Lockyer Valley Regional Council

Waste Reduction and Recycling Plan

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Lockyer Valley
REGIONAL COUNCIL

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Executive Summary

The Waste Reduction and Recycling Plan (***WRRP)*** satisfies Lockyer Valley Regional Council's statutory obligations under the *Waste Reduction and Recycling Act 2011* for a periodically updated Waste Reduction and Recycling Plan (WRRP). The pre-amalgamation waste strategies for Gatton and Laidley respectively are now superseded. This strategy will assist the Lockyer Valley community to make the transition from 2012 to 2021 to a more sustainable waste management approach consistent with the region's development profile. The management of waste is a rapidly changing regulatory environment in Queensland, with a high expectation that Council will manage more of its waste streams as secondary resources. This regulatory regime will use new economic instruments and associated legislative requirements to promote waste minimisation in all sectors of the community. Where these outcomes are not achieved, there will be significant financial implications for all waste generators, including ratepayers. Despite behavioural changes that residents may make, investing in additional Council infrastructure will also be required to make significant gains in recovering secondary resources. The Queensland legislation will lead to cost increases for all waste generators unless waste diversion performance is improved.

Council must provide facilities, opportunities and effective policies and education to engage the community in relation to the importance of changing current behaviour, to mitigate the financial exposure of all stakeholders should growth in waste generation continue. The Council will also need to continue with its established partnerships with local community groups and businesses, waste industry service and technology providers and governments. Lockyer Valley will benefit from participation in relevant forums, including those associated with the South East Queensland Council of Mayors (SEQCoM), to develop the best mix of local and regional infrastructure to support the diversion of waste from landfill.

The WRRP has considered a variety of strategic options and concluded that several key elements are essential to achieve the necessary changes to make future waste management sustainable. To fully integrate this program with Council's corporate and community plans a range of strategies are required:

- Seek to reduce per capita waste generation in appropriate stages to satisfy State objectives and targets;
- Development of integrated waste collection and recycling contracts for the region;
- Tailor solutions to the needs of each local community, including universal collection services;
- Provision of appropriate resource recovery infrastructure to service the Lockyer Valley region;
- Develop an efficient regional bulk transfer capacity to allow local disposal of residual materials;
- Development of regional partnerships for sharing essential long term waste treatment and disposal infrastructure.

To initially assess the capacity of several strategic options to deliver such outcomes, preliminary financial modelling over the first twenty year period of the WRRP was undertaken. It confirmed that the lowest long term cost option, based on a 20 year Net Present Value (NPV), is the scenario described as Option 2. That includes:

- The development of amalgamated waste and recycling contracts utilising a two bin system for the entire region;
- Delivery of the household recyclable materials to a local Materials Recovery Facility (MRF);
- Delivery of the household waste to a local landfill located at Gatton;
- Investigate provision for a new landfill facility located within the LVRC region and future development of the landfill facility;
- Closure of the rural bin sites;
- Upgrading of the current transfer stations and relocation of one transfer station to a more suitable site; and
- Continuing a green waste diversion and mulching arrangement for the diversion of organic matter from landfill and waste bins.

This would be complemented by an education campaign and source separation initiatives at the household and business level to divert recyclables from the bulk transport system. However, a 2021 residual waste stream of 60,000 tonnes will still remain for landfill disposal principally at Gatton Landfill (with some C&D disposal at Laidley Landfill) even after diversions. The licence for the Gatton Landfill facility may require upgrading in order to accept this volume of waste material. It has been assumed that all of the strategic options modelled are compatible with any regional treatment and disposal facilities that may become available in the longer term.

It is anticipated that the bulk transfer infrastructure proposed will allow LVRC to participate in suitable regional alternative waste technology initiatives in future. Council will however retain the choice to use any one or more facility destinations, as deemed most appropriate for bulked waste, in future. Also, it is important to the local community, in employment and resource availability terms, that local processing and markets are part of the solution. Merely exporting benefits to a large private sector facility elsewhere is not consistent with the Council's broader objectives. It is also noted that no large scale alternative waste technology will be available for the short term needs of LVRC, due to the due diligence, planning approvals and construction lead times required. This alternative treatment option will be even more complex in a regional negotiating environment.

The WRRP describes a number of supporting policies that are able to positively influence the outcomes of this plan. These include the litter strategy, sustainable procurement plan and the review of specifications to allow recycled materials to be more widely used in the Council Works Program. In addition, the wider use of planning powers to condition the requirement for waste management plans for major developments and community events is proposed.

The WRRP outlines strategic action items in four program areas as follows:

- Waste Minimisation;
- Resource Recovery;
- Energy Recovery; and
- Residual Disposal.

The above programs are strongly aligned with the new National Waste Policy (NWP) and Queensland Waste Reduction and Recycling Act 2011. LVRC will also accommodate any new end of life recovery of televisions, computers and tyres in accordance with roll-out of NWP initiatives in Extended Producer Responsibility and the Australian Packaging Covenant. While energy recovery has been evaluated at the present time as being an unsuitable option, it should be continuously monitored

as this industry grows and develops new products. These programs will help LVRC to improve its overall diversion rate performance to meet Australian best practice over the twenty year period. The overall expenditure associated with the WRRP is significant over the next ten years, at over $104M, but leads to overall community benefits. This is some $18.6M less than the Business As Usual (BAU) case. In the future, Council is likely to be required to have greater transparency in full cost pricing for its Waste Services. Given the resulting cost recovery pressures expected, LVRC should consider using a mix of users pays fees such as gate fees, rates and a Local Government levy to cover such costs.

Specifically, it is recommended that Council use gate fees as one of their appropriate price signals to the community and the business supply chain concerning sustainable outcomes through waste minimisation, and to encourage source separation and local resource utilisation. Those voluntarily opting into such schemes can be given incentives to do so in this pricing environment. This will maintain consistency with surrounding Councils and avoid perverse effects and cross boundary waste flows in the market. This measure reduces the use of flat rates that may send limited behavioural signals to the community and allows for a gradual transition to the level of pricing anticipated for future regional infrastructure facilities. This approach is consistent with that being applied in a number of other sectors and is supported by the Queensland Waste and Recycling Strategy.

Key target dates for the roll out of this Waste Reduction and Recycling Plan (WRRP) are as follows:

- Completion of the new landfill cell at Gatton by June 30th 2012;
- New Waste and recycling collection arrangements alignment to 1st July 2013;
- Minor transfer station upgrades to be completed by the end of 2013;
- Roll out of the two bin system to all ratepayers of LVRC prior to the new collection contract commencing in 2013;
- Decommissioning of the rural bin sites at the commencement of the new waste collection contract in 2013/2014;
- Selection of a reserve landfill site before 2016 and zoning to protect the site for future development; and
- Development of the new landfill site from 2016 or as required due to capacity at Gatton landfill.

It is recommended that:

- Council immediately negotiates contract extensions with current service providers to achieve a common termination date for all waste services;
- Council uses gate fees as one of their appropriate price signals to the community and the business supply chain concerning sustainable outcomes through waste minimisation, and to encourage source separation and local resource utilisation.
- Council provides facilities to recycle in order to allow opportunities to minimise gate fees;
- A full cost recovery model for waste services be implemented using a combination of gate fees, rates and a Local Government levy;
- Council maintain a watching brief on potential future Alternative Waste Technologies (AWT's) suitable for the region;
- A waste education campaign be included in the Council's waste reduction measures for homes and that Council encourages the business sector to

adopt EcoBiz or similar programs for the reduction of commercial and industrial waste streams, and;

- LVRC carry out a round of public consultation on the future of the regions waste and recycling collection, reuse and disposal options.

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LIST OF ACRONYMS/ABBREVIATIONS

ABS Australian Bureau of Statistics

APC Australian Packaging Covenant

AWT Alternative Waste Technology

BAU Business As Usual

C&D Construction and Demolition

C&I	Commercial and Industrial
DCCEE	Department of Climate Change and Energy Efficiency
DERM	Qld Department of Environment and Resource Management
EfW	Energy from Waste
EIS	Environmental Impact Statements
EMR	Environmental Management Register
EPR	Extended Producer Responsibility
ERA	Environmentally Relevant Activity
GHG	Green-House Gas (emissions)
KPI	Key Performance Indicator
LVRC	Lockyer Valley Regional Council
MRETS	Mandatory Renewable Energy Targets
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste (defined as household waste only)
NDRRA	Natural Disaster Relief and Recovery Arrangements
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NGERS	National Greenhouse and Energy Reporting System
NPI	National Pollutant Inventory
NPC	National Packaging Covenant
NPV	Net Present Value
NWP	National Waste Policy
ORER	Office of the Renewable Energy Regulator
PIFU	Planning Information Forecasting Unit
RBS	Rural Bin Sites
RECS	Renewable Energy Certificates
RRC	Rockhampton Regional Council
RRF	Resource Recovery Forum
RWMS	Regional Waste Management Strategy
SEQCoM	South East Queensland Council of Mayors
WMP	Waste Management Plan
WMS	Waste Management Strategy
WRRP	Waste Reduction and Recycling Plan
WSA	Waste Solutions Australia Pty Ltd

1 INTRODUCTION

1.1 BACKGROUND

Waste Solutions Australia Pty Ltd (WSA) was commissioned by Lockyer Valley Regional Council (LVRC) to undertake the development of a Regional Waste Management Strategy (RWMS) for the region. This has subsequently changed to a Waste Reduction and Recycling Plan (WRRP) due to the introduction of new legislation. Under The Waste Reduction and Recycling Act 2011; each local government is required to have a WRRP in place. Since the amalgamation of the former Gatton Shire Council and the former Laidley Shire Council, the different waste management facilities, collection contracts and recycling operations that existed prior to the merger require assessment in order to design a WRRP that encompasses the needs of both areas and consolidates the existing systems in an efficient, cost effective manner. The WRRP is to be based on the scope of works supplied by LVRC in the Consultancy Brief.

1.2 OBJECTIVE

The objective of this investigation is to compile a WRRP tailored for the Lockyer Valley Regional Council. In order to draft this strategy, WSA carried out a review of relevant legislation and regulations, an assessment of the facilities, collection contracts, waste streams, costs, projected waste tonnages and viable alternative waste technologies based on future population growth. Based on these findings and stakeholder feedback, the waste management options best suited to LVRC were financially modelled and reviewed by LVRC. LVRC selected the most suitable option based on the financial modelling. A WRRP was developed from all of the information assessed and the input of LVRC.

The WRRP includes recommendations for immediate actions and both short term (10 year), medium term (20 year) and long term (50 year) planning objectives, although it is recognised that 50 year term planning may be inaccurate due to the variability of government policy, available waste and resource recovery technologies and regional growth.

The introduction of the WRRP will establish consistent waste management policies and practices throughout the region via revised waste contracts, agreements and co-operative arrangements which provide incentives to minimise the environmental, economic and social impacts of LVRC's waste management activities. Alongside this is waste awareness education for the public and business managers in order to effect change that reduces waste to landfill while increasing recycling (household, commercial and industrial and construction and demolition) throughout the region. A monitoring and feedback system is incorporated into the WRRP review to gauge the effectiveness of the waste reduction efforts and change the focus of the awareness campaign where necessary.

1.3 SCOPE OF WORK

The Consultancy Brief supplied by LVRC (in late 2009) contained the following tasks, but is not confined to:

1. A review of the Statutory Requirements (both State and Federal) including proposed State and Federal legislation such as the Queensland Waste Levy and Carbon Tax and their implications for LVRC;
2. Review of the current facilities and practices, including facilities outside the region such as the Ti Tree bioreactor;
3. Waste stream analysis for verification of the current waste stream makeup and projected waste volumes. This is also to take into account the Draft South East Queensland Regional Plan (2009) and LVRC's Draft Planning Scheme.
4. Strategy options are to be developed for suitable waste collection and disposal arrangements and recycling collection across the region;
5. Assess options via whole of life financial analysis including a comparison with the current costing and the consideration of day labour verses contract labour, community expectations, public/private partnerships, build/own/operate scenarios and funding opportunities from State and Federal Governments;
6. Other relevant issues, such as carbon dioxide emissions;
7. Put forward a comprehensive and integrated set of recommendations with a preferred option or options for waste management approaches in the regional area; and
8. Provide an Implementation Plan including cash flows for the preferred option.

