has shown that up to 80% of glass sent to recycling plants such as the one at VISY actually ends up as landfill as it becomes too contaminated with other forms of glass and earth based materials such as crockery and clays. Glass makes up 30% of the co-mingled recycling stream collected in Lismore by weight.

Council currently pays a gate fee to VISY Recycling to process the co-mingled recyclables ($14.94 per tonne) and also has to pay for transport ($36 per tonne). If Council was to remove the glass from the recycling stream there would be a reduction in the transport charges for the glass of around $72,000 per annum. In addition VISY Recycling has indicated that it may lower the gate fee for the remainder of the recyclables in the co-mingled stream if the glass is removed.

The glass waste is valuable as sand and can easily be sorted from the co-mingled recycling using a screen. The removed glass then can be crushed using a crushing unit and a screening unit to grade into different sand fractions.

There is an internal market within Council to use the sand at the Asphalt Plant at Blakebrook Quarry. It is now an accepted practice to incorporate glass sands into road base and asphalt and to use the glass sand anywhere normal sand is used (concrete, pipe packing and drainage). There is an ability to internally sell the sand to the Asphalt Plant at around $23 per tonne.

This project offers immediate environmental gains as there will be fewer truck movements on the road and reduced use of virgin sand materials.

The facility would require additional staff, a shed, bay areas and a skid steer loader. The sorting and crushing facility would cost in the vicinity of $1 million.

Glass crushing costs in summary:

Tonnes:	2,010, 30% of co-mingled recycling stream
Reduction in fees:	At least $72,000 per annum, more if Visy gate fee is reduced
Potential income:	$23 per tonne, $46,230 per annum
Infrastructure cost:	Up to $1 million dependant on shed costs. Grant funding to assist with infrastructure cost is currently being investigated
Overall operating estimate:	$30,000 per annum surplus
Urgency:	Availability of grant funding, potential savings and immediate environmental gain make this a priority
Timeframe:	Recommend commence project in 2011/12 financial year

5.5 Tunnel Composting

Composting of municipal and commercial kerbside organics and self haul green waste has been occurring at the Lismore Recycling and Recovery Centre since 1999, firstly under the control of Tryton Waste Service until 2006 and then under Council control. The composting has been conducted using open windrow composting, where the shredded material is heaped in long high rows to optimise internal composting temperatures. One main issue with this type of composting is an inability to control how the environment, for example rainfall, no rainfall and temperatures fluctuations, and its impact on the compost.

In the last few years undercover tunnel composting has gained increased exposure with new tunnel composting plants being built in Coffs Harbour and Port Macquarie. These undercover systems allow for optimal control of the environment and provide for more efficient methods of composting, turning and mixing.

As part of the registration of interest process for the waste sorting facility information was provided to Council on tunnel composting and its potential to be integrated into the recycling systems at the Recycling and Recovery Centre. It was outlined how tunnel composting can significantly improve the nutrient and economic value of the compost produced and allow for market expansion.

A tunnel composting system can be installed in place of the existing Tryton Vermiculture Facility and would cost between $2 to $5 million including buildings, composting tunnels and mobile equipment, dependant on design.

In 2009 the Recycling and Recovery Centre commenced taking biosolids from the East Lismore Waste Water Treatment Plant, saving Council around $200,000 in on-farm disposal fees. Northern Rivers Waste has been conducting trials of biosolid composting and has produced products meeting the DECCW Grade A standard.

Lismore City Council manages around 10,000 tonne of kerbside organics; self haul green waste and biosolids. In July 2011 Council may begin taking organic waste from Ballina Shire Council for processing, around 5,000 tonne of kerbside organics. The additional Ballina Shire organics will allow for additional sales revenue to be created.

Currently composting reduces the volume of the organics by approximately 50%. With existing Lismore only organics, around 5,000 tonne of compost is produced each year. From July 2011 this could increase to 7,500 tonne with the addition of Ballina's organics.

The compost is sold to Tryton Waste Services for $30 per tonne. Through a tunnel composting process that will improve the compost quality the tonnage fee could be lifted to $50 (which is the market rate of high quality compost sold in the Lismore region currently).

Tunnel Composting costs in Summary:

Potential income:	7,500 tonne at $50 - $375,000 per annum
Infrastructure cost:	Estimated between $2 and $5 million, dependant on design
Urgency:	Better quality control will result in higher income levels. The Tryton Waste Services contract finishes in May 2012 and will trigger the need for compost sales on the open market
Timeframe:	Recommend to undertake this project in a staged approach. This would allow for infrastructure to be built over a number of years reducing up front cost

5.6 Recycling Store

Since 2008 Lismore City Council has introduced a number of Resource Recovery Collection Stations around the Council area to collect specialised recyclable products. These items have included printer cartridges, household batteries and smoke detectors, reading glasses, corks, CDs and DVDs and x-rays. There are also 20 collection stations located at primary schools both urban and rural.

These recyclables are highly valued, containing metals such as silver, copper and gold. Without a specialised collection system these items are hard to recover.

In 2009 Council introduced Biobags and caddies for use in residents' homes who have an organics collection service. This roll out has been very successful with over 3,000 homes now using the system. These bags and resulting education program have resulted in a drop of plastic bag contamination in the kerbside organics stream. With so many homes using these bags ensuring a ready supply of bags and a convenient location for the public to collect bags is important.

Council is also investigating the introduction of compostable nappies that can be disposed of in the kerbside organics bins. One option to encourage their use is to retail these to the public.