2 REGULATORY FRAMEWORK REVIEW

A range of Regulations and Acts apply to the management of waste materials in Queensland. The following is a summary of the relevant sections as they apply to the LVRC waste management strategy. The relevant Regulations and Acts should be reviewed on an on-going basis for changes.

2.1 ENVIRONMENTAL PROTECTION ACT 1994 (QLD)

This legislation has been reprinted (03 February 2012) and is in force. The Environmental Protection Act (1994) is the primary legislation that controls waste management in Queensland. Additional strategic frameworks are provided through:

- The Environmental Protection (Waste Management) Policy 2000; and
- The Environmental Protection (Waste Management) Regulation 2000.

The aims of the act and subordinate legislation are to clarify waste management practices and achieve the coordinated implementation of waste management across Queensland in a consistent manner. This is expected to lead to improved environmental outcomes.

Under this Act, waste storage, treatment or disposal, that is: "storing, treating, reprocessing or disposal of regulated waste (other than at the place where it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50,000 persons having sludge drying beds or on-site disposal facilities" is defined as a Notifiable Activity.

The object of the Act is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).

2.2 ENVIRONMENTAL PROTECTION (WASTE MANAGEMENT) REGULATION 2008

This regulation is made under the Environmental Protection Act 1994 and commenced on 1st January 2009. The Regulation covers Environmental Impact Statements (EIS), Environmentally Relevant Activities (ERA's) and Regulatory Requirements. In addition, the regulation also addresses matters relating to environmental management and environmental offences which includes regulated waste and contaminated land.

The Environmental Protection (Waste Management) Regulation 2008 also includes a chapter on the National Pollutant Inventory, which has the purpose of giving effect to, and enforcing compliance with the National Environment Protection (National Pollutant Inventory) Measure 1998 (the NPI NEPM). The Regulation defines reporting periods, reporting requirements and reporting thresholds.

The regulations administration chapter details matters devolved to local Government, which includes "waste incineration and thermal treatment for incinerating waste vegetation, clean paper or cardboard."

2.3 WASTE REDUCTION AND RECYCLING ACT 2011

The objects of this Act are to:

- Promote waste avoidance and reduction, and resource recovery and efficiency actions;
- Reduce the consumption of natural resources and minimise the disposal of waste by encouraging waste avoidance and the recovery, re-use and recycling of waste;
- Minimise the overall impact of waste generation and disposal;
- Ensure a shared responsibility between government, business and industry and the community in waste management and resource recovery;
- Support and implement national frameworks, objectives and priorities for waste management and resource recovery.

It refers to the waste and resource management hierarchy as the guide to waste reduction and achieving best practice in waste management. The waste management hierarchy is as follows (in the preferred order):

a) Avoid unnecessary resource consumption;
b) Reduce waste generation and disposal;
c) Re-use waste resources without further manufacturing;
d) Recycle waste resources to make the same or different products;
e) Recover waste resources, including the recovery of energy;
f) Treat waste prior to disposal, including reducing the hazardous nature of the waste, and;
g) Dispose of waste only if there is no viable alternative.

The key to the achievement of the objects of this Act must, if practicable, be guided by:

(a) the waste and resource management hierarchy; and
(b) the following policy principles (*waste and resource management principles*):

(i) the polluter pays principle;
(ii) the user pays principle;
(iii) the proximity principle;
(iv) the product stewardship principle.

The polluter pays principle states, in part, that all costs associated with the management of waste should, if possible, be borne by the persons who generated the waste.

The user pays principle states, in part, that all costs associated with the use of a resource should, if practicable, be included in the price of the goods and services (including government services) that result from the use.

The proximity principle is the principle that waste and recovered resources should be managed as close to the source of generation as possible.

The product stewardship principle states, in part, that the producer of a product should plan its design and production to minimise the environmental harm that may be caused by waste generated from the production, proper use and disposal of the product. The importers of products are also to take all reasonable steps to meet the above obligations.

The key provisions of the *Waste Reduction and Recycling Act 2011* include:

- A waste disposal levy on industry waste sent to landfill;
- A requirement for Queensland Government agencies and local governments to prepare waste management plans;
- Introduction of product stewardship arrangements for any waste products that are identified as a growing problem for landfill in the future;
- Strengthened litter and illegal dumping offences, including public reporting of vehicle-related littering offences.

The Act states, in part, that a local government must adopt a waste management and recycling plan for its local government area. It must, where reasonably practicable, include the following:

- Waste reduction and recycling targets for:
    - Waste generated by the local government in carrying out its activities;
    - Waste generated by households in the local government's area;
    - Other waste generated in the local government's area other than by the local government.
- Actions to be taken to improve waste reduction and recycling of:
    - Waste generated by the local government in carrying out its activities;
    - Waste generated by households in the local government's area;
    - Other waste generated in the local government's area other than by the local government (i.e. C&D initiatives under the planning assessment process).
- Details of current and proposed waste infrastructure;
- The management and monitoring of the local government's performance under the plans;
- Information about achieving continuous improvement in waste management;

- Other matters prescribed under a regulation about the requirements for a local government's waste reduction and recycling plans.

The waste management and recycling plan must regard:

- Current and predicted information about population profiles, residential, commercial and industrial development and waste generation types;
- The services, markets and facilities relevant to dealing with the different types and amounts of waste;
- The waste management hierarchy and principles.

The WRRP must be reviewed every three years. Before adoption of a new WRRP or making a significant amendment to the plan, consultation with the public, especially households and businesses, must be undertaken with the comment period being at least 28 days.

There is also a duty to report on waste and recycling management annually. The report must include details of recycling activities, waste to energy facilities and waste disposed of to landfill. This report must address waste generated both within and outside of the local government's area.

Under the section on the objectives of the Act, there is a reference to community involvement in waste management; this may include the provision of public place recycling facilities and major events recycling facilities. Public recycling facilities would contribute towards the reduction of littering and continuous improvement. Council may also engage with community groups to provide support for community driven initiatives.

The Act also contains exemptions for disaster management waste. This is defined as meaning waste generated by or because of a disaster that is or has been the subject of a declaration of a disaster situation under the Disaster Management Act 2003, but only within limits, if any, declared by the chief executive by gazette notice for a particular disaster.

2.4 QUEENSLAND WASTE & RECYCLING STRATEGY, 2010 - 2020

The Queensland Environmental Waste Levy has now been detailed and came into force on the 1st December, 2011. The levy is weight based and aims to collect fees on landfilled waste as a means of providing encouragement for waste diversion programs. The levy does not apply to Municipal Solid Waste (MSW), but does apply to C&D and C&I waste. All other general waste delivered to landfill by means other than the kerbside collection of wheelie bins may also be subjected to the levy. The strategy contains strong anti-dumping and anti-littering enforcement measures. There is a special exemption for the landfill disposal of asbestos products waste to continue to encourage the safe disposal of these materials. However, contaminated soil is not exempt from the levy in order to encourage (via the pricing mechanism) the on-site remediation of contaminated soil where possible.

The details of the strategy revolve around:

- Best waste management practice services,
- Waste and resource recovery programs, infrastructure improvement (AWT's) & market development;
- Landfill levy;
- Strong advocacy;
- Educational and awareness material;
- Regional contracting and service delivery;
- Green purchasing of goods and services.

The Queensland Government has set targets that it intends to meet via the implementation of the waste levy, but has exempted municipal waste collection from the levy owing to the high rate of recycling already being achieved by the majority of local governments.

The Queensland Government issued this strategic plan in late 2010, to guide the next ten years of waste and resources management in Queensland. The broad goals are consistent with the National Waste Policy and include:

- Reduce waste generation;
- Optimise resource recovery and recycling (including C&D from new developments); and
- Develop sustainable waste industries and jobs.

The policy approach is based on a five part strategy covering:

- Clear targets and priorities;
- Price signal via a waste disposal levy;
- Stronger regulations;
- New programs and investment strategies; and
- Partnering for change.

The 10 year plan is underpinned by the waste management hierarchy (re-defined since the Environmental Protection Plan was issued in 2000). Refer **Section 2.3**, points a) to g) of the *Waste Reduction and Recycling Act 2011.* Disposal of waste to landfill is the lowest priority and should only be carried out if there is no other viable alternative.

Targets

The priority targets listed include:

- Reduce waste to landfill by 50% by 2020;
- Reduce landfill gas emissions by 50% by 2020;
- Increase the recovery and recycling of materials across target waste streams;
- Reduce the per capita generation of waste; and
- Reduce litter dumping and associated effects.

The detailed targets nominated are more fully defined in *Table 1* below.

Table 1 - Queensland State Targets

Targets	2008 Base	By 2014	By 2017	By 2020	Priorities
Reduce waste disposal to landfill	Business as usual	25%-4.6Mt avoided	40%-9.9Mt avoided	50%-16.3Mt avoided	
Increase recycling of C&D Waste (%) HIGH	35	50	60	75	Mixed timber and concrete
Increase recycling of C&I Waste (%) MEDIUM	18	40	50	60	Packaging, batteries, fluoro light, tyres, organic food waste, gas bottles, high hazard reg. wastes
Increase recycling of Regulated Waste (%)	30	35	40	45	
Increase recycling of MSW (%)-150kg MEDIUM	23-64kg	50-80kg	55-100kg	65-150kg	Computers, TVs, tyres, organic (garden waste), gas bottles
Reduce waste generation (%)-T/p/a	2.4 T/p/a	5% -2.3 T/p/a	10%-2.2 T/p/a	15%-2.0 T/p/a	

A convenient “catch-phrase” is Target 150 - 2020, meaning for the municipal solid waste (MSW) sector to increase recycling per person to 150kg per year and reduce landfill waste to 150kg per year per person by 2020.

Waste Disposal Levy

This levy is initially instigated in gazetted areas only but is expected to apply broadly over time. Waste generated and disposed of outside the levy zone is excluded. LVRC is located within the gazetted levy zone. The waste disposal levy is specifically intended to provide an incentive for industry investment in resource recovery infrastructure. *Table 2* indicates the applicable waste disposal levy rates from 1 December, 2011. The levy is payable by the waste disposal site operator but is likely to be passed on to all customers.

*Table 2 - Waste Disposal Levy Rates**

Category	Levy Starting Rate	Examples
Base Rate	$35.00/tonne	C&I Waste, C&D Waste, Contaminated Soil and Acid Sulphate Soils
Low Hazard Regulated Waste	$50.00/tonne	Not defined as yet
High Hazard Regulated Waste	$150.00/tonne	Not defined as yet

** These rates are proposed to increase in line with CPI increases.*

2.5 NATIONAL WASTE POLICY FRAMEWORK

The Commonwealth has recently developed and adopted a framework for a National Waste Policy (NWP). The policy was agreed and signed by all Australian Environment Ministers in November 2009. This policy is intended to re-structure the waste management sector and is a key driver for future planning. Therefore, its specific goals are reflected in this report. While recycling has advanced considerably over the years, waste generation has increased by 31% to 43.8 million tonnes over the period from 2002-03 to 2006-07. Hazardous waste (as defined under the Basel Convention) has doubled from 0.64 million tonnes to 1.19 million tonnes over the period 2002-03 to 2006-07. Both now appear to have stabilised.

A key principle of the NWP is the promotion of partnerships between various stakeholders, with each taking responsibility for their own waste minimisation. A new Australian Packaging Covenant is also proposed to further strengthen packaging recycling. The NWP includes Extended Producer Responsibility (EPR) proposed for end-of-life televisions and computers to contribute to e-waste management needs. Initiatives under the scheme are expected to be rolled out by industry in 2012, extending to regional areas by the end of 2013. LVRC may seek to provide safe storage facilities to support this EPR initiative as it develops.

The aims of the National Waste Policy are to:

- Avoid the generation of waste; reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource;
- Ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner; and
- Contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency and the productivity of the land.

The NWP establishes a comprehensive work program for national coordinated action on waste across six key areas:

- Reducing hazard and risk;
- Tailoring solutions;
- Providing the evidence;
- Taking responsibility;
- Improving the market;
- Pursuing sustainability.

2.6 CLEAN ENERGY ACT 2011

A carbon tax is due to be levied on approximately 150 waste management facilities from the 1st of July 2012. These facilities generate greenhouse gas emissions primarily in the form of methane gas measured as carbon dioxide equivalent (CO2-e). For the purpose of calculating landfill gas liability, a designated large landfill facility is defined as having total covered emissions, legacy emissions and exempt emissions of 25,000 tonnes or more in a single year. In addition, emissions will be generated from fuel usage for transportation, operation of heavy equipment and energy usage. The financial year beginning on 1 July 2011 is an eligible financial year. Annual reporting for Green-House Gas (GHG) emissions for corporations that emit over the 25KT CO2-e is already required under National Greenhouse and

Energy Reporting System (NGERS) and will soon apply to municipalities. NGERS submittals are also subject to audits by the Department of Climate Change and Energy Efficiency (DCCEE). In addition, organisations are required to undertake energy efficiency audits. Furthermore, proposed policies and legislation will increase the requirements pertaining to reducing GHG emissions, which will increase operating costs. The impact of the Government's plan on industry is expected to include:

- Increased investment in management of landfill gas including costs for infrastructure, measurement and administration;
- Costs payable on GHG emissions from landfill sites;
- Higher gate fees payable to third party disposal sites;
- Higher costs of fuel for off-road use;
- Higher costs of energy due to the tax on power generators as well as the potential for subsidised investment in renewables.

Unresolved problems with the scheme include:

- There are still uncertainties around the current measurement of emissions;
- Uncertainty with the future price of carbon, and;
- Uncertainly associated the future emissions of methane from landfill sites as methane generation can continue for 30 or more years.

A recent waste industry presentation provided estimates for potential future costs under the Carbon Tax (Australian Landfill Owners Association, 2012). Refer below table.

Table 3 – Various Future Cost Scenarios

Example: For one tonne of MSW landfilled in a wet temperate zone in 2012/13

Year	Emissions (tonnes CO_2-e)	Carbon Price ($/tonne CO_2-e)	Carbon Permit Cost ($/tonne waste)
2012/13	0	23	0
2013/14	0.1376	24	3.28
2014/15	0.1187	25	2.98
Balance	0.9335	15 to 40	14.00-37.34
Total	1.190	17.02 to 36.63	20.26-43.60

2.7 NATIONAL ENVIRONMENTAL PROTECTION MEASURE (USED PACKAGING MATERIALS)

This Federal legislation applies to used packaging material and has been rescinded in 2011 with relevant provisions included in a new Waste Resources and Recycling Act. Changes to the EP Act and sub-ordinate policies and regulations have been made to support this separate waste legislation.

2.8 AUSTRALIAN PACKAGING COVENANT 2010

The new Australian Packaging Covenant (APC) builds on the lessons learned from the first National Packaging Covenant (NPC). The NPC contained mainly aspirational targets with little or no penalties or enforcement of its voluntary membership. Improvements made under the NPC were mainly centred on light-weighting of packaging materials, a process some argued that industry would have made in the

course of normal operations. Reporting of waste diversion by some NPC members has been criticized for lacking accountability to verify the full extent achieved. Signatories to the NPC were exempt from the NEPM (for used packaging materials).

The NPC (now APC) has funded research into littering and waste avoidance programs. These include public place recycling initiatives, school education kits and mobile education trailers / vehicles. The NPC has made some funds available directly to Councils and other organisations for infrastructure projects e.g. public place recycling bin caps, signage and educational materials. These activities are seen to assist Local Governments in their efforts to create waste awareness among residents. The APC has strengthened the requirements of the participating members to meet the aims of the covenant.

2.9 MANDATORY RENEWABLE ENERGY TARGETS

Renewable energy generation in Australia is managed under several pieces of supporting legislation and regulations. These cover large scale and small scale renewable energy generation projects. The Legislation has been amended several times to reflect the Federal Governments intentions to achieve greater renewable energy generation, most notably:

- The mandatory Renewable Energy Target review (2006);
- Expansion of the Renewable Energy Target (2009), and;
- Delivery of the enhanced Renewable Energy Target (2010).

The latest legislation amendment *Delivery of the enhanced Renewable Energy Target (2010)* has been passed to establish medium term Mandatory Renewable Energy Targets (MRETS) for Australia. This requires 20% of Australia's energy generation to come from green or renewable energy sources by 2020. As such, this provides some certainty to investors in renewable energy projects up to 2030. This is expected to impact the rate of technology implementation in the resource and energy recovery sectors. LVRC could benefit from greater infrastructure choice in the future as a result of the availability of Renewable Energy Certificates (RECS) for certain Energy from Waste (EfW) projects.

Previously the Office of the Renewable Energy Regulator (ORER) administered the Legislation and Regulations pertaining to renewable energy. However in April 2011 the ORER became amalgamated into the Clean Energy Regulator and the responsibilities of the Renewable Energy Regulator transferred to the statutory role of the Clean Energy Regulator. The Clean Energy Regulator will also administer and enforce:

- The Carbon Pricing Mechanism;
- The National Greenhouse and Energy Reporting System, and;
- The Carbon Farming Initiative.

3 CURRENT WASTE MANAGEMENT FACILITIES

3.1 REGIONAL OVERVIEW

The Lockyer Valley Regional Council area is made up of the former Gatton Shire Council and Laidley Shire Council areas, which comprise a significant number of

waste management assets. The following breakdown is explored under the headings below:

- Gatton Landfill;
- Laidley Landfill/major transfer station;
- Minor transfer stations
- Rural bin sites

3.2 LANDFILLS

There are two landfills, the Gatton Landfill and Laidley Transfer Station / Landfill.

3.2.1 GATTON LANDFILL

The Gatton landfill facility is located on Ford St, approximately 2.4km to the north of the town of Gatton. This facility is manned by LVRC staff for landfill operations and Anuha Services staff for gatehouse and recycling services. This site is due to be fitted with a weighbridge obtained under a state government funding round aimed at having Local Governments ready for the implementation of the Queensland waste levy in 2011.

The Gatton landfill accepts municipal solid waste (household), C&D and C&I waste materials from both commercial operators and the public. The Gatton area MRF is operated by Anuha Services and is located within the same site. Rejected material from this facility is also disposed of in the landfill cells.

There are a series of drop-off points alongside the entry to the landfill where regulated waste (oils, tyres, lead acid batteries) and recyclable materials (including reusable items, green waste and bulk steel) may be deposited prior to entering the landfill cell. The Gatton waste management facility includes a large shed which acts as a shop for the sale of the reusable items dropped off at the landfill.

A new landfill cell is currently being developed at this site and the expected remaining life for landfilling activities is approximately 20 plus years.

3.2.2 LAIDLEY TRANSFER STATION/LANDFILL

The Laidley transfer station site is located on Burgess Rd, approximately 3.2km to the west of the town of Laidley. This facility is not equipped with a weighbridge. Both MSW and recyclables are collected by a contractor utilising a split 240L wheelie bin and the collected materials are deposited into separate hook bins at the Laidley facility. The recyclable materials are then transported to a MRF operated by a contractor, while the MSW is transported to the Ti Tree landfill/bioreactor to the north-west of Ipswich. The Ti Tree contract contains a minimum monthly weight (675tonnes) clause and is in force until January 2014.

Members of the public are also allowed to deposit waste materials into the hook bins and there are a range of drop off points for recyclable and reusable materials (including bulk metals and green waste) and regulated waste near the hook bin stations. Some compaction is applied to the deposited materials in the hook bins using the bucket of a back hoe that is otherwise used for site works. C&I waste materials are usually placed into the hook bins, however C&D materials are deposited on the old landfill cell to form a contoured crown suitable for capping as

per the closure plan for this landfill. Concrete is separated from this C&D material and stockpiled separately to await sufficient volume for cost effective recycling.

3.3 MINOR TRANSFER STATIONS

Within the LVRC area there are six minor transfer stations located at:

- Lockyer Waters;
- Lockrose;
- Heildon;
- Murphy's Creek;
- Withcott; and
- Grantham.

Currently none of the above transfer stations are fitted with a weighbridge.

Of the sites listed above, Lockyer Waters and Lockrose are operated (manned) under an arrangement that originated with the former Laidley Shire Council. These transfer stations were collecting MSW, C&I and C&D materials in hook bins until the introduction of state waste levy legislation. Currently only MSW is allowed to be delivered to these transfer stations for disposal. When full, the hook bins are then transported to the Ti Tree facility for disposal. There are drop off areas at both sites for the collection of recyclable materials (including bulk metals) and reusable materials and green waste, which is mulched by a contractor when required.

Compaction is not applied to the loads in the hook bins at the transfer stations and low delivery weights have often resulted from this. The situation is much more relevant to these two transfer stations (Lockyer Waters and Lockrose) from where the waste is transported to the Ti Tree facility.

The Lockyer Waters transfer station site operates satisfactorily, however the Lockrose transfer station has an issue with limited space on the site. This has led to access problems for dropping off green waste and at times green waste has been included in the hook bin loads sent to Ti Tree in order to maintain functioning of the site. The previous Laidley Shire Council was aware of this problem for some time and an alternate site for this facility was proposed in 2007.

The remaining transfer station sites are within the former Gatton Shire Council area and are supervised by staff provided under an arrangement by Anuha Services. These facilities all provide drop off areas for recyclable and reusable items (including green waste and bulk metals). Each site operates a 'tip shop' for the sale of reusable items. The sites are only operated for certain hours each day and are fenced and secured when not operating.

MSW and other waste is placed into the hook bins provided and transported to the Gatton landfill facility for disposal. Although compaction is not applied, the relatively short transport distances negate most of the negative effects of light loads and the use of the council's own facility for waste disposal also relieves the financial impost of operating these transfer stations.

These transfer stations have been established on sites where small landfills were once sited, therefore making the land unsuitable for development. Many of these sites acted as emergency waste deposit sites during the emergency clean-up operations following the January floods in 2011.

Since December 1st 2011 the transfer stations no longer accept loads of C&D and C&I waste, as it is likely that the weight of these materials collected at the transfer stations would be subjected to the Queensland waste levy. However, Withcott transfer station has been designated as a site that will receive MSW, C&D and C&I waste and must collect fees for the state levy.

3.4 RURAL BIN SITES

Within the LVRC area there are Rural Bin Sites (RBS) located at:

- Ma Ma Creek;
- Mt Sylvia;
- Mt Whitestone;
- Flagstone;
- Stockyard Creek;
- Ropely;
- Caffey; and
- Junction View.

The rural bin sites are all unmanned sites. Some sites have fencing or enclosures; however most do not have any method of securing the site. Although provided primarily for the use of rural residents on selections who do not have access to a household wheelie bin service, there has been evidence of some C&I waste materials being deposited at RBS. In addition, most RBS do not have any recycling drop-off areas. It is suspected that minor quantities of regulated waste may be finding their way to landfill via the unsupervised bins.

LVRC has been faced with increased clean-up costs to maintain these sites due to the nature of their use, with large items being left on the ground beside the bins.

4 CURRENT COLLECTION SERVICES

For the sake of clarity the former local government areas are referred to in this section. This is because currently the waste and recycling systems are still operating almost as before, i.e. as two independent services with different contracts, methods and levels of service. One of the goals of this WRRP is to propose methods for the amalgamation of services for both waste and recycling collection across all areas of the new LVRC and in the process gain an improved level of service for all concerned. This should be achieved at the best possible economical rate for the community and businesses.

4.1 GATTON – MUNICIPAL SOLID WASTE

MSW is collected in the former Gatton shire by a contractor and delivered to the Gatton landfill located at Ford Street. The collection contract also includes some C&I waste collected via the 240L wheelie bins provided to some businesses. All the collected waste is then landfilled.

4.2 GATTON – RECYCLING

The household recycling service in the Gatton area is carried out by Anuha Services, which is a church-based service specifically formed to assist those with some form of disability or disadvantage to find employment and training opportunities within their local area. Anuha provides the facilities; training, supervision and equipment for carrying out the recycling service with some funding provided by government (State and Federal) and are strongly supported by both the LVRC and the local community.

Householders place recyclable items into a textile bag provided by Anuha and this is collected manually by Anuha staff, with the bag emptied into a collection vehicle. Anuha staff members also operate the vehicle and return the collected materials for sorting and bailing at the MRF located alongside the Gatton Landfill facility at Ford Street. Some reject (waste) material is generated by the MRF operation and this waste material is disposed of to the nearby landfill.