An option to improve the efficiency of specialised recyclable drop off and the collection of biobags and nappies is to commence operation of a specific recycling store in the Lismore Central Business District. Such a store could sell compostable nappies and compost bins and worm farms, be a special drop off location for the items listed above including smaller electrical items, provide customer service to residents with questions about waste and recycling services and dispense items such as biobags to the public.

It is proposed to utilise a section of the Council CBD Centre where the foyer area can host a special recyclable collection receptacle and the front counter can be jointly used as a point of sale for certain items as well as the standard customer service operations.

Recycle Store costs in Summary:

Potential income:	Unknown, expected to be a deficit subsidised from the Waste Minimisation budget
Urgency:	To allow expansion of recycling programs immediate action is required
Timeframe:	Recommend provisions in 2011/12 budget for alterations to CBD centre

5.7 Environmental Education Centre

There has been a proposal to build a waste education centre at the waste facility since 1999. There is no doubt of the need to have such an all purpose facility at the Recycling and Recovery Centre to provide community education.

There is an ability to expand the concept of the waste education centre to an 'Environmental Education Centre' given new partnerships and the evolving role of the Recycling and Recovery Centre.

It is proposed to construct an environmental education centre for Lismore City Council that will focus on waste and recycling, botanic gardens, waste water, storm water, koalas, rehabilitation, weeds and floodplain management. The centre will be used as a base for the Friends of the Lismore

Rainforest Botanic Gardens, for school and community group tours, a site for staff and community training and be available for environmentally based community organisations for meetings.

The Friends of the Lismore Rainforest Botanic Gardens who have been conducting planting at the Recycling and Recovery Centre for 10 years are close to a point of opening the gardens to the public on a permanent basis. Part of their plans has included a building that can be used as a visitors centre, such as the education centre.

Initial planning for the centre includes externally accessible male and female disabled toilets, allowing for access while the botanic gardens are open, office space, a kitchenette and a large open presentation/meeting room.

Initial estimates have been acquired for the project at $220,000. This includes a provision for a Development Application, relocatable building, fitting out of the building and connection of power, sewer and water.

Environmental Education Centre costs in Summary:

Infrastructure: Estimated at $220,000

Urgency: Use for the facility is immediate

Timeframe: Recommend to commence project in 2011/12

5.8 Nimbin Waste Transfer Station Redevelopment

The existing Nimbin Waste Transfer Station has been operating since 1994, previously the Nimbin Tip. Currently the centre is operated on a contract basis where someone is contracted to operate it on behalf of Council.

The Transfer Station is in need of an upgrade to improve visitor safety and increase waste diversion.

Initial plans for the site include the introduction of additional skips for a more diverse range of recyclable material. The plans also include a concreted raised area, such as that at the front of the Resource Recovery Facility, with a sawtooth design allowing for safer disposal of wastes into skips.

More work is required to develop this plan and will require surveying activities.

Richmond Valley Council has constructed a new waste transfer station an Evans Head and there are other newer transfer stations around the region that can be used to assist design.

Nimbin Waste Transfer Station Redevelopment costs in Summary:

Infrastructure: Unknown

Urgency: Important to improve public safety and resource recovery

Timeframe: Recommend to commence feasibility study in 2012/13

5.9 Regional Developments

Scale is an important consideration when developing waste management programs. Research has shown that it is difficult to make some waste treatment systems economically viable without additional tonnages of waste and recyclables to process. The result here is the need to consider regional partnerships in waste management.

In 2010 Lismore City Council signed a Memorandum of Understanding with Ballina Shire Council focusing on waste activities to deliver improved economics for the two councils. The closer working relationship may result in benefits to the entire region should there be a decision to actively pursue regional synergies in the management of waste and recyclables.

Two key examples of the benefits of regional partnerships has been the joint contracts signed by Lismore City Council and Ballina Shire Council for the processing of recyclables and the shredding of green waste and organics and the use of the Lismore recyclables handling shed by Richmond Valley Council.

It is clear that with waste disposal the most significant issue are the distances involved and the high degree of inefficiencies in the transporting of un-processed waste. Most gain can be had by lower technology processing in individual Council or sub-regional areas with transport of fully or partially processed materials subsequently occurring. This is particularly the case for the larger centre's in the region.

Options for the long term disposal of residual waste streams are likely to require regional co-operation due to the need to reach critical volumes and obtaining finance. Options include energy generation from waste via gasification or Refuse Derived Fuel (RDF) production.

A glass sorting and crushing facility has potential to operate on a regional level, sorting recycling from the recyclables from other Council areas.

In 2010 NOROC commenced a review of waste management resource sharing opportunities across the member Councils. This investigation is likely to have some impact on the way waste is managed regionally.

6 Program Timeframe Summary

Project	Financial year					Notes
	2011/12	2012/13	2013/14	2014/15	2015/16	
Site Rehabilitation - Phytocapping	$125,000	$125,000	$125,000	$125,000	$125,000	Ongoing program
Landfill Cell 2	$100,000	$2,500,000	$2,500,000			
Waste Sorting	$60,000	$5,000,000				
Glass Crushing	$1,010,000					
Tunnel Composting	$600,000	$1,500,000	$1,500,000	$1,500,000		Staged approach
Recycling Store	$50,000					
Environmental Education Centre	$220,000					
Nimbin Waste Transfer Station		$50,000	$250,000			
Budget implications	$2,165,000	$9,175,000	$4,375,000	$1,625,000	$125,000	

Key	
Feasibility	
Commencement/construction	
Completion	