Anuha Services have already noted the potential health and safety issues associated with the manual handling part of the recyclables collection, as well as the time, expense, vehicle and staff required to operate the collection service. At the same time, Anuha have received a Federal Government grant to expand the MRF at the Gatton landfill site. At this time it may be considered appropriate that with the introduction of a two-bin system, recyclables are collected by a contractor and delivered to the expanded Anuha facility for sorting and processing.

4.3 GATTON – CONSTRUCTION & DEMOLITION WASTE

C&D waste materials are usually delivered by contractors and private companies to the Gatton landfill at Ford Street. Currently there is no separation carried out, with the exception of green waste and metals. Regulated wastes should be separated from the C&D waste. All remaining materials are placed into the landfill cells. There is an opportunity for Council to impose waste minimisation conditions on developers under the new waste regulation. Consultation with Council's development assessment team would be warranted to determine how to implement such a policy.

4.4 LAIDLEY – MUNICIPAL SOLID WASTE

MSW is collected within the former Laidley area by a contractor using a 240L split bin and is bought to the Laidley transfer station and deposited into large skip bins located at a ramp site within the facility. Private individuals and companies are also able to deposit waste materials into these bins. Drop off areas are provided for regulated waste materials and salvageable/recyclable items.

4.5 LAIDLEY – RECYCLABLES

Household recyclable materials are collected via the 240L split bin system operated by a contractor and bought to the Laidley landfill, where the recyclable materials are unloaded into a hook bin for removal to a recycling facility run by a contractor. The use of a split bin has been discontinued by many local governments as this system has been found to have a greater contamination rate and lower resource recovery rate than a two-bin system.

A green waste drop off area is available to private and commercial operators for the recycling of green waste. Drop off areas are available for regulated waste materials and recyclable/salvageable items.

4.6 LAIDLEY – CONSTRUCTION & DEMOLITION WASTE

C&D materials are delivered to the top of the old landfill cell at the Laidley transfer station facility. There is no sorting facility, other than the provided recycling/salvageable items areas and drop off areas for regulated waste materials and concrete stockpiling. The remaining C&D materials are transported to the landfill cell and compacted in place to form a crown prior to the final capping of the site.

4.7 MINOR TRANSFER STATIONS

Six transfer stations exist within the Lockyer Valley region. These are all manned facilities. All transfer stations provide drop off areas for recyclable materials, reusable materials, regulated waste items and other waste materials for landfilling. Materials to be landfilled are placed into large hook bins for uplift to either Ti Tree landfill (Laidley sites) or Gatton landfill (Gatton sites).

4.8 RURAL BIN SITES

Eight rural bin sites exist within the LVRC area. These are uncontrolled sites consisting of bin containers of approximately three and/or six cubic metres and are sited at locations in the south of the region.

5 WASTE FLOWS

5.1 CURRENT WASTE FLOWS

Along with waste stream data provided by LVRC, a visual waste bin inspection was carried out by the consultants. This visual characterisation included the rural bin sites and the minor transfer stations. The results of the visual waste audit were tabulated; see *Table B1* in ***Appendix B***, and the findings compared to general municipal waste makeup data available to the consultants.

The waste stream makeup in the LVRC region is consistent with that of a typical rural shire. Rural areas tend to recycle green waste and food scraps within the rural properties, while the lack of recycling services offered to these areas contributes to an increased rate of recyclable material in the general waste bins. It should be noted that although rural residents were not provided with a household recycling collection service. They were provided with recycling drop off points at the minor and major transfer stations in the region.

The waste audit categories recorded were:

- Cardboard/paper;
- Container glass;
- Other glass;
- Plastic drink containers (recyclable);
- Other plastics (non-recyclable);
- Aluminium drink containers;
- Metals (including white goods);
- Green waste;
- Timber waste;

- General waste;
- Hazardous waste;
- E waste;
- Other (all materials that did not fall into an above classification).

5.2 REVIEW OF CURRENT WASTE FLOW DATA

Waste flow data supplied by LVRC has been sourced from various inputs, while waste delivered to Ti Tree landfill facility is weighed. The weight of waste delivered to the Gatton landfill is estimated as there is no weighbridge currently located at this facility. The data supplied is for the 2008/09 period as the design of the WRRP began in 2010. Table 4 below presents a summary of known waste flows.

Table 4 - Waste Flow Data 2008/2009

Source	Weight t/yr	Destination	Comments
Gatton	39,000	Landfill cell	New cell development, current life projected as 20 plus years.
Laidley T/S	5,825	Ti Tree landfill	MSW and drop off waste transported to Ti Tree, C&D waste landfilled at Laidley as part of closure plan.
Black Metal	?	Sims Metal	Metal collected when sufficient volumes require removal.
Green Waste	?	Local area distribution	Green waste is mulched and made available to residents or moved out of the area to large commercial users.
Household Recyclables - Gatton Household Recyclables - Laidley	10,210 3,976	Anuha Services MRF or JJ's Toowoomba MRF	Anuha MRF to undergo expansion after receiving a Federal Government grant.
Anuha Business Recycling	2,160	Anuha MRF	Collection area for this service extends outside of the LVRC area to Esk.

? - *These weight totals require further research by LVRC*

5.3 PROJECTED POPULATION GROWTH

Municipal solid waste volumes can be readily projected from a per capita basis as these rates are already known. Using population growth figures provided by both LVRC and the Population Information Forecasting Unit (PIFU), the number of residents within the LVRC region is set to increase from approximately 36,537 persons in 2011 to 58,713 persons by 2031. The Medium series population growth projections have been adopted for the purposes of modelling as can be seen in *Table 5* below.

Table 5 - PIFU Population Growth Projections

	2011 (persons)	2021 (persons)	2031 (persons)
Low Series	35,666	45,113	54,632
Med Series	36,537	46,316	58,713
High Series	38,076	50,489	93,219

5.4 PROJECTED WASTE GROWTH

The rate of waste generated per person was estimated at 2.1 tonnes per person per year in 2006/07 as an average for all of Australia's waste generation (ABS 2010), however approximately 40% waste diversion was achieved resulting in 1.26 tonnes per person being landfilled over that year. A total waste generation growth rate of 4.5% has been projected by the ABS which would make these figures even higher in 2011. For LVRC the total waste stream is projected from the Hyder Consulting (2009) report as being approximately 70,589 tonnes or 1.93 tonnes per person in 2011 without any waste diversion being applied.

Taking household recycling, C&D and C&I diversion into account, the waste projected to be landfilled in LVRC in 2011 was approximately 37,597 tonnes, or 1.03 tonnes per person. The waste material growth figures included in *Table 6* below do not include any diversion. This is to illustrate the projected total waste growth under the different population projections only.

Table 6 – Waste Material Growth Projections

	2011 (tonnes/yr)	2021 (tonnes/yr)	2031 (tonnes/yr)
Low Series (2.2%)	70,589	78,750	87,854
Med Series (2.4%)	70,589	89,483	113,433
High Series (2.8%)	70,589	93,040	122,631

5.4.1 WASTE STREAM MAKEUP

The Queensland State of the Environment Report (2008) indicates that Queensland's waste stream makeup is divided into five general categories, these are:

- Domestic waste (MSW);
- Commercial and Industrial waste (C&I);
- Construction and Demolition waste (C&D);
- Green waste; and
- Biosolids.

The makeup of the typical regional domestic waste stream can be seen in *Table 7* below.

Table 7 – Typical Regional Domestic Waste Stream Makeup

Material	%	Composition
Paper	20	Office paper, newspapers, magazines, wrapping
Glass	9	Beer and wine bottles, food jars
Metals	4	Non-ferrous 1% and ferrous 3%
Organics	42	Putrescible 37% and other (timber, dead animals) 5%
Plastics	13	Drink bottles, toys, goods and packaging
Liquid	1	Milk, soft drink and water
Hazardous	4	Oil, solvents, bleaches and pesticides
Other	6	All materials that could not be categorised, soil and fines

The most recent data available from the LVRC showed that overall approximately 21.6% of the domestic waste stream is composed of readily recyclable materials including metals, plastics, glass and paper products (EnviroCom 2012) although these proportions vary across the region.

5.5 REGULATED WASTES

Regulated wastes consist of a range of products and materials as defined in the Environmental Protection Regulation 2008, Schedule 7. For LVRC the most common regulated waste materials received at waste management facilities are:

- Tyres;
- Lead acid batteries;
- Oils and petroleum products;
- Oil Filters;
- Acids and bases;
- Pesticides and other chemicals; and
- Asbestos products.

These regulated waste materials must be recycled or disposed of by licensed persons, companies or facilities. Systems are already in place throughout the LVRC area and it is expected that these will be retained for the future waste management system.

Minor volumes of clinical wastes are also being disposed of at landfill. The provision of home care has resulted in some medical related material finding its way into domestic waste bins. Medical facilities are required to manage their own waste materials and these should not be delivered to a landfill without the required pre-treatment.

The list of regulated waste is long and most are generated by industry and should be managed by the generator through licensed waste treatment and disposal companies. The generators are required to report on the waste generated, transported and disposed of to the relevant Local Government.

6 WASTE COLLECTION CONTRACT REVIEW

At the time of the commencement of the Waste Management Strategy several different waste collection contracts were in force owing to the Local Government amalgamations mandated by the state government. The existence of the different contracts is seen as inefficient as a lower price per unit / service may be gained for a larger allotment of work. Another aspect of the different contracts relates to the collection of household recyclables. The former Gatton area is being serviced by Anuha Services using bags that are collected manually, while the former Laidley area is being serviced by JJ Richards is using 240L split MSW / recycling collection bins.

While the bag collection system is known to produce a product stream for the recycling market with low contamination, the manual handling aspects of this system are becoming a potential liability for operators. The split bin system, while producing a greater volume of collected materials is also known to contain a greater proportion of waste materials. This is often due to the failure of the divider within the bin allowing the waste and recycling streams to become mixed.

The recyclable materials collected by Anuha are separated and bailed by Anuha Services at their own Materials Recovery Facility (MRF) located adjacent to the Gatton landfill entrance. The recyclables collected by JJ Richards are loaded into a hook bin for transport to their materials recovery facility located at Toowoomba, some 56km away. It is believed that no compaction is applied to the load in either the collection truck or the hook bin, reducing the load efficiency of material transportation.

The above review indicates that neither the collection nor processing systems for recyclables are currently operating at an optimum level.

6.1 CURRENT CONTRACTS

The LVRC WRRP will be supported by the rationalisation of existing contracts for waste collection and treatment and other existing waste management service arrangements. This will provide consistent waste management levels of service across the region, while considering the differing needs of urban and rural areas. Details of key existing waste contracts and agreements are shown below in *Table 8*.

Table 8 – Existing Waste Management Contracts and Agreements

Reference	Contract Name	Contractor
1.	Gatton Recycling Collection & Processing	ANUHA Services
2.	LVRC Waste Sites Supervision	ANUHA Services
3.	Irrigation Tape Recycling	SteelPlas
4.	Laidley TS DCO	JJ Richards
5.	Laidley TS Bin Servicing	JJ Richards
6.	Rural Bin Sites Servicing	JJ Richards

7.	Laidley Collection	JJ Richards
8.	Gatton Collection	JJ Richards
9.	LVRC Public Places	JJ Richards
10.	Green Waste Mulch	TinLee/Plencove
11.	Miscellaneous (Batteries, Oil & Agricultural Chemicals)	ANUHA Services (Sunstate Metal Recyclers, Transpacific & DrumMuster)
12	Grinding of Green Waste	Various

6.2 CONTRACT ALIGNMENT

Council waste and recycling contracts will continue to be rolled over in the near future due to their expiry dates. The rollover extension period of the Gatton Collection Contract was three months. While this maintains short-term flexibility for Council, the development and implementation of the WRRP will take time. The lead time post-award for a new integrated waste collection contract is in the order of 6 to 9 months (including allowance for truck delivery and mobilisation). Therefore it is estimated that a new consolidated waste collection contract will not be fully operational until mid-2013. If day labour is determined to be the favoured option for any aspect of waste collection or haulage, then a similar time frame is expected.

Considering these constraints LVRC needs to evaluate longer term extensions to existing contracts due for renewal from now on (e.g. 12 months). This approach would cover the interim period until the major new contracts are implemented to both improve certainty to the contractor and lead to possible savings to LVRC. The development of a new integrated waste collection contract should be initiated as soon as possible, with a view to calling for tenders by April 2012. This tender would cover all likely collection options under consideration by the WRRP.

A preliminary review of the risk levels associated with various waste management activities undertaken by LVRC and its Contractors has also been undertaken. This review indicates several opportunities for improvement in Council's risk profile that should be considered in the structure of future waste management contracts. These are:

- Landfill operations are a future high risk activity for LVRC that can expect more scrutiny and reporting obligations under the recent upgrade to the DERM Queensland Waste Strategy and associated legislation. The new waste levy regime will also increase the economic impact of residual waste disposal practices. Therefore, LVRC should review the potential costs and benefits of a landfill operations contract to better address emerging requirements. This may include future facility upgrades to reflect the changing role of the site under the WRRP and landfill operations. LVRC need to ensure they control risk from their landfill activities directly, whether contract or day labour is preferred.
- An integrated waste collection contract will allow the standardisation of service levels across the region, economies of scale and enhanced waste diversion from landfill. It is recommended that LVRC tender for a single

contract with separable portions to assess the widest combination of options and the discounts that may be applicable for awarding multiple portions to a single tenderer. This will also allow bin servicing contracts to be consolidated across LVRC.

- Council could link contracts to service areas with a defined standard of service, depending on the location of the service as follows:

- Urban Services: serve a 10 km radius of urban centres;
- Rural Transfer Stations: serve a 20 km radius;
- Rural Services: other areas greater than 20km from a transfer station.

- Designated green organics drop off locations and processing should be either carried out in-house or contracted to minimise waste to landfill and improve services for rural organic waste generators and special wastes (such as dead animals).
- The recent grant to Anuha Services for the upgrading of the Gatton MRF requires a review of activities at Gatton Landfill. It also presents an opportunity to eliminate health and safety issues associated with Gatton's recycling bag handling and Laidley's split bin collection system. This should be achieved by integrating recyclables collection services with new MRF materials handling design features.

New contracts should be designed with a view to achieving WRRP goals. Contracts should be rationalised and integrated across LVRC region. A suggested list of new contracts is as follows:

- Integrated kerbside waste collection services by 1 July, 2013. (This tender will need to be fast tracked in order to meet this date).
- LVRC bulk waste haulage services by 1 July, 2014. (This tender includes Laidley TS bin haulage to Gatton plus other LVRC bin services consolidated).
- Gatton MRF upgrade by 1 July, 2012 (existing project subject to negotiation with funding sources).
- LVRC resource recovery services by 1 July, 2014 (upgrade of current Anuha Services agreement to suit new MRF operations only and coordination of specialist recyclers. Early contractor involvement type procurement negotiates directly with preferred contractor on an open book basis then locks in service fees apart from indexation).
- LVRC green waste services by 1 July 2013. (Integrated green waste services including supervision, grinding, haulage and central processing by mulching and/or composting or equivalent process - no third bin included).
- Gatton Landfill (operations) by 1 July, 2013 (specification for new landfill cell operations and a site based management plan for use by either day labour or contract staff as determined by LVRC).
- LVRC transfer stations (operations) by 1 January 2013 (specification for supervision of sites and bulky item resource recovery).

LVRC needs to review the financial implications of any early termination of the existing JJR waste management contracts to facilitate the above arrangements and determine transitional arrangements and switchover dates. Alternatively LVRC may wish to vary one of the existing contracts to achieve the outcomes required. LVRC should ensure transitional arrangements are staged and sequenced where inter-dependencies exists.

7 RESOURCE RECOVERY & WASTE MINIMISATION

7.1 HOUSEHOLD RECYCLING

Household recycling is presently rated as poor across the region due to the different systems employed. Both the bag collection system and the split bin system have problems as previously discussed in Section 4.2 and 4.5. The recycling collection contracts should be aligned with a single contractor collecting all household recycling materials across the LVRC area by utilising a second dedicated 240 litre recycling bin. The strategy team believes that this material should be delivered to the expanded materials recovery facility run by Anuha Services and located adjacent to the Gatton landfill facility. Residuals disposal should still take place in the Gatton landfill.

The change from the previous systems is expected to generate a higher volume and weight of recyclable material with less contamination. Actual contamination rates will depend, on the depth of a public education campaign that should be run in conjunction with the recycling bin rollout. This recycling increase has been modelled in the options spread sheets as an improvement of 10%; however this figure is believed to be conservative. Improved household recycling will also assist in meeting the goals of the Waste Reduction and Recycling Act 2011 and the Queensland state target for a reduction of waste disposal to landfill of 50% by the year 2020.

7.2 GREEN WASTE

Green waste is currently collected at transfer stations and the Gatton landfill facility. The green waste is mulched on an as required basis by a local contractor. The mulch generated is reused by the local community. This arrangement should continue with the community encouraged to separate as much green waste as possible for recycling. The recycling of this material is important for both the reduction of waste to landfill and the avoidance of the potential greenhouse gas emissions generated by organic matter decomposing in landfills. As such, the recycling of green waste meets many goals for LVRC:

- Lowers waste to landfill weight;
- Reduction of leachate generation at landfill;
- Reduction of greenhouse gas emissions from the landfill; and
- Limits carbon tax liability.

All of the above points reduce the overall landfill management risk for LVRC at the same time.

7.3 CONSTRUCTION AND DEMOLITION WASTE

Construction and Demolition waste is seen as an easy target for many Local Governments due to the high weight and readily recyclable materials usually present in this waste stream. The Queensland strategy sets high targets for this material, from the 2008 diversion of 35% to a 2020 diversion of 75%. LVRC may drive the recycling of C&D materials by requiring Waste Management Plans (WMP) to be approved for new developments within the region. The WMP should be supported by the following methods.

7.3.1 'DIRTY' C&D MATERIALS RECOVERY FACILITY

A 'dirty' MRF refers to a facility set up to sort and recover recyclable materials from a mixed waste stream as generated from a construction site where all materials are loaded into large bins for disposal to a waste management facility. The equipment used is of an industrial nature other than for a household material recycling facility, but the facility itself is a basic design with a large concrete apron for a sorting floor and room set aside for stockpiling large volumes of separated materials. Processing of waste concrete into aggregate and gravel products are carried out when sufficient materials are accumulated to make the hire / contracting of a crushing machine economic.

The waste strategy team believes that the best management option for LVRC involves the maintenance of the Laidley landfill as a purely C&D landfill, minimising the environmental risk and controls required at that site. All C&D waste should be directed to this facility. As such, it would make the ideal site for a dirty MRF and remain a disposal site for residuals from that facility.

There are two important factors that need to be considered within this recommendation:

1. That a weighbridge be installed at the Laidley transfer station for the correct application of the waste levy to all loads received, and;
2. Full cost accounting is used to determine the appropriate gate fee for loads delivered to this facility.

7.3.2 SOURCE SEPARATION

Source separation at the construction site transfers part of the cost of recycling onto the developer. The theory behind this action is that the developer can implement material separation policies on the work site more cost effectively than trying to separate mixed materials at a later time. While this has some advantages for LVRC there may be problems with space within building sites for the storage of separate waste containers and with the cost efficiency of transporting multiple waste containers that may not be full. This strategy may be more effective on larger building sites than individual residential sites where the higher costs have to be borne directly by a single owner, while larger multi-unit or commercial developments may spread the costs among multiple owners / tenants. LVRC should consider a cut-in point for source separation based on building project size, but also allow for the granting of exemptions where site limitations make this impractical.

7.4 ALTERNATIVE WASTE TECHNOLOGIES

The waste management strategy team reviewed several alternative waste technologies that are currently commercially available in Australia:

- Gasification with energy recovery;
- Mechanical / biological treatment;
- Aerobic composting;
- Anaerobic digestion, and;
- Modular incineration.

At this time, the technologies reviewed, did not meet the assessment criteria for LVRC of being a proven and cost effective technology. Details of an example of an

AWT technology can be found in **Appendix F**. No alternative waste treatment has been recommended for further investigation, however the WRRP is due for review every three years and the evaluation of AWT's should be carried out again during each strategy review. AWT's are still evolving and as they become established and more accurate information is gained on the cost and efficiency of each treatment, LVRC will be in a better position to assess the potential for the use of an AWT.

Detailed waste auditing is needed in order to accurately evaluate potential treatment systems. At the time of compiling this waste strategy limited waste stream makeup data was available to the strategy team.

It is advised that LVRC participate in appropriate study groups that may be formed in order to obtain accurate information concerning emerging AWT's that may meet some regional waste treatment needs in future. Since large scale plants are usually needed for viability and LVRC would not generate sufficient waste volumes to pursue such AWT options alone, LVRC may in future wish to join a regional AWT initiative.

Council has also already received one preliminary expression of interest from a technology provider to establish a small scale 50 tpd modular gasification plant to generate electricity from a thermal process treating various LVRC and imported waste streams. Commercial demonstration plants at the scale proposed are still in the early stages of development at Oakey and Biloela in Queensland. There is still some significant technology risk for the process offered, especially for a MSW plus timber waste feedstock. While it would be prudent for LVRC to monitor the performance of these prototype plants in the short term, it should maintain a watching brief on this process and similar opportunities in future until the level of technology and financial risk to LVRC is reduced. Any procurement of AWT based facilities should follow standard turnkey project delivery processes with appropriate transaction advisers involved due to the level of contractual risk involved.

7.5 WASTE EDUCATION & AWARENESS

The main education and engagement messages are:

- Minimise all types of waste generation;
- Manage potential wastes as resources;
- Opportunities for Waste Avoidance and Resource Recovery available to ratepayers in all areas;
- Local markets developed for Recovered Resources;
- Product stewardship and Extended Producer Responsibility (EPR) concepts encouraged;
- Businesses in manufacturing/supply chain minimise their ecological footprint; and
- Council activities to facilitate Waste Avoidance and Resource Recovery.

7.6 WASTE AUDITING AND FEEDBACK

A good waste management strategy requires knowledge of the waste stream and this stream may change over time with the establishment of new industry and residential housing. The State Government also requires annual reporting by Local Governments on the waste weights (or volumes) generated, recycled and disposed of within their area. For this reason the auditing of waste streams should be carried out on a regular basis to meet the reporting requirements and obtain data that is

relevant to planning for the future waste management of the region. Accurate data may also assist in evaluating options for alternative waste technologies.

Since the WRRP has a review date every three years, it is recommended that a detailed waste audit be carried out prior to the strategy review to align the waste generation figures and allow for the evaluation of potential waste management options. It is noted that LVRC has just carried out a household waste and recycling audit (EnviroCom 2012) and therefore has current data on their household waste stream that may be used as the benchmark for measuring the effectiveness of future initiatives under the WRRP. The EnviroCom waste audit found that there are up to 20% of recyclable materials still going to landfill across the LVRC area. Waste audit information will then feed into the revised projections for capital works and future provisions, leading to a more accurate figure for full cost recovery. The waste audit data may also be used for the annual reporting requirement.

8 LANDFILL MANAGEMENT

8.1 CURRENT FACILITIES

Landfilling activities are carried out at two sites within the LVRC area, Laidley and Gatton. These facilities are discussed in **Sections 3.2.1** and **3.2.2** of this document. Both facilities accept all types of waste materials; however the Gatton landfill facility landfills all types of waste and the Laidley facility diverts MSW and other delivered materials to disposal at the Ti Tree bioreactor facility (located to the west of Ipswich City). The types of materials landfilled at Laidley are mainly C&D materials, which presents an opportunity for the establishment of a recycling facility for this material.

8.2 PROJECTED LIFE

The Gatton landfill facility has a projected life of greater than 20 years. This figure does not take into account the expected increase in the volume of waste to be received following the change of contracting arrangements in 2014. With all the MSW from LVRC being landfilled at Gatton the land reserved for future landfill cells may be developed earlier than currently expected unless recycling gains are able to offset most of the expected increase.

A further consideration may be the increasing population expected to inhabit the region in the future and the locations where new housing will be established. While the area surrounding the Gatton landfill facility is currently mainly undeveloped, this may change. It is a known concept that if residential housing is allowed to encroach on a facility such as a landfill, pressure will be bought to bear for the relocation of the facility. This may bring about the abandonment of the site prior to the full development of the facility.

The Laidley landfill facility has technically, no life remaining as the MSW side of the landfill has closed. Currently C&D waste is accepted for the purpose of engineering a crown shape over the waste cells suitable for capping. This follows the closure plan for the landfill. In contrast to Gatton, the Laidley facility may have an extended life for accepting C&D waste under the WRRP as significant diversion of C&D materials should occur. At the same time, the landfilling of residuals from the C&D waste stream is less likely to result in community action towards an accelerated closure of the facility.

8.2.1 LANDFILL CELL DEVELOPMENT

Landfill cells at Gatton will be required to have lining with leachate capture systems installed. The cells with also require capping and landfill gas capture. If the rate of landfill gas production is sufficient, energy recovery from the waste methane gas should be considered, however a well capped cell should generate only low levels of landfill gas. The most likely event is that there will be an insufficient gas volume produced for economical energy recovery and the gas should be captured and treated / flared to reduce its environmental effects. This will also reduce LVRC's liability under the carbon tax. Monitoring systems should be installed and the capping design should allow for landfill gas capture and flaring systems.

8.2.2 CLOSURE PLANNING

All landfill facilities require a closure plan and in the case of putrescible waste landfills there is a significant post closure monitoring period. The landfill operator or owner may be required to post a bond with DERM and provide reports on routine monitoring rounds in order to prove that there are no adverse environmental effects occurring as a result of the presence of the landfill. The post closure monitoring period is typically 30 years. This expenditure should be provisioned for in the gate fees charged during the active life of the landfill.

Currently on other Council landfills within Australia, trials have been completed for the use of plants to fulfil the capping requirements of closed landfills. This method is called a phytocap. Many conventional compacted clay caps have been found to fail within three to five years of closure. This is mainly due to differential settlement of the waste material as it decomposes, although dry weather conditions may also affect a conventional clay cap. The phytocap consists of a layer of soil cover over the waste, the thickness of which has sufficient field capacity to trap the projected rainfall from even severe rainfall events. The surface of the soil cap is then planted with selected native plant species that both suit the local conditions and are known to transpire large volumes of water. Following rainfall events the soil holds the water while the plants pump the water into their leaves and loose it to the atmosphere.

Plant root zones are also known to break down methane emissions due to enzyme action and this process is still being evaluated as a carbon tax mitigation measure.

8.3 GATE FEES

There is no longer any argument that gate fees must be set for the recovery of the full cost of landfilling, including closure works and post closure monitoring. This is in accordance with the waste and resource management principles of the Waste Reduction and Recycling Act 2011:

(i) the polluter pays principle; and
(ii) the user pays principle;

LVRC should implement full cost accounting for their waste management business unit.

8.4 ENVIRONMENTAL CONTROLS

Environmental controls in regard to waste management activities are detailed in the DERM guidelines. For example ERA 60 – Waste Disposal: landfill siting, design, operation and rehabilitation. These include:

- Air issues (odour management, greenhouse gas emissions, dust);
- Water issues (sediment control, leachate management);
- Noise issues (plant and equipment and traffic), and;
- Waste management practices (litter control, waste handling and storage practices).

Other specific facility environmental controls are covered in state handbooks such as NSW Handbook for Design and Operation of Rural and Regional Transfer Stations (DEC 2006).

8.4.1 CARBON LIABILITIES

Landfill facilities that generate more than 25,000 tonnes of emissions per year (CO2 equivalent), consisting of total covered emissions, legacy emissions and exempt emissions, are required to pay a carbon tax on those emissions. Under this system, the financial year beginning on 1 July 2011 is an eligible financial year. Emissions generated from fuel usage for transportation, heavy equipment and energy usage will have to be taken into account. Annual reporting for Green-House Gas emissions for corporations that emit over the 25KT CO2-e is already required under National Greenhouse and Energy Reporting System and will soon apply to municipalities.

8.5 FUTURE FACILITY PROVISION

This WRRP includes modelling for the provision of a future waste management facility. The waste strategy team considers that there is currently no alternative to landfill, with no zero-waste schemes, no matter how well resourced, achieving success at present. It is also considered that Local Government has always historically managed waste to landfill and this is a well understood part of ordinary business. While some private landfill facilities do exist, exclusive use of these facilities while closing the local facilities would expose LVRC to a higher financial risk of rising gate fees and transportation costs.

The waste strategy team recommends that LVRC identify a future waste disposal site and apply zoning constraint's to this area in order to reserve it for the future development as a landfill facility. Purchase of the land is allowed for between 2015 and 2017, with development of the site commencing in 2017. Although a date of 2017 has been used in the modelling for the development of the site, this is contingent on many of the factors already discussed in Section 8.2. An effectively run waste minimisation and recycling program may extend the life of the current Gatton facility and push back the start date for the establishment of a new site, however the reserving of the site should be carried out as a near term requirement.

8.6 DISASTER WASTE MANAGEMENT OPTIONS

During the recent flood event, the minor waste transfer stations acted as emergency waste receiving sites. Waste materials were stockpiled in vacant areas of each site near impacted areas. Most waste materials were then loaded into hook bins and transported to the Ti Tree bioreactor facility for disposal as quickly as was

practicable. No effort to sort or recycle waste was able to be undertaken under these conditions.

This plan worked effectively under emergency conditions when an enormous volume of sometimes highly contaminated waste was generated in a very short timeframe. It is the recommendation of the waste strategy team that these emergency arrangements be formalised in an emergency response plan that is available to all persons in positions of authority throughout the LVRC area and lodged with the state government's *Department of Community Safety* which uses the *Natural Disaster Relief and Recovery Arrangements (NDRRA)* program to form the State Disaster Management Group.

Issues that the waste strategy team identified from discussions were:

- The presence of asbestos materials mixed into the waste;
- There was limited space at some minor transfer stations requiring an immediate and high level of services to keep them operational;
- There is a need to identify standby facilities in the event that access is cut-off to any of the designated waste receivable sites (one transfer station (Grantham) was isolated by floodwaters for a short period);
- The availability of heavy equipment was limited due to unprecedented demand;
- Large materials were difficult to handle and machinery was needed to break down and compact loads;
- There was no specific method in place for dealing with dead animals and rotting food;
- Several sites reported odour issues, exacerbated by the combination of rainfall, high humidity and high temperature combined with the organic loading of the waste materials; and
- Funding assistance for the additional waste disposal costs was not immediately available.

9 TRANSFER STATION MANAGEMENT

9.1 CURRENT FACILITIES

The current LVRC transfer station facilities consist of:

- Laidley;
- Lockyer Waters;
- Lockrose;
- Heildon;
- Murphy's Creek;
- Withcott; and
- Grantham.

The waste strategy team believes that all of these sites (with the exception of Lockrose) should be retained by LVRC. The Lockrose site should be relocated as per correspondence cited in **Appendix D** due to operational problems arising from its confined site located on a road reserve.

The compaction of waste into the hook bins provided at each transfer station was also seen as an issue by the waste strategy team. It is recommended that LVRC investigate a cost effective method of applying greater compaction to the transfer station loads. The Laidley transfer station achieves the greatest compaction rate by using the bucket of a backhoe to crush the mixed loads into the hook bin. This load density issue will be reduced in the future as waste disposal is bought back to local landfill making the transportation costs less than at present. However; the Laidley contract still has two years to run and short term costs may be reduced by implementing simple measures immediately.

9.2 FUTURE DEVELOPMENT

In 2007 the former Laidley Shire Council determined that the present site of the Lockrose transfer station was not efficient. The site is narrow and can easily become congested. Further to this, the local area is seen as a high growth area under the regional growth plan. The planned development of a major correctional facility in the near area is also expected to lead to higher commercial and residential development. For these reasons, the waste management strategy team believes that this transfer station should be relocated rather than decommissioned.

The Laidley Shire Council report has been bought to the attention of the current LVRC members. The site recommended in that report for the relocated transfer station should be reassessed for suitability. If that site is found to be unsuitable, alternative site options should be investigated and assessed. This relocation should take place prior to the tendering of the aligned waste collection contracts due to be carried out in 2013.

Since the introduction of the Queensland waste levy consideration of methods for charging the levy on waste delivered to transfer stations has to be addressed. The following are two methods by which this may be accomplished:

1. The collection of waste levy fees may be avoided by only accepting MSW and recyclable materials at transfer stations. While this option simplifies the transfer station operation for LVRC it may be seen by residents as a loss of the services they are currently provided with. It is recommended that public education and consultation take place prior to the implementation of this option.
2. Acceptance of all waste types at transfer stations and the charging of the waste levy based on vehicle volume calculations. This method relies on the volume to weight rates provided by the Queensland State Government and may be open to some dispute. The overall weight of waste from each transfer station may be checked to some extent when the waste is delivered to the Gatton landfill where a weighbridge is installed. The waste volume to weight rates will have to be displayed prominently at each transfer station. It is recommended that public education and consultation take place prior to the implementation of this option.

It has been noted by the waste strategy team that LVRC has adopted the first point above with only MSW being accepted at transfer stations for disposal. The exception to this is the Withcott transfer station, which has been designated to accept C&D and C&I materials and is collecting the Queensland waste levy for these materials.

10 WASTE MANAGEMENT STRATEGY OPTIONS

10.1 STAKEHOLDER FEEDBACK

Feedback was sought via a series of consultations with Council members, business leaders and prominent community members in 2010 concerning the waste service levels and costs expected from LVRC. Further telephone comments from LVRC were received following a WSA telephone call to Rockhampton Regional Council (RRC) in 2011 concerning the local government amalgamations in that area and the changes to the waste collections systems initiated across the region. RRC are significant in that they operate their own waste collection fleet, while most other councils have contracted this service. Part of the strategy scope was to consider the possibility of LVRC providing a day labour operated waste collection service.

This WRRP is intended to be released to the public for additional comment following endorsement by Council and prior to adoption by LVRC.

10.1.1 LVRC BUSINESS COMMUNITY

A summary of the stakeholder feedback received is provided in **Appendix E**. The stakeholders consulted consisted of:

- Adjoining Councils (Somerset Regional, Scenic Rim Regional, Ipswich City and Toowoomba Regional);
- Business and Industry sector representatives, LVRC economic development advisor, Strategic town planning and Regional Development advisor, LVRC elected representatives;
- Regulatory Agencies (DERM Regional Officer and DERM Manger - Waste Policy); and
- Significant special precincts representatives (Gatton Correctional Facility and University of Queensland: Gatton Campus).

10.1.2 ROCKHAMPTON REGIONAL COUNCIL FEEDBACK

On 14th October 2011, Ross Lawrence contacted Rockhampton Regional Council's waste services staff to follow up on issues raised in the waste management strategy meeting held at Gatton on Tuesday 13th September. Specifically, feedback was sought on the use of day labour for the collection of waste / recyclables as may be relevant to the LVRC area. Comment was sought from the waste services staff at RRC since RRC is one of only a few Council's that still utilises day labour for their waste collection service. A summary of the RRC consultation feedback is contained in **Appendix H**.

Based on this information, LVRC should note the following:

- The need to carry out a complete waste service audit to identify all rateable properties;
- Full cost accounting of the services intended to be contracted;
- OHS and staffing contingencies;
- Vehicle serviceability and priority repairs by Council or contractor, and;
- Community engagement and education was rated as highly important.

The project team is aware that other Councils use day labour; however feedback was not obtained from these councils. It is recommended that ongoing dialogue be maintained with the relevant Councils.

10.2 LVRC Endorsed Options

The LVRC was presented with an Interim Options Report dated May 2010. Following feedback from LVRC, the waste management strategy project team made a formal recommendation to LVRC for the adoption of Option 2 as shown in the recommendation letter dated 11 November 2011. *Table 9* below shows the breakdown of the major risks and costs associated with each Option.

Table 9 – Risk Profiles

Option	**BAU**	**1**	**2**	**3**
	Existing System with Minor Improvements	**New Collection Limited Local Infrastructure Less Rural Bins Plus Organics**	**New Collection More Local Infrastructure Minimal Resource Recovery**	**New Collection Plus external Disposal Plus Resource Recovery**
Risk Areas				
Environmental compliance	High risk of non-compliance due to multiple uncontrolled sites	Moderate risk of non-compliance due to no provision for new landfill development	Low risk of non-compliance	Moderate risk of non-compliance, dependent on third party performance
Collection Service	Inefficient	Efficiency gains	Efficiency gains	Efficiency gains
Social	Poor Service Image/Ratepayer dissatisfaction Different service levels across region	Improved service but some local amenity issues Caters for recovering resources from agricultural wastes	Improved services with few amenity issues Reaction to closing rural bins	Improved services with few amenity issues except if transport disputes Higher charges overall affect ability to pay
Economic	Low Capital Cost Higher Compliance Costs and Unit operating costs per service	Modest Capital Cost Higher Service Costs	Moderate Capital Costs Lower unit service cost Avoided transport cost and low exposure to	Moderate Capital Costs Higher transport costs and exposure to fuel price increases

			price increases Resource price exposure	Market exposure to potential gate price increases.
Global	Higher carbon	Moderate Carbon Flaring option	Moderate carbon Flaring option	Low carbon from LFG recovery
Cost – 20 yr NPV	***$109.3 M***	***$122.6M***	***$104.1M***	***$118.1M***
Rates	**$581**	**$393**	**$334**	**$379**

BAU – Business as Usual
NPV – Net Present Value

The summary in Table 8 indicates the following:

1. BAU offers a relatively low level of service to ratepayers;
2. Of the options offering service level improvements:

- There is a $14M advantage to Option 2 versus Option 3 which is due to a series of locally based solutions that avoid long distance waste haulage.
- There is a $18.5M advantage to Option 2 versus Option 1 as a result of a greater resource recovery effort for Option 2.
- Option 3 has a $4.5M advantage over Option 1. However Option 3 is more exposed to future cost increases for transportation and is also exposed to potential future increases in gate charges. To provide for risk minimisation, Option 3 reserves, but does not develop suitable available land for a potential new landfill facility.
- It is noted that Option 2 is the lowest cost impost on ratepayers as the universal collection system coverage lowers unit costs i.e. $334 per notice versus $581 for BAU.

This strategy option (Option 2) includes the following major items:

- New regional waste collection contracts (kerbside collection, recyclables collection, bulk bin and community services). A two bin collection service throughout the entire LVRC region;
- MRF upgrade at Gatton Landfill;
- Recycling facility infrastructure upgrade at Laidley transfer station (‘dirty MRF’);
- New cells at Gatton Landfill as required (and identify available future local sites should Gatton Landfill be restricted for any reason, reserve such sites with appropriate land zoning);
- Closure of rural bin sites; and
- Other resource recovery initiatives limited to proven technologies following life cycle assessment process to ensure cost effectiveness.

The financial data in Table 8 can be checked against the modelling spread sheets previously forwarded to LVRC. Option 2 offered the best combination of improved service delivery and value for money while achieving the lowest risk of non-compliance. LVRC is also protected from the potential for disposal cost rises due to the continued use of local landfill facilities and the provision of a site for future landfill use when required. The future adoption of suitable AWT facilities is also feasible due to LVRC retaining control of the waste management facilities.

LVRC notified the waste management strategy team that Option 2 has been formally adopted for the purposes of the WRRP.

	*Collection	*Haulage	*Transfer Stations	*Landfills	*Technology	*Ave Year Total	NPV (20Yr) $M
BAU	1.317	0.316	2.149	2.251	-	6.033	109.3
1	1.592	0.166	1.327	2.036	1.452	6.573	122.6
2	1.528	0.166	1.474	2.542	0.039	5.749	104.0
3	1.592	0.475	1.691	1.407	1.155	6.320	118.1

11 FINANCIAL MODELLING OUTPUTS

WSA proposed five Options (BAU plus four options) for the consideration of LVRC in the interim options report, dated May 2010. Some items have since been ruled out by LVRC following a review of the interim options report. A three bin system (for collecting household organics) was considered as unsuitable at the time by both the consultant team and LVRC. The BAU case plus three Options was then modelled as below in *Table 10*.

Table 10 - Indicative Annual Costs of WRRP Scenarios-$Million

***10 year averaged figures*

Once established the Option 2 average annual costs over the next ten years are lower than BAU by over $320,000 a year or $3.23M over ten years. In addition, it has a $5.3M advantage over BAU in 20 year NPV terms. Further it has a $14.1M advantage over Option 3. It has a minor reliance on mechanical and or biological processing technologies but a greater investment in local long term residual waste disposal sites.

Table 11 - Capital Expenditure (10 Year)-$Million

Scenario	Transfer Stations	Landfill Disposal	Total	Difference to BAU	Key Items
BAU	$6.05	$5.20	$11.25	--	Rural Bin Improvements Minor TS Upgrades Gatton Landfill Gatton MRF Laidley TS Upgrade
1	$8.25	$5.20	$13.45	$2.2	Gatton Landfill Gatton MRF
2	$5.25	$11.80	17.05	$5.8	Gatton Landfill

					Gatton MRF Minor Laidley TS Upgrade New Landfill Preliminaries
3	$12.25	$5.20	$17.45	$6.2	Gatton Landfill Gatton MRF Gatton TS Laidley TS Upgrade

The establishment of Option 2 will necessitate the expenditure of an additional $5.80M over the next ten years compared with BAU. This is a modest annual increment to achieve a higher standard of service and consistent programs across the region. The margin is only $3.6M greater than Option 1. This investment will help realise a
$14-19M benefit compared to other options in the medium term.

11.1 BUSINESS AS USUAL CASE

The BAU case is simply the existing collection system with some minor improvements and the scheduled MRF upgrade (which is occurring via Anuha). The BAU case has been modelled to give a cost comparison between the level of costs that LVRC could expect to pay if no significant changes are made to the current waste management system and the three improved waste management system options.

The modelling does not take into account all the costs involved as it is intended to illustrate the differences between BAU and the options. Costs that are common to all four are not included, therefore the full cost of waste management services in the LVRC region are not shown by the model. The BAU case does not take into account potential fines and compliance orders that may be imposed by the regulatory authority.

The NPV as determined by the model for the BAU case is **$109.3M** over the twenty year modelling horizon.

11.2 OPTION 1

Option 1 includes a new combined regional waste collection contract with minor improvements and an upgraded MRF located at the current site. The proposed new collection contract establishes a two bin collection system across the entire LVRC area. A 240L bin for Municipal Solid Waste (MSW) and a 240L bin for household recycling collection. The establishment of the two bin service also sees the removal of the existing minor transfer stations that have provided this service for rural households.

Option 1 also sees the tendering for innovative organics processing and residuals disposal at Gatton, Laidley or Ti Tree landfills. Rural bin sites are retained, however due to the introduction of the Queensland Waste Levy; this feature has now been deleted from all modelling scenarios. The lack of any controls on the waste materials deposited at the unmanned RBS would expose Council to potential waste levy payments while at the same time present no opportunity for levy collection from the persons depositing the waste materials.

The NPV as determined by the model for Option 1 is **$122.6M** over the twenty year modelling horizon.

11.3 OPTION 2

Option 2 builds on the combined LVRC waste and recycling collection contract with the two bin system and includes the upgrading of the local landfill at Gatton and the MRF at the current site. This option retains the minor transfer stations and also provisions for the construction of a future landfill site by the identifying and reserving of a suitable land parcel. Council would also place rezoning restrictions on the surrounding area as required to provide a sufficient buffer zone between the proposed site and future residential development. Local landfilling also fits with the proximity principle in which waste is not exported but treated and disposed of near the point of generation. At this time the new landfill site is not intended to be developed.

The NPV as determined by the model for Option 2 is **$104.0M** over the twenty year modelling horizon.

11.4 OPTION 3

Option 3 builds on the upgrades discussed in Option 2 with the provision for external disposal of MSW and the construction of a new central major transfer station. This option retains the existing Laidley transfer station but sees the closure of the minor transfer stations. The MRF upgrade is retained on the existing site, innovative organics processing is employed and C&D waste recycling is carried out.

With MSW being disposed of externally only the residual fractions generated from the C&D recycling facilities will require disposal at the local landfills. This option also reserves a future land package for the establishment of the new landfill with appropriate zoning of the surrounding land to preserve the site but does not develop the site at this time. The reservation of a potential future site is seen as a risk management strategy to ensure that LVRC is not locked into outside service providers regardless of the changes to waste management practices that may arise in the future.

The NPV as determined by the model for Option 3 is **$118.1M** over the twenty year modelling horizon.

11.5 RECOMMENDED OPTION

The consultant team recommended the LVRC adopt Option 2 as the preferred option. This recommendation was made in consideration of the costs and benefits delivered by Option 2 being superior to options 1 and 3. The NPV of Option 2 was less than both Option 1 and Option 3 while still delivering significant increases in recycling and risk management at the existing landfills. Furthermore, the closure of the rural bin sites, amalgamation of waste collection service contracts and supply of a two bin system to all rateable properties in the LVRC region will assist in driving down landfilling rates towards the new Queensland waste strategy targets as is required. This recommendation has been discussed at Council meetings and by Council's own waste management group and has been formally adopted for detailed modelling.

12 WASTE REDUCTION AND RECYCLING PLAN

12.1 GOALS AND OBJECTIVES FOR THE WRRP

LVRC should set up a series of programs and goals under the WRRP for achieving the desired outcomes. The details of these programs are shown in *Table 13* below. Key performance indicators should be set to the local level for what is reasonably achievable with the current and proposed infrastructure and service levels. Waste minimisation activities should be assessed with regard to quadruple bottom line (governance, social, economic and environmental sustainability) sustainability criteria.

Table 12 – Goals and Objectives of the WRRP

AREA	OBJECTIVES
Vision	The WRRP will facilitate sustainable growth for the Lockyer Valley Regional community by providing best practice in sustainable management of resources through effective waste minimization, source separation and resource recovery, energy recovery and residual waste disposal. It will enable individuals, businesses and the Council to take responsibility for diverting their own resources through flexible user pays services with a mix of local treatment and transfer facilities and local landfills supported externally by major regional infrastructure and technologies.
Community Plan	The WRRP links to the Community Plan – Our Valley Our Vision - Be Healthy and Safe ; Implement and promote a waste management strategy across the region

Programs	Goals
Waste Minimisation	Prioritise waste minimisation by reducing household waste generation per capita, focusing on universal recycling services, together with a concerted effort to minimize C&I and C&D waste from building activity as well as Council generated waste.
Resource Recovery	To increase amount of resource recovery in LVRC to national best practice over twenty years. All current programs should be maintained with continuous improvement and additional recycling from waste transfer stations, business and away from home public recycling.
Energy Recovery	To consider maximum recovery of available energy resources and minimising fugitive greenhouse gas emissions from existing and former waste disposal sites and transportation operations. A review of a facility to produce renewable energy from LVRC organic waste will be undertaken.
Residual Disposal	Develop local waste disposal infrastructure with sites based on quadruple bottom line governance, environmental, social and economic performance indicators to current practices. Monitor and review future opportunities for the use of regional infrastructure.
Key Performance Indicators	LVRC will establish specific measurable KPI's for each of these program areas and associated key action items.

To assist in monitoring the performance of the new waste collection and recycling contracts and WRRP aims, it is prudent to set key performance indicators on some of the measurable data. One KPI that will assist is measuring the rate of waste generation and waste to landfill (found in *Table 13* below). The data should be obtained from sources such as weighbridge receipts and waste audits.

Table 13 – WRRP Future Targets 2012-2021

KPI TARGET	2012	2014	2017	2020
Per Capita Waste to Landfill (t)	1. 03	0.95	0.85	0.75
Per Capita Total Waste Generation (t)	1.93	1.75	1.45	1.00

Table 13 indicates that compliance with Qld DERM targets is likely to be achieved in the medium term, but funding and contractual constraints limit LVRC's ability to meet short term targets.

12.2 STRATEGIC AREAS / PROGRAM MATRIX

The overall structure of the WRRP can be seen broadly in *Table 14.*

Table 14 – Simplified Overview of the WRRP

LVRC WRRP	HOUSEHOLDS		BUSINESSES	
	Urban	Rural	C&D	C&I
Waste Minimisation	Organics source separated and mulched, new MRF access and user pays fees	Organics source separated and re-used locally	DA conditions for Building - Waste Management Plans (see WRR Act 2011)	EcoBiz and RRF
Resource Recovery	Kerbside Recycling. Tip Shops improved for reuse items, more commercial focus.	Kerbside Recycling. Recycling station & composting for local horticultural market.	Commercial operators in partnership to recover materials and value add.	Future infrastructure/RRF including storage areas for EPR items.
Energy Recovery	Potential for small scale EfW technology using combustible's i.e. gasification.	Potential for small scale EfW technology using combustible's i.e. gasification.	Monitor C&D waste generation rates for potential 'dirty MRF' recycling of materials.	Landfill, performance monitored.
Residual Disposal	Future Transfer Station upgrades and local landfill short term, then AWT/new landfill.	Future Transfer Station upgrades and local landfill short term, then AWT/new landfill.	C&D waste residual to Laidley landfill, minimal environmental controls required	C&I waste residual to Gatton landfill, advanced environmental controls required

RRF – Resource Recovery Forum

12.3 ACTION PLAN

The Action Plan shown in *Table 15* outlines the actions by program proposed to give effect to the WRRP.

Table 15 – Proposed WRRP Action Plan

Reference Section	Action Item	Timeframe
Administration/General		
2.3 - 2.4	Develop waste targets policy within LVRC	Short term
2.3 - 2.4	Endorse DERM litter/dumping policy	Short term
2.4 - 12.1	Review Strategy performance and targets	Annually
2.3 - 14.4	Review of Waste Reduction and Recycling Plan	3 Years

2.3	Provide DERM with annual reports	Annually
2.3 – 10.1.2	LVRC to provide public feedback on performance via Council Annual reports	Annually
2.4	Investigation of future regional contract alignment for economy of scale in waste management activities	Ongoing
	Waste Minimisation	
12.1	Adopt WRRP per capita waste reduction KPI's and reporting	Annually
2.4	Develop waste education material to focus on sustainability, based on the regional resource kit on waste avoidance from SEQ Council of Mayors	Short term
	Develop Council advocacy framework	Short term
2.4 - 7.3.1	Develop a plan for C&D recycling	Medium term
7.3	Require a Waste Management Plan with all Development Applications	Medium term
12.1	Assess waste minimisation using Quadruple Bottom Line (governance, social, economic and environmental sustainability) criteria	Medium term
2.5	Promote national Extended Producer Responsibility schemes such as electronic waste with future drop off points	Medium term
13	Develop sustainable procurement policy for Council	Medium term
5.5	Incorporate hazardous household waste drop-off areas in new infrastructure and monitor collections for improvements	Short term
	Resource Recovery	
14.3	Conduct feedback campaign for performance and customer bin non-compliance	3 years
2.3	Invest in new public area recycling collection points	Long term
6.1 – 7.2	Review local and regional markets for commodities including organics	Short term
2.3	Review and trial options for recovery of resources and organics and use by community groups i.e. Men's Sheds/Community Gardens etc.	Medium term
2.4	Investigate options to increase diversion of resources from bins	Ongoing
2	Monitor State and Regional Policy on Diversion	Ongoing
12.1 - 15	Review options for assisting business and industry to increase resource recovery	Ongoing
12.2	Deliver Infrastructure for bulk transfer and resource recovery review service levels	Medium term
	Energy Recovery	
7.4	Review available Energy from Waste (EfW) technologies	Ongoing
2.6	Monitor National GHG emissions targets and carbon capture performance	Ongoing
2.3 - 2.6	Annual Report on LVRC waste quantities and GHG emissions and CPRS Mitigation needs	Annual
	Residuals Disposal	
12.4.1	Develop medium term operations plan for Waste Services, including full cost pricing, hours of operation and service standards for waste facilities	Medium term
8.2.2	Maximise landfill life and develop landfill closure	Short term

	plans, as required	
8.5	Life Cycle Assessment of waste disposal services contract to select reserve landfill site	Ongoing
2.3	Monitor and report landfill tonnage & diversion rate using new standard waste datasets	Medium term
2	Monitor any government or private regional Landfill initiatives	Ongoing

12.4 WRRP IMPLEMENTATION

Feedback from LVRC has indicated their preference for strategic Option 2 as the scenario for future waste management planning. On this basis, a preliminary assessment of issues related to WRRP implementation has been undertaken. One important dimension of this assessment is to consider whether particular services could be carried out on a day labour basis. The basic assumption of modelling undertaken to compare broad strategic options was that all services would be contracted through appropriate tender processes. These issues are discussed further in the following Sections.

12.4.1 WASTE COLLECTION

Existing services are contracted to the private sector. Due to historical circumstances, former Gatton and Laidley areas are covered by separate contracts based on different bin configurations. In addition, the combined service area does not extend to all rural properties. These services require a high level of availability and performance and benefit from the economy of scale available to contractors. The nature of contracts in this sector leads to a competitive market place and continuous innovation. These factors could be expected to lead to competitive prices for an integrated waste collection tender for the entire LVRC area. A single contract with separable portions leaves the widest opportunity for competitive tenders and could include an in-house bid for any portion council believed it could manage appropriately. Contracting out waste collection services is considered to lead to benefits ranging from 10–20 per cent.

12.4.2 WASTE TRANSPORTATION

The existing long haulage contract from Laidley to Ti Tree is tied to the Laidley transfer station operations under a design, build and operate contract. After this contract expires in 2014 waste transportation will become a relatively short haul arrangement with lower risk profile. LVRC may consider that it could undertake such services using its own resources following this transition. Alternatively, it could tender for such services to take advantage of recent bulk transport innovations.

12.4.3 RESOURCE RECOVERY

Processing of resources recovered from source separated collections is currently undertaken at Gatton MRF. This facility will be upgraded to provide sufficient capacity for recovery of select secondary resources from the whole LVRC waste stream. Anuha Services, the incumbent contractor is therefore likely to have a continuing role in this area. Such services should be undertaken under appropriate performance based contract to ensure LVRC objectives are met through partnering.

12.4.4 WASTE DISPOSAL

The level of environmental and compliance risk to Council associated with the changed regulatory regime for landfills, in the post waste levy environment, suggests that LVRC could manage their own risk by outsourcing landfill operations to a contractor, having regard to the recently upgraded DERM enforcement regime. Recent quotes received by Western Downs Regional Council suggests that a contractor can offer plant and equipment at reduced hourly rates (up to 50% less) due to the differences in accounting rules (including amortisation periods and financing) for local government and the private sector. These factors suggest landfill operations could be tendered at least for Gatton Landfill with strict pre-qualification requirements around management and compliance systems and technical competency.

12.4.5 MINOR TRANSFER STATIONS

The waste levy legislation requires a greater degree of control and supervision at MFS facilities to minimise council risk. There is an opportunity for LVRC to provide supervision and staffing for operation of the facilities that will continue. Alternatively, a single contract for these services across LVRC could be awarded. LVRC may also wish to engage a third party to handle all gatehouse functions involving cash receipts or move to automated accounts or voucher based systems for these sites.

13 SUPPORTING POLICIES

13.1 SUSTAINABLE PROCUREMENT PLAN

Several similar Councils in the state have adopted or are in the process of developing a sustainable purchasing policy that includes provision for green purchasing and the use of recycled materials in its own purchasing of goods and services. Consideration could be given to the inclusion of a specific target for the percentage of purchase orders that include recycled product. A better indicator could be the quantity or value of recycled product utilised or the annual avoided greenhouse emissions arising from the substitution of recycled product. LVRC could review this aspect in their contract management department. Amendment of the contracting documents is required to include provision for recycled materials in Council's construction projects. Some examples include the:

- Inclusion of recycled crushed concrete in site civil works (specifications are dependent on the proposed infrastructure);
- Recycling of glass fines in works programs as aggregate or fill.

14 WRRP ADMINISTRATION

14.1 STRATEGIC PLAN

The WRRP for the LVRC was postponed to facilitate the inclusion of all the recent post-amalgamation changes to infrastructure and extensions to contracted services and facilities in the plan. This document now satisfies this obligation.

14.2 AMENDMENT

Council may choose to initiate a review of this WRRP before the date nominated in the legislation (WRR Act 2011) under any of the following circumstances:

- Changing local collaborative waste management opportunities;
- Changing waste industry or technologies;
- Matters arising from any Council review of compliance issues; and/or
- Any other matter Council considers relevant.

14.3 PLAN EXPIRY

Each WRRP is required to be reviewed within three years. Therefore, it is proposed to take this date from the end of this financial year, giving a planned expiry date of 30 June, 2015. At this time the review process may consider the development of a new local landfill site and/or the adoption of a suitable alternative waste technology for processing waste materials. The review process should also conduct a feedback campaign to determine the current WRRP performance and assess the reasons for any bin non-compliance issues (if there are any bin non-compliance issues).

14.4 REVIEW DATE

In order to ensure that Council adopts an updated plan by either the expiry date or as soon as possible thereafter, it is proposed that a formal independent review be initiated by 31 December, 2014.

15 CONCLUSIONS AND RECOMMENDATIONS

This waste management Strategy concludes that Option 2, as modeled for the LVRC represents the best value in overall service delivery to ratepayers and risk minimization for LVRC. The combined contracting process has the potential to deliver savings on the current separate contracts and institute a two bin household waste and recycling bin for all rate able properties. This would feed recyclables into an expanded local MRF run by the local church based group, Anuha Services, assisting in making that operation more efficient in the process and reducing risk in that work environment. It is also possible that LVRC may tender on a fully priced basis for some or all separable parts of the new waste contracts.

It is recommended that:

- Council immediately negotiates contract extensions with current service providers to achieve a common termination date for all waste services. The recommended date is that of the termination of the current waste contract for the former Laidley region;
- Council uses gate fees as one of their appropriate price signals to the community and the business supply chain concerning sustainable outcomes through waste minimisation, and to encourage source separation and local resource utilisation;
- A full cost recovery model for waste services be implemented using a combination of gate fees, rates and a Local Government levy;
- Council maintain a watching brief on potential future AWT's suitable for the region;

- A waste education campaign be included in the Council's waste reduction measures for homes (including recycling education) and that Council encourages the business sector to adopt EcoBiz or similar programs for the reduction of commercial and industrial waste streams;
- LVRC carry out a round of public consultation on the future of the regions waste and recycling collection, reuse and disposal options.

16 LIMITATIONS

Waste Solutions Australia Pty Ltd has prepared this Waste Reduction and Recycling Plan for the use of the Lockyer Valley Regional Council in accordance with generally accepted consulting practice. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report may not contain sufficient information for purposes other than for the client and its respective consulting advisers.

The accuracy of the assessment made in this report is dependent upon the accuracy and reliability of evidence drawn together from a number of sources. The field investigations on which this report is based were restricted to a level of detail appropriate for the current stage of the project. Waste Solutions Australia Pty Ltd has taken steps to ensure the accuracy and reliability of field observations and investigations. It is important, however, that the limitations of the assessment be clearly recognised when the findings of this study are being interpreted. This report is based on information derived partly from other parties over which Waste Solutions Australia Pty Ltd has no control.

The report is based on conditions encountered in a limited quantity of available data. Investigations have not been conducted to ascertain all possible waste streams in the Lockyer Valley region, or to investigate all possible waste strategy options.

17 REFERENCES

ALOA 2012: http://www.aloa.com.au/ *Spedding - What is true cost of carbon from landfills?*

EnviroCom 2012: Waste Stream Audit 2011, Assessment of the General Waste and Recycling Streams, Lockyer Valley Regional Council, February 2012.

Hyder Consulting (2009): Waste and Recycling in Australia, Amended report, Hyder Consulting 19 November 2009.

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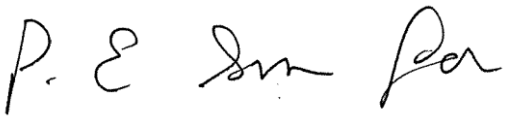

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APPENDIX A

STRATEGY DELIVERY PATH – OPTION 2

APPENDIX B

WASTE AUDIT RESULTS

APPENDIX C

OPTIONS MODELLING OUTPUTS

APPENDIX D

INFORMATION SUPPLIED BY LVRC
(Commercial in Confidence)

APPENDIX E

STAKEHOLDER FEEDBACK SUMMARIES

APPENDIX F

ALTERNATIVE TECHNOLOGIES
(Commercial in Confidence)

APPENDIX G

COUNCIL CORRESPONDENCE
(Commercial in Confidence)

APPENDIX H

ROCKHAMPTON REGIONAL COUNCIL CONSULTATION FEEDBACK
